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MAR 2005

Date: March 31, 2005
Refer To: ER2005-0180

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SUBJECT: SUBMITTAL OF INVESTIGATION WORK PLAN FOR CONSOLIDATED SOLID WASTE MANAGEMENT UNITS 16-007(A)-99 (30S LINE) AND 16-008(A)-99 (90S LINE) AT TECHNICAL AREA 16

Dear Mr. Bearzi:

Enclosed is one copy of the Investigation Work Plan for Consolidated Solid Waste Management Units 16-007(a)-99 (30s Line) and 16-008(a)-99 (90s Line) at TA –16. Also enclosed is one electronic copy of the document. This deliverable is being provided pursuant to Section VI.D.2 of the Compliance Order on Consent.

If you have any questions, please contact Don Hickmott at (505) 667-8753 or Lance Woodworth at (505) 665-5820.

Sincerely,

David McInroy, Deputy Project Director
Environmental Stewardship
Los Alamos National Laboratory

Sincerely,

David Gregory, Federal Project Director
Department of Energy
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Enclosures: Investigation Work Plan for Consolidated Solid Waste Management Units 16-007(A)-99 (30S Line) and 16-008(A)-99 (90S) at Technical Area 16

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Document Title: **SUBMITTAL OF INVESTIGATION WORK PLAN FOR CONSOLIDATED SOLID WASTE MANAGEMENT UNITS 16-007(A)-99 (30S LINE) AND 16-008(A)-99 (90S LINE) AT TECHNICAL AREA 16**

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

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LA-UR-05-1694
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Investigation Work Plan for Consolidated Solid Waste Management Units 16-007(a)-99 (30s Line) and 16-008(a)-99 (90s Line) at Technical Area 16

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Prepared by
Environmental Stewardship–Remediation Services

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Investigation Work Plan for Consolidated Solid Waste Management Units 16-007(a)-99 (30s Line) and 16-008(a)-99 (90s Line) at Technical Area 16

March 2005

Responsible project leader:

Printed Name	Signature	Title	Organization	Date
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EXECUTIVE SUMMARY

This work plan presents the proposed investigation activities required to complete the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) into consolidated Solid Waste Management Units (SWMUs) 16-007(a)-99 (the 30s Line) and 16-008(a)-99 (the 90s Line) at Technical Area 16 (TA-16) within Los Alamos National Laboratory. The 30s and 90s Lines include structures within the post–World War II era S-Site complex which were used historically to process high explosives (HE).

Consolidated SWMU 16-007(a)-99 consists of four backfilled ponds, each approximately 100 ft square [SWMU 16-007(a)]; former machining buildings 16-31, 16-32, and 16-33, including their associated sumps and drainlines [SWMUs 16-025(e), 16-025(f), and 16-024(e), respectively]; and two former magazines [SWMU 16-024(c) and Area of Concern (AOC) 16-024(d)]. Consolidated SWMU 16-008(a)-99 consists of one pond (not previously backfilled) approximately 200 ft in diameter [SWMU 16-008(a)]; HE-machining and electroplating buildings 16-89 [SWMU 16-017(e)-99], 16-90 [SWMU 16-017(d)-99], 16-91 [SWMU 16-017(c)-99], 16-92 [SWMU 16-017(a)-99], and 16-93 [SWMU 16-017(b)-99]; sumps [SWMUs 16-029(k, l, s, t, u)]; outfalls [SWMUs 16-026(m, n, o, p)]; and a drum storage area (AOC C-16-067).

Although soil remediation has been completed for the 30s and 90s Line buildings and associated sumps, drainlines, and outfalls, additional investigation sampling and analysis will be conducted at selected locations to evaluate the nature and extent of contamination. These investigations may lead to future cleanup activities. The investigation activities proposed in this work plan are also associated with the 30s and 90s Line settling ponds [SWMU 16-007(a) and SWMU 16-008(a), respectively], for which the nature and extent of contamination are not fully defined.

Analytical results for environmental samples collected at the 30s Line ponds in 2004 provided enough information to determine both the vertical and lateral extent of soil contamination in all but the northernmost pond. Based on a comparison of analytical results with background or fallout values and New Mexico Environment Department industrial soil-screening levels, the RFI data collected at the 30s Line ponds indicate that HE concentrations are low enough in the southern three ponds that soil excavation is likely not warranted. Sample data collected in 1989 from the 90s Line pond indicate that there may be soil and groundwater contamination that may require soil removal as part of an interim remedial action. As of March 2005 standing water in the 90s Line pond has prevented the installation of the characterization borings.

Evaluation of historical environmental data generated during voluntary corrective action activities associated with the 90s Line and data collected in 2004 for the 30s Line resulted in the identification of the following contaminants associated with the sites: HE, semivolatile organic compounds, volatile organic compounds, metals, and radionuclides.

To determine the nature and extent of contamination, additional characterization activities are required at the 30s and 90s Lines. This work plan presents a strategy for further characterizing the lateral and vertical extent of contamination associated with these settling ponds and other SWMUs associated with them. The information collected from this investigation will help define the scope of any additional remedial actions for contaminated soil and groundwater associated with the 30s and 90s Lines.

Characterization activities for the 30s Line will include installing

- three shallow (~15 ft) borings in the northernmost 30s Line pond, which will be used to determine the lateral extent of soil contamination noted in two borings installed during the most recent field investigation;

- an intermediate-depth (~150 ft) boring adjacent to the three shallow borings to determine the vertical extent of contamination;
- two intermediate-depth borings in the 30s Line ponds area to determine the vertical and lateral extent of any contamination at depth;
- one shallow boring at the locations of each of the former 30s Line sumps; and
- two shallow borings within the building footprints of each of the three former 30s Line buildings.

Characterization activities for the 90s Line will include installing

- four shallow (~15 ft) borings in the pond (these four shallow borings were scheduled to be installed during the November 2004 field investigation but standing water in the ponds has prevented drill rig access);
- two shallow borings on the north and east sides of the 90s Line pond to evaluate the lateral extent of shallow soil contamination;
- three intermediate-depth (~ 150 ft) borings in the 90s Line pond area to assess the extent of contamination at depth and near the Qbt 3/Qbt 4 contact (a zone of perched ephemeral groundwater was previously noted at this depth; therefore, an assessment of groundwater—if encountered—will also be performed using these three intermediate-depth borings);
- shallow borings associated with the former 90s Line buildings, sumps, and drainlines (one boring at the former locations of each sump and two shallow borings within the building footprint of each 90s Line structure);
- two shallow borings at the location of a former drum storage area;
- a series of shallow borings in the 90s Line drainage channels using a hand auger or power auger, based on existing geomorphic features; and
- additional hand auger borings within the 90s Line pond to assess the lateral extent of contaminated pond sediments and to determine the waste volumes associated with the pond.

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1.0 INTRODUCTION

Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility owned by the U.S. Department of Energy (DOE) and managed by the University of California. The Laboratory is located in north-central New Mexico, approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory covers 40 mi^2 of the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep canyons containing perennial and intermittent streams running from west to east. Mesa tops range in elevation between 6200 and 7800 ft above mean sea level (msl).

The Laboratory's Environmental Stewardship–Remediation Services (ENV-RS) project, formerly known as the Environmental Restoration (ER) Project, is part of a national effort by the DOE to clean up sites and facilities formerly involved in weapons research and production. The goal of the ENV-RS project is to ensure that past operations under the DOE do not threaten human or environmental health and safety in and around Los Alamos County, New Mexico. To achieve this goal, ENV-RS personnel are currently investigating sites that potentially have been contaminated by past Laboratory operations. The sites under investigation are either solid waste management units (SWMUs) or areas of concern (AOCs).

This investigation work plan addresses the high explosives (HE) ponds areas, which include consolidated SWMUs 16-007(a)-99 (the 30s Line) settling ponds, and 16-008(a)-99 (the 90s Line) at Technical Area 16 (TA-16) (S-Site). These SWMUs consist of former HE-processing buildings, former materials storage buildings, sumps, drainlines, and outfall systems (drainages) that were associated with the 30s and 90s Lines. The settling ponds were used to store wastewater generated in the nearby buildings during HE-processing operations. The wastewater in the settling ponds was known to contain hazardous and possibly radioactive components and is, therefore, undergoing the Resource Conservation and Recovery Act (RCRA) corrective action process. Both the 30s and 90s Lines [SWMUs 16-007(a)-99 and 16-008(a)-99, respectively] are included in this work plan because they are so close geographically and because they have similar contaminant sources. It is also likely that any further cleanup at both sites would be completed in a single field campaign using similar methods.

The administrative authority (AA) over work performed by ENV-RS at a site depends upon the site's history and the type of contaminant(s) present, or potentially present, at the site. Under the New Mexico Hazardous Waste Act (NMHWA), the New Mexico Environment Department (NMED) has authority over the cleanup of sites with hazardous wastes or certain hazardous constituents. DOE has authority over the cleanup of sites with radioactive contamination. Radionuclides are regulated under DOE Order 5400.5, "Radiation Protection of the Public and the Environment," and DOE Order 435.1, "Radioactive Waste Management."

This work plan describes proposed work activities that will be executed and completed in accordance with the NMED Compliance Order on Consent dated March 1, 2005. This work plan contains data regarding radioactive contaminants, the management of which is regulated under the Atomic Energy Act and is specifically excluded from regulation under RCRA and NMHWA. These data are provided to the NMED for informational purposes only.

1.1 General Site Information

TA-16 is located in the southwest corner of the Laboratory (Figure 1.1-1). TA-16 covers approximately 2410 acres (3.8 mi^2) and is on a portion of land that was acquired by the Department of the Army for the Manhattan Project in 1943. TA-16 is bordered by Bandelier National Monument along State Highway 4 to the south and by the Santa Fe National Forest along State Highway 501 to the west. To the north and east it is bordered by TAs 8, 9, 11, 14, 15, 37, and 49 (Figure 1.1-1). Water Canyon, a 200-ft-deep ravine

with steep walls, separates State Highway 4 from active sites at TA-16. Cañon de Valle forms the northern boundary of TA-16. TA-16 is surrounded by a security fence.

SWMUs 16-007(a)-99 (the 30s Line) and 16-008(a)-99 (the 90s Line) are located near the western end of TA-16 (Figure 1.1-2). The 90s Line pond is all that remains of the 30s and 90s Line production facilities. Buildings associated with the discharge to the 30s Line ponds were destroyed by burning during January and February 1960; this included former buildings 16-30, 16-31, 16-32, and 16-33. Only drains from 16-31, 16-32, and 16-33 discharged to the 30s Line ponds. The buildings associated with the discharge to the 90s Line pond were decommissioned between August 1995 and September 1996. Decommissioning activities included the demolition of buildings 16-89, 16-90, 16-91, 16-92, and 16-93, 16-99, and the removal of ten concrete sumps, blast shields, drainlines, earthen berms, and asphalt roadways. Most materials were recycled; however, some of these materials were classified as hazardous waste and were, therefore, disposed of off-site. Thrap (1970, 05784, p. 2) indicates that the 90s Line pond received waste only from the HE sumps at buildings 16-89, 16-90, and 16-91.

Historically, the 30s and 90s Lines were used for HE-processing operations. These included electroplating and machining. All the ponds were/are unlined and likely received wastes contaminated with HE and barium and, possibly, uranium, organic cleaning agents, and machining oils.

This work plan presents the results of historical investigations, including the Phase I RCRA facility investigation (RFI) of the 30s Line ponds and the voluntary corrective action (VCA) at the 90s Line (LANL 1997, 87847). This work plan also contains descriptions of site background, site conditions, the scope of investigation activities to continue the RFI, investigation methods, and an anticipated schedule for completing the field activities. Appendix A lists the acronyms and abbreviations used in this report and contains a glossary. Appendix B describes the historical investigations of the 30s and 90s Lines, including pre-RFI and Phase I RFI activities and analytical results. Appendix C, which is on a compact disc included with this work plan, provides a summary of all previous sampling data. Appendix D presents a plan for the management of investigation-derived waste (IDW).

1.2 Investigation Objectives

The objectives of this work plan for SWMUs 16-007(a)-99 and 16-008(a)-99 are to

- present the current knowledge about the nature and extent of contamination based on existing data;
- establish the rationale for sampling and analysis at the 30s Line and 90s Line ponds and adjacent areas; and
- identify appropriate methods and protocols for collecting, analyzing, and evaluating data to complete characterization.

SWMU 16-008(a) specifically is subject to the conditions of the NMED Compliance Order on Consent. However, the background, operational history, geographic setting, and proposed sampling of SWMUs 16-007(a)-99 (the 30s Line pond) and 16-008(a)-99 (the 90s Line pond) are similar; therefore, the investigation activities described in this work plan encompass the 30s Line and 90s Line ponds and adjacent areas of former processing facilities.

2.0 BACKGROUND

2.1 Operational History and SWMU Descriptions

TA-16 was established to develop explosive formulations, cast and machine explosive charges, and assemble and test explosive components for the U.S. nuclear weapons program. Almost all the work has been conducted in support of the development, testing, and production of explosive charges for the implosion method. Present-day use of this TA is essentially the same, although facilities have been upgraded and expanded as explosive and manufacturing technologies have advanced. This section provides a summary of the historical and current characteristics of consolidated SWMUs 16-007(a)-99 and 16-008(a)-99. Detailed SWMU descriptions are presented in the historical investigation report (HIR), which is provided as Appendix B to this document.

2.1.1 Consolidated SWMU 16-007(a)-99

Consolidated SWMU 16-007(a)-99 (Figure 1.1-2) includes

- four settling ponds—SWMU 16-007(a)
- three former HE-machining buildings—16-31 [SWMU 16-025(e)], 16-32 [SWMU 16-025(f)], and 16-33 [SWMU 16-024(e)], including their associated sumps and drainlines
- two former magazines—16-30 [SWMU 16-024(c)] and 16-34 [AOC 16-024(d)]

These are shown on Figure 2.1-1. Descriptions of individual SWMUs and structures associated with consolidated SWMU 16-007(a)-99 are summarized in Table 2.1-1 and discussed in detail in the HIR (Appendix B). HE-machining buildings 16-31, 16-32, and 16-33 were operated from 1944 to the early 1950s. During the 1950s, the buildings were converted to purposes other than HE machining. On a 1950s list of structures, 16-31 is listed as a hot-cold chamber, 16-32 is listed as an x-ray building, and 16-33 is listed as an additive storage building (Engineering Department, 1959, 05778, p. 1). The buildings were destroyed by intentional burning during 1960. Magazines 16-30 and 16-34 were built in June 1945. Magazine 16-30 was intentionally burned in 1960, and magazine 16-34 was demolished at a later, unknown date (LANL, 1997, 56660, pp. 36 and 44).

Four settling ponds [SWMU 16-007(a)] located approximately 100 ft southwest of building 16-90 (Figure 2.1-1) received wastewater discharge from buildings 16-31, 16-32 and 16-33. Each of these 30s Line ponds were approximately 100 ft by 100 ft , flat-bottomed, and aligned in a row from northwest to southeast. The ponds were located on a level mesa in depressions 8- to 10-ft deep. Berms 4- to 6-ft high separated the ponds. Aerial photographs from the 1940s and 1950s show the ponds containing liquids (Figure 2.1-2). In the 1960s, the ponds were excavated and filled as part of the S-Site demolition and restoration activities (Thrap, 1970, 05784, p. 2), and the area is now level with the mesa and covered with grasses (Figure 2.1-3). The ponds are believed to have received HE-contaminated liquids containing barium and, possibly, organics. Based on the results of the 2004 Phase I RFI sampling that was conducted within the backfilled 30s Line ponds, inorganic compounds and HE are the primary contaminants of concern. Low levels of other organic compounds (e.g., polycyclic aromatic hydrocarbons, volatile organic compounds [VOCs], and semivolatile organic compounds [SVOCs]) were also detected above the laboratory method detection limits. The detailed analytical results are summarized in Appendix B.

2.1.2 Consolidated SWMU 16-008(a)-99

Consolidated SWMU 16-008(a)-99 (Figure 1.1-2) includes

- sumps—SWMUs 16-029(k), 16-029(l), 16-029(s), 16-029(t), and 16-029(u)
- drainlines and outfalls—SWMUs 16-026(m), 16-026(n), 16-026(o), and 16-026(p)
- a drum storage area—AOC C-16-067
- a settling pond—SWMU 16-008(a)
- buildings—16-89 [SWMU 16-017(e)-99], 16-90 [SWMU 16-017(d)-99], 16-91 [SWMU 16-017(c)-99], 16-92 [SWMU 16-017(a)-99], and 16-93 [SWMU 16-017(b)-99]

Descriptions of the individual SWMUs and structures associated with consolidated SWMU 16-007(a)-99 are summarized in Table 2.1-1 and discussed in detail in the HIR (Appendix B). Most of the 90s Line structures were built in 1950 and operated from 1950 to 1970. They were primarily used to machine HE, although TA-16-93 was also used for electroplating HE. Use of the buildings for HE machining was heaviest in the early 1950s, before the TA-16-260 HE-machining building became operational. In the 1960s and 1970s, buildings 16-91 and 16-92 were also used for cleaning and refurbishing HE-contaminated equipment, which resulted in uranium contamination of the latter building. After 1970, all of the buildings were used for storage until they were removed from service in 1991. Outfalls from buildings 16-92 and 16-93 discharged into a small drainage that feeds into Cañon de Valle. Outfalls from buildings 16-89, 16-90, and 16-91 discharged into drainages that feed into the 90s Line pond (Figure 2.1-1).

The 90s Line pond [SWMU 16-008(a)] is an inactive, unlined settling pond, 200 ft in diameter, that received liquid waste from the HE sumps and drainlines. The pond was approximately 10 to 15 ft deep. Wastewaters entering the 90s Line pond were likely contaminated with HE, barium, and, possibly, uranium and organics. The 90s Line pond has never been cleaned up. Currently (March 2005), the pond contains runoff water, although this generally dries up during the summer months and the pond has been dry during the recent drought.

During the 1996 90s Line VCA activities, soil, sediment, and tuff containing site-related contaminants were excavated until results from confirmatory analytical samples were below cleanup levels set to one-half of industrial preliminary remediation goals. Soil removals were based on both field-screening and laboratory data. The cleanup goals, which were presented in the VCA plan (LANL, 1996, 53841, pp. 40–41), were the applicable cleanup standards at the time of the VCA activities. The contaminants remaining in place, but below cleanup standards applicable during the VCA, include HE, VOCs, SVOCs, polycyclic aromatic hydrocarbons (PAHs), and inorganic compounds. See Appendix B for descriptions of soil removals and for analytical results from this investigation.

2.2 Land Use

Currently, the area that comprises SWMUs 16-007(a)-99 and 16-008(a)-99 is not used for specific Laboratory operations, although it lies within the current TA-16 HE exclusion zone. The nearest permanent residents to the SWMUs are in the town of Los Alamos, 6 mi to the northeast. Public access to the site is restricted by security fences, guards, HE-access control, and other site controls. Entrance to the site requires a security clearance. The Laboratory does not anticipate that the land use at TA-16 and surrounding TAs will change in the future. NMED has previously approved industrial (site-specific) risk

scenarios for sites near the ponds such as TA-16-260 (LANL, 1998, 59173) and V-Site (LANL, 1997, 55512). Residential use is not considered a likely potential future land-use scenario.

2.3 Relationship to Other SWMUs and AOCs

Several groups of nearby SWMUs and AOCs also have the potential to influence aspects of the investigation for SWMUs 16-007(a)-99 and 16-008(a)-99 (Figure 2.1-1). These areas were associated with radiographic inspection activities in addition to HE-machining operations and storage.

2.3.1 T-Site Complex

Decommissioned TA-24 (T-Site) is located in the northwestern portion of TA-16, northwest of the TA-16 ponds (Figure 2.1-1). Most of the SWMUs and AOCs at T-Site were consolidated into SWMU 16-034(b)-99. Descriptions of structures and SWMUs associated with T-Site are provided in Table 2.3-1. T-Site is located northwest of the S-Site explosives-manufacturing complex. T-Site was built in 1944 and was used primarily for radiography of HE and metal parts used in the Fat Man implosion device. The site is currently devoid of structures, and trees have overgrown the northern portion of the site. Runoff from the site drains to the east and north.

TA-24 ceased to be an active site in the fall of 1950 (Martin and Hickmott, 1993, 59423, p. 1). Site activities were transferred to the newly constructed GT-Site, located at the old Anchor East Site. Most of the structures remaining at TA-24 were destroyed by burning in February 1960. The residual debris from the burning and the remaining subsurface structures were cleaned up in 1966. HE was remediated to better than 3 weight percent (wt%) (Martin and Hickmott, 1993, 87662, p. 1), and radionuclides were cleaned up to background levels using 1960s hand-held screening equipment (Buckland, 1966, 05060, p. 1).

All of the structures at TA-24 were surveyed for radiation, HE, and toxic compounds prior to being burned (LANL, 1994, 39440, p. 5-481). Unless otherwise noted, the results of these surveys were negative (LANL, 1994, 39440, p. 5-481). A former site worker (Blackwell, 1983, 36408, p. 5) recalled that most of the structures at T-Site were contaminated with uranium-238; however, examination of documentation of the radiation surveys done in the late 1950s suggests that only a subset of the structures at T-Site were uranium-238-contaminated. All of the structures at T-Site were free of residual radioactivity in 1966 when they were resurveyed after being burned (Buckland, 1966, 05060, p. 1). The areas of potential contamination consist of surface (building footprints) and subsurface soils (a septic system and sump). The principal contaminants are inorganic chemicals, HE, VOCs, SVOCs, and radionuclides.

2.3.2 TA-16-99 Area

The TA-16-99 area (Figure 2.1-1) includes

- the two sumps at building 16-99, their drains, and the outfall [SWMU 16-029(q)], a drum storage platform (AOC 16-064), and building 16-99 [SWMU 16-017(f)-99] [consolidated SWMU 16-029(q)-99];
- SWMUs 16-024(b) and 16-017(g)-99, which contain potentially contaminated surface soil associated with HE magazines 16-74 and 16-80, respectively;
- SWMU 16-012(a2), an interim storage area proposed for no further action (NFA) in the Operable Unit (OU) 1082 RFI work plan (LANL, 1993, 20948, p. 6-8);

- SWMU 16-025(c), utility building 16-35, which supported machining buildings 16-31, 16-32, and 16-33 and which is administratively complete; and
- AOC C-16-066, a former storage area located south of the 30s Line, which is administratively complete.

TA-16-99 was primarily used for sawing the risers off cast explosives. Structures and SWMUs associated with the building 16-99 area are described in Table 2.3-1.

Contaminated soils associated with 16-99 were also cleaned up as part of the 1996 VCA at the 90s Line (LANL 1997, 87847, pp. 99–102). Principal contaminants are HE, inorganic chemicals, and VOCs.

2.3.3 Radiography Buildings

SWMUs 16-025(a) and 16-025(b) contain potentially contaminated soil associated with radiography buildings 16-39 and 16-40, respectively, and are located west of the 90s Line and northwest of the 30s Line structures (Figure 2.1-1). Structures and SWMUs associated with the radiography buildings are described in Table 2.3-1. Building 16-39 [SWMU 16-025(a)] served as a film-loading building for HE radiography at T-Site (Martin, 1993, 52964, p. 3). It was also reported that 16-39 had cobalt-60 contamination prior to destruction by burning (Buckland, 1957, 05764, p. 1). Thus, it is likely either that radiography or the storage of sources occurred in building 16-39.

Building 16-40 [SWMU 16-025(b)] was constructed west of 16-39 during 1950 to provide gamma radiography within the GMX-3 area (GMX was a former Laboratory division). The building was found to be contaminated with cobalt-60 (Buckland, 1957, 05764, p. 1). HE contamination was discovered in both structures during late 1950s surveys (Engineering Department 1959, 05778, p. 1). It was also reported that 16-39 and 16-40 were contaminated with radium-226, and uranium-238 (Blackwell, 1983, 36408, p. 2). In 1966, the debris of this building and 16-39 were checked for radioactivity after cleanup, but no radioactivity was found (Buckland, 1966, 05060, p. 1).

2.3.4 Septic System

Structure 16-173 [SWMU 16-005(n)] is a decommissioned septic system associated with a latrine (16-172; AOC C-16-003), the latter of which is administratively complete. Both are located north of the 90s Line structures (Figure 2.1-1). Features of this septic system are described in Table 2.3-1. The septic system was constructed in 1949 (LANL, 1990, 07512) and recommended for NFA in the OU 1082 RFI work plan (LANL, 1993, 20948, pp. 6-16 to 6-17). A series of 1971 memoranda leads to the conclusion that the septic tank does not pose a threat to human health or the environment (DeField, 1971, 55274, p. 1). A November 17, 1983, memorandum from Charles Blackwell (HSE-1) to A. John Ahlquist (HSE-8) indicates “none” under a column headed “Structure Use and/or Hazardous Material Use” in reference to TA-16-162, the building serviced by the septic tank (Blackwell, 1983, 36408, p. 4).

2.3.5 Machining Line Buildings

Consolidated SWMU 16-029(h2)-99 is an HE-machining line and includes SWMUs 16-025(d), 16-025(g), 16-025(h), 16-025(i), 16-025(j), 16-029(m), 16-029(n), 16-029(o), 16-029(p), and 16-029(h2). It consists of possibly contaminated surface and subsurface soil associated with control building 16-94 and HE-machining buildings 16-95, 16-96, 16-97, and 16-98 (often called North/South/East/West) and their sumps and drainlines. The buildings were located southeast of the 30s Line on flat terrain with a slight drop in elevation to the northeast (Figure 2.1-1). This machining line was built in 1948 and operated until

the early 1950s. More details about these structures and SWMUs are provided in Table 2.3-1. The buildings were destroyed by intentional burning during 1960 and the subsurface structures associated with these SWMUs were removed in 1967. All of the buildings were designated as HE-contaminated in a 1959 HE survey (Engineering Department, 1959, 05778, p. 2). The principal contaminants associated with these SWMUs are HE and inorganic chemicals.

2.4 Contaminant Transport

The contaminants potentially released within SWMU 16-007(a)-99 (the 30s Line) are HE (principally 2,4,6-trinitrotoluene [TNT] and hexahydro-1,3,5-trinitro-1,3,5-triazine [RDX] and, to a lesser extent, octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine [HMX]); HE byproducts (e.g., 2,4- and 2,6-dinitrotoluene [DNT], 1,3-dinitrobenzene [DNB], 1,3,5-trinitrobenzene [TNB]); VOCs; SVOCs, including PAHs (see Appendix B, Table B-5); and inorganic chemicals.

The potential contaminants in the sumps, drainlines, and outfall discharge areas associated with SWMU 16-008(a)-99 (the 90s Line) structures include uranium, HE (principally 2,4,6-TNT and RDX), HE byproducts, VOCs, SVOCs, cyanide, and inorganic chemicals associated with electroplating activities (see Appendix B). Barium, chromium, copper, nickel, and uranium are the inorganic contaminants of greatest concern because these metals are known to have been associated with 90s Line HE-processing and plating operations.

The relevant release and transport processes associated with these contaminants are a function of chemical-specific properties that include the relationship between the physical form of the constituents and the nature of the constituent transport processes in the environment. Specific properties include the degree of saturation and the potential for ion exchange (barium and other metals) or sorption and the potential for natural bioremediation. The transport of VOCs occurs primarily in the vapor phase by diffusion or advection in subsurface air. Relatively water-soluble low-vapor-pressure constituents, such as HE and metals, are susceptible to release and transport by infiltration of water through the vadose zone or by alluvial water pathways. The hydrogeologic conceptual model for TA-16 (Figure 3.2-3) is discussed in section 3.2.2.

The primary potential release and transport mechanisms for contaminants at SWMUs 16-007(a)-99 and 16-008(a)-99 are direct discharge; precipitation, sorption, and mechanical transport; dissolution and advective transport in water; and volatilization, diffusion, and dispersion. Less significant transport mechanisms include wind entrainment and dispersal of surface soils and uptake of contaminants from soil and water by biota. The primary transport mechanisms are described below.

2.4.1 Direct Discharge of Fine Particulates and Dissolved Contaminants as Operational Releases

Studies of contaminant distributions at such TA-16 sites as TA-16-260 (LANL, 1998, 59891, pp. 2-2–2-5), the 90s Line (LANL, 1997, 87847, pp. 76–99), and V-Site (LANL, 1999, 63973) indicate that, after the initial deposition of contaminants at outfall discharge points or sump and drainline leak points, high levels of contaminants tend to remain concentrated in the vicinity of these deposition points. The specific gravity of RDX and HMX tends to cause particulates of these compounds discharged from sumps and drainlines to be deposited at water settling areas (e.g., outfall discharge areas or points of leakage).

2.4.2 Precipitation, Sorption, and Mechanical Transport

Barium and many other inorganic compounds have a high affinity for adsorption on clays, oxides, and hydrous oxides, with literature values for sorption coefficients in soil ranging from 66 to 2800 mL/g (Myers, 2003, 76188, p. 3). These inorganic compounds tend to bind to fine particulates or precipitates as new phases and are transported by physical processes such as sediment transport via stormwater runoff and redeposition. For Cañon de Valle, the fine particle-sized fraction appears to contain the highest inventories of highly adsorbing contaminants such as barium (LANL, 2003, 77965, p. 5-16).

2.4.3 Dissolution and Advective Transport in Water

HE such as RDX and HMX do not tend to adsorb on particulates in the environment and tend to be transported in the dissolved phase (LANL, 2003, 77965, p. 5-17). Rain, vadose zone water, or melting snow transport contaminants through surface water, the vadose zone, or alluvial systems. At TA-16, transport through the vadose zone is known to be primarily along fast pathways such as fracture zones and surge beds (LANL, 1998, 59891, p. 4-96; LANL, 2003, 77965, section 5) that are intermittently saturated. RDX is moderately soluble in water (approximately 60 mg/L at 25°C). RDX and the other HE (e.g., HMX) tend to be transported primarily by either infiltration through saturated pathways through the vadose zone or through an alluvial or surface water pathway. The relative sorption potentials of barium and RDX are reflected in their respective contaminant distributions at other sites at TA-16. In the deep-perched zone of regional well R-25 (see section 3.2.2), barium has not been detected at high levels, whereas RDX has been detected at a maximum concentration of 84 µg/L (Broxton and others, 2002, 72640, p. 58).

2.4.4 Volatilization, Diffusion, and Dispersion

Gas or vapor-phase contaminants such as VOCs are likely to volatilize to the atmosphere from near-surface soils and sediments and/or migrate by diffusion through air-filled pores in the vadose zone. Migration of vapor-phase contaminants from tuff into ambient air may occur by diffusion or advection driven by barometric pressure changes.

2.5 Potential Receptors

Human receptors potentially exposed to contamination at SWMUs 16-007(a)-99 and 16-008(a)-99 include on-site industrial workers. Following the conceptual site model for TA-16-260 (LANL, 2003, 77965, p. 6-3) the complete pathways identified for receptor exposure include

- inhalation of contaminated dust derived from sediment (when 30s Line and 90s Line ponds are dry) and soil/tuff;
- incidental ingestion of sediment, soil/tuff, and surface water;
- external irradiation;
- dermal contact with sediment, surface water, and soil/tuff; and
- inhalation of gas-phase contaminants such as VOCs.

There is intermittent surface water in the 90s Line pond. Human exposure pathways include direct contact (by ingestion and dermally) with sediment (particularly when the ponds are dry) and, to a lesser extent, with surface water (when the ponds are wet and during stormwater runoff events). For surface water,

direct contact is a potentially complete pathway but exposure is likely to be infrequent. Human receptors are not typically in direct contact with surface water (e.g., by wading) under normal circumstances, nor do they use the pond as a drinking water source. Similarly, contact with perched waters, manifest at local springs such as SWSC, Burning Ground, and Martin Springs (LANL, 2003, 77965, section 4) is a potentially complete pathway, but exposure is likely to be infrequent. No groundwater from the site is available for drinking water, and potential receptor exposures to deep perched (Broxton and others, 2002, 72640, p. ix) and regional groundwater at TA-16 will be evaluated in the context of the deep groundwater corrective measures study (CMS) for TA-16-260. The results of that evaluation will apply to SWMUs 16-007(a)-99 and 16-008(a)-99.

Ecological receptors may be exposed through the same pathways as workers as well as by root uptake and the food web; in addition, these receptors may be exposed to contaminants in subsurface burrows.

2.6 Waste Inventory

Historical waste-management practices at TA-16 conformed to standard procedures of the day. These procedures focused on safety and minimizing hazards to operating personnel. The major emphasis was placed on safe disposal of HE and HE-contaminated material. To this end, an extensive system of HE sumps was used to separate HE from process waste streams. The larger fragments of HE scrap generated by processes not directly associated with the waste stream were also carefully collected for disposal.

As disposal quantities of HE or HE-contaminated materials were collected, the waste was taken to one of a number of burning grounds (MDA R or MDA P) that have existed at TA-16 over the years. Residuals and noncombustible materials from the burning grounds were typically placed in a landfill adjacent to the burning ground or taken to another Laboratory disposal area.

No formal waste inventory exists for the 30s and 90s Lines; however, HE is the primary contaminant at TA-16. Large quantities—up to 100,000 lbs of HE per month—were processed through TA-16 during the waning stages of World War II (Hawkins, 1946, 04704, p. 211).The two principal types of HE used in World War II–era HE lenses were Composition-B and baratol. The former contained the primary explosives TNT and RDX; the latter contained TNT and the inert material barium nitrate. In process buildings, fine HE powder produced during the machining of HE was washed into sump systems and may have collected or passed through cracks in building floors (LANL, 1994, 39440, p. 5-311). After World War II, HE-processing activities decreased markedly, although HE processing continued at the 30s and 90s Lines until the early 1950s when machining operations were largely transferred to TA-16-260.

The RFI sampling data collected at the 30s Line in 2004, and the VCA data from the 90s Line (LANL, 1997, 87847), confirmed the presence of HE, solvents, and inorganic compounds in soils at former sump locations, drainages, and the 30s Line pond.

2.7 Historical Releases

Results of historical investigations indicate that contaminants have been released to environmental media at the SWMUs evaluated in this work plan. “RFI Work Plan for OU 1082” (LANL, 1993, 20948) and “RFI Work Plan for OU 1082, Addendum 1” (LANL, 1994, 39440) describe historical information concerning chemical use at the 30s- and 90s-Line complex (see section 2.1) and present pre-RFI data concerning contaminants associated with releases at these facilities.

Pre-RFI sampling data collected during 1986 and 1989 confirmed the presence of HE, metals, and VOCs in soil around and within the 30s and 90s Line ponds (Baytos, 1986, 05834; DOE, 1989, 15366,

pp. 4-24-1 to 4-24-68; Appendix B). With the exception of styrene, the presence of these constituents was verified during the 1996 VCA for the 90s Line and the 2004 Phase I RFI sampling for the 30s Line pond.

The 1996 VCA (LANL, 1997, 87847) provided additional information about contaminants detected in environmental media at the 90s Line (see section 2.8 and Appendix B, sections B-2.0 and B-3.0). To summarize, historical information indicates releases of HE (e.g., RDX, HMX, and TNT) in sump water from the 30s and 90s Lines together with releases of smaller amounts of organic solvents and inorganic compounds.

Groundwater sampling was conducted during the drilling of monitoring well 16-02669, which was a component of the RFI for the 260 outfall (LANL, 2003, 77965, pp. 4-55–4-77). Results from this groundwater sampling indicate that contaminants from the 90s Line pond are being transported downward through the vadose zone. An unfiltered groundwater sample was analyzed for metals, HE, VOCs, and SVOCs. Barium was the only metal detected, but at concentrations below the NMED groundwater standard for human health (1000 µg/L) and the EPA maximum contaminant level (MCL) of 2000 µg/L (EPA, 2004, 85204, p. 8). HMX, 2,4-DNT and 2,4,6-TNT were all detected, but at levels below EPA Region 6 tap water screening levels of 1800 µg/L, 73 µg/L, and 2.2 µg/L, respectively (EPA, 2004, 87478). RDX was detected at a concentration of 281 µg/L, which is above the EPA Region 6 tap water standard of 0.61 µg/L (EPA, 2004, 87478).

2.8 Summary of Historical Investigations

The following historical investigations were conducted at the TA-16 ponds and associated SWMUs and AOCs:

- 1986 and 1989 pre-RFI site-characterization sampling activities at SWMUs 16-007(a)-99 and 16-008(a)-99
- 1996 VCA decontamination and decommissioning (D&D) activities and associated confirmation sampling at former 90s Line structures (i.e., sumps, drainlines, and outfalls)
- 2004 Phase I RFI sampling activities at SWMU 16-007(a)-99 (30s Line ponds).

These historical investigations are briefly described below, and in greater detail in the HIR (Appendix B).

2.8.1 Pre-RFI Field Investigations

Sampling and analysis for ascertaining the presence and scale of potential environmental contamination at the 30s and 90s Lines began in 1986. Baytos (1986, 05834) analyzed soil samples from the 90s Line pond for HE. A maximum of 0.02 wt% total HE was reported in a sample collected on the shore of the 90s Line pond (Figure B-1). Total HE was either a nondetect or less than 0.02 wt% in the remaining samples (see Appendix B). No barium nitrate was detected.

In 1989, soil, surface water, and sediment samples were collected from the 30s and 90s Line ponds (LANL, 1993, 20948, pp. 5-217–5-218). At SWMU 16-007(a), three grab subsurface soil samples were collected from the bottom 12 to 15 in. of core samples which ranged in depth from 4.5 ft to 5 ft below ground surface (bgs). Sediment at SWMU 16-008(a) was collected from four locations at 0 to 6 in. bgs, and three grab surface water samples were collected on three different days at the influent end of the pond. Samples were analyzed for radionuclides, metals, VOCs, and HE.

In SWMU 16-007(a) soil samples, several VOCs were detected at low levels. Barium (up to 230 mg/kg) and several other inorganic chemicals were detected at low levels. No HE was detected in the 30s Line

pond samples collected in 1989; however, several of the analytical results were qualified for various reasons, and the chromatography was poor (LANL, 1993, 20948, p. 5-217).

Sediment grab samples collected in 1989 from SWMU 16-008(a) had reported elevated concentrations of barium (up to 2300 mg/kg) and low levels of other inorganic compounds. Low levels of VOCs were also detected. Surface water grab samples from SWMU 16-008(a) had reported concentrations of barium (up to 6 mg/kg), silver (0.034 mg/kg), and chromium (0.016 mg/kg). No HE was detected in the 90s Line pond samples collected during 1989; however, several of the analytical results were qualified for various reasons, and the chromatography was poor (LANL, 1993, 20948, p. 5-217).

2.8.2 90s Line VCA

In 1996, a VCA (LANL, 1997, 87847) was coordinated with D&D activities at the 90s Line (Figure 2.8-1). Several hundred cubic yards of soil were removed from the 90s Line SWMUs during these activities. Field-screening and fixed-laboratory samples were collected from soils associated with 90s Line sumps, drainlines, outfalls, drainages, and a drum storage area. Confirmation samples were collected from location where cleanups had occurred. In addition, confirmation samples were collected from locations where remediation had occurred at a depth of 2–3 ft beneath the removed soil. The results of the sampling and analysis from the 1996 VCA are provided in Appendix B, section B-3.0. The principal detected contaminants included HE, particularly RDX, and inorganic compounds, particularly barium, nickel and copper. Radionuclides were not detected.

As described in Appendix B (Tables B-20 and B-21), inorganic compounds were pervasively detected above background values (BVs) in the areas investigated during the VCA. Barium, chromium, copper, nickel, and uranium are the inorganic chemicals of greatest concern because these metals are known to have been associated with 90s Line HE-processing and plating operations. Barium was detected at a high frequency with a maximum concentration of 3920 mg/kg. Nickel (up to 3280 mg/kg), copper (up to 2210 mg/kg), and chromium (up to 220 mg/kg) were also widely detected at levels much higher than BV. The vertical and lateral nature and extent of inorganic contamination at SWMU 16-008(a)-99 have not been defined since the VCA did not attempt to bound contamination relative to BV nor did it include an investigation of the ponds area or sample distal reaches of some drainages. In addition, a decreasing trend in sample concentrations was not observed at most locations and many areas had only one depth sampled.

Low-level organic compounds were detected at every area investigated during the 90s Line VCA activities (Tables B-22 and B-23). HE, which was also noted in practically every area of the 90s Line, was reported at elevated concentrations (RDX up to 8.92 mg/kg and TNT up to 26.4 mg/kg). Elevated contamination was mainly located around the areas of former sumps and drainlines. Appendix B presents the distribution of HE compounds in soil and includes all analytical sample results from the 90s Line VCA. High concentrations of both HMX and RDX were used to determine additional sampling locations as presented in this work plan. An examination of the vertical and lateral distribution of organic detections at the 90s Line indicates that vertical nature and extent have also not been defined for organic compounds. The 1996 VCA did not use “nondetect” levels as contaminant bounding criteria nor did it include investigations of the pond or the distal reaches of some drainages.

2.8.3 Phase I RFI Field Investigation

Phase I RFI fieldwork was conducted at the 30s Line in October 2004. The approved RFI work plan for OU 1082 (LANL, 1993, 20948) specified the sampling of surface soil and sediment, subsurface soil, and subsurface bedrock (tuff), with analysis of samples for radionuclides, inorganic compounds, VOCs,

SVOCs, HE, and HE byproducts (LANL, 1993, 20948, p. 5-224–5-225). The objectives of the Phase I RFI were to (1) identify contaminants present in the subsurface soil, sediment, and bedrock within the boundaries of the ponds; and (2) determine if additional investigative or corrective actions were warranted. These activities and the analytical results are summarized in the HIR (Appendix B, section B-4.0).

According to fixed-laboratory analytical results, contaminants include HE, PAHs, VOCs, SVOCs, and inorganic compounds, including perchlorate (Table 2.8-1 and Table 2.8-2). Radionuclides were not detected. Inorganic compounds were pervasively detected above BVs in the areas investigated during the RFI. Barium was detected at a high frequency, with a maximum concentration of 2270 mg/kg noted in the northernmost pond. The vertical nature and extent of contamination at SWMU 16-007(a)-99 have not been fully defined because some of the borings were not advanced to a depth yielding analytical results that showed decreasing trends relative to BVs. The lateral nature and extent of contamination have not been fully defined because bounding samples that showed decreasing trends relative to BVs were not collected at all locations.

Low-level organic compounds (HE, VOCs, and SVOCs) were detected at every area investigated during the 30s Line RFI activities. Most of these detections were just above the laboratory method detection limit or were flagged as estimated values. HE detections were also noted in practically every area of the 30s Line, with the highest concentrations (RDX >1000 mg/kg) noted in the northernmost of the four ponds. An examination of the spatial distribution of organic compounds detected at the 30s Line indicates that vertical nature and extent are not fully defined for organic compounds in the northern portion of the 30s Line ponds. The lateral nature and extent of contamination at SWMU 16-007(a)-99 are not fully defined since there is residual HE contamination in the northernmost portion of the 30s Line pond that needs to be further investigated.

3.0 SITE CONDITIONS

This section summarizes aspects of the environmental setting for the ponds area at TA-16 that are important to assessing the potential impacts posed by contaminated surface and subsurface media.

- **Climate**. The climate is semiarid with low precipitation and a high evapotranspiration rate. These characteristics limit the amount of moisture percolating through surface and near-surface media and thereby limit the amount of moisture available to leach hazardous constituents or to transport contaminated sediments into the subsurface.

- **Vadose zone.** The vadose zone in the area is thick and intermittently saturated. These characteristics, which may restrict the matrix transport of subsurface contaminants, may also facilitate contaminant transport by “saturated ribbons” to perched and regional water bodies.

- **Terrain.** The canyon-mesa terrain affects erosion and sediment transport, atmospheric conditions, and ecological habitats.

- **Ponded water.** During machining operations in the late 1940s and 1950s, both the 30s Line and 90s Line ponds contained standing water. The 30s Line ponds were backfilled in the 1960s. The 90s Line pond contained water during the early 1990s except during the dry summer months and contained water during snowmelt periods and periods of high precipitation during the late 1990s and early 2000s. Because of the drought conditions of the past few years, the 90s Line pond has remained dry during much of each year. Currently (March 2005), the pond contains water. Standing water in both ponds would result in a hydrologic head that would have helped drive

contaminants through the underlying vadose zone, particularly through saturated fractures and surge beds.

3.1 Surface Conditions

The TA-16 ponds are located on the TA-16 mesa, a 200-ft-high mesa that trends east to west (Figures 1.1-1 and 1.1-2). The mesa is bounded on the north by Cañon de Valle (approximately 1200 ft north of the TA-16 ponds) and on the south by Water Canyon (approximately 5500 ft south of the TA-16 ponds) (Figures 1.1-1 and 1.1-2). The elevation of the mesa ranges from 7700 ft to 7500 ft, and the elevation at the ponds is approximately 7600 ft. The topography in the area is relatively level, with a gentle slope from west to east.

The surface vegetation community at TA-16, as a whole, consists of species typical of the Rocky Mountain Montane Conifer forest, which contains several distinct habitat types (LANL, 1998, 59891, pp. B-41 to B-43). The most prevalent habitat type on the mesa top and in the area around the ponds area is ponderosa pine/Gamble oak. Canyon bottoms, such as Cañon de Valle, may grade into ponderosa pine/Douglas fir. Dominant trees within the mesa overstory canopy are ponderosa pine and aspen; the mesa top shrub layer is primarily Gamble oak and New Mexico locust; and dominant forbs and grasses include bluegrass, mountain muhly, blue gramma, pine dropseed, wormwood, false tarragon, tall lupine, and cinquefoil. The areas around the TA-16 Ponds did not burn during the Cerro Grande fire. Additional details on the vegetation communities and habitat types at TA-16 are presented in Appendix B of the Phase II RFI report for SWMU 16-021(c)-99 (LANL, 1998, 59891, pp. B-32 to B-58).

3.1.1 Current Site Conditions

The area around the TA-16 ponds is a light-use, high-security industrial area typical of TA-16 areas on the mesa top. Future industrial development of the area is possible following the D&D of various inactive facilities located around TA-16. The soils of the TA-16 mesa are derived from the weathering of the Tshirege Member of the Bandelier Tuff and from the El Cajete pumice (including contributions from phenocrysts and phenocryst fragments, devitrified glasses, and minor lithic fragments) and from windblown sources. Most of the native soils in the vicinity of the ponds have been disturbed. A detailed discussion of soils at TA-16 is provided in Appendix B of the Phase II RFI Report for SWMU 16-021(c)-99 (LANL 1998, 59891, pp. B-12 to B-15).

3.1.2 Surface Water

Surface water runoff, ponding, and associated infiltration are probably the most important hydrologic transport pathways at TA-16. Both HE and barium, the principal contaminants at TA-16, are moderately to strongly soluble and are transported in surface water. Six aspects of the surface hydrology at TA-16 that may be relevant to contaminant transport (LANL 1998, 59891, pp. B-16–B-17), are as follows:

1. the location of pathways of surface water runoff and associated sediment deposition,
2. rates of soil erosion, transport, and sedimentation,
3. the effects of operational disturbances on surface hydrology,
4. the relative importance of surface runoff versus infiltration as transport pathways in different soil types,
5. the solubility and sorption behavior of the contaminants, and

6. the ultimate fate of surface waters at TA-16.

Surface water in the vicinity of the TA-16 ponds consists of storm and snowmelt runoff that may flow by small drainages or sheet flow into the 90s Line pond and Cañon de Valle. Surface flow in Cañon de Valle is seasonal with the exception of the stretch from Burning Ground Spring to a location just east of the TA-16 Burning Ground (Figure 1.1-2), which could be classified as perennial flow. Perched groundwater periodically discharges downgradient of the TA-16 ponds at SWSC and Martin Springs. A continuous discharge occurs at Burning Ground Spring with a 400 ml/s seasonal average.

Alluvial groundwater is present in both Martin/S-Site Canyon and Cañon de Valle, which contain several alluvial monitoring wells, including 16-02655 through 16-02659 (Cañon de Valle), and 16-06293 through 16-06295 (Martin Canyon). Some of these wells contain water on a seasonal basis only; these include 16-02657 (Cañon de Valle), 16-06293 (Martin Canyon), and 16-06294 (Martin Canyon).

Surface water runoff, alluvial water flow, and associated sediment transport represent potential migration pathways by which contaminants may be transported off-site. However, these pathways are less important for the TA-16 ponds than for many sites at TA-16 because of the relatively flat topography in the area of the ponds.

During the late 1990s and early 2000s, ENV-RS personnel conducted surface water assessments for some of the SWMUs and AOCs associated with the TA-16 ponds. Most of the sites received low scores [3.6 for 16-007(a), 16-008(a), 16-026(k–o), and C-16-067; 8.8 for 16-024(d–f), 16-025(e), and 16-029(u)] due to the flat topography in the ponds area. SWMUs 16-029(s) and 16-029(t) received higher scores (45.5 and 41.5, respectively) due to evidence of ponding and sheet flow. The other SWMUs associated with the ponds have not been scored in a surface water assessment.

3.2 Subsurface Conditions

3.2.1 Stratigraphy

The former ER Project (now ENV-RS) and the Laboratory Groundwater Protection Program drilled, cored, and sampled several intermediate and deep boreholes relevant to interpretation of the subsurface stratigraphy in the vicinity of the TA-16 ponds (Figures 1.1-2, 3.2-1a, 3.2-1b, and 3.2-2). These include regional well R-25 (total depth of 1942 ft), located approximately 3000 ft east of the ponds area (Broxton and others, 2002, 72640, p. 8); R-26 (total depth of 1490.5 ft), located approximately 1500 ft northwest of the ponds area (Kleinfelder, 2005, 87846, p. 18), well CdV-R-37-2 (total depth of 1664 ft), located approximately 8000 ft southeast of the ponds area (Kopp et al. 2003, 73707, p. 16); intermediate depth well CdV-16-1(i) (total depth of 683 ft), located approximately 3000 ft northeast of the ponds area (Kleinfelder 2004, 87844, p. 4); borehole CdV-16-2(i) (total depth of 1063 ft), located approximately 5000 ft east of the ponds area (Kleinfelder 2004, 87843, p. 4); and borehole CdV-16-3(i) (total depth of 1405 ft), located approximately 4500 ft southeast of the ponds area (Kleinfelder 2004, 87845, p. 4). Locations and depths of the boreholes used to infer the stratigraphy beneath the ponds are shown in Figures 1.1-2, 3.2-1a, and 3.2-1b. Figures 3.2-1a and 3.2-1b also show geologic cross sections in the vicinity of the ponds area. The stratigraphy in the vicinity of the ponds area includes Bandelier Tuff, Cerro Toledo Formation, Puye Formation, and Tschicoma Lavas (Figures 3.2-1a, 3.2-1b, and 3.2-2).

General descriptions of the stratigraphic units in the vicinity of the TA-16 ponds are provided in this section. These descriptions rely most heavily on the stratigraphy observed in regional well R-25 (Figure 3.2-2). More detailed descriptions of the stratigraphy, mineralogy, chemistry, and other properties of the rock units described in this section are available in the completion report for well R-25 (Broxton and others, 2002, 72640, pp. 19–32). More specific stratigraphy and lithologic descriptions related to the TA-

16 ponds area rely on observations made during the installation of boring 16-02669, which was installed on the east side of the 90s Line pond (LANL 2003, 77965, pp. 4-55 to 4-77) .

3.2.1.1 Bandelier Tuff

The Bandelier Tuff is a chemically zoned ignimbrite that exhibits complex zones of welding and crystallization subdivided into four major cooling units. The term welding is used to distinguish between tuffs that are noncompacted and porous (nonwelded) from tuffs that are more compacted and dense (welded). In the field or in borehole cuttings, the degree of welding is quantified by the degree of flattening of pumice fragments (a higher degree of flattening and elongation equals a higher degree of welding). Petrographically, welded tuffs show adhesion (welding) of grains, and nonwelded tuffs do not. The term "devitrified" is applied to tuffs whose volcanic glass has crystallized.

3.2.1.2 Tshirege Member

The Pleistocene Tshirege Member of the Bandelier Tuff is a compound cooling unit that resulted from several successive ash-flow depositions separated by periods of inactivity that allowed partial cooling of each unit. Properties related to water flow and contaminant migration (e.g., density, porosity, degree of welding, fracture content, and mineralogy) vary both vertically and laterally as a result of localized variations in emplacement temperature, cooling history, thickness, gas content, and chemical composition. The Tshirege Member of the Bandelier Tuff was 384-ft thick in regional well R-25 (Broxton and others, 2002, 72640, p. 20).

3.2.1.3 Tshirege Member Unit 4 (Qbt 4)

Unit 4 of the Tshirege Member of the Bandelier Tuff is made up of a series of variably welded vitric-to-devitrified ash-flow tuffs that extend to a depth of 84 ft in the R-25 well. Unit 4 is characterized by local thin, discontinuous, crystal-rich, fine- to coarse-grained volcanic surge deposits. The lower, more indurated parts of Unit 4 are also fractured. These fractures and surge beds are potential groundwater pathways. Unit 4 makes up the mesa-top unit at TA-16 and outcrops on the slopes extending into the canyons.

3.2.1.4 Tshirege Member Unit 3 (Qbt 3 and Qbt 3t)

Unit 3 of the Tshirege Member of the Bandelier Tuff is poorly to moderately welded and indurated to slightly indurated. It tends to be a cliff-forming unit of the Pajarito Plateau. In general, Unit 3 is divided into two subunits, Qbt 3t (*t* for transitional) and Qbt 3. Qbt 3t is a devitrified ignimbrite that grades from partially welded at the top to moderately welded at the base. Qbt 3 is a second devitrified ignimbrite that grades from moderately welded at the top to nonwelded at the base. Qbt 3t and upper Qbt 3 also contain localized thin, discontinuous, crystal-rich, fine- to coarse-grained surge deposits that may represent potential groundwater pathways. Unit 3 (including both subunits Qbt 3 and Qbt 3t) is 145-ft thick in the R-25 well (Broxton and others, 2002, 72640, p. 22).

3.2.1.5 Tshirege Member Unit 2 (Qbt 2)

Unit 2 of the Tshirege Member of the Bandelier Tuff is a competent, resistant unit that forms cliffs where it is exposed on the sides of the mesa. It is a moderately welded, well indurated, devitrified ignimbrite. Welding grades from moderately welded at the top of the unit to partially welded at the base. Unit 2 is 103 ft thick in the R-25 well (Broxton and others, 2002, 72640, p. 22).

Tshirege Member unit 2 is extensively fractured in many outcrops across the Laboratory as a consequence of contraction during postdepositional cooling. The cooling fractures are visible on mesa edges. In general, such fractures are vertical to subvertical and dissipate near the bottom of the unit.

Near the base of unit 2 is a series of thin, discontinuous, crystal-rich, fine- to coarse-grained surge deposits, which mark the base of unit 2. Bedding structures are often observed in these deposits.

3.2.1.6 Tshirege Member Unit 1v (Qbt 1v)

Tshirege Member unit 1v is a vapor-phase-altered cooling unit that underlies unit 2. This unit forms sloping outcrops that contrast with the near-vertical cliffs of unit 2. Unit 1v is further subdivided into units 1vu and 1vc in many parts of the Laboratory. Unit 1v is 29.5 ft thick in the R-25 well but was not broken out into subunits based on the cuttings from that borehole (Broxton and others, 2002, 72640, p. 22).

Unit 1vu. Unit 1vu is the uppermost portion of unit 1v (*u* signifies upper). It is devitrified and consists of vapor-phase-altered ash-fall and ash-flow tuff. Unit 1vu is unconsolidated at its base and becomes moderately welded near overlying unit 2. Only the most prominent cooling fractures that originate in unit 2 continue into the more welded upper section of unit 1vu, but these end in the less-consolidated lower section of the unit.

Unit 1vc. Beneath unit 1vu is unit 1vc (*c* stands for colonnade), named for the columnar jointing visible in cliffs formed from this unit. Unit 1vc is a poorly welded, devitrified ash-flow tuff at its base and top, becoming more welded in its interior.

3.2.1.7 Tshirege Member Unit 1g (Qbt 1g)

The basal contact of unit 1vc is characterized by an abrupt change (within 0.7 ft vertically) from devitrified (crystallized) matrix in unit 1vc to vitric (glassy) matrix in the underlying unit 1g (*g* stands for glassy). Vitric pumices in unit 1g stand out in relief against the weathered outcrops, but devitrified pumices above this interval are weathered out. In outcrop, this devitrification interval forms a prominent erosional recess termed the “vapor-phase notch.” There is no depositional or compositional break associated with the vapor-phase notch; the abrupt transition indicates that this feature is the base of the devitrification front that occurred in the hot interior of the cooling ash-flow sheets after emplacement.

Unit 1g is a massive, poorly consolidated, vitric ash-flow tuff. Few fractures are observed in outcrops of this unit, and the weathered cliff faces have a distinct Swiss-cheese appearance that reflects the variable hardness of the unit. The upper portion of unit 1g is resistant to erosion, which helps to preserve the vapor-phase notch in outcrop. A distinctive pumice-poor surge bed forms the base of unit 1g. Unit 1g is 20.3 ft thick in the R-25 well (Broxton and others, 2002, 72640, p. 2).

3.2.1.8 Tsankawi Pumice Bed (Qbt 1g)

The Tsankawi Pumice Bed is the basal Plinian air-fall deposit of the Tshirege member of the Bandelier Tuff. It is a thin bed of gravel-sized vitric pumice. The unit thickness in the R-25 well is 2.2 ft (Broxton and others, 2002, 72640, p. 2).

3.2.1.9 Cerro Toledo Interval (Qct)

The Cerro Toledo interval separates the Tshirege and Otowi Members of the Bandelier Tuff and consists of thin beds of tuffaceous sandstones, paleosols, siltstones, ash, and pumice falls. The Cerro Toledo

interval also includes localized gravel- and cobble-rich fluvial deposits predominantly derived from intermediate-composition lavas eroded from the Jemez Mountains west of the Pajarito Plateau. Numerous large lithics, including dacite lava derived from Sawyer Dome, were present in the R-25 well. The interval is 125-ft thick in the R-25 well (Broxton and others, 2002, 72640, p. 22). This anomalously large thickness indicates that the R-25 well was located in a paleodrainage on the surface of the underlying Otowi Member of the Bandelier Tuff.

3.2.1.10 Otowi Member and Guaje Pumice Bed (Qbo)

The Otowi Member tuffs are 341.5 ft thick in the R-25 well (Broxton and others, 2002, 72640, p. 2). The tuffs are a massive, poorly consolidated, nonwelded, pumice-rich, and mostly vitric ash flow. The pumices are fully inflated and support tubular structures that have not collapsed as a result of welding. The matrix is an unsorted mix of glass shards, phenocrysts, perlite clasts, and broken pumice fragments.

The Guaje Pumice Bed forms the lowermost 6.7 ft of the Otowi Member in R-25. It is the basal air-fall deposit of the Otowi Member of the Bandelier Tuff. The occurrence of the Guaje Pumice Bed at R-25 is thinner than occurrences farther to the east and north, indicating that this area was either south of the main dispersal axis for this fall deposit or that this deposit was partly eroded before or during emplacement of the main Otowi ignimbrite. Two cycles of pumice fall were noted in the R-25 well.

3.2.1.11 Puye Formation Fanglomerates (Tpf)

The Puye Formation in the R-25 well is an alluvial fan deposit made up primarily of coarse clastic rocks derived from the rhyodacite units of the Tschicoma Formation that crop out in the Jemez Mountains west of the Pajarito fault. Because of the proximity of these source rocks, these fanglomerate deposits consist of poorly consolidated and poorly sorted boulders, cobble, gravels, and sands. Boulders up to 2 ft in diameter are present in the R-25 well.

The Puye Formation is more than 1090 ft thick in R-25, extending from a depth of 852 ft to below the total depth of 1942 ft (Broxton and others, 2002, 72640, p. 22). It is overlain by a 1.5-ft-thick late-Miocene paleosol deposit characterized by brown, massive, generally fine-grained sediment with highly scattered pebbles. Two subunits of the Puye Formation are recognized in R-25 according to the provenance of their dominant clasts: (1) the upper Pajarito Mountain unit at depths from 852 to 1657 ft, and (2) the Rendija Canyon unit at depths from 1657 to 1942 ft. The upper Pajarito Mountain unit is the eastern part of a fan that was contemporaneous with eruption of the upper dacite of Pajarito Mountain. The Rendija Canyon unit represents the southern part of a fan that was contemporaneous with eruption of the rhyodacite of Rendija Canyon. Lithification at both units is poor and as such is likely to sustain open fractures.

3.2.1.12 Tschicoma Formation Dacite Lavas

Lava flows of the Tschicoma Formation occur in well CdV-R-37-2 (Kopp et al., 2003, 73707, p. 23), to the southeast of R-25, but were not found in the R-25 well. In addition, they were intercepted in the CdV-16-3(i) borehole located southeast of the ponds area (Kleinfelder, 2004, 87845, p. 12).

Thus, the transition between subsurface dacite and the Puye Formation probably occurs to the east of the TA-16 ponds. The dacite lavas are massive, apparently homogeneous, locally rubbly intermediate lavas. Minor siltstones are present in the upper 142 ft at the CdV-R-37-2 borehole. The Tschicoma dacite lavas extend from a depth of 1072 ft to total depth (1664 ft) in CdV-R-37-2 and from 900 ft to a total depth of approximately 1400 ft in CdV-16-3(i).

3.2.2 Hydrology

The hydrogeologic conceptual model for TA-16 is presented in Figure 3.2-3 (LANL 2003, 77965, p. 5-2). The model indicates that infiltration of water into the subsurface and the subsequent transport of water, natural solutes, and contaminants at multiple recharge zones at TA-16. Shallow transport pathways are heterogeneous, with water transport along fast pathways such as surge beds and fracture zones. Perched and regional groundwater flow directions are generally from west to east, but there are significant complexities in flow in the deep aquifers at TA-16.

3.2.2.1 Infiltration

Surface water infiltration is a potential mechanism for surface contaminant migration into subsurface soil and tuff and eventually into perched or regional aquifers. Surface water infiltration is recharging perched aquifers at TA-16 (LANL 1998, 59891, p. B-18; LANL 2003, 77965, p. B-16). The presence of HE compounds in samples from well R-25 indicates that the transport from surface waters to deep perched and possibly the regional aquifer at TA-16 is rapid (less than 50 yr). The surface and alluvial groundwaters present in Cañon de Valle are hypothesized to be the major sources of these contaminated waters. Geophysical surveys and other lines of evidence presented in the Phase III RFI report for SWMU 16-021(c)-99 (LANL 2003, 77965, pp. 3-105 to 3-108) indicate that a key area of infiltration is a zone of Cañon de Valle west of MDA P. Surface water infiltration is an important contaminant transport pathway at TA-16 in Cañon de Valle.

Other recharge infiltration zones identified or hypothesized at TA-16 include the Pajarito fault zone; the steam plant drainage; localized ponding areas, such as the 90s Line pond; diffuse infiltration from the TA-16 mesa top; and other intermittent zones of natural and anthropogenic surface water runoff (Figure 3.2-3) (LANL 2003, 77965, p. 5-2). The alluvial system that is intermittently present in the canyons downgradient from the TA-16 ponds likely is or has been part of a zone of infiltration.

During the installation of monitoring well 16-02669 (Figure 1.1-2), located on the east side of the 90s Line pond, an interval of intermittent perched groundwater was observed at a depth of approximately 120 ft bgs, and a groundwater sample was collected (LANL, 2003, 77965, pp. 4-55 to 4-77). Analytical results from this sample indicate the presence of HE compounds that have likely migrated from the 90s Line pond by surface water infiltration. Stable isotopic analyses of pore waters in this borehole were also conducted during the installation of 16-02669. Results of these investigations provide additional evidence of surface water infiltration from the 90s Line pond into the vadose zone (LANL, 2003, 77965, pp. 4-55 to 4-77).

3.2.2.2 Groundwater

Groundwater beneath the Laboratory occurs in the regional aquifer at depths ranging from 1300 to 600 ft (Figure 3.2-4) and in perched aquifers at both shallow (less than 200 ft) and deep (up to ~1000 ft) depths (LANL 2000, 66802, pp. 2-30 to 2-32; Nylander, 2003, 76059). Canyon and mesa topography and the internal structures/subsurface hydrogeologic features (surge beds, fracture zones, permeable units) of the Bandelier Tuff and other subsurface units control the hydrogeology of TA-16. The hydrology (occurrence and movement of water in the surface and subsurface environments) at individual SWMUs or sites such as the TA-16 ponds area, is controlled by the physiographic location (e.g., draining to canyon bottoms, or on mesa tops) of each SWMU or site.

3.2.2.3 Perched Intermediate Waters

Perched water may occur in the Bandelier Tuff, in epiclastic sediments and in basalts of the Pajarito Plateau (LANL 2000, 66802, p. 2-32). These frequently form at horizons where medium properties change dramatically, such as at paleosol horizons, surge beds, or zones containing clays or caliche. TA-16 is characterized by an abundance of perched waters, although distinguishing true perched waters from waters hydrologically connected to the regional aquifer is difficult. In previous TA-16 documents, waters are referred to as *perched* if a distinct zone of dry rock exists beneath a zone of saturation or if the depth of the waters is consistent with water depths for perched zones in nearby wells. These zones may be hydrologically connected to the regional aquifer.

Several springs and seeps have been identified at TA-16 during the past several years (Figure 1.1-2). These represent discharge points of shallow (less than 200 ft depth) perched waters in the vadose zone. The Phase II RFI report for TA-16-260 (LANL, 1998, 59891, section 4) and the Phase III RFI report for that site (LANL, 2003, 77965, section 4) provide details on these springs and the perched zones. The investigations for the TA-16-260 outfall have shown that (1) connectivity between the mesa top and springs is rapid (less than six months) based on a tracer study; (2) the springs are manifestations of zones of saturated ribbons in the vadose zone (most boreholes drilled on the mesa top have not intersected perched waters; two intersected water but dried up soon after drilling and only occasionally rewet during high-recharge time periods); (3) the perched zones appear to be concentrated within the transition zone between Tshirege units 3 and 4, which is characterized by several localized base surge units; and (4) there are multiple recharge zones for these shallow perched zones, including outfalls from buildings used for processing, mesa-top ponding areas (such as the 90s Line pond), and diffuse recharge from east of the Pajarito fault zone.

Waters identified as perennial perched intermediate waters have been found in wells SHB-3, R-25, R-26, and borehole CdV-16-1(i) (Figure 1.1-2). Well SHB-3 had a static water level of 664 ft in 1992, which is consistent with its containing a perennial perched zone. Perched water was encountered in the R-25 well at a depth of 747 ft within the Otowi Member of the Bandelier Tuff and extending intermittently to a depth of 1132 ft within the Puye Formation (Broxton and others, 2002, 72640, p. ix). Hydraulic head measurements in this zone decrease with depth, indicating that there is a downward vertical gradient and that this well is located in a recharge area. Well R-26 encountered what is probably a perched zone at 604 ft (Kleinfelder, 2005, 87846, p. 9). CdV-16-1(i) encountered water at a depth of 563 ft (Kleinfelder, 2004, 87844, p. 4), which is roughly consistent with the depth to the perched zone in well R-25.

Borehole video logs and drilling observations for boreholes CdV-R-15-3, CdV-R-37-2, and CdV-16-2(i) record small quantities of what may be perched water (Kopp et al. 2002, 73179, p. 27; Kopp et al. 2003, 73707, p. 29; Kleinfelder 2004, 87843, p. 10). However, the screens installed to capture water from these zones have never produced enough for sampling. Small, ephemeral perched water zones apparently existed in these boreholes, but they were not of the scale of the perched zones in well R-25.

Perched water was encountered during the installation of monitoring well 16-02669 located adjacent to the 90s Line pond in 1998. Analytical results collected from water samples indicate that HE have migrated vertically from the 90s Line pond to at least the first perched groundwater interval at approximately 120 ft bgs (LANL 2003, 77965, p. 4-58).

The groundwater from the perched zone in well R-25 contains concentrations of RDX greater than EPA lifetime health advisory (HA) limits (maximum value of 84 µg/L compared to the current EPA lifetime HA limit of 2 µg/L) (Broxton and others, 2002, 72640, p. 59; EPA, 2004, 85204, p. 6), nitrate concentrations greater than those observed in the Water Canyon Gallery, VOCs, elevated metal concentrations, and tritium indicating travel times to the upper saturated zone of 10 to 50 yr (Broxton and others, 2002, 72640,

p. ix). Preliminary data from recently drilled boreholes CdV-16-1(i) and the ephemeral zone at CdV-16-2(i) also have levels of RDX greater than EPA HA limits, although the levels are lower than those observed in well R-25 (Broxton and others, 2002, 72640, p. 59).

3.2.2.4 Regional Aquifer

The regional aquifer of the Pajarito Plateau is the only aquifer capable of supporting a large-scale municipal water supply (Purtymun 1984, 06513, p. 1). The regional aquifer extends throughout the Española Basin (an area of roughly 6000 km^2) and reaches its maximum thickness beneath the Pajarito Plateau (over 9800 ft thick; Cordell 1979, 76049). The regional aquifer is located primarily in the Santa Fe Group and the Puye Formation.

Depths to the regional aquifer range between about 1500 ft (along the western edge of the plateau) to about 600 ft (to the east). The depths to the regional aquifer at TA-16 that have been determined by drilling are 1490.5 ft (at R-26 west of the TA-16 Ponds) (Kleinfelder, 2004, 87846, p. 22), 1245 ft (at CdV-R-15-3 east of Cañon de Valle), 1197 ft (at CdV-R-37-2 southeast of TA-16), and 1286 ft (at R-25 northeast of the TA-16 Ponds) (LANL 2003, 77965, p. B-20). The regional aquifer may have been penetrated at a depth of 1350 ft in the CdV-16-3(i) borehole. The nearest production well to TA-16 is PM-2 in Pajarito Canyon 4 to 5 mi east of the operational areas at TA-16. Figure 3.2-4 depicts water-table elevations in the regional aquifer across the Pajarito Plateau; this figure does not include results for wells drilled during 2004.

The regional aquifer at well R-25 also exhibits a downward head gradient, indicating that this area is a zone of recharge (Broxton and others, 2002, 72640, p. 47). Lateral gradients in the regional aquifer are typically on the order of 0.02 to 0.03. These estimates do not take into account the results of drilling during 2004.

Estimates of groundwater transport velocity will be evaluated more accurately using the existing aquifer model (Nylander, 2003, 76059) and using site-specific modeling in support of the deep groundwater CMS for SWMU 16-021(c)-99, the 260 outfall. These calculations will take into account the three-dimensionality of the groundwater flow paths, the spatial distribution of recharge along the canyons, media heterogeneity, and the time variation of pumping in water supply wells.

3.2.2.5 Vadose Zone

The region beneath the ground surface and above the regional aquifer is called the vadose (unsaturated) zone. This discussion focuses on the vadose zone beneath the TA-16 mesa top. The principal sources of moisture in the vadose zone are precipitation, much of which is removed as runoff, evaporation and transpiration, and infiltration from canyon bottoms. Characteristics of infiltration in the vadose zone are described in the preceding sections for infiltration and perched intermediate waters. Subsurface movement of moisture is predominantly vertical in direction and is influenced by the properties and conditions of the vadose zone. Lateral flow can also occur when there are significant contrasts in hydrologic properties between adjacent units. Surge beds may be a particularly favorable zone of lateral mobility because of their high porosity.

The geologic properties of the Bandelier Tuff that most influence fluid flow in the vadose zone are the degree of welding and hydraulic conductivity. There are significant heterogeneities in both of these properties within the TA-16 vadose zone. Welded tuffs tend to have less matrix porosity and more fractures than nonwelded tuffs. Fractures in welded tuffs may include relatively closely spaced cooling joints as well as tectonic fractures. Nonwelded tuffs also have fractures but generally fewer than welded

tuffs. Saturated hydraulic conductivities in the Bandelier Tuff beneath the TA-16 mesa top range over five orders of magnitude between subunits in Tshirege units 4 and 3t (LANL 2003, 77965, p. 4-58). In boreholes drilled at TA-16, saturated hydraulic conductivity ranges from 3.8×10^{-3} cm/s in a surge unit to 9.8×10^{-9} cm/s in a densely welded subunit.

Several competing effects determine moisture content, degree of saturation, and resultant likelihood of flow and contaminant transport. Although water moves slowly through unsaturated tuff matrix, it can move relatively rapidly through fractures and surge beds if saturated conditions exist (LANL, 1997, 63131). Because of the higher precipitation levels at TA-16, volumetric moisture levels at TA-16 tend to be higher than at TAs east of TA-16. Several zones in boreholes at TA-16 were at or near saturation, in particular the intermittent saturated zones in boreholes located near the 90s Line pond and near the head of Martin Spring Canyon (LANL, 2003, 77965, p. 4-55). Such pathways are indicated as the saturated ribbons on the conceptual model diagram (Figure 3.2-3).

4.0 SCOPE OF INVESTIGATION ACTIVITIES

This section identifies the specific activities that will be performed as part of characterizing the TA-16 ponds area.

Specific goals include delineating areas that are likely to require remediation based on characterization results; defining the potential waste types and volumes that may require removal; performing additional site characterization around the former buildings, sumps, and drainlines; and defining the nature and extent of contamination associated with consolidated SWMUs 16-007(a)-99 and 16-008(a)-99.

4.1 TA-16 Ponds Investigation Activities

To characterize the nature and extent of contamination at the TA-16 ponds, the following investigation activities are anticipated:

- Mobilization and site preparation
- Pre-sampling geodetic and utilities survey
- Best management practices (BMPs) installation
- Surface and subsurface sampling
- Site restoration and demobilization
- Post-sampling geodetic surveys
- Down-hole moisture screening (neutron probe)
- IDW management (see Appendix D)

Health and safety activities will be governed by a Laboratory-approved site-specific health and safety plan and integrated work documents. The Laboratory does not anticipate that associated health and safety concerns will prohibit the implementation of this work plan.

4.2 General Investigation Strategy for Surface and Subsurface Characterization

The investigation strategy for the site characterization described in this section applies to those areas within the boundaries of, and adjacent to, consolidated SWMUs 16-007(a)-99 and 16-008(a)-99 that may have been affected by past facility operations/disposal activities at the 30s and 90s production lines.

Based on RFI and VCA sampling results, contaminants such as HE (RDX, HMX, and TNT) and metals (barium, chromium, copper, nickel, and lead) were identified at low concentrations in soils and underlying tuff associated primarily with release areas (sumps, drainlines, outfalls, and ponds) (Figure 4.2-1a). The characterization approach for these potential source areas includes surface and subsurface soil/tuff sampling, field and quantitative screening, and laboratory analysis of samples. The data obtained from these activities will be used to define the nature and extent of contamination at the TA-16 ponds and former process lines, and will be used to guide future remediation activities.

The objective of the proposed investigation is to acquire site-characterization data that will supplement historical information and help to define the nature and extent of contamination. These additional data are required because previous sampling activities have failed to adequately define the extent of elevated contaminant concentrations in soil and groundwater, both laterally and vertically. The activities proposed in this work plan will accomplish this objective through the collection of samples from deeper intervals (for vertical extent) and over a wider area (for lateral extent). The focus of this sampling is the likely contaminant transport pathways, based on the conceptual model for contaminant transport. Hence, vertical extent-of-contamination samples will be located at areas of known releases where significant hydrologic head may have existed (e.g., the ponds and soil-removal areas associated with leaking sumps and drainlines). These are the places where transport deep into the vadose zone is most likely to have occurred. Similarly, lateral extent-of-contamination samples will be located down the surface gradient in drainages, and in areas where contamination may have been mobilized during high-flow events (e.g., along the pond edges and in the overbank areas of drainages).

To fully evaluate the nature and extent of contamination at the TA-16 ponds and to meet characterization goals, the lateral and vertical extent of sampling may be expanded beyond what is discussed in this work plan. The extent of contamination will be delineated relative to nondetects for organic compounds and to background values for inorganic compounds.

4.2.1 Site Characterization Sampling Approach

Table 4.2-1 lists the proposed locations to be sampled during this investigation and the number of each type of sample per location. The numbers and types of samples for each location are minimum numbers to be collected. Additional field-screening and confirmation samples may be collected based on field observations and screening results.

Hereafter, the term *samples* will refer to analytical samples submitted to off-site laboratories. Field-screening samples will be specifically identified as such.

Samples will be collected at specified intervals during the installation of several types of borings: shallow hollow-stem auger (HSA) (~15 ft bgs), intermediate-depth (~150 ft bgs), and shallow hand-augered or power-augered (~5 ft bgs) (Table 4.2-1; Figures 4.2-2a and 4.2-2b). The selection of samples for quantitative screening and confirmatory laboratory analysis, and the locations from which to collect these samples, will be biased by previous sample results and real-time field-screening results. For safety purposes, all samples will be screened for gross radioactivity and spot-tested for HE. Field screening will also include photoionization detector (PID) screening for total VOCs.

Semiquantitative screening for RDX will be conducted on all samples using D TECH test kits (see section 5.1.2). D TECH kits will not detect HMX or HE-degradation products quantitatively. During drilling/augering, if D TECH results for RDX screening are above the detection limit (1 mg/kg) at the deepest interval, the boring will be advanced beyond the proposed target depth to determine the vertical extent of contamination. The sample with the highest D TECH RDX value from each borehole will be submitted for laboratory analysis.

During drilling, x-ray fluorescence (XRF) screening for metals will be used to increase the likelihood that vertical extent of contamination is determined in each borehole. The deepest sampling interval in each borehole will be screened using XRF, particularly for barium, and the results will be compared to local tuff background levels. If elevated metals, particularly barium, are indicated by the XRF screening, the borehole will be advanced until the metals are within the local tuff background range.

In the absence of elevated HE field-screening results, PID field-screening results will be used to bias laboratory sample selection. Elevated PID and beta-gamma readings were not observed during previous investigation activities (see Appendix B).

4.2.2 Mobilization and Site Preparation

Mobilization and site preparation will include the following tasks:

- Mobilizing equipment and preparing the sites (including installing any necessary BMPs)
- Ensuring control of the site, including waste-management and support areas, by using fences, signs, and any other appropriate measures to prevent unauthorized entry by workers
- Obtaining excavation permits and utilities surveys, as needed

Pre-sampling Geodetic and HE Surveys

A pre-sampling geodetic survey will be conducted to properly identify and stake all proposed drilling and sampling locations. An HE survey will also be conducted to identify any areas of chunk HE that may still be present on the ground surface. An explosive ordnance disposal–certified expert in the identification of various types of HE will conduct this survey.

4.2.3 Shallow Subsurface Characterization Activities

Characterization activities at consolidated SWMUs 16-007(a)-99 and 16-008(a)-99 will determine if constituents associated with historic HE-machining and electroplating operations at the 30s and 90s Lines remain present in soil and groundwater beneath these sites. The contaminants most likely to be associated with these operations include HE (RDX, HMX, and TNT) and metals (barium, chromium, copper, nickel, uranium, and lead). Low-level concentrations of VOCs and SVOCs were identified during previous investigations (see Appendix B).

4.2.3.1 Shallow Subsurface Sampling Using an HSA

Forty-eight shallow borings will be drilled at the 30s and 90s Line ponds and in surrounding areas associated with former structures and discharge areas (i.e., sumps, buildings, drainlines, ponds). These borings are largely designed to define the vertical extent of contamination in the shallow subsurface. Figure 4.2-1b shows the location of these proposed shallow hollow-stem auger (HSA) borings and

Figure 4.2-2a provides a schematic of the sampling intervals. The anticipated depth of these borings is approximately 15 ft bgs.

Table 4.2-1 shows the minimum proposed number of borings and describes sampling locations for this investigation. Additional locations and samples may be added based on field-screening results. Each of the proposed borings will be drilled using an HSA truck-mounted drill rig equipped with a continuous-core split barrel sampler. The HSA method is discussed further in section 5.2.1.1. The specific sampling approach for each area is described below.

- 90s Line Pond RFI—Four borings, approximately 20 ft bgs, will be drilled within the 90s Line pond (Figure 4.2-1b), as described in the July 1993 OU 1082 RFI work plan, which was conditionally approved by EPA on December 22, 1994. As part of recent RFI activities, an attempt was made to drill these borings during October 2004; however, considerable precipitation through the summer and fall months created standing water in the pond and made conditions unfavorable for drilling and sampling. These four borings are an integral part of the vadose zone evaluation below the 90s Line pond and they will be drilled when the pond dries sufficiently to support the weight of the drill rig.

- 90s Line Pond—At least two shallow borings will be drilled around the perimeter of the 90s Line pond to better define the vertical and lateral extent of contamination associated with the pond. The two borings will be located on the north and east sides of the pond, respectively, at a distance of approximately 20 ft from the edge (Figure 4.2-1b). These shallow borings will be drilled to a total depth of approximately 5 ft below the alluvium/tuff interface for a total depth of approximately 15 ft bgs. If field screening indicates that soil contamination exists, the borings will be advanced further. The vertical extent of impacts below the pond itself will also be determined by the intermediate-depth borings (see section 4.2.3.3).

- 30s Line Pond—At least three shallow borings will be drilled in the northernmost 30s Line pond (Figure 4.2-1b) to delineate HE-contaminated soil encountered during the 2004 RFI investigation (see Appendix B). Of the 13 borings drilled during the 2004 investigation, only one (16-23739) exhibited highly elevated HE concentrations (RDX >1000 ppm). The three additional borings will be drilled to a depth of at least 5 ft below the fill/tuff contact. If contaminated soil is encountered at this depth, deeper drilling depths or additional offset borings may be required.

- 90s Line Former Building, Sump, and Excavation Locations—At least one boring will be drilled at the former location of each sump/drainline connection, for a total of ten borings (Figure 4.2-1b). Based on analytical data collected during the VCA, these are locations that have been identified as having elevated concentrations of HE, VOCs, SVOCs, and metals (see Appendix B). Although these areas were previously excavated, the vertical extent of contamination was not determined. Two additional borings will be drilled within the footprint of each of the five former 90s Line buildings to determine the nature and extent of contaminants below the building slab. Nine additional borings will be installed at the ends of the excavation areas where other samples have not been proposed. The ends of several of these excavated areas correspond to other proposed boring locations where sumps and underlying soil were removed. One additional boring will be drilled at the location of the former drum storage area near building 90 (AOC C-16-067). Each of these 30 borings will be advanced through the fill material to a depth of at least 5 ft into tuff, or deeper if field screening indicates the presence of contamination.

- 30s Line Former Buildings and Sumps—At least one shallow boring will be drilled at the former locations of the sump associated with each of the 30s Line buildings (Figure 4.2-1b). Soil samples were not collected during the removal of these sumps in 1960. Two additional shallow borings will

be drilled within the footprint of each of the three former 30s Line buildings in order to assess impacts that may have occurred due to leaks below the building slab. Each of the nine borings will be advanced through the fill material to a depth of approximately 5 ft into the underlying tuff. If contaminated soil is encountered, additional or deeper borings will be required to determine the lateral and vertical extent of contamination.

Field Screening and Analytical Sampling

Field-screening samples will be collected from these shallow borings at 5-ft intervals (beginning at the 0- to 0.5-ft interval) and where staining or other features indicate the presence of contamination (Figure 4.2-2a). Field-screening parameters will include HE (by spot test), gross radioactivity (beta-gamma), total VOCs (by PID headspace), and metals (by XRF) in the deepest interval. D TECH screening analysis will also be conducted at (1) intervals where discoloration or obvious signs of contamination are present, (2) major lithologic changes, (3) the contact between the base of the alluvium (or fill) and the top of tuff (soil/tuff interface), (4) the bottom of the boring, and (5) intervals that contain HE spot test detects (i.e., where total HE concentrations are greater than 100 ppm).

At a minimum, laboratory analytical samples will be collected from each boring at the soil/tuff interface and at total depth. A surface sample (0.0- to 0.5-ft bgs) will also be collected for laboratory submittal at all borings located in areas that were not previously excavated. Additional samples will be submitted based on field observations and field-screening results. In all cases, the highest D TECH screening sample in an individual borehole will be submitted for laboratory analysis. The proposed shallow boring sampling scheme is shown on Figure 4.2-2a. All laboratory analytical samples will be submitted for the analyses listed in section 5.1.3.

Borehole Abandonment

All of the shallow borings, except those drilled in the 90s Line pond, will be abandoned by backfilling with the drill cuttings that came from that particular borehole, assuming no elevated field-screening results are obtained (i.e., that no total HE concentrations are greater than 100 ppm). Drill cuttings that are not returned to the borehole will be containerized and classified as nonhazardous IDW pending analysis (Appendix D), in accordance with ENV-RS Standard Operating Procedure 1.06 (SOP-1.06), Management of Environmental Restoration Project Wastes. Due to possible accumulated water in the 90s Line pond, the proposed four borings will be abandoned using a bentonite grout and tremie placement method.

4.2.3.2 Shallow Subsurface Sampling Using a Hand Auger/Power Auger

Using a hand auger/power auger, 40 shallow borings will be drilled at the 30s and 90s Line ponds and surrounding areas associated with former structures (i.e., sumps, buildings, and drainlines). These shallow borings are largely designed to define lateral extent of contamination. Figure 4.2-1b shows the location of these proposed shallow hand-auger/power-auger borings, and Figure 4.2-2a provides a schematic of the sampling intervals.

Table 4.2-1 describes the minimum proposed number of borings and sampling locations for this investigation. Additional locations and samples will be added based on field-screening results. The specific sampling approach for each area is described below.

- 90s Line Pond—Shallow subsurface sampling activities will be conducted at the 90s Line pond to better define the lateral extent of contamination associated with the pond. These borings will also help determine waste volumes, since contaminated pond sediments are likely to require removal during the remediation phase of activities at the site. These shallow borings will be drilled using a

power auger and will be located near the edge of the 90s Line pond based on a geomorphic evaluation of where the high water mark of the pond was located. Four traverses will be sampled, and four borings will be offset radially (at approximately 10-ft intervals) outward until field-screening results indicate that the extent of contamination has been determined. Each of these borings will be advanced approximately 2 ft into tuff, or until auger refusal is met, whichever occurs first. Actual sample locations will be determined in the field and will be based on evidence of deposition and occurrence of non-native material.

- 90s Line Drainage Channels—At least nine locations will be sampled within the drainage channels associated with the 90s Line discharge to the 90s Line pond. These locations will be determined in the field and will be based on the geomorphic conditions observed. Target locations will include drainage confluences and depositional areas. Each of these borings will be drilled with either a hand auger or power auger to a depth of approximately 2 ft into tuff, or until auger refusal is met. An additional two locations will be sampled approximately 10 ft outside of each drainage (a total of 12 locations) at a point approximately 50 ft downgradient from the former drainline discharge point to evaluate subsurface conditions and migration at the alluvium/tuff (or fill/tuff) interface. Data collected from these borings will determine if lateral seepage of effluents occurred along this contact during periods of high discharge from the drainlines into the drainage channels.

- Distal 90s Line Drainage Channel into Cañon de Valle—At least three borings will be drilled within the 90s Line drainage (from former buildings 92 and 93) at and near the confluence with Cañon de Valle. One of these borings will be drilled at the confluence while the other two will be drilled approximately 30 ft upgradient from the confluence with the 90s Line drainage. The locations of these borings will permit the assessment of shallow subsurface conditions where the 90s Line drainage converges with Cañon de Valle and the downgradient extent of contamination near the confluence of the 90s Line drainage with Cañon de Valle. Each of these borings will be drilled with a hand auger or power auger to a depth of approximately 2 ft into tuff.

Field Screening and Analytical Sampling

Field-screening samples will be collected from these shallow borings beginning at the 0- to 0.5-ft interval and where staining or other features indicate the possibility of contamination. Screening samples will also be collected at intervals where there is a major change in lithology or obvious natural fractures. Field-screening parameters will include HE (by spot test), gross radioactivity (beta-gamma), total VOCs (by PID headspace) and metals (by XRF) in the deepest sampling interval. D TECH screening analysis will be conducted at (1) intervals where discoloration or obvious signs of contamination are present, (2) major lithologic changes, (3) the soil/tuff interface, (4) the total depth of the boring, and (5) intervals that contain HE spot test detects (i.e., where total HE concentrations are greater than 100 ppm).

At a minimum, laboratory analytical samples will be collected from each boring at the soil/tuff interface and at total depth. Additional samples will be submitted based on field observations and field-screening results. In all cases, the highest D TECH screening sample in an individual borehole will be submitted for laboratory analysis. All laboratory analytical samples will be submitted for the analyses listed in section 5.1.3.

Borehole Abandonment

Upon completion of sampling and borehole-logging activities, all of the shallow borings will be abandoned by backfilling with the drill cuttings, assuming no elevated field-screening results are obtained (i.e., total HE concentrations greater than 100 ppm). Drill cuttings that are not returned to the borehole will be

containerized and classified as nonhazardous IDW pending analysis (Appendix D), in accordance with SOP-1.06, Management of Environmental Restoration Project Wastes.

4.2.3.3 Intermediate-Depth Boreholes

To bound the vertical nature and extent of contamination in the vadose zone that is associated with the 30s and 90s Line ponds, six intermediate-depth boreholes will be drilled. Each of these borings will be drilled to a depth of at least 150 ft bgs, which is approximately 20 to 30 ft beyond the Bandelier Tuff Tshirege Member Unit 3/Unit 4 (Qbt 3 and Qbt 4) contact. Figure 4.2-1b shows the approximate location of these proposed intermediate borings, and Figure 4.2-2b provides a schematic of the sampling intervals.

Table 4.2-1 describes the minimum proposed number of borings and sampling locations for this investigation. Particular attention will be focused on the interval between 100 and 150 feet bgs since this is the zone where surge beds and possible perched groundwater may be present. In addition, the springs at TA-16 occur in this stratigraphic interval (LANL, 1998, 59891, section 5). Surge beds and perched groundwater were encountered during the installation of monitoring well 16-02669, at a depth of approximately 120 ft, when it was drilled in February 1998 (LANL, 2003, 77965, p. 4-55–4-77).

- 30s Line Ponds—Three intermediate-depth boreholes will be drilled in (and near) the 30s Line ponds. One of these borings will be located immediately down-dip (i.e., the downgradient direction along the bedding plane) of shallow borings 16-23739 and 16-23749, both of which had HE contamination at the (former) base of the northernmost pond. The second intermediate-depth boring will be drilled in the southern portion of the third pond to evaluate the vadose zone immediately below the four ponds. The third intermediate-depth boring will be drilled approximately 20 ft southeast of the southern edge of the 30s Line ponds. This boring will be drilled to evaluate the vadose zone down-dip (and outside) of the 30s Line ponds area (see Figure 4.2-1b).

- 90s Line Pond—At the 90s Line pond, three intermediate-depth borings will be drilled (see Figure 4.2-1b). The data collected from these borings will be used to supplement data collected from the shallow borings because contamination may have potentially migrated deep below the 90s Line pond. The first boring will be drilled in the center of the pond; this will allow for evaluating the tuff immediately below the pond and determining if pond water may be contributing to the perched groundwater previously noted in this area. The second intermediate-depth boring in the 90s Line pond area will be located approximately 120 ft southeast of the southern edge of the pond. This boring will be used to evaluate if contaminated soil and or perched groundwater extends in a down-dip direction from the 90s Line and the pond. The third intermediate-depth boring will be drilled on the west end of the pond at a point where the discharge to the pond (from the 90s Line) once occurred. Borehole drilling at the center of the pond is complicated by the possibility of standing water because this is the lowest portion of the pond and probably the last area to effectively dry up. A contingency plan for dealing with standing water in the pond is presented in section 4.2.4.

All intermediate-depth boreholes will be drilled to a total depth of approximately 150 ft and are expected to penetrate into Unit 3 of the Bandelier Tuff (see Figure 4.2-2b). Each intermediate-depth borehole will be logged using a neutron probe, and intervals exhibiting elevated pore-water contents will also be selected for screening analysis. If perched water is encountered, drilling will be stopped and a groundwater sample will be collected. After the collection of groundwater samples, any remaining water will be purged from the borehole and it will be allowed to equilibrate overnight. If, by the following day, a

sufficient amount of groundwater has recharged the borehole, a monitoring well will be installed. If the borehole is not recharged, drilling will continue until the target depth is reached. A well will be completed only after a well design is submitted to NMED and after NMED approves the design.

Field Screening and Analytical Sampling

Field screening (spot test, D TECH, PID, and radioactivity) will be conducted at (1) the surface interval (0- to 0.5-ft bgs); (2) intervals where discoloration or possible signs of contamination are present; (3) major lithologic changes; (4) the soil/tuff interface; (5) the total depth of the boring; and (6) major fractures, surge beds, areas of high volumetric water based on neutron probe, or other anomalies. At a minimum, field-screening samples will be collected every 20 ft, and laboratory analytical samples will be collected every 40 ft and at total depth (see Figure 4.2-2b). In all cases, the highest D TECH screening sample in an individual borehole will be submitted for laboratory analysis. The deepest interval will be screened for metals by XRF. All laboratory analytical samples will be submitted for the analyses listed in section 5.1.3.

Borehole Abandonment

All of the shallow borings, except those drilled in the 90s Line pond, will be abandoned by backfilling with the drill cuttings that came from that particular borehole, assuming no elevated field-screening results are obtained (i.e., that no total HE concentrations are greater than 100 ppm). Drill cuttings that are not returned to the borehole will be containerized and classified as nonhazardous IDW pending analysis (Appendix D), in accordance with ENV-RS Standard Operating Procedure 1.06 (SOP-1.06), Management of Environmental Restoration Project Wastes. Due to the possibility of periodic standing water in the 90s Line pond, the deeper intermediate-depth boring at the center of the pond will be abandoned using a bentonite grout and tremie placement method to reduce the possibility of introducing surface water at depth, thereby possibly cross-contaminating a clean subsurface zone.

4.2.4 Contingency Plan for Drilling at the 90s Line Pond

Drilling of the intermediate-depth borings at the center of the 90s Line pond may require a significant amount of site preparation if the pond contains standing water and/or deep mud. For the past several years the Los Alamos area has experienced drought conditions that have allowed the 90s Line pond water to evaporate faster than it could accumulate. Presently, and within the past year, the area has experienced average to above-average amounts of precipitation that has caused water to accumulate in the 90s Line pond. Because of this standing water and mud, the pond was inaccessible to a drill rig during recent RFI activities in October and November of 2004. An attempt was made to install at least two of the proposed RFI borings in the muddy areas on the edge of the pond; however, due to site egress and safety concerns, drilling activities were not completed.

Drilling of the four shallow boreholes is currently scheduled to begin when the pond is dry enough to support the weight of a drill rig. It is anticipated that these boreholes might be drilled in May or June of 2005 if the pond dries sufficiently. If the 90s Line pond is still saturated by the time this work plan is implemented, the four shallow borings will be synchronously drilled along with the central intermediate-depth borehole.

To provide a stable platform for a drill rig during saturated site conditions, specific engineering controls may be required. Standing water and/or mud will be a significant obstacle during the installation of the four RFI borings and the proposed intermediate-depth boring. Drilling with standing water in the borehole is not desirable, because of the possibility of creating a contaminant pathway into the vadose zone. If these conditions exist and engineering controls are required, a drilling contingency plan will be developed in consultation with NMED. LANL will contact NMED to discuss viable options.

4.2.5 Site Restoration, Decontamination, and Demobilization

Site restoration will include backfilling of all sampling locations to the surrounding grade of the ground surface. Extensive revegetation upon completion of ENV-RS activities is not likely to be required since the site is currently sparsely vegetated; however, native seed mix will be hand-dispersed over areas of significant disturbance. In addition, BMPs for controlling stormwater run-on and run-off will be installed, inspected, and maintained, as needed.

Disturbances from intrusive activities such as hand-auger sampling will be minimal. Assuming no elevated field-screening results are obtained (i.e., no total HE concentrations are greater than 100 ppm), drill cuttings will be used to backfill their respective borings. Drill cuttings that are not returned to their boreholes will be containerized and classified as nonhazardous IDW pending analysis (Appendix D), in accordance with SOP-1.06, Management of Environmental Restoration Project Wastes.

Stainless-steel sampling equipment will be decontaminated between sampling locations. This will be done using an Alconox/water solution and decontamination technique in accordance with the SOPs listed in section 5.

The wastewater derived from the daily decontamination of sampling equipment will be contained in a 5-gal. plastic bucket and may be disposed of on-site, using the exemption for wastewater volumes of less than 6 gal. per day. All sampling and decontamination equipment, materials, and IDW will be removed from the site (see Appendix D).

A final site inspection will be conducted to assure that site restoration, decontamination, and demobilization activities have been completed.

All site-preparation, site-fieldwork (excavation, sampling, etc.), and site-restoration activities will be documented in field logbooks. Photographs will be taken during this phase of the work and descriptive annotations will be added.

4.2.6 Post-sampling Geodetic Survey

A post-investigation geodetic survey will be conducted at all sampling locations. This will be done to confirm the exact locations of sample collection and to ensure that any deviations from the proposed sample design are documented.

5.0 INVESTIGATION METHODS

The most current versions of the SOPs and quality procedures (QPs) discussed below, and the current ENV-RS quality management plan, are applicable to the investigation activities proposed in this plan (Table 5.0-1). The SOPs and QPs referred to in this plan are available at http://erproject.lanl.gov/documents/procedures.html.

5.1 Sampling for Site Characterization of Nature and Extent

The lateral and vertical extent of chemicals of potential concern (COPCs) at the TA-16 ponds will be determined by collecting surface and subsurface soil and tuff samples and performing analyses as outlined in section 4. The data will be evaluated to define the nature and extent of contamination, to determine if residual COPC concentrations at the site pose potential human health or ecological risks, and to determine if soil removal or other remediation is warranted.

5.1.1 Surface and Subsurface Sampling

Surface and subsurface soil and tuff samples will be collected as outlined in section 4. These samples will be collected from the specified sample depths at each sample location in accordance with SOP-6.10, Hand Auger and Thin-Wall Tube Sampler, and SOP-6.26, Core Barrel Sampling for Subsurface Earth Materials. Samples will be packaged, preserved, and shipped in accordance with SOP-1.02, Sample Container and Preservation, and SOP-1.03, Handling, Packaging, and Shipping of Samples. To minimize the loss of VOCs, sediment or alluvial material samples destined for VOC analysis will be collected immediately upon recovery using disposable En Core samplers, according to the latest version of the manufacturer's instructions (as referenced in SOP-6.10, Hand Auger and Thin-Wall Tube Sampler). Glass jars will be used to collect VOC samples in those situations where an En Core sampler is not practical (e.g., when sampling competent tuff).

5.1.2 Field Analytical Methods

Each sample will be qualitatively screened for health and safety purposes and to select sample locations for fixed-laboratory analysis. These qualitative field-screening methods include (1) screening for gross radionuclides (beta-gamma) using a NaI detector; (2) HE spot testing; (3) immunoassay testing for RDX; (4) total organic vapor headspace screening using a PID (SOP-6.33); and (5) total metals screening, primarily for barium, using an XRF analyzer (SOP-10.08). Immunoassay, PID, and XRF field-screening results will be recorded in the field boring logs and field notebooks in accordance with QP-5.7, Notebook Documentation for Environmental Restoration Technical Activities.

D TECH immunoassay test kits from Strategic Diagnostics, Inc., will be used to field screen both soil and tuff samples for RDX. This semi-quantitative field-screening method will be used to guide drilling and sampling investigation activities and enable the volume of contaminated soil/tuff to be estimated. The field analytical method for RDX is EPA SW-846 (Update III) Method 4051 (EPA, 1997, 57589). The D TECH detection limit for RDX in soils is 1.0 mg/kg.

Headspace vapor screening will target VOCs and will be conducted by placing the soil or rock sample in a plastic resealable bag. The bag will be partially filled and allowed to stand for a minimum of 5 min. to allow for vapor equilibration. Vapors will be measured by inserting the probe through a small opening in the bag. The maximum value and the ambient air temperature will be recorded on the boring log and field notebooks for each sample location. The PID will be equipped with a 10.6 or higher electron volt lamp. The PID will be calibrated daily, following the manufacturer's instructions, using a calibration gas consisting of 100 ppm isobutylene. A principal limitation of PID screening is that it does not discriminate among VOCs and is susceptible to false positives in response to naturally occurring compounds and moisture. Typical PID detection limits are 1 ppm.

A Spectrace 9000 (or comparable) field-portable XRF instrument will used to field screen for total metals, particularly barium in the lowermost depth interval of each boring. A field duplicate sample will be screened with every set (typically 10) of characterization samples analyzed. Field-calibration standards for quantitative field-screening methods will be run daily or as prescribed in the equipment manufacturer's instructions. The Spectrace 9000 XRF has a detection limit of 10 mg/kg for barium.

5.1.3 Fixed-Laboratory Analytical Methods

Fixed-laboratory analytical samples will be submitted as outlined in section 4. Sample collection and analysis will be coordinated with the ENV-RS Sample Management Office (SMO). The SMO will ship samples to an analytical laboratory that has been qualified according to QP-7.2, Supplier Evaluation, and is on the ENV-RS–approved list of suppliers.

Surface and subsurface soil and tuff samples will be submitted to the SMO for off-site contract laboratory analysis. Table 5.1-1 lists the analytical suites and methods (EPA 1997, 57589) to be used for soil and tuff samples.

Samples collected from the locations at, and downgradient from, drainages associated with former building 93 will also be analyzed for hexavalent chromium (chromium VI), based on previous detections noted during the 1996 VCA investigation. Samples collected from all locations associated with this investigation (see Table 4.2-1) will be analyzed for target analyte list (TAL) metals including chromium, but not chromium VI. The samples located at the former drum storage area will be analyzed for total petroleum hydrocarbons (diesel). The proposed analytical suite is based on process knowledge of the historic operations at the facility; therefore, additional sampling and analysis for polychlorinated biphenyls (PCBs) and dioxins/furans is not warranted.

Quality assurance/quality control (QA/QC) procedures for samples will include collecting field duplicates (at a rate of 1 in 10 samples or 1 per day, whichever is more frequent) to evaluate the reproducibility of the sampling techniques, rinsate blanks to evaluate decontamination procedures (if decontaminated equipment is being reused for sampling), and trip blanks (for VOCs) to evaluate possible laboratory cross-contamination (see SOP-1.05, Field Quality Control Samples). These samples will be collected at a frequency consistent with SOP-1.05.

Waste samples will be analyzed for metals using the toxicity characteristic leaching procedure (TCLP) rather than a method for total metals analysis.

5.2 Methods for Drilling and Sampling Boreholes

5.2.1 Drilling Methods

Over 40 shallow vertical boreholes (<25 ft bgs) and six intermediate-depth boreholes (~150 ft bgs) are proposed. All boreholes, as outlined in section 4.2.2, will be drilled using the HSA method. If HSA refusal occurs, the boring location will be offset and redrilled; otherwise, rock-coring methods will be used to complete the boring.

5.2.1.1 HSA

The hollow-stem continuous flight auger consists of a hollow steel shaft with a continuous spiral steel flight welded to the exterior site of the stem. The stem is connected to an auger bit and, when rotated, transports cuttings to the surface. The hollow stem of the auger allows drill rods, split-spoon core barrels, Shelby tubes, and other samplers to be inserted through the center of the auger so that samples may be retrieved during the drilling operations. The hollow stem also temporarily cases the borehole so that the well screen and casing (riser) may be inserted down through the center of the augers once the desired depth is reached, minimizing the risk of possible collapse of the borehole. A bottom plug or pilot bit can be fastened onto the bottom of the augers to keep out most of the soils and/or water that have a tendency to clog the bottom of the augers during drilling. Drilling without a center plug is acceptable provided that the soil plug, formed in the bottom of the auger, is removed before sampling or installing well casings. The soil plug can be removed by washing out the plug using a side discharge rotary bit, or by drilling out the plug with a solid-stem auger bit sized to fit inside the HSA. In situations where heaving sands are a problem, potable water may be poured into the augers to equalize the pressure so that the inflow of formation materials and water is held to a minimum when the bottom plug is removed. The HSA method is best suited for drilling shallow overburden wells.

5.2.1.2 Rock Coring

Six 150-ft boreholes will be drilled at the approximate locations shown on Figure 4.2-1b. Each borehole will be drilled using the HSA method unless auger refusal occurs and prevents borehole advancement, at which time it might be necessary to switch to a rock-coring method. Subsurface material will be cored to total depth using a split-barrel sampler in accordance with SOP-4.01, Drilling Plan Development. A drilling plan will be developed as part of the readiness preparations for this field activity. The core will be screened for radioactivity, HE, metals, and VOCs (section 4.2); visually inspected; and geologically logged. If contamination is detected using field-screening methods at the proposed total depth, the boring will be advanced at least 25 ft beyond the contaminated interval until nature and extent are defined.

5.2.2 Neutron Logging of Boreholes

Each proposed boring will be moisture-logged, using a neutron probe, after drilling to total depth is completed. Logging will be conducted at 1-ft intervals to total depth in accordance with SOP-7.05, Subsurface Moisture Measurements Using a Neutron Probe.

5.2.3 Collection of Tuff Samples

Subsurface tuff samples will be collected from the core barrel sampler and put into sealed sleeves or core-protect bags to preserve core moisture by using the methods described in SOP-6.26, Core Barrel Sampling for Subsurface Earth Materials. Tuff samples will be collected according to protocols presented in section 4.2. Samples will be collected from intervals where contamination is suspected due to elevated field-screening results and/or visual inspection that identifies fractures or staining; otherwise, samples will be collected at the 40-ft default intervals discussed in section 4.2.

Field documentation of samples collected from fractures will include a detailed physical description of the fracture fill material and rock matrix sampled and will be conducted according to SOP-12.01, Field Logging, Handling, and Documentation of Borehole Materials. The volumes of fracture fill and rock matrix material included in the sample will be estimated from field measurements.

Tuff samples from the intermediate-depth boreholes will be analyzed by the methods specified in Table 5.1-1. QA/QC samples will include field duplicate samples for evaluating the reproducibility of the sampling technique, rinsate blanks for evaluating decontamination procedures, and trip blanks (for VOCs) for evaluating contamination during transport or at the analytical laboratories. Collection of these samples will follow the procedures and the frequency described in SOP-01.05, Field Quality Control Samples.

5.2.4 Collection of Perched Water Samples

Water samples will be collected from each borehole whenever water is encountered during drilling and from each completed perched water well when water is present (see SOP-6.01, SOP-6.02, and SOP-6.03). The procedures for sampling water during drilling differ from the procedures for sampling water from a completed well. Both methods are described in this section.

5.2.4.1 Collection of Water Samples During Drilling

If saturation is encountered as a borehole advances, drilling will stop and the water level will be measured to determine if sufficient water volume is available for sample collection and field measurement of water quality parameters. Water quality parameters will include measurements for pH, specific conductivity, and temperature. If groundwater samples are collected, analyses will include VOCs, SVOCs, metals, HE,

anions, perchlorate, alkalinity, uranium, cyanide, and total dissolved solids. The total volume required for each analysis is usually 0.5 to 1 L. If a sufficient volume of groundwater cannot be collected for analysis, the borehole will continue to be advanced to the planned total depth or until saturation is encountered again, in which case the water-collection process will be repeated. Insufficient water sample volumes from discrete depths will not be commingled to obtain the required volume for analysis.

If a sufficient volume of groundwater is collected, the sample will be submitted for analysis on an expedited turnaround time. An expedited sample turnaround will typically provide analytical results within 48 hr. After the sample is collected, the borehole will be advanced to the base of saturation or the perching horizon. The objective is to identify, but not penetrate, the perching horizon and thereby determine the thickness of the zone of saturation and the characteristics of the perching horizon. Borehole drilling will be halted at the base of saturation or the perching horizon, a monitoring well will be designed, and the design will be submitted to NMED for approval. Following approval of the design, a monitoring well will be installed.

5.2.4.2 Collection of Water Samples from a Perched Zone Well

Following well development, wells will be completed with single-screen systems. The procedures that will be used for collecting groundwater samples are described in SOP-06.01, Purging and Sampling of Single Completion Wells, and in SOP-06.03, Sampling for Volatile Organic Compounds in Groundwater.

The first step in collecting a groundwater sample from a single-screen well will be to measure the static water level. This measurement will be used with measurements of the total depth and diameter of the well to calculate the volume of water that must be purged before collecting a sample. The water will be purged with either a submersible pump or a bailer. The total volume of water purged will be noted on the sample collection log, and measurements of discharge rate and water level will be made periodically.

During purging, multiple 1.0-L capacity bailers will be filled with water from the screen and hoisted to the surface. Subsamples will be collected from the sampling bottles for laboratory analyses. A 0.45-µm filter will be used to filter samples that are to be analyzed for dissolved constituents. Field parameters (i.e., temperature, conductivity, pH, alkalinity, dissolved oxygen, and turbidity) will be measured at the start of purging and several times during purging. The samples will be collected when either three casing volumes have been removed or field parameters have been stabilized. Field parameters are considered stable when the pH varies by less than 0.2 units or when the variation in the other parameters over a series of four readings is within 10%. If the field parameters do not stabilize, a sample will be collected and the field parameters will be recorded. Field parameters will be measured for each sample by using the procedures described in SOP-6.02, Field Analytical Measurements of Groundwater.

Groundwater samples that have been collected and processed will be placed in appropriate containers and preserved according to SOP-01.02, Sample Container and Preservation. Groundwater samples for chemical analyses will be placed in appropriate secondary containers and transported to the SMO for shipment either to off-site analytical laboratories or to LANL laboratories for more rapid analyses. The procedures for sample packaging and delivery that will be used are described in SOP-01.0, Handling, Packaging, and Shipping of Samples.

Table 5.2-1 lists the analytical suites and methods to be used for all water samples associated with the ponds area.

Filtered and unfiltered water samples will be analyzed for TAL metals, cyanide, and uranium. Analyses for all other suites will be conducted only for unfiltered water samples. The proposed analytical suite is based on process knowledge of historic operations at the facility; therefore, additional sampling and analysis for

PCBs and dioxins/furans is not warranted. Water samples will be collected following initial completion of each well and as required by the monitoring and sampling program described in section 6. QA/QC samples will be collected in accordance with SOP-01.05, Field Quality Control Samples.

6.0 MONITORING AND SAMPLING PROGRAM

Monitoring of surface water and groundwater associated with the TA-16 ponds may be necessary. However, the information needed for designing a monitoring plan is insufficient at this time. If circumstances are such that the installation of a monitoring well(s) is warranted, the sampling of the additional well(s) would be incorporated into the existing TA-16 groundwater monitoring program that is being completed as part of the 260 outfall RFI and CMS activities. This ongoing quarterly monitoring event includes collecting groundwater as well as surface water samples from the 90s Line pond and springs that occur in the adjacent canyons.

7.0 SCHEDULE

This work plan for the TA-16 ponds investigation is scheduled to be submitted to NMED on March 31, 2005. Assuming a 60-day NMED review period and 30 days to resolve comments between NMED and the Laboratory, the work plan will be approved in late June 2005.

The field activities, including preparation for fieldwork, drilling, sampling and field screening, will take approximately 12 weeks to complete (barring inclement weather or other unforeseen delays). Analytical sample results are anticipated to be received, validated, and analyzed within 60 days. Additional sampling may be required to bound the nature and extent of contamination (e.g., if a sample needs to be taken at depth beneath a positive analytical result). Any additional sampling is likely to be conducted within 60 days of receiving results from the first sampling round. If additional sampling is conducted, the results will be received, validated, and analyzed within an additional 60 days.

The investigation report for consolidated SWMUs 16-007(a)-99 and 16-008(a)-99 will be submitted to NMED by May 31, 2007. Additional drilling may be proposed in the investigation report, if the nature and extent of contamination have not been adequately defined as a result of this investigation.

8.0 REFERENCES

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Copies of the reference sets are maintained at the NMED Hazardous Waste Bureau; the DOE Los Alamos Site Office; the U.S. EPA, Region 6; and ENV-RS. The sets were developed to ensure that the administrative authority has all the material needed to review this document, and they are updated periodically as needed. Documents previously submitted to the administrative authority are not included.

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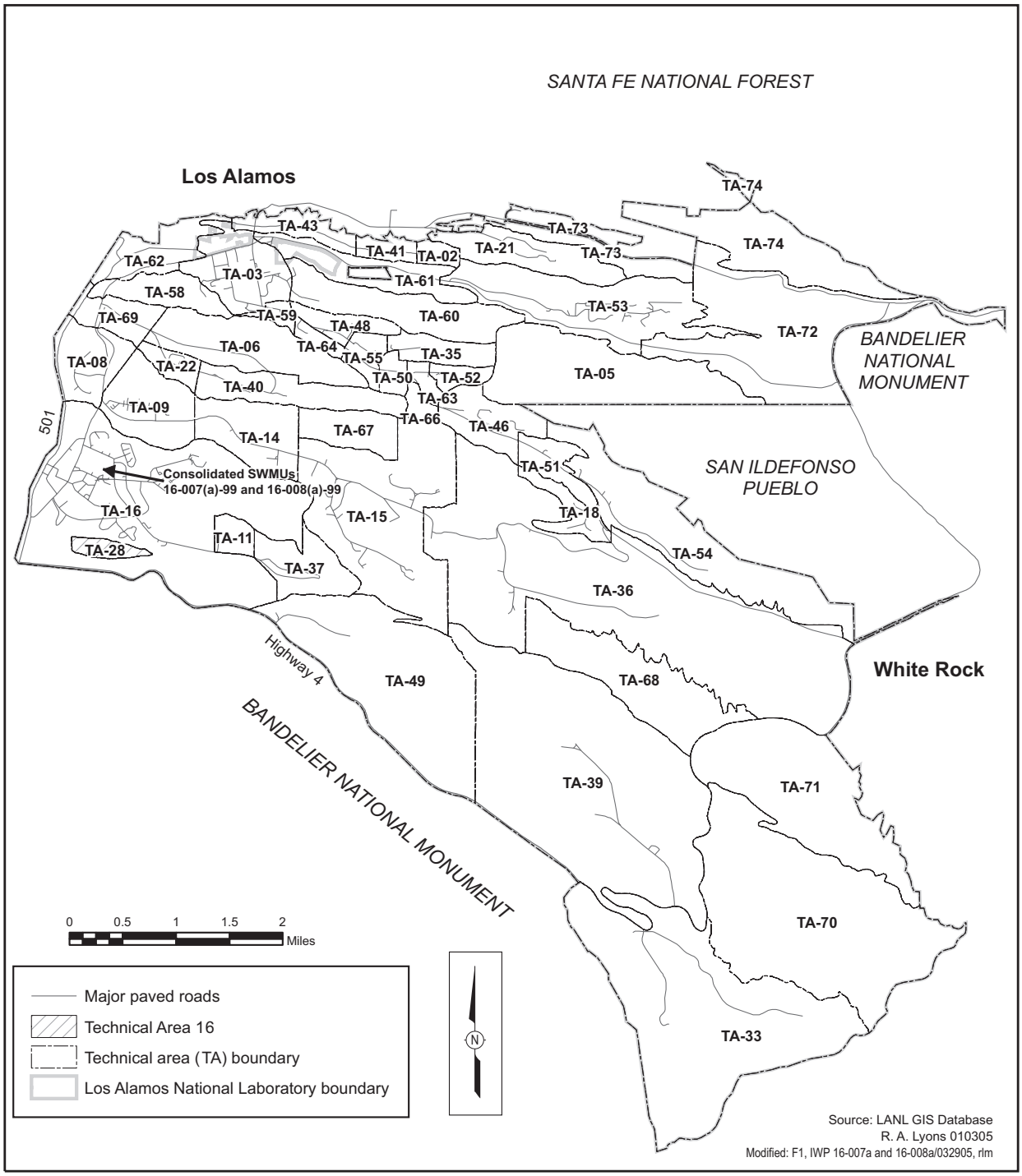

Figure 1.1-1. Approximate location of SWMUs 16-007(a)-99 and 16-008(a)-99 (TA-16 ponds) with respect to Laboratory technical areas

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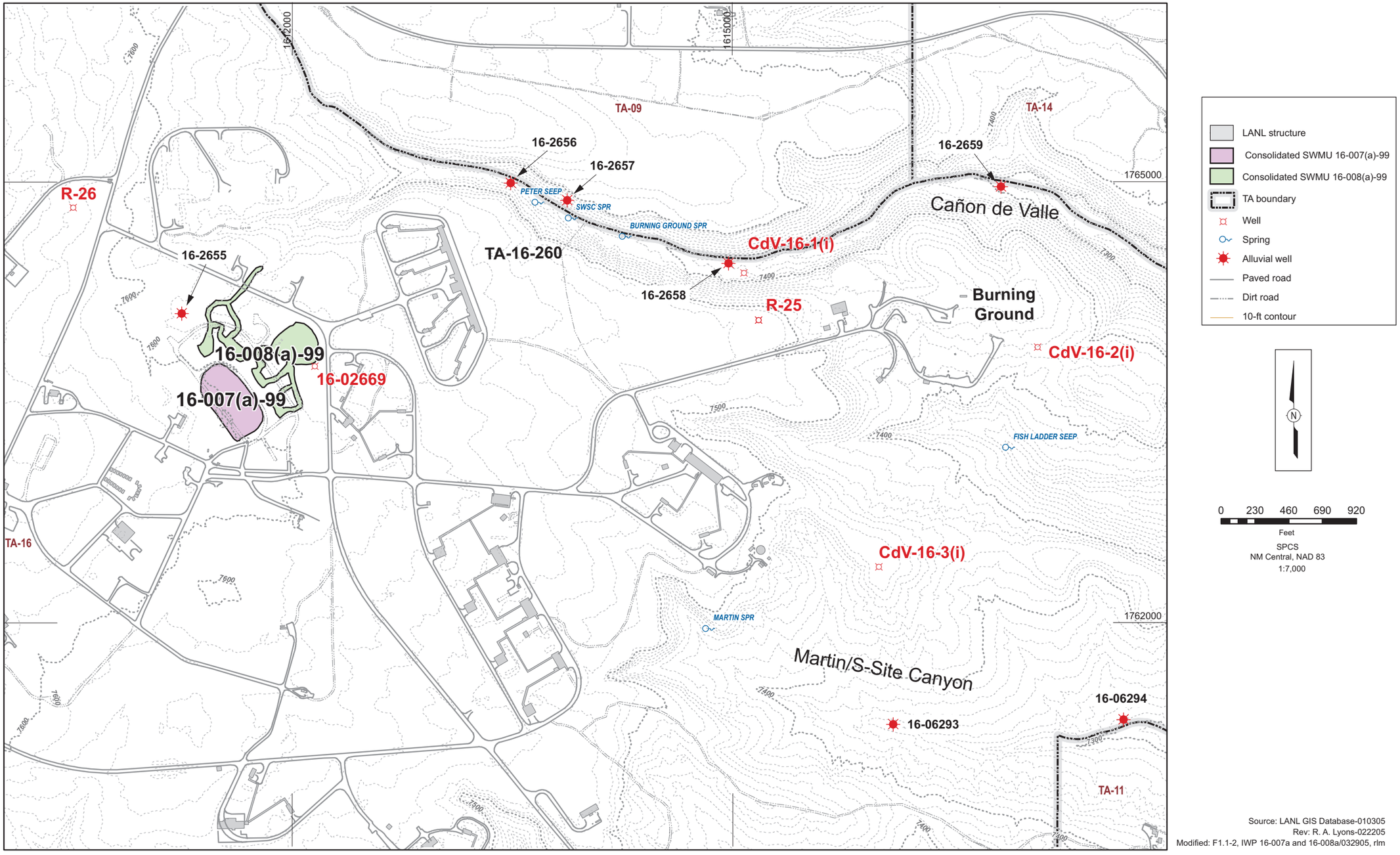


Figure 1.1-2. Locations of SWMUs 16-007(a)-99 and 16-008(a)-99 (TA-16 ponds) and nearby wells

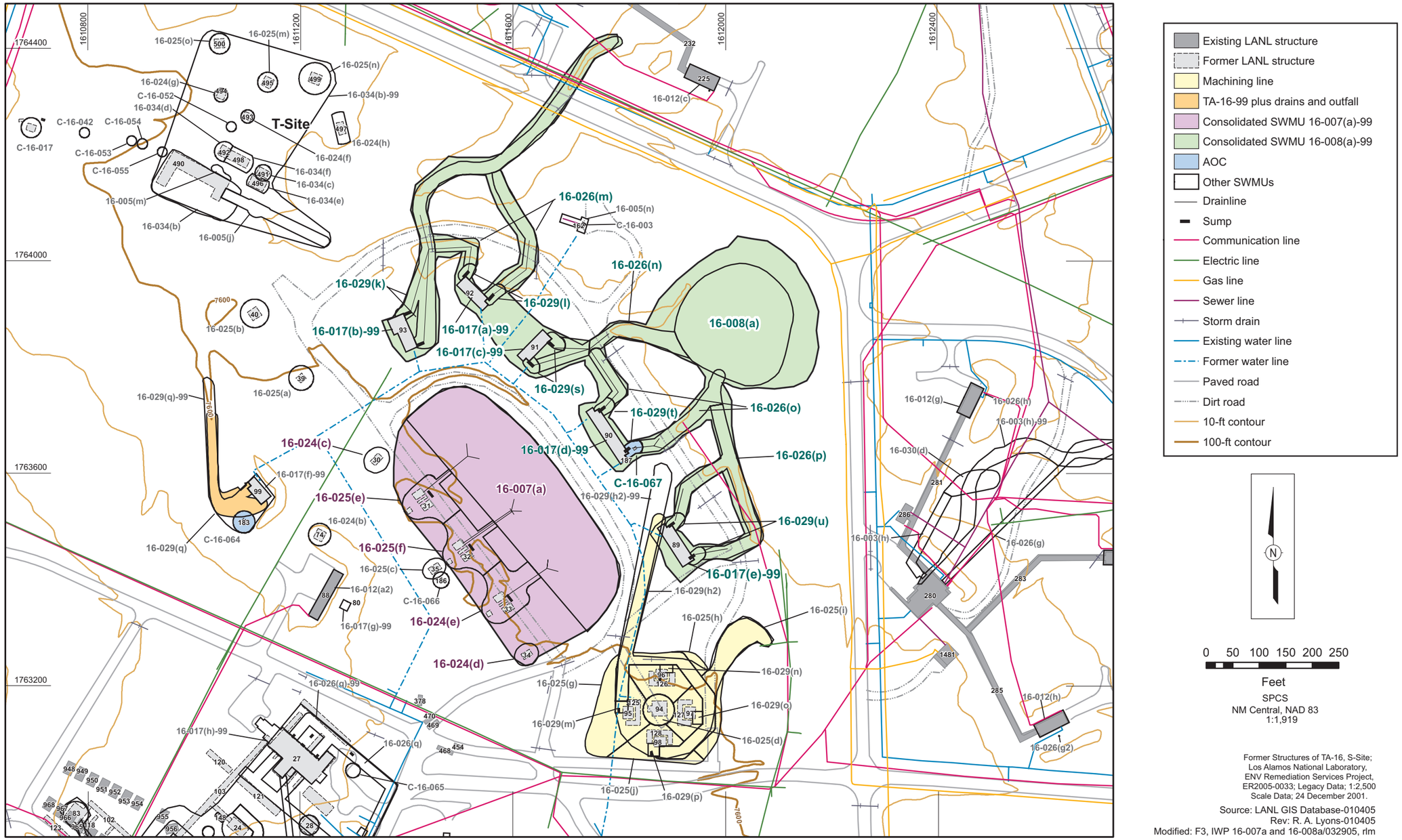


Figure 2.1-1. **Locations of AOCs and SWMUs that make up consolidated SWMUs 16-007(a)-99 and 16-008(a)-99, and nearby AOCs and SWMUs**

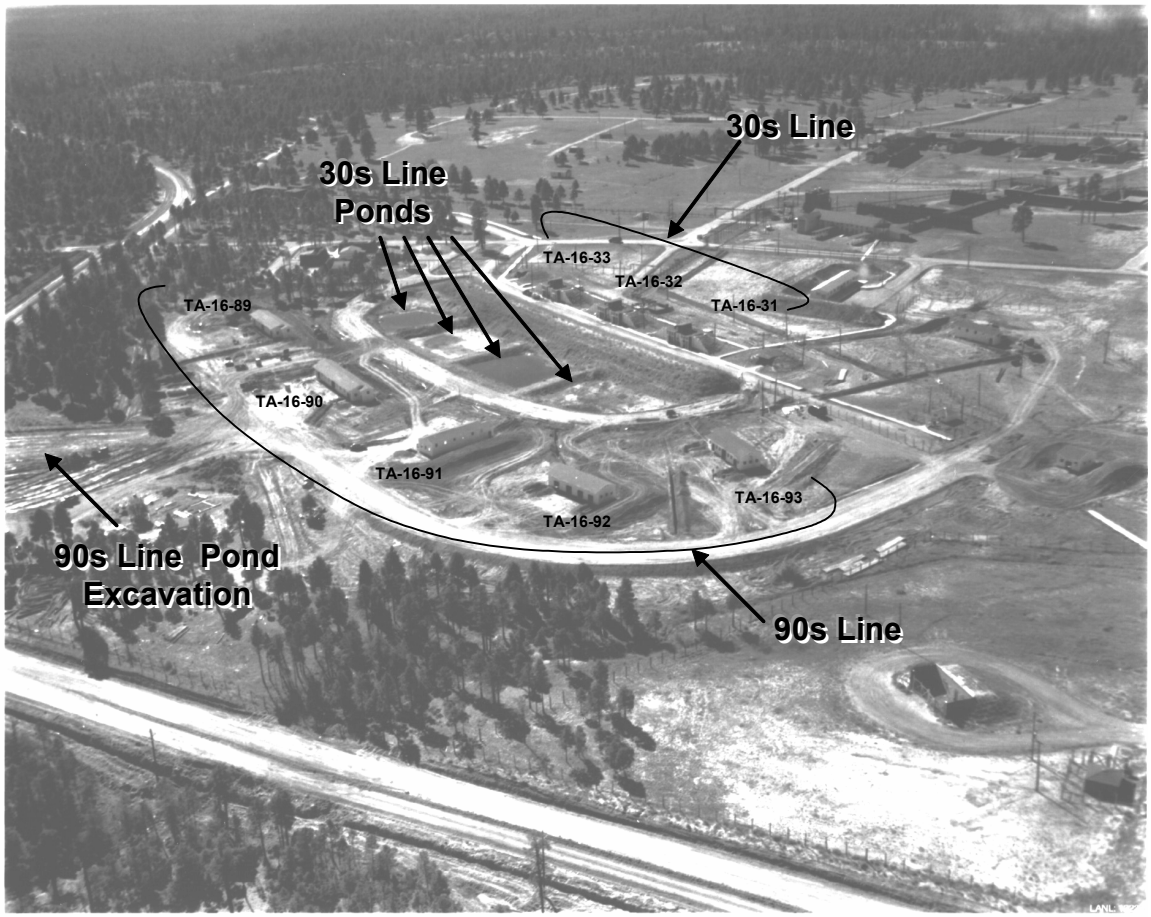


Figure 2.1-2. **1950s aerial photograph of the 30s- and 90s-Line complex (looking southeast) taken during construction of the 90s Line**

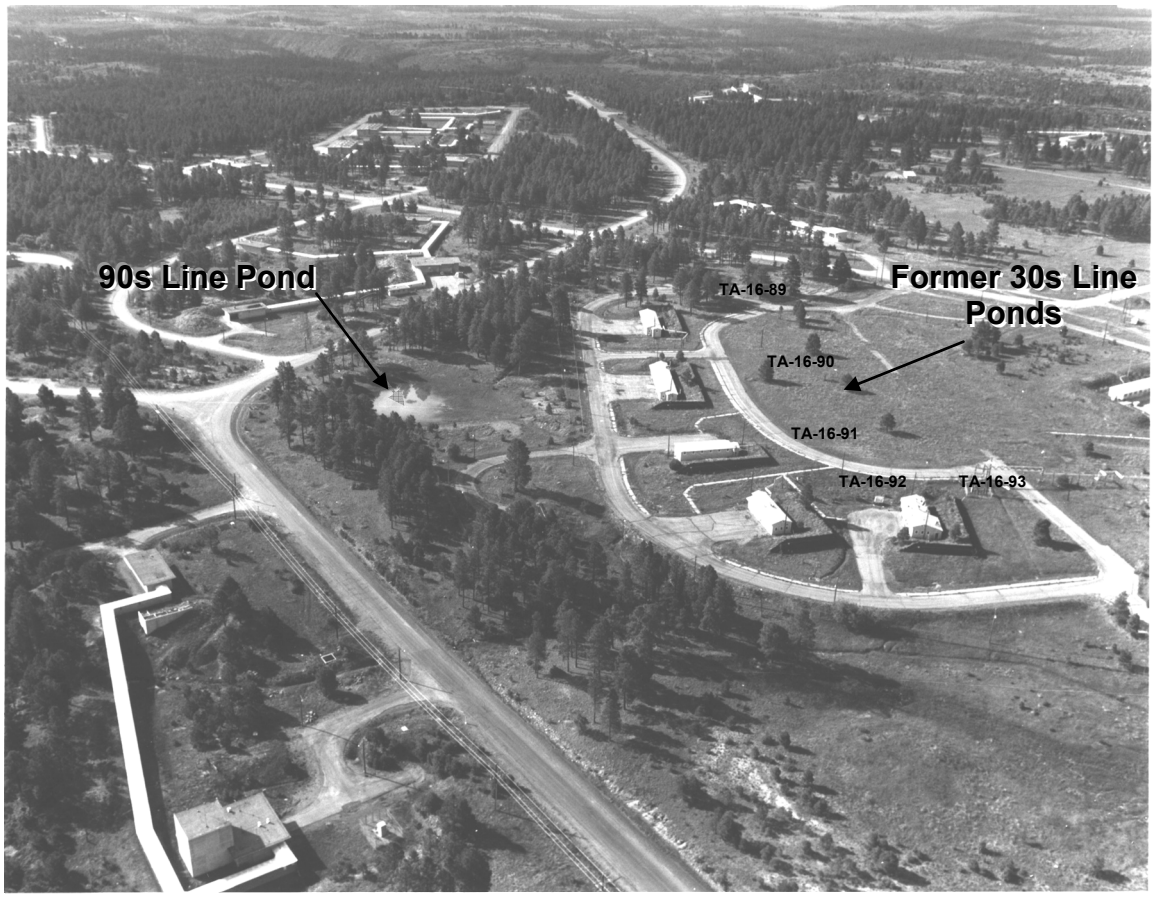


Figure 2.1-3. **1987 aerial photograph of the 30s- and 90s-Line complex (looking south) after reclamation of the 30s Line pond; the 90s Line pond is still visible**

Figure 2.8-1. 1996 photographs of (a) 90s Line sump removal, (b) removed 90s Line sumps, (c) bucket sampling from drainline trench, (d) drainline sampling, (e) drainline excavation and contaminated soil removal

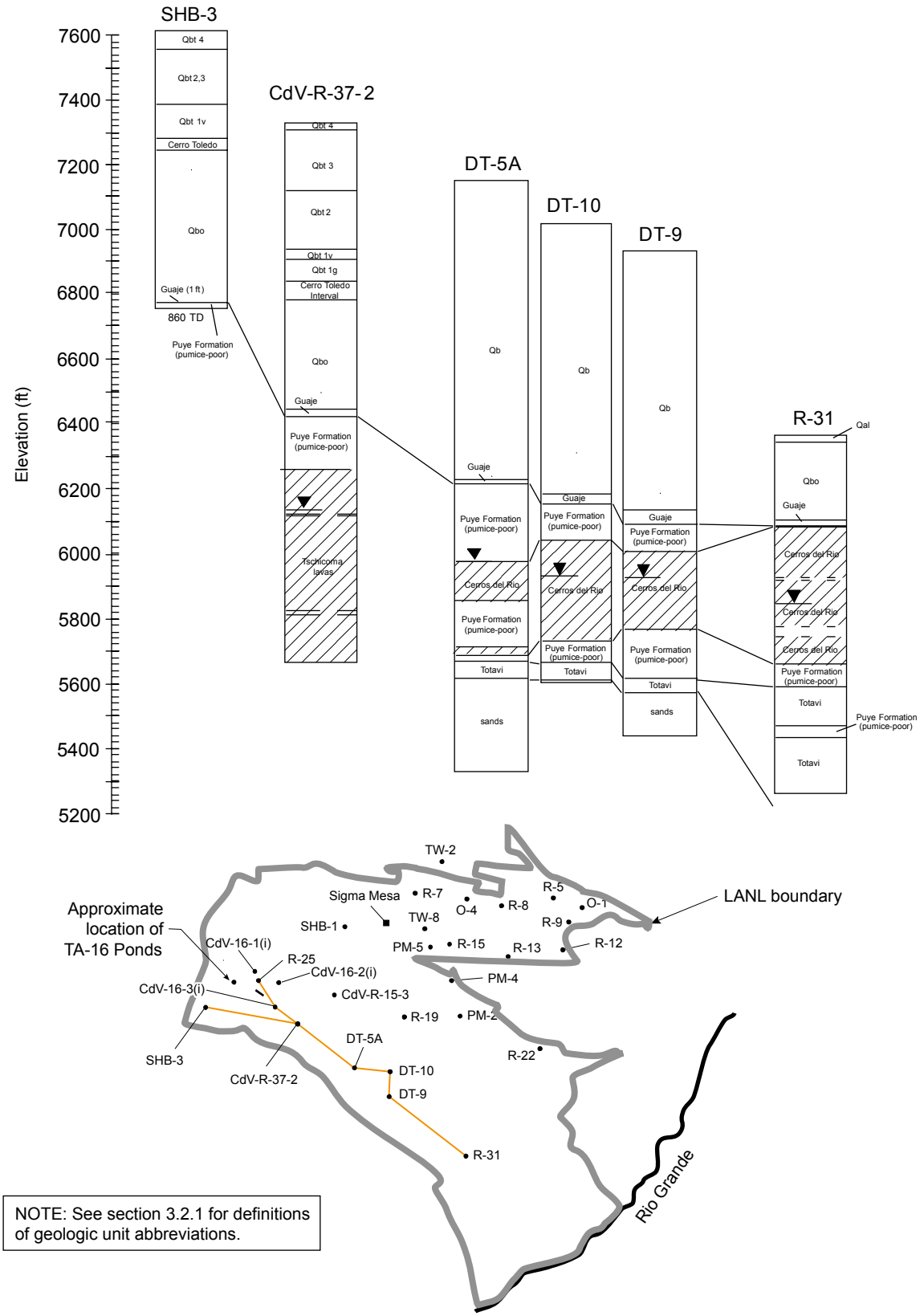
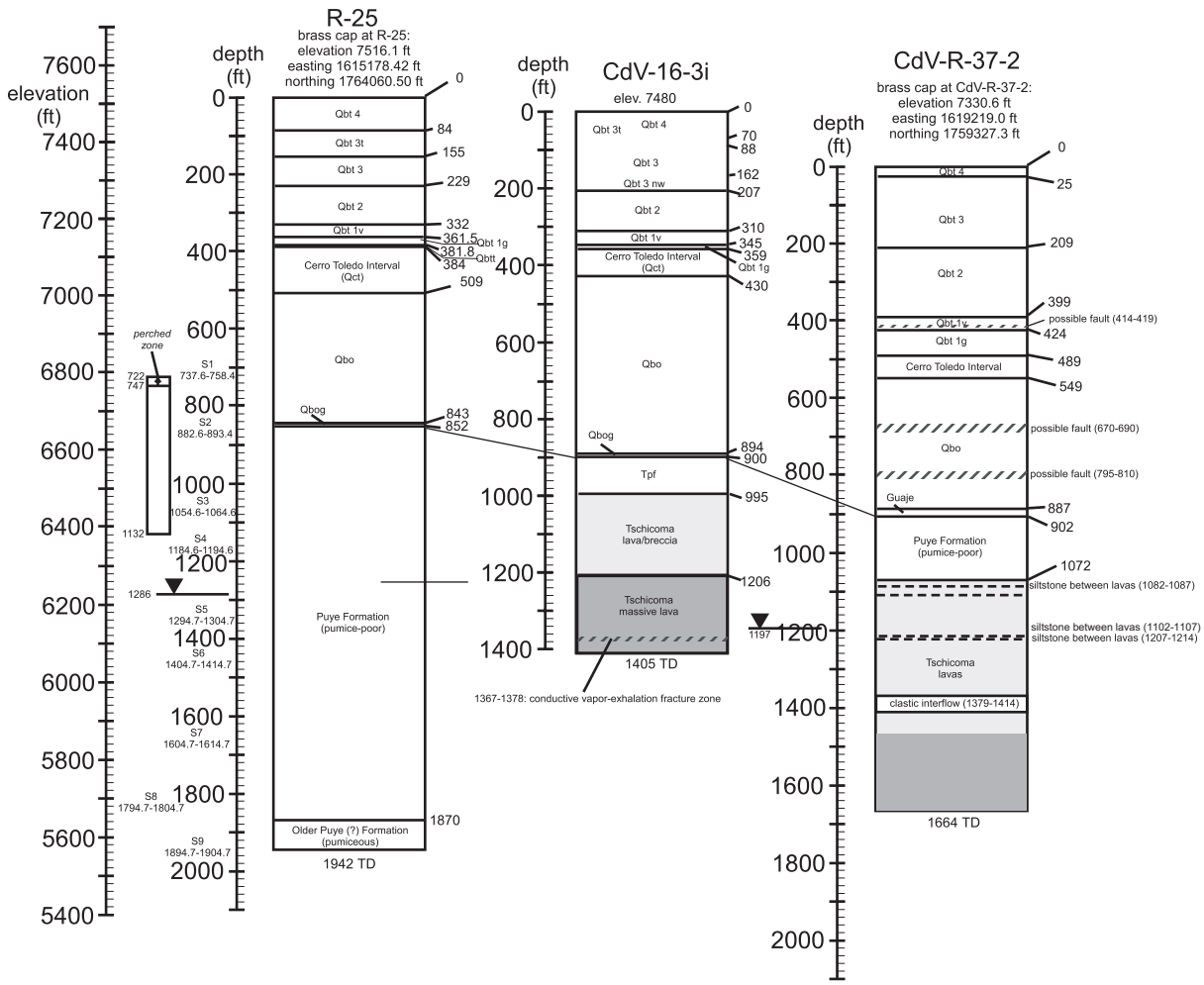


Figure 3.2-1a. Drill-hole correlations (west-northwest to east-southeast)



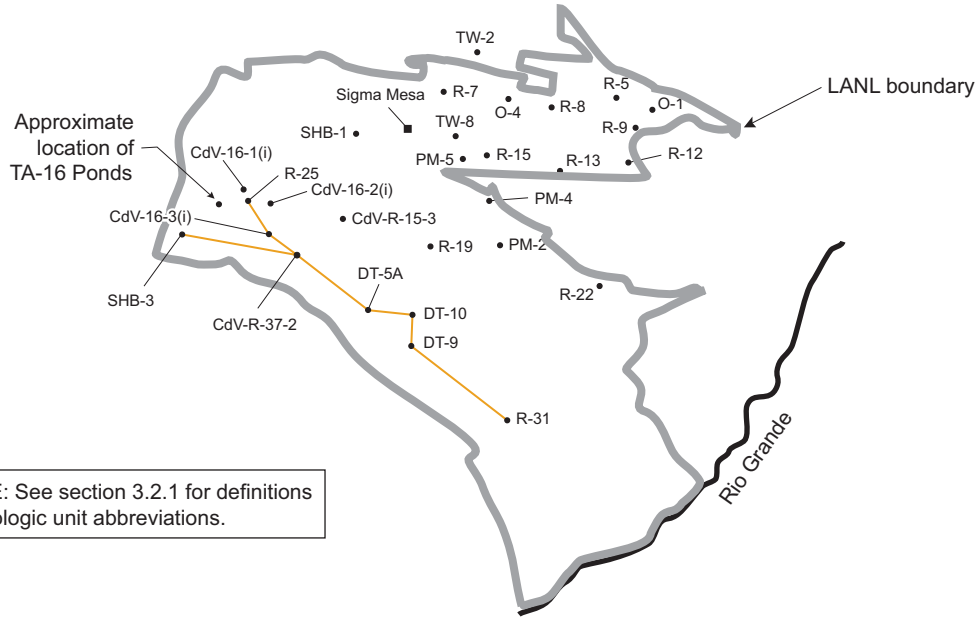


Figure 3.2-1b. Drill-hole correlations (south to north)

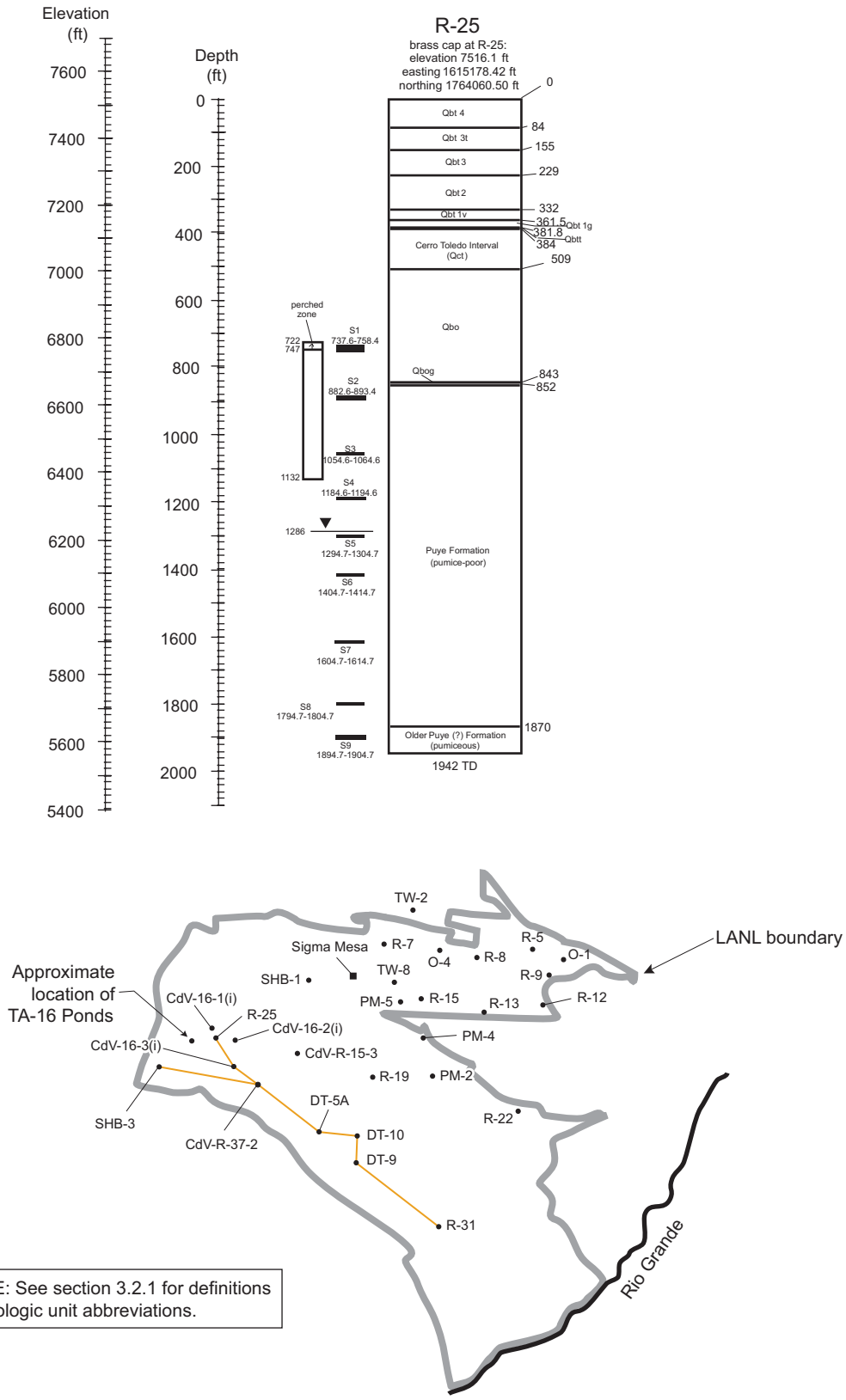


Figure 3.2-2. Stratigraphy at the TA-16 ponds (based on stratigraphy from well R-25)

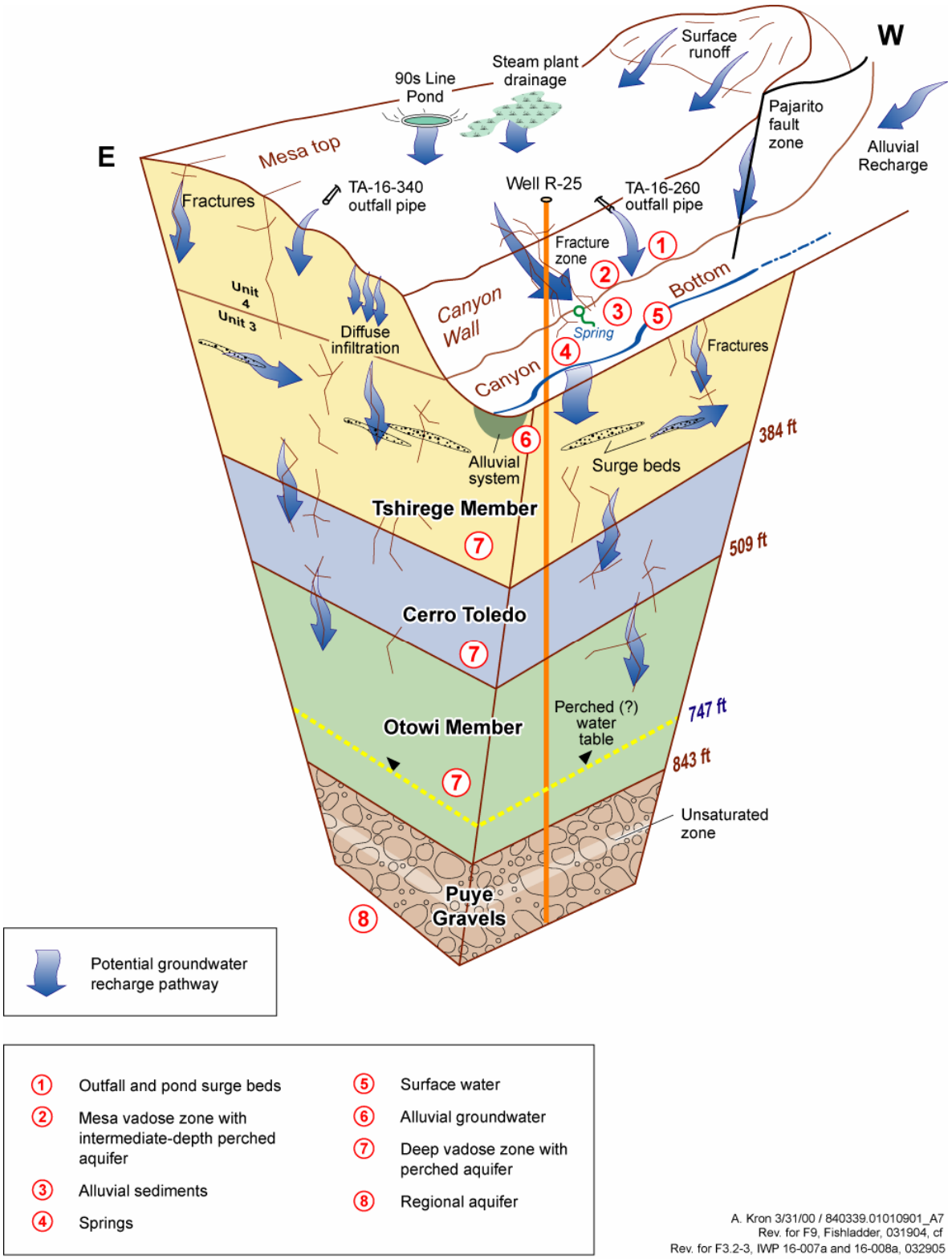


Figure 3.2-3. Hydrogeologic conceptual model for TA-16

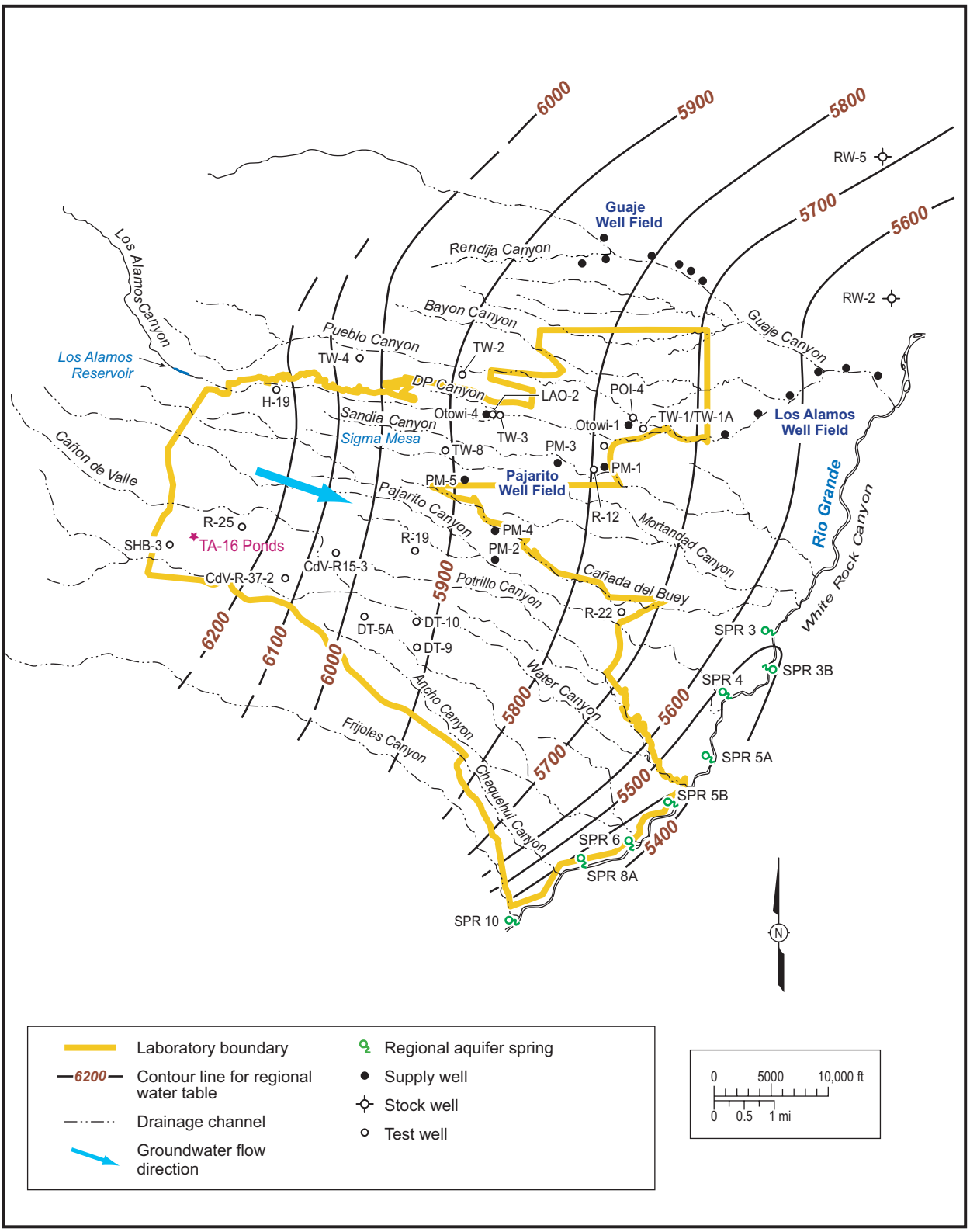


Figure 3.2-4. Water table elevations across the Pajarito Plateau

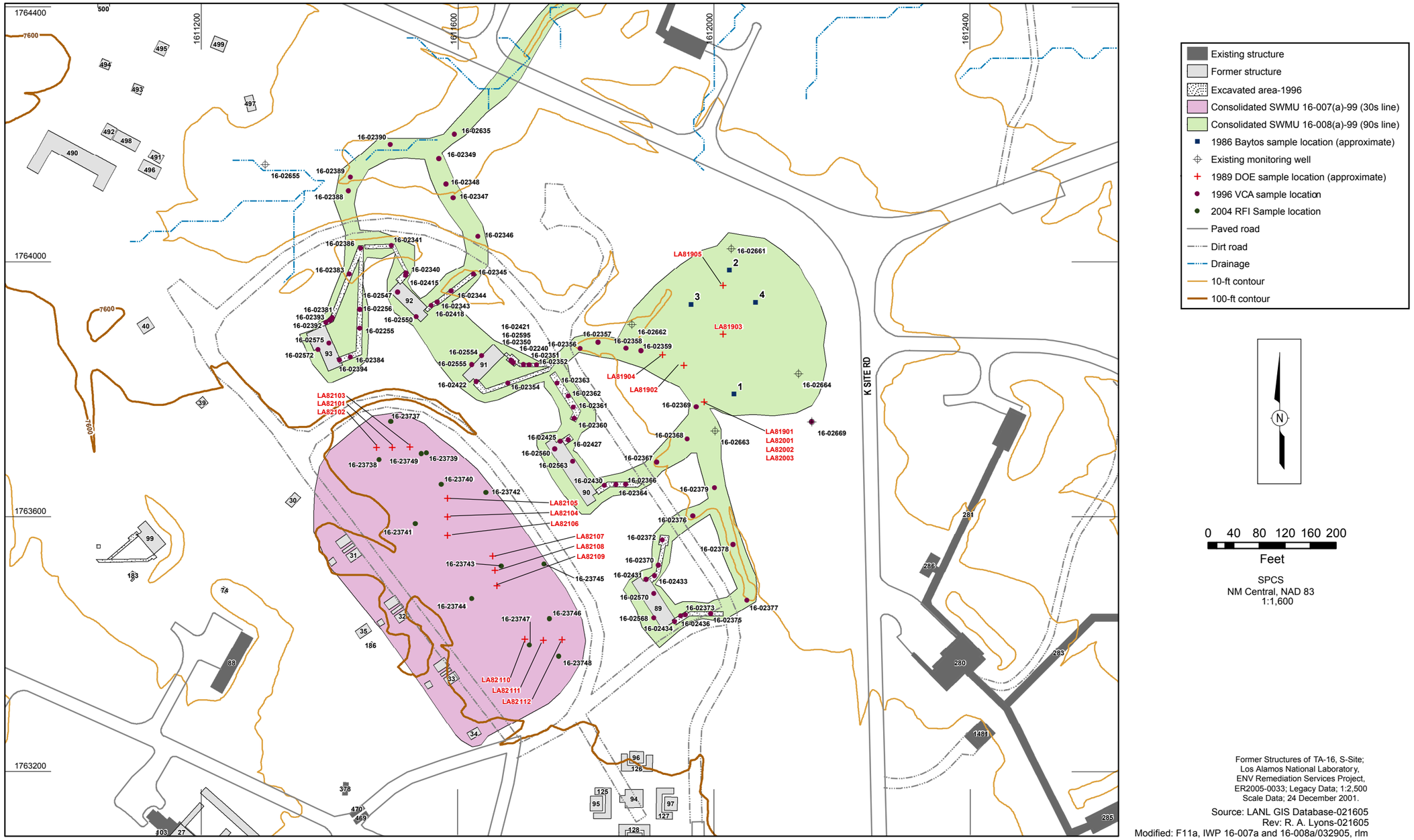


Figure 4.2-1a **Sample locations associated with historical investigation activities at SWMUs 16-007(a)-99 and 16-008(a)-99**

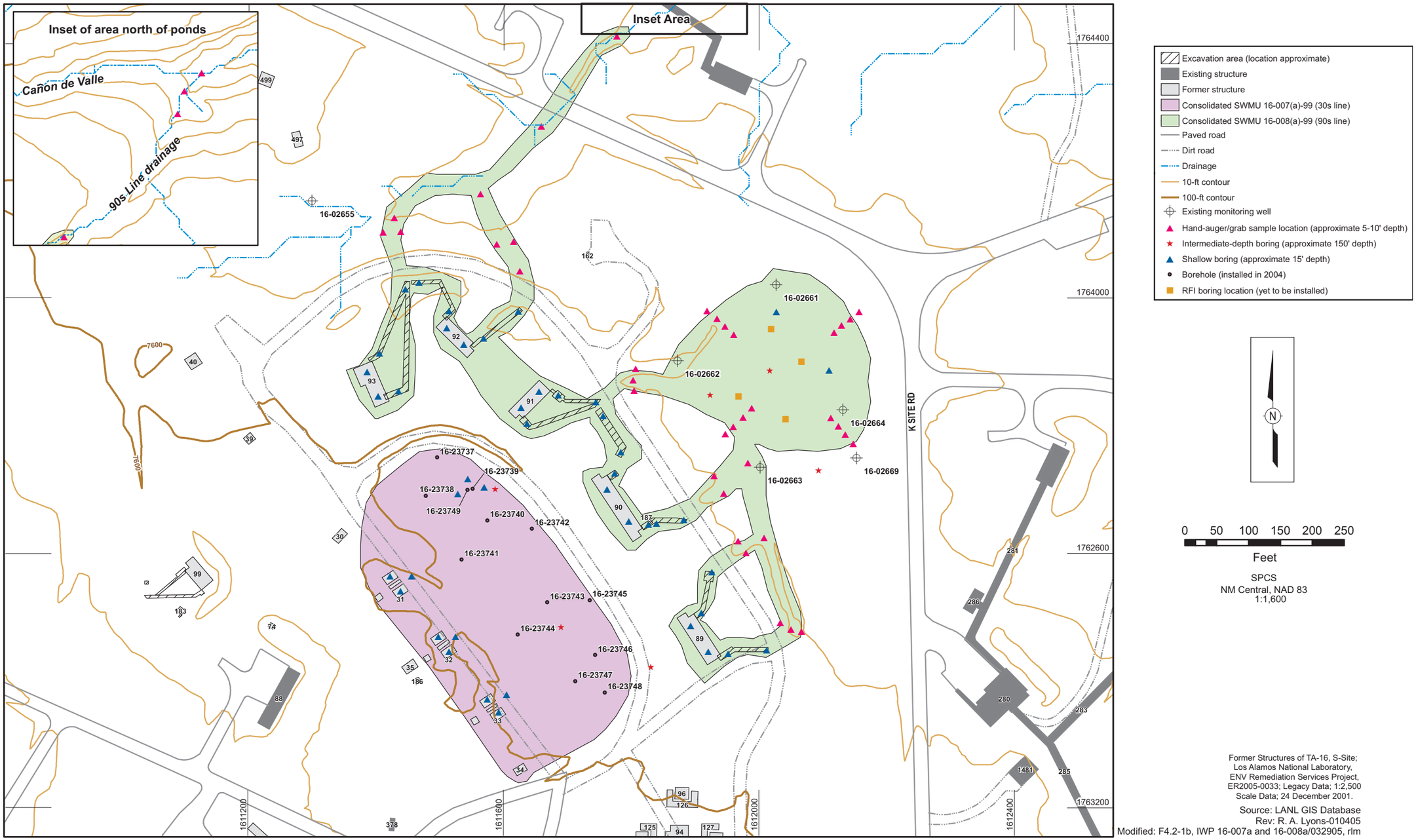


Figure 4.2-1b. Proposed sample locations for determining the nature and extent of contamination

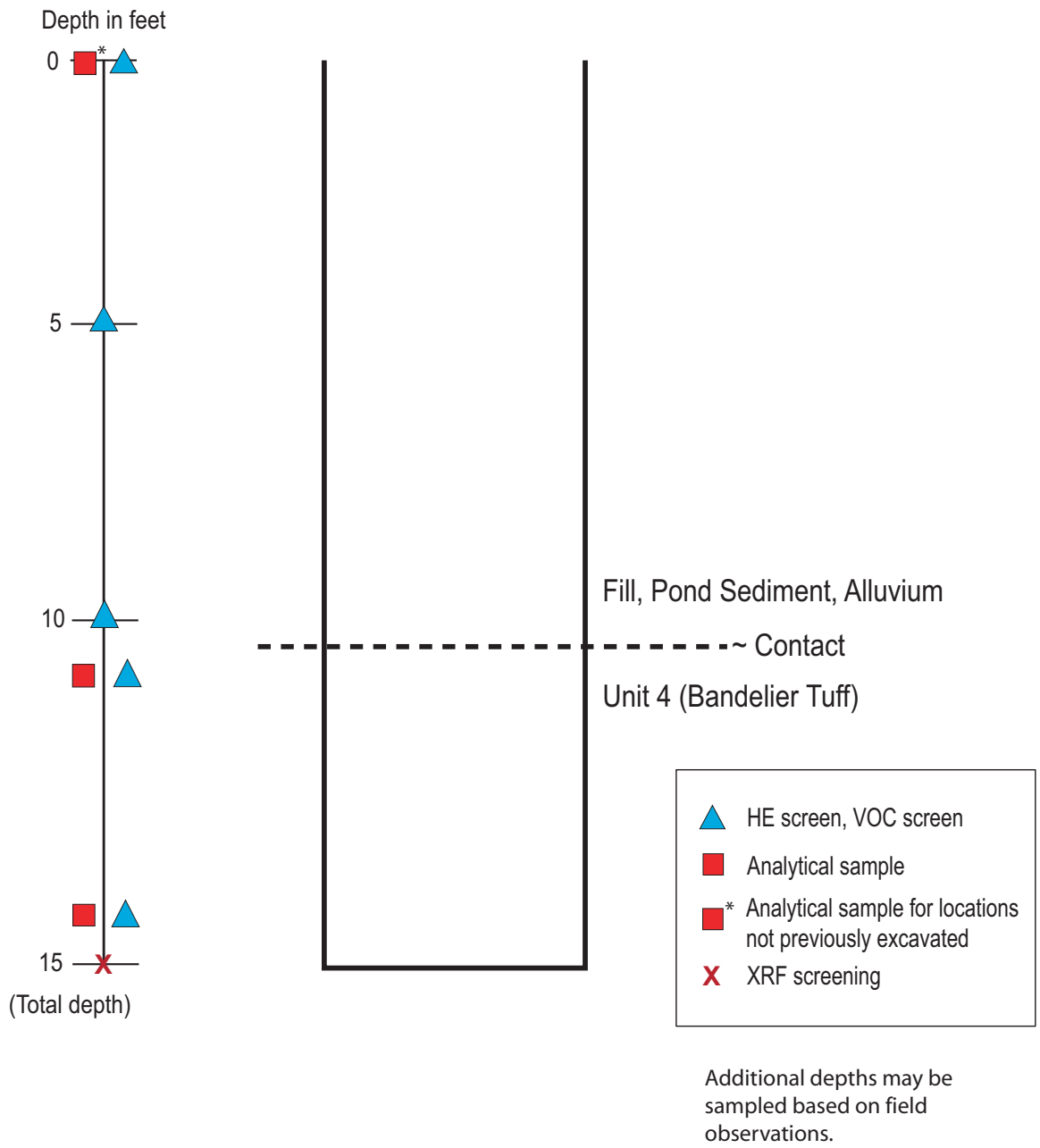


Figure 4.2-2a. Schematic representation of proposed shallow borehole sampling

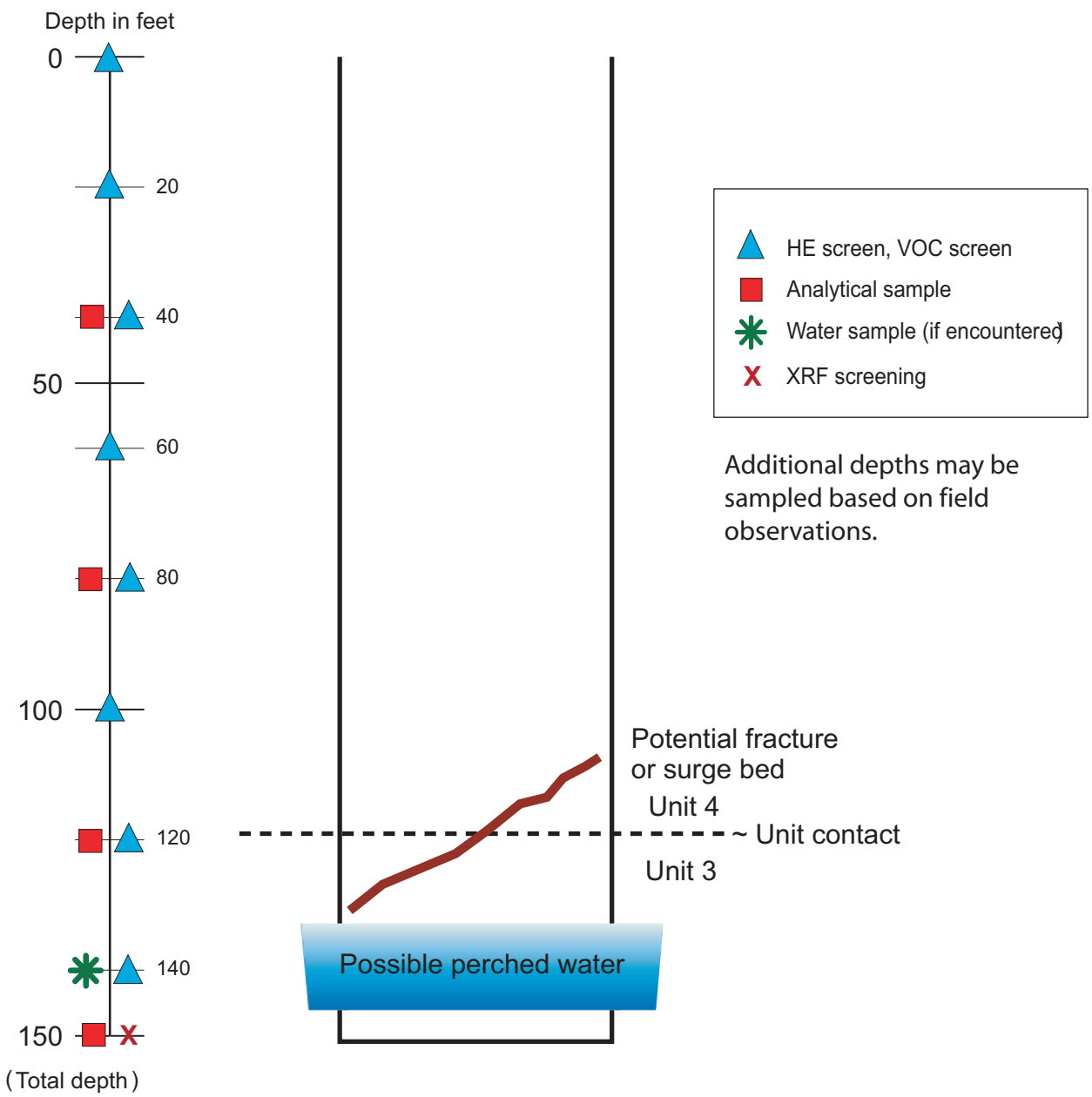


Figure 4.2-2b. Schematic representation of proposed intermediate borehole sampling

Table 2.1-1
SWMUs and AOCs Within Consolidated SWMUs 16-007(a)-99 and 16-008(a)-99 at TA-16

Area	SWMU or AOC	Location	Operational History	Construction Details	D&D	Contaminants	References
Consolidated SWMU 16-007(a)-99 (30s Line)	SWMU 16-007(a)	30s Line ponds	• Received wastewater discharge from Buildings 16-31, 16-32, and 16-33, which were used for HE processing • Constructed in 1944	• Four 100-ft-by-100-ft flat-bottomed settling ponds aligned in a row from northwest to southeast • Located on a level mesa with a depression 8- to 10-ft deep; berms 4- to 6-ft high separated the ponds	Yes; excavated and filled (1967)	HE, inorganic chemicals, including natural uranium, VOCs, and SVOCs	LANL, 1993, 20948, pp. 5-214–5-215 Courtright, 1969, 52964, p. 11
	SWMU 16-025(e)	TA-16-31: Building, including associated sumps and drainlines	• Buildings were used for machining HE from 1944 to the early 1950s. Machine tools were transferred from machining buildings to TA-16-260 in 1951 • Buildings were converted to purposes other than machining in 1950s; in a 1950s list of structures, TA-16-31 is listed as a hot-cold chamber, TA-16-32 is listed as an x-ray building, and TA-16-33 is listed as an additive storage building • Buildings were listed as having HE contamination in 1959	• Consisted of two chambers (13 ft^2) for machining and a separate control room (8 ft^2); pipes connected control rooms to machining chambers • Wooden structures with concrete slab floors; each building was almost entirely buried and had a door to the control room that was exposed on the southwest side; doors to machining chambers were located in blowout walls on the northeast side • Originally, each machining chamber had a lead-lined trough for washing out HE; lead-lined troughs were replaced by concrete troughs with spark-proof mastic covering in August 1945 • A sump that received effluent from the troughs of two machining chambers was located between each building and the road northeast of the 30s Line; each sump had a drainline that passed beneath the adjacent road, under an earthen barricade, and into the 30s Line ponds; there were no secondary settling tanks, and each of the three drainlines daylighted at one of the boundaries between two of the four ponds, feeding the two with a Y-shaped end pipe	Yes; decommissioned and burned (1960); debris disposed of at MDA P	HE, inorganic chemicals, including natural uranium, VOCs, and SVOCs	LANL, 1993, 20948, pp. 5-214–5-215 LANL, 1994, 39440, pp. 5-318–5-319 and 5-356–5-358 Engineering Department, 1959, 05778, p. 1 Wingfield, 1960, 00915, p. 3
	SWMU 16-025(f)	TA-16-32: Building, including associated sumps and drainlines					
	SWMU 16-024(e)	TA-16-33: Building, including associated sumps and drainlines					

Table 2.1-1 (continued)

Area	SWMU or AOC	Location	Operational History	Construction Details	D&D	Contaminants	References
Consolidated SWMU 16-007(a)-99 (30s Line) *(continued)*	SWMU 16-024(c)	TA-16-30: Magazine	• Built June 1945 • Used to store HE castings to be machined in TA-16-31, TA-16-32, and TA-16-33	• Magazines were small (12-ft wide x 17.5-ft long x 8-ft high) and of wooden-frame construction with a concrete floor • A rough measurement of the earthen mounds over these magazines indicates that each was covered by approx. 5000 ft^3 of soil	Yes; burned (1960)	HE, inorganic chemicals	
	AOC C-16-024(d)	TA-16-34: Magazine	• Built June 1945 • Stored machined product for physical and x-ray examination		Yes ; unknown (unknown date)	HE, inorganic chemicals	
Consolidated SWMU 16-008(a)-99 (90s Line)	SWMU 16-008(a)	90s Line pond	• Settling pond that received liquid waste from the HE sumps at processing Buildings 16-89, 16-90, and 16-91; pond area was once a small HE-burning site	• 200-ft-diameter, unlined settling pond • May have been 10- to 15-ft deep • Located on level mesa surrounded by trees	No	HE, inorganic chemicals, including natural uranium, VOCs, and SVOCs	LANL, 1993, 20948, pp. 5-215, 5-217–5-219 Thrap, 1970, 05784, p. 2
	16-017(a)-99	TA-16-92: HE-machining building	• Building did not discharge to the 90s Line pond and instead drained to a northeast drainage that empties into Cañon de Valle 600 ft north of the 90s Line • Former HE-machining building constructed in 1950; later converted for cleaning and refurbishing HE-contaminated equipment; by 1970, the building was devoted entirely to storage and by 1991 it was totally abandoned	• Constructed of wood on a concrete slab and 1332 ft^2 in floor area; it was surrounded by an earthen berm that was packed against steel pilings	Yes; demolished and decontam-inated (1996)	HE, inorganic chemicals including natural uranium, VOCs, and SVOCs	LANL, 1997, 87847, p. 36
	16-017(b)-99	TA-16-93: HE-machining building	• Building did not discharge to the 90s Line pond and instead drained to a northeast drainage that empties into Cañon de Valle 600 ft north of the 90s Line • Former HE-machining building constructed in 1950; subsequently converted to an electroplating facility; by 1970 the building was devoted entirely to storage and by 1991 it was totally abandoned	• Constructed of wood on a concrete slab and 1627 ft^2 in floor area; it was surrounded by an earthen berm that was packed against steel pilings			LANL, 1997, 87847, p. 43

Table 2.1-1 (continued)

Area	SWMU or AOC	Location	Operational History	Construction Details	D&D	Contaminants	References
Consolidated SWMU 16-008(a)-99 (90s Line) *(continued)*	16-017(c)-99	TA-16-91: HE-machining building	• Building discharged to 90s Line pond • SWMU is a former HE-machining building constructed in 1950 and converted in the late 1950s or early 1960s to a facility for cleaning and refurbishing HE-contaminated equipment; it operated from 1950 to ~1980; the building was totally abandoned by 1991	• Constructed of wood on a concrete slab and 1332 ft^2 in floor area; it was surrounded by an earthen berm that was packed against steel pilings	Yes; demolished and decontaminated (1996)	HE, inorganic chemicals, including natural uranium, VOCs, and SVOCs	LANL, 1997, 87847, p. 28
	16-017(d)-99	TA-16-90: HE-machining building	• Building discharged to 90s Line pond • SWMU is a former HE-machining building constructed in 1950 and operated until the early 1950s to late 1950s; the building was subsequently converted to a storage facility during the late 1950s or early 1960s; it operated from 1950 to ~1980; the building was totally abandoned by 1991	• Constructed of wood on a concrete slab and 2165 ft^2 in floor area; it was surrounded by an earthen berm that was packed against steel pilings			LANL, 1997, 87847, p. 20
	16-017(e)-99	TA-16-89: HE-machining building	• Building discharged to 90s Line pond • SWMU is a former HE-machining building constructed in 1950, and operated until mid-1951 when the modern HE-machining building (TA-16-260) was finished; low levels of HE machining continued from the early 1950s to the late 1950s; in the late 1950s or early 1960s, the building was converted to a storage facility; TA-16-89 was totally abandoned by 1991	• Constructed of wood on concrete slab and 1684 ft^2 in floor area; it was surrounded on three sides by an earthen berm that was packed against steel pilings	Yes; demolished and decontaminated (1996)	HE, inorganic chemicals, including natural uranium, VOCs, and SVOCs	LANL, 1997, 87847, p. 11

Table 2.1-1 (continued)

Area	SWMU or AOC	Location	Operational History	Construction Details	D&D	Contaminants	References
Consolidated SWMU 16-008(a)-99 (90s Line) *(continued)*	16-026(m)	Drainlines and outfall	• Drain serviced building 16-92	• Consisted of buried vitrified-clay pipe from the sumps to the road, depressions next to the road where the pipes day lighted, additional vitrified-clay pipe beneath the road leading to the north road, and an open-air drainage channel	Yes; demolished and decontaminated (1996)	HE, inorganic chemicals, including natural uranium, VOCs, and SVOCs	LANL, 1994, 39440, p. 5-462 LANL, 1997, 87847, pp. 11, 20, 28, and 36
	16-026(n)	Drainlines and outfall	• Drain serviced building 16-91				
	16-026(o)	Drainlines and outfall	• Drain serviced building 16-90				
	16-026(p)	Drainlines and outfall	• Drain serviced building 16-89				
	16-029(k)	Sumps and drainlines for TA-16-93	• Received effluent from drain troughs in the floors of 90s Line buildings • Sumps remodeled in 1967 to aid the machine-cleaning operations but all were inactive by 1970; effluents were listed as effectively negligible in 1971 except from TA-16-92, which discharged small amounts of HE, solvents, or other materials • SWMU 16-029(k) also includes the drainline, outfall, and drainage because no outfall SWMU was defined for TA-16-93	• Two concrete sumps were located in each building; each sump was roughly 15-ft long x 5-ft wide x 5-ft deep	Yes; demolished and decontaminated (1996)	HE, inorganic chemicals, including natural uranium, VOCs, and SVOCs	LANL, 1994, 39440, pp. 5-462–5-463 LANL, 1997, 87847, pp. 11, 20, 28, and 36
	16-029(l)	Sumps for TA-16-92					
	16-029(s)	Sumps for TA-16-91					
	16-029(t)	Sumps for TA-16-90					
	16-029(u)	Sumps for TA-16-89					
	AOC C-16-067	Drum storage platform (TA-16-187)	• Constructed in 1950 along with the 90s Line • Copper and chromium sulfates used in electroplating were stored on the platform in addition to oils, solvents, and possibly HE; materials were stored in containers equipped with spigots and laid on their sides; platform was decommissioned in 1970	• Structure was made of wood and sat on steel legs a few feet off the ground adjacent to TA-16-90 • The storage platform was 8-ft long x 8-ft wide x 4.5-ft high	Yes; decommissioned (1970)	HE, inorganic chemicals, oils, VOCs, SVOCs	LANL, 1994, 39440, p. 5-462 Martin, 1993, 52964, p. 5

Table 2.3-1
Summary of SWMUs and AOCs Surrounding the 30s and 90s Lines

Area	SWMU or AOC/ Consolidated SWMU	Description	Operational History	Construction Details	D&D	Contaminants	References
TA-24 (T-Site))	SWMU 16-005(j)/16-034(b)-99	Septic Tank (TA-16-504)	• Construction completed in 1948; • Includes decommissioned septic tank that served the lavatories and darkrooms in TA-16-490.	• Located about 75 ft east of Building TA-16-490 and was connected by a 4-in. vitrified clay pipe. • Tank was 4 ft x 5 ft x 3 ft.	Yes – Removed (1963)	HE, radionuclides, inorganic chemicals, VOCs, SVOCs, cyanide	LANL, 1994, 39440, pp. 5-479 and 5-481 LANL, 1990, 07512, Volume 2
	SWMU 16-005(m)/16-034(b)-99	Decommissioned Concrete Sump (TA-16-507)	• Construction completed in late 1944; • Includes a decommissioned concrete sump that received effluent from a room in TA-16-490 containing x-ray equipment. HE contamination was discovered before its removal in 1960.	• Drained to the east of TA-16-490 through a 6-in. vitrified clay pipe. • Concrete sump was 8.5 ft x 4.5 ft x 5 ft.	Yes – Removed (1960)	HE, radionuclides, inorganic chemicals, VOCs, SVOCs, cyanide	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-479 and 5-481 Engineering Department 1959, 05778, p. 4
	SWMU 16-024(f)	Decommissioned HE Magazine (TA-16-493)	• Constructed in June 1945; • Includes footprints of wooden-frame, decommissioned HE magazine. Before being burned, structure was found to be contaminated with HE.	• 6 ft x 6 ft x 7 ft wooden frame construction with earthen barricades on three sides and top.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, barium	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-480–5-482 Engineering Department, 1959, 05778, p. 3
	SWMU 16-024(g)	Decommissioned HE Magazine (TA-16-494)	• Constructed in June 1945; • Includes footprints of wooden-frame, decommissioned HE magazine. Before being burned, structure was found to be contaminated with HE.	• 6 ft x 6 ft x 7 ft wooden frame construction with earthen barricades on three sides and top.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, barium	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-480–5-482 Engineering Department, 1959, 05778, p. 3
	AOC 16-024(h)	Decommissioned HE Magazine (TA-16-497)	• Operated from 1944 to 1950. Includes the footprint of a decommissioned HE magazine located at the east end of T-Site on level ground. A radioactive lanthanum source broke open in this building, contaminating it with residual strontium-90 activity. It was also determined that the building was contaminated with residual HE.	• 15 ft x 40 ft x 9 ft wooden-frame construction with earthen barricades on three sides and top. Concrete foundation and floor.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, barium, radionuclides	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, p. 5-482 Buckland, 1954, 05739, p. 1 Engineering Department, 1959, 05778, p. 4

Table 2.3-1 (continued)

Area	SWMU or AOC/ Consolidated SWMU	Description	Operational History	Construction Details	D&D	Contaminants	References
TA-24 (T-Site) *(continued)*	SWMU 16-025(m)/16-034(b)-99	Decommissioned X-Ray or Gamma-Ray Radiography Facility (TA-16-495)	• Built by the end of 1945; • Contained either radium-226 or cobalt-60 gamma sources. Before burning, it was determined that this building was contaminated both with HE and with uranium-238.	• Located on level ground in north-central portion of T-Site. • 16 ft x 16 ft x 9 ft wooden-frame structure with a concrete floor. No pit in center as with other source buildings.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, barium, radionuclides	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-480 and 5-482 Martin and Hickmott, 1993, 59422, pp. 1-2 Engineering Department, 1959, 05778, p. 4 Buckland, 1957, 05764, p. 1
	SWMU 16-025(n)/16-034(b)-99	Decommissioned Source Hutment (TA-16-499)	• Constructed in early 1945; • Hutment used for gamma-ray radiography of baratol lenses and other dense weapon parts. The structure was used for radium-226 sources and for cobalt-60 sources. The hutment was also contaminated with HE according to a predemolition survey.	• The hutment was located along the northern margin of T-Site. • 16 ft x 16 ft x 9 ft wooden-frame construction with a concrete floor with a pit in the center 2 ft long x 4 ft wide x 2.5 ft deep.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, barium, radionuclides	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-479 and 5-483 Martin, 1993, 52964, p. 6 Engineering Department, 1959, 05778, p. 4
	SWMU 16-025(o)/16-034(b)-99	Decommissioned Source Hutment (TA-16-500)	• Constructed in 1947; • Hutment used for gamma-ray radiography of baratol lenses and other dense weapon parts. The hutment was located along the northern margin of T-Site. The structure was used for radium-226 sources and for cobalt-60 sources. The hutment was also contaminated with HE according to a predemolition survey. Radioactive contamination was not found during a 1957 survey, but it was recommended that the concrete floor be sent to TA-54.	• 16 ft x 16 ft x 9 ft wooden-frame construction with a concrete floor and with pit in the center 2 ft long x 4 ft wide x 2.5 ft deep.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, barium, radionuclides	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-480 and 5-483 Buckland, 1966, 05060, p. 1 Buckland, 1957, 05764, p. 1 Martin, 1993, 52964, p. 6 Engineering Department, 1959, 05778, p. 3

Table 2.3-1 (continued)

Area	SWMU or AOC/ Consolidated SWMU	Description	Operational History	Construction Details	D&D	Contaminants	References
TA-24 (T-Site) *(continued)*	SWMU 16-034(b)/16-034(b)-99	Decommissioned Laboratory and Office Building (TA-16-490)	• Building was constructed during late summer of 1944 with additions in fall and winter of 1944 and early 1945. Building was rebuilt in 1946 after fire destroyed darkroom and was further modified in 1947 and 1948. Electron microscope installed in 1948 for examination of beryllium parts. • The laboratory was determined to be contaminated with HE. Silver and solvents are also associated with activities that occurred in this building.	• Wooden-frame, L-shaped building with an internal radiation/explosion barrier transecting it and a concrete slab as part of its foundation and floor. The top of the "T" was approximately 72 ft x 18 ft x 12 ft high. The staff of the "T" was approximately 93 ft x 18 ft x 12 ft high. • The building is located in the south-central portion of TA-24 on ground sloping slightly to the south.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, radionuclides, inorganic chemicals, SVOCs, cyanide	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-479, 5-483, and 5-486 Martin, 1993, 52964, p. 6 Engineering Department, 1959, 05778, p. 3
	SWMU 16-034(c)/16-034(b)-99	Decommissioned Warehouse Hut (TA-16-491)	• Constructed in early 1945; • The building was used to store tools, but by 1950 it was being used for x-ray exposure experiments on rats and rabbits.	• A 16 ft x 24 ft x 9 ft high wooden frame-building located northeast of TA-16-490 on ground sloping slightly to the east.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, barium	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-479 and 5-483 Martin and Hickmott, 1993, 59422, p. 2 Martin and Hickmott, 1993, 59423, p. 1 Engineering Department, 1959, 05778, p. 3
	SWMU 16-034(d)/16-034(b)-99	Decommissioned Machine Shop (TA-16-492)	• Constructed in early 1945; • No HE machining was done in the shop. However, the shop was shown to be contaminated with residual HE during the surveys preceding destruction by burning.	• Small building of wooden-frame construction located north of TA-16-490 on fairly level ground. Dimensions were 16 ft x 16 ft x 9 ft high.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, inorganic chemicals, SVOCs	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-479 and 5-484 Martin and Hickmott, 1993, 59423, p. 1 Engineering Department, 1959, 05778, p. 3

Table 2.3-1 (continued)

Area	SWMU or AOC/ Consolidated SWMU	Description	Operational History	Construction Details	D&D	Contaminants	References
TA-24 (T-Site) *(continued)*	SWMU 16-034(e)/16-034(b)-99	Decommissioned Storage Building (TA-16-496)	• Constructed in 1940s and moved from Anchor Ranch Site to T-Site in 1948; • It was shown to be contaminated with HE during the preburning inspection in 1959.	• A wooden-frame building located east of TA-16-490 on ground sloping slightly to the east. Dimensions were 16 ft x 32 ft x 9 ft high.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, barium	LANL, 1990, 07512, Volume 2 LANL 1994, 39440, pp. 5-480 and 5-484 Engineering Department 1959, 05778, p. 4
	SWMU 16-034(f)/16-034(b)-99	Decommissioned Laboratory (TA-16-498)	• Built in June 1945 and converted to a laboratory used for autoradiography of plutonium components of weapons by 1950; • The building was initially used for storage and as an eating area, but by 1950 it was being used by draftsmen in its western end, by site photographers in its center, and for plutonium autoradiography experiments in its eastern end. Small-scale photo processing was done in this building in support of the plutonium autoradiography experiments. HE contamination was discovered before burning.	• A wooden-frame building located northeast of TA-16-490 on fairly level ground. Dimensions were 16 ft x 42 ft x 9 ft high.	Yes - Burned (1960); Residual debris disposed of (1966)	HE, radionuclides, inorganic chemicals, VOCs, SVOCs, cyanide	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-480 and 5-484 Martin and Hickmott, 1993, 59422, p. 2 Martin and Hickmott, 1993, 59423, p. 2 Engineering Department, 1959, 05778, p. 4
Building 99 Area	AOC 16-024(b)	HE Magazine (TA-16-74)	• Built in 1946. • Used to store HE in transit to the machining buildings but later used with the 20s Line casting operation. Held the cast HE after sawing of risers. Regarded as HE contaminated when surveyed in the late 1950s before burning.	• Magazines are bermed on three sides and on top. Each magazine was small (9 ft wide x 11 ft long x 7 ft high) and of wooden-frame construction with a concrete floor.	Yes - Burned (1960)	HE, inorganic chemicals	LANL, 1994, 39440, pp 5-356–5-358 Engineering Department, 1959, 05778, p. 1 Wingfield, 1960, 00915, p. 3

Table 2.3-1 (continued)

Area	SWMU or AOC/ Consolidated SWMU	Description	Operational History	Construction Details	D&D	Contaminants	References
Building 99 Area *(continued)*	SWMU 16-012(a2)	Interim Storage Area	• Proposed for NFA in the OU 1082 RFI work plan. The SWMU is not regulated under 3004(u) of the HSWA. All releases are cleaned up immediately; therefore, there is no potential for this SWMU to become a historical release site.	• Construction details not available.	No (active)	No known radiological, HE, or toxic chemical contamination problems. Wastes stored include beryllium, thorium, and depleted uranium.	LANL, 1993, 20948, p. 6-8
	AOC 16-064/16-029(q)-99	Drum Storage Platform	• The structure was constructed in 1949 and was used for storage of garbage cans that contained HE scrap from the riser cutting building.	• The platform was constructed a few feet off level terrain on steel legs and was located roughly 50 ft southwest of Building TA-16-99.	Yes - Burned (1968)	HE	LANL, 1994, 39440, p. 5-362 Martin, 1993, 52964, p. 5
	16-025(c)	Utility Building (TA-16-35)	• Utility building that supported machining buildings TA-16-31, TA-16-32, and TA-16-33.	• Completed in 1945; • 15 ft x 13 ft x 8 ft wood and gypsum building.	Yes - Removed (after 1960, unknown date)	No known radiological, HE, or toxic chemical contamination problems	LANL, 1994, 39440, pp. 6-37–6-38
	16-017(f)-99/16-029(q)-99	Decommisioned HE Machining Building (TA-16-99)	• Building completed in 1950, and riser-cutting activities were at maximum levels until 1951 when the modern HE building (TA-16-260) was finished. The building was converted to a storage facility in the late 1950s or early 1960s and taken out of service by 1991.	• 892 ft^2 building made of wood on a concrete slab surrounded on three sides by an earthen berm packed against steel pilings.	Yes – Removed (1996)	HE, barium, SVOCs	LANL, 1994, 39440, pp. 5-459–5-461, 5-464 LANL, 1992, 67369.1
	C-16-066	Storage Area	• Established in 1945. It served utility room TA-16-35 and was used to store tools and equipment for servicing TA-16-35. Housed machinery such as air compressors.	• Construction details not available.	Yes - Abandoned in place in 1960 and removed some time thereafter	No known radiological, HE, or toxic chemical contamination problems	LANL, 1994, 39440, pp. 6-47–6-48
	SWMU 16-029(q)/16-029(q)-99	Sumps, drain lines, and outfall for Building TA-16-99	• Primary operation was sawing risers off cast explosives following casting in TA-16-27 and cooling in TA-16-88. In 1970 the sumps were declared surplus and HE contaminated and were recommended for removal.	• Sump was approximately 15 ft x 5 ft x 5 ft. Located 300 ft west of the 30s Line ponds.	Yes – removed (1996)	HE, barium	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, p. 5-463

Table 2.3-1 (continued)

Area	SWMU or AOC/ Consolidated SWMU	Description	Operational History	Construction Details	D&D	Contaminants	References
Radiography Buildings	SWMU 16-025(a)	Radiography Building (TA-16-39)	• Built in early 1945 • Served as a film-loading building for HE radiography. Reports suggest that it was a radiographic building containing a lead-lined pit. Other reports show it to have shelf-lined walls and a concrete slab floor with no pit. Also, it was reported that TA-16-39 had cobalt-60 contamination before destruction by burning. Thus, it is likely either that radiography or the storage of sources occurred.	• 16 ft long x 16 ft wide x 9 ft high wooden frame building with concrete floors. No plumbing. • Located west of the 30s Line machining buildings.	Yes – Burned (1966)	HE, radionuclides, inorganic chemicals	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-358–5-359 Martin, 1993, 52964, p. 3
	SWMU 16-025(b)	Radiography Building (TA-16-40)	• Constructed in 1950; • Provided gamma radiography within the GMX-3 area. Contained a lead-lined pit in the floor for radioactive sources. It was found to be contaminated by cobalt-60 in 1957. Removal of radiation-contaminated materials was recommended. In 1966, the debris of this building and TA-16-39 were checked for radioactivity before cleanup, but no radioactivity was found.	• 20 ft long x 20 ft wide x 14 ft high wooden frame building with concrete floors. No plumbing.	Yes – Burned (1966)	HE, radionuclides, inorganic chemicals	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-358–5-359 Buckland, 1957, 05764, p. 1 Buckland, 1966, 05060, p. 1
Septic System	SWMU 16-005[n]	Septic System for TA-16-162 (TA-16-173)	• Constructed in 1949 and recommended for NFA in the OU 1082 RFI work plan. The septic system was associated with TA-16-162, a latrine that was removed in 1971.	• 600-gal. capacity.	Removed (1971)	No known radiological, HE, or toxic chemical contamination problems	LANL, 1990, 07512, Volume 2 LANL, 1993, 20948, pp. 6-16 Stephens, 1983, 05370, p. 6 Blackwell, 1983, 36408, p. 4 DeField, 1971, 55274, p. 5 Courtwright, 1971, 52964.63, p. 1 Purtymun, 1971, 05898, p. 1

Table 2.3-1 (continued)

Area	SWMU or AOC/ Consolidated SWMU	Description	Operational History	Construction Details	D&D	Contaminants	References
Latrine	AOC C-16-003	Septic System (TA-16-162)	• Built in 1950. • Received sanitary waste.	• Wooden-frame construction (12 ft x 9 ft x 9 ft). An equipment room of wood frame construction (5 ft x 9 ft x 9 ft) with concrete floor was added.	Yes – Removed (1971)	Sanitary waste	LANL, 1994, 39440, pp. 6-48–6-49 LANL, 1992, 67369
Control Building for Machining Line	SWMU 16-025(d)/16-029(h2)-99	Decommissioned Equipment and Control Building (TA-16-94)	• Built in 1948 as a control building for machining buildings TA-16-95, TA-16-96, TA-16-97, and TA-16-98; • Surveys completed before destruction suggested that it was clean, but it has also been reported as HE-contaminated.	• Located in the center of the North/South/East/West machining buildings and is southeast of the 30s Line Ponds. Structure was of wooden-frame construction on a concrete platform.	Yes - Burned (1960)	HE, inorganic chemicals	LANL, 1994, 39440, p. 5-360 Engineering Department, 1956, 05778, p. 2 Blackwell, 1983, 36408, p. 2
Machining Line	SWMU 16-025(g)/16-029(h2)-99	HE Machining (TA-16-95)	• HE Machining buildings that contained a platform with garbage cans to collect pieces of HE for disposal at the burning ground; • Buildings were burned, explosive residues were removed to TA-54, and noncombustibles were disposed of at Area P landfill; • Buildings were designated as HE contaminated in 1959.	• Small (20 ft long x 12 ft wide with 20 ft x 6 ft porches), and of wooden-frame construction on concrete floors. They were surrounded by access roads that roughly formed a square border. Each building had a U-shaped and wooden earthen barricade separating it from a central control building, TA-16-94.	Yes - Burned (1960)	HE, inorganic chemicals	LANL, 1994, 39440, pp. 5-322–5-323 Engineering Department, 1959, 05778, p. 1
	SWMU 16-025 (h) /16-029(h2)-99	HE Machining (TA-16-96)					
	SWMU 16-025(i)/16-029(h2)-99	HE Machining (TA-16-97)					
	SWMU 16-025(j)/16-029(h2)-99	HE Machining (TA-16-98)	• Contained a platform with garbage cans to collect pieces of HE for disposal at the burning ground; • Decommissioned as a machining building and converted into a coffee and smoking room; • Building was designated as HE contaminated in 1959; • Building was burned, explosive residues were removed to TA-54, and noncombustibles were disposed of at Area P landfill.				

Table 2.3-1 (continued)

Area	SWMU or AOC/ Consolidated SWMU	Description	Operational History	Construction Details	D&D	Contaminants	References
Machining Line	SWMU 16-029(m)/16-029(h2)-99	Decommissioned Sump and Drain (TA-16-95)	• Sumps and drainlines associated with HE machining buildings. There were no secondary sumps.	• Unknown dimensions.	Yes - Removed (1967)	HE, inorganic chemicals	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, pp. 5-322–5-323
	SWMU 16-029(n)/16-029(h2)-99	Decommissioned Sump and Drain (TA-16-96)					
	SWMU 16-029(o)/16-029(h2)-99	Decommissioned Sump and Drain (TA-16-97)					
	SWMU 16-029(p)/16-029(h2)-99	Decommissioned Sump and Drain (TA-16-98)					
	SWMU 16-029(h2)/16-029(h2)-99	Drain Line and Outfall (TA-16-95, TA-16-96, TA-16-97, TA-16-98)	• Merger and outfall for SWMUs 16-029(m-p).	• Unknown dimensions.	Yes – Removed 1967	HE, inorganic chemicals	LANL, 1990, 07512, Volume 2 LANL, 1994, 39440, p. 5-323

Table 2.8-1
2004 RFI,
Frequency of Inorganic Chemicals Detected Above BVs
in Soil, Sediment, and Tuff at the 30s Line Ponds

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Aluminum	Soil	19	19	7170 to 29200	29200	0/19	0/19
	Fill	3	3	6180 to 10100	29200	0/3	0/3
	Qbt 4	9	9	419 to 8450	7340	2/9	0/9
Antimony	Soil	15	0	[0.403 to 0.71]	0.83	0/15	0/15
	Fill	3	0	[5.7 to 5.9]	0.83	0/3	3/3
	Qbt 4	7	0	[0.417 to 0.437]	0.5	0/7	0/7
Arsenic	Soil	19	19	1.68 to 5.2	8.17	0/19	0/19
	Fill	3	3	2.3 to 2.8	8.17	0/3	0/3
	Qbt 4	9	8	[1.49] to 4.73	2.79	2/9	0/9
Barium	Soil	19	19	89.2 to 2270	295	7/19	0/19
	Fill	3	3	133 to 163	295	0/3	0/3
	Qbt 4	9	9	14.3 to 1100	46	5/9	0/9
Beryllium	Soil	19	19	0.484 to 1.78	1.83	0/19	0/19
	Fill	3	3	0.98 to 1.5	1.83	0/3	0/3
	Qbt 4	9	9	0.183 to 0.695	1.21	0/9	0/9
Bromide	Soil	18	0	[2.01 to 2.33]	n/a [b]	0/18	n/a
	Qbt 4	9	0	[2.04 to 2.18]	n/a	0/9	n/a
Cadmium	Soil	19	0	[0.08 to 1.15]	0.4	0/19	18/19
	Fill	3	1	[0.59] to 1.1	0.4	1/3	2/3
	Qbt 4	9	0	[0.517 to 0.551]	1.63	0/9	0/9
Calcium	Soil	19	19	1690 to 3140	6120	0/19	0/19
	Fill	3	3	2000 to 2930	6120	0/3	0/3
	Qbt 4	9	9	321 to 2740	2200	1/9	0/9
Chloride	Soil	18	7	1.37 to 9.65	231	0/18	0/18
	Qbt 4	9	6	[2.04] to 3.77	94.6	0/9	0/9
Chromium	Soil	19	19	6.97 to 19.2	19.3	0/19	0/19
	Fill	3	3	5.8 to 8.9	19.3	0/3	0/3
	Qbt 4	9	8	[0.577] to 4.95	7.14	0/9	0/9
Cobalt	Soil	19	19	3.26 to 13.8	8.64	2/19	0/19
	Fill	3	3	4.9 to 6.4	8.64	0/3	0/3
	Qbt 4	9	9	0.109 to 4.42	3.14	1/9	0/9
Copper	Soil	19	19	6.75 to 17	14.7	1/19	0/19
	Fill	3	3	5.9 to 8.3	14.7	0/3	0/3
	Qbt 4	9	9	0.606 to 6.26	4.66	1/9	0/9

Table 2.8-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Cyanide (Total)	Soil	18	6	[0.049] to [0.29]	0.5	6/18	0/8
	Fill	3	0	[1.2 to 1.2]	0.5	0/3	3/3
	Qbt 4	9	2	0.0495 to [0.269]	0.5	2/9	0/9
Fluoride	Soil	18	16	[1.01] to 9.02	n/a	16/18	n/a
	Qbt 4	9	4	[1.02] to 3.76	n/a	4/9	n/a
Iron	Soil	19	19	11500 to 20500	21500	0/19	0/19
	Fill	3	3	9600 to 12100	21500	0/3	0/3
	Qbt 4	9	9	4130 to 8310	14500	0/9	0/9
Lead	Soil	19	19	4.63 to 50.9	22.3	2/19	0/19
	Fill	3	3	11.5 to 12.6	22.3	0/3	0/3
	Qbt 4	9	8	1.24 to 8.7	11.2	0/9	0/9
Magnesium	Soil	19	19	1040 to 3590	4610	0/19	0/19
	Fill	3	3	1270 to 1800	4610	0/3	0/3
	Qbt 4	9	9	255 to 1220	1690	0/9	0/9
Manganese	Soil	19	19	230 to 1550	671	2/19	0/19
	Fill	3	3	304 to 414	671	0/3	0/3
	Qbt 4	9	9	28.9 to 796	482	1/9	0/9
Mercury	Soil	19	18	0.0075 to 0.0244	0.1	0/19	0/19
	Fill	3	3	0.06 to 0.06	0.1	0/3	0/3
	Qbt 4	9	9	0.0015 to 0.0563	0.1	0/9	0/9
Nickel	Soil	19	19	5.68 to 12.5	15.4	0/19	0/19
	Fill	3	3	6.5 to 9.1	15.4	0/3	0/3
	Qbt 4	9	9	0.53 to 4.89	6.58	0/9	0/9
Nitrate	Soil	1	0	[1.08 to 1.08]	n/a	0/1	n/a
	Qbt 4	1	0	[1.07 to 1.07]	n/a	0/1	n/a
Oxalate	Soil	17	0	[10.1 to 11.7]	n/a	0/17	n/a
	Qbt 4	8	0	[10.2 to 10.9]	n/a	0/8	n/a
Perchlorate	Soil	35	9	0.000575 to [0.0467]	n/a	9/35	n/a
	Qbt 4	21	1	0.000616 to[0.0437]	n/a	1/21	n/a
Potassium	Soil	19	19	758 to 2880	3460	0/19	0/19
	Fill	3	3	945 to 1130	3460	0/3	0/3
	Qbt 4	9	9	156 to 921	3500	0/9	0/9
Selenium	Soil	19	6	0.219 to 0.762	1.52	0/19	0/19
	Fill	3	0	[0.29 to 0.29]	1.52	0/3	0/3
	Qbt 4	9	1	0.351 to [0.551]	0.3	1/9	8/9

Table 2.8-1 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Silver	Soil	19	18	0.0475 to [0.25]	1	0/19	0/19
	Fill	3	1	[0.59] to 0.63	1	0/3	0/3
	Qbt 4	9	9	0.0108 to 0.072	1	0/9	0/9
Sodium	Soil	19	19	49.2 to 318	915	0/19	0/19
	Fill	3	3	275 to 386	915	0/3	0/3
	Qbt 4	9	9	58.8 to 311	2770	0/9	0/9
Sulfate	Soil	18	15	4.1 to 99	293	0/18	0/18
	Qbt 4	9	3	[4.07] to 14.6	157	0/9	0/9
Thallium	Soil	19	18	[0.046] to 0.433	0.73	0/19	0/19
	Fill	3	0	[0.29 to 0.29]	0.73	0/3	0/3
	Qbt 4	9	8	0.0232 to 0.857	1.1	0/9	0/9
Uranium	Soil	18	18	0.256 to 1.17	1.82	0/18	0/18
	Fill	3	3	2.43 to 2.95	1.82	3/3	0/3
	Qbt 4	9	9	0.138 to 0.606	2.4	0/9	0/9
Vanadium	Soil	19	19	18.9 to 32.4	39.6	0/19	0/19
	Fill	3	3	18.8 to 23.4	39.6	0/3	0/3
	Qbt 4	9	9	1.79 to 13.2	17	0/9	0/9
Zinc	Soil	19	19	29 to 51.9	48.8	1/19	0/19
	Fill	3	3	27.4 to 30.5	48.8	0/3	0/3
	Qbt 4	9	9	6.61 to 34.7	63.5	0/9	0/9

[a] Values in brackets are detection limits.
[b] n/a = Not available.

Table 2.8-2
2004 RFI,
Frequency of Detected Organic Chemicals in Soil, Sediment, and Tuff at the 30s Line Ponds

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	Frequency of Detects	Quantitation Limit [b]
Acenaphthene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Acetone	Soil	18	5	[0.0051] to 0.194	5/18	0.037
	Qbt 4	13	7	0.0039 to 0.01	7/13	0.037
Amino-2,6-dinitrotoluene[4-]	Soil	19	3	0.193 to 64.1	3/19	0.375
	Qbt 4	13	1	[0.375] to 0.965	1/13	0.375
Amino-4,6-dinitrotoluene[2-]	Soil	19	5	6.92E-02 to 3.15	5/19	0.25
	Qbt 4	13	6	0.0883 to 1.58	6/13	0.25
Benzo(a)pyrene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Benzo(k)fluoranthene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Bis(2-ethylhexyl)phthalate	Soil	19	1	0.0325 to [3.81]	1/19	3.81
Chrysene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Di-n-butylphthalate	Qbt 4	13	1	0.0445 to [0.387]	1/13	3.81
Dinitrotoluene[2,4-]	Qbt 4	26	3	0.03 to [0.75]	3/26	3.81
Di-n-octylphthalate	Fill	3	1	0.18 to [0.4]	1/3	3.81
Fluoranthene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
HMX	Soil	19	5	[0.25] to 84.4	5/19	2.2
	Qbt 4	13	11	0.121 to 3.05	11/13	2.2
Methylene chloride	Fill	3	1	0.002 to [0.006]	1/3	0.0064
Phenanthrene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Pyrene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
RDX	Soil	19	5	[0.25] to 1040	5/19	1
	Qbt 4	13	11	[0.25] to 5.43	11/13	1
Tetrachloroethene	Soil	18	2	0.00082 to 0.0045	2/18	0.006
Toluene	Soil	18	4	0.00059 to 0.0015	4/18	0.006
Trichlorofluoromethane	Fill	3	3	0.01 to 0.011	3/3	0.0013
Trinitrobenzene[1,3,5-]	Soil	19	3	0.0704 to 8.59	3/19	0.25
	Qbt 4	13	11	0.0867 to 8.03	11/13	0.25
Trinitrotoluene[2,4,6-]	Soil	19	4	0.121 to 359	4/19	0.25
	Qbt 4	13	6	0.0716 to 4.97	6/13	0.25

[a] Values in brackets are detection limits.

[b] Maximum nondetect quantitation limit reported in mg/kg for each analyte detected.

Table 4.2-1
Minimum Number of Locations and Samples for the TA-16 Ponds Area

SWMU	Location	Minimum Number of Borings and Drilling Method	Minimum Number and Type of Samples		
			Screening[a]	D TECH[b]	Laboratory[c]
16-007(a)-99	30s Line Former Sumps	3 Shallow HSA Borings (~15 ft)	15	15	9
	30s Line Former Buildings	6 Shallow HSA Borings (15 ft)	30	30	18
	16-23739/	3 Shallow HSA Borings (~15 ft)	15	15	9
	30s Line Ponds	3 Intermediate-Depth Borings (~150 ft)	24	24	9
16-008(a)-99	90s Line Pond	4 Shallow HSA Borings (~15 ft)	20	20	12
		2 Shallow Perimeter HSA Borings (~15 ft)	10	10	6
		3 Intermediate-Depth Borings (~150 ft)	24	24	9
		16 Shallow Borings, Hand Auger/Power Auger (~5-10 ft)	48	48	32
	90s Line Building Footprints	10 Shallow HSA Borings (~15 ft)	50	50	30
	90s Line Former Drum Storage Area	1 Shallow HSA Boring (~15 ft)	5	5	3
	90s Line Former Excavation Areas (Including Former Sumps)	19 Shallow HSA Borings (~15 ft)	76	76	38
	90s Line Drainage Channels (Geomorphic)	9 Shallow Borings, Hand Auger/Power Auger (~5-10 ft)	27	27	18
	90s Line Cañon de Valle discharge	3 Shallow Borings, Hand Auger/Power Auger (~5-10 ft)	9	9	6
	90s Line Lateral Control at Discharge Lines	12 Shallow Borings, Hand Auger/Power Auger (~5-10 ft)	36	36	24

[a] Screening sample locations will be screened by HE spot test, PID, and for gross radioactivity (beta gamma). The HE spot-test detection limit is 100 ppm. Additional screening samples may be needed, depending upon initial screening results, particularly for the determination of vertical and lateral extent.

[b] D TECH sample locations are samples screened for HE. The D TECH detection limit for HE is 1 ppm.

[c] Laboratory sample locations are for samples that will be sent to off-site laboratories for analyses. Laboratory samples may be collected to define nature and extent.

Table 5.0-1
Summary of Applicable SOPs and QPs

Procedure	Title	Summary
SOP-1.01	General Instruction for Field Investigations	This SOP provides an overview of instructions regarding activities to be performed before, during, and after field investigations completed by the Los Alamos National Laboratory's Environmental Stewardship, Remediation Services (ENV-RS) project. It is assumed that field investigations involve standard sampling equipment, personal protective equipment, waste-management, and site-control equipment/materials. The procedure covers premobilization activities, mobilization to the site, documentation and sample-collection activities, sample-media evaluation, surveying, and completing lessons learned.
SOP-1.02	Sample Containers and Preservation	This SOP describes the specific requirements/process for sample containers, preservation techniques, and holding times as specified by field regulations and guidance documents. The use of specific types of sample containers, and preservation techniques is mandatory for hazardous site investigations because the integrity of any sample is diminished over time. Physical factors (light, pressure, temperature, etc.), chemical factors (changes in pH, volatilization, etc.), and biological factors may alter the original quality of the sample. Because the various target parameters are uniquely altered at varying rates, distinct sample containers, preservation techniques, and holding times have been established to maintain sample integrity for a reasonable and acceptable period of time. The procedure covers documenting SOP deviations, using proper sample containers and preservatives, performing data entry, implementing containment procedures, preserving samples, implementing holding times, completing documentation, implementing postoperation activities, and performing lessons learned.
SOP-1.03	Handling, Packaging, and Shipping of Samples	This SOP directs field team members in the preparation of environmental and waste characterization samples for transportation to the Sample Management Office or an approved radiation-screening laboratory. In general, samples taken for the Remediation Services Project are expected to have a low concentration of potential contaminants, although higher concentrations will be present in some cases. Those low-concentration samples that do not satisfy the U.S. Department of Transportation (DOT) hazard-class definitions are classified as environmental samples and are not subject to DOT regulations. Historical data, knowledge of processes, and field screening results assist the team members in making decisions as to whether a sample can be designated as "environmental" or needs to be treated as a DOT-regulated material. The procedure covers the transportation of environmental and DOT-regulated samples.
SOP-1.04	Sample Control and Field Documentation	This SOP describes the process for documenting samples collected for the ENV-RS project using sample control and field documentation, specifically, container labels, sample collection logs, chain of custody (COC)/request for analysis forms, and daily activity log forms or field notebooks. The procedure covers performing request notification, generating sample control and field documentation, completing sample collection logs, using field chain-of-custody forms, delivering samples to the Sample Management Office (SMO), delivering samples to another analytical laboratory, using custody seals, collecting the samples, completing field investigation summaries, and performing field closeouts.

Table 5.0-1 (continued)

Procedure	Title	Summary
SOP-1.05	Field Quality Control Samples	This SOP describes the requirements for the collection of field quality control (QC) samples to ensure the reliability and validity of field and laboratory data. Field QC samples shall be collected as described in this procedure and taken to the Los Alamos National Laboratory SMO with the regular field samples for subsequent chemical and physical testing. The procedure covers preoperation activities, collecting and preparing each type of QC sample including equipment rinsate blank, field duplicate, and trip blank.
SOP-1.06	Management of Environmental Restoration Project Wastes	This SOP describes the process for managing waste generated during corrective action activities. This procedure outlines the preparation, approval, and retention of all required documents associated with waste generation. The procedure covers waste identification and characterization, waste minimization/recycling, waste generation/storage, segregation, waste treatment, authorized release limits, packaging/transportation, disposal options, and specific ENV-RS project policies, including the area of contamination policy, environmental media, and “contained in” policy.
SOP-1.07	Operational Guidelines for Taking Soil and Water Samples in Explosive Areas	This SOP describes the process for taking soil and water samples in explosives areas in the ENV-RS project. It is intended to ensure that samples taken in explosive areas are safe to ship off-site and that such samples meet Department of Transportation requirements for the shipping of explosive materials. Sampling localities are classified either as heterogeneous (HE chunks possible) or homogeneous (HE chunks highly unlikely). Samples from the heterogeneous areas must be shipped as explosive materials, those from homogeneous areas must be shown to contain less than 5 wt% HE, based on field analyses.
SOP-1.08	Field Decontamination of Drilling and Sampling Equipment	This SOP describes the process for the general field decontamination of drilling and sampling equipment. It is intended to help ensure the integrity of soil, sediment, rock, water, and other samples collected from potentially contaminated sites and to minimize the potential for cross contamination between sampling locations. Implementation of this procedure will help protect site and project personnel, requiring that equipment not be removed from a controlled area without proper decontamination. The procedure covers set up of dry and wet decontamination areas, drilling/excavation equipment decontamination, and sampling equipment decontamination.
SOP-1.10	Waste Characterization	This SOP describes the development of a strategy for characterizing wastes generated during projects performed. Specifically, this document (1) identifies the steps involved in waste identification and characterization, and (2) provides instructions for completing a Waste Characterization Strategy Form (WCSF), a task that is required before every project.
SOP-1.12	Field Site Closeout Checklist	This SOP describes the process for documenting completion of fieldwork at individual ENV-RS Project sites. It includes a checklist that is designed to ensure that upon demobilization from a ENV-RS field site all necessary field compliance activities, equipment accountability, and documentation are complete. Thus, it addresses waste management, stormwater compliance, equipment decontamination and removal from sites, and records management.

Table 5.0-1 (continued)

Procedure	Title	Summary
SOP-3.11	Geodetic Surveys	This SOP describes the methodology for coordinating and evaluating geodetic surveys and establishing quality assurance (QA) and control for geodetic survey data. The procedure covers evaluating geodetic survey requirements, preparing to perform a geodetic survey, performing geodetic survey field activities, preparing geodetic survey data for QA review, performing QA review of geodetic survey data, and submitting geodetic survey data.
SOP-4.01	Drilling Plan Development	This SOP describes the drilling methods and drilling-package implementation to meet subsurface sampling requirements. Various drilling methods have been developed to achieve successful subsurface contact for retrieving suitable formation, gas, and water samples. These include, but are not limited to, solid-stem augering, hollow-stem augering, direct rotary drilling, reverse rotary drilling, cable-tool drilling, and hand augering.
SOP-5.07	Operation of LANL-Owned Borehole Logging Trailer	This SOP describes the process for the operation and maintenance of the borehole video/geophysics logging trailer. The procedure covers running the borehole video camera system, running the borehole caliper tool, running the borehole conductivity/resistivity (induction) tool, running the gamma tool, and running the borehole spontaneous potential/single-point resistance tool.
SOP-6.01	Purging and Sampling Methods for Single Completion Wells	This SOP describes methods used in the LANL ENV-RS project for evacuating stagnant water from a well bore in sufficient quantities so that the water samples that are collected afterwards are representative of the formation interval open to the well bore. It specifies field parameters (turbidity, conductance, pH) that should be measured, and acceptable levels of variability in these parameters to ensure that representative samples of formation water can be collected.
SOP-6.02	Field Analytical Measurements of Groundwater	This SOP describes procedures for measuring field water-quality parameters of groundwater samples for the LANL ENV-RS project. Measurement procedures discussed include those for temperature, specific conductance, alkalinity, pH, dissolved oxygen, and turbidity that closely represent water-quality conditions in the aquifers.
SOP-6.03	Sampling for Volatile Organic Compounds in Groundwater	This SOP states the responsibilities and describes the process for the sampling for volatile organic compounds (VOCs) in groundwater. This SOP also describes the selection of equipment and materials used in the sampling process. The objectives are to collect valid samples for volatile organic analysis and to subject samples to the least amount of turbulence and subsequent possible aeration. This procedure covers conducting preoperation activities, sampling, preparing documentation, and conducting postoperation activities.
SOP-6.09	Spade and Scoop Method for the Collection of Soil Samples	This SOP describes the process for spade-and-scoop collection of shallow (i.e., typically 0 to 12 inches) soil samples. The “spade-and-scoop” method involves digging a hole to the desired depth, as prescribed in the sampling and analysis plan, and collecting a discrete grab or portion of a composite sample. The procedure covers presampling activities, sampling activities, and post sampling activities.
SOP-6.10	Hand Auger and Thin-Wall Tube Sampler	This SOP states the responsibilities and describes the process for collecting surface and subsurface (up to about 15 ft) soil samples with a hand auger and thin-wall tube sampler. This procedure describes the selection and use of sampling methods and equipment at sites that may include contamination with hazardous or radioactive materials. The procedure covers presampling activities, sampling activities, collecting field duplicates, and postsampling activities.

Table 5.0-1 (continued)		
Procedure	**Title**	**Summary**
SOP-6.26	Core Barrel Sampling for Subsurface Earth Materials	This SOP describes the process for collecting core-barrel samples of subsurface earth materials. The field team may sample for other constituents under this SOP (or modifications thereof). The procedure covers presampling activities, sampling activities, and postsampling activities.
SOP-6.33	Headspace Vapor Screening with a Photoionization Detector	This SOP describes the process for screening headspace vapor for VOC in soil samples with a photoionization detector (PID). The PID is a portable, nonspecific, vapor/gas detector employing the principle of photoionization to detect and measure real-time concentrations of a variety of chemical compounds in air. Procedure covers: performing field calibration, operating, and post operating activities.
SOP-7.05	Subsurface Moisture Measurements Using a Neutron Probe	This SOP describes the process of collecting subsurface moisture measurements using a neutron probe for the ENV-RS project. A neutron probe is used to measure the subsurface moisture using a probe containing a source of high-energy neutrons and a slow neutron detector. The procedure covers performing a daily field standard count, preparing instruments for field measurements, taking a field measurement, and documenting the results of the field measurement.
SOP-10.08	Operation of the Spectrace 9000 Field-Portable X-Ray Fluorescence Instrument	This SOP describes the process for operating and using the Spectrace 9000 field portable XRF analyzer to screen for hazardous, or potentially hazardous, inorganic materials in the LANL ENV-RS project. The data that are generated allow for rapid evaluation of the extent of contamination. Samples are analyzed for elements of atomic number 13 (aluminum) through 92 (uranium), with proper x-ray sources and instrument calibration.
SOP-12.01	Field Logging, Handling, and Documentation of Borehole Material	This SOP prescribes the specific borehole material management methods to be followed and the documentation to be prepared, during handling and field logging of selected borehole materials identified in the site guidance documents and waste-characterization strategy form. This procedure is limited to the activities necessary to take custody of core and cuttings from drill rig personnel, conduct field screening, remove time-sensitive analytical samples and subsamples for preliminary characterization, complete photo documentation when necessary, perform field structural and lithologic description, and mark, package, and temporarily store the borehole materials at a drill-site borehole material storage trailer. This procedure describes the handling of the subset of borehole materials to be curated from the time they are withdrawn from the borehole to the time they are ready to be transported to the Remediation Services Project's Field Support Facility for curating and archiving. For the purposes of this SOP, borehole material may also refer to other solid materials, such as drive samples or augured materials. This procedure covers borehole material staging, temporary packaging of time-sensitive analytical samples, measurement and determination of material loss, marking core (depth notation and stripes), core photography, core logging, removal of analytical samples (core), and core-box loading and storing.
QP-2.1	Documenting Personnel Qualifications and Selection Process	This QP states the responsibilities and describes the methodology for documenting personnel qualifications for LANL staff and augmented staff (contractors) in the LANL ENV-RS project. It includes forms for delineation of position descriptions and documenting personnel qualifications for individuals entering the ENV-RS project.

Table 5.0-1 (continued)		
Procedure	**Title**	**Summary**
QP-2.2	Personnel Orientation and Training	This QP states the responsibilities and describes the process for managing personnel training for the ENV-RS project at LANL. It includes a personnel training management flow chart, a training documentation form, and training requirements for individual job categories.
QP-3.4	Corrective Action Process	This QP states the responsibilities and describes the process for providing a mechanism for identifying, logging, resolving and reporting conditions adverse to quality. The data captured in the system described in this QP allow management to make informed decisions about how to employ resources in the most efficient manner to solve systemic problems.
QP-4.4	Record Transmittal to the Records Processing Facility	This QP describes the responsibilities for transmitting records to the Records Processing Facility (RPF) for the ENV-RS project and describes the process for transmitting documents to the RPF. The procedure defines what types of information the term *records* includes, which records should be submitted, and details the steps necessary to submit records.
QP-4.12	Documenting Oral Communications	This QP describes the process, using the graded approach, for documenting oral communications that represent evidence of quality or safety concerns, the organization, functions, policies, decisions, procedures, operations, or other activities of the ENV-RS project or that contain valuable informational data for the LANL ENV-RS project.
QP-5.2	Control of Measuring and Test Equipment	This QP states the responsibilities and describes the process for identifying, maintaining, and managing measurement and test equipment (M&TE) with the ENV-RS project. It discusses instrument calibration, calibration frequencies, and documentation requirements for M&TE. It provides forms and labels to support M&TE utilization.
QP-5.3	Readiness Planning and Reviews	This QP describes the responsibilities and defines the process for conducting readiness planning and reviews for the ENV-RS project. The procedure is used as a planning tool for preparing fieldwork, as a method to ensure compliance with all identified requirements, and to gain consensus on key preparations before field activities can proceed. The QP defines the personnel responsible for the various readiness planning and review activities. The procedure also presents the criteria for determining if a readiness review meeting is necessary, as well as details the process for conducting such a meeting. A readiness review checklist is required in order to assure that all requirements are met and to assign responsible personnel for meeting the requirements.
QP-5.7	Notebook Documentation for Environmental Restoration Technical Activities	This QP describes the responsibilities and process for properly documenting environmental restoration technical activities performed for the ENV-RS project. The procedure defines the requirements for documenting field activities including the requirements for notebooks, notebook entries, notebook attachments, notebook data evaluation, technical review of notebooks, Quality Integration and Improvement review of notebooks, and notebook submission as a record.
QP-7.2	Supplier Evaluation	This QP describes the requirements and process for evaluating and approving potential suppliers of items and/or services to the ENV-RS project. The QP also describes the requirements and process for implementing and maintaining the qualified suppliers list. The procedure specifically excludes certain items to which the QP does not apply.
QP-10.3	Stop Work and Restart	This QP states the responsibility and describes the methods for issuing and controlling formal stop work and restart processes within the ENV-RS project.

Table 5.1-1
Analytical Methods for Soil and Rock Samples

Analyte	Method
HE	EPA SW-846: Method 8321A, "Solvent Extractable Nonvolatile Compounds by High Performance Liquid Chromatography/Thermospray/Mass Spectrometry (HPLC/TS/MS)"
Perchlorate	EPA SW-846 (Update III) Method 8321A, "Solvent Extractable Nonvolatile Compounds by High Performance Liquid Chromatography/Thermospray/Mass Spectrometry (HPLC/TS/MS) or Ultraviolet (UV) Detection"
Nitrate	EPA's National Exposure Research Laboratory Method 300.0, "Determination of Inorganic Anions in Drinking Water by Ion Chromatography"
VOCs	EPA SW-846 (Update III) Method 8260B, "Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)"
SVOCs	EPA SW-846 (Update III) Method 8270C, "Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)"
TAL Metals	EPA SW-846 (Update III) Method 6010B, "Inductively Coupled Plasma-Atomic Emission Spectrometry"
Uranium	EPA SW-846 (Update II) Method 6020, "Inductively Coupled Plasma-Mass Spectrometry"
Mercury	EPA SW-846 (Update II) Method 7471A, "Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique)"
Cyanide	EPA SW-846 (Update III) Method 9012A, "Total and Amenable Cyanide (Automated Colorimetric, with Off-Line Distillation)"
Chromium VI	EPA SW-846: Method 7196A, "Hexavalent Chromium by Colorimetric Techniques"
TPH	EPA SW-846: Method 8015, "Nonhalogenated Organics Using Gas Chromatography/Flame Ionization Detection (GC/FID)"

Table 5.2-1
Analytical Methods for Water Samples

Analyte	Method
HE	EPA SW-846 (Update III) Method 8330 standard suite, including PETN, "Solvent Extractable Nonvolatile Compounds by High Performance Liquid Chromatography/Thermospray/Mass Spectrometry (HPLC/TS/MS) or Ultraviolet (UV) Detection"
Perchlorate	EPA SW-846 (Update III) Method 8321A, "Solvent Extractable Nonvolatile Compounds by High Performance Liquid Chromatography/Thermospray/Mass Spectrometry (HPLC/TS/MS) or Ultraviolet (UV) Detection"
Anions, including nitrate	EPA's National Exposure Research Laboratory Method 300.0, "Determination of Inorganic Anions in Drinking Water by Ion Chromatography"
VOCs	EPA SW-846 (Update III) Method 8260B, "Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)"
SVOCs	EPA SW-846 (Update III) Method 8270C, "Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)"
TAL Metals	EPA SW-846 (Update III) Method 6010B, "Inductively Coupled Plasma-Atomic Emission Spectrometry"
Uranium	EPA SW-846 (Update II) Method 6020, "Inductively Coupled Plasma-Mass Spectrometry"
Mercury	EPA SW-846 (Update II) Method 7471A, "Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique)"
Cyanide	EPA SW-846 (Update III) Method 9010B, "Total and Amenable Cyanide: Distillation"

Appendix A

Acronyms, Abbreviations, Glossary, and Metric Conversion Table

A-1.0 ACRONYMS AND ABBREVIATIONS

AA	administrative authority
AK	acceptable knowledge
AOC	area of concern
asl	above sea level
bgs	below ground surface
BMP	best management practice
BV	background value
CMS	corrective measures study
COC	chain of custody
COPC	chemical of potential concern
D&D	decontamination and decommission
DNB	dinitrobenzene
DNT	dinitrotoluene
DOE	US Department of Energy
DOT	Department of Transportation
ENV-ECR	Environmental Stewardship–Environmental Characterization & Remediation
ENV-RS	Environmental Stewardship–Remediation Services
EM	electromagnetic
EPA	US Environmental Protection Agency
ER	environmental restoration
ER ID	Environmental Restoration Project identification number
GC-MS	gas chromatography-mass spectrometry
GPS	global positioning system
HA	health advisory
HE	high explosive(s)
HIR	historical investigation report
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HPLC/TS/MS	high-performance liquid chromatography/thermospray/mass spectrometry
HRMB	Hazardous and Radioactive Materials Bureau
HSA	hollow-stem auger
HSWA	Hazardous and Solid Waste Amendments of 1984
ICN	interim change notice
IDW	investigation-derived waste
IWP	investigation work plan
LASO	Los Alamos Site Office (US Department of Energy)

LANL	Los Alamos National Laboratory
LASL	Los Alamos Scientific Laboratory (designation of the Laboratory before January 1, 1981)
LIR	Laboratory implementation requirement
LLW	low level waste
MDA	material disposal area
µg	microgram
M&TE	measurement and test equipment
MCL	maximum contaminant level
MSL	mean sea level
NFA	no further action
NMED	New Mexico Environment Department
NMHWA	New Mexico Hazardous Waste Act
NOI	notice of intent
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photo-ionization detector
PPE	personal protective equipment
PRG	preliminary remediation goal
PRS	potential release site
PAH	polycyclic aromatic hydrocarbon
QA	quality assurance
QC	quality control
QP	quality procedure
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RFI	RCRA facility investigation
SAA	satellite accumulation area
SMO	Sample Management Office
SOP	standard operating procedure
SSL	soil-screening level (NMED)
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWSC	sanitary wastewater system consolidation
TA	technical area

TAL	target analyte list (EPA)
TCE	trichloroethene
TCLP	toxicity characteristic leaching procedure
TNB	trinitrobenzene
TNT	trinitrotoluene
TS	thermospray
TSDF	treatment, storage, and disposal facility
uv	ultraviolet
VCA	voluntary corrective action
VOC	volatile organic compound
WCSF	Waste Characterization Strategy Form
WQCC	Water Quality Control Commission
XRF	x-ray fluorescence

A-2.0 GLOSSARY

accuracy — A measure of the closeness of measurements to the true value of the parameter being measured.

action level — Health- and environmental-based concentrations derived using *chemical*-specific toxicity information and standardized exposure assumptions. Action levels can be developed on a facility-specific basis or can be taken from standardized lists (61 Federal Register 19446). Contamination found in a particular *medium* below an appropriate action level would not generally be subject to *remediation* or further study.

administrative authority (AA) — The New Mexico Environment Department, the US Environmental Protection Agency, or the US Department of Energy, as appropriate.

adsorption — The surface retention of solid, liquid, or gas molecules, atoms, or ions by a solid or a liquid.

alkalinity — Various soluble mineral salts are found in natural water and arid soils that have a pH greater than 7. In water analysis alkalinity indicates the presence of carbonates, bicarbonates, and/or hydroxides, and occasionally the borates, chlorates, silicates, or phosphates.

alluvial — Relating to geologic deposits or features formed by running water.

alluvium — Clay, silt, sand, and gravel *transported* by water and deposited on streambeds, *flood plains*, and *alluvial fans*.

alpha radiation — *Radiation* composed of alpha particles emitted during the *radioactive decay* of certain nuclides. The least penetrating of the three common types of *radiation* (*alpha*, *beta*, and *gamma*), alpha radiation can be blocked easily (for example, by a sheet of paper or the outer layer of skin).

analysis — Includes physical analysis, *chemical analysis*, and knowledge-of-process determinations. (Laboratory Hazardous Waste Facility Permit)

analyte — The element, nuclide, or ion a *chemical analysis* seeks to identify and/or quantify; the *chemical* constituent of interest.

analytical method — A body of procedures and techniques for systematically performing an activity.

anomaly — A deviation that is beyond normal variations.

anthropogenic — Refers to environmental alterations that result from the presence or activities of humans.

aquifer — Body of permeable geologic material whose saturated portion is capable of readily yielding *groundwater* to wells.

aquitard — Body of low-permeability geologic material whose saturated portion does not readily yield *groundwater* to wells.

area of concern (AOC) — Areas at the Laboratory that might warrant further investigation for *releases* based on past facility waste-management activities.

area of contamination (AOC) — Discrete areas of generally dispersed contamination.

ash-flow tuff — A *tuff* deposited by a hot, dense volcanic current. Ash-flow tuff can be either *welded* or nonwelded.

assessment — (1) The act of reviewing, inspecting, testing, checking, conducting surveillance, auditing, or otherwise determining and documenting whether items, processes, or services meet specified requirements. (2) An evaluation process used to measure the performance or effectiveness of a system and its elements. In this document, assessment is an all-inclusive term used to denote any of the following: audit, performance evaluation, management system review, peer review, inspection, and surveillance.

assessment endpoint — In a *risk analysis*, the quantitative or quantifiable expression of an environmental value considered to be at *risk* (e.g., a 25% reduction in fish *biomass* or local extinction of an avian species).

audit (quality) — An independent, systematic examination to determine whether quality activities and related results comply with planned arrangements, whether these arrangements are implemented effectively, and whether they are suitable to achieve objectives.

background data — Data that represent naturally occurring concentrations of inorganic constituents in a geological medium. The Laboratory's background data are derived from samples collected at locations that are either within or adjacent to the Laboratory. These locations (1) are representative of geological media found within Laboratory boundaries and (2) have not been affected by Laboratory operations.

background level — Naturally occurring concentrations (levels) of an inorganic *chemical* and naturally occurring *radionuclides* in soil, *sediment*, and *tuff*.

background sample — A sample collected from an area or site similar to the one being studied but located in an area known or thought to be free from constituents of concern.

background screening value (BSV) — A threshold used to identify site *sample* results that may be greater than *background levels*.

barrier — Any material or structure that prevents or substantially delays movement of solid-, liquid-, or gaseous-phase *chemicals* in environmental media.

basalt — A fine grained, dark volcanic rock comprised chiefly of plagioclase, augite, olivine, and magnetite.

baseline level — *Anthropogenic* concentrations of a given *chemical* in the soil associated with Laboratory and/or commercial activities or processes that may not be related to source material(s) or a *release(s)* from within a *potential release site*. Examples of baseline levels are nuclear fallout and organic *chemicals* associated with urban activities.

bentonite — A clay composed of the mineral montmorillonite and variable amounts of magnesium and iron, formed over time by the alteration of volcanic ash. As bentonite can *adsorb* large quantities of water and expand to several times its normal volume, it is a common additive to drilling mud.

bentonite/bentonite annular seal — A hydrous aluminum silicate in slurry, powder, granular, or pellet form that, when hydrated, provides an impervious seal between the well casing and the borehole wall.

Bentonite may also be used in a 2% to 5% mixture with Portland Type I or II cement to form a pumpable grout seal that expands as the material hardens.

best management practices (BMPs) — For facilities that manufacture, use, store, or *discharge* toxic or hazardous pollutants as defined by the 1977 Clean Water Act, a required program to control the potential spill or *release* of those materials to surface waters. (*The Facts on File Dictionary of Environmental Science,* edited by L. Harold Stevenson and Bruce Wyman)

beta radiation — Radioactive transformation of a nuclide in which the nucleus emits a beta particle (electron or positron). Beta radiation can be blocked by an inch of wood or by a thin sheet of aluminum.

bias — Systematic deviation from the true value that remains constant over replicated measurements within the statistical *precision* of the measurement process.

blank sample — *Sample* expected to have negligible or unmeasurable amounts of *analytes*. Results of blank sample *analyses* indicate whether *field samples* might have been contaminated during the *sample* collection, *transport*, storage, preparation, and *analysis* process.

blind sample — See *single blind sample* and *double blind sample*.

caldera — An approximately circular volcanic depression, generally on the order of tens of kilometers in diameter, formed during the eruption of large volumes (tens to hundreds of cubic kilometers) of dense rock equivalent, *ash-flow tuff*, and ash-fall tuff deposits.

calibration — Process used to identify the relationship between the true (reference) *analyte* concentration or other variable and the response of a measurement instrument, *chemical analysis method*, or other measurement system.

casing — A solid piece of pipe, typically steel, stainless steel, or polyvinyl chloride (PVC) plastic, used to keep a well open in either unconsolidated materials or unstable rock and as a means to contain zone-isolation materials such as cement grout and bentonite.

catchment — (1) A structure, such as a basin or reservoir, used for collecting or draining water. (2) The amount of water collected in such a structure. (3) A catching or collecting of water, especially rainwater.

certification — A signed statement attached to all reports required by permits and to other information requested by the administrative authority (AA), It ensures that a document and all its attachments were prepared under the direction or supervision of an authorized person in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted; it carries significant penalties for known violations [Permit Program, 27.11(b)(c)(d)].

chain of custody — Unbroken, documented trail of accountability designed to ensure the uncompromised physical integrity of *samples*, data, and records.

chemical — Any naturally occurring or man-made substance characterized by a definite molecular composition, including molecules that contain *radionuclides*.

chemical analysis — Process used to measure one or more attributes of a *sample* in a clearly defined, controlled, systematic manner. Often requires treating a *sample* chemically or physically before measurement.

chemical interference — A *chemical* or physical entity whose influence results in a decrease or increase in the response of an *analytical method* or other measurement system relative to the response obtained in the absence of the entity.

chemical of concern — *Chemical* identified as a potential *risk* during a site-specific human-health or ecological *risk assessment*.

chemical of potential concern (COPC) — A *chemical*, detected at a site, that has the potential to adversely affect human *receptors* due to its concentration, distribution, and mechanism of toxicity. A COPC remains a concern until *exposure pathways* and *receptors* are evaluated in a site-specific human health *risk assessment*.

chemical of potential ecological concern (COPEC) — A *chemical*, detected at a site, that has the potential to adversely affect ecological *receptors* due to its concentration, distribution, and mechanism of toxicity.

cleanup levels — *Media*-specific *contaminant* concentration levels that must be met by a selected *corrective action*. Cleanup levels are established by using criteria such as protection of human health and the environment; compliance with regulatory requirements; reduction of toxicity, mobility, or volume through *treatment*; long- and short-term effectiveness; implementability; cost; and public acceptance.

Code of Federal Regulation (CFR) — A codification of all regulations developed by federal government agencies and finalized by publication in the *Federal Register*.

collocated sample — One of two or more *samples* collected within close proximity of each other meant to represent the same immediate area.

colluvium — Loose rock debris that accumulates at the base of a cliff or on a slope principally by the action of gravity.

comparability — Qualitative measure of the degree to which one item or data set can be compared with another.

conceptual hydrogeologic model — Mathematical approximation of the occurrence, movement, and quality of *groundwater* in a given area and the relationship of that *groundwater* to the surface water, *soil water*, and geologic framework in that area.

conceptual model — See *site conceptual model*.

confluence — Place where two or more streams meet; the point where a tributary meets the main stream.

contaminant — Any *chemical* (including *radionuclides*) present in environmental *media* or on structural debris.

contract analytical laboratory — An analytical laboratory under contract to the University of California to perform analysis of samples for work performed at the Laboratory.

contract-required detection limit (CRDL) — The minimum *reporting limits* required under a contract between Los Alamos National Laboratory and a contract laboratory. The CRDLs are not necessarily intrinsically tied to instrument *sensitivity* but rather are *reporting limits*.

corrective action — Action to rectify conditions adverse to human health or the environment.

corrective measures study (CMS) — A formal process to identify and evaluate remedy alternatives for *releases* at the facility (55 Federal Register 30798).

cumulative risk — The evaluation of simultaneous exposure to a receptor across multiple media, pathways, and contaminants to estimate the resulting health and environmental effects.

Curie — Unit of radioactivity defined as the quantity of any radioactive nuclide that has an activity of 3.7×10^{10} disintegrations per second (dps).

daily calibration — Combination of *calibration blank* and *calibration standard*; used to determine if the instrument response to *analyte* concentration is within acceptable bounds relative to the *initial calibration*. A daily calibration establishes the instrument response factors on which quantitations are based, thus verifying the satisfactory performance of an instrument on a day-to-day basis.

data quality assessment — Statistical and scientific evaluation of a data set that establishes whether it is adequate for its intended use.

data validation — Systematic process that applies a defined set of performance-based criteria to a body of data; may result in qualification of the data. The data validation process is performed independently of the analytical laboratory that generates the data set and occurs before conclusions are drawn from the data. The process may comprise a standardized data review (*routine data validation*) and/or a problem-specific data review (*focused data validation*).

data validator — The person who performs *data validation* in accordance with ENV-RS project procedures.

data verification — Process of evaluating the completeness, correctness, consistency, and compliance of a laboratory data package against a specified standard or contract.

- Completeness means all required information is present—both hard copy and electronic.
- Correctness means the reported results are based on properly documented and correctly applied algorithms.
- Consistency means values are the same when they appear in different reports or are transcribed from one report to another.
- Compliance means the data pass numerical *quality control* (QC) tests based on parameters or limits specified in a contract or in an auxiliary document.

decommissioning — Permanent removal from service of facilities and their components, after the discontinued use of structures or buildings deemed no longer useful, in accordance with regulatory requirements and environmental policies.

decontamination — Removal of unwanted material from the surface of or from within another material.

detect — Sample result above the method detection level (MDL) reported by the laboratory. The laboratory reports the concentration of the analyte in the sample.

detection limit — Minimum concentration that can be determined by a single measurement by an instrument; implies a specified statistical confidence that the analytical concentration is greater than zero.

discharge — Accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of *hazardous waste* into or on any land or water. (*RCRA*, 40 CFR 260.10)

disposal — The discharge, deposit, injection, dumping, spilling, leaking, or placing of any *solid waste* or *hazardous waste* into or on any land or water so that such *solid waste* or *hazardous waste* or any constituent thereof may enter the environment or be emitted into the air or *discharged* into any waters, including *groundwaters*. (40 CFR Part 260.10)

dissolved oxygen — The amount of oxygen dissolved in water, in parts per million (ppm) by weight or in milligrams per liter (mg/l).

document — A written or pictorial compilation of information that describes, defines, specifies, reports, or certifies activities, requirements, procedures, or results (any plan, report, proposal, regulatory response, permit modification request, document addendum or update, or procedure) that must be submitted to the AA or that has significance to the operations of the ENV-RS project. Document types are shown in QP-4.9.

dose — Quantity of *radiation* that is *absorbed*, per unit of mass, by the body or by any portion of the body.

dose equivalent — Estimated amount of biological damage (in rems) done by the deposition in tissue of a given unit of *absorbed-radiation dose*.

double blind sample — *Performance-evaluation sample* whose *analyte* concentration and *sample* identity are unknown to the analyst (i.e., the analyst is not informed that the *sample* is a *performance-evaluation sample*).

drill bit — The cutting tool attached to the bottom of the drill stem.

drill rods or drill pipe — Special pipe used to transmit rotation and energy from the drill rig to the bit. The conduit which conveys circulation fluids such as air, water, or other mixtures to cool the bit and evacuate the borehole cuttings.

drilling fluid — A liquid or gas circulated into the borehole during the drilling process to cool and lubricate the bit and carry cuttings out of the borehole.

duplicate analysis — *Analysis* performed on one of a pair of identically prepared *subsamples* taken from the same *sample*.

duplicate measurement — An additional measurement performed on a *prepared sample* under identical conditions to evaluate the variance in the measurement.

ecological screening level (ESL) — An organism's exposure-response threshold for a given *chemical* constituent. The concentration of a substance in a particular *medium* corresponds to a *hazard quotient* (HQ) of 1.0 for a given organism below which no *risk* is indicated.

effluent — Liquid *discharged* as a waste, such as contaminated water from a factory or the outflow from a sewage works; water *discharged* from a storm sewer or from land after irrigation.

environmental samples — Air, soil, water, or other media samples that are collected from streams, wells, and soils or other locations and are not expected to exhibit properties classified by the Department of Transportation (DOT) as hazardous.

environmental surveillance — Collection and *analysis* of *samples* of air, water, soil, foodstuffs, biota, and other media to determine the environmental quality of an industry or community. Environmental surveillance commonly is performed at sites that contain nuclear facilities.

eolian — Pertaining to the geological products of wind action. Especially said of *sediment* deposition by the wind, such as eolian sand and eolian dunes.

EPA — See *US Environmental Protection Agency*

ephemeral — Said of a stream or *spring* that flows only during and immediately after periods of rainfall or snowmelt.

equipment blank (or *rinsate blank*) **—** A *blank sample* that is used to rinse the *sample*-collection equipment and is then transferred to a sampling container. The equipment blank is collected after equipment *decontamination* is completed but before collection of another *field sample*.

ER data — Data derived as a result of *samples* that are collected and paid for by ENV-RS (formerly the ER Project) funding.

ER ID number — The number assigned by the Records Processing Facility (RPF) when a document is submitted as a final record.

error — The quantifiable difference between an observed value and the true value of the parameter being measured.

estimated detection limit (EDL) — The detection limit required by the Laboratory statement of work (SOW) for analytical services (RFP No. 9-XS1-Q4257). The Laboratory value reflect the contract-required detection limits (CRDLs) of the Contract Laboratory Program (CLP) methods.

estimated quantitation limit (EQL) — The lowest concentration that can be reliably achieved within specified limits of *precision* and *accuracy* during routine analytical-laboratory operating conditions. The low point on a *calibration* curve should reflect this quantitation limit. The EQL is not used to establish detection status. *Sample* estimated quantitation limits are highly *matrix*-dependent, and the specified estimated quantitation limits might not always be achievable. See the statement of work (SOW) for analytical services (RFP No. 9-XS1-Q4257) for a more complete definition.

evapotranspiration — The combined *discharge* of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces, and by transpiration from plants.

exposure pathway — Mode by which a *receptor* may be exposed to *contaminants* in environmental media (e.g., drinking water, ingesting food, or inhaling dust).

exposure unit — The bounded area or volume within which a person or other *receptor* may be exposed to *contaminants* that have been *released* to the environment.

external standard — External standard *calibration* involves comparison of instrument responses from the *sample* to the responses from the target compounds in the *calibration standards*. *Sample* peak areas (or peak heights) are compared to peak areas (or heights) of the standards.

fallout radionuclides — Radionuclides that are present at globally elevated levels in the environment as a result of the fallout from atomic weapons tests. The Laboratory background data sets consist of Environmental Surveillance samples taken from marginal and regional locations for the following radionuclides associated with fallout: tritium, cesium-137, americium-241, plutonium-238, plutonium-239/240, and strontium-90. Samples were collected from regional and marginal locations in the vicinity of the Laboratory that are (1) representative of geological media found within Laboratory boundaries and (2) were not impacted by Laboratory operations.

fault — A fracture, or zone of fractures, in rock along which there has been vertical or horizontal movement; adjacent rock layers or bodies are displaced.

Federal Register — The official daily publication for Rules, Proposed Rules, and Notices of federal agencies and organizations, as well as Executive Orders and other Presidential Documents.

field blank (also known as *field reagent blank*) **—** A *blank sample* either prepared in the field or carried to the sampling site, exposed to sampling conditions (e.g., bottle caps removed, preservatives added), and returned to a laboratory for *analysis* in the same manner in which environmental *samples* are analyzed. Used to identify the presence of contamination potentially added during the sampling and *analysis* process.

field duplicate (replicate) **samples —** Two separate, independent *samples* taken from the same source that are collected in such a manner that they are *collocated samples*, equally representative of the *sample matrix* at a given location and time.

field matrix spike — A known amount of a *field sample* to which a known amount of the *target analyte* has been added. Used to compute the proportion of added *analyte* that is recovered upon *analysis*.

field notebook — A field notebook is generally used to record activities performed in the field or to compile field data.

field reagent blank — See *field blank*.

field sample — See *sample*.

field split — A *field sample* that has been homogenized and divided in the field into equally representative portions that are submitted for *analysis* (see also *split sample*).

filter pack — Sand, gravel, or glass beads that are uniform, clean, and well rounded that are placed in the annulus of the well, between the borehole wall and the well intake in order to prevent foreign material from entering through the well intake and to stabilize the formation.

flood plain — The portion of a river valley that is built of overbank *sediment* deposited when the river floods.

fluid invasion — The migration of drilling fluid or one or more components of the drilling fluid into the pores, fractures, and other openings of the formation near the borehole.

focused data validation — A technically based *analyte*-, *sample*-, and potentially data-use-specific process that extends the qualification of data beyond method or contractual compliance and provides a level of confidence that an *analyte* is present or absent. If the *analyte* is present, the quality of the quantitation may be obtained through focused validation.

gamma radiation — A form of electromagnetic, high-energy *radiation* emitted from a nucleus. Gamma rays are essentially the same as x-rays and require heavy shielding, such as concrete or steel, to be blocked.

geohydrology — The science that applies hydrologic methods to the understanding of geologic phenomena.

grab sample — A specimen collected by a single application of a field sampling procedure to a target *population* (e.g., the surface soil from a single hole collected following the spade and scoop sampling procedure or a single air filter left in the field for three months).

groundwater — Water in a subsurface saturated zone; water beneath the regional *water table*.

grout — Cement or bentonite mixtures used in sealing boreholes and wells and for zone isolation. Only Portland Type I or II cement is approved for use at investigative sites.

half-life — The time required for one-half of the radioactive atoms initially present in a *sample* to decay. Each *radionuclide* has a characteristic half-life ranging from a fraction of a second to thousands of years.

hazard index (HI) — The sum of *hazard quotients* for multiple *contaminants* to which a *receptor* (j) is determined to be exposed, i.e., $HI_j = \sum_I HQ_{ij}$.

hazard quotient (HQ) — The ratio of a calculated exposure (E) to or *dose* (D) from a given *contaminant* (I) to a given *receptor* (j) over a reference value (TRV) for *contaminant* (I) determined to be protective of *receptor* (j), i.e., $HQ_{ij} = E_{ij}$ [or D_{ij}]TRV_{ij}.

Hazardous and Solid Waste Amendments (HSWA) — The Hazardous and Solid Waste Amendments of 1984 (Public Law No. 98-616, 98 Stat. 3221), which amended the *Resource Conservation and Recovery Act* of 1976, 42 U.S.C. § 6901 et seq.

hazardous constituent — Those constituents listed in Appendix VIII to 40 CFR Part 261.

hazardous waste — Any *solid waste* is generally a hazardous waste if it

- is not excluded from regulation as a hazardous waste,
- is listed in the regulations as a hazardous waste,
- exhibits any of the defined characteristics of hazardous waste (ignitability, corrosivity, reactivity, or toxicity), or
- is a mixture of *solid waste* and hazardous waste.

See 40 CFR 261.3 for a complete definition of hazardous waste.

holding time — The maximum elapse of time that one can expect to store a *sample* without unacceptable changes in *analyte* concentrations. Holding times apply under prescribed conditions and deviations from these conditions may affect the holding time. Extraction holding time refers to the time lapse from *sample* collection to *sample* preparation; analytical holding time refers to the time lapse between *sample* preparation and *analysis*.

HSWA module — Module VIII of the Laboratory's Hazardous Waste Facility Permit. This permit allows the Laboratory to operate as a *treatment, storage, and disposal facility*.

hydraulic conductivity — The rate at which water moves through a *medium* in a unit of time under a unit *hydraulic gradient* through a unit area measured perpendicular to the direction of flow.

hydraulic gradient — The rate of change of *hydraulic head* per unit of distance in the direction of *groundwater* flow.

hydraulic head — Elevation of the *water table* or *potentiometric surface* as measured in a well.

hydrogen-ion activity (pH) — The effective concentration (activity) of dissociated hydrogen ions [H+]. A measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, increasing with alkalinity and decreasing as acidity increases.

hydrogeology — The science that applies geologic methods to the understanding of hydrologic phenomena.

inductively coupled plasma emission spectroscopy (ICPES) — ICPES determines trace elements, including metals, in solutions. The instrument measures characteristic emission spectra by optical

spectrometry. Samples are nebulized, and the resulting aerosol is *transported* to the plasma torch. Element-specific emission spectra are produced by a radio-frequency inductively coupled plasma. The spectra are dispersed by a grating spectrometer, and photosensitive devices are used to monitor the intensities of the emission lines.

inductively coupled plasma mass spectroscopy (ICPMS) — ICPMS is applicable to the determination of sub-μg/l concentrations of a large number of elements in water *samples* and in waste extracts or digests. When dissolved constituents are required, *samples* must be filtered and acid preserved before *analysis*. No digestion is required before *analysis* for dissolved elements in water *samples*. The method measures ions produced by a radio-frequency inductively coupled plasma. *Analyte* species originating in a liquid are nebulized, and the resulting aerosol *transported* by argon gas into the plasma torch. The ions produced are entrained in the plasma gas and introduced, by means of an interface, into a mass spectrometer. The ions produced in the plasma are sorted according to their mass-to-change ratios and quantified with a channel electron multiplier.

industrial-use scenario — Industrial use is the scenario in which current Laboratory operations continue. Any necessary *remediation* involves cleanup to standards designed to ensure a safe and healthy work environment for Laboratory workers.

infiltration — Entry of water into the ground.

initial calibration — The process used to establish the relationship between instrument response and *analyte* concentration at several *analyte* concentration values to demonstrate that an instrument is capable of acceptable analytical performance.

institutional controls — Controls that prohibit or limit access to contaminated media: use restrictions, permitting requirements, *standard operating procedures*, Laboratory Implementation Requirements, Laboratory Implementation Guidance, Laboratory Performance Requirements, etc.

instrument detection limit (IDL) — The IDL is defined to be three times the average of the standard deviations obtained on three nonconsecutive days from the *analysis* of a standard solution, with seven consecutive measurements of that solution per day. The standard solution must be prepared at a concentration of three to five times the instrument manufacturer's estimated IDL. This is a measure of instrument *sensitivity* without any consideration for contributions to signal from reagents.

instrument drift — A systematic change in the output of a given logging system due to causes inherent in the logging system, such as changing tool temperature or the deterioration of an electronic component.

interflow — A runoff process that involves lateral subsurface flow in the soil zone.

interim measure — Short-term actions taken to respond to immediate threats to human health or to prevent damage or *contaminant migration* to the environment.

intermittent stream — A stream that flows only in certain reaches due to losing and gaining characteristics of the channel bed.

internal standard (IS) — Chemical compound added to every method blank, sample, and standard extract at a known concentration that is used to (1) compensate for analyte concentration changes that might occur during storage of the extract and (2) compensate for quantitation variations that can occur during analysis. ISs are used as the basis for quantitating target analytes.

internal standards — Compounds added to the *sample* after sample preparation for qualitative and quantitative instrument *analysis*—the compounds serve as a standard of retention time and response, which is invariant from run to run with the instruments. (*Handbook of Environmental Analysis,* by Roy-Keith Smith, 3rd ed.)

laboratory control sample (LCS) — A known *matrix* that has been spiked with compound(s) representative of the *target analytes*. The LCS is used to document laboratory performance. The acceptance criteria for LCSs are method specific.

laboratory duplicate sample — The portions of a *sample* taken from the same sample container, prepared for *analysis* and analyzed independently but under identical conditions; used to assess or demonstrate acceptable laboratory method precision at the time of analysis. Each duplicate *sample* is expected to be equally representative of the original material. Duplicate analyses also are performed to generate data, to determine the long-term precision of an analytical method on various matrices.

laboratory notebook — A notebook generally used to record activities performed in the laboratory or to compile laboratory data.

laboratory qualifier (or laboratory flag) **—** Codes applied to the data by the contract analytical laboratory to indicate, on a gross scale, a verifiable or potential data deficiency. These flags are applied using the *Environmental protection Agency (EPA)* contract laboratory program (CLP) guidelines.

land disposal restrictions (LDR) — Requirements in 40 CFR 268 that specify *treatment* standards that are protective of human health and the environment when *hazardous waste* is land disposed.

LANL data validation qualifiers — The data qualifiers defined by the Laboratory (LANL) and used in the ENV-RS baseline-validation process. For a complete list of data qualifiers applicable to any particular analytical suite, consult the appropriate *standard operating procedure* (ENV-ECR SOPs 15.01–15.06).

LANL data validation reason codes — The codes applied to the sample data by *data validators* who are independent of the contract laboratory which performed the *sample analysis*. Reason codes provide an in-depth and *analysis*-specific explanation for applying the qualifier with some description of the potential impact on the data use. For a complete list of data qualifiers applicable to any particular analytical suite, consult the appropriate *standard operating procedure* (ENV-ECR SOPs 15.01–15.06).

leachate — Any liquid, including any suspended components in the liquid, that has percolated through or drained from *hazardous waste* (40 CFR 260.10).

leaching — The separation or dissolving out of soluble constituents of a solid material by the natural action of percolating water or by *chemicals*.

Los Alamos unlimited release (LA-UR) number — The identification number required for all documents or presentations prepared for distribution outside the Laboratory. LA-UR numbers are attained by filling out a Technical Information Release (TIR) form located on the Laboratory network under documents (http://enterprise.lanl.gov/alpha.htm), and submittal of the form with a specified number of copies of the document to the Laboratory's Classification Group (S-7) for review.

lower acceptance limit (LAL) — Lowest limit that is acceptable, based on the quality control (QC) criteria for a specific QC sample for a specific method. Any results lower than the LAL are qualified following this routine validation procedure.

matrix (see also *sample matrix*) **—** Relatively fine material in which coarser fragments or crystals are embedded; also called "ground mass" in the case of igneous rocks.

matrix spike — An *aliquot* of *sample* spiked with a known concentration of *target analyte(s)*. Matrix spike samples are used to measure the ability to recover prescribed analytes from a native sample matrix. The spiking typically occurs before *sample* preparation and *analysis*.

matrix spike duplicate — An intralaboratory duplicate *sample* spiked with a known amount of *target analyte(s)*. Spiking occurs before *sample* preparation and *analysis*.

maximum contaminant level (MCL) — Under the Safe Drinking Water Act, the maximum permissible level of a *contaminant* in water that is delivered to any user of a public water system that serves 15 or more connections and 25 or more people. The standards set take into account the feasibility and cost of attaining the standard.

medium (environmental) **—** Any media capable of *absorbing* or *transporting* constituents. Examples of media include *tuffs*, soils and *sediments* derived from these *tuffs*, surface water, *soil water*, *groundwater*, air, structural surfaces, and debris.

medium (geological) **—** The solid part of the hydrogeological system; may be unsaturated or saturated.

method blank — An *analyte*-free *matrix* to which all reagents are added in the same volumes or proportions as those used in the environmental *sample* processing and which is prepared and analyzed in the same manner as the corresponding environmental *samples*. The method blank is used to assess the potential for contamination to the *sample* during preparation and *analysis*.

method detection limit (MDL) — The minimum concentration of a substance that can be measured and reported with a known statistical confidence that the *analyte* concentration is greater than zero. The MDL is determined from *analysis* of *samples* of a given *matrix* type that contain the *analyte* after subjecting the *sample* to the usual preparation and analyses. The MDL is used to establish detection status.

migration — The movement of inorganic and organic species through unsaturated or saturated materials.

migration pathway — A route (e.g., a stream or subsurface flow path) that controls the potential movement of *contaminants* to environmental *receptors* (plants, animals, humans).

minimum detectable activity — For the *analysis* of *radionuclides*, the minimum detectable activity is the lowest detectable radioactivity for a given analytical technique. The following equation shall be used to calculate the MDA unless otherwise noted or approved by the Laboratory:

$$\text{MDA} = \frac{4.65(\text{BKG})^{0.5} + 2.71}{2.22 \times \text{EFF} \times \text{V} \times \text{T}_\text{S} \times \text{Y}}$$

where BKG = the total background counts,
EFF = the fraction detector efficiency,
V = the volume or unit weight,
T_s = the *sample* count duration, and
Y = the fractional *chemical* recovery obtained from the *tracer* recovery.

Depending on the type of *analysis*, other terms may also be required in the denominator (e.g., gamma abundance).

mitigation — (1) Avoiding an impact altogether by not taking a certain action or parts of an action. (2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment. (4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. (5) Compensating for the impact by replacing or providing substitute resources or environments.

mixed waste — Waste that contains both *hazardous waste* (as defined by *RCRA*) and *radioactive waste* (as defined by the Atomic Energy Act [AEA] and its amendments).

model — A mathematical approximation of a physical, biological, or social system.

monitoring well — A well or borehole drilled for the purpose of yielding *groundwater samples* for *analysis*.

National Pollutant Discharge Elimination System (NPDES) — The national program for both issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits and imposing requirements under Sections 307, 318, 402, and 405 of the Clean Water Act.

neutralize — To make a toxic *chemical* agent harmless by *chemical* action.

no further action (NFA) — A recommendation that not further investigation or *remediation* is warranted based on specific criteria.

nondetect — Sample result that is less than the MDL. The laboratory reports nondetects as undetected at the EQL.

non-ER data — Data derived as a result of *samples* collected and paid for by sources other than the ENV-RS project (formerly the ER Project).

notice of deficiency (NOD) — A notice issued to *DOE* and the Laboratory by the administrative authority which states that some aspect(s) of a plan, report, or application does not meet their requirements or that requires clarification or correction.

operable unit (OU) — At the Laboratory, one of 24 areas originally established for administering the former ER Project. Set up as groups of *potential release sites*, the OUs were aggregated based on geographic proximity for the purpose of planning and conducting *RCRA facility assessments* and *RCRA facility investigations*. As the project matured, it became apparent that 24 were too many to allow efficient communication and to ensure consistency in approach. Therefore, in 1994, the 24 OUs were reduced to six administrative "field units."

outfall — The vent or end of a drain, pipe, sewer, ditch, or other conduit that carries wastewater, sewage, storm runoff or other *effluent* into a stream.

percent recovery (%R) — Amount of material detected in a sample (minus any amount already in the sample) divided by the amount added to the sample and expressed as a percentage.

perched groundwater — *Groundwater* that lies above the regional *water table* and is separated from it by one or more *unsaturated zones*.

percolation — Gravity flow of *soil water* through the pore spaces in soil or rock below the ground surface.

perennial stream — A stream or reach that flows continuously throughout the year.

performance-evaluation sample — A *sample* of known composition with respect to selected *analytes* which, upon *analysis*, is expected to yield results that fall within a prescribed range. Performance-evaluation samples are selected to mimic as closely as possible those matrices representative of environmental *samples* from a particular location.

permit modification — A request by either the permittee or the administrative authority to change to change a condition of the Laboratory's Hazardous Waste Facility Permit.

polychlorinated biphenyls (PCBs) — Any *chemical* substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substances. PCBs are colorless, odorless compounds that are chemically, electrically, and thermally stable and have proven to be toxic to both humans and animals.

population (statistical) **—** A set of units or a continuum in a physical, biological, or social system of interest (e.g., the residents of Los Alamos County, the water in an *alluvial aquifer*, or the plants in Pajarito Canyon).

porosity — The ratio of the volume of interstices in a soil or rock *sample* to its total volume expressed as a percentage or as a fraction.

potential release site (PRS) — Refers to potentially contaminated sites at the Laboratory that are identified either as *solid waste management units (SWMUs)* or *areas of concern* (AOCs). PRS refers to *SWMUs* and AOCs collectively.

precision — A concept used to describe dispersion of measurements with respect to a measure of location or central tendency. Precision may be represented by the inverse of the standard deviation of a set of measurements.

preliminary assessment — The process of collecting and reviewing available information about a *potential release site*.

preliminary remediation goal (PRG) — Acceptable exposure levels, protective of human health and the environment, that are used as a *risk*-based tool for evaluating remedial alternatives.

preliminary risk assessment — A *risk assessment* conducted using conservative assumptions and scenarios and assuming no mitigating or corrective measures beyond those already in place.

quality assessment sample — A *sample* submitted for *analysis*, the data from which are used to assess the quality of performance of a sampling or *analysis* process. May include *performance-evaluation samples*, *field duplicates*, *field blanks*, etc.

quality assurance — All those planned and systematic actions necessary to provide adequate confidence that a facility, structure, system, or component will perform satisfactorily in service.

Quality Assurance Project Plan (QAPP) — A formal document describing in comprehensive detail the necessary QA, QC, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria.

quality control (QC) — (1) All those actions necessary to control and verify the features and characteristics of a material, process, product, or service to specified requirements. QC is the process through which actual quality performance is measured and compared with standards. (2) All methods and procedures used to obtain accurate and reliable results from environmental sampling and *analysis*. Includes rules for when, where, and how *samples* are taken; *sample* storage, preservation and *transport*; and the use of *blanks*, *duplicates*, and *split samples* during the *analysis*.

quality control sample — A *sample* which, upon *analysis*, is intended to provide information useful for adjusting, controlling, or verifying continuing acceptability of sampling and/or *analysis* activities that are in progress.

Quality Management Plan (QMP) — A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The QMP provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA and QC.

quality procedure — A document that describes the process for performing activities governed by the project's *Quality Management Plan*.

Quaternary — The second period of the Cenozoic Era, following the Tertiary, and including the last 2–3 million years.

radiation — Energy emitted in the form of rays or particles that are thrown off by disintegrating atoms. The rays or particles emitted may consist of neutrons, positrons, *alpha particles*, *beta particles*, or *gamma radiation*.

radioactive decay — (1) The process whereby radioactive materials undergo a change from one nuclide, element, or state to another, releasing *radiation* in the process. This action ultimately results in a decrease in the number of radioactive nuclei present in the *sample*. (2) The spontaneous transformation of one nuclide into a different nuclide or into a different isotope of the same nuclide accompanied by either the emission of particles from the nucleus, nuclear capture or ejection of orbital electrons, or fission.

radioactive material — Any material having a specific activity greater than 2 nanocuries per gram (nCi/g), is the activity per unit mass of the material and in which the radionuclide is evenly distributed. (This is a Department of Transportation definition.)

radioactive waste — Waste that has been determined to contain added (or concentrated naturally occurring radioactive material [NORM]) radioactive material or activation products by either monitoring or *analysis*, acceptable knowledge of both, or **does not** meet radiological *release* criteria.

radionuclide — A nuclide (species of atom) that exhibits radioactivity.

RCRA facility assessment (RFA) — Usually the first step in the *RCRA corrective action* process, to identify potential and actual *releases* from *solid waste management units* and make preliminary determinations about *releases*, the need for *corrective action*, and *stabilization measures*.

RCRA facility investigation (RFI) — The investigation that determines if a *release* has occurred and the nature and extent of the contamination at a *hazardous waste* facility. The RFI is generally equivalent to

the remedial investigation portion of the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA) process.

readiness review — A process to ensure the closure of preparatory activities required before starting fieldwork and to ensure that the preparatory activities not required to start fieldwork are scheduled and closed appropriately.

receptor — A person, plant, animal, or geographical location that is exposed to a *chemical* or physical agent *released* to the environment by human activities**.**

recharge — The process by which water is added to the zone of saturation, either directly from the overlying *unsaturated zone* or indirectly by way of another material in the saturated zone.

recreational-use scenario — A land use condition under which individuals may be exposed for a limited amount of time as a result of outdoor activities such as hiking, camping, hunting, and fishing.

redox potential (Eh) — Chemical reactions whereby a participating element changes its valence state by losing or gaining orbital electrons. This may be referred to as oxidation-reduction potential.

regional aquifer — Geologic material(s) or unit(s) of regional extent whose saturated portion yields significant quantities of water to wells, contains the regional zone of saturation, and is characterized by the regional *water table* or *potentiometric surface*.

regulatory standard — Media-specific *contaminant* concentration levels of potential concern that are mandated by federal or state legislation or regulation (e.g., the Safe Drinking Water Act, New Mexico Water Quality Control Commission regulations).

release — Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, *leaching*, dumping, or disposing of *hazardous waste* or *hazardous constituents* into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles that contain any *hazardous wastes* or *hazardous constituents*).

remediation — The process of reducing the concentration of a *contaminant* (or *contaminants*) in air, water, or soil media to a level that poses an acceptable *risk* to human health and the environment; the act of restoring a contaminated area to a usable condition based on specified standards.

replicate measurement — A re-*analysis* (remeasurement) of a *prepared sample*.

reporting limit (RL) — The numerical value that an analytical laboratory (in conjunction with its client) selects to determine if a *target analyte* is detected. Results below the RL are considered not detected, while results greater than the RL are considered detected. The RLs are not necessarily based on instrument *sensitivity*. RLs can be established at the *instrument detection limit*, *method detection limit*, *estimated quantitation limit*, and *contract-required detection limit*.

representativeness — The degree to which data accurately and precisely represent a characteristic of a *population* or an environmental condition.

request number — An identifying number assigned by the ENV-RS project to a group of *samples* that are submitted for *analysis*.

residential-use scenario — The standards for residential use are the most stringent of the three current- and future-use scenarios being considered by the ENV-RS project and is the level of cleanup the *EPA* is currently specifying for *SWMUs* located off the Laboratory site and for those released for non-Laboratory use.

Resource Conservation and Recovery Act (RCRA) — The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976. (40 CFR 270.2)

retardation — The act or process that reduces the rate of movement of a *chemical* substance in water relative to the average velocity of the water. The movement of *chemical* substances in water can be retarded by *adsorption* and precipitation reactions, and by diffusion into the pore water of the rock *matrix*.

RFI borehole — A borehole whose purpose is the immediate or short-term determination of contamination conditions at a site, or a borehole used in a corrective action or remediation of a site.

rill erosion — An erosion process in which numerous small channels only several inches deep are formed by concentrated runoff that flows during and immediately following rain storms.

rinsate blank — See *equipment blank*.

risk — A measure of a negative or undesirable impact associated with an event.

risk assessment — See *baseline risk assessment.*

risk assessment, preliminary — See *preliminary risk assessment*.

risk characterization — The summarization and integration of the results of toxicity and exposure assessments into quantitative and qualitative expressions of *risk*. The major assumptions, scientific judgments, and sources of uncertainty related to the assessment are also presented.

risk management — The integration of *risk characterization* with other nonscientific considerations specified in applicable statutes to make and justify regulatory decisions *(RCRA/CERCLA* Update, June 1992).

routine analysis — The *analysis* categories of inorganics, metals, organics, radiochemistry, and high explosives as defined in the current contract laboratory statement of work.

routine data — Data generated using analytical methods that are identified as routine methods in the current LANL ENV-RS project SOW for analytical services.

routine data validation — Process of reviewing analytical data relative to quantitative routine acceptance criteria. The objective of routine data validation is two-fold:

- to estimate the technical quality of the data relative to minimum national standards adopted by the project and
- to indicate to data users the technical data quality at a gross level by assigning *LANL qualifiers* to environmental data whose quality indicators do not meet acceptance criteria.

runoff — The portion of the precipitation on a drainage area that is discharged from the area either by sheet flow or adjacent stream channels.

run-on — Surface water flowing onto an area as a result of runoff occurring higher up the slope.

sample — A portion of a material (e.g., rock, soil, water, air), which, alone or in combination with other samples, is expected to be representative of the material or area from which it is taken. Samples are typically sent to a laboratory for *analysis* or inspection or are analyzed in the field. When referring to samples of environmental media, the term *field sample* may be used.

sample matrix — In *chemical analysis*, that portion of a *sample* which is exclusive of the *analytes* of interest. Together, the *matrix* and *analytes* of interest form the *sample*.

screening action level (SAL) — *Medium*-specific concentration level for a *chemical* derived using conservative criteria below for which it is generally assumed that there is no potential for unacceptable *risk* to human health. The derivation of a SAL is based on conservative exposure and land-use assumptions. However, if an applicable *regulatory standard* exists that is less than the value derived by *risk*-based computations, it will be used for the SAL.

screening assessment — A process designed to determine whether contamination detected in a particular *medium* at a site may present a potentially unacceptable human-health and /or ecological *risk*. The assessment utilizes screening levels that are either human-health or ecologically based concentrations derived by using *chemical*-specific toxicity information and standardized exposure assumptions below which no additional actions are generally warranted.

sediment — (1) A mass of fragmented inorganic solid that comes from the weathering of rock and is carried or dropped by air, water, gravity, or ice; or a mass that is accumulated by any other natural

agent and that forms in layers on the earth's surface such as sand, gravel, silt, mud, fill, or loess. (2) A solid material that is not in solution and either is distributed through the liquid or has settled out of the liquid.

sensitivity — An indication of the lowest *analyte* concentration that can be measured with a specified degree of confidence.

single blind sample — A *performance-evaluation sample* submitted for *analysis* whose sample identity is known to the analyst and whose composition is known to the submitter but not to the analyst.

site characterization — Defining the pathways and methods of *migration* of the *hazardous waste* or *constituents*, including the *media* affected, the extent, direction and speed of the *contaminants*, complicating factors influencing movement, concentration profiles, etc. (US Environmental Protection Agency, May 1994. "RCRA Corrective Action Plan, Final," Publication EPA-520/R-94/004, Office of Solid Waste and Emergency Response, Washington, DC)

site conceptual model — A qualitative or quantitative description of sources of contamination, environmental *transport* pathways for contamination, and biota that may be impacted by contamination (called *receptors*) and whose relationships describe qualitatively or quantitatively the *release* of contamination from the sources, the movement of contamination along the pathways to the exposure points, and the uptake of *contaminant* by the *receptors*.

Site-Specific Health and Safety Plan (SSHASP) — A health and safety plan that is specific to a site or ER-related field activity that has been approved by an ER health and safety representative. This document contains information specific to the project including scope of work, relevant history, descriptions of hazards by activity associated with the project site(s), and techniques for exposure mitigation (e.g., personal protective equipment [PPE]) and hazard mitigation.

slope — A slope is a ratio of units of elevation change to units of horizontal change usually expressed in degrees.

soil gas — Those gaseous elements and compounds that occur in the void spaces in unsaturated rock or soil. Such gases can move through or leave the rock or soil, depending on changes in pressure.

solid waste — Any garbage; refuse; sludge from a waste *treatment* plant, water-supply *treatment* plant, or air-pollution-control facility; and other discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities.

solid waste management unit (SWMU) — Any discernible unit at which *solid wastes* have been placed at any time, irrespective of whether the unit was intended for the management of *solid or hazardous waste*. Such units include any area at a facility at which *solid wastes* have been routinely and systematically *released*. This definition includes regulated units (i.e., landfills, surface impoundments, waste piles, and land *treatment* units) but does not include passive leakage or one-time spills from production areas and units in which wastes have not been managed (e.g., product-storage areas).

specific (electrical) conductance — A measure of the ease with which a conduction current flows through a substance under the influence of an applied electric field. It is dependant upon the presence of ions (total and relative concentrations, valence, and mobility) and temperature. It is the reciprocal of resistivity and is measured in either siemens (S) or micro-ohms per centimeter (μohm/cm) at 25°C.

split sample — A *sample* that has been subdivided into two or more portions which are expected to be of the same composition. Used to characterize within-sample heterogeneity, *sample* handling, and measurement variability.

split-spoon sampler — A hollow, tubular sampling device below the drill stem that is driven by a weight to retrieve soil samples. The core barrel can be opened to remove samples. This is a sampling method commonly used with auger drilling. The split spoon sampler can be driven into the ground or can be advanced inside hollow-stem augers.

spring — The site where *groundwater discharges* to the ground surface.

stakeholder — As used in this document, stakeholder refers to any party or agency, whether inside or outside the Laboratory, interested in or affected by Environmental Restoration Project issues and activities.

standard operating procedure (SOP) — A document that details the method for an operation, *analysis*, or action with thoroughly prescribed techniques and steps, and is officially approved as the method for performing certain routine or repetitive tasks.

stratigraphy — The science dealing with the succession, age, composition, and history of strata.

surrogate compound or surrogate — An organic compound used in the analyses of organic *target analytes* that is similar in composition and behavior to *target analytes* but is not normally found in *field samples*. *Surrogates* are added to every blank and spike sample to evaluate the efficiency with which *analytes* are recovered during extraction and *analysis*.

target analyte — An element, *chemical*, or parameter, the concentration, mass, or magnitude of which is designed to be quantified by use of a particular test method.

target analyte — Chemical or parameter, the concentration, mass or magnitude of which is designed to be quantified by use of a particular test method.

technical area (TA) — The Laboratory established technical areas as administrative units for all its operations. There are currently 49 active TAs spread over 43 square miles.

technical notebook — A record of the methodology, observations, and results of technical activity investigations.

tentatively identified compound (TIC) — Chemical compound detected in a sample that is not a target analyte, IS, or surrogate compound. Up to 30 chromatographic peaks may be subject to mass spectral matching for identification as TICs.

topography — The physical configuration of the land surface in an area.

total propagated uncertainty (TPU) — The range of concentrations (expressed as plus or minus the measured concentration) that include the theoretical or true concentration of an *analyte* with a specific degree of confidence. Radiochemical results are required to be accompanied by *sample*-specific uncertainty bounds (TPU) that reflect the 67% confidence level (1-sigma TPU). The TPU includes not only the measurement or counting *error* but also the technique-specific *error* term that includes uncertainty values for each contributing measurement process and a sample-specific contribution reflecting specific *chemical* recoveries, detectors used, etc. All radiochemical result uncertainties incorporate terms for technique-related and sample-specific measurement *errors*.

toxic pollutants — The 126 individual priority toxic pollutants contained in 65 toxic compounds or classes of compounds (including organic pollutants and metals) adopted by the *EPA* pursuant to Section 307 (a) (1) of the Clean Water Act (DOE 1991).

tracer — A substance, usually a radioactive isotope, added to a *sample* to determine the efficiency (*chemical* or physical losses) of the *chemical* extraction, reaction, or *analysis*. The tracer is assumed to behave in the same manner as that of the target *radionuclides*. Recovery guidelines for tracer results are 30% to 110% under the current contract laboratory statement of work and will be 40% to 105% under the new statement of work. Correction of the analytical results for the tracer recovery is performed for each *sample*. The concentration of the tracer added needs to be sufficient to result in a maximum of 10% uncertainty at the 95% confidence level in the measured recovery.

transport or transportation — The movement of a *hazardous waste* by air, rail, highway, or water. (40 CFR 260.10)

treatment — Any method, technique, or process, including elementary neutralization, designed to change the physical, *chemical*, or biological character or composition of any *hazardous waste* so as to neutralize such waste; recover energy or material resources from the waste; or so as to render such waste nonhazardous or less hazardous; safer to *transport*, store, or dispose of; or amenable for recovery or storage; or reduced in volume.

treatment, storage, and disposal (TSD) facility — An interim status or permitted facility in which *hazardous waste* is treated, stored, or disposed.

tremie pipe — A small-diameter pipe used to carry sand pack, bentonite, or grouting materials to the bottom of the borehole. Materials are pumped under pressure or poured to the hole bottom through the pipe. The pipe is retracted as the annulus is filled.

trip blank — A *sample* of *analyte*-free media taken to the sampling site and returned to the analytical laboratory unopened along with *samples* taken in the field. Used to monitor cross contamination of *samples* during handling and storage both in the field and in the analytical laboratory.

tuff — A compacted deposit of volcanic ash and dust that contains rock and mineral fragments accumulated during an eruption.

turbidity (nephelometric) — A measure of the intensity of light scattered by sample particulates relative to a standard reference suspension. The range of water turbidity is measured from 0 to 40 nephelometric turbidity units (NTU).

unconfined — Said of water in a saturated zone that is open to the atmosphere (that is, not beneath a confining bed or under artesian pressure).

unsaturated hydraulic conductivity — A coefficient that describes the rate at which a fluid can potentially move through a permeable, unsaturated medium (EPA, 1986).

unsaturated zone — The zone between the land surface and the regional *water table* and between perched zones of saturation. Generally, fluid pressure in this zone is less than atmospheric pressure, and some of the voids may contain air or other gases at atmospheric pressure.

upper acceptance limit (UAL) — Highest limit that is acceptable, based on the quality control (QC) criteria for a specific QC sample for a specific method. Any results greater than the UAL are qualified following this routine validation procedure.

US Department of Energy (DOE) — Federal agency that sponsors energy research and regulates nuclear materials for weapons production.

US Environmental Protection Agency (EPA) — Federal agency responsible for enforcing environmental laws. While state regulatory agencies may be authorized to administer some of this responsibility, the EPA retains oversight authority to ensure protection of human health and the environment.

vadose zone — The unsaturated zone. Portion of the subsurface above the regional *water table* in which pores are not fully saturated.

verification — A test or tests, generally performed before and after logging in lieu of a calibration, to ascertain whether the logging system is operating properly. The verification differs from a calibration in that it does not provide updated system-calibration values.

water content — (Also *gravimetric moisture content*) The amount of water in an unsaturated *medium*, expressed as the ratio of the weight of water in a *sample* to the weight of the oven-dried *sample*; often expressed as a percent.

water table — The top of the regional saturated zone; the *piezometric surface* associated with an *unconfined aquifer*.

watercourse — Any river, creek, arroyo, canyon, draw, wash, or other channel that has definite banks and beds with visual evidence of occasional flow of water.

watershed — The region drained by, or contributing waters to, a stream, lake or other body of water and separated from adjacent drainage areas by a divides such as a ridge or summit of high ground.

welded tuff — A volcanic deposit hardened by the action of heat, pressures from overlying material, and hot gases.

A-3.0 METRIC CONVERSION TABLE

Multiply SI (Metric) Unit	by	To Obtain US Customary Unit
kilometers (km)	0.622	miles (mi)
kilometers (km)	3281	feet (ft)
meters (m)	3.281	feet (ft)
meters (m)	39.37	inches (in.)
centimeters (cm)	0.03281	feet (ft)
centimeters (cm)	0.394	inches (in.)
millimeters (mm)	0.0394	inches (in.)
micrometers or microns (µm)	0.0000394	inches (in.)
square kilometers (km^2)	0.3861	square miles (mi^2)
hectares (ha)	2.5	acres
square meters (m^2)	10.764	square feet (ft^2)
cubic meters (m^3)	35.31	cubic feet (ft^3)
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter (g/cm^3)	62.422	pounds per cubic foot (lb/ft^3)
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram (µg/g)	1	parts per million (ppm)
liters (l)	0.26	gallons (gal.)
milligrams per liter (mg/l)	1	parts per million (ppm)
degrees Celsius (°C)	9/5 + 32	degrees Fahrenheit (°F)

Appendix B

Historical Investigation Report

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B-1.0 INTRODUCTION

This historical investigation report (HIR) summarizes the field investigations and the associated environmental data collected to date for consolidated Solid Waste Management Units (SWMUs) 16-007(a)-99 (the 30s Line) and 16-008(a)-99 (the 90s Line) at Los Alamos National Laboratory (LANL or the Laboratory). The purpose of this HIR is to provide supporting information for the proposed sampling activities presented in section 4.0 of this work plan. Additional sampling activities are proposed to define the nature and extent of contamination associated with the 30s and 90s Line ponds, buildings, sumps, outfalls, and drainages. The data collected during the proposed sampling activities will be used to supplement the characterization data collected during the 1996 voluntary corrective action (VCA) and the 2004 Resource Conservation and Recovery Act (RCRA) facility investigation (RFI). Historical data from investigations conducted in 1986 (Baytos, 1986, 05834) and 1989 (DOE, 1989, 15366) are also provided here for informational purposes.

B-2.0 OPERATIONAL HISTORY

Technical Area 16 (TA-16) was established to develop explosive formulations, to cast and machine explosive charges, and to assemble and test explosive components for the U.S. nuclear weapons program. Almost all of the work at TA-16 has been conducted in support of the development, testing, and production of explosive charges for the implosion method. Present-day use of this TA is essentially the same, although facilities have been upgraded and expanded as explosive and manufacturing technologies have advanced.

This HIR provides a summary of historical and current characteristics of consolidated SWMUs 16-007(a)-99 and 16-008(a)-99. Unless otherwise cited, the brief SWMU descriptions below have been excerpted from the Operable Unit (OU) 1082 RFI work plan (LANL, 1993, 20948, pp. 5-214–5-217), addendum 1 to that work plan (LANL, 1994, 39440, pp. 5-356–5-358), or the VCA completion report for potential release sites (PRSs) at the 90s Line (LANL, 1997, 87847).

B-2.1 Consolidated SWMU 16-007(a)-99

Consolidated SWMU 16-007(a)-99 (Figure B-1 and Table B-1) is made up of

- four settling ponds [SWMU 16-007(a)];
- three former high explosives (HE) machining buildings 16-31, 16-32, and 16-33 [SWMUs 16-025(e), 16-025(f), and 16-024(e), respectively, including their associated sumps and drainlines]; and
- two former magazines, 16-30 [SWMU 16-024(c)] and 16-34 [former Area of Concern (AOC) 16-024(d)].

Structures associated with the 30s Line machining buildings were used for HE processing from 1944 to the early 1950s. When TA-16-260 opened in 1951, many machine tools were transferred to that building. The four settling ponds [SWMU 16-007(a)], which have been backfilled, are located approximately 100 ft southwest of the 90s Line buildings and 300 ft northeast of building 16-88 and received wastewater discharge from buildings 16-31, 16-32, and 16-33 (Figure B-1). These buildings were decommissioned and burned in January and February 1960 (Wingfield, 1960, 00915, p. 3). The debris from the burning was subsequently disposed of at Material Disposal Area (MDA) P, with the exception of the drainlines, which were disposed of in Area J at TA-54. Two additional buildings, 16-30 [SWMU 16-024(c)] and 16-34

[AOC 16-024(d)], are also part of consolidated SWMU 16-007(a)-99 but were operated as magazines and did not contain discharge lines (Figure B-1).

Each one of the 30s Line ponds was approximately 100 ft × 100 ft and flat-bottomed. They were aligned in a row from northwest to southeast and located on a level mesa with an 8- to 10-ft-deep depression. Berms 4- to 6-ft high separated the ponds. Aerial photographs from the 1940s show the ponds containing liquids (LANL, 1993, 20948, p. 5-214) (see Figure 2.1-2 in the main text of this plan). The ponds were excavated and filled as part of the S-Site demolition and restoration activities in 1967 (Thrap, 1970, 05784, p. 1), and the area is now level with the mesa and covered with grasses (see Figure 2.1-3 in the main text). A former employee indicated that the cleanup of these ponds may not have been very thorough (Martin, 1993, 52964, p. 7). The ponds are believed to have received HE-contaminated liquid containing barium and, possibly, organic chemicals. Natural uranium was used in association with some explosive charges (Courtright, 1969, 52964, p. 11) and may have been discharged to the ponds (LANL, 1993, 20948, p. 5-214).

Buildings 16-31, 16-32, and 16-33 were three identical HE-machining buildings, each consisting of two 13-ft^2 chambers for machining and an 8-ft^2 control room. Pipes connected each control room to the machining chambers. The buildings were made of wood and had concrete slab floors. Each building was almost entirely buried and had a door to the control room on the southwest side. Doors to the machining chambers were located in blowout walls on the northeast side. An air-conditioning system was mounted atop each mound that surrounded each machining building. Originally, each machining chamber had a lead-lined trough for washing out HE. In August 1945, the lead-lined troughs were replaced with concrete troughs covered with spark-proof mastic. In the 1950s, the buildings were converted to purposes other than machining. In a 1950s list of structures, 16-31 is listed as a hot-cold chamber, 16-32 is listed as an x-ray building, and 16-33 is listed as an additive storage building (Engineering Department, 1959, 05778, p. 1). One sump which received effluent from the troughs of two machining chambers was located between each building and the road northeast of the 30s Line. Each sump had a drainline that passed beneath the adjacent road, under an earthen barricade, and into the 30s Line ponds. There were no secondary settling tanks, and each of the three drainlines daylighted at one of the boundaries between two of the four ponds, feeding the two with a Y-shaped end pipe. In 1959, the buildings were listed as HE-contaminated (Engineering Department, 1959, 05778, p. 1). Suspect contaminants associated with the buildings include HE, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and inorganic chemicals.

HE magazine 16-34 was located southwest of the 30s Line ponds and TA-16-30 was on the northwest side. HE magazines are typically small buildings without plumbing in which either raw HE or finished HE product are stored during processing. Generally, magazines are bermed on three sides and on top for safety purposes. Each magazine was small (12 ft wide × 17.5 ft long × 8 ft high) and of wooden frame construction with a concrete floor. Magazine 16-30 was used to store castings to be machined in buildings 16-31, 16-32, and 16-33. Magazine 16-34 stored machined product for physical and x-ray examination. Magazine 16-30 was burned in 1960, but magazine 16-34 had collapsed and was not burned at that time. Instead, it was demolished at a later, unknown date (LANL, 1997, 56660, p. 44). A rough measurement (from a photograph) of the earthen mounds over these magazines suggests that each was covered by approximately 5000 ft^3 of soil.

B-2.2 Consolidated SWMU 16-008(a)-99

Consolidated SWMU 16-008(a)-99 (Figure B-1) includes

- a settling pond [SWMU 16-008(a)];
- sumps [SWMUs 16-029(k, l, s, t, u)];
- drainlines [SWMUs 16-026(m, n, o, p)];
- drum storage area (AOC C-16-067); and
- buildings 16-89 [SWMU 16-017(e)-99], 16-90 [SWMU 16-017(d)-99], 16-91 [SWMU 16-017(c) 99], 16-92 [SWMU 16-017(a)-99], and 16-93 [SWMU 16-017(b)-99].

From 1950 to 1970, the buildings were used for the machining and electroplating of HE. Most of the 90s Line structures were built in 1950. After 1970, the buildings were generally used for storage until they were removed from service in 1991.

The 90s Line buildings were each equipped with two sumps that received effluent from drain troughs in the concrete slab floors. Initially, the sumps contained filter baskets, but the sumps subsequently were converted to conventional concrete sumps that were cleaned by vacuum-removal of wastewater. In addition to the effluent from the building sumps, drainage from driveways, roof drains, and building-cleaning activities discharged to several drainlines and outfalls. Effluent discharged into a drainage that emptied either into Cañon de Valle 600 ft north of the 90s Line or into the 90s Line pond [SWMU 16-008(a)], where it was allowed to evaporate. When TA-16-260 opened in 1951, many machine tools were transferred to that building. Buildings 16-89 and 16-90 were converted into storage facilities, and 16-91 and 16-92 were converted for cleaning and refurbishing HE-contaminated equipment. Building 16-93 became an electroplating building. After 1970, all of the buildings were used for storage until they were removed from service (by 1991). In 1971, the operational effluents were listed as effectively negligible for these buildings (Panowski and Salgado, 1971, 70968, Appendix A), except for 16-92, which discharged small or moderate amounts of explosives, solvents, or other materials of concern. The 90s Line buildings were removed during decontamination and decommission (D&D) activities in 1996 (LANL, 1996, 87660).

As shown on Figure B-1, the 90s Line pond [SWMU 16-008(a)] is a 200 ft-diameter, inactive, unlined settling pond that received liquid waste from the HE sumps at processing buildings 16-89, 16-90, and 16-91. Buildings 16-92 and 16-93 did not empty into the 90s Line pond. The pond may have been 10- to 15-ft deep and was once a small-scale, HE-burning area (LANL, 1993, 20948, p. 5-217). The pond may have received HE, barium, uranium, and organic chemicals. No documentation has been found that indicates the pond was ever decontaminated. The area currently contains stormwater and frequently dries up in the summer and during drought conditions.

Building 16-89 [SWMU 16-017(e)-99] was a wooden HE-machining building which was constructed on a concrete slab in 1950 (Figure B-1). It was 1684 ft^2 and surrounded on three sides by an earthen berm that was packed against steel pilings. Two sumps, both approximately 15 × 5 ft × 5 ft [SWMU 16-029(u)], were located adjacent to building 16-89. The drainlines and outfall from the sumps [SWMU 16-026(p)] consisted of vitrified-clay pipe that discharged to the 90s Line pond. HE-machining activities continued at maximum levels until mid-1951 when the modern HE machining building (TA-16-260) was finished. Low levels of HE machining continued from the early 1950s to the late 1950s. In the late 1950s or early 1960s, the building was converted to a storage facility that operated until 1970. The HE sumps were filled with

gravel in the mid- to late-1960s, and building 16-89 was totally abandoned by 1991. The building, sumps, drainlines, and berms were removed during D&D operations in 1996 (LANL, 1997, 87847).

Building 16-90 [SWMU 16-017(d)-99] was a wooden HE-machining building constructed on a concrete slab (Figure B-1). It was 2165 ft^2 and surrounded on three sides by an earthen berm that was packed against steel pilings. Building 16-90 was completed in 1950, and machining activities were at maximum levels until mid-1951, when the modern HE-machining building (TA-16-260) was finished. Low levels of HE machining continued from the early 1950s to the late 1950s. Building 16-90 was converted to a storage facility during the late 1950s or early 1960s and operated from 1950 to 1980. Two former sumps [SWMU 16-029(t)], both approximately 15 ft × 5 ft × 5 ft, were located adjacent to building 16-90. The drainlines and outfalls [SWMU 16-026(o)] from the sumps discharged to the 90s Line pond. The HE sumps were filled with gravel in the mid- to late-1960s. The building was totally abandoned by 1991 and the building, sumps, drainlines, and berms were removed during D&D operations in 1996 (LANL, 1997, 87847).

Building 16-91 [SWMU 16-017(c)-99] was a wooden HE-machining building constructed on a concrete slab (Figure B-1). It was 1332 ft^2 and surrounded on three sides by an earthen berm that was packed against steel pilings. The building was constructed in 1950, and machining activities were at maximum levels until mid-1951 when the modern HE-machining building (TA-16-260) was finished. Building 16-91 was converted in the late 1950s or early 1960s to a facility for cleaning and refurbishing HE-contaminated equipment and operated from 1950 to 1980. Two former sumps [SWMU 16-029(s)], both approximately 15 ft × 5 ft × 5 ft, were located adjacent to building 16-91. The drainline and outfall from the sumps [SWMU 16-026(n)] discharged to the 90s Line pond. The HE sumps were filled with gravel in the mid- to late-1960s. The building was totally abandoned by 1991 and the building, sumps, drainlines, and berms were removed during D&D operations in 1996 (LANL, 1997, 87847).

Buildings 16-92 and 16-93 did not discharge to the 90s Line pond but instead discharged to a northeast drainage that empties into Cañon de Valle 600 ft north of the 90s Line (Figure B-1). Building 16-92 [SWMU 16-017(a)-99] is a former HE-machining building that consisted of a wooden structure on a concrete slab. It measured 1332 ft^2, was surrounded on three sides by an earthen berm that was packed against steel pilings, and operated from 1950 to 1955. The building was subsequently converted for cleaning and refurbishing HE-contaminated equipment. Operations at building 16-92 may have resulted in uranium contamination because disassembled items may have contained uranium. By 1970, the building was devoted entirely to storage. Two former sumps [SWMU 16-029(l)], both approximately 15 ft × 5 ft × 5 ft, were located adjacent to building 16-92. SWMU 16-026(m) included the drainline and outfall from the sumps at building 16-92. By 1991, the building was totally abandoned, and the building, sumps, drainlines, and berms were removed during D&D operations in 1996 (LANL, 1997, 87847).

Building 16-93 (SWMU 16-017[b]-99) was a wooden HE-machining building built on a concrete slab. It was 1627 ft^2 and surrounded by an earthen berm on three sides; the berm was packed against steel pilings. The building was subsequently converted to an electroplating facility. By 1970, the building was devoted entirely to storage. SWMU 16-029(k) consists of two former sumps, a drainline, and an outfall from building 16-93. The building was totally abandoned by 1991, and the building, sumps, drainlines, and berms were removed during D&D operations in 1996 (LANL, 1997, 87847).

AOC C-16-067 was a drum platform (structure 16-187) that was constructed in 1950 along with the 90s Line. The structure was made of wood and sat on steel legs a few feet off the ground, adjacent to TA-16-90. The storage platform was 8 ft × 8 ft × 4.5 ft. Copper and chromium sulfates used in electroplating were stored on the platform (LANL, 1994, 39440, p. 5-462), in addition to oils, solvents, and possibly HE. The materials were stored in containers that were equipped with spigots and were laid on their sides (Martin, 1993, 52964, p. 5). The drainline for building 16-90 extended through the boundary of

AOC C-16-067. The platform was decommissioned in 1970, and contaminated soil was removed during D&D operations in 1996 (LANL, 1997, 87847, pp. 105–106).

B-2.3 Waste Inventory and Disposal History

Historical waste-management practices at TA-16 conformed to standard procedures of the day. These procedures focused on safety and on minimizing hazards to operating personnel. The major emphasis was placed on safe disposal of HE and HE-contaminated material. To this end, an extensive system of HE sumps was used to separate HE from process waste streams. The larger fragments of HE scrap that were generated by processes not directly associated with the waste stream were carefully collected for disposal.

As disposal quantities of HE or HE-contaminated materials were collected, the waste was taken to one of the TA-16 burning grounds. These burning grounds were associated with MDA P and MDA R. Residuals and noncombustible materials from the burning grounds were typically placed in a landfill adjacent to the burning ground or taken to another Laboratory disposal area. Building drains and septic systems that may have received HE or chemically contaminated wastes were often connected to outfalls that discharged into canyons directly via drainages, such as those for buildings 16-92 and 16-93, or into the 30s and 90s Line settling ponds.

No formal waste inventory exists for the 30s and 90s Lines; however, HE is the primary contaminant at TA-16. Large quantities, up to 100,000 lbs of HE per month, were processed through TA-16 during the waning stages of World War II (Hawkins, 1946, 04704, p. 211). The two principal types of HE used in World War II–era HE lenses were Composition-B and baratol. The former contained the primary explosives 2,4,6-trinitrotoluene (TNT) and hexahydro-1,3,5-trinitro1,3,5-triazine (RDX); the latter contained TNT and the inert material barium nitrate. The fine HE powder from machining buildings, which was produced during riser sawing and machining, was washed into sump systems and may have collected or passed through cracks in the floors of the buildings (LANL, 1994, 39440, p. 5-311). After World War II, HE-processing activities decreased markedly. HE processing continued within the 30s and 90s Lines until the early 1950s when operations were transferred to TA-16-260.

A description of the wastes likely to have been discharged at the 30s and 90s Lines is provided in “RFI Work Plan for Operable Unit [OU] 1082” (LANL, 1993, 20948, pp. 5-214–5-219), which was approved by the U.S Environmental Protection Agency (EPA). RFI and VCA sampling data confirmed the presence of HE, solvents, and inorganic chemicals in soils at former sump locations, in drainages, and in the 30s and 90s Lines ponds.

This HIR presents data from all previous investigations conducted at the 30s and 90s Lines, including the 1986 Baytos investigation (Baytos, 1986, 05834), the 1989 DOE investigation (DOE, 1989, 15366), the 1996 VCA (LANL, 1997, 87847), and the 2004 RFI investigation, which was conducted under the 1993 RFI work plan (LANL, 1993, 20948). The data show that a number of HE compounds, inorganic chemicals, and organic chemicals have been released to soils in the vicinity of the former 30s and 90s Lines buildings, sumps, drainlines, and ponds. As part of the continuing investigation associated with the TA-16-260 corrective measures study (CMS), quarterly sampling of surface water is conducted at the 90s Line pond. The well at location 16-02669 is checked on a quarterly basis to determine if groundwater is present. To date, only one groundwater sample has been collected because the well has been dry subsequent to drilling.

In 1959, the 30s Line buildings were listed as HE-contaminated (Engineering Department, 1959, 05778, p. 1). Most of the 30s and 90s Line structures were destroyed by burning in 1960. The residual debris

from burning, as well as the subsurface structures (i.e., sumps and drainlines), were cleaned up in 1967 (LANL, 1994, 39440, p. 5-313).

B-2.4 Previous (pre-VCA and pre-RFI) Field Investigations

The following information regarding field investigations conducted at the 30s and 90s Lines before the VCA and Phase I RFI sampling activities is summarized from section 5.12 of the EPA-approved "RFI Work Plan for OU 1082" (LANL, 1993, 20948, pp. 5-214–5-225).

To ascertain the presence of potential environmental contamination at the 90s Line, sampling and analysis activities began in 1986. Baytos (as summarized in the RFI work plan [LANL, 1993, 20948, pp. 5-218–5-219]) analyzed four surface soil samples from the 90s Line pond for HE (Figure B-1, Table B-2). The HE results showed a maximum of 0.02 wt% or less. Barium nitrate was also analyzed for and was not detected in any of the samples (Baytos, 1986, 05834, p. 1).

In 1989, surface water, sediment, and soil samples were collected from the 30s and 90s Lines ponds (LANL, 1993, 20948, pp. 5-217–5-218; DOE, 1989,15366). Note that these samples were not run through the LANL Sample Management Office and are of uncertain quality. At the 90s Line pond, five grab samples of sediment (LA81901 through -05; Figure B-1) and three grab samples of water (LA82001 through -03; Figure B-1) were collected. One sediment sample was located at the mouth of each of two drainage pipe ditches (LA81901 and -04), three sediment samples were collected from locations traversing the pond (LA81902, -03, and -05), and three water samples were collected by a pond sampler and stainless-steel beaker on three different days at the influent end of the pond. However, discharge to the pond did not occur during the sampling period. Any influent to the pond during the sampling period would have been surface runoff (DOE, 1989, 15366, p. 4.24-3). At the 30s Line ponds, three subsurface soil grab samples were collected from each of the four backfilled ponds, resulting in a total of 12 samples (LA82101 through -12; Figure B-1).

Tables B-3 through B-5 summarize the chemicals detected in sediment samples in the 90s Line pond during the 1989 investigation. The metals detected included aluminum, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, silver, vanadium, and zinc. The highest concentration of barium (2310 mg/kg) was detected in sample LA81902, which was collected approximately 30 ft from the southern boundary of the pond. The lowest concentration of barium (434 mg/kg) was found in sample LA81901, which was collected near the southern drainage pipe. Acetone was detected in sediment samples LA81901, -02, and -05, with the highest concentration in sample LA81902 (0.040 mg/kg]). All sediment samples except LA81904 contained 2-butanone in concentrations ranging from 0.014 to 0.150 mg/kg. Styrene was detected in sample LA81902 at 0.002 mg/kg. Methylene chloride was detected in all samples at concentrations that were flagged as estimated.

Table B-6 summarizes the chemicals detected in water collected from the 90s Line pond during the 1989 investigation. All three water samples contained barium in concentrations ranging from 5330 to 6420 µg/L (Table B-7). All three water samples contained zinc at concentrations ranging from 24 to 84 µg/L. Silver was detected in all three samples at a maximum concentration of 38.5 µg/L. Chromium was detected in LA82003 at 15.6 µg/L. 2-Hexanone was detected in water sample LA82003 at 13 µg/L (Table B-8). 2-Butanone, acetone, and methylene chloride were also detected (Table B-8).

Table B-9 summarizes the chemicals detected in soil samples from the 30s Line ponds during the 1989 investigation. Barium (up to 226 mg/kg), beryllium (up to 1.9 mg/kg), and chromium (up to 30.9 mg/kg) were detected in each of the four 30s Line ponds (Table B-10). Aluminum, arsenic, cadmium, calcium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium,

vanadium, and zinc were also detected. No HE was detected in the 30s Line pond soil samples collected in 1989; however, several of the analytical results were qualified for various reasons such as “in general, the chromatography was very poor” (LANL, 1993, 20948, p. 5-217). In the 30s Line ponds, acetone, trichloroethene, benzene, toluene, chlorobenzene, chloroform, methylene chloride, 2-butanone, and 4-methyl 2-pentanone were detected in one or more samples (Table B-11).

The screening data for radionuclides in sediment at the 30s Line pond included reported concentrations of cesium-137 (up to 0.79 pCi/g) in sample LA81905 and potassium-40 (up to 22.5 pCi/g) in sample LA81905.

B-3.0 VCA FOR 90s LINE SWMUs

In 1996, a VCA (LANL, 1997, 87847) was coordinated with D&D activities (LANL, 1996, 87660) at the 90s Line. Soil was excavated as either (1) part of the D&D, or (2) as part of the VCA if chemical concentrations were above one-half of the industrial preliminary remediation goals (PRGs) provided in the VCA plan (LANL, 1996, 53841, Table 3.2.3-1). Under the VCA plan, soil was left in place where chemical concentrations were below one-half of the relevant industrial PRG. As a result, the analytical data for soils remaining in place (i.e., unexcavated) at the 90s Line include results from beneath excavated locations (confirmation samples at the bases of excavations) and locations where chemical concentrations did not exceed one-half of the industrial PRGs applicable at the time. Because the VCA was conducted in phases, some of the initial characterization samples were removed during excavation; in other cases, the confirmation samples associated with excavated locations were removed when additional excavation was necessary. Throughout the remainder of this HIR, text that discusses soils from the 1996 VCA “remaining in place” refers to locations that were either at the bases of excavations or locations that were not excavated because chemical concentrations were below one-half of the industrial PRGs.

Specifically, the VCA for the 90s Line included the following activities:

- The D&D group excavated soil as needed to remove chunk HE, sumps, and drainlines. If soils surrounding the sumps and drainlines tested positive according to the HE spot test, the D&D group continued to remove soils until negative HE spot-test results were achieved, or until they had removed 2 ft of soil from around the sump or drainline where the contamination had been detected. If a negative HE spot test was achieved, excavation ceased. All buildings, paved parking lots and roads, berms, sumps, and drainlines were removed.
- Visual inspection and quantitative field-screening methods were used to locate additional areas potentially requiring remediation.
- Based on quantitative field screening, samples from the locations showing the highest level of each constituent were submitted for laboratory analysis.
- Soil remediation and vertical and lateral remediation boundaries were based on quantitative field-screening results and analytical laboratory results (LANL, 1997, 87847, p. 7). The initial remediation target was one-half of the industrial soil PRGs provided in the VCA plan (LANL, 1996, 53841, Table 3.2.3-1). The PRGs were developed using assumptions and equations from EPA Region 9 (EPA, 1996, 54899) and were applicable at the time of the VCA.
- Vertical bounding laboratory samples were taken at a depth of 2–3 ft beneath each soil location that required remediation.

- Following the receipt of laboratory analytical results, additional remediation occurred if analyte concentrations exceeded one-half of the industrial PRGs.
- Confirmation samples were collected at locations where remediation had occurred and at locations that had not previously been sampled for laboratory analysis. Samples from locations where no remediation was required, and bounding samples from beneath excavated areas, were used with confirmation samples to evaluate the residual contaminant concentrations remaining after remediation. To characterize the soil that remained within each exposure unit, confirmation samples were collected for laboratory analysis.
- If confirmation samples showed that one-half of the industrial PRGs had not been achieved for constituents without quantitative screening results, then additional soil removal, confirmation samples, and bounding sampling occurred.
- Confirmation sampling data were compared with one-half of the relevant industrial PRGs. If any chemical concentration level approached one-half of its PRG, a 95 % upper confidence limit on the mean concentration was calculated and compared with one-half of the industrial PRG. In most cases, the results were below one-half of the PRG.
- Sump and drainline excavations were backfilled, and the soil was reseeded by the D&D contractor.

Field-screening (Figures B-2 and B-2a to B-2f) and fixed-laboratory samples (Figures B-3 and B-4) were collected from contaminated soils associated with 90s Line sumps, drainlines, outfalls, drainages, and a drum storage area. In addition, confirmation samples were collected from those locations where cleanups had occurred, and vertical bounding laboratory samples were taken at a depth of 2–3 ft beneath each soil location that required cleanup. Table B-12 summarizes information about the soil, sediment, and tuff samples that were collected from the 90s Line during the 1996 VCA and submitted for laboratory analysis. The locations for samples submitted for laboratory analysis were biased to those with positive field-screening results and those where visual examination indicated the leakage of process water. Field-screening samples were typically analyzed for RDX and TNT by D TECH immunoassay kit, for metals by x-ray fluorescence (XRF), for VOCs by photoionization detector (PID), for radionuclides by a hand-held sodium iodide detector, and for HE by spot test. Quantitative field-screening D TECH results for RDX and TNT are summarized in Table B-13. Field logs containing details about the field-screening results for HE (spot test), metals, VOCs, and radionuclides are provided on the enclosed CD as Attachment B1.

Samples were analyzed by a fixed laboratory for those analytes presented in Table B-12. Confirmation and bounding samples collected for fixed-laboratory analysis are shown on Figure B-1.

Samples were collected from the areas discussed below (also see Figure B-1). The following text, which was summarized from the VCA completion report (LANL, 1997, 87847), describes the areas that were investigated and remediated during the 1996 VCA.

<u>SWMU 16-017(e)-99 (building 16-89), SWMU 16-029(u) (building 16-89 sumps), and SWMU 16-026(p) (building 16-89 drainlines and outfall)</u>. The D&D activities involved the removal of all surface and subsurface structures, including building 16-89, two concrete sumps, and two vitrified clay drainlines. Following D&D activities, 28 field-screening samples were collected from 26 locations and analyzed for RDX and TNT by D TECH immunoassay kit (Table B-13), for metals by XRF, for VOCs by PID, for radionuclides by sodium iodide detector, and for HE by spot test. Six additional screening points were located within the building footprints (Figure B-2). Twenty samples from unexcavated areas (including duplicates and samples collected from beneath the building footprint) were submitted to a fixed laboratory

based on positive field-screening results and visual examination that suggested the leakage of process water.

As part of the VCA, additional excavation was completed—beyond the soil removed during D&D—based on one-half of the industrial PRGs presented in the VCA plan (LANL, 1996, 53841).

To allow comparison of chemical concentrations before and after the VCA, analytical results from the samples listed below, from soils that were ultimately excavated (i.e., initial characterization samples removed during excavation), are summarized in Tables B-14 and B-15.

- From location ID 16-02372 [laboratory sample 0316-96-0043 collected at 0–0.5 ft below ground surface (bgs); LANL 1997, 87847, p. 77]
- From location ID 16-02373 (laboratory sample 0316-96-0044 collected at 3.5–4 ft bgs; LANL 1997, 87847, p. 13).
- Form location ID 16-02372 (laboratory sample 0136-96-2000 collected at 0–0.5 ft bgs; LANL 1997, 87847, p.14).
- From location ID 16-02373 (laboratory sample 0136-96-2001 collected at 3–3.5 ft bgs; LANL 1997, 87847, p.14).
- From location ID 16-02373 (laboratory sample 0136-96-2002 collected at 4–4.5 ft bgs; LANL, 1997, 87847, p.14).

Waste volumes included a total of 20 yd^3 of soil (Figure B-1; LANL, 1997, 87847, pp. 77–78 and Table 4.0-2). To provide information regarding the chemical concentrations that were remediated from the 90s Line during the VCA, spoils pile data are presented in Tables B-16 to B-19. One sample (laboratory sample 0316-96-0101) was collected from the spoils pile associated with these SWMUs.

Six confirmatory samples were distributed in zones where remediation had occurred and at other unsampled locations within the SWMUs. Tables B-20 through B-23 present the analytical results from confirmation and characterization samples taken from in situ locations (i.e., unexcavated soils) following the VCA. All analytes detected in confirmatory samples were below one-half of the industrial PRGs in use at the time (LANL, 1997, 87847, p. 79).

<u>SWMU 16-017(d)-99 (building 16-90), SWMU 16-029(t) (building 16-90 sumps), and SWMU 16-026(o) (building 16-90 drainlines and outfall)</u>. The D&D activities involved the removal of all surface and subsurface structures, which included building 16-90, two sumps, 30 ft of drainline from the south drainage, and 100 ft of drainline from the north drainage (LANL, 1997, 87847, p. 80). Following D&D activities, 39 field-screening samples were collected from 35 locations and analyzed for RDX and TNT by D TECH immunoassay kit (Table B-13), for metals by XRF, for VOCs by PID, for radionuclides by sodium iodide detector, and for HE by spot test. Six additional screening points were located within the building footprints (Figure B-2). Twenty-one soil samples from unexcavated areas (including duplicates and samples collected from beneath the building footprint) were submitted to a fixed laboratory. These samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water.

As part of the VCA, additional excavation was completed—beyond the soil removed during D&D—based on one-half of the industrial PRGs presented in the VCA plan (LANL, 1996, 53841, Table 3.2.3-1).

To allow comparison of chemical concentrations before and after the VCA, analytical results from the samples listed below, from soils that were ultimately excavated (i.e., initial characterization samples removed during excavation), are summarized in Tables B-14 and B-15.

- From location ID 16-02360 (laboratory sample 0316-96-0155 collected at 5.0–6.0 ft) and location 16-02362 (laboratory sample 0316-96-0156 at 5–6 ft bgs; LANL, 1997, 87847, p. 22)
- From location ID 16-02362 (laboratory sample 0316-96-0034 collected at 5–5.5 ft bgs, and laboratory sample 0316-96-0091 at 4-4.5 ft bgs; LANL,1997, 87847, p. 86)
- From location ID 16-02360 (laboratory sample 0316-96-0090 collected at 4.5–5 ft bgs; LANL, 1997, 87847, p. 86)

Waste volumes included a total of 125 yd^3 of soil (Figure B-1; LANL, 1997, 87847, pp. 80–83 and Table 4.0-2). To provide information regarding the chemical concentrations that were remediated from the 90s Line during the VCA, spoils pile data are presented in Tables B-16 to B-19.

Fifteen confirmatory samples were taken (LANL, 1997, 87847, p. 84). Tables B-20 through B-23 present the analytical results from confirmation and characterization samples taken from in situ locations (i.e., unexcavated soils) following the VCA. Results from four locations were above one-half of the industrial PRGs, which prompted additional excavation. All analytes detected in confirmatory samples from locations where soils remained in place were below one-half of the industrial PRGs (LANL, 1997, 87847, p. 79).

<u>SWMU 16-017(c)-99 (building 16-91), SWMU 16-029(s) (building 16-91 sumps), and SWMU 16-026(n) (building 16-91 drainlines and outfall)</u>. The D&D activities involved the removal of all surface and subsurface structures, which included building 16-91, two sumps, 105 ft of drainline from the southeast drainage, and 75 ft of drainline from the northeast drainage (LANL, 1997, 87847, p. 87). Following D&D activities, 34 field-screening samples were collected from 32 locations and analyzed for RDX and TNT by D TECH immunoassay kit (Table B-13), for metals by XRF, for VOCs by PID, for radionuclides by sodium iodide detector, and for HE by spot test. Six additional screening points were located within the building footprints (Figure B-2). Twenty samples that were submitted to a fixed laboratory were biased to locations with positive field readings and to areas where visual examination suggested the leakage of process water (LANL, 1997, 87847, p. 31).

No initial characterization samples were excavated at this site, although excavation did occur. Waste volumes included a total of 6.5 yd^3 of soil (LANL, 1997, 87847, pp. 87–89). To provide information regarding the chemical concentrations that were remediated from the 90s Line during the VCA, spoils pile data are presented in Tables B-16 to B-19.

Eleven confirmatory samples were taken (LANL, 1997, 87847, p. 89). Tables B-20 through B-23 present the analytical results from confirmation and characterization samples taken from in situ locations (i.e., unexcavated) following the VCA. All analytes detected in confirmatory samples from locations where soils remained were below one-half of the industrial PRGs (LANL, 1997, 87847, p. 90) that were applicable at the time.

<u>SWMU 16-017(a)-99 (building 16-92), SWMU 16-029(l) (building 16-92 sumps), and SWMU 16-026(m) (building 16-92 drainlines and outfall)</u>. The D&D activities involved the removal of all surface and subsurface structures, which included building 16-92, two sumps, 105 ft of drainline from the west drainage, and 82 ft of drainline from the east drainage (LANL, 1997, 87847, p. 91). Following D&D activities, 20 field-screening samples were collected from 20 locations and analyzed for RDX and TNT by

D TECH immunoassay kit, for metals by XRF, for VOCs by PID, for radionuclides by sodium iodide detector, and for HE by spot test. Six additional screening points were located within the building footprints (Figure B-2). Sixteen soil samples, eleven of which were confirmatory, were collected from locations remaining in place (i.e., unexcavated) following D&D. The 16, which included duplicates and samples collected from beneath the building footprint, were submitted to a fixed laboratory (LANL, 1997, 87847, p. 93).

No soil-removal activities occurred in this area as part of the VCA (LANL, 1997, 87847, p. 91).

Tables B-20 through B-23 present analytical results from VCA sample locations. All analytes detected in confirmatory samples taken from locations where soils remained were below one-half of the industrial PRGs (LANL, 1997, 87847, p. 94) that were applicable at the time.

SWMU 16-017(b)-99 (building 16-93) and SWMU 16-029(k) (building 16-93 sumps, drainlines, and outfall). The D&D activities involved the removal of all surface and subsurface structures, which included building 16-93, two sumps, 180 ft of drainline from the south drainage, and 130 ft of drainline from the north drainage (LANL, 1997, 87847, p. 94). Following D&D activities, 29 field-screening samples were collected in 27 locations and analyzed for RDX and TNT by D TECH immunoassay kit, for metals by XRF, for VOCs by PID, for radionuclides by sodium iodide detector, and for HE by spot test. Six additional screening points were located within the building footprints (Figure B-2). Seventeen samples from locations that remained in the ground (including duplicates and samples collected from beneath the building footprint) were submitted to a fixed laboratory. The locations of these samples were biased to locations with positive field readings and to areas where visual examination suggested the leakage of process water (LANL, 1997, 87847, p. 31).

No initial characterization sample locations were excavated as part of the VCA at this site, although drainlines were removed by D&D.

Waste volumes included 3 yd^3 from location 16-02393 at the northwest sump outlet (LANL, 1997, 87847, p. 96). To provide information regarding the chemical concentrations that were remediated from the 90s Line during the VCA, spoils pile data are presented in Tables B-16 to B-19.

Twelve confirmatory samples were taken (LANL, 1997, 87847, p. 97). All analytes detected in confirmatory samples from locations where soils remained were below one-half the industrial PRGs (LANL, 1997, 87847, p. 98) that were applicable at the time. Tables B-20 through B-23 present the analytical results from confirmation and characterization samples taken from in situ locations following the VCA.

AOC C-16-067. C-16-067 is the drum storage area near building 16-90. The D&D activities included the removal of all surface and subsurface structures (LANL, 1997, 87847, p. 66). Eighteen field-screening samples were collected at different depths from two locations and analyzed for metals by XRF, for VOCs by PID, for radionuclides by sodium iodide detector, for petrochemicals by Handby BTEX, for polycyclic aromatic hydrocarbons (PAHs) by Millipore screening kits, and for HE by spot test. Samples were screened for petrochemicals and PAHs because some of the drums in this storage area contained oils (LANL, 1994, 39440, p. 5-363). Two locations (16-02542 and 16-02543) had field-screening results showing 500 to 1000 mg/kg of diesel fuel. The remaining samples contained concentrations of petrochemicals around 10 mg/kg (LANL, 1997, 87847, p. 68). AOC C-16-067 lies entirely within the cleanup boundaries for SWMU 16-029(t). Because the area of the AOC was small and the bucket on the trackhoe used for excavating the samples was large, only two locations within the AOC were sampled. The sampling exercise removed the entire AOC to a depth of 7.5–8.0 ft bgs (LANL, 1997, 87847, p. 105). To allow comparison of chemical concentrations before and after the VCA, analytical results from the

samples below, which were ultimately excavated (i.e., initial characterization samples removed during excavation), are summarized in Tables B-14 and B-15:

- From location ID 16-02542 (laboratory sample 0316-96-0131 collected at 0–1 ft bgs; LANL, 1997, 87847 p. 68)
- From location ID 16-02543 (laboratory sample 0316-96-0200 collected at 7–7.5 ft bgs; LANL, 1997, 87847, p. 68)

Two samples from locations 16-02542 and 16-02543 (0316-96-0131 and 0316-96-0200, respectively), which were within the area excavated for removal of TA-16-90 drainlines, were submitted to a fixed laboratory for analysis of inorganics, SVOCs, VOCs, and HE (LANL, 1997, 87847, p. 68). The bounding sample (7.0–7.5 ft bgs) concentrations were below one-half of the industrial PRGs (LANL, 1997, 87847, p. 106). Fourteen yd^3 were excavated from this area at locations 16-02542 and 16-02543.

B-3.1 Field-Screening Results

RDX and TNT screening results from the 1996 VCA are shown in Table B-13 and in Figures B-2 and B-2a through B-2f. These field-screening results include samples from both removed soils and soils remaining in place. Most samples collected were screened for HE using D TECH immunoassay kits, for metals by XRF, and for VOCs using a PID. Attachment B1 (on the enclosed CD) provides scanned logbooks containing D TECH, XRF, and PID field-screening results. Field-screening results from the HE spot test and sodium iodide detector (radionuclides) are summarized in the 1997 VCA report for the 90s Line (LANL, 1997, 87847).

RDX screening using D TECH kits. All samples were screened for RDX and TNT using D TECH immunoassay test kits. The detection limit for RDX is approximately 1.0 mg/kg. Samples collected from most field-screening subsurface and surface locations had an RDX and/or TNT detect. Higher detections typically occurred in areas that coincided with the former locations of sumps or drainlines. Although most detections were noted in the 1–2 mg/kg range, several exceeded 6 mg/kg. Samples collected within building footprints typically showed lower results. RDX field-screening results are shown as bubble plots (Figures B-2 and B-2a to B-2c). TNT field-screening results are also shown as bubble plots (Figures B-2 and B-2d to B-2f). HE field-screening results are included in Table B-13.

PID screening for VOCs. All samples were screened in the field for VOCs using a PID. Samples were collected from the sample core barrel immediately after it was opened. Screening samples were placed in 1-gal. Ziploc bags and allowed to warm to room temperature. No elevated PID readings were observed.

XRF screening for metals. All samples were screened for at least 24 metals: chromium, potassium, titanium, manganese, iron, cobalt, nickel, copper, zinc, arsenic, selenium, strontium, zirconium, molybdenum, mercury, lead, rubidium, cadmium, tin, antimony, barium, silver, uranium, and thorium. Of the five metals (barium, copper, nickel, uranium, and chromium) that are known to have been used in 90s Line operations, only barium was consistently detected at elevated concentrations. Field-screening results for metals are included as Attachment B1 on the enclosed CD.

B-3.2 Soil, Fill, and Bedrock Investigation

Tables B-20 through B-23 present the analytical results from those sample locations at 90s Line SWMUs that remained in place following the 1996 VCA (i.e., locations that were not excavated). For this HIR, a comparison of analytical results for inorganic chemicals against background values (BVs) (LANL, 1998, 59730) and industrial soil-screening levels (SSLs) (New Mexico Environment Department [NMED], 2004, 85615) was conducted for soil, fill, and tuff. The frequency of detection above BVs is provided in Table B-

20 for inorganic chemicals. Table B-21 provides a summary of information about those samples with inorganic chemical concentrations above BVs. Tables B-14 through B-19 present the analytical data for locations that were removed during VCA excavation activities. The frequency of detection for organic chemicals is presented in Table B-22; samples with detected organic chemicals are summarized in Table B-23. Complete data for the VCA are provided in Appendix C (on enclosed CD).

Evaluation of Inorganic Chemicals

Inorganic chemicals were detected above BVs in the areas investigated during the VCA (Table B-20). Barium, chromium, copper, nickel, and uranium are the inorganic chemicals known to have been associated with 90s Line HE-processing and plating operations. Of these five metals, only barium, copper, and nickel were detected frequently. Of the inorganic chemicals detected, barium is the most ubiquitous and, therefore, diagnostic of where nature and extent are defined. Therefore, barium was used to guide the selection of additional sampling locations presented in this work plan. Many of the highest barium concentrations are concentrated near the former sump and drainline locations (Figure B-3).

For the three metals listed, the following maximum concentrations were noted: (1) barium at 3920 mg/kg, (2) nickel at 3280 mg/kg, and (3) copper at 2210 mg/kg, all at former sump locations. These concentrations are all above the current BVs for both soil and tuff. None of the inorganic chemical concentrations exceeded industrial SSLs (NMED, 2004, 85615). It is concluded that the lateral nature and extent of inorganic chemical concentrations at SWMU 16-008(a)-99 have not been fully defined. In addition, the VCA did not include an investigation of the ponds area and did not sample distal reaches of some drainages. The vertical nature and extent of inorganic chemical contamination have not been defined because, in most cases, a decreasing trend in sample concentrations was not observed and, in many areas, only one depth was sampled.

Evaluation of Organic Chemicals

Low-level concentrations of organic chemicals (HE, VOCs, and SVOCs) were detected at every area investigated during the 90s Line VCA. Most of these concentrations were just above the laboratory method detection limit and were qualified as estimated values. RDX is the organic contaminant most frequently detected at levels well above the method detection limit. In addition, none of the organic chemical concentrations exceeded industrial SSLs (NMED, 2004, 85615). Figure B-4 shows the distribution of RDX in laboratory samples. Table B-23 lists all sample results from the 90s Line VCA for detected organic chemicals. RDX concentrations were used to guide the additional sampling locations presented in the work plan.

Forty organic chemicals were detected at the 90s line (Table B-23), including HE, polycyclic aromatic hydrocarbons, VOCs, and SVOCs. Of the RDX concentrations in soils that remained in place after VCA activities, the maximum concentration was 8.92 mg/kg at the sump on the south end of building 16-90. The maximum TNT concentration in soils remaining in place after VCA activities was 26.4 mg/kg at the former sump location on the north end of building 16-90. An examination of the vertical distribution of organic chemical concentrations at the 90s Line indicates that vertical nature and extent of organic chemical contamination have not been defined for organic chemicals, partly because not many samples were collected at multiple depths. The lateral nature and extent of organic chemical concentrations at SWMU 16-008(a)-99 have also not been defined. In addition, the VCA did not include an investigation into the pond or the distal reaches of some drainages.

Evaluation of Radionuclides

Within the sample results for radionuclides no detected concentrations were reported.

B-3.3 Water Investigations

As part of the 260 outfall investigation (LANL, 2003, 77965, pp. 4-55–4-77), one groundwater sample (120 ft bgs) was collected from monitoring well 16-02669, which is located adjacent to the 90s Line pond. In addition, the surface water that accumulates in the 90s Line pond is sampled on a quarterly basis as part of the ongoing hydrogeological investigation for TA-16-260 which is, in turn, conducted as part of the CMS investigations for PRS 16-021(c). Because the 90s Line drainage channels are still present, much of the surface water that accumulates in the pond flows through these channels. The surface and groundwater samples collected at the 90s Line pond and analyzed by a fixed laboratory are summarized in Table B-24. The frequency of detected inorganic chemicals in surface and groundwater is presented in Table B-25, and analytical results for detected inorganic chemicals are shown in Table B-26. The frequency of detected organic chemicals in surface and groundwater is presented in Table B-27, and analytical results for detected organic chemicals are shown in Table B-28.

The analytical results for the single groundwater sample showed detected concentrations of barium, octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX), 2,4-dinitrotoluene (2,4-DNT), RDX, and TNT. Barium and RDX were detected in groundwater at concentrations of 200 and 281 µg/L, respectively. The barium concentration (200 µg/L) from the unfiltered sample is below the EPA maximum contaminant levels of 2000 µg/L and the NMED Water Quality Control Commission (WQCC) groundwater standard of 1000 µg/L (Table B-26).Currently, EPA provides a 10-day health advisory of 100 µg/L for RDX (EPA, 2004, 85204, p. 6). The RDX concentration (281 µg/L) detected in well 16-02669 exceeds the 10-day health advisory as well as the EPA Region 6 tap water screening level of 0.61 µg/L (EPA, 2004, 87478, p. 7).

Analytical results from the pond's surface water samples show elevated concentrations of metals and HE that have fluctuated over time. As presented in Table B-26, the NMED WQCC does not currently provide a surface water standard for barium, other than the criterion of 2000 µg/L for domestic use. Most filtered surface water samples from the 90s Line pond exceeded this concentration. The maximum dissolved barium concentration detected in 90s Line pond surface water is 6700 µg/L (Table B-25). Historically, RDX has been detected in 90s Line surface water at a maximum concentration of 23 µg/L (from a filtered sample). The NMED WQCC does not currently provide a surface water standard for RDX. Results for tritium in surface water at the 90s Line pond are provided in Tables B-29 and B-30.

In 1997, four shallow (10- to 15-ft) boreholes (16-02661–16-02664) were drilled around the 90s Line pond. These were designed to evaluate whether interflow along the soil-tuff interface was recharging the pond. Wells with 5-ft screens were installed across the soil-tuff interface in each borehole. No water was found in any of the boreholes. No analytical samples were taken from the boreholes, but results of HE spot tests performed on the core were negative.

B-4.0 PHASE I RFI FIELD INVESTIGATIONS AND REVIEW OF FIELD-SCREENING AND LABORATORY RESULTS FOR THE 30s LINE PONDS

RFI fieldwork was conducted at the 30s Line ponds during October 2004. The EPA-approved "RFI Work Plan for Operable Unit 1082" (LANL, 1993, 20948) specified the sampling of surface soil and sediment, subsurface soil, and subsurface bedrock (tuff), with analyses of samples for radionuclides, inorganic chemicals, VOCs, SVOCs, and HE and its byproducts (LANL, 1993, 20948, pp. 5-224–5-225). The objectives of the RFI were (1) to identify the chemicals present in the subsurface soil, sediment, and bedrock within the boundaries of the ponds; and (2) to determine if additional investigative or corrective actions were warranted. All samples were screened for radionuclides, HE, and VOCs for health and safety purposes and to bias sample selection (LANL, 1993, 20948, p. 5-224). All radiation surveys at the 30s Line ponds were performed using a pancake probe with additional wipe samples collected and

submitted for off-site analysis. Organic vapors were screened using a PID. HE was screened for using the HE spot test. RDX was also screened for using using a D TECH test kit. XRF screening was not conducted.

Sampling was based on the RFI work plan, following the intervals and frequencies specified in section 5.12.4.2 of that document (LANL, 1993, 20948, p. 5-252). The four 30s Line ponds were sampled at three random locations within the boundaries of each pond. Cores were collected in 5-ft runs from the surface to a minimum of 2.5 ft into bedrock. Cores were screened by PID to determine the presence of VOCs. Each core was also field-screened for HE and radiation.

A total of 13 soil borings were drilled in the former 30s Line ponds using a CME75 hollow stem auger rig equipped with continuous core samplers. Three borings were installed in three of the four ponds; four borings were installed in the fourth, northernmost pond (Figure B-1). Each boring was advanced through the fill material to below the base of the former pond at a depth of approximately 8–10 ft bgs. Fill material generally consisted of sandy silt with gravel, although some larger cobbles were encountered, particularly at the base of the former ponds. Material encountered below the ponds generally consisted of yellowish-brown weathered tuff, although in the northernmost pond the tuff was bluish-gray, only slightly weathered, and much harder. Auger refusal was met in three of the four boreholes installed in the northernmost pond as documented in the field boring logs. If auger refusal was met, drilling began at the next scheduled borehole.

At least three samples were submitted for laboratory analysis from each boring: the shallowest positive sample, the deepest positive sample, and a sample taken 2 ft deeper than the deepest positive sample (LANL, 1994, 39440, p. 5-252). If no D TECH samples yielded positive screening results, one sample was submitted from the 3-ft interval bracketing the bottom of the pond (LANL, 1994, 39440, p. 5-252). A total of 98 screening samples were collected. Based on the results of HE D TECH screening, a total of 32 soil samples were submitted for laboratory analysis.

Elevated HE detections noted during the D TECH screening of sample 16-05-056162 (boring 16-23739) prompted the installation of an offset boring (16-23749,) located approximately 8 ft to the west.

B-4.1 Field-Screening Results

Screening results are shown in Table B-31. All samples collected were screened for HE by spot test and D TECH immunoassay kit, and for VOCs using a PID. Radiological screening was conducted by the Health Physics Operations Group (HSR-1) for alpha using an Eberline E600 detector and for beta/gamma using an Eberline SHP380AB.

<u>HE spot test</u>. All samples collected were screened for HE using a colorimetric HE spot-test kit, which screens for RDX, HMX, pentaerythritol tetranitrate, tetryl, and 2,4,6-TNT. The detection limit for the HE spot test is 100 mg/kg. Although none of the samples collected showed a positive spot-test reading for HE, a screening (wipe) sample collected from residual soil on the lead auger, after its removal from boring 16-23749, showed a detect of RDX.

<u>RDX screening using D TECH kits.</u> All samples were screened for RDX using a D TECH immunoassay test kit. The detection limit for RDX is approximately 1.0 mg/kg. Samples collected from each of the 13 borings had at least one interval that exhibited an RDX detect. The exception is boring 16-23738, which had nondetect results for all screening intervals. Most of the detects noted from the remaining borings were below the 2.0 mg/kg level, with the highest readings noted in boring 16-23739 (the northernmost 30s Line pond) at 4.5 mg/kg.

PID screening for VOCs. All samples were screened in the field for VOCs with a PID. Samples were collected from the sample core barrel immediately after it was opened. Screening samples were placed in 1-gal. Ziploc bags and allowed to warm to room temperature. There were no PID readings noted above the background (ambient air) levels in any of the samples collected.

Radiological screening. All samples collected were screened for alpha, beta, and gamma emitters by HSR-1 personnel. Screening was conducted with the use of a pancake probe and direct smear samples, which were analyzed off-site. Results of the radiological screening did not show detected levels for any of the samples analyzed.

B-4.2 Bedrock and Overburden (Fill) Investigation

Drilling activities were specifically designed to evaluate subsurface conditions within the backfilled 30s Line ponds. The only two lithologic units encountered were the Bandelier Tuff (Qbt 4) and the fill material used in the former ponds. As expected, samples collected from the fill material did not show signs of significant contamination based on field-screening results. This fill material typically extended to a depth of 8–10 ft below current ground surface. The top of the tuff unit, which was generally noted as weathered to severely weathered, is the interval that typically exhibited low concentrations of HE. The constituents known to be associated with 30s Line operations are discussed below. RFI analytical data are provided in Appendix C.

Evaluation of Inorganic Chemicals

Inorganic chemicals were detected above BVs in the areas investigated during the RFI investigation (Table B-32). Barium is known to have been associated with 30s Line operations. Barium was detected at a high frequency, with a maximum concentration of 2270 mg/kg in the northernmost pond (Figure B-3). The highest concentrations were generally at the base of the former ponds (approximately 7–9 ft bgs), with concentrations decreasing with depth. Samples collected from each of the four 30s Line ponds reported barium detections above the BV (Table B-33). The additional sampling locations proposed in the work plan were based on barium concentrations because barium is the most widely distributed inorganic contaminant in the ponds. Other inorganic constituents detected above BVs in several samples include cobalt, cyanide, manganese, and perchlorate. The vertical nature and extent of inorganic chemical contamination at SWMU 16-007(a)-99 have not been fully defined. The lateral nature and extent of inorganic chemical contamination have also not yet been defined. No inorganic chemicals were detected above NMED industrial SSLs (Table B-33).

Evaluation of Organic Chemicals

Low concentrations of organic chemicals (HE, VOCs, SVOCs) were detected at every area investigated during the 30s Line RFI activities. Many of these concentrations were just above the laboratory method detection limit and were qualified as estimated values because they were detected below the quantitation limit. HE concentrations were also reported in practically every area of the 30s Line, with the highest concentrations (>1000 mg/kg RDX) reported in the northernmost of the four ponds. Table B-34 shows the HE compounds in soil that were noted during field-screening activities. Figure B-4 shows the distribution of RDX detected in laboratory samples. Table B-34 presents the frequency of detection for organic chemicals detected during the RFI. Table B-35 lists the analytical sample results for organic chemicals.

An examination of the spatial distribution of detected organic chemicals at the 30s Line indicates that the vertical nature and extent of organic chemical contamination have not been defined in the northern portion of the 30s Line ponds. The lateral nature and extent of organic chemical contamination at SWMU 16-007(a)-99 have also not been defined. Only sample RE16-05-56162 from location 16-23739

(in the northernmost pond) showed exceedances of NMED industrial SSLs. Both RDX and TNT exceeded SSLs in this sample (Table B-35), with values of 1040 mg/kg and 359 mg/kg, respectively.

Evaluation of Radionuclides

Within the sample results for radionuclides no detected concentrations were reported (Table B-36).

B-5.0 REFERENCES

The following list includes all documents cited in this report. Parenthetical information following each reference provides the author, publication date, and ER identification (ID) number. This information is also included in text citations. ER ID numbers are assigned by the ENV-RS Records Processing Facility (RPF) and are used to locate the document at the RPF.

Copies of the reference sets are maintained at the NMED Hazardous Waste Bureau; the DOE Los Alamos Site Office; the US EPA, Region 6; and ENV-RS. The sets were developed to ensure that the administrative authority has all the material needed to review this document, and they are updated periodically as needed. Documents previously submitted to the administrative authority are not included.

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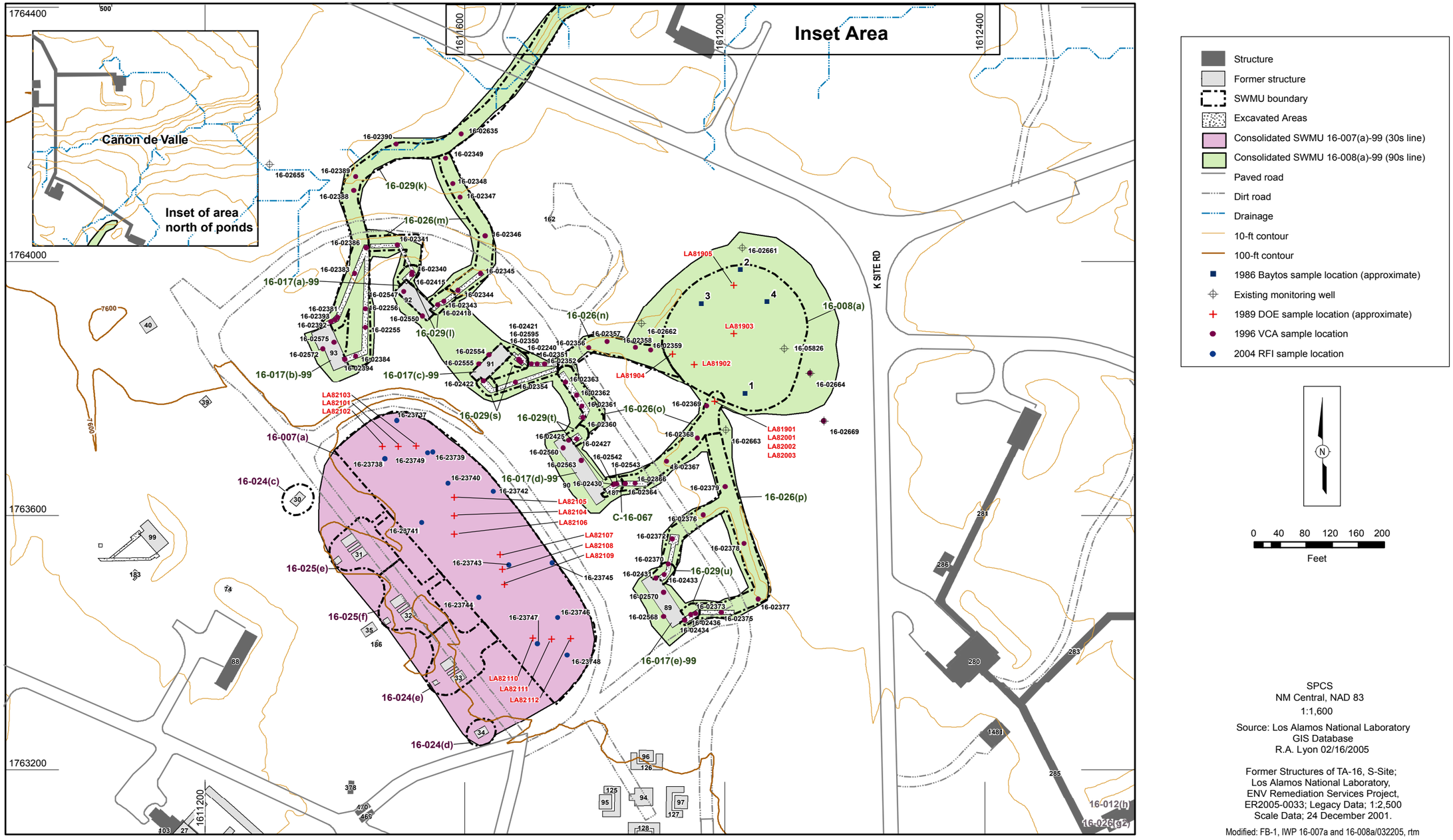


Figure B-1. Site map, including historical sample locations at SWMUs 16-007(a)-99 and 16-008(a)-99

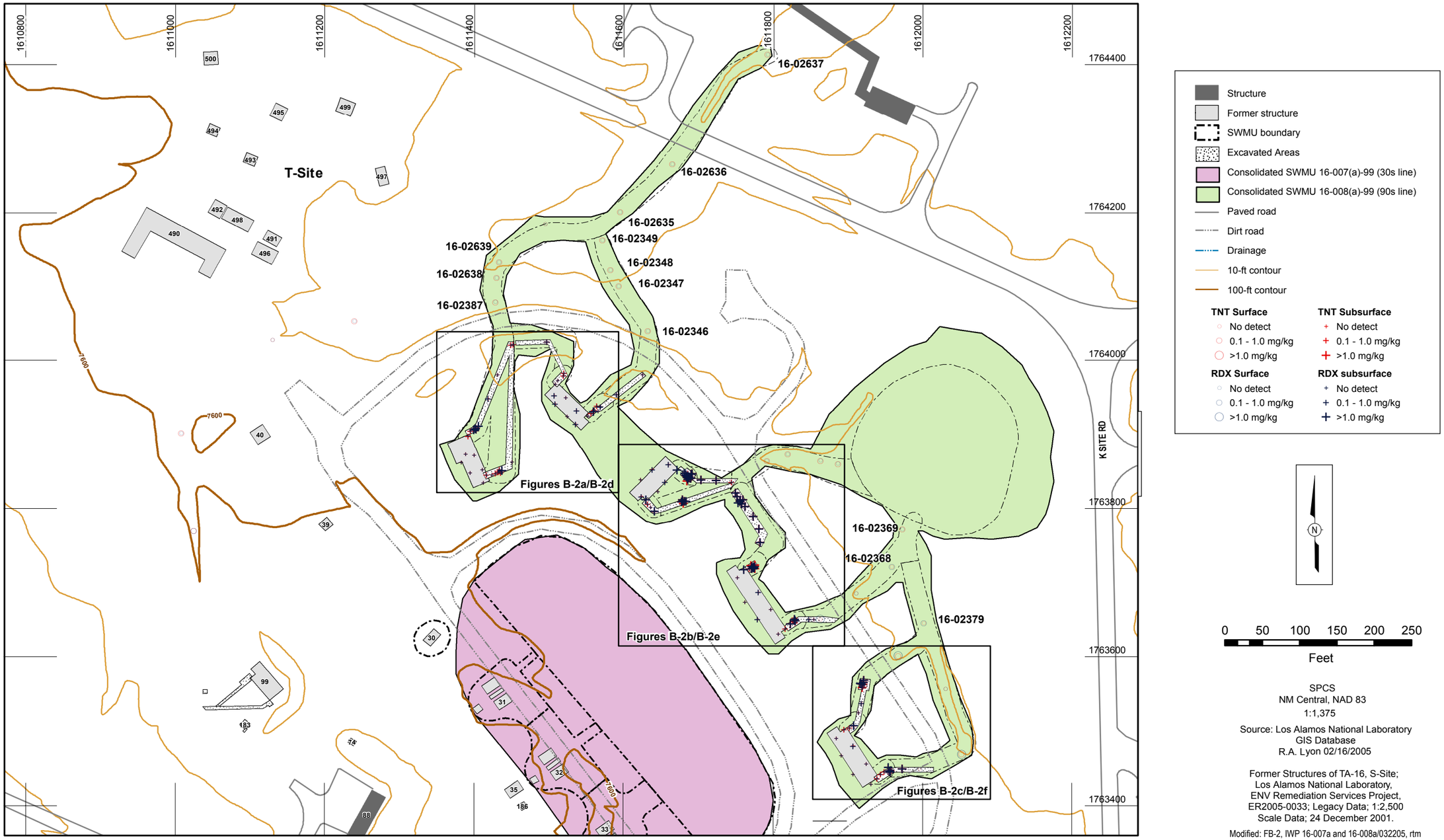


Figure B-2. Site-wide bubble plot of HE (D TECH) field-screening results from the 1996 VCA

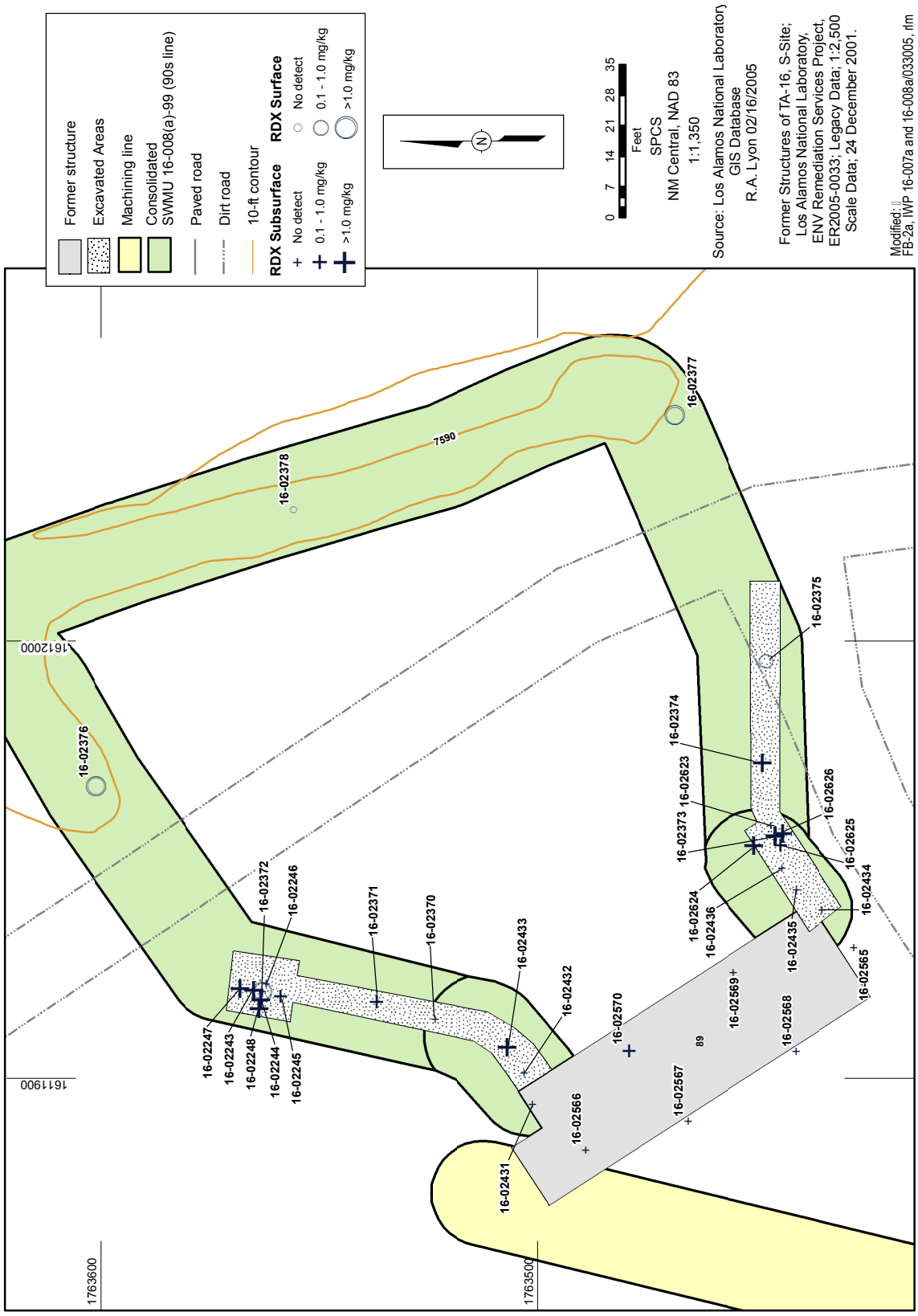


Figure B-2a. Bubble plot of RDX (D-Tech^{tm}) field screening results (Buildings 16-89 and 16-90), 1996 VCA

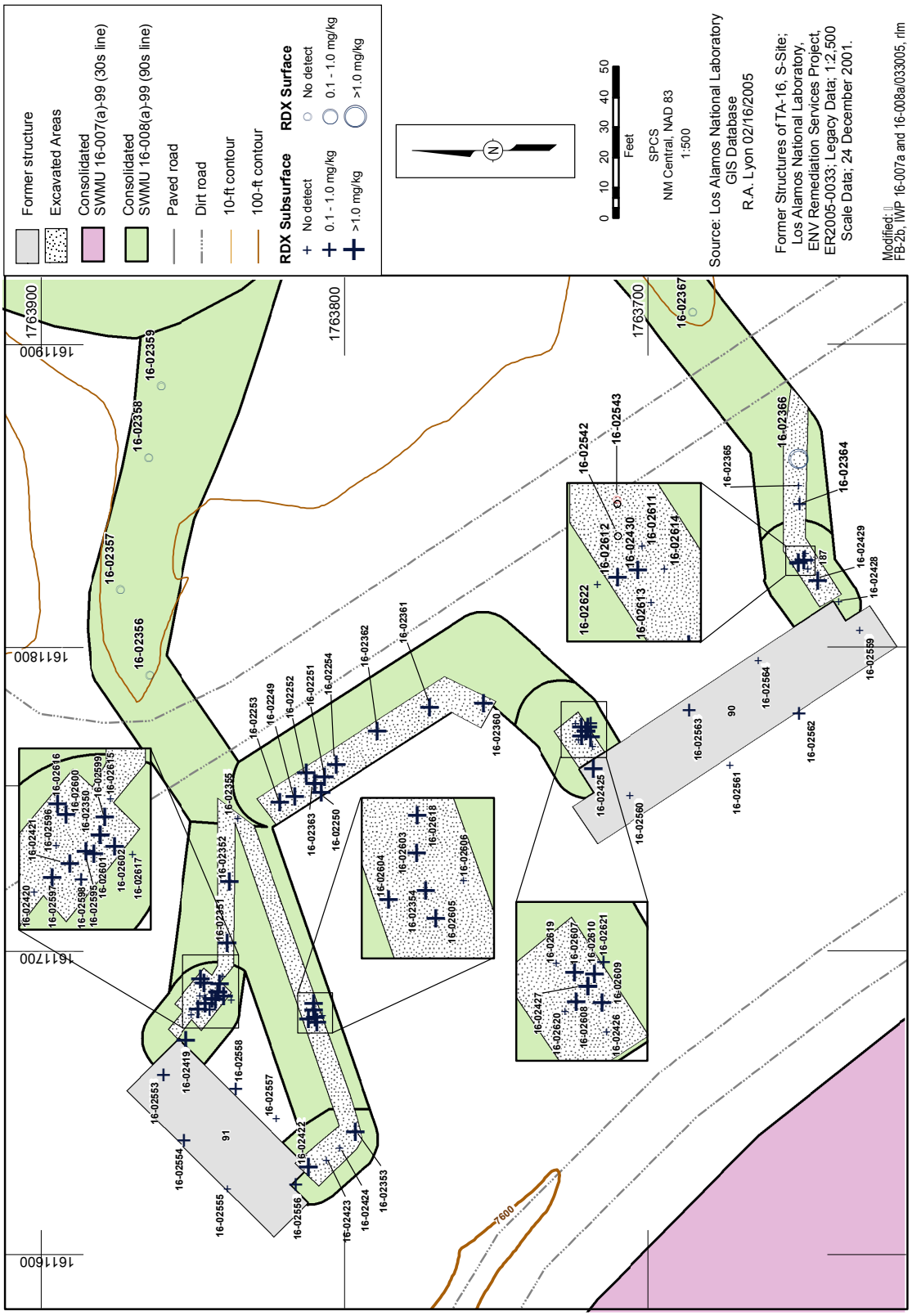


Figure B-2b. Bubble plot of RDX (D-Tech™) field screening results (Buildings 16-90 and 16-91), 1996 VCA

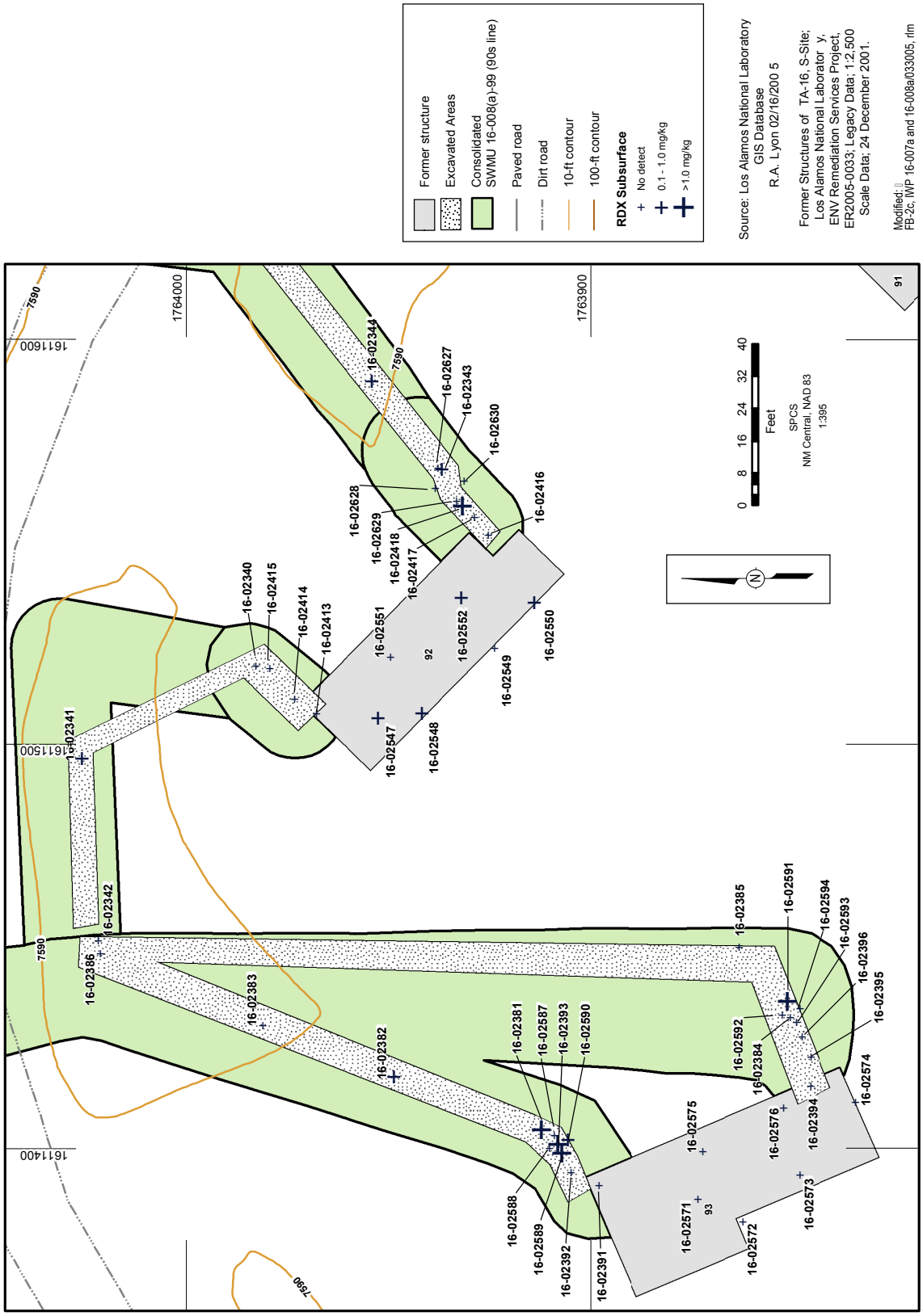


Figure B-2c. Bubble plot of RDX (D-Tech™) field screening results (Buildings 16-92 and 16-93), 1996 VCA

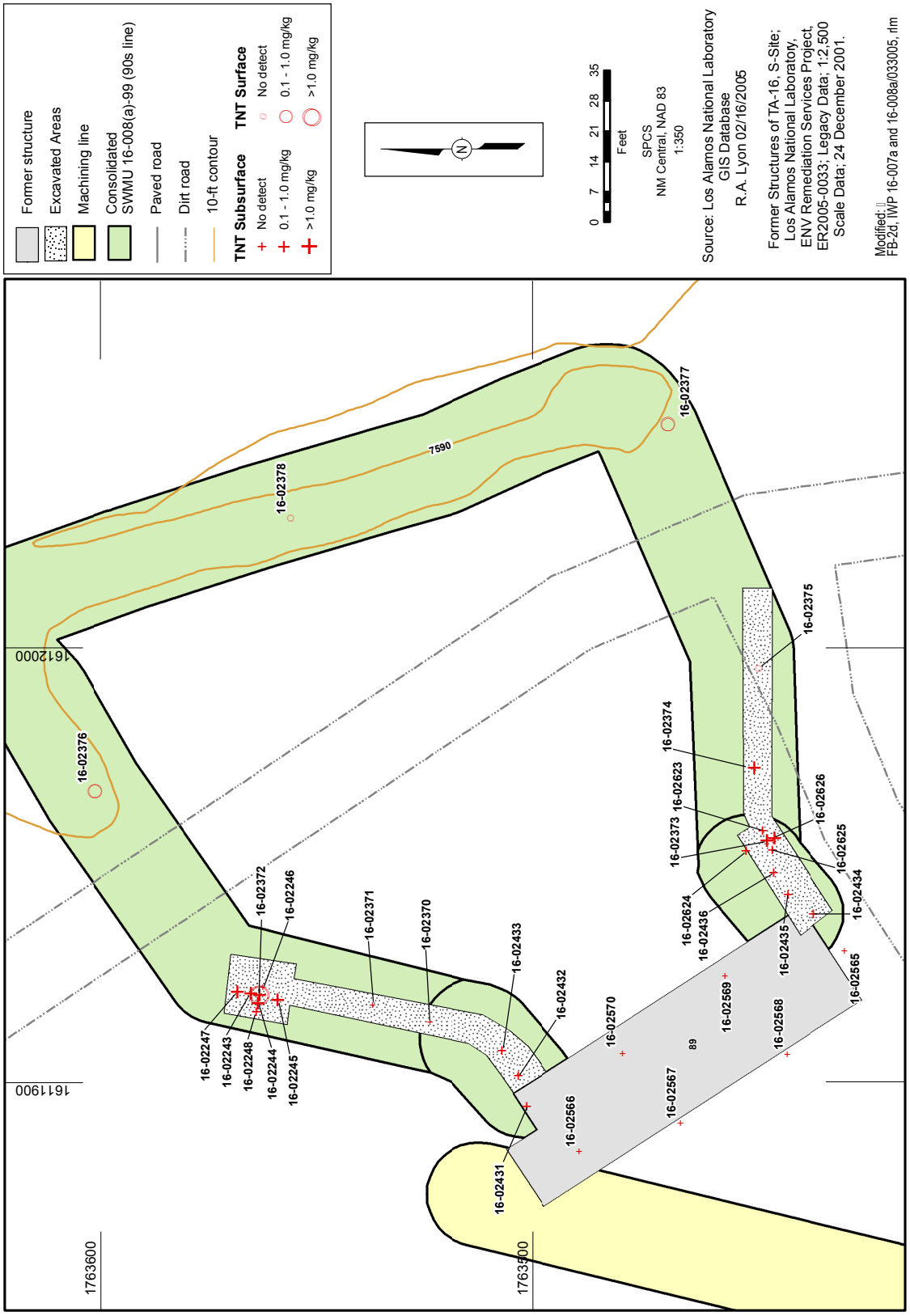


Figure B-2d. Bubble plot of TNT (D-Tech™) field screening results (Buildings 16-89 and 16-90), 1996 VCA

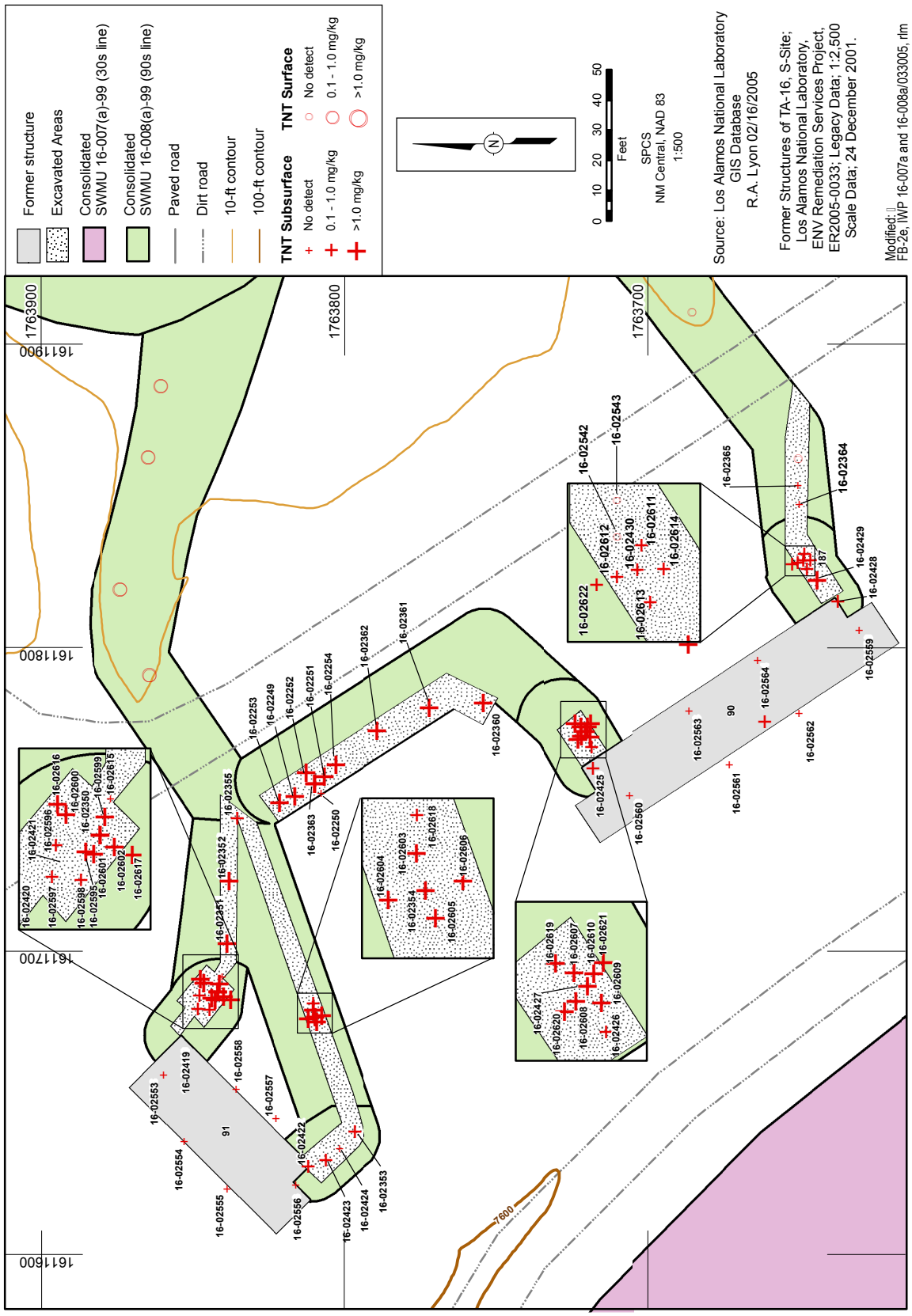


Figure B-2e. Bubble plot of TNT (D-Tech™) field screening results (Buildings 16-90 and 16-91), 1996 VCA

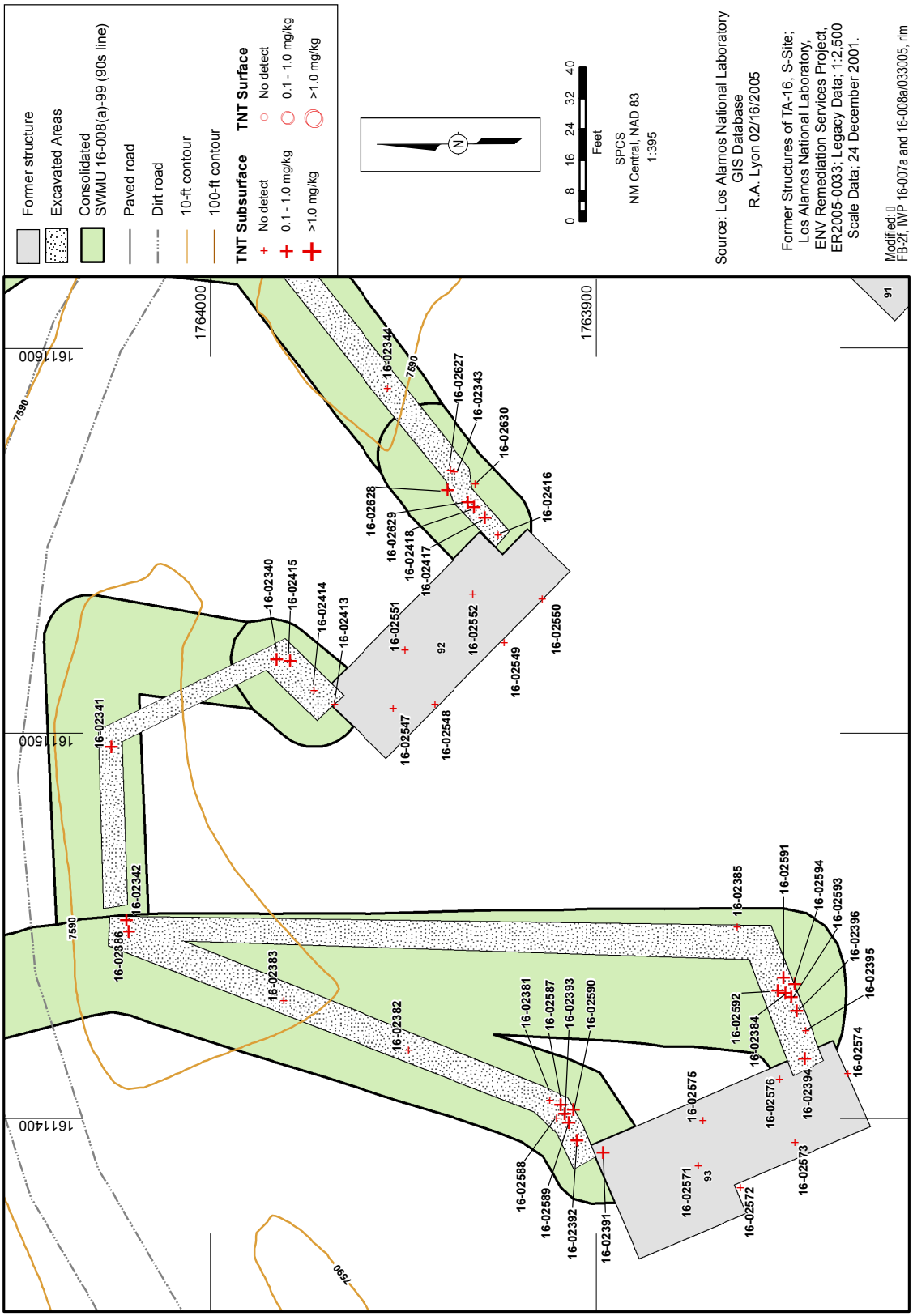
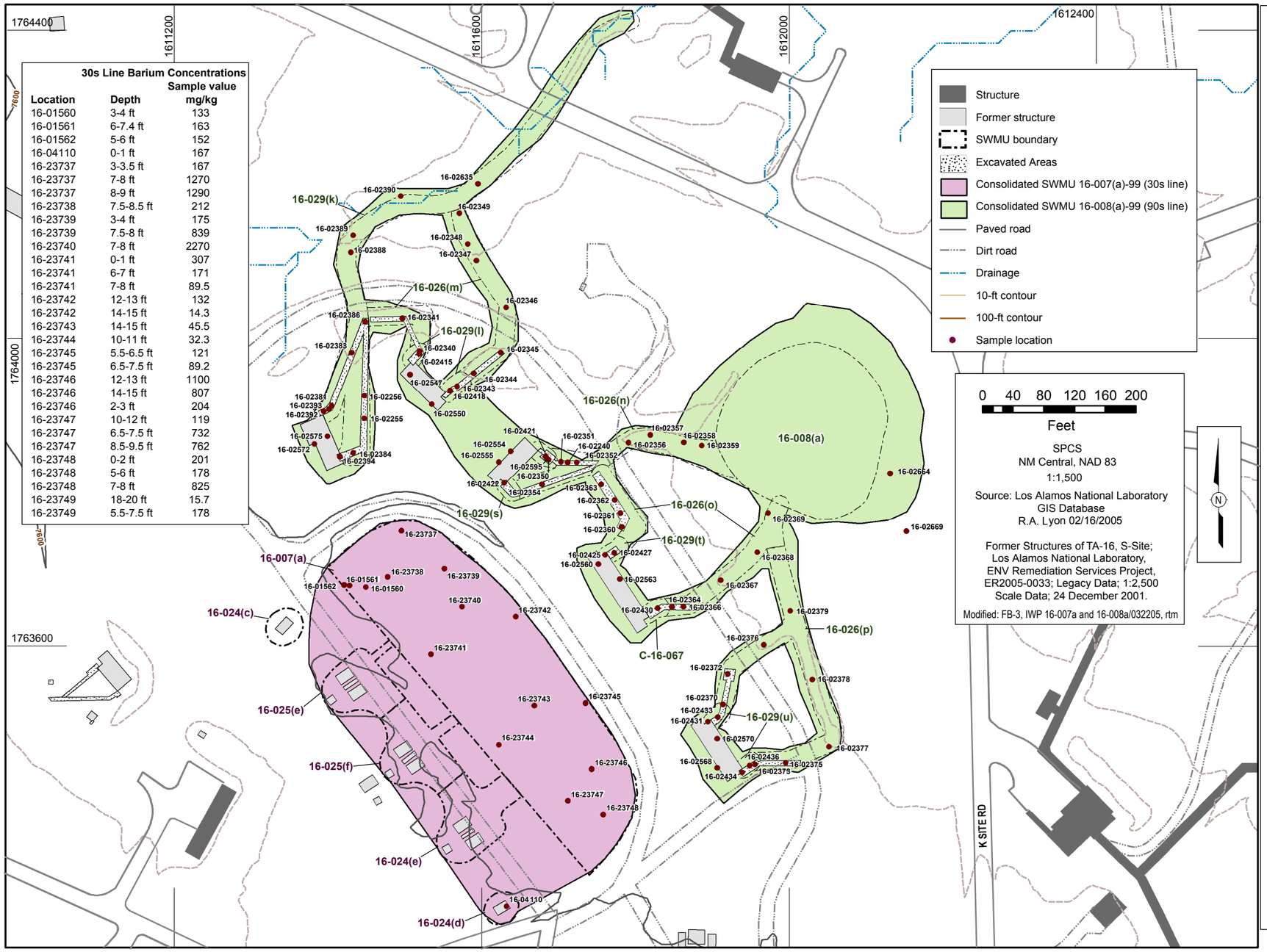


Figure B-2f. Bubble plot of TNT (D-Tech™) field screening results (Buildings 16-92 and 16-93), 1996 VCA



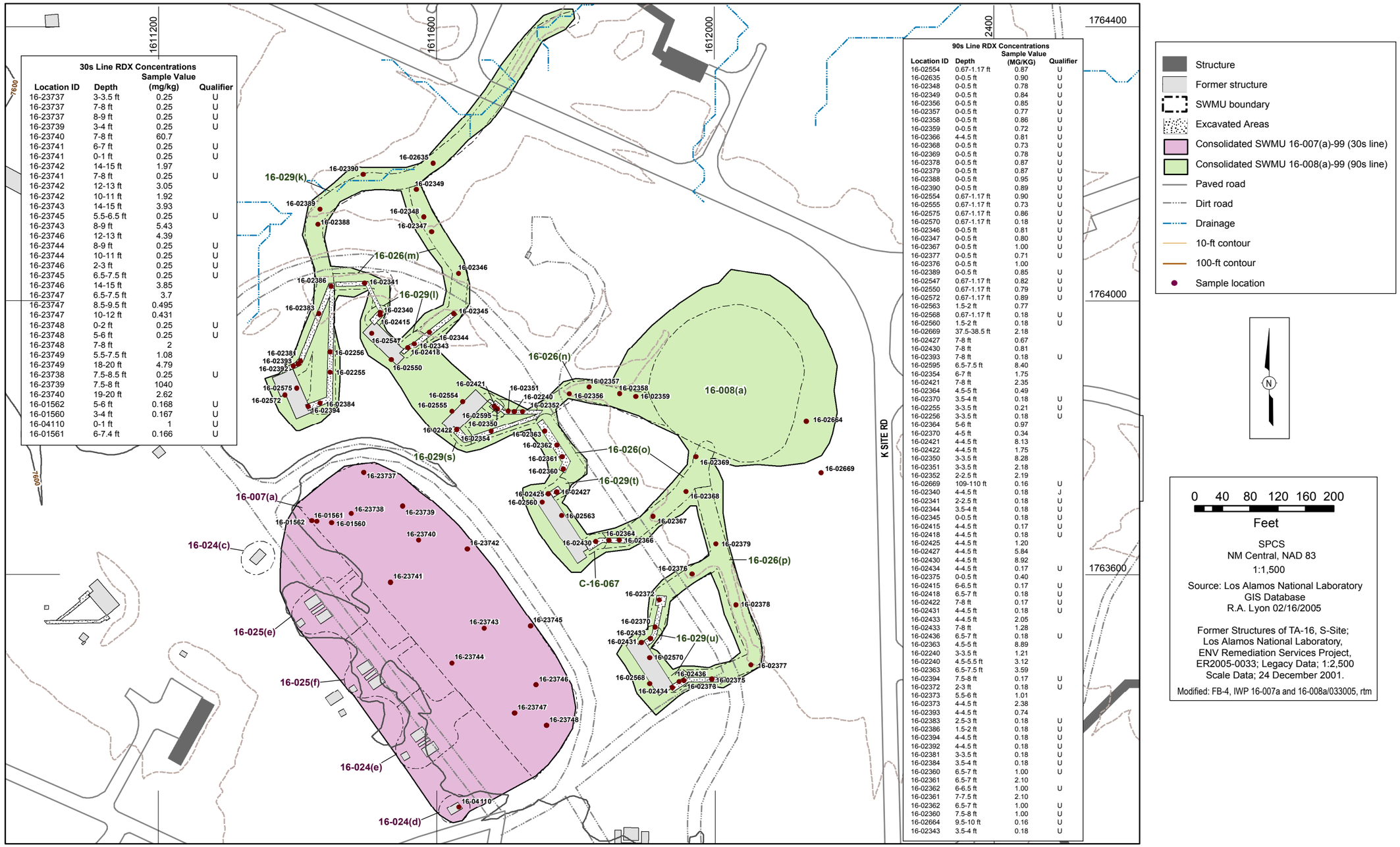
30s Line Barium Concentrations

Location	Depth	Sample value mg/kg
16-01560	3-4 ft	133
16-01561	6-7.4 ft	163
16-01562	5-6 ft	152
16-04110	0-1 ft	167
16-23737	3-3.5 ft	167
16-23737	7-8 ft	1270
16-23737	8-9 ft	1290
16-23738	7.5-8.5 ft	212
16-23739	3-4 ft	175
16-23739	7.5-8 ft	839
16-23740	7-8 ft	2270
16-23741	0-1 ft	307
16-23741	6-7 ft	171
16-23741	7-8 ft	89.5
16-23742	12-13 ft	132
16-23742	14-15 ft	14.3
16-23743	14-15 ft	45.5
16-23744	10-11 ft	32.3
16-23745	5.5-6.5 ft	121
16-23745	6.5-7.5 ft	89.2
16-23746	12-13 ft	1100
16-23746	14-15 ft	807
16-23746	2-3 ft	204
16-23747	10-12 ft	119
16-23747	6.5-7.5 ft	732
16-23747	8.5-9.5 ft	762
16-23748	0-2 ft	201
16-23748	5-6 ft	178
16-23748	7-8 ft	825
16-23749	18-20 ft	15.7
16-23749	5.5-7.5 ft	178

90s Line Barium Concentrations

Location ID	Depth (ft)	Sample Value (mg/kg)	Qualifier
16-02240	3-3.5 ft	691.00	J+
16-02240	4.5-5.5 ft	443.00	J+
16-02255	3-3.5 ft	778.00	
16-02256	3-3.5 ft	331.00	
16-02340	4-4.5 ft	246.00	
16-02341	2-2.5 ft	699.00	
16-02343	3.5-4 ft	125.00	
16-02344	3.5-4 ft	108.00	
16-02345	0-0.5 ft	76.70	
16-02346	0-0.5 ft	80.20	
16-02347	0-0.5 ft	72.10	
16-02348	0-0.5 ft	60.40	
16-02349	0-0.5 ft	83.60	
16-02350	3-3.5 ft	2190.00	
16-02351	3-3.5 ft	1260.00	
16-02352	2-2.5 ft	2670.00	
16-02354	6-7 ft	104.00	
16-02356	0-0.5 ft	715.00	
16-02357	0-0.5 ft	767.00	
16-02358	0-0.5 ft	1100.00	
16-02359	0-0.5 ft	3920.00	
16-02360	6.5-7 ft	180.00	
16-02360	7.5-8 ft	110.00	
16-02361	6.5-7 ft	140.00	
16-02361	7-7.5 ft	46.00	
16-02362	6.5-7 ft	350.00	
16-02362	6-6.5 ft	380.00	
16-02363	4.5-5 ft	1190.00	J+
16-02363	6.5-7.5 ft	159.00	
16-02364	4.5-5 ft	620.00	
16-02364	5-6 ft	177.00	
16-02366	4-4.5 ft	166.00	
16-02367	0-0.5 ft	343.00	
16-02368	0-0.5 ft	421.00	
16-02369	0-0.5 ft	398.00	
16-02370	3.5-4 ft	85.80	
16-02370	4-5 ft	84.40	
16-02372	2-3 ft	71.50	J-
16-02373	4-4.5 ft	56.00	J-
16-02373	5.5-6 ft	107.00	J-
16-02375	0-0.5 ft	3070.00	J+
16-02376	0-0.5 ft	502.00	
16-02377	0-0.5 ft	320.00	
16-02378	0-0.5 ft	803.00	
16-02379	0-0.5 ft	406.00	
16-02381	3-3.5 ft	192.00	
16-02383	2.5-3 ft	1550.00	
16-02384	3.5-4 ft	2710.00	
16-02386	1.5-2 ft	439.00	
16-02388	0-0.5 ft	194.00	
16-02389	0-0.5 ft	385.00	
16-02390	0-0.5 ft	603.00	
16-02392	4-4.5 ft	188.00	
16-02393	4-4.5 ft	253.00	
16-02393	7-8 ft	79.10	
16-02394	4-4.5 ft	54.00	
16-02394	7.5-8 ft	98.40	
16-02415	4-4.5 ft	140.00	
16-02415	6-6.5 ft	81.40	
16-02418	4-4.5 ft	133.00	
16-02418	6.5-7 ft	107.00	
16-02421	4-4.5 ft	1780.00	
16-02421	7-8 ft	276.00	
16-02422	4-4.5 ft	567.00	
16-02422	7-8 ft	60.20	
16-02425	4-4.5 ft	613.00	J+
16-02427	4-4.5 ft	708.00	J+
16-02427	7-8 ft	1710.00	
16-02430	4-4.5 ft	447.00	J+
16-02430	7-8 ft	185.00	
16-02431	4-4.5 ft	164.00	
16-02433	4-4.5 ft	611.00	
16-02433	7-8 ft	1320.00	
16-02434	4-4.5 ft	589.00	J+
16-02436	6.5-7 ft	309.00	
16-02547	0.67-1.17 ft	173.00	
16-02550	0.67-1.17 ft	172.00	
16-02554	0.67-1.17 ft	186.00	
16-02554	0.67-1.17 ft	168.00	
16-02555	0.67-1.17 ft	150.00	
16-02560	1.5-2 ft	191.00	
16-02563	1.5-2 ft	112.00	
16-02568	0.67-1.17 ft	122.00	
16-02570	0.67-1.17 ft	152.00	
16-02572	0.67-1.17 ft	183.00	
16-02575	0.67-1.17 ft	207.00	
16-02595	6.5-7.5 ft	469.00	
16-02635	0-0.5 ft	568.00	
16-02664	9.5-10 ft	24.30	J
16-02669	109-110 ft	2.10	J-
16-02669	37.5-38.5 ft	2.90	J

Figure B-3. Barium concentrations in soil at SWMUs 16-007(a)-99 and 16-008(a)-99 following 1996 VCA activities



30s Line RDX Concentrations

Location ID	Depth	Sample Value (mg/kg)	Qualifier
16-23737	3-3.5 ft	0.25	U
16-23737	7-8 ft	0.25	U
16-23737	8-9 ft	0.25	U
16-23739	3-4 ft	0.25	U
16-23740	7-8 ft	60.7	
16-23741	6-7 ft	0.25	U
16-23741	0-1 ft	0.25	U
16-23742	14-15 ft	1.97	
16-23741	7-8 ft	0.25	U
16-23742	12-13 ft	3.05	
16-23742	10-11 ft	1.92	
16-23743	14-15 ft	3.93	
16-23745	5.5-6.5 ft	0.25	U
16-23743	8-9 ft	5.43	
16-23746	12-13 ft	4.39	
16-23744	8-9 ft	0.25	U
16-23744	10-11 ft	0.25	U
16-23746	2-3 ft	0.25	U
16-23745	6.5-7.5 ft	0.25	U
16-23746	14-15 ft	3.85	
16-23747	6.5-7.5 ft	3.7	
16-23747	8.5-9.5 ft	0.495	
16-23747	10-12 ft	0.431	
16-23748	0-2 ft	0.25	U
16-23748	5-6 ft	0.25	U
16-23748	7-8 ft	2	
16-23749	5.5-7.5 ft	1.08	
16-23749	18-20 ft	4.79	
16-23738	7.5-8.5 ft	0.25	U
16-23739	7.5-8 ft	1040	
16-23740	19-20 ft	2.62	
16-01562	5-6 ft	0.168	U
16-01560	3-4 ft	0.167	U
16-04110	0-1 ft	1	U
16-01561	6-7.4 ft	0.166	U

90s Line RDX Concentrations

Location ID	Depth	Sample Value (MG/KG)	Qualifier
16-02554	0.67-1.17 ft	0.87	U
16-02635	0-0.5 ft	0.90	U
16-02348	0-0.5 ft	0.78	U
16-02349	0-0.5 ft	0.84	U
16-02356	0-0.5 ft	0.85	U
16-02357	0-0.5 ft	0.77	U
16-02358	0-0.5 ft	0.86	U
16-02359	0-0.5 ft	0.72	U
16-02366	4-4.5 ft	0.81	U
16-02368	0-0.5 ft	0.73	U
16-02369	0-0.5 ft	0.78	U
16-02378	0-0.5 ft	0.87	U
16-02379	0-0.5 ft	0.87	U
16-02388	0-0.5 ft	0.95	U
16-02390	0-0.5 ft	0.89	U
16-02554	0.67-1.17 ft	0.90	U
16-02555	0.67-1.17 ft	0.73	U
16-02575	0.67-1.17 ft	0.86	U
16-02570	0.67-1.17 ft	0.18	U
16-02346	0-0.5 ft	0.81	U
16-02347	0-0.5 ft	0.80	U
16-02367	0-0.5 ft	1.00	U
16-02377	0-0.5 ft	0.71	U
16-02376	0-0.5 ft	1.00	
16-02389	0-0.5 ft	0.85	U
16-02547	0.67-1.17 ft	0.82	U
16-02550	0.67-1.17 ft	0.79	U
16-02572	0.67-1.17 ft	0.89	U
16-02563	1.5-2 ft	0.77	
16-02568	0.67-1.17 ft	0.18	U
16-02560	1.5-2 ft	0.18	U
16-02669	37.5-38.5 ft	2.18	
16-02427	7-8 ft	0.67	
16-02430	7-8 ft	0.81	
16-02393	7-8 ft	0.18	U
16-02595	6.5-7.5 ft	8.40	
16-02354	6-7 ft	1.75	
16-02421	7-8 ft	2.35	
16-02364	4.5-5 ft	0.49	
16-02370	3.5-4 ft	0.18	U
16-02255	3-3.5 ft	0.21	U
16-02256	3-3.5 ft	0.18	U
16-02364	5-6 ft	0.97	
16-02370	4-5 ft	0.34	
16-02421	4-4.5 ft	8.13	
16-02422	4-4.5 ft	1.75	
16-02350	3-3.5 ft	8.28	
16-02351	3-3.5 ft	2.18	
16-02352	2-2.5 ft	2.19	
16-02669	109-110 ft	0.16	U
16-02340	4-4.5 ft	0.18	J
16-02341	2-2.5 ft	0.18	U
16-02344	3.5-4 ft	0.18	U
16-02345	0-0.5 ft	0.18	U
16-02415	4-4.5 ft	0.17	U
16-02418	4-4.5 ft	0.18	U
16-02425	4-4.5 ft	1.20	
16-02427	4-4.5 ft	5.84	
16-02430	4-4.5 ft	8.92	
16-02434	4-4.5 ft	0.17	U
16-02375	0-0.5 ft	0.40	
16-02415	6-6.5 ft	0.17	U
16-02418	6.5-7 ft	0.18	U
16-02422	7-8 ft	0.17	U
16-02431	4-4.5 ft	0.18	U
16-02433	4-4.5 ft	2.05	
16-02433	7-8 ft	1.28	
16-02436	6.5-7 ft	0.18	U
16-02363	4.5-5 ft	8.89	
16-02240	3-3.5 ft	1.21	
16-02240	4.5-5.5 ft	3.12	
16-02363	6.5-7.5 ft	3.59	
16-02394	7.5-8 ft	0.17	U
16-02372	2-3 ft	0.18	U
16-02373	5.5-6 ft	1.01	
16-02373	4-4.5 ft	2.38	
16-02393	4-4.5 ft	0.74	
16-02383	2.5-3 ft	0.18	U
16-02386	1.5-2 ft	0.18	U
16-02394	4-4.5 ft	0.18	U
16-02392	4-4.5 ft	0.18	U
16-02381	3-3.5 ft	0.18	U
16-02384	3.5-4 ft	0.18	U
16-02360	6.5-7 ft	1.00	U
16-02361	6.5-7 ft	2.10	
16-02362	6-6.5 ft	1.00	U
16-02361	7-7.5 ft	2.10	
16-02362	6.5-7 ft	1.00	U
16-02360	7.5-8 ft	1.00	U
16-02664	9.5-10 ft	0.16	U
16-02343	3.5-4 ft	0.18	U

Figure B-4. RDX concentrations in soil at SWMUs 16-007(a)-99 and 16-008(a)-99 following 1996 VCA activities

Table B-1
SWMUs and AOCs within Consolidated SWMUs 16-007(a)-99 and 16-008(a)-99 at TA-16

Area	SWMU or AOC	Location	Operational History	Construction Details	D&D	Contaminants	References
Consolidated SWMU 16-007(a)-99 (30s Line)	SWMU 16-007(a)	30s Line ponds	• Received waste water discharge from Buildings 16-31, 16-32, and 16-33, which were used for HE processing. • Constructed in 1944	• Four 100-ft × 100-ft flat-bottomed settling ponds aligned in a row from northwest to southeast. • Located on a level mesa with a depression 8 to 10 ft deep. Berms 4 to 6 ft high separated the ponds.	Yes - Excavated and filled (1967)	HE, inorganic chemicals including natural uranium, VOCs, and SVOCs	LANL, 1993, 20948, pp. 5-214–5-215 Courtright, 1969, 52964, p. 11
	SWMU 16-025(e)	TA-16-31: Building including associated sumps and drainlines	• Buildings were used for machining HE from 1944 to the early 1950s. Machine tools were transferred from machining buildings to TA-16-260 in 1951; • Buildings were converted to purposes other than machining in 1950s. In a 1950s list of structures, TA-16-31 is listed as a hot-cold chamber, TA-16-32 is listed as an x-ray building, and TA-16-33 is listed as an additive storage building; • Buildings were listed as HE-contamined in 1959.	• Consisted of two chambers (13 ft^2) for machining and a separate control room (8 ft^2). Pipes connected the control rooms to the machining chambers. • Wooden structures with concrete slab floors. Each building was almost entirely buried and had a door to the control room that was exposed on the southwest side. Doors to the machining chambers were located in blowout walls on the northeast side. • Originally, each machining chamber had a lead-lined trough for washing out HE. The lead-lined troughs were replaced with concrete troughs with spark-proof mastic covering in August 1945. • A sump that received effluent from the troughs of two machining chambers was located between each building and the road northeast of the 30s Line. Each sump had a drainline that passed beneath the adjacent road, under an earthen barricade, and into the 30s Line ponds. There were no secondary settling tanks and each of the three drainlines daylighted at one of the boundaries between two of the four ponds, feeding the two with a Y-shaped end pipe.	Yes - Decommissioned and burned (1960); Debris disposed at MDA P	HE, inorganic chemicals including natural uranium, VOCs, and SVOCs	LANL, 1993, 20948, pp. 5-214–5-215 LANL, 1994, 39440, pp. 5-318–5-319 and 5-356–5-358 Engineering Department, 1959, 05778, p. 1 Wingfield, 1960, 00915, p. 3
	SWMU 16-025(f)	TA-16-32: Building including associated sumps and drainlines					
	SWMU 16-024(e)	TA-16-33: Building including associated sumps and drainlines					

Table B-1 (continued)

Area	SWMU or AOC	Location	Operational History	Construction Details	D&D	Contaminants	References
Consolidated SWMU 16-007(a)-99 (30s Line)	SWMU 16-024(c)	TA-16-30: Magazine	• Built June 1945; • Used to store HE castings to be machined in TA-16-31, TA-16-32, and TA-16-33.	• Magazines were small (12 ft wide x 17.5 ft long x 8 ft high) and of wooden frame construction with a concrete floor. • A rough measurement of the earthen mounds over these magazines indicates that each was covered by approx. 5000ft^3 of soil.	Yes - Burned (1960)	HE, inorganic chemicals	
	AOC C-16-024(d)	TA-16-34: Magazine	• Built June 1945; • Stored machined product for physical and x-ray examination.		Yes - Unknown (unknown date)	HE, inorganic chemicals	
Consolidated SWMU 16-008(a)-99 (90s Line)	SWMU 16-008(a)	90s Line pond	• Settling pond that received liquid waste from the HE sumps at processing Buildings TA-16-89, TA-16-90, and TA-16-91. Pond area was once a small HE-burning site.	• 200ft-diameter, unlined settling pond. • May have been 10 to 15 ft deep. • Located on level mesa surrounded by trees.	No	HE, inorganic chemicals including natural uranium, VOCs, and SVOCs	LANL, 1993, 20948, pp. 5-215 and 5-217–5-219 Thrap, 1970, 05785, p. 2
	16-017(a)-99	TA-16-92: HE Machining Building	• Building did not discharge to the 90s Line pond and instead drained to a northeast drainage that empties into Cañon de Valle 600 ft north of the 90s Line; • Former HE machining building constructed in 1950, later converted for cleaning and refurbishing HE-contaminated equipment. By 1970, building was devoted entirely to storage and totally abandoned by 1991.	• Constructed of wood on a concrete slab and was 1332 ft^2 in the floor area. It was surrounded by an earthen berm that was packed against steel pilings.	Yes - Demolished and decontaminated (1996)	HE, inorganic chemicals including natural uranium, VOCs, and SVOCs	LANL, 1997, 87847, p. 36
	16-017(b)-99	TA-16-93: HE Machining Building	• Building did not discharge to the 90s Line pond and instead drained to a northeast drainage that empties into Cañon de Valle 600 ft north of the 90s Line; • Former HE machining building constructed in 1950, later converted to an electroplating facility. By 1970 building was devoted entirely to storage and totally abandoned by 1991.	• Constructed of wood on a concrete slab and was 1627 ft^2 in the floor area. It was surrounded by an earthen berm that was packed against steel pilings.			LANL, 1997, 87847, p. 43

Table B-1 (continued)

Area	SWMU or AOC	Location	Operational History	Construction Details	D&D	Contaminants	References
Consolidated SWMU 16-008(a)-99 (90s Line)	16-017(c)-99	TA-16-91: HE Machining Building	• Building discharged to 90s Line pond; • SWMU is a former HE machining building constructed in 1950 and converted in the late 1950s or early 1960s to a facility for cleaning and refurbishing HE-contaminated equipment. It operated from 1950 to 1980. The building was totally abandoned by 1991.	• Constructed of wood on a concrete slab and was 1332 ft^2 in the floor area. It was surrounded by an earthen berm that was packed against steel pilings.	Yes - Demolished and decontaminated (1996)	HE, inorganic chemicals including natural uranium, VOCs, and SVOCs	LANL, 1997, 87847, p. 28
	16-017(d)-99	TA-16-90: HE Machining Building	• Building discharged to 90s Line pond; • SWMU is a former HE machining building constructed in 1950 and operated until the early-1950s to late-1950s. The building was subsequently was converted to a storage facility during the late 1950s or early 1960s. It operated from 1950 to 1980. The building was totally abandoned by 1991.	• Constructed of wood on a concrete slab and was 2165 ft^2 in the floor area. It was surrounded by an earthen berm that was packed against steel pilings.			LANL, 1997, 87847, p. 20
	16-017(e)-99	TA-16-89: HE Machining Building	• Building discharged to 90s Line pond; • SWMU is a former HE machining building constructed in 1950 and operated until mid-1951 when the modern HE machining building (TA-16-260) was finished. Low levels of HE machining continued from the early-1950s to the late-1950s. In the late 1950s or early 1960s, the building subsequently was converted to a storage facility that operated until 1970. TA-16-89 was totally abandoned by 1991.	• Constructed of wood on concrete slab and was 1684 ft^2 in the floor area. It was surrounded on three sides by an earthen berm that was packed against steel pilings.	Yes - Demolished and decontaminated (1996)	HE, inorganic chemicals including natural uranium, VOCs, and SVOCs	LANL, 1997, 87847, p. 11

Table B-1 (continued)

Area	SWMU or AOC	Location	Operational History	Construction Details	D&D	Contaminants	References
Consolidated SWMU 16-008(a)-99 (90s Line)	16-026(m)	Drainlines and outfall	• Drain serviced building 16-92.	• Consisted of buried vitrified-clay pipe from the sumps to the road, depressions next to the road where the pipes day lighted, additional vitrified-clay pipe beneath the road leading to the north road, and an open-air drainage channel.	Yes - Demolished and decontaminated (1996)	HE, inorganic chemicals including natural uranium, VOCs, and SVOCs	LANL, 1994, 39440, p. 5-462 LANL, 1997, 87847, pp. 11, 20, 28, and 36
	16-026(n)	Drainlines and outfall	• Drain serviced building 16-91.				
	16-026(o)	Drainlines and outfall	• Drain serviced building 16-90.				
	16-026(p)	Drainlines and outfall	• Drain serviced building 16-89.				
	16-029(k)	Sumps for TA-16-93 and drainlines	• Received effluent from drain troughs in the floors of 90s Line buildings; • Sumps remodeled in 1967 to aid the machine cleaning operations but all were inactive by 1970. Effluents were listed as effectively negligible in 1971 except from TA-16-92, which discharged small amounts of HE, solvents, or other materials; • SWMU 16-029(k) also includes the drainline, outfall, and drainage because no outfall SWMU was defined for TA-16-93.	• Two concrete sumps were located in each building. Each sump was roughly 15 ft long x 5 ft wide x 5 ft deep.	Yes - Demolished and decontaminated (1996)	HE, inorganic chemicals including natural uranium, VOCs, and SVOCs	LANL, 1994, 39440, pp. 5-462–5-463 LANL, 1997, 87847, pp. 11, 20, 28, and 36
	16-029(l)	Sumps for TA-16-92					
	16-029(s)	Sumps for TA-16-91					
	16-029(t)	Sumps for TA-16-90					
	16-029(u)	Sumps for TA-16-89					
	AOC C-16-067	Drum Storage Platform (TA-16-191)	• Constructed in 1950 along with the 90s Line; • Copper and chromium sulfates used in electroplating were stored on the platform in addition to oils, solvents, and possibly HE. Materials were stored in containers equipped with spigots and laid on their sides. Platform was decommissioned in 1970.	• Structure made of wood and sat on steel legs a few feet off the ground adjacent to TA-16-90. • The storage platform was 8 ft long x 8 ft wide x 4.5 ft high.	Yes - Decommissioned (1970)	HE, inorganic chemicals, oils, VOCs, SVOCs	LANL, 1994, 39440, p. 5-462 Martin, 1993, 52964, p. 5

Table B-2
Analytical Results for 1986 Samples Collected at the 90s Line Pond

Location of Samples at Pond	Acetone [a] Solubles (wt%)	CCl_4 [b] Insolubles (wt%)	CCl_4 [c] Solubles (wt%)	HMX/RDX [d] Solubles (wt%)	TNT [e] (wt%)	Total Explosive (wt%)
1. On shore, in line with outfall and cut to pond	0.20	0.00	0.14	0.00	0.02	0.02
2. On shore, diametrically opposite outfall and cut	1.12	0.00	0.06	0.00	0.00	0.00
3. Knee deep in water, 2 m from shore, to left of (2)	0.16	0.00	0.13	0.00	0.01	0.01
4. Knee deep in water, 5 m from shore, to left of (2)	0.59	0.01	0.08	0.00	0.01	0.01
5. Control, soil sample from TA-16-460	0.07	0.00	0.05	0.00	0.00	0.00

Source: Baytos 1986, 05834

[a] The filtrate comes from the acetone Soxhlet extract on a dried, crushed, 14-mesh-sieved, rolled, and quartered sample. This filtrate includes explosives, decomposition products, plastic, lubrication oils, and other natural acetone-soluble materials.

[b] The residue from the carbon tetrachloride (CCl_4) wash includes the RDX and HMX fractions and other decomposition products from the acetone extract.

[c] The filtrate from the carbon tetrachloride wash includes the TNT fraction and other soluble products.

[d] These values have been run on a Perkin Elmer UV/Vis Model 554 ultraviolet spectrophotometer. The total explosives tend to be a fraction of the solubles and insolubles when determined by UV.

Table B-3
Summary of Detected Chemicals for Sediment Samples Collected in 1989 at the 90s Line Pond

Analyte	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	Frequency of Detects	Quantitation Limit (mg/kg)
2-Butanone	5	4	[0.011][a] to 0.150	4/5	0.011
Acetone	5	3	[0.010] to 0.040	3/5	0.011
Aluminum	5	5	16900 to 27700	5/5	NR[b]
Barium	5	5	434 to 2310	5/5	NR
Beryllium	5	5	0.96 to 1.4	5/5	NR
Cadmium	5	5	2.0 to 5.1	5/5	NR
Calcium	5	5	1190 to 3300	5/5	NR
Chromium	5	5	9.3 to 25.4	5/5	NR
Cobalt	5	2	[8.5] to 12.1	2/5	9.6
Copper	5	5	6.8 to 18.4	5/5	NR
Iron	5	5	10700 to 19600	5/5	NR
Magnesium	5	5	1830 to 3490	5/5	NR
Manganese	5	5	138 to 547	5/5	NR
Methylene chloride	5	5	0.002 to 0.004	5/5	NR
Nickel	5	1	[3.7] to 13.3	1/5	4.2
Potassium	5	5	1900 to 2830	5/5	NR
Silver	5	5	2.7 to 3.6	5/5	NR
Styrene	5	1	0.002 to [0.005]	1/5	0.005
Vanadium	5	5	9.4 to 28.1	5/5	NR
Zinc	5	5	31.1 to 99.3	5/5	NR

[a] Values in brackets are detection limits.
[b] NR = Not reported.

Table B-4
Summary of Inorganic Chemical Results for Sediment Samples Collected in 1989 at the 90s Line Pond

Sample ID	Depth (ft)	Aluminum	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Magnesium	Manganese	Nickel	Potassium	Silver	Vanadium	Zinc
LA81901XW	0.0–1.0	23500	434	1.1 (B)[a]	5	3300	23.2	9.6 (B)	8	17700	3020	422	4 (U)[b]	2480	2.7 (B)	27.6	99.3
LA81902XW	0.0–1.0	23800	2310	1.4	5.1	2640	25.4	12.1	12.8	19600	2880	547	13.3	2460	2.8 (B)	28.1	65.9
LA81903XW	0.0–1.0	27700	1730	1.4	4.5 (B)	2570	17.3	9.6 (U)	9.4	18800	3490	218	4.2 (U)	2830	3.6 (B)	25.3	57.4
LA81904XW	0.0–1.0	16900	1910	0.97 (B)	2.8 (B)	2100	9.3	9 (U)	18.4	12200	2350	340	3.9 (U)	2200	2.9 (B)	9.4 (B)	99
LA81905XW	0.0–1.0	17300	1080	0.96 (B)	2 (B)	1190	10.3	8.5 (U)	6.8	10700	1830	138	3.7 (U)	1900	2.9 (B)	10.8	31.1

Notes: Units are mg/kg.

a B = This qualifier indicates that the reported value is less than the contract-required detection limit or U.S. Department of Energy method detection limit, but greater than the instrument detection limit. Equivalent concentrations are allowable in method blanks, so data flagged with a “B” must be interpreted with caution.

b U = This qualifier indicates that the analyte was analyzed for, but not detected at or above the instrument detection limit (e.g., a value of 5 U indicates that the analyte was not present in concentrations equal to or greater than 5 µg/L or 5 mg/kg, depending on sample media).

Table B-5
Summary of Organic Chemical Results for Sediment Samples Collected in 1989 at the 90s Line Pond

Sample ID	Depth (ft)	2-Butanone	Acetone	Methylene Chloride	Styrene
LA81901XX	0.0–1.0	0.150	0.027	0.003 (J)[a]	0.005 (U)[b]
LA81902XX	0.0–1.0	0.100	0.040	0.004 (J)	0.002 (J)
LA81903XX	0.0–1.0	0.077	0.010 (U)	0.003 (J)	0.005 (U)
LA81904XX	0.0–1.0	0.011 (U)	0.011 (U)	0.002 (J)	0.005 (U)
LA81905XX	0.0–1.0	0.014	0.017	0.003 (J)	0.005 (U)

Note: Units are mg/kg.

[a] J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit. For example, if the sample quantitation limit is 0.010 mg/kg, but a concentration of 0.003 mg/kg is calculated, it is reported as 0.003 (J). The sample quantitation limit is adjusted for both dilution and percent moisture.

[b] U = Indicates the compound was analyzed for but not detected. The sample quantitation limit, which precedes the “U” qualifier, is corrected for dilution and percent moisture.

Table B-6
Summary of Detected Chemicals for Water Samples Collected in 1989 at the 90s Line Pond

Analyte	Number of Analyses	Number of Detects	Concentration Range (µg/L)	Frequency of Detects	Quantitation Limit (µg/L)
2-Butanone	3	1	5 to [10][a]	1/3	10
2-Hexanone	3	1	[10] to 13	1/3	10
Acetone	3	3	5 to 11	3/3	NR[b]
Aluminum	3	3	4550 to 38700	3/3	NR
Antimony	3	1	[73.5] to 122	1/3	73.5
Barium	3	3	5330 to 6420	3/3	NR
Beryllium	3	3	1.6 to 2.7	3/3	NR
Calcium	3	3	9860 to 12300	3/3	NR
Chromium	3	1	[4.9] to 15.6	1/3	4.9
Copper	3	2	[10] to 22.1	2/3	10
Iron	3	3	3040 to 24300	3/3	NR
Magnesium	3	3	3630 to 5770	3/3	NR
Manganese	3	3	63.2 to 125	3/3	NR
Methylene chloride	3	3	3 to 63	3/3	NR
Potassium	3	3	7430 to 9570	3/3	NR
Selenium	3	1	[272] to 339	1/3	272
Silver	3	3	10.2 to 38.5	3/3	NR
Sodium	3	3	4440 to 5320	3/3	NR
Vanadium	3	1	[16.5] to 17.8	1/3	16.5
Zinc	3	3	24.2 to 84.1	3/3	NR

[a] Values in brackets are detection limits.
[b] NR = Not reported.

Table B-7
Summary of Inorganic Chemical Results for Water Samples Collected in 1989 at the 90s Line Pond

Sample ID	Depth (ft)	Aluminum	Antimony	Barium	Beryllium	Calcium	Chromium	Copper	Iron	Magnesium	Manganese	Potassium	Selenium	Silver	Sodium	Vanadium	Zinc
LA82001XH	0.0–0.33	22500	122 (B)[a]	5330	1.6 (B)	10200	4.9 (U)[b]	10 (U)	16400	4510 (B)	88.3	8150	339 (B)	10.2 (B)	5320	16.5 (U)	65.6
LA82002XH	0.0v0.33	4550	73.5 (U)	6420	2.7 (B)	12300	4.9 (U)	22.1 (B)	3040	3630 (B)	63.2	7430	272 (U)	38.5	5040	16.5 (U)	24.2
LA82003XH	0.0–0.33	38700	73.5 (U)	5470	2 (B)	9860	15.6	20.4 (B)	24300	5770	125	9570	272 (U)	33.7	4440 (B)	17.8 (B)	84.1

Note: Units are µg/L.

[a] B = This qualifier indicates that the reported value is less than the contract-required detection limit or U.S. Department of Energy method detection limit, but greater than the instrument detection limit. Equivalent concentrations are allowable in method blanks, so data flagged with a “B” must be interpreted with caution.

[b] U = This qualifier indicates that the analyte was analyzed for, but not detected at or above the instrument detection limit (e.g., a value of 5 U indicates that the analyte was not present in concentrations equal to or greater than 5 µg/L or 5 mg/kg, depending on sample media).

Table B-8
Summary of Organic Chemical Results for Water Samples Collected in 1989 at the 90s Line Pond

Sample ID	Depth (ft)	2-Butanone	2-Hexanone	Acetone	Methylene Chloride
LA82001XA	0–0.33	10 (U)[a]	10 (U)	5 (J)[b]	57 (B)[c]
LA82002XA	0–0.33	10 (U)	10 (U)	7 (J)	63 (B)
LA82003XA	0–0.33	5 (JB)	13 (B)	11 (B)	3 (JB)

Note: Units are µg/L.

[a] U = Indicates that the compound was analyzed for but not detected. The sample quantitation limit, which precedes the "U" qualifier, is corrected for dilution and percent moisture.

[b] J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit. For example, if the sample quantitation limit is 10 µg/L, but a concentration of 3 µg/L is calculated, it is reported as 3 (J). The sample quantitation limit is adjusted for both dilution and percent moisture.

[c] B = This flag is used when the analyte is found in the associated analytical blank as well as the sample. It indicates possible/probable blank contamination and warns the data user that high bias is possible. This flag is used for a tentatively identified compound as well as for a positively identified target compound list compound.

Table B-9
Summary of Detected Chemicals for Soil Samples Collected in 1989 at the 30s Line Ponds

Analyte	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	Frequency of Detects	Quantitation Limit (mg/kg)
2-Butanone	12	3	0.004 to 0.106	3/12	0.066
4-Methyl-2-pentanone	12	1	[0.01][a] to [0.066]	1/12	0.066
Acetone	12	9	0.007 to 0.310	9/12	0.062
Aluminum	12	12	15600 to 39600	12/12	NR[b]
Arsenic	12	6	20.4 to [43.3]	6/12	43.3
Barium	12	12	160 to 226	12/12	NR
Benzene	12	1	0.004 to [0.033]	1/12	0.033
Beryllium	12	12	0.89 to 1.9	12/12	NR
Cadmium	12	6	[0.67] to 3.4	6/12	0.7
Calcium	12	12	2180 to 3880	12/12	NR
Chlorobenzene	12	1	0.004 to [0.033]	1/12	0.033
Chloroform	12	6	[0.005] to 0.048	6/12	0.006
Chromium	12	12	11 to 30.9	12/12	NR
Cobalt	12	7	7.0 to 11.5	7/12	9.2
Copper	12	12	4.7 to 11.8	12/12	NR
Iron	12	12	12900 to 25300	12/12	NR
Lead	12	6	10.6 to [31.9]	6/12	31.9
Magnesium	12	12	2270 to 4480	12/12	NR
Manganese	12	12	379 to 624	12/12	NR
Methylene chloride	12	10	0.002 to 0.032	10/12	0.005
Nickel	12	7	[3.7] to 18.6	7/12	4
Potassium	12	12	2000 to 4140	12/12	NR
Silver	12	6	[0.76] to 3.2	6/12	0.79
Sodium	12	6	206 to 300	6/12	268
Toluene	12	1	0.005 to [0.033]	1/12	0.033
Trichloroethene	12	1	0.002 to [0.033]	1/12	0.033
Vanadium	12	12	18.2 to 46	12/12	NR
Zinc	12	12	30.2 to 51.8	12/12	NR

[a] Values in brackets are detection limits.
[b] NR = Not reported.

Table B-10
Summary of Inorganic Chemical Results for Soil Samples Collected in 1989 at the 30s Line Ponds

Sample ID	Depth (ft)	Aluminum	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium
LA82101XW	3–4.5	28400	21.3 (B) [a]	221	1.5	0.67 (U) [b]	3040	22.3	8.7 (B)	10.8	19800	16.9 (B)	3470
LA82102XW	3–4.5	28900	20.4 (B)	200	1.5	0.68 (U)	3120	25.3	7 (B)	10.2	20400	10.6 (B)	3580
LA82103XW	2.5–4.5	29400	29.2 (B)	210	1.4	0.68 (U)	3000	28.6	8.3 (B)	9.7	20000	12.7 (B)	3610
LA82104XW	2.5–4.5	30200	33.3 (B)	216	1.5	0.68 (U)	3170	22.7	8.4 (B)	11.1	19600	13.7 (B)	3770
LA82105XW	2.5–4.5	39600	34.7 (B)	200	1.9	0.69 (U)	3880	30.9	11.5 (B)	11.8	25300	19.1 (B)	4480
LA82106XW	2.5–4.5	31500	29.2 (B)	207	1.5	0.7 (U)	3700	26.5	8.7 (B)	10.6	20800	13.7 (B)	3850
LA82107XW	0V5	21900	43.3 (U)	193	1.2	3.4 (B)	2600	15.8	9.2 (U)	4.7 (B)	15900	31.9 (U)	2790
LA82108XW	0–5	15700	40.2 (U)	175	0.89 (B)	2.8 (B)	2180	11	8.6 (U)	7.4	12900	29.7 (U)	2270
LA82109XW	0–5	15600	42.3 (U)	160	0.93 (B)	3 (B)	2270	11.4	9 (U)	7.1	13400	31.2 (U)	2290
LA82110XW	0–5	18000	42.6 (U)	226	1.1 (B)	3.4 (B)	2710	13	10.3 (B)	6.2	13400	31.4 (U)	2540
LA82111XW	0–5	19900	39.2 (U)	192	1.1	3.2 (B)	2470	14	8.4 (U)	5.9	13900	29 (U)	2610
LA82112XW	0–5	19300	42.1 (U)	170	1 (B)	3 (B)	2280	12.5	9 (U)	7.1	13600	31.1 (U)	2360

Table B-10 (continued, reading from left to right)

Sample ID	Depth (ft)	Manganese	Nickel	Potassium	Silver	Sodium	Vanadium	Zinc
LA82101XW	3–4.5	571	15.5	3140	0.76 (U)	239 (B)	29	43
LA82102XW	3–4.5	379	15.2	2970	0.77 (U)	245 (B)	28.7	44.6
LA82103XW	2.5–4.5	451	15.2	3280	0.77 (U)	206 (B)	32.7	38.7
LA82104XW	2.5–4.5	468	17	3340	0.77 (U)	209 (B)	30.1	40.8
LA82105XW	2.5–4.5	524	18.6	4140	0.78 (U)	300 (B)	46	51.8
LA82106XW	2.5–4.5	489	14.5	3720	0.79 (U)	244 (B)	32.3	41.4
LA82107XW	0–5	537	4 (U)	2290	3 (B)	268 (U)	21.3	34.8
LA82108XW	0–5	583	3.7 (U)	2120	3.1 (B)	250 (U)	18.2	30.2
LA82109XW	0–5	529	3.9 (U)	2130	3.2 (B)	262 (U)	20.6	34.9
LA82110XW	0–5	624	3.9 (U)	2000	2.8 (B)	264 (U)	21.2	36.4
LA82111XW	0–5	468	4.2 (B)	2380	2.9 (B)	243 (U)	19.6	37.1
LA82112XW	0–5	439	3.9 (U)	2300	2.7 (B)	261 (U)	19.2	39.5

Notes: Units are mg/kg.

[a] B = This qualifier indicates that the reported value is less than the contract-required detection limit or U.S. Department of Energy method detection limit, but greater than the instrument detection limit. Equivalent concentrations are allowable in method blanks, so data flagged with a “B” must be interpreted with caution.

[b] U = This qualifier indicates that the analyte was analyzed for, but not detected at or above the instrument detection limit (e.g., a value of 5 U indicates that the analyte was not present in concentrations equal to or greater than 5 µg/L or 5 mg/kg, depending on sample media).

Table B-11
Summary of Organic Chemical Results for Soil Samples Collected in 1989 at the 30s Line Ponds

Sample ID	Depth (ft)	2-Butanone	4-Methyl-2-pentanone	Acetone	Benzene	Chlorobenzene	Chloroform	Methylene chloride	Toluene	Trichloroethene
LA82101XX	3–4.5	0.060 (U) [a]	0.013 (J) [b]	0.081 (B) [c]	0.030 (U)	0.030 (U)	0.034 (B)	0.022 (JB)	0.030 (U)	0.030 (U)
LA82102XX	3–4.5	0.066 (U)	0.066 (U)	0.190 (B)	0.033 (U)	0.033 (U)	0.035 (B)	0.025 (JB)	0.033 (U)	0.033 (U)
LA82103XX	2.5–4.5	0.062 (U)	0.062 (U)	0.310 (B)	0.031 (U)	0.031 (U)	0.048 (B)	0.023 (JB)	0.031 (U)	0.031 (U)
LA82104XX	2.5–4.5	0.062 (U)	0.062 (U)	0.220 (B)	0.031 (U)	0.031 (U)	0.028 (JB)	0.032 (B)	0.031 (U)	0.031 (U)
LA82105XX	2.5–4.5	0.062 (U)	0.062 (U)	0.160 (B)	0.031 (U)	0.031 (U)	0.033 (B)	0.024 (JB)	0.031 (U)	0.031 (U)
LA82106XX	2.5–4.5	0.106	0.062 (U)	0.062 (U)	0.031 (U)	0.031 (U)	0.035 (B)	0.022 (JB)	0.031 (U)	0.031 (U)
LA82107XX	0–5	0.010 (U)	0.010 (U)	0.007 (J)	0.005 (U)	0.005 (U)	0.005 (U)	0.002 (J)	0.005 (U)	0.005 (U)
LA82108XX	0–5	0.011 (U)	0.011 (U)	0.011 (U)	0.005 (U)	0.005 (U)	0.005 (U)	0.005 (U)	0.005 (U)	0.005 (U)
LA82109XX	0–5	0.004 (JB)	0.012 (U)	0.010 (JB)	0.006 (U)	0.006 (U)	0.006 (U)	0.005 (JB)	0.006 (U)	0.006 (U)
LA82110XX	0–5	0.007 (JB)	0.012 (U)	0.012 (JB)	0.006 (U)	0.006 (U)	0.006 (U)	0.006 (B)	0.006 (U)	0.006 (U)
LA82111XX	0–5	0.011 (U)	0.011 (U)	0.009 (JB)	0.005 (U)	0.005 (U)	0.005 (U)	0.006 (B)	0.005 (U)	0.005 (U)
LA82112XX	0–5	0.011 (U)	0.011 (U)	0.011 (U)	0.004 (J)	0.004 (J)	0.005 (U)	0.005 (U)	0.005 (J)	0.002 (J)

Notes: Units are mg/kg.

[a] U = Indicates the compound was analyzed for but not detected. The sample quantitation limit, which precedes the "U" qualifier, is corrected for dilution and percent moisture.

[b] J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit. For example, if the sample quantitation limit is 0.010 mg/kg, but a concentration of 0.003 mg/kg is calculated, it is reported as 0.003 (J). The sample quantitation limit is adjusted for both dilution and percent moisture.

[c] B = This flag is used when the analyte is found in the associated analytical blank as well as the sample. It indicates possible/probable blank contamination and warns the data user that high bias is possible. This flag is used for a tentatively identified compound as well as for a positively identified target compound list compound.

Table B-12
Soil, Sediment, and Tuff Samples Collected from 90s Line During the 1996 VCA

Sample ID	Location ID	Depth	Medium	Uranium	Metals (EPA 6010)	Metals (EPA 6020)	Chromium VI (EPA 7196A)	Mercury (EPA 7470)	Mercury (EPA 7471A)	Thallium (EPA 7841)	VOCs (EPA 8260)	SVOCs (EPA 8270)	HE (EPA 8330)	Cyanide (EPA 9010)	Cyanide (EPA 9012A)
0316-96-0010	16-02340	4-4.5	Fill	*—	1968	1970	—	—	1968	—	1967	1967	1969	—	1968
0316-96-0011	16-02341	2-2.5	Fill	—	1968	1970	—	—	1968	—	1967	1967	1969	—	1968
0316-96-0012	16-02343	3.5-4	Fill	—	1968	1970	—	—	1968	—	1967	1967	1969	—	1968
0316-96-0013	16-02344	3.5-4	Fill	—	1968	1970	—	—	1968	—	1967	1967	1969	—	1968
0316-96-0014	16-02345	0-0.5	Fill	—	1968	1970	—	—	1968	—	1967	1967	1969	—	1968
0316-96-0015	16-02415	4-4.5	Fill	—	1968	1970	—	—	1968	—	1967	1967	1969	—	1968
0316-96-0016	16-02418	4-4.5	Fill	—	1968	1970	—	—	1968	—	1967	1967	1969	—	1968
0316-96-0018	16-02415	6-6.5	Qbt4	—	2013	2015	—	2013	—	—	—	—	2014	—	2013
0316-96-0019	16-02418	6.5-7	Qbt4	—	2013	2015	—	2013	—	—	—	—	2014	—	2013
0316-96-0020	16-02421	4-4.5	Soil	—	1955	—	—	1955	—	—	1954	1954	1956	—	1955
0316-96-0021	16-02422	4-4.5	Fill	—	1955	—	—	1955	—	—	1954	1954	1956	—	1955
0316-96-0022	16-02350	3-3.5	Fill	—	1955	—	—	1955	—	—	1954	1954	1956	—	1955
0316-96-0023	16-02351	3-3.5	Fill	—	1955	—	—	1955	—	—	1954	1954	1956	—	1955
0316-96-0024	16-02352	2-2.5	Fill	—	1955	—	—	1955	—	—	1954	1954	1956	—	1955
0316-96-0028	16-02421	7-8	Soil	—	2092	—	—	—	2092	—	2090	2090	2093	—	2092
0316-96-0029	16-02422	7-8	Qbt4	—	2013	—	—	2013	—	—	—	—	2014	—	2013
0316-96-0030	16-02425	4-4.5	Soil	—	1998	—	—	1998	—	—	1997	1997	1999	—	1998
0316-96-0031	16-02427	4-4.5	Soil	—	1998	—	—	1998	—	—	1997	1997	1999	—	1998
0316-96-0032	16-02430	4-4.5	Soil	—	1998	—	—	1998	—	—	1997	1997	1999	—	1998
0316-96-0033	16-02363	4.5-5	Soil	—	2158	—	—	—	2158	—	2157	2157	2159	—	2158
0316-96-0038	16-02427	7-8	Qbt4	—	2092	—	—	—	2092	—	2090	2090	2093	—	2092
0316-96-0039	16-02430	7-8	Qbt4	—	2092	—	—	—	2092	—	2090	2090	2093	—	2092
0316-96-0040	16-02431	4-4.5	Soil	—	2013	—	—	2013	—	—	—	—	2014	—	2013
0316-96-0041	16-02433	4-4.5	Soil	—	2013	—	—	2013	—	—	—	—	2014	—	2013
0316-96-0042	16-02434	4-4.5	Fill	—	2132	—	—	2132	—	—	2131	2131	2133	—	2132
0316-96-0045	16-02375	0-0.5	Soil	—	2132	—	—	2132	—	—	—	—	2133	—	2132

Table B-12 (continued)

Sample ID	Location ID	Depth	Medium	Uranium	Metals (EPA 6010)	Metals (EPA 6020)	Chromium VI (EPA 7196A)	Mercury (EPA 7470)	Mercury (EPA 7471A)	Thallium (EPA 7841)	VOCs (EPA 8260)	SVOCs (EPA 8270)	HE (EPA 8330)	Cyanide (EPA 9010)	Cyanide (EPA 9012A)
0316-96-0048	16-02433	7-8	Soil	—	2013	—	—	2013	—	—	—	—	2014	—	2013
0316-96-0049	16-02436	6.5-7	Soil	—	2013	—	—	2013	—	—	—	—	2014	—	2013
0316-96-0050	16-02394	4-4.5	Soil	—	1935	—	—	1935	—	—	1934	1934	1936	—	1935
0316-96-0051	16-02392	4-4.5	Soil	—	1935	—	—	1935	—	—	1934	1934	1936	—	1935
0316-96-0052	16-02393	4-4.5	Soil	—	1935	—	—	1935	—	—	1934	1934	1936	—	1935
0316-96-0053	16-02381	3-3.5	Soil	—	1935	—	—	1935	—	—	1934	1934	1936	—	1935
0316-96-0054	16-02383	2.5-3	Soil	—	1935	—	—	1935	—	—	1934	1934	1936	—	1935
0316-96-0055	16-02384	3.5-4	Soil	—	1935	—	1935	1935	—	—	1934	1934	1936	—	1935
0316-96-0056	16-02386	1.5-2	Soil	—	1935	—	—	1935	—	—	1934	1934	1936	—	1935
0316-96-0058	16-02393	7-8	Qbt4	—	2092	—	—	—	2092	—	2090	2090	2093	—	2092
0316-96-0059	16-02394	7.5-8	Qbt4	—	2030	—	—	—	2030	—	2029	2029	2028	—	2030
0316-96-0076	16-02346	0-0.5	Soil	2244	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0077	16-02347	0-0.5	Soil	2244	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0078	16-02348	0-0.5	Soil	2244	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0079	16-02349	0-0.5	Soil	2244	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0080	16-02240	3-3.5	Soil	—	2158	—	—	—	2158	—	2157	2157	2159	—	2158
0316-96-0086	16-02356	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0087	16-02357	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0088	16-02358	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0089	16-02359	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0092	16-02364	4.5-5	Soil	—	2197	—	—	—	2197	—	2196	2196	2198	—	2197
0316-96-0094	16-02360	6.5-7	Qbt4	—	2492	—	—	—	2492	—	2491	2491	2494	2492	—
0316-96-0095	16-02360	6.5-7	Qbt4	—	—	—	—	—	2492	—	—	—	—	—	—
0316-96-0095	16-02361	6.5-7	Qbt4	—	2492	—	—	—	—	—	2491	2491	2494	2492	—
0316-96-0096	16-02366	4-4.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0097	16-02367	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242

Table B-12 (continued)

Sample ID	Location ID	Depth	Medium	Uranium	Metals (EPA 6010)	Metals (EPA 6020)	Chromium VI (EPA 7196A)	Mercury (EPA 7470)	Mercury (EPA 7471A)	Thallium (EPA 7841)	VOCs (EPA 8260)	SVOCs (EPA 8270)	HE (EPA 8330)	Cyanide (EPA 9010)	Cyanide (EPA 9012A)
0316-96-0098	16-02368	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0099	16-02369	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0100	16-02370	3.5-4	Soil	—	2197	—	—	—	2197	—	2196	2196	2198	—	2197
0316-96-0102	16-02362	6-6.5	Qbt4	—	2492	—	—	—	2492	—	2491	2491	2494	2492	—
0316-96-0106	16-02377	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0107	16-02378	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0108	16-02376	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0109	16-02379	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0110	16-02255	3-3.5	Soil	—	2197	—	—	—	2197	—	2196	2196	2198	—	2197
0316-96-0111	16-02256	3-3.5	Soil	—	2197	—	—	—	2197	—	2196	2196	2198	—	2197
0316-96-0116	16-02388	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0117	16-02389	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0118	16-02390	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0119	16-02635	0-0.5	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0132	16-02547	0.67-1.17	Soil	2244	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0133	16-02550	0.67-1.17	Soil	2244	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0134	16-02554	0.67-1.17	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0135	16-02555	0.67-1.17	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0136	16-02560	1.5-2	Soil	—	2079	—	—	—	2079	—	2078	2078	2082	—	2079
0316-96-0137	16-02563	1.5-2	Soil	—	2079	—	—	—	2079	—	2078	2078	2082	—	2079
0316-96-0138	16-02568	0.67-1.17	Soil	—	2079	—	—	—	2079	—	2078	2078	2082	—	2079
0316-96-0139	16-02570	0.67-1.17	Soil	—	2079	—	—	—	2079	—	2078	2078	2082	—	2079
0316-96-0140	16-02572	0.67-1.17	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0141	16-02575	0.67-1.17	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-96-0146	16-02595	6.5-7.5	Soil	—	2092	—	—	—	2092	—	2090	2090	2093	—	2092
0316-96-0147	16-02354	6-7	Soil	—	2092	—	—	—	2092	—	2090	2090	2093	—	2092

Table B-12 (continued)

Sample ID	Location ID	Depth	Medium	Uranium	Metals (EPA 6010)	Metals (EPA 6020)	Chromium VI (EPA 7196A)	Mercury (EPA 7470)	Mercury (EPA 7471A)	Thallium (EPA 7841)	VOCs (EPA 8260)	SVOCs (EPA 8270)	HE (EPA 8330)	Cyanide (EPA 9010)	Cyanide (EPA 9012A)
0316-96-0148	16-02372	2-3	Soil	—	2170	—	—	2170	—	—	2169	2169	2171	—	2170
0316-96-0149	16-02373	5.5-6	Soil	—	2170	—	—	2170	—	—	2169	2169	2171	—	2170
0316-96-0153	16-02240	4.5-5.5	Soil	—	2158	—	—	—	2158	—	2157	2157	2159	—	2158
0316-96-0154	16-02363	6.5-7.5	Soil	—	2158	—	—	—	2158	—	2157	2157	2159	—	2158
0316-96-0157	16-02364	5-6	Soil	—	2197	—	—	—	2197	—	2196	2196	2198	—	2197
0316-96-0158	16-02370	4-5	Soil	—	2197	—	—	—	2197	—	2196	2196	2198	—	2197
0316-96-0160	16-02361	7-7.5	Qbt4	—	2492	—	—	—	2492	—	2491	2491	2494	2492	—
0316-96-0161	16-02362	6.5-7	Qbt4	—	2492	—	—	—	2492	—	2491	2491	2494	2492	—
0316-96-0164	16-02360	7.5-8	Qbt4	—	2492	—	—	—	2492	—	2491	2491	2494	2492	—
0316-96-0201	16-02415	7.5-8	Qbt4	—	—	—	—	—	—	—	2090	2090	—	—	—
0316-96-0202	16-02418	7-7.5	Qbt4	—	—	—	—	—	—	—	2090	2090	—	—	—
0316-96-0203	16-02422	6.5-7	Qbt4	—	—	—	—	—	—	—	2090	2090	—	—	—
0316-96-0204	16-02433	7-8	Qbt4	—	—	—	—	—	—	—	2090	2090	—	—	—
0316-96-0205	16-02436	7-8	Qbt4	—	—	—	—	—	—	—	2090	2090	—	—	—
0316-96-0206	16-02431	4-4.5	Soil	—	—	—	—	—	—	—	2128	2128	—	—	—
0316-96-0207	16-02433	4-4.5	Soil	—	—	—	—	—	—	—	2128	2128	—	—	—
0316-96-0208	16-02373	4-4.5	Soil	—	2170	—	—	2170	—	—	2169	2169	2171	—	2170
0316-96-2000	16-02372	0-0.5	Soil	—	2170	—	—	2170	—	—	2169	2169	2171	—	2170
0316-96-2001	16-02373	3-3.5	Soil	—	2129	—	—	—	2129	—	—	—	2130	—	2129
0316-96-2002	16-02373	4-4.5	Soil	—	2170	—	—	2170	—	—	2169	2169	2171	—	2170
0316-96-2003	16-02554	0.67-1.17	Soil	—	2242	—	—	—	2242	—	2241	2241	2243	—	2242
0316-97-0425	16-02664	9.5-10	Sediment	—	3910R	—	—	—	3910R	—	3908R	3908R	3909R	—	3910R
0316-98-0418	16-02669	37.5-38.5	Qbt4	—	4093R	—	—	—	4093R	—	4091R	4091R	4092R	4093R	—
0316-98-0419	16-02669	109-110	Qbt4	—	4154R	—	—	—	4154R	4154R	4152R	4152R	4153R	4154R	—

Note: Numbers in the analysis columns are analytical request numbers.

*— = Not analyzed.

Table B-13
Quantitative Field-Screening Results for RDX and TNT
Obtained During the 1996 VCA

Date Collected	Field Screening Sample ID	Location ID	Location Description	Sample Medium	Concen-tration[a]	Analyte
5/21/1996	0316-96-1226	16-02243	16-026(p) HE Drainline	Subsurface	1.86	RDX
5/21/1996	0316-96-1226	16-02243	16-026(p) HE Drainline	Subsurface	>5	TNT
5/21/1996	0316-96-1227	16-02244	16-026(p) HE Drainline	Subsurface	>6	RDX
5/21/1996	0316-96-1227	16-02244	16-026(p) HE Drainline	Subsurface	>5	TNT
5/21/1996	0316-96-1228	16-02245	16-026(p) HE Drainline	Subsurface	0.7	RDX
5/21/1996	0316-96-1228	16-02245	16-026(p) HE Drainline	Subsurface	1.21	TNT
5/21/1996	0316-96-1229	16-02246	16-026(p) HE Drainline	Subsurface	ND	RDX
5/21/1996	0316-96-1229	16-02246	16-026(p) HE Drainline	Subsurface	ND	TNT
5/23/1996	0316-96-1230	16-02247	16-026(p) HE Drainline	Subsurface	3.62	RDX
5/23/1996	0316-96-1230	16-02247	16-026(p) HE Drainline	Subsurface	1.475	TNT
5/23/1996	0316-96-1231	16-02248	16-026(p) HE Drainline	Subsurface	1.54	RDX
5/23/1996	0316-96-1231	16-02248	16-026(p) HE Drainline	Subsurface	0.5	TNT
5/24/1996	0316-96-1232	16-02249	16-026(o) HE Drainline	Subsurface	5.5	RDX
5/24/1996	0316-96-1232	16-02249	16-026(o) HE Drainline	Subsurface	>5	TNT
5/24/1996	0316-96-1233	16-02250	16-026(o) HE Drainline	Subsurface	1.54	RDX
5/24/1996	0316-96-1233	16-02250	16-026(o) HE Drainline	Subsurface	ND	TNT
5/24/1996	0316-96-1234	16-02251	16-026(o) HE Drainline	Subsurface	>6	RDX
5/24/1996	0316-96-1234	16-02251	16-026(o) HE Drainline	Subsurface	>5	TNT
5/24/1996	0316-96-1235	16-02252	16-026(o) HE Drainline	Subsurface	1.05	RDX
5/24/1996	0316-96-1235	16-02252	16-026(o) HE Drainline	Subsurface	2.625	TNT
5/29/1996	0316-96-1236	16-02253	16-026(o) HE Drainline	Subsurface	1.98	RDX
5/29/1996	0316-96-1236	16-02253	16-026(o) HE Drainline	Subsurface	1.575	TNT
5/29/1996	0316-96-1237	16-02254	16-026(o) HE Drainline	Subsurface	2.45	RDX
5/29/1996	0316-96-1237	16-02254	16-026(o) HE Drainline	Subsurface	1.625	TNT
4/9/1996	0316-96-1000	16-02340	16-026(m) HE Drainline	Subsurface	ND	RDX
4/9/1996	0316-96-1000	16-02340	16-026(m) HE Drainline	Subsurface	0.5	TNT
4/9/1996	0316-96-1001	16-02341	16-026(m) HE Drainline	Subsurface	0.7	RDX
4/9/1996	0316-96-1001	16-02341	16-026(m) HE Drainline	Subsurface	0.5	TNT
4/9/1996	0316-96-1002	16-02342	16-026(m) HE Drainline	Subsurface	ND	RDX
4/9/1996	0316-96-1002	16-02342	16-026(m) HE Drainline	Subsurface	0.5	TNT
4/9/1996	0316-96-1003	16-02343	16-026(m) HE Drainline	Subsurface	0.5	RDX
4/9/1996	0316-96-1003	16-02343	16-026(m) HE Drainline	Subsurface	ND	TNT
4/9/1996	0316-96-1004	16-02344	16-026(m) HE Drainline	Subsurface	0.8	RDX
4/9/1996	0316-96-1004	16-02344	16-026(m) HE Drainline	Subsurface	ND	TNT
4/9/1996	0316-96-1005	16-02345	16-026(m) HE Drainline	Subsurface	ND	RDX
4/9/1996	0316-96-1005	16-02345	16-026(m) HE Drainline	Subsurface	ND	TNT
4/16/1996	0316-96-1006	16-02346	16-026(m) HE Drainline	Surface	ND	RDX
4/16/1996	0316-96-1006	16-02346	16-026(m) HE Drainline	Surface	0.5	TNT
4/16/1996	0316-96-1007	16-02347	16-026(m) HE Drainline	Surface	ND	RDX
4/16/1996	0316-96-1007	16-02347	16-026(m) HE Drainline	Surface	0.5	TNT
4/16/1996	0316-96-1008	16-02348	16-026(m) HE Drainline	Surface	ND	RDX
4/16/1996	0316-96-1008	16-2348	16-026(m) HE Drainline	Surface	0.5	TNT

Table B-13 (continued)

Date Collected	Field Screening Sample ID	Location ID	Location Description	Sample Medium	Concen-tration [a]	Analyte
4/16/1996	0316-96-1009	16-02349	16-026(m) HE Drainline	Surface	ND	RDX
4/16/1996	0316-96-1009	16-02349	16-026(m) HE Drainline	Surface	0.5	TNT
5/13/1996	0316-96-1471	16-02350	16-026(n) HE Drainline	Subsurface	2	RDX
4/5/1996	0316-96-1010	16-02350	16-026(n) HE Drainline	Subsurface	>6	RDX
5/13/1996	0316-96-1471	16-02350	16-026(n) HE Drainline	Subsurface	1.4	TNT
4/5/1996	0316-96-1010	16-02350	16-026(n) HE Drainline	Subsurface	>5	TNT
4/5/1996	0316-96-1011	16-02351	16-026(n) HE Drainline	Subsurface	5	RDX
4/5/1996	0316-96-1011	16-02351	16-026(n) HE Drainline	Subsurface	1.3	TNT
4/5/1996	0316-96-1012	16-02352	16-026(n) HE Drainline	Subsurface	2.1	RDX
4/5/1996	0316-96-1012	16-02352	16-026(n) HE Drainline	Subsurface	1.6	TNT
4/5/1996	0316-96-1013	16-02353	16-026(n) HE Drainline	Subsurface	4	RDX
4/5/1996	0316-96-1013	16-02353	16-026(n) HE Drainline	Subsurface	1	TNT
5/13/1996	0316-96-1472	16-02354	16-026(n) HE Drainline	Subsurface	0.9	RDX
4/5/1996	0316-96-1014	16-02354	16-026(n) HE Drainline	Subsurface	>6	RDX
5/13/1996	0316-96-1472	16-02354	16-026(n) HE Drainline	Subsurface	0.9	TNT
4/5/1996	0316-96-1014	16-02354	16-026(n) HE Drainline	Subsurface	1.75	TNT
4/5/1996	0316-96-1015	16-02355	16-026(n) HE Drainline	Subsurface	ND	RDX
4/5/1996	0316-96-1015	16-02355	16-026(n) HE Drainline	Subsurface	0.9	TNT
4/5/1996	0316-96-1016	16-02356	16-026(n) HE Drainline	Surface	ND	RDX
4/5/1996	0316-96-1016	16-02356	16-026(n) HE Drainline	Surface	0.7	TNT
4/5/1996	0316-96-1017	16-02357	16-026(n) HE Drainline	Surface	ND	RDX
4/5/1996	0316-96-1017	16-02357	16-026(n) HE Drainline	Surface	0.6	TNT
4/5/1996	0316-96-1018	16-02358	16-026(n) HE Drainline	Surface	ND	RDX
4/5/1996	0316-96-1018	16-02358	16-026(n) HE Drainline	Surface	0.6	TNT
4/5/1996	0316-96-1019	16-02359	16-026(n) HE Drainline	Surface	ND	RDX
4/5/1996	0316-96-1019	16-02359	16-026(n) HE Drainline	Surface	0.7	TNT
5/23/1996	0316-96-1020	16-02360	16-026(o) HE Drainline	Subsurface	1.78	RDX
5/23/1996	0316-96-1020	16-02360	16-026(o) HE Drainline	Subsurface	3.618	TNT
5/23/1996	0316-96-1021	16-02361	16-026(o) HE Drainline	Subsurface	4.6	RDX
5/23/1996	0316-96-1021	16-02361	16-026(o) HE Drainline	Subsurface	2.175	TNT
5/23/1996	0316-96-1022	16-02362	16-026(o) HE Drainline	Subsurface	2.06	RDX
5/23/1996	0316-96-1022	16-02362	16-026(o) HE Drainline	Subsurface	3.484	TNT
5/29/1996	0316-96-1480	16-02363	16-026(o) HE Drainline	Subsurface	2.58	RDX
5/23/1996	0316-96-1023	16-02363	16-026(o) HE Drainline	Subsurface	>6	RDX
5/29/1996	0316-96-1480	16-02363	16-026(o) HE Drainline	Subsurface	2.175	TNT
5/23/1996	0316-96-1023	16-02363	16-026(o) HE Drainline	Subsurface	>5	TNT
5/16/1996	0316-96-1024	16-02364	16-026(o) HE Drainline	Subsurface	1	RDX
5/16/1996	0316-96-1024	16-02364	16-026(o) HE Drainline	Subsurface	ND	TNT
5/16/1996	0316-96-1025	16-02365	16-026(o) HE Drainline	Subsurface	ND	RDX
5/16/1996	0316-96-1025	16-02365	16-026(o) HE Drainline	Subsurface	ND	TNT
5/16/1996	0316-96-1026	16-02366	16-026(o) HE Drainline	Surface	1.3	RDX
5/16/1996	0316-96-1026	16-02366	16-026(o) HE Drainline	Surface	ND	TNT
4/24/1996	0316-96-1027	16-02367	16-026(o) HE Drainline	Surface	ND	RDX
4/24/1996	0316-96-1027	16-02367	16-026(o) HE Drainline	Surface	ND	TNT
4/24/1996	0316-96-1028	16-02368	16-026(o) HE Drainline	Surface	0.7	RDX
4/24/1996	0316-96-1028	16-02368	16-026(o) HE Drainline	Surface	ND	TNT
4/24/1996	0316-96-1029	16-02369	16-026(o) HE Drainline	Surface	ND	RDX
4/24/1996	0316-96-1029	16-02369	16-026(o) HE Drainline	Surface	0.5	TNT

Table B-13 (continued)

Date Collected	Field Screening Sample ID	Location ID	Location Description	Sample Medium	Concen-tration [a]	Analyte
5/16/1996	0316-96-1030	16-02370	16-026(p) HE Drainline	Subsurface	ND	RDX
5/16/1996	0316-96-1030	16-02370	16-026(p) HE Drainline	Subsurface	ND	TNT
5/16/1996	0316-96-1031	16-02371	16-026(p) HE Drainline	Subsurface	0.85	RDX
5/16/1996	0316-96-1031	16-02371	16-026(p) HE Drainline	Subsurface	ND	TNT
5/22/1996	0316-96-1478	16-02372	16-026(p) HE Drainline	Subsurface	ND	RDX
5/22/1996	0316-96-1478	16-02372	16-026(p) HE Drainline	Subsurface	1.725	TNT
5/16/1996	0316-96-1032	16-02372	16-026(p) HE Drainline	Surface	5.58	RDX
5/16/1996	0316-96-1032	16-02372	16-026(p) HE Drainline	Surface	>5	TNT
5/22/1996	0316-96-1479	16-02373	16-026(p) HE Drainline	Subsurface	2.14	RDX
5/1/1996	0316-96-1033	16-02373	16-026(p) HE Drainline	Subsurface	>6	RDX
5/22/1996	0316-96-1479	16-02373	16-026(p) HE Drainline	Subsurface	0.855	TNT
5/1/1996	0316-96-1033	16-02373	16-026(p) HE Drainline	Subsurface	4.7	TNT
5/1/1996	0316-96-1034	16-02374	16-026(p) HE Drainline	Subsurface	2.3	RDX
5/1/1996	0316-96-1034	16-02374	16-026(p) HE Drainline	Subsurface	2.6	TNT
5/1/1996	0316-96-1035	16-02375	16-026(p) HE Drainline	Surface	0.6	RDX
5/1/1996	0316-96-1035	16-02375	16-026(p) HE Drainline	Surface	ND	TNT
4/24/1996	0316-96-1036	16-02376	16-026(p) HE Drainline	Surface	4.9	RDX
4/24/1996	0316-96-1036	16-02376	16-026(p) HE Drainline	Surface	0.5	TNT
4/24/1996	0316-96-1037	16-02377	16-026(p) HE Drainline	Surface	4	RDX
4/24/1996	0316-96-1037	16-02377	16-026(p) HE Drainline	Surface	0.5	TNT
4/24/1996	0316-96-1038	16-02378	16-026(p) HE Drainline	Surface	ND	RDX
4/24/1996	0316-96-1038	16-02378	16-026(p) HE Drainline	Surface	ND	TNT
4/24/1996	0316-96-1039	16-02379	16-026(p) HE Drainline	Surface	0.9	RDX
4/24/1996	0316-96-1039	16-02379	16-026(p) HE Drainline	Surface	ND	TNT
3/28/1996	0316-96-1041	16-02381	16-029(k) HE Sump/Drainline	Subsurface	1.5	RDX
3/28/1996	0316-96-1041	16-02381	16-029(k) HE Sump/Drainline	Subsurface	ND	TNT
3/28/1996	0316-96-1042	16-02382	16-029(k) HE Sump/Drainline	Subsurface	0.7	RDX
3/28/1996	0316-96-1042	16-02382	16-029(k) HE Sump/Drainline	Subsurface	ND	TNT
3/28/1996	0316-96-1043	16-02383	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/28/1996	0316-96-1043	16-02383	16-029(k) HE Sump/Drainline	Subsurface	ND	TNT
3/28/1996	0316-96-1044	16-02384	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/28/1996	0316-96-1044	16-02384	16-029(k) HE Sump/Drainline	Subsurface	0.6	TNT
3/28/1996	0316-96-1045	16-02385	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/28/1996	0316-96-1045	16-02385	16-029(k) HE Sump/Drainline	Subsurface	ND	TNT
3/28/1996	0316-96-1046	16-02386	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/28/1996	0316-96-1046	16-02386	16-029(k) HE Sump/Drainline	Subsurface	0.8	TNT
3/28/1996	0316-96-1047	16-02387	16-029(k) HE Sump/Drainline	Surface	ND	RDX
3/28/1996	0316-96-1047	16-02387	16-029(k) HE Sump/Drainline	Surface	0.7	TNT
3/29/1996	0316-96-1048	16-02388	16-029(k) HE Sump/Drainline	Surface	ND	RDX
3/29/1996	0316-96-1048	16-02388	16-029(k) HE Sump/Drainline	Surface	0.6	TNT
3/29/1996	0316-96-1049	16-02389	16-029(k) HE Sump/Drainline	Surface	ND	RDX
3/29/1996	0316-96-1049	16-02389	16-029(k) HE Sump/Drainline	Surface	0.5	TNT
3/29/1996	0316-96-1050	16-02390	16-029(k) HE Sump/Drainline	Surface	ND	RDX
3/29/1996	0316-96-1050	16-02390	16-029(k) HE Sump/Drainline	Surface	ND	TNT
3/29/1996	0316-96-1051	16-02391	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/29/1996	0316-96-1051	16-02391	16-029(k) HE Sump/Drainline	Subsurface	0.8	TNT
3/29/1996	0316-96-1052	16-02392	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/29/1996	0316-96-1052	16-02392	16-029(k) HE Sump/Drainline	Subsurface	0.5	TNT

Table B-13 (continued)

Date Collected	Field Screening Sample ID	Location ID	Location Description	Sample Medium	Concen-tration [a]	Analyte
3/29/1996	0316-96-1053	16-02393	16-029(k) HE Sump/Drainline	Subsurface	>6	RDX
5/14/1996	0316-96-1470	16-02393	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
5/14/1996	0316-96-1473	16-02393	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/29/1996	0316-96-1053	16-02393	16-029(k) HE Sump/Drainline	Subsurface	0.6	TNT
5/14/1996	0316-96-1470	16-02393	16-029(k) HE Sump/Drainline	Subsurface	ND	TNT
5/14/1996	0316-96-1473	16-02393	16-029(k) HE Sump/Drainline	Subsurface	ND	TNT
3/26/1996	0316-96-1054	16-02394	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/27/1996	0316-96-1054	16-02394	16-029(k) HE Sump/Drainline	Subsurface	0.6	TNT
3/26/1996	0316-96-1055	16-02395	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/27/1996	0316-96-1055	16-02395	16-029(k) HE Sump/Drainline	Subsurface	ND	TNT
3/26/1996	0316-96-1056	16-02396	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
3/27/1996	0316-96-1056	16-02396	16-029(k) HE Sump/Drainline	Subsurface	0.5	TNT
4/9/1996	0316-96-1073	16-02413	16-029(l) HE Sump	Subsurface	ND	RDX
4/9/1996	0316-96-1073	16-02413	16-029(l) HE Sump	Subsurface	ND	TNT
4/9/1996	0316-96-1074	16-02414	16-029(l) HE Sump	Subsurface	ND	RDX
4/9/1996	0316-96-1074	16-02414	16-029(l) HE Sump	Subsurface	ND	TNT
4/9/1996	0316-96-1075	16-02415	16-029(l) HE Sump	Subsurface	ND	RDX
4/9/1996	0316-96-1075	16-02415	16-029(l) HE Sump	Subsurface	0.6	TNT
4/9/1996	0316-96-1076	16-02416	16-029(l) HE Sump	Subsurface	ND	RDX
4/9/1996	0316-96-1076	16-02416	16-029(l) HE Sump	Subsurface	ND	TNT
4/9/1996	0316-96-1077	16-02417	16-029(l) HE Sump	Subsurface	ND	RDX
4/9/1996	0316-96-1077	16-02417	16-029(l) HE Sump	Subsurface	0.5	TNT
4/9/1996	0316-96-1078	16-02418	16-029(l) HE Sump	Subsurface	4.7	RDX
4/9/1996	0316-96-1078	16-02418	16-029(l) HE Sump	Subsurface	0.5	TNT
4/2/1996	0316-96-1079	16-02419	16-029(s) HE Sump	Subsurface	1.6	RDX
4/3/1996	0316-96-1080	16-02420	16-029(s) HE Sump	Subsurface	ND	RDX
4/3/1996	0316-96-1081	16-02421	16-029(s) HE Sump	Subsurface	>6	RDX
4/3/1996	0316-96-1082	16-02422	16-029(s) HE Sump	Subsurface	1.7	RDX
4/3/1996	0316-96-1082	16-02422	16-029(s) HE Sump	Subsurface	0.7	TNT
4/3/1996	0316-96-1083	16-02423	16-029(s) HE Sump	Subsurface	ND	RDX
4/3/1996	0316-96-1083	16-02423	16-029(s) HE Sump	Subsurface	0.6	TNT
4/3/1996	0316-96-1084	16-02424	16-029(s) HE Sump	Subsurface	ND	RDX
4/3/1996	0316-96-1084	16-02424	16-029(s) HE Sump	Subsurface	ND	TNT
4/15/1996	0316-96-1085	16-02425	16-029(t) HE Sump	Subsurface	1.1	RDX
4/15/1996	0316-96-1085	16-02425	16-029(t) HE Sump	Subsurface	0.8	TNT
4/15/1996	0316-96-1086	16-02426	16-029(t) HE Sump	Subsurface	ND	RDX
4/15/1996	0316-96-1086	16-02426	16-029(t) HE Sump	Subsurface	0.8	TNT
5/14/1996	0316-96-1474	16-02427	16-029(t) HE Sump	Subsurface	1.2	RDX
4/15/1996	0316-96-1087	16-02427	16-029(t) HE Sump	Subsurface	>6	RDX
5/14/1996	0316-96-1475	16-02427	16-029(t) HE Sump	Subsurface	ND	RDX
5/14/1996	0316-96-1474	16-02427	16-029(t) HE Sump	Subsurface	0.6	TNT
4/15/1996	0316-96-1087	16-02427	16-029(t) HE Sump	Subsurface	>5	TNT
5/14/1996	0316-96-1475	16-02427	16-029(t) HE Sump	Subsurface	ND	TNT
4/15/1996	0316-96-1088	16-02428	16-029(t) HE Sump	Subsurface	ND	RDX

Table B-13 (continued)

Date Collected	Field Screening Sample ID	Location ID	Location Description	Sample Medium	Concen-tration [a]	Analyte
4/15/1996	0316-96-1088	16-02428	16-029(t) HE Sump	Subsurface	0.9	TNT
4/15/1996	0316-96-1089	16-02429	16-029(t) HE Sump	Subsurface	1.1	RDX
4/15/1996	0316-96-1089	16-02429	16-029(t) HE Sump	Subsurface	1.6	TNT
4/15/1996	0316-96-1090	16-02430	16-029(t) HE Sump	Subsurface	>6	RDX
5/14/1996	0316-96-1476	16-02430	16-029(t) HE Sump	Subsurface	ND	RDX
5/14/1996	0316-96-1477	16-02430	16-029(t) HE Sump	Subsurface	ND	RDX
4/15/1996	0316-96-1090	16-02430	16-029(t) HE Sump	Subsurface	0.9	TNT
5/14/1996	0316-96-1476	16-02430	16-029(t) HE Sump	Subsurface	ND	TNT
5/14/1996	0316-96-1477	16-02430	16-029(t) HE Sump	Subsurface	ND	TNT
4/22/1996	0316-96-1091	16-02431	16-029(u) HE Sump	Subsurface	ND	RDX
4/22/1996	0316-96-1091	16-02431	16-029(u) HE Sump	Subsurface	0.6	TNT
4/22/1996	0316-96-1092	16-02432	16-029(u) HE Sump	Subsurface	ND	RDX
4/22/1996	0316-96-1092	16-02432	16-029(u) HE Sump	Subsurface	0.9	TNT
4/22/1996	0316-96-1093	16-02433	16-029(u) HE Sump	Subsurface	1.7	RDX
4/22/1996	0316-96-1093	16-02433	16-029(u) HE Sump	Subsurface	0.8	TNT
4/22/1996	0316-96-1094	16-02434	16-029(u) HE Sump	Subsurface	ND	RDX
4/22/1996	0316-96-1094	16-02434	16-029(u) HE Sump	Subsurface	0.6	TNT
4/22/1996	0316-96-1095	16-02435	16-029(u) HE Sump	Subsurface	ND	RDX
4/22/1996	0316-96-1095	16-02435	16-029(u) HE Sump	Subsurface	0.6	TNT
4/23/1996	0316-96-1096	16-02436	16-029(u) HE Sump	Subsurface	ND	RDX
4/22/1996	0316-96-1096	16-02436	16-029(u) HE Sump	Subsurface	0.7	TNT
6/5/1996	0316-96-1142	16-02547	16-017(a)-99 Building Footprint	Subsurface	0.8	RDX
6/5/1996	0316-96-1142	16-02547	16-017(a)-99 Building Footprint	Subsurface	ND	TNT
6/5/1996	0316-96-1143	16-02548	16-017(a)-99 Building Footprint	Subsurface	0.8	RDX
6/5/1996	0316-96-1143	16-02548	16-017(a)-99 Building Footprint	Subsurface	ND	TNT
6/5/1996	0316-96-1144	16-02549	16-017(a)-99 Building Footprint	Subsurface	ND	RDX
6/5/1996	0316-96-1144	16-02549	16-017(a)-99 Building Footprint	Subsurface	ND	TNT
6/5/1996	0316-96-1145	16-02550	16-017(a)-99 Building Footprint	Subsurface	0.8	RDX
6/5/1996	0316-96-1145	16-02550	16-017(a)-99 Building Footprint	Subsurface	ND	TNT
6/5/1996	0316-96-1146	16-02551	16-017(a)-99 Building Footprint	Subsurface	ND	RDX
6/5/1996	0316-96-1146	16-02551	16-017(a)-99 Building Footprint	Subsurface	ND	TNT
6/5/1996	0316-96-1147	16-02552	16-017(a)-99 Building Footprint	Subsurface	0.7	RDX
6/5/1996	0316-96-1147	16-02552	16-017(a)-99 Building Footprint	Subsurface	ND	TNT
6/5/1996	0316-96-1148	16-02553	16-017(c)-99 Building Footprint	Subsurface	0.8	RDX
6/5/1996	0316-96-1148	16-02553	16-017(c)-99 Building Footprint	Subsurface	ND	TNT
6/5/1996	0316-96-1149	16-02554	16-017(c)-99 Building Footprint	Subsurface	1	RDX
6/5/1996	0316-96-1149	16-02554	16-017(c)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1150	16-02555	16-017(c)-99 Building Footprint	Subsurface	ND	RDX
6/6/1996	0316-96-1150	16-02555	16-017(c)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1151	16-02556	16-017(c)-99 Building Footprint	Subsurface	0.8	RDX
6/6/1996	0316-96-1151	16-02556	16-017(c)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1152	16-02557	16-017(c)-99 Building Footprint	Subsurface	ND	RDX
6/6/1996	0316-96-1152	16-02557	16-017(c)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1153	16-02558	16-017(c)-99 Building Footprint	Subsurface	1	RDX
6/6/1996	0316-96-1153	16-02558	16-017(c)-99 Building Footprint	Subsurface	ND	TNT
5/3/1996	0316-96-1154	16-02559	16-017(d)-99 Building Footprint	Subsurface	ND	RDX
5/3/1996	0316-96-1154	16-02559	16-017(d)-99 Building Footprint	Subsurface	ND	TNT
5/3/1996	0316-96-1155	16-02560	16-017(d)-99 Building Footprint	Subsurface	ND	RDX

Table B-13 (continued)

Date Collected	Field Screening Sample ID	Location ID	Location Description	Sample Medium	Concen-tration [a]	Analyte
5/3/1996	0316-96-1155	16-02560	16-017(d)-99 Building Footprint	Subsurface	ND	TNT
5/3/1996	0316-96-1156	16-02561	16-017(d)-99 Building Footprint	Subsurface	ND	RDX
5/3/1996	0316-96-1156	16-02561	16-017(d)-99 Building Footprint	Subsurface	ND	TNT
5/3/1996	0316-96-1157	16-02562	16-017(d)-99 Building Footprint	Subsurface	0.7	RDX
5/3/1996	0316-96-1157	16-02562	16-017(d)-99 Building Footprint	Subsurface	ND	TNT
5/3/1996	0316-96-1158	16-02563	16-017(d)-99 Building Footprint	Subsurface	0.8	RDX
5/3/1996	0316-96-1158	16-02563	16-017(d)-99 Building Footprint	Subsurface	ND	TNT
5/3/1996	0316-96-1159	16-02564	16-017(d)-99 Building Footprint	Subsurface	ND	RDX
5/3/1996	0316-96-1159	16-02564	16-017(d)-99 Building Footprint	Subsurface	ND	TNT
5/8/1996	0316-96-1160	16-02565	16-017(e)-99 Building Footprint	Subsurface	ND	RDX
5/8/1996	0316-96-1160	16-02565	16-017(e)-99 Building Footprint	Subsurface	ND	TNT
5/8/1996	0316-96-1161	16-02566	16-017(e)-99 Building Footprint	Subsurface	ND	RDX
5/8/1996	0316-96-1161	16-02566	16-017(e)-99 Building Footprint	Subsurface	ND	TNT
5/8/1996	0316-96-1162	16-02567	16-017(e)-99 Building Footprint	Subsurface	ND	RDX
5/8/1996	0316-96-1162	16-02567	16-017(e)-99 Building Footprint	Subsurface	ND	TNT
5/8/1996	0316-96-1163	16-02568	16-017(e)-99 Building Footprint	Subsurface	ND	RDX
5/8/1996	0316-96-1163	16-02568	16-017(e)-99 Building Footprint	Subsurface	ND	TNT
5/8/1996	0316-96-1164	16-02569	16-017(e)-99 Building Footprint	Subsurface	ND	RDX
5/8/1996	0316-96-1164	16-02569	16-017(e)-99 Building Footprint	Subsurface	ND	TNT
5/8/1996	0316-96-1165	16-02570	16-017(e)-99 Building Footprint	Subsurface	0.5	RDX
5/8/1996	0316-96-1165	16-02570	16-017(e)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1166	16-02571	16-017(b)-99 Building Footprint	Subsurface	ND	RDX
6/6/1996	0316-96-1166	16-02571	16-017(b)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1167	16-02572	16-017(b)-99 Building Footprint	Subsurface	ND	RDX
6/6/1996	0316-96-1167	16-02572	16-017(b)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1168	16-02573	16-017(b)-99 Building Footprint	Subsurface	ND	RDX
6/6/1996	0316-96-1168	16-02573	16-017(b)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1169	16-02574	16-017(b)-99 Building Footprint	Subsurface	ND	RDX
6/6/1996	0316-96-1169	16-02574	16-017(b)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1170	16-02575	16-017(b)-99 Building Footprint	Subsurface	ND	RDX
6/6/1996	0316-96-1170	16-02575	16-017(b)-99 Building Footprint	Subsurface	ND	TNT
6/6/1996	0316-96-1171	16-02576	16-017(b)-99 Building Footprint	Subsurface	ND	RDX
6/6/1996	0316-96-1171	16-02576	16-017(b)-99 Building Footprint	Subsurface	ND	TNT
4/18/1996	0316-96-1182	16-02587	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
4/18/1996	0316-96-1182	16-02587	16-029(k) HE Sump/Drainline	Subsurface	0.5	TNT
4/18/1996	0316-96-1183	16-02588	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
4/18/1996	0316-96-1183	16-02588	16-029(k) HE Sump/Drainline	Subsurface	ND	TNT
4/18/1996	0316-96-1184	16-02589	16-029(k) HE Sump/Drainline	Subsurface	2.1	RDX
4/18/1996	0316-96-1184	16-02589	16-029(k) HE Sump/Drainline	Subsurface	0.9	TNT
4/18/1996	0316-96-1185	16-02590	16-029(k) HE Sump/Drainline	Subsurface	1	RDX
4/18/1996	0316-96-1185	16-02590	16-029(k) HE Sump/Drainline	Subsurface	0.6	TNT
4/18/1996	0316-96-1186	16-02591	16-029(k) HE Sump/Drainline	Subsurface	1.1	RDX
4/18/1996	0316-96-1186	16-02591	16-029(k) HE Sump/Drainline	Subsurface	0.6	TNT
4/18/1996	0316-96-1187	16-02592	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
4/18/1996	0316-96-1187	16-02592	16-029(k) HE Sump/Drainline	Subsurface	0.6	TNT
4/18/1996	0316-96-1188	16-02593	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
4/18/1996	0316-96-1188	16-02593	16-029(k) HE Sump/Drainline	Subsurface	0.6	TNT

Table B-13 (continued)

Date Collected	Field Screening Sample ID	Location ID	Location Description	Sample Medium	Concen-tration [a]	Analyte
4/18/1996	0316-96-1189	16-02594	16-029(k) HE Sump/Drainline	Subsurface	ND	RDX
4/18/1996	0316-96-1189	16-02594	16-029(k) HE Sump/Drainline	Subsurface	0.5	TNT
4/19/1996	0316-96-1190	16-02595	16-029(s) HE Sump	Subsurface	4	RDX
4/19/1996	0316-96-1190	16-02595	16-029(s) HE Sump	Subsurface	1.5	TNT
4/19/1996	0316-96-1191	16-02596	16-029(s) HE Sump	Subsurface	ND	RDX
4/19/1996	0316-96-1191	16-02596	16-029(s) HE Sump	Subsurface	0.7	TNT
4/19/1996	0316-96-1192	16-02597	16-029(s) HE Sump	Subsurface	2.4	RDX
4/19/1996	0316-96-1192	16-02597	16-029(s) HE Sump	Subsurface	0.9	TNT
4/19/1996	0316-96-1193	16-02598	16-029(s) HE Sump	Subsurface	0.8	RDX
4/19/1996	0316-96-1193	16-02598	16-029(s) HE Sump	Subsurface	0.6	TNT
4/19/1996	0316-96-1194	16-02599	16-026(n) HE Drainline	Subsurface	>6	RDX
4/19/1996	0316-96-1194	16-02599	16-026(n) HE Drainline	Subsurface	>5	TNT
4/19/1996	0316-96-1195	16-02600	16-026(n) HE Drainline	Subsurface	>6	RDX
4/19/1996	0316-96-1195	16-02600	16-026(n) HE Drainline	Subsurface	>5	TNT
4/19/1996	0316-96-1196	16-02601	16-026(n) HE Drainline	Subsurface	5.9	RDX
4/19/1996	0316-96-1196	16-02601	16-026(n) HE Drainline	Subsurface	3.9	TNT
4/19/1996	0316-96-1197	16-02602	16-026(n) HE Drainline	Subsurface	>6	RDX
4/19/1996	0316-96-1197	16-02602	16-026(n) HE Drainline	Subsurface	>5	TNT
4/19/1996	0316-96-1198	16-02603	16-026(n) HE Drainline	Subsurface	>6	RDX
4/19/1996	0316-96-1198	16-02603	16-026(n) HE Drainline	Subsurface	1.4	TNT
4/19/1996	0316-96-1199	16-02604	16-026(n) HE Drainline	Subsurface	2.5	RDX
4/19/1996	0316-96-1199	16-02604	16-026(n) HE Drainline	Subsurface	1.4	TNT
4/19/1996	0316-96-1200	16-02605	16-026(n) HE Drainline	Subsurface	2.5	RDX
4/19/1996	0316-96-1200	16-02605	16-026(n) HE Drainline	Subsurface	1.4	TNT
4/19/1996	0316-96-1201	16-02606	16-026(n) HE Drainline	Subsurface	ND	RDX
4/19/1996	0316-96-1201	16-02606	16-026(n) HE Drainline	Subsurface	1.1	TNT
4/29/1996	0316-96-1202	16-02607	16-029(t) HE Sump	Subsurface	>6	RDX
4/29/1996	0316-96-1202	16-02607	16-029(t) HE Sump	Subsurface	>5	TNT
4/29/1996	0316-96-1203	16-02608	16-029(t) HE Sump	Subsurface	>6	RDX
4/29/1996	0316-96-1203	16-02608	16-029(t) HE Sump	Subsurface	>5	TNT
4/29/1996	0316-96-1204	16-02609	16-029(t) HE Sump	Subsurface	1.2	RDX
4/29/1996	0316-96-1204	16-02609	16-029(t) HE Sump	Subsurface	3.3	TNT
4/29/1996	0316-96-1205	16-02610	16-029(t) HE Sump	Subsurface	5.7	RDX
4/29/1996	0316-96-1205	16-02610	16-029(t) HE Sump	Subsurface	>5	TNT
4/26/1996	0316-96-1206	16-02611	16-029(t) HE Sump	Subsurface	ND	RDX
4/26/1996	0316-96-1206	16-02611	16-029(t) HE Sump	Subsurface	0.6	TNT
4/26/1996	0316-96-1207	16-02612	16-029(t) HE Sump	Subsurface	>6	RDX
4/26/1996	0316-96-1207	16-02612	16-029(t) HE Sump	Subsurface	0.6	TNT
4/26/1996	0316-96-1208	16-02613	16-029(t) HE Sump	Subsurface	ND	RDX
4/26/1996	0316-96-1208	16-02613	16-029(t) HE Sump	Subsurface	0.6	TNT
4/26/1996	0316-96-1209	16-02614	16-029(t) HE Sump	Subsurface	ND	RDX
4/26/1996	0316-96-1209	16-02614	16-029(t) HE Sump	Subsurface	0.6	TNT
4/29/1996	0316-96-1210	16-02615	16-026(n) HE Drainline	Subsurface	ND	RDX
4/29/1996	0316-96-1210	16-02615	16-026(n) HE Drainline	Subsurface	ND	TNT
4/29/1996	0316-96-1211	16-02616	16-026(n) HE Drainline	Subsurface	2.1	RDX
4/29/1996	0316-96-1211	16-02616	16-026(n) HE Drainline	Subsurface	1.1	TNT
4/29/1996	0316-96-1212	16-02617	16-026(n) HE Drainline	Subsurface	ND	RDX

Table B-13 (continued)

Date Collected	Field Screening Sample ID	Location ID	Location Description	Sample Medium	Concen-tration [a]	Analyte
4/29/1996	0316-96-1212	16-02617	16-026(n) HE Drainline	Subsurface	1.4	TNT
4/29/1996	0316-96-1213	16-02618	16-026(n) HE Drainline	Subsurface	1.3	RDX
4/29/1996	0316-96-1213	16-02618	16-026(n) HE Drainline	Subsurface	0.5	TNT
5/2/1996	0316-96-1214	16-02619	16-029(t) HE Sump	Subsurface	ND	RDX
5/2/1996	0316-96-1214	16-02619	16-029(t) HE Sump	Subsurface	1.6	TNT
5/2/1996	0316-96-1215	16-02620	16-029(t) HE Sump	Subsurface	ND	RDX
5/2/1996	0316-96-1215	16-02620	16-029(t) HE Sump	Subsurface	1.5	TNT
5/2/1996	0316-96-1216	16-02621	16-029(t) HE Sump	Subsurface	0.6	RDX
5/2/1996	0316-96-1216	16-02621	16-029(t) HE Sump	Subsurface	1.5	TNT
5/2/1996	0316-96-1217	16-02622	16-029(t) HE Sump	Subsurface	ND	RDX
5/2/1996	0316-96-1217	16-02622	16-029(t) HE Sump	Subsurface	0.5	TNT
5/2/1996	0316-96-1218	16-02623	16-026(p) HE Drainline	Subsurface	ND	RDX
5/2/1996	0316-96-1218	16-02623	16-026(p) HE Drainline	Subsurface	0.6	TNT
5/2/1996	0316-96-1219	16-02624	16-026(p) HE Drainline	Subsurface	1.8	RDX
5/2/1996	0316-96-1219	16-02624	16-026(p) HE Drainline	Subsurface	0.5	TNT
5/2/1996	0316-96-1220	16-02625	16-026(p) HE Drainline	Subsurface	0.6	RDX
5/2/1996	0316-96-1220	16-02625	16-026(p) HE Drainline	Subsurface	0.6	TNT
5/2/1996	0316-96-1221	16-02626	16-026(p) HE Drainline	Subsurface	1.7	RDX
5/2/1996	0316-96-1221	16-02626	16-026(p) HE Drainline	Subsurface	1.3	TNT
5/6/1996	0316-96-1222	16-02627	16-029(l) HE Sump	Subsurface	ND	RDX
5/6/1996	0316-96-1222	16-02627	16-029(l) HE Sump	Subsurface	ND	TNT
5/6/1996	0316-96-1223	16-02628	16-029(l) HE Sump	Subsurface	ND	RDX
5/6/1996	0316-96-1223	16-02628	16-029(l) HE Sump	Subsurface	0.8	TNT
5/6/1996	0316-96-1224	16-02629	16-029(l) HE Sump	Subsurface	ND	RDX
5/6/1996	0316-96-1224	16-02629	16-029(l) HE Sump	Subsurface	1	TNT
5/6/1996	0316-96-1225	16-02630	16-029(l) HE Sump	Subsurface	ND	RDX
5/6/1996	0316-96-1225	16-02630	16-029(l) HE Sump	Subsurface	ND	TNT
4/5/1996	0316-96-1521	16-02635	16-029(k) HE Drainage	Surface	ND	RDX
4/5/1996	0316-96-1521	16-02635	16-029(k) HE Drainage	Surface	0.7	TNT
4/5/1996	0316-96-1522	16-02636	16-029(k) HE Drainage	Surface	ND	RDX
4/5/1996	0316-96-1522	16-02636	16-029(k) HE Drainage	Surface	0.6	TNT
4/5/1996	0316-96-1523	16-02637	16-029(k) HE Drainage	Surface	ND	RDX
4/5/1996	0316-96-1523	16-02637	16-029(k) HE Drainage	Surface	0.6	TNT

Note: Units are mg/kg.

[a] D TECH results.

[b] ND = Not detected.

[c] Units are milligrams per liter.

Table B-14
Summary of Inorganic Chemical Results Above BVs for Soils, Tuff, and Fill for Locations Excavated During the 1996 VCA at the 90s Line

Sample ID	Location ID	Depth (ft)	Medium	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron
Soil BV				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21,500**
Qbt 2,3,4 BV				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14,500**
Fill BV				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21,500**
Industrial Worker SSL[a]:				**100,000[b]**	**454**	**17.7**	**78,300**	**2250**	**1128[c]**	**NA[d]**	**5000[e]**	**20,500**	**45,400**	**22,700**	**100,000[b]**
0316-96-0034	16-02362	5-5.5	ALLH	–[f]	6.5 (UJ)[g]	–	2590 (J+)[h]	–	0.77 (U)[i]	–	–	–	–	0.55(U)	–
0316-96-0043	16-02372	0-0.5	ALLH	–	6.9 (UJ)	–	478 (J-)[j]	–	0.82 (U)	–	–	12.1	–	0.59(U)	–
0316-96-0044	16-02373	3-3.5	ALLH	–	6.2 (UJ)	–	–	2.0	0.82 (U)	–	–	–	23.7	0.55(U)	–
0316-96-0090	16-02360	4.5-5	ALLH	–	5.9 (U)	–	–	–	0.77 (U)	–	–	–	–	0.52(U)	–
0316-96-0091	16-02362	4.5-5	ALLH	–	6.1 (U)	–	1980	–	2.2	–	–	–	–	0.54(U)	–
0316-96-0131	16-02542	0-1	FILL	–	-	–	–	–	–	–	–	–	46.8	0.53(U)	–
0316-96-0155	16-02360	5-6	ALLH	–	7.3 (U)	–	–	–	0.95 (J)[k]	–	–	–	–	0.6(U)	–
0316-96-0156	16-02362	5-6	QBT4	–	6.5 (U)	–	1550	–	–	–	–	–	5 (J)	0.59(U)	–
0316-96-0200	16-02543	7-7.5	ALLH	–	0.84 (J)	–	387 (J+)	–	0.65 (J)	–	–	–	–	0.57(U)	–
0316-96-2000	16-02372	0-0.5	ALLH	–	7.0 (UJ)	–	308 (J-)	–	0.83 (J)	–	–	–	–	–	–
0316-96-2001	16-02373	3-3.5	ALLH	–	6.6 (UJ)	–	–	2.0	0.87 (U)	–	–	–	–	–	–
0316-96-2002	16-02373	4-4.5	ALLH	–	6.9 (UJ)	–	–	–	0.82 (U)	–	–	–	–	–	–

Table B-14 (continued)

Sample ID	Location ID	Depth (ft)	Medium	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Soil BV				**22.3**	**4610**	**671**	**0.1**	**15.4**	**3460**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Qbt 2,3,4 BV				**11.2**	**1690**	**482**	**0.1**	**6.58**	**3500**	**0.3**	**1**	**2770**	**1.1**	**2.4**	**63.5**
Fill BV				**22.3**	**4610**	**671**	**0.1**	**15.4**	**3460**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Industrial Worker SSL[a]:				**750**	**NA**	**21,800**	**340[e]**	**22,500**	**NA**	**5680**	**5680**	**NA**	**74.9**	**7950**	**100,000[b]**
0316-96-0034	16-02362	5-5.5	ALLH	–	–	–	–	–	–	–	1.2 (U)	–	–	7.7 (J)	–
0316-96-0043	16-02372	0-0.5	ALLH	–	–	–	–	–	–	–	1.2 (U)	–	–	29.6	–
0316-96-0044	16-02373	3-3.5	ALLH	–	–	–	–	19.1	–	–	1.5 (U)	–	–	27.5	61.1
0316-96-0090	16-02360	4.5-5	ALLH	–	–	–	–	–	–	–	1.4 (U)	–	–	8.7 (J)	–
0316-96-0091	16-02362	4.5-5	ALLH	–	–	–	–	–	–	–	1.6 (J)	–	–	15.2	54.6
0316-96-0131	16-02542	0-1	FILL	83.9	–	–	–	–	–	–	-	–	–	6.4 (J)	–
0316-96-0155	16-02360	5-6	ALLH	–	–	–	–	–	–	–	1.6 (U)	–	–	6.1 (J)	–
0316-96-0156	16-02362	5-6	QBT4	–	–	–	–	–	–	0.51 (UJ)	1.6 (U)	–	–	5.3 (J)	–
0316-96-0200	16-02543	7-7.5	ALLH	–	–	–	–	–	–	–	-	–	–	21.7	–
0316-96-2000	16-02372	0-0.5	ALLH	–	–	–	–	–	–	–	1.2 (U)	–	–	28.8	–
0316-96-2001	16-02373	3-3.5	ALLH	–	–	–	–	–	–	–	1.6 (U)	–	–	16.9	–
0316-96-2002	16-02373	4-4.5	ALLH	–	–	–	–	–	–	–	1.2 (U)	–	–	10.9 (J)	–

Note: Units are mg/kg.
[a] SSLs reflecting a 10^{-5} cancer risk or noncarcinogenic hazard quotient of 1 (whichever is lower) were obtained from NMED 2004, 85615, unless otherwise noted.
[b] Low toxicity maximum, health-based SSL exceeds 10^5 mg/kg.
[c] Cadmium SSL incorrectly calculated in NMED 2004, 85615; recalculated to obtain SSL presented.
[d] Not available.
[e] SSL obtained from EPA Region 6 (EPA 2004, 87478); carcinogenic SSLs adjusted to 10^{-5} risk level.
[f] – = Result is below BV.
[g] UJ = The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.
[h] J+ = The analyte was positively identified, and the result is likely to be biased high.
[i] U = The analyte was analyzed for but not detected.
[j] J- = The analyte was positively identified, and the result is likely to be biased low.
[k] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

Table B-15
Summary of Organic Chemical Results for Soils, Tuff, and Fill for Locations Excavated During the 1996 VCA at the 90s Line SWMUs

Sample ID	Location ID	Depth (ft)	Medium	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene [2-]	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Fluoranthene	HMX
Industrial Worker SSL[a]:				**680[b,c]**	**680 [b,c]**	**2.34**	**23.4**	**31,300[d]**	**234**	**100,000[b,e]**	**1,370**	**2,340**	**68,400**	**24,400**	**34,200**
0316-96-0034	16-02362	5-5.5	ALLH	—[f]	0.211	—	—	—	—	—	—	—	—	—	0.351
0316-96-0043	16-02372	0-0.5	ALLH	—	0.263	—	—	—	—	—	—	—	—	—	—
0316-96-0044	16-02373	3-3.5	ALLH	—	0.42	—	—	—	—	—	—	—	—	—	10.8
0316-96-0090	16-02360	4.5-5	ALLH	—	—	—	—	—	—	—	—	—	—	—	0.32
0316-96-0091	16-02362	4.5-5	ALLH	—	0.24	—	—	—	—	—	0.062(J)	—	—	—	0.39
0316-96-0131	16-02542	0-1	FILL	—	1.2	0.089(J)	0.085(J)	0.18(J)	0.078(J)	0.089(J)	0.12(J)	0.054(J)	0.25(J)	0.038(J)	12.5
0316-96-0155	16-02360	5-6	ALLH	—	—	—	—	—	—	—	—	—	—	—	0.72
0316-96-0156	16-02362	5-6	QBT4	0.136	0.18	—	—	—	—	—	—	—	—	—	0.305
0316-96-0200	16-02543	7-7.5	ALLH	—	—	—	—	—	—	—	—	—	—	—	0.191
0316-96-2000	16-02372	0-0.5	ALLH	—	0.31	—	—	—	—	—	—	—	—	—	0.301
0316-96-2001	16-02373	3-3.5	ALLH	—	0.093	—	—	—	—	—	—	—	—	—	1.62
0316-96-2002	16-02373	4-4.5	ALLH	—	0.182	—	—	—	—	—	—	—	—	—	0.568

Table B-15 (continued, reading left to right)

Sample ID	Location ID	Depth (ft)	Medium	Indeno(1,2,3-cd)pyrene	Pyrene	RDX	Trichloroethane[1,1,1-]	Trinitrobenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
Industrial Worker SSL[a]:				**23.4**	**31,300**	**174**	**551[g]**	**21,000[b]**	**342**
0316-96-0034	16-02362	5-5.5	ALLH	-	-	2.7	-	3.7	2.4
0316-96-0043	16-02372	0-0.5	ALLH	-	-	2.3	-	-	14.7
0316-96-0044	16-02373	3-3.5	ALLH	-	-	186	-	0.17	86.4
0316-96-0090	16-02360	4.5-5	ALLH	-	-	0.93	-	18.9	-
0316-96-0091	16-02362	4.5-5	ALLH	-	-	2.8	-	3.5	3.1
0316-96-0131	16-02542	0-1	FILL	0.13(J)	0.043(J)	173	0.002(J)	-	121
0316-96-0155	16-02360	5-6	ALLH	-	-	2.8	-	16.3	0.5
0316-96-0156	16-02362	5-6	QBT4	-	-	3.4	-	2.1	1.8
0316-96-0200	16-02543	7-7.5	ALLH	-	-	5.8	-	-	0.14
0316-96-2000	16-02372	0-0.5	ALLH	-	-	2.2	-	-	23.7
0316-96-2001	16-02373	3-3.5	ALLH	-	-	17.7	-	-	16.5
0316-96-2002	16-02373	4-4.5	ALLH	-	-	4.33	-	-	2.07

Note: Units are mg/kg.

[a] SSLs reflecting a 10-5 cancer risk or noncarcinogenic hazard quotient of 1 (whichever is lower) were obtained from NMED 2004, 85615, unless otherwise noted.

[b] SSL obtained from EPA Region 6 (EPA 2004, 87478); carcinogenic SSLs adjusted to 10-5 risk level.

[c] Dinitrotoluene[2,6-] used as a surrogate for amino-2,6-dinitrotoluene[4-] and amino-4,6-dinitrotoluene[2-].

[d] Pyrene is used as a surrogate for benzo(g,h,i)perylene.

[e] Low-toxicity maximum, health-based SSL exceeds 105 mg/kg.

[f] Not detected.

[g] Soil saturation limit basis.

Table B-16
Frequency of Inorganic Chemicals above BVs
in 1996 VCA Spoils Samples from the 90s Line SWMUs

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Aluminum	Soil	5	5	4490 to 15000	29200	0/5	0/5
Aluminum	Fill	1	1	11000 to 11000	29200	0/1	0/1
Antimony	Soil	5	0	[5.6 to 6.4]	0.83	0/5	5/5
Antimony	Fill	1	0	[12 to 12]	0.83	0/1	1/1
Arsenic	Soil	5	5	0.98 to 1.8	8.17	0/5	0/5
Arsenic	Fill	1	1	2.4 to 2.4	8.17	0/1	0/1
Barium	Soil	5	5	83.3 to 198	295	0/5	0/5
Barium	Fill	1	1	140 to 140	295	0/1	0/1
Beryllium	Soil	5	5	0.47 to 0.98	1.83	0/5	0/5
Beryllium	Fill	1	1	1.2 to 1.2	1.83	0/1	0/1
Cadmium	Soil	5	0	[0.66 to 0.76]	0.4	0/5	5/5
Cadmium	Fill	1	0	[0.6 to 0.6]	0.4	0/1	1/1
Calcium	Soil	5	5	1470 to 3180	6120	0/5	0/5
Calcium	Fill	1	1	3700 to 3700	6120	0/1	0/1
Chromium	Soil	5	5	2 to 164	19.3	1/5	0/5
Chromium	Fill	1	1	7.2 to 7.2	19.3	0/1	0/1
Cobalt	Soil	5	5	2.5 to 9.8	8.64	1/5	0/5
Cobalt	Fill	1	1	8.9 to 8.9	8.64	1/1	0/1
Copper	Soil	5	5	2.4 to 29.4	14.7	1/5	0/5
Copper	Fill	1	1	7.1 to 7.1	14.7	0/1	0/1
Cyanide (Total)	Soil	5	0	[0.5 to 0.54]	NA [b]	0/5	NA
Cyanide (Total)	Fill	1	0	[0.6 to 0.6]	NA	0/1	NA
Iron	Soil	5	5	4280 to 13400	21500	0/5	0/5
Iron	Fill	1	1	13000 to 13000	21500	0/1	0/1
Lead	Soil	5	5	10.9 to 94.5	22.3	1/5	0/5
Lead	Fill	1	1	16 to 16	22.3	0/1	0/1
Magnesium	Soil	5	5	685 to 1980	4610	0/5	0/5
Magnesium	Fill	1	1	1900 to 1900	4610	0/1	0/1
Manganese	Soil	5	5	276 to 937	671	1/5	0/5
Manganese	Fill	1	1	300 to 300	671	0/1	0/1
Mercury	Soil	5	0	[0.02 to 0.05]	0.1	0/5	0/5
Mercury	Fill	1	0	[0.12 to 0.12]	0.1	0/1	1/1
Nickel	Soil	5	4	[2.3] to 37.5	15.4	1/5	0/5
Nickel	Fill	1	1	10 to 10	15.4	0/1	0/1
Potassium	Soil	5	5	530 to 1350	3460	0/5	0/5
Potassium	Fill	1	1	1400 to 1400	3460	0/1	0/1

Table B-16 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Selenium	Soil	5	0	[0.38 to 0.48]	1.52	0/5	0/5
Selenium	Fill	1	0	[1.2 to 1.2]	1.52	0/1	0/1
Silver	Soil	5	0	[1 to 1.4]	1	0/5	3/5
Silver	Fill	1	0	[2.4 to 2.4]	1	0/1	1/1
Sodium	Soil	5	5	62.6 to 179	915	0/5	0/5
Sodium	Fill	1	1	160 to 160	915	0/1	0/1
Thallium	Soil	5	1	[0.16] to 0.3	0.73	0/5	0/5
Thallium	Fill	1	0	[1.5 to 1.5]	0.73	0/1	1/1
Uranium	Soil	1	1	2.23 to 2.23	1.82	1/1	0/1
Vanadium	Soil	5	5	7.8 to 22.2	39.6	0/5	0/5
Vanadium	Fill	1	1	20 to 20	39.6	0/1	0/1
Zinc	Soil	5	5	10.6 to 55.3	48.8	1/5	0/5
Zinc	Fill	1	1	29 to 29	48.8	0/1	0/1

[a] Values in brackets are detection limits.

[b] NA = Not applicable.

Table B-17
Summary of 1996 VCA Spoils Samples with Inorganic Chemicals above BVs from the 90s Line SWMUs

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Silver	Thallium	Uranium	Zinc
Soil BV				**0.83**	**0.4**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**1**	**0.73**	**1.82**	**48.8**
Fill BV				**0.83**	**0.4**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**15.4**	**1**	**0.73**	**1.82**	**48.8**
Industrial Worker SSL[a]:				**454**	**1,128[b]**	**5,000[c]**	**20,500**	**45,400**	**750**	**21,800**	**340[c]**	**22,500**	**5,680**	**74.9**	**200[d]**	**100,000[e]**
SWMU 16-008(a)-99																
0316-96-0070	NA [f]	0.00-0.00	Soil	6.4 (U)	0.76 (U)	– [g]	–	–	–	–	–	–	1.1 (U) [h]	–	2.23	–
0316-96-0081	NA	0.00-0.50	Soil	5.8 (U)	0.69 (U)	–	9.8 (J) [i]	–	–	937	–	–	–	–	–	–
0316-96-0093	NA	0.00-0.50	Soil	5.6 (U)	0.66 (U)	–	–	–	–	–	–	–	–	–	–	–
0316-96-0101	NA	0.00-0.50	Soil	6 (U)	0.71 (U)	–	–	29.4	–	–	–	–	1.1 (U)	–	–	55.3
0316-96-0103	NA	0.00-0.00	Fill	12 (UJ)	0.6 (U)	–	8.9	–	–	–	0.12 (U)	–	2.4 (U)	1.5 (U)	–	–
0316-96-0112	NA	0.00-0.50	Soil	5.7 (U)	0.75 (U)	164	–	–	94.5	–	–	37.5	1.4 (U)	–	–	–

Notes: Units are mg/kg.

[a] SSLs reflecting a 10^{-5} cancer risk or noncarcinogenic hazard quotient of 1 (whichever is lower) were obtained from NMED 2004, 85615, unless otherwise noted.[f]

[b] Cadmium SSL incorrectly calculated in NMED 2004, 85615; recalculated to obtain SSL presented.

[c] SSL obtained from EPA Region 6 (EPA 2004, 87478); carcinogenic SSLs adjusted to 10^{-5} risk level.

[d] SSL obtained from EPA Region 9 2004 preliminary remediation goal table http://www.epa.gov/Region9/waste/sfund/prg/files/04prgtable.pdf .

[e] Low-toxicity maximum, health-based SSL exceeds 10^5 mg/kg.

[f] NA = Not applicable.

[g] — = Value not above BV for corresponding media.

[h] U = The analyte was analyzed for but not detected.

[i] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

Table B-18
Frequency of Detected Organic Chemicals in Spoils Samples from the 90s Line SWMUs

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	Frequency of Detects	Quantitation Limit [b] (mg/kg)
Benzo(a)anthracene	Soil	5	1	0.056 to [0.86]	1/5	0.86
Benzo(a)pyrene	Soil	5	1	0.062 to [0.86]	1/5	0.86
Benzo(b)fluoranthene	Soil	5	1	0.054 to [0.86]	1/5	0.86
Benzo(g,h,i)perylene	Soil	5	1	0.071 to [0.86]	1/5	0.86
Benzo(k)fluoranthene	Soil	5	1	0.047 to [0.86]	1/5	0.86
Chrysene	Soil	5	1	0.066 to [0.86]	1/5	0.86
Dichloroethene[cis-1,2-]	Soil	5	1	0.001 to [0.006]	1/5	0.006
Fluoranthene	Soil	5	1	0.14 to [0.86]	1/5	0.86
HMX	Soil	5	1	[1.5] to 3.4	1/5	2
Indeno(1,2,3-cd)pyrene	Soil	5	1	0.052 to [0.86]	1/5	0.86
Isopropyltoluene[4-]	Soil	5	1	0.002 to [0.006]	1/5	0.006
Phenanthrene	Soil	5	1	0.11 to [0.86]	1/5	0.86
Pyrene	Soil	5	1	0.13 to [0.86]	1/5	0.86
RDX	Soil	5	3	[0.72] to 36	3/5	0.79
RDX	Fill	1	1	3.5 to 3.5	1/1	0.79
Tetrachloroethene	Soil	5	1	0.001 to [0.006]	1/5	0.006
Toluene	Soil	5	4	0.001 to [0.005]	4/5	0.0058
Trichloro-1,2,2-trifluoroethane[1,1,2-]	Soil	5	1	0.002 to [0.006]	1/5	0.006
Trichloroethene	Soil	5	4	0.004 to 0.005	4/5	0.0058
Trichlorofluoromethane	Soil	5	3	0.001 to [0.005]	3/5	0.0058
Trinitrotoluene[2,4,6-]	Soil	5	3	[0.18] to 9.5	3/5	0.2
Trinitrotoluene[2,4,6-]	Fill	1	1	0.97 to 0.97	1/1	0.2

[a] Values in brackets are detection limits.
[b] Maximum nondetect quantitation limit reported for each analyte detected.

Table B-19
Summary of 1996 VCA Spoils Samples with Detected Organic Chemicals from the 90s Line SWMUs

Sample ID	Location ID	Depth (ft)	Media	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dichloroethene[cis-1,2-]	Fluoranthene	HMX	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Phenanthrene
Industrial Worker SSL[a]:				**23.4**	**2.34**	**23.4**	**31,300[b]**	**234**	**2,340**	**267**	**24,400**	**34,200**	**23.4**	**2,730**	**20,500**
SWMU 16-008(a)-99															
0316-96-0070	NA[d]	0.00-0.00	Soil	–[e]	–	–	–	–	–	–	–	–	–	–	–
0316-96-0081	NA	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	–	–
0316-96-0093	NA	0.00-0.50	Soil	0.056 (J)[f]	0.062 (J)	0.054 (J)	0.071 (J)	0.047 (J)	0.066 (J)	0.001 (J)	0.14 (J)	3.4	0.052 (J)	–	0.11 (J)
0316-96-0101	NA	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	–	–
0316-96-0103	NA	0.00-0.00	Fill	–	–	–	–	–	–	–	–	–	–	–	–
0316-96-0112	NA	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	0.002 (J)	–

Table B-19 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pyrene	RDX	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethene	Trichlorofluoromethane	Trinitrotoluene[2,4,6-]
Industrial Worker SSL[a]:				**31,300**	**174**	**24.6**	**248[g]**	**100,000[h]**	**1.59**	**959[g]**	**342**
SWMU 16-008(a)-99											
0316-96-0070	NA	0.00-0.00	Soil	-	-	-	0.004 (J)	-	0.005 (J)	0.001 (J)	-
0316-96-0081	NA	0.00-0.50	Soil	-	8.8	-	0.001 (J)	0.002 (J)	0.004 (J)	0.002 (J)	9.5
0316-96-0093	NA	0.00-0.50	Soil	0.13 (J)	36	-	0.005	-	0.004 (J)	0.002 (J)	1.2
0316-96-0101	NA	0.00-0.50	Soil	-	1.7	-	-	-	-	-	0.66
0316-96-0103	NA	0.00-0.00	Fill	-	3.5	-	-	-	-	-	0.97
0316-96-0112	NA	0.00-0.50	Soil	-	-	0.001 (J)	0.004 (J)	-	0.005	-	-

Note: Units are mg/kg.

[a] SSLs reflecting a 10^{-5} cancer risk or noncarcinogenic hazard quotient of 1 (whichever is lower) were obtained from NMED 2004, 85615, unless otherwise noted.

[b] Pyrene is used as a surrogate for benzo(g,h,i)perylene.

[c] Isopropylbenzene (cumene) used as a surrogate for 4-isopropyltoluene.

[d] NA = Not applicable.

[e] Not detected.

[f] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[g] Soil saturation limit basis.

[h] Low-toxicity maximum, health-based SSL exceeds 10^5 mg/kg.

Table B-20
Frequency of Inorganic Chemicals Detected During the 1996 VCA Above BVs in Soil, Sediment, and Tuff at the 90s Line SWMUs

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Aluminum	Soil	63	63	2600 to 28200	29200	0/63	0/63
	Fill	12	12	5530 to 21200	29200	0/12	0/12
	Qbt 4	15	15	17 to 11000	7340	5/15	0/15
Antimony	Soil	63	2	[0.61] to [13.8]	0.83	2/63	57/63
	Fill	12	0	[0.65 to 6.1]	0.83	0/12	2/12
	Qbt 4	14	0	[0.36 to 14]	0.5	0/14	13/14
Arsenic	Soil	63	57	[0.31] to 3.8	8.17	0/63	0/63
	Fill	12	3	[1.2] to 3.3	8.17	0/12	0/12
	Qbt 4	15	14	0.53 to 3.2	2.79	1/15	0/15
Barium	Soil	63	63	24.3 to 3920	295	32/63	0/63
	Fill	12	12	76.7 to 2670	295	6/12	0/12
	Qbt 4	15	15	2.1 to 1710	46	12/15	0/15
Beryllium	Soil	63	61	0.3 to 2	1.83	2/63	0/63
	Fill	12	12	0.55 to 2.1	1.83	1/12	0/12
	Qbt 4	15	12	[0.091] to 1.5	1.21	2/15	0/15
Cadmium	Soil	63	9	[0.04] to 2.5	0.4	9/63	53/63
	Fill	12	11	0.44 to 30.4	0.4	11/12	1/12
	Qbt 4	15	1	[0.091] to 0.89	1.63	0/15	0/15
Calcium	Soil	63	63	961 to 6860	6120	1/63	0/63
	Fill	12	12	1840 to 3580	6120	0/12	0/12
	Qbt 4	15	15	130 to 7290	2200	6/15	0/15
Chromium	Soil	63	57	[1.7] to 226	19.3	4/63	0/63
	Fill	12	11	[4.4] to 19.7	19.3	1/12	0/12
	Qbt 4	15	11	[0.18] to 9.1	7.14	2/15	0/15
Chromium VI	Soil	1	1	67.7 to 67.7	NA [b]	1/1	NA
Cobalt	Soil	63	61	0.8 to 38.1	8.64	16/63	0/63
	Fill	12	12	2.5 to 31.1	8.64	3/12	0/12
	Qbt 4	15	10	[0.27] to 6.9	3.14	7/15	0/15
Copper	Soil	63	63	1.8 to 579	14.7	20/63	0/63
	Fill	12	12	5.3 to 2210	14.7	5/12	0/12
	Qbt 4	15	14	0.48 to 166	4.66	9/15	0/15
Cyanide (Total)	Soil	63	2	[0.5] to 1.6	0.5	2/63	61/63
	Fill	12	1	[0.54] to 1.5	0.5	1/12	11/12
	Qbt 4	15	0	[0.00059 to 1]	0.5	0/15	14/15

Table B-20 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Iron	Soil	63	63	3650 to 27100	21500	3/63	0/63
	Fill	12	12	5440 to 14000	21500	0/12	0/12
	Qbt 4	15	15	456 to 20700	14500	1/15	0/15
Lead	Soil	63	63	2.1 to 109	22.3	12/63	0/63
	Fill	12	12	10.1 to 47	22.3	3/12	0/12
	Qbt 4	15	15	1.5 to 11	11.2	0/15	0/15
Magnesium	Soil	63	63	465 to 4250	4610	0/63	0/63
	Fill	12	12	964 to 2380	4610	0/12	0/12
	Qbt 4	15	14	[34] to 2700	1690	2/15	0/15
Manganese	Soil	63	62	[0.91] to 1780	671	8/63	0/63
	Fill	12	12	129 to 672	671	1/12	0/12
	Qbt 4	15	15	41 to 2300	482	3/15	0/15
Mercury	Soil	63	10	[0.02] to 0.11	0.1	1/63	0/63
	Fill	12	0	[0.02 to 0.11]	0.1	0/12	1/12
	Qbt 4	15	0	[0.012 to 0.14]	0.1	0/15	6/15
Nickel	Soil	63	58	2.4 to 451	15.4	20/63	1/63
	Fill	12	12	6.1 to 3280	15.4	6/12	0/12
	Qbt 4	15	12	[0.27] to 404	6.58	8/15	0/15
Potassium	Soil	63	57	541 to 2790	3460	0/63	0/63
	Fill	12	12	918 to 2020	3460	0/12	0/12
	Qbt 4	15	13	45.7 to 2300	3500	0/15	0/15
Selenium	Soil	63	3	[0.17] to [0.93]	1.52	0/63	0/63
	Fill	12	1	[0.18] to [0.41]	1.52	0/12	0/12
	Qbt 4	15	1	[0.36] to [1.4]	0.3	1/15	14/15
Silver	Soil	63	9	[0.15] to 16.9	1	9/63	48/63
	Fill	12	5	[0.24] to 2.5	1	3/12	1/12
	Qbt 4	15	0	[0.18 to 2.9]	1	0/15	14/15
Sodium	Soil	63	61	40.7 to 1030	915	2/63	0/63
	Fill	12	12	95.7 to 210	915	0/12	0/12
	Qbt 4	15	13	[26] to 480	2770	0/15	0/15
Thallium	Soil	63	3	[0.15] to [3]	0.73	0/63	1/63
	Fill	12	0	[0.22 to 0.33]	0.73	0/12	0/12
	Qbt 4	15	0	[0.18 to 1.8]	1.1	0/15	6/15
Uranium	Soil	6	6	1.8 to 8.1	1.82	5/6	0/6
	Fill	7	7	4.69 to 64.9	1.82	7/7	0/7
	Qbt 4	2	2	2.4 to 4.25	2.4	1/2	0/2

Table B-20 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Vanadium	Soil	63	63	4.3 to 35.4	39.6	0/63	0/63
	Fill	12	12	9.6 to 26.3	39.6	0/12	0/12
	Qbt 4	15	14	0.33 to 16.9	17	0/15	0/15
Zinc	Soil	63	63	7.4 to 689	48.8	22/63	0/63
	Fill	12	12	26.7 to 77.8	48.8	2/12	0/12
	Qbt 4	15	15	9.3 to 60.3	63.5	0/15	0/15

[a] Values in brackets are detection limits.

[b] NA = Not applicable.

Table B-21
Summary of 1996 VCA Samples with Inorganic Chemicals Above BVs in Soil, Sediment, and Tuff at the 90s Line SWMUs

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium (Total)	Chromium VI	Cobalt	Copper	Cyanide (Total)
Soil BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**NA**	**8.64**	**14.7**	**0.5**
Qbt 2,3,4 BV				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**NA**	**3.14**	**4.66**	**0.5**
Fill BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**NA**	**8.64**	**14.7**	**0.5**
Industrial Worker SSL[a]:				**100,000[b]**	**454**	**17.7**	**78,300**	**2,250**	**1,128[c]**	**NA**	**5,000[e]**	**3,400**	**20,500**	**45,400**	**22,700**
SWMU 16-008(a)-99															
0316-96-0080	16-02240	3.00-3.50	Soil	–[f]	7.4 (UJ)[g]	–	691 (J+)[h]	–	0.87 (U)[i]	–	–	–	–	–	0.62 (U)
0316-96-0153	16-02240	4.50-5.50	Soil	–	7.2 (UJ)	–	443 (J+)	–	0.85 (U)	–	–	–	–	–	0.61 (U)
0316-96-0110	16-02255	3.00-3.50	Soil	–	5.7 (U)	–	778	–	0.75 (U)	–	–	–	–	–	0.51 (U)
0316-96-0111	16-02256	3.00-3.50	Soil	–	6.4 (U)	–	331	–	0.84 (U)	–	–	–	–	–	0.57 (U)
0316-96-0010	16-02340	4.00-4.50	Fill	–	–	–	–	–	30.4 (J+)	–	–	–	31.1	15.6	0.62 (U)
0316-96-0011	16-02341	2.00-2.50	Fill	–	0.84 (UJ)	–	699	–	1 (J+)	–	19.7	–	–	–	0.73 (U)
0316-96-0012	16-02343	3.50-4.00	Fill	–	–	–	–	–	0.84 (J+)	–	–	–	–	682	0.61 (U)
0316-96-0013	16-02344	3.50-4.00	Fill	–	–	–	–	–	0.74 (J+)	–	–	–	–	139	0.63 (U)
0316-96-0014	16-02345	0.00-0.50	Fill	–	–	–	–	–	0.58 (J+)	–	–	–	–	104	0.56 (U)
0316-96-0076	16-02346	0.00-0.50	Soil	–	6.3 (U)	–	–	–	0.75 (U)	–	–	–	–	200	0.56 (U)
0316-96-0077	16-02347	0.00-0.50	Soil	–	5.8 (U)	–	–	–	0.69 (U)	–	–	–	–	129	
0316-96-0078	16-02348	0.00-0.50	Soil	–	6 (U)	–	–	–	0.71 (U)	–	–	–	–	458	0.51 (U)
0316-96-0079	16-02349	0.00-0.50	Soil	–	6 (U)	–	–	–	0.71 (U)	–	–	–	–	238	0.51 (U)
0316-96-0022	16-02350	3.00-3.50	Fill	–	–	–	2190	–	1.1 (J)[j]	–	–	–	12.3 (J)	–	1.5
0316-96-0023	16-02351	3.00-3.50	Fill	–	–	–	1260	–	1.2 (J)	–	–	–	–	–	0.63 (U)
0316-96-0024	16-02352	2.00-2.50	Fill	–	–	–	2670	–	0.44 (J)	–	–	–	–	–	0.63 (U)
0316-96-0147	16-02354	6.00-7.00	Soil	–	6.5 (U)	–	–	–	0.77 (U)	–	–	–	–	–	0.55 (U)
0316-96-0086	16-02356	0.00-0.50	Soil	–	6 (U)	–	715	–	0.71 (U)	–	–	–	9 (J)	–	0.51 (U)

Table B-21 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium (Total)	Chromium VI	Cobalt	Copper	Cyanide (Total)
Soil BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**NA**	**8.64**	**14.7**	**0.5**
Qbt 2,3,4 BV				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**NA**	**3.14**	**4.66**	**0.5**
Fill BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**NA**	**8.64**	**14.7**	**0.5**
Industrial Worker SSL[a]:				**100,000[b]**	**454**	**17.7**	**78,300**	**2,250**	**1,128[c]**	**NA**	**5,000[e]**	**3,400**	**20,500**	**45,400**	**22,700**
0316-96-0087	16-02357	0.00-0.50	Soil	–	5.9 (U)	–	767	–	0.7 (U)	–	–	–	–	–	0.51 (U)
0316-96-0088	16-02358	0.00-0.50	Soil	–	6 (U)	–	1100	–	0.71 (U)	–	–	–	28.2	64.4	0.51 (U)
0316-96-0089	16-02359	0.00-0.50	Soil	–	5.9 (U)	–	3920	–	0.7 (U)	–	–	–	–	–	
0316-96-0094	16-02360	6.50-7.00	Qbt 4	–	14 (UJ)	–	180	1.4 (J+)	–	2400	8.6	–	6.9	5.9 (J+)	0.7 (U)
0316-96-0095	16-02360	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–	0.66 (U)
0316-96-0164	16-02360	7.50-8.00	Qbt 4	11000	14 (UJ)	–	110	–	–	–	–	–	3.3	–	0.71 (U)
0316-96-0095	16-02361	6.50-7.00	Qbt 4	8000	13 (UJ)	3.2	140	–	–	2600	–	–	3.2	5 (J+)	0.66 (U)
0316-96-0160	16-02361	7.00-7.50	Qbt 4	–	14 (UJ)	–	–	–	–	–	–	–	–	–	0.68 (U)
0316-96-0102	16-02362	6.00-6.50	Qbt 4	9900	14 (UJ)	–	380	–	–	2600	–	–	–	4.7 (J+)	0.68 (U)
0316-96-0161	16-02362	6.50-7.00	Qbt 4	–	13 (UJ)	–	350	1.5 (J+)	–	5200	9.1	–	5.2	8.3 (J+)	0.67 (U)
0316-96-0033	16-02363	4.50-5.00	Soil	–	7.1 (UJ)	–	1190 (J+)	–	0.83 (U)	–	–	–	9.1 (J)	–	0.6 (U)
0316-96-0154	16-02363	6.50-7.50	Soil	–	6.4 (UJ)	–	–	–	0.75 (U)	–	–	–	–	–	0.54 (U)
0316-96-0092	16-02364	4.50-5.00	Soil	–	9.4 (U)	–	620	2	2.5	–	–	–	–	–	0.57 (U)
0316-96-0157	16-02364	5.00-6.00	Soil	–	6.3 (U)	–	–	–	0.83 (U)	–	–	–	–	–	0.59 (U)
0316-96-0096	16-02366	4.00-4.50	Soil	–	6.6 (U)	–	–	–	0.78 (U)	–	–	–	–	–	0.58 (U)
0316-96-0097	16-02367	0.00-0.50	Soil	–	6.1 (U)	–	343	–	0.88 (J)	–	–	–	9 (J)	17.8	0.54 (U)
0316-96-0098	16-02368	0.00-0.50	Soil	–	6.1 (U)	–	421	–	0.72 (U)	–	–	–	–	–	0.53 (U)
0316-96-0099	16-02369	0.00-0.50	Soil	–	5.9 (U)	–	398	–	0.7 (U)	–	–	–	–	14.9	0.52 (U)
0316-96-0100	16-02370	3.50-4.00	Soil	–	7.6 (U)	–	–	–	0.77 (U)	–	–	–	–	–	0.52 (U)
0316-96-0158	16-02370	4.00-5.00	Soil	–	6.6 (U)	–	–	–	0.87 (U)	–	–	–	–	–	0.6 (U)
0316-96-0148	16-02372	2.00-3.00	Soil	–	7.1 (UJ)	–	–	–	0.84 (U)	–	–	–	–	–	0.6 (U)
0316-96-0208	16-02373	4.00-4.50	Soil	–	6.8 (UJ)	–	–	–	0.81 (U)	–	–	–	–	–	0.58 (U)
0316-96-0149	16-02373	5.50-6.00	Soil	–	7.4 (UJ)	–	–	–	0.87 (U)	–	–	–	–	–	0.62 (U)
0316-96-0045	16-02375	0.00-0.50	Soil	–	6.4 (UJ)	–	3070 (J+)	–	0.85 (U)	–	–	–	–	14.9	0.57 (U)

Table B-21 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium (Total)	Chromium VI	Cobalt	Copper	Cyanide (Total)
Soil BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**NA**	**8.64**	**14.7**	**0.5**
Qbt 2,3,4 BV				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**NA**	**3.14**	**4.66**	**0.5**
Fill BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**NA**	**8.64**	**14.7**	**0.5**
Industrial Worker SSL[a]:				**100,000[b]**	**454**	**17.7**	**78,300**	**2,250**	**1,128[c]**	**NA**	**5,000[e]**	**3,400**	**20,500**	**45,400**	**22,700**
0316-96-0108	16-02376	0.00-0.50	Soil	–	6.3 (U)	–	502	–	1.2	–	–	–	38.1	15.8	0.54 (U)
0316-96-0106	16-02377	0.00-0.50	Soil	–	6.4 (U)	–	320	–	0.76 (U)	–	–	–	–	28	0.54 (U)
0316-96-0107	16-02378	0.00-0.50	Soil	–	6 (U)	–	803	–	0.71 (U)	–	–	–	11.3	–	0.52 (U)
0316-96-0109	16-02379	0.00-0.50	Soil	–	5.8 (U)	–	406	–	0.69 (U)	–	–	–	9 (J)	–	0.52 (U)
0316-96-0053	16-02381	3.00-3.50	Soil	–	9.8 (U)	–	–	–	0.88 (U)	–	–	–	12.9	226	0.58 (U)
0316-96-0054	16-02383	2.50-3.00	Soil	–	10.5 (U)	–	1550	–	0.95 (U)	–	–	–	11.9 (J)	579	0.63 (U)
0316-96-0055	16-02384	3.50-4.00	Soil	–	10.6 (U)	–	2710	–	0.97 (U)	–	226	67.7	–	–	0.64 (U)
0316-96-0056	16-02386	1.50-2.00	Soil	–	10.3 (U)	–	439	–	0.93 (U)	–	52.9	–	–	37.2	0.61 (U)
0316-96-0116	16-02388	0.00-0.50	Soil	–	5.5 (U)	–	–	–	0.72 (U)	–	–	–	–	119	0.51 (U)
0316-96-0117	16-02389	0.00-0.50	Soil	–	12.7 (U)	–	385	–	1.7 (U)	–	25	–	9.1 (J)	91.6	1.1 (U)
0316-96-0118	16-02390	0.00-0.50	Soil	–	13.5 (U)	–	603	–	1.8 (J)	–	25.4	–	11.2 (J)	137	1.2 (U)
0316-96-0051	16-02392	4.00-4.50	Soil	–	10 (U)	–	–	–	0.94 (U)	–	–	–	11.4 (J)	–	0.62 (U)
0316-96-0052	16-02393	4.00-4.50	Soil	–	10 (U)	–	–	–	0.9 (U)	–	–	–	–	19.2	0.6 (U)
0316-96-0058	16-02393	7.00-8.00	Qbt 4	9720	6.8 (U)	–	79.1	–	–	–	–	–	5.6 (J)	5 (J)	0.57 (U)
0316-96-0050	16-02394	4.00-4.50	Soil	–	10 (U)	–	–	–	0.91 (U)	–	–	–	–	–	0.6 (U)
0316-96-0059	16-02394	7.50-8.00	Qbt 4	–	7.1 (U)	–	98.4	–	–	–	–	–	–	–	0.6 (U)
0316-96-0015	16-02415	4.00-4.50	Fill	–	–	–	–	–	0.76 (J+)	–	–	–	–	–	0.71 (U)
0316-96-0018	16-02415	6.00-6.50	Qbt 4	7720	6.7 (U)	–	81.4	–	–	2450	–	–	3.4 (J)	5.1 (J)	
0316-96-0016	16-02418	4.00-4.50	Fill	–	–	–	–	2.1	0.86 (J+)	–	–	–	14.1	2210	0.63 (U)
0316-96-0019	16-02418	6.50-7.00	Qbt 4	–	6 (U)	–	107	–	–	–	–	–	–	166	0.54 (U)
0316-96-0020	16-02421	4.00-4.50	Soil	–	–	–	1780	–	0.93 (J)	–	–	–	–	–	0.61 (U)
0316-96-0028	16-02421	7.00-8.00	Soil	–	6.8 (U)	–	–	–	0.8 (U)	–	–	–	–	–	0.57 (U)
0316-96-0021	16-02422	4.00-4.50	Fill	–	–	–	567	–	0.94 (J)	–	–	–	–	–	0.61 (U)
0316-96-0029	16-02422	7.00-8.00	Qbt 4	–	6.5 (U)	–	60.2	–	–	–	–	–	–	–	0.58 (U)
0316-96-0030	16-02425	4.00-4.50	Soil	–	–	–	613 (J+)	–	1.4	–	–	–	–	–	0.58 (U)
0316-96-0031	16-02427	4.00-4.50	Soil	–	–	–	708 (J+)	–	0.97 (J)	–	–	–	–	–	0.55 (U)

Table B-21 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium (Total)	Chromium VI	Cobalt	Copper	Cyanide (Total)
Soil BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**NA**	**8.64**	**14.7**	**0.5**
Qbt 2,3,4 BV				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**NA**	**3.14**	**4.66**	**0.5**
Fill BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**NA**	**8.64**	**14.7**	**0.5**
Industrial Worker SSL[a]:				**100,000[b]**	**454**	**17.7**	**78,300**	**2,250**	**1,128[c]**	**NA**	**5,000[e]**	**3,400**	**20,500**	**45,400**	**22,700**
0316-96-0038	16-02427	7.00-8.00	Qbt 4	–	7.5 (U)	–	1710	–	–	–	–	–	–	–	0.63 (U)
0316-96-0032	16-02430	4.00-4.50	Soil	–	1.1 (J)	–	447 (J+)	–	0.85 (J)	–	–	–	–	–	0.66 (U)
0316-96-0039	16-02430	7.00-8.00	Qbt 4	–	6.9 (U)	–	185	–	–	7290	–	–	4.6 (J)	4.7 (J)	0.58 (U)
0316-96-0040	16-02431	4.00-4.50	Soil	–	6.6 (U)	–	–	–	0.87 (U)	–	–	–	8.9 (J)	–	1.6
0316-96-0041	16-02433	4.00-4.50	Soil	–	6.6 (U)	–	611	–	0.86 (U)	–	–	–	–	20	0.58 (U)
0316-96-0048	16-02433	7.00-8.00	Soil	–	6.7 (U)	–	1320	–	0.88 (U)	–	–	–	–	20.6	0.59 (U)
0316-96-0042	16-02434	4.00-4.50	Fill	–	6.1 (UJ)	–	589 (J+)	–	0.8 (U)	–	–	–	–	–	0.54 (U)
0316-96-0049	16-02436	6.50-7.00	Soil	–	6.8 (U)	–	309	–	0.89 (U)	–	–	–	–	–	0.6 (U)
0316-96-0132	16-02547	0.67-1.17	Soil	–	6.5 (U)	–	–	–	0.85 (U)	–	–	–	10.1 (J)	–	0.58 (U)
0316-96-0133	16-02550	0.67-1.17	Soil	–	6.3 (U)	–	–	–	0.82 (U)	–	–	–	–	–	0.56 (U)
0316-96-0134	16-02554	0.67-1.17	Soil	–	6.3 (J)	–	–	–	0.86 (J)	–	–	–	–	–	0.52 (U)
0316-96-0135	16-02555	0.67-1.17	Soil	–	5.9 (U)	–	–	–	0.77 (U)	–	–	–	–	–	0.52 (U)
0316-96-0136	16-02560	1.50-2.00	Soil	–	6.4 (UJ)	–	–	–	0.84 (U)	6860	–	–	–	–	0.57 (U)
0316-96-0137	16-02563	1.50-2.00	Soil	–	6.2 (UJ)	–	–	–	0.82 (U)	–	–	–	–	–	0.55 (U)
0316-96-0138	16-02568	0.67-1.17	Soil	–	7.8 (UJ)	–	–	1.9	1 (U)	–	–	–	–	–	0.71
0316-96-0139	16-02570	0.67-1.17	Soil	–	6.9 (UJ)	–	–	–	0.9 (U)	–	–	–	–	–	0.61 (U)
0316-96-0140	16-02572	0.67-1.17	Soil	–	6.4 (U)	–	–	–	0.84 (U)	–	–	–	14.1	–	0.57 (U)
0316-96-0141	16-02575	0.67-1.17	Soil	–	6 (U)	–	–	–	0.79 (U)	–	–	–	–	–	0.56 (U)
0316-96-0146	16-02595	6.50-7.50	Soil	–	6.8 (U)	–	469	–	0.8 (U)	–	–	–	–	–	0.57 (U)
0316-96-0119	16-02635	0.00-0.50	Soil	–	13.8 (U)	–	568	–	1.8 (U)	–	–	–	9.9 (J)	196	1.3 (U)
0316-98-0418	16-02669	37.5-38.5	Qbt 4	–	–	–	–	–	–	–	–	–	–	–	1 (U)
0316-98-0419	16-02669	109-110	Qbt 4	–	–	–	–	–	–	–	–	–	–	6.6 (J-)[k]	0.51 (U)

Table B-21 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Selenium	Silver	Sodium	Thallium	Uranium	Zinc
Soil BVe				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Qbt 2,3,4 BV				**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**0.3**	**1**	**2770**	**1.1**	**2.4**	**63.5**
Fill BV				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Industrial Worker SSL[a]:				**100,000[b]**	**750**	**NA**	**21,800**	**340[e]**	**22,500**	**5,680**	**5,680**	**NA**	**74.9**	**200[l]**	**100,000[b]**
SWMU 16-008(a)															
0316-96-0080	16-02240	3.00-3.50	Soil	–	–	–	–	–	–	–	1.3 (U)	–	–	–	–
0316-96-0153	16-02240	4.50-5.50	Soil	–	–	–	–	–	–	–	1.3 (U)	–	–	–	–
0316-96-0110	16-02255	3.00-3.50	Soil	–	–	–	–	–	26.2	–	1.4 (U)	–	–	–	–
0316-96-0111	16-02256	3.00-3.50	Soil	–	–	–	–	–	30.1	–	1.5 (U)	–	–	–	–
0316-96-0010	16-02340	4.00-4.50	Fill	–	–	–	–	–	225	–	1.2 (J)	–	–	28.8	–
0316-96-0011	16-02341	2.00-2.50	Fill	–	31.9	–	–	–	21.7	–	–	–	–	9.34	–
0316-96-0012	16-02343	3.50-4.00	Fill	–	–	–	–	–	437	–	–	–	–	22.8	–
0316-96-0013	16-02344	3.50-4.00	Fill	–	–	–	–	–	277	–	1.5 (J)	–	–	4.69	–
0316-96-0014	16-02345	0.00-0.50	Fill	–	–	–	–	–	179	–	–	–	–	7.19	54.5
0316-96-0076	16-02346	0.00-0.50	Soil	–	30.6	–	–	–	236	–	8.7	–	–	8.1	125
0316-96-0077	16-02347	0.00-0.50	Soil	–	–	–	–	–	194	–	6.3	–	–	3.85	–
0316-96-0078	16-02348	0.00-0.50	Soil	–	–	–	–	–	451	–	13.4	–	–	7.8	132
0316-96-0079	16-02349	0.00-0.50	Soil	–	–	–	–	–	212	–	7.3	–	–	4.84	–
0316-96-0022	16-02350	3.00-3.50	Fill	–	–	–	672	–	–	–	–	–	–	–	–
0316-96-0023	16-02351	3.00-3.50	Fill	–	–	–	–	–	–	–	–	–	–	–	–
0316-96-0024	16-02352	2.00-2.50	Fill	–	–	–	–	–	–	–	–	–	–	–	–
0316-96-0147	16-02354	6.00-7.00	Soil	–	–	–	–	–	–	–	1.2 (U)	–	–	–	–
0316-96-0086	16-02356	0.00-0.50	Soil	–	–	–	–	–	–	–	1.1 (U)	–	–	–	263

Table B-21 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Selenium	Silver	Sodium	Thallium	Uranium	Zinc
Soil BV				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Qbt 2,3,4 BV				**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**0.3**	**1**	**2770**	**1.1**	**2.4**	**63.5**
Fill BV				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Industrial Worker SSL[a]:				**100,000[b]**	**750**	**NA**	**21,800**	**340[e]**	**22,500**	**5,680**	**5,680**	**NA**	**74.9**	**200[l]**	**100,000[b]**
0316-96-0087	16-02357	0.00-0.50	Soil	–	–	–	–	–	–	–	1.1 (U)	–	–	–	–
0316-96-0088	16-02358	0.00-0.50	Soil	–	–	–	1260	–	–	–	1.1 (U)	–	–	–	99.9
0316-96-0089	16-02359	0.00-0.50	Soil	–	–	–	–	–	–	–	1.1 (U)	–	–	–	–
0316-96-0094	16-02360	6.50-7.00	Qbt 4	–	–	2300	730	0.14 (U)	14 (J+)	1.4 (UJ)	2.8 (U)	–	1.8 (U)	–	–
0316-96-0095	16-02360	6.50-7.00	Qbt 4	–	–	–	–	0.13 (U)	–	–	–	–	–	–	–
0316-96-0164	16-02360	7.50-8.00	Qbt 4	–	–	–	–	0.14 (U)	7.4 (J+)	1.4 (UJ)	2.9 (U)	–	1.8 (U)	–	–
0316-96-0095	16-02361	6.50-7.00	Qbt 4	–	–	–	–	–	6.8 (J+)	1.3 (UJ)	2.6 (U)	–	1.6 (U)	–	–
0316-96-0160	16-02361	7.00-7.50	Qbt 4	–	–	–	–	0.14 (U)	–	1.4 (UJ)	2.7 (U)	–	1.7 (U)	–	–
0316-96-0102	16-02362	6.00-6.50	Qbt 4	–	–	–	–	0.14 (U)	–	1.4 (UJ)	2.7 (U)	–	1.7 (U)	–	–
0316-96-0161	16-02362	6.50-7.00	Qbt 4	–	–	2700	2300	0.13 (U)	33 (J+)	1.3 (UJ)	2.7 (U)	–	1.7 (U)	–	–
0316-96-0033	16-02363	4.50-5.00	Soil	–	–	–	1110	–	–	–	1.3 (U)	–	–	–	–
0316-96-0154	16-02363	6.50-7.50	Soil	–	–	–	–	–	–	–	1.1 (U)	–	–	–	–
0316-96-0092	16-02364	4.50-5.00	Soil	–	–	–	804	–	17.2	–	1.5 (U)	–	–	–	49.3
0316-96-0157	16-02364	5.00-6.00	Soil	–	–	–	–	–	15.5	–	1.5 (U)	–	–	–	–
0316-96-0096	16-02366	4.00-4.50	Soil	–	–	–	–	–	–	–	1.2 (U)	–	–	–	–
0316-96-0097	16-02367	0.00-0.50	Soil	–	–	–	–	–	–	–	1.1 (U)	–	–	–	430
0316-96-0098	16-02368	0.00-0.50	Soil	–	–	–	–	–	–	–	1.1 (U)	–	–	–	199
0316-96-0099	16-02369	0.00-0.50	Soil	–	–	–	–	–	–	–	1.1 (U)	–	–	–	132
0316-96-0100	16-02370	3.50-4.00	Soil	–	–	–	–	–	–	–	1.4 (U)	–	–	–	–
0316-96-0158	16-02370	4.00-5.00	Soil	–	30.6	–	–	–	–	–	1.6 (U)	–	–	–	–
0316-96-0148	16-02372	2.00-3.00	Soil	–	–	–	–	–	–	–	1.3 (U)	–	–	–	–
0316-96-0208	16-02373	4.00-4.50	Soil	–	–	–	–	–	–	–	1.2 (U)	–	–	–	–
0316-96-0149	16-02373	5.50-6.00	Soil	–	–	–	–	–	–	–	1.3 (U)	–	–	–	–
0316-96-0045	16-02375	0.00-0.50	Soil	–	–	–	–	–	–	–	1.6 (U)	–	3 (UJ)	–	64

Table B-21 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Selenium	Silver	Sodium	Thallium	Uranium	Zinc
Soil BV				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Qbt 2,3,4 BV				**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**0.3**	**1**	**2770**	**1.1**	**2.4**	**63.5**
Fill BV				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Industrial Worker SSL[a]:				**100,000[b]**	**750**	**NA**	**21,800**	**340[e]**	**22,500**	**5,680**	**5,680**	**NA**	**74.9**	**200[l]**	**100,000[b]**
0316-96-0108	16-02376	0.00-0.50	Soil	–	36.5	–	1780	0.11	–	–	1.1 (U)	–	–	–	689
0316-96-0106	16-02377	0.00-0.50	Soil	–	23	–	–	–	–	–	1.1 (U)	–	–	–	485
0316-96-0107	16-02378	0.00-0.50	Soil	–	–	–	–	–	–	–	1.1 (U)	–	–	–	78.6
0316-96-0109	16-02379	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	–	152
0316-96-0053	16-02381	3.00-3.50	Soil	–	–	–	906 (J+)	–	49.4	–	1.6 (U)	–	–	–	–
0316-96-0054	16-02383	2.50-3.00	Soil	–	–	–	–	–	429	–	1.7 (U)	–	–	–	–
0316-96-0055	16-02384	3.50-4.00	Soil	–	–	–	–	–	19.1	–	1.7 (U)	–	–	–	–
0316-96-0056	16-02386	1.50-2.00	Soil	–	45.2	–	–	–	135	–	1.8 (J)	–	–	–	69.8 (J+)
0316-96-0116	16-02388	0.00-0.50	Soil	–	35.1	–	–	–	210	–	1.3 (U)	–	–	–	284
0316-96-0117	16-02389	0.00-0.50	Soil	–	–	–	–	–	177	–	6	1030 (J)	–	–	161
0316-96-0118	16-02390	0.00-0.50	Soil	–	–	–	735	–	219	–	15.3	–	–	–	83.4
0316-96-0051	16-02392	4.00-4.50	Soil	–	–	–	–	–	–	–	1.7 (U)	–	–	–	–
0316-96-0052	16-02393	4.00-4.50	Soil	–	–	–	–	–	130	–	1.6 (U)	–	–	–	–
0316-96-0058	16-02393	7.00-8.00	Qbt 4	20700	–	–	494	–	10.3	0.5 (U)	1.2 (U)	–	–	–	–
0316-96-0050	16-02394	4.00-4.50	Soil	–	–	–	–	–	–	–	1.6 (U)	–	–	–	–
0316-96-0059	16-02394	7.50-8.00	Qbt 4	–	–	–	–	–	–	0.53 (U)	1.3 (U)	–	–	–	–
0316-96-0015	16-02415	4.00-4.50	Fill	–	–	–	–	–	–	–	–	–	–	49.5	–
0316-96-0018	16-02415	6.00-6.50	Qbt 4	–	–	–	–	–	9.5	0.52 (U)	1.6 (U)	–	–	–	–
0316-96-0016	16-02418	4.00-4.50	Fill	–	47	–	–	0.11 (U)	3280	–	2.5	–	–	64.9	77.8
0316-96-0019	16-02418	6.50-7.00	Qbt 4	–	–	–	–	–	404	0.47 (U)	1.5 (U)	–	–	4.25	–
0316-96-0020	16-02421	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–	–	–
0316-96-0028	16-02421	7.00-8.00	Soil	–	–	–	–	–	–	–	1.7 (J)	–	–	–	–
0316-96-0021	16-02422	4.00-4.50	Fill	–	23.8 (J-)	–	–	–	–	–	–	–	–	–	–
0316-96-0029	16-02422	7.00-8.00	Qbt 4	–	–	–	–	–	–	0.51 (U)	1.6 (U)	–	–	–	–

Table B-21 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Selenium	Silver	Sodium	Thallium	Uranium	Zinc
Soil BV				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Qbt 2,3,4 BV				**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**0.3**	**1**	**2770**	**1.1**	**2.4**	**63.5**
Fill BV				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Industrial Worker SSL[a]:				**100,000[b]**	**750**	**NA**	**21,800**	**340[e]**	**22,500**	**5,680**	**5,680**	**NA**	**74.9**	**200[l]**	**100,000[b]**
0316-96-0031	16-02427	4.00-4.50	Soil	21600	–	–	–	–	–	–	–	–	–	–	90.3
0316-96-0038	16-02427	7.00-8.00	Qbt 4	–	–	–	–	–	–	0.56 (U)	1.3 (U)	–	–	–	–
0316-96-0032	16-02430	4.00-4.50	Soil	21800	–	–	–	–	17.1	–	–	–	–	–	–
0316-96-0039	16-02430	7.00-8.00	Qbt 4	–	–	–	–	–	9.7	0.68 (J)	1.2 (U)	–	–	–	–
0316-96-0040	16-02431	4.00-4.50	Soil	–	109	–	–	–	–	–	1.6 (U)	–	–	–	–
0316-96-0041	16-02433	4.00-4.50	Soil	–	–	–	–	–	–	–	1.6 (U)	–	–	–	–
0316-96-0048	16-02433	7.00-8.00	Soil	–	–	–	–	–	–	–	1.6 (U)	–	–	–	–
0316-96-0042	16-02434	4.00-4.50	Fill	–	–	–	–	–	–	–	1.5 (U)	–	–	–	–
0316-96-0049	16-02436	6.50-7.00	Soil	–	–	–	–	–	–	–	1.6 (U)	–	–	–	69.1
0316-96-0132	16-02547	0.67-1.17	Soil	–	–	–	–	–	–	–	1.6 (U)	–	–	2.89	–
0316-96-0133	16-02550	0.67-1.17	Soil	–	–	–	–	–	–	–	1.5 (U)	–	–	–	–
0316-96-0134	16-02554	0.67-1.17	Soil	–	–	–	–	–	–	–	1.4 (U)	–	–	–	–
0316-96-0135	16-02555	0.67-1.17	Soil	–	–	–	–	–	–	–	1.4 (U)	–	–	–	–
0316-96-0136	16-02560	1.50-2.00	Soil	–	24.3	–	–	–	–	–	1.5 (U)	–	–	–	–
0316-96-0030	16-02425	4.00-4.50	Soil	27100	40.1	–	954	–	–	–	–	–	–	–	110

Table B-21 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Selenium	Silver	Sodium	Thallium	Uranium	Zinc
Soil BV				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Qbt 2,3,4 BV				**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**0.3**	**1**	**2770**	**1.1**	**2.4**	**63.5**
Fill BV				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Industrial Worker SSL[a]:				**100,000[b]**	**750**	**NA**	**21,800**	**340[e]**	**22,500**	**5,680**	**5,680**	**NA**	**74.9**	**200[l]**	**100,000[b]**
0316-96-0137	16-02563	1.50-2.00	Soil	–	26.1	–	–	–	–	–	1.5 (U)	–	–	–	–
0316-96-0138	16-02568	0.67-1.17	Soil	–	23.5	–	–	–	15.5 (U)	–	1.9 (U)	–	–	–	–
0316-96-0139	16-02570	0.67-1.17	Soil	–	–	–	–	–	–	–	1.7 (U)	–	–	–	–
0316-96-0140	16-02572	0.67-1.17	Soil	–	–	–	741	–	15.8	–	1.5 (U)	–	–	–	–
0316-96-0141	16-02575	0.67-1.17	Soil	–	–	–	–	–	16.8	–	1.5 (U)	–	–	–	68.4
0316-96-0146	16-02595	6.50-7.50	Soil	–	–	–	–	–	–	–	1.2 (U)	–	–	–	–
0316-96-0119	16-02635	0.00-0.50	Soil	–	29.1	–	–	–	224	–	16.9	940 (J)	–	–	71.5
0316-98-0418	16-02669	37.5-38.5	Qbt 4	–	–	–	–	–	–	0.36 (U)	–	–	–	–	–
0316-98-0419	16-02669	109-110	Qbt 4	–	–	–	–	–	–	0.51 (UJ)	2 (UJ)	–	–	–	–

Note: Units are mg/kg.

[a] SSLs reflecting a 10^{-5} cancer risk or noncarcinogenic hazard quotient of 1 (whichever is lower) were obtained from NMED 2004, 85615, unless otherwise noted.

[b] Low-toxicity maximum, health-based SSL exceeds 10^5 mg/kg

[c] Cadmium SSL incorrectly calculated in NMED 2004, 85615; recalculated to obtain SSL presented.

[d] Not available.

[e] SSL obtained from EPA Region 6 (EPA 2004, 87478); carcinogenic SSLs adjusted to 10^{-5} risk level.

[f] — = Value not above BV for corresponding media.

[g] UJ = The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.

[h] J+ = The analyte was positively identified, and the result is likely to be biased high.

[i] U = The analyte was analyzed for but not detected.

[j] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[k] J- = The analyte was positively identified, and the result is likely to be biased low.

[l] SSL obtained from EPA Region 9 2004 preliminary remediation goal table http://www.epa.gov/Region9/waste/sfund/prg/files/04prgtable.pdf.

Table B-22
Frequency of Organic Chemicals Detected During the 1996 VCA in Soil, Sediment, and Tuff at the 90s Line

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	Frequency of Detects	Quantitation Limit [b] (mg/kg)
Acenaphthene	Soil	58	1	0.072 to [1.9]	1/58	2.6
Acetone	Soil	58	2	[0.002] to [0.29]	2/58	0.29
	Qbt 4	15	1	[0.002] to 0.043	1/15	0.29
Amino-2,6-dinitrotoluene[4-]	Soil	37	7	0.084 to 0.849	7/37	0.25
	Fill	12	4	[0.084] to 0.306	4/12	0.25
	Qbt 4	15	2	[0.084] to 0.67	2/15	0.25
Amino-4,6-dinitrotoluene[2-]	Soil	37	13	[0.082] to 1.03	13/37	0.25
	Fill	12	4	[0.082] to 1.15	4/12	0.25
	Qbt 4	15	1	[0.082] to 0.282	1/15	0.25
Amino-DNTs	Soil	26	2	[0.35] to 0.92	2/26	0.5
Anthracene	Soil	58	3	0.041 to [1.9]	3/58	2.6
	Qbt 4	15	1	0.058 to [0.41]	1/15	2.6
Benzo(a)anthracene	Soil	58	2	0.055 to [1.9]	2/58	2.6
	Qbt 4	15	1	0.037 to [0.41]	1/15	2.6
Benzo(a)pyrene	Soil	58	2	0.039 to [1.9]	2/58	2.6
Benzo(b)fluoranthene	Soil	58	4	0.041 to [1.9]	4/58	2.6
Benzo(g,h,i)perylene	Soil	57	2	0.052 to [1.9]	2/57	2.6
Benzo(k)fluoranthene	Soil	57	3	0.042 to [1.9]	3/57	2.6
Benzoic Acid	Soil	58	2	0.092 to [9.4]	2/58	13
	Qbt 4	15	3	0.085 to [3.4]	3/15	13
Bis(2-ethylhexyl)phthalate	Soil	58	12	0.039 to [1.9]	12/58	1.9
	Fill	12	2	[0.37] to 3.3	2/12	1.9
	Qbt 4	15	1	[0.22] to [0.41]	1/15	1.9
Butanone[2-]	Soil	58	7	0.009 to [0.046]	7/58	0.046
Butylbenzylphthalate	Soil	58	1	0.083 to [1.9]	1/58	2.6
Chrysene	Soil	58	4	0.045 to [1.9]	4/58	2.6
	Qbt 4	15	1	0.069 to [0.41]	1/15	2.6
Dibenzofuran	Soil	58	1	0.073 to [1.9]	1/58	2.6
Dichloroethene[cis-1,2-]	Soil	58	15	0.001 to 0.067	15/58	0.013
Dinitrotoluene[2,4-]	Soil	121	6	[0.055] to [1.9]	6/121	2.6
Di-n-octylphthalate	Soil	58	1	0.078 to [1.9]	1/58	1.9
	Fill	12	1	[0.37 to 1.2]	1/12	1.9
Fluoranthene	Soil	58	6	0.04 to [1.9]	6/58	2.6
	Qbt 4	15	1	0.14 to [0.41]	1/15	2.6
Fluorene	Soil	58	2	0.048 to [1.9]	2/58	2.6
Hexanone[2-]	Soil	58	1	0.001 to [0.052]	1/58	0.052
HMX	Soil	63	11	[0.163 to 2.2]	11/63	2.2
	Fill	12	4	[0.18] to 1.61	4/12	2.2

Table B-22 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	Frequency of Detects	Quantitation Limit [b] (mg/kg)
Indeno(1,2,3-cd)pyrene	Soil	58	2	0.043 to [1.9]	2/58	2.6
Isopropyltoluene[4-]	Soil	58	12	0.001 to 0.03	12/58	0.007
Methylene Chloride	Qbt 4	15	1	[0.004] to [0.041]	1/15	0.06
Methylphenol[4-]	Soil	58	3	[0.34] to [1.9]	3/58	2.6
Nitrotoluene[2-]	Soil	63	1	[0.156] to [1]	1/63	1
Nitrotoluene[4-]	Soil	63	2	[0.162] to [3]	2/63	3
	Qbt 4	15	1	[0.16] to [0.25]	1/15	3
Phenanthrene	Soil	58	4	0.053 to [1.9]	4/58	2.6
	Qbt 4	15	1	0.11 to [0.41]	1/15	2.6
Pyrene	Soil	58	6	0.044 to [1.9]	6/58	2.6
	Qbt 4	15	1	0.1 to [0.41]	1/15	2.6
RDX	Soil	63	22	[0.163] to 8.92	22/63	1
	Fill	12	5	[0.165] to 8.28	5/12	1
	Qbt 4	15	5	[0.16] to 2.18	5/15	1
Tetrachloroethene	Soil	58	8	0.001 to 0.16	8/58	0.013
	Fill	12	1	[0.005] to [0.007]	1/12	0.013
	Qbt 4	15	2	0.002 to 0.013	2/15	0.013
Toluene	Soil	58	22	0.001 to 0.019	22/58	0.007
	Soil	58	1	0.002 to [0.013]	1/58	0.013
	Qbt 4	15	1	[0.005] to [0.0069]	1/15	0.013
Trichloroethane[1,1,1-]	Soil	58	4	0.001 to [0.013]	4/58	0.013
Trichloroethene	Soil	58	23	0.001 to 0.12	23/58	0.013
	Qbt 4	15	2	0.003 to 0.016	2/15	0.013
Trichlorofluoromethane	Soil	58	25	0.001 to [0.006]	25/58	0.007
	Qbt 4	15	2	0.001 to [0.0069]	2/15	0.007
Trinitrobenzene[1,3,5-]	Soil	63	10	[0.081] to 10.4	10/63	0.25
	Fill	12	4	[0.08] to 1.08	4/12	0.25
	Qbt 4	15	6	[0.084] to 2.7	6/15	0.25
Trinitrotoluene[2,4,6-]	Soil	63	19	[0.085] to 26.4	19/63	0.25
	Fill	12	4	[0.088] to 10.7	4/12	0.25
	Qbt 4	15	5	[0.08] to 1.4	5/15	0.25

[a] Values in brackets are detection limits.

[b] Maximum nondetect quantitation limit reported for each analyte detected.

Table B-23
Summary of 1996 VCA Samples with Detected Organic Chemicals in Soil, Sediment, and Tuff at the 90s Line SWMUs

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	Amino-DNTs	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene
Industrial Worker SSL[a]:				**34,800**	**100,000[b]**	**680[c,d]**	**680[c,d]**	**680[c,d]**	**264,000**	**23.4**	**2.34**	**23.4**	**31,300[e]**
SWMU 16-008(a)-99													
0316-96-0080	16-02240	3.00-3.50	Soil	–[f]	–	0.094	0.093	–	–	–	–	–	–
0316-96-0153	16-02240	4.50-5.50	Soil	–	–	–	0.138	–	–	–	–	–	–
0316-96-0110	16-02255	3.00-3.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0010	16-02340	4.00-4.50	Fill	–	–	0.153	0.083	–	–	–	–	–	–
0316-96-0011	16-02341	2.00-2.50	Fill	–	–	0.148	–	–	–	–	–	–	–
0316-96-0076	16-02346	0.00-0.50	Soil	–	–	–	–	–	–	–	–	0.043 (J)[g]	–
0316-96-0077	16-02347	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0078	16-02348	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0079	16-02349	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0022	16-02350	3.00-3.50	Fill	–	–	–	1.15	–	–	–	–	–	–
0316-96-0023	16-02351	3.00-3.50	Fill	–	–	0.271	0.371	–	–	–	–	–	–
0316-96-0024	16-02352	2.00-2.50	Fill	–	–	0.306	0.389	–	–	–	–	–	–
0316-96-0147	16-02354	6.00-7.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0086	16-02356	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0087	16-02357	0.00-0.50	Soil	–	–	–	–	0.75	–	–	–	–	–
0316-96-0088	16-02358	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0089	16-02359	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0095	16-02361	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	Amino-DNTs	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene
Industrial Worker SSL[a]:				**34,800**	**100,000[b]**	**680[c,d]**	**680[c,d]**	**680[c,d]**	**264,000**	**23.4**	**2.34**	**23.4**	**31,300[e]**
0316-96-0160	16-02361	7.00-7.50	Qbt 4	–	–	0.67	–	–	–	–	–	–	–
0316-96-0102	16-02362	6.00-6.50	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0161	16-02362	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0033	16-02363	4.50-5.00	Soil	–	–	–	0.53	–	–	–	–	–	–
0316-96-0154	16-02363	6.50-7.50	Soil	–	–	0.084	0.14	–	–	–	–	–	–
0316-96-0092	16-02364	4.50-5.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0157	16-02364	5.00-6.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0096	16-02366	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0097	16-02367	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0098	16-02368	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0099	16-02369	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0100	16-02370	3.50-4.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0158	16-02370	4.00-5.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0148	16-02372	2.00-3.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0208	16-02373	4.00-4.50	Soil	–	–	–	0.182	–	–	–	–	–	–
0316-96-0149	16-02373	5.50-6.00	Soil	–	–	0.199	0.203	–	–	–	–	–	–
0316-96-0045	16-02375	0.00-0.50	Soil	–	–	0.198	0.144	–	–	–	–	–	–
0316-96-0108	16-02376	0.00-0.50	Soil	–	–	–	–	0.92	–	–	–	0.052 (J)	–
0316-96-0106	16-02377	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0107	16-02378	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0109	16-02379	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0053	16-02381	3.00-3.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0054	16-02383	2.50-3.00	Soil	–	–	0.849	1.03	–	–	–	–	–	–
0316-96-0055	16-02384	3.50-4.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0056	16-02386	1.50-2.00	Soil	–	–	0.147	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	Amino-DNTs	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene
Industrial Worker SSL[a]:				**34,800**	**100,000[b]**	**680[c,d]**	**680[c,d]**	**680[c,d]**	**264,000**	**23.4**	**2.34**	**23.4**	**31,300[e]**
0316-96-0116	16-02388	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0117	16-02389	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0118	16-02390	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0051	16-02392	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0052	16-02393	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0058	16-02393	7.00-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0059	16-02394	7.50-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0201	16-02415	7.50-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0202	16-02418	7.00-7.50	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0020	16-02421	4.00-4.50	Soil	–	–	–	0.791	–	–	–	–	–	–
0316-96-0028	16-02421	7.00-8.00	Soil	–	–	–	0.224	–	–	–	0.039 (J)	–	–
0316-96-0021	16-02422	4.00-4.50	Fill	–	–	–	–	–	–	–	–	–	–
0316-96-0203	16-02422	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0029	16-02422	7.00-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0030	16-02425	4.00-4.50	Soil	–	–	–	–	–	0.14 (J)	0.3 (J)	0.21 (J)	0.2 (J)	0.097 (J)
0316-96-0031	16-02427	4.00-4.50	Soil	–	–	–	0.419	–	–	–	–	0.041 (J)	0.052 (J)
0316-96-0038	16-02427	7.00-8.00	Qbt 4	–	–	0.161	0.282	–	–	–	–	–	–
0316-96-0032	16-02430	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0039	16-02430	7.00-8.00	Qbt 4	–	–	–	–	–	0.058 (J)	0.037 (J)	–	–	–
0316-96-0041	16-02433	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0048	16-02433	7.00-8.00	Soil	–	–	0.222	0.185	–	–	–	–	–	–
0316-96-0042	16-02434	4.00-4.50	Fill	–	–	–	–	–	–	–	–	–	–
0316-96-0049	16-02436	6.50-7.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0132	16-02547	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0133	16-02550	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	Amino-DNTs	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene
Industrial Worker SSL[a]:				**34,800**	**100,000[b]**	**680[c,d]**	**680[c,d]**	**680[c,d]**	**264,000**	**23.4**	**2.34**	**23.4**	**31,300[e]**
0316-96-0134	16-02554	0.67-1.17	Soil	–	–	–	–	–	0.041 (J)	–	–	–	–
0316-96-0135	16-02555	0.67-1.17	Soil	0.072 (J)	–	–	–	–	0.057 (J)	0.055 (J)	–	–	–
0316-96-0136	16-02560	1.50-2.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0137	16-02563	1.50-2.00	Soil	–	0.009 (J)	–	–	–	–	–	–	–	–
0316-96-0138	16-02568	0.67-1.17	Soil	–	0.007 (J)	–	–	–	–	–	–	–	–
0316-96-0140	16-02572	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0141	16-02575	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0146	16-02595	6.50-7.50	Soil	–	–	–	0.216	–	–	–	–	–	–
0316-96-0119	16-02635	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-98-0418	16-02669	37.50-38.50	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-98-0419	16-02669	109-110	Qbt 4	–	0.043	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzylphthalate	Chrysene	Dibenzofuran	Dichloroethene[cis-1,2-]	Di-n-butylphthalate	Dinitrotoluene[2,4-]
Industrial Worker SSL[a]:				**234**	**100,000[c,h]**	**1,370**	**2,100**	**240[b,c]**	**2,340**	**3,170**	**267**	**68,400**	**1,370**
SWMU 16-008(a)-99													
0316-96-0080	16-02240	3.00-3.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0153	16-02240	4.50-5.50	Soil	–	–	–	–	–	–	–	–	–	0.265
0316-96-0110	16-02255	3.00-3.50	Soil	–	–	–	0.01 (J)	–	–	–	–	–	–
0316-96-0010	16-02340	4.00-4.50	Fill	–	–	3.3	–	–	–	–	–	–	–
0316-96-0011	16-02341	2.00-2.50	Fill	–	–	3.3	–	–	–	–	–	–	–
0316-96-0076	16-02346	0.00-0.50	Soil	0.042 (J)	–	–	–	–	0.2 (J)	–	–	–	–
0316-96-0077	16-02347	0.00-0.50	Soil	–	–	–	–	–	–	–	0.003 (J)	–	–
0316-96-0078	16-02348	0.00-0.50	Soil	–	–	–	0.023 (J+) [i]	–	–	–	0.003 (J)	–	–
0316-96-0079	16-02349	0.00-0.50	Soil	–	–	–	–	–	–	–	0.002 (J+)	–	–
0316-96-0022	16-02350	3.00-3.50	Fill	–	–	–	–	–	–	–	–	–	–
0316-96-0023	16-02351	3.00-3.50	Fill	–	–	–	–	–	–	–	–	–	–
0316-96-0024	16-02352	2.00-2.50	Fill	–	–	–	–	–	–	–	–	–	–
0316-96-0147	16-02354	6.00-7.00	Soil	–	0.092 (J)	–	–	–	–	–	–	–	–
0316-96-0086	16-02356	0.00-0.50	Soil	–	–	–	–	–	–	–	0.002 (J)	–	–
0316-96-0087	16-02357	0.00-0.50	Soil	–	–	0.068 (J)	–	–	–	–	–	–	–
0316-96-0088	16-02358	0.00-0.50	Soil	–	–	–	0.009 (J)	–	–	–	–	–	–
0316-96-0089	16-02359	0.00-0.50	Soil	–	–	–	–	–	–	–	0.001 (J)	–	–
0316-96-0095	16-02361	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzylphthalate	Chrysene	Dibenzofuran	Dichloroethene[cis-1,2-]	Di-n-butylphthalate	Dinitrotoluene[2,4-]
Industrial Worker SSL[a]:				**234**	**100,000[c,h]**	**1,370**	**2,100**	**240[b,c]**	**2,340**	**3,170**	**267**	**68,400**	**1,370**
0316-96-0160	16-02361	7.00-7.50	Qbt 4	–	–	0.23	–	–	–	–	–	–	–
0316-96-0102	16-02362	6.00-6.50	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0161	16-02362	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0033	16-02363	4.50-5.00	Soil	–	–	–	–	–	–	–	–	–	0.076
0316-96-0154	16-02363	6.50-7.50	Soil	–	–	–	–	–	–	–	–	–	0.124
0316-96-0092	16-02364	4.50-5.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0157	16-02364	5.00-6.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0096	16-02366	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0097	16-02367	0.00-0.50	Soil	–	–	0.039 (J)	–	–	–	–	–	–	–
0316-96-0098	16-02368	0.00-0.50	Soil	–	–	0.059 (J)	–	–	–	–	0.002 (J)	–	–
0316-96-0099	16-02369	0.00-0.50	Soil	–	–	0.32 (J)	0.026 (J+)	–	–	–	0.001 (J+)	–	–
0316-96-0100	16-02370	3.50-4.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0158	16-02370	4.00-5.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0148	16-02372	2.00-3.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0208	16-02373	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	0.069 (J)
0316-96-0149	16-02373	5.50-6.00	Soil	–	–	–	–	–	–	–	–	–	0.066 (J)
0316-96-0045	16-02375	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0108	16-02376	0.00-0.50	Soil	0.044 (J)	–	0.11 (J)	–	–	0.045 (J)	–	0.002 (J+)	–	–
0316-96-0106	16-02377	0.00-0.50	Soil	–	–	0.04 (J)	–	–	–	–	0.002 (J+)	–	–
0316-96-0107	16-02378	0.00-0.50	Soil	–	–	–	–	–	–	–	0.003 (J+)	–	–
0316-96-0109	16-02379	0.00-0.50	Soil	–	–	–	–	–	–	–	0.002 (J)	–	–
0316-96-0053	16-02381	3.00-3.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0054	16-02383	2.50-3.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0055	16-02384	3.50-4.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0056	16-02386	1.50-2.00	Soil	–	–	0.11 (J)	–	0.083 (J)	–	–	0.011	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzylphthalate	Chrysene	Dibenzofuran	Dichloroethene[cis-1,2-]	Di-n-butylphthalate	Dinitrotoluene[2,4-]
Industrial Worker SSL[a]:				**234**	**100,000[c,h]**	**1,370**	**2,100**	**240[b,c]**	**2,340**	**3,170**	**267**	**68,400**	**1,370**
0316-96-0116	16-02388	0.00-0.50	Soil	–	–	0.2 (J)	0.016 (J)	–	–	–	0.001 (J)	–	–
0316-96-0117	16-02389	0.00-0.50	Soil	–	–	1.4	–	–	–	–	–	–	–
0316-96-0118	16-02390	0.00-0.50	Soil	–	–	0.085 (J)	0.022 (J-) [j]	–	–	–	0.067 (J-)	–	–
0316-96-0051	16-02392	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0052	16-02393	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0058	16-02393	7.00-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0059	16-02394	7.50-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0201	16-02415	7.50-8.00	Qbt 4	–	0.085 (J)	–	–	–	–	–	–	–	–
0316-96-0202	16-02418	7.00-7.50	Qbt 4	–	0.1 (J)	–	–	–	–	–	–	–	–
0316-96-0020	16-02421	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0028	16-02421	7.00-8.00	Soil	–	–	0.058 (J)	–	–	–	–	–	–	–
0316-96-0021	16-02422	4.00-4.50	Fill	–	–	–	–	–	–	–	–	–	–
0316-96-0203	16-02422	6.50-7.00	Qbt 4	–	0.087 (J)	–	–	–	–	–	–	–	–
0316-96-0029	16-02422	7.00-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0030	16-02425	4.00-4.50	Soil	0.16 (J)	–	–	–	–	0.36 (J)	–	–	–	–
0316-96-0031	16-02427	4.00-4.50	Soil	–	–	0.071 (J)	–	–	–	–	–	–	–
0316-96-0038	16-02427	7.00-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-96-0032	16-02430	4.00-4.50	Soil	–	0.12 (J)	–	–	–	–	–	–	–	–
0316-96-0039	16-02430	7.00-8.00	Qbt 4	–	–	–	–	–	0.069 (J)	–	–	–	–
0316-96-0041	16-02433	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0048	16-02433	7.00-8.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0042	16-02434	4.00-4.50	Fill	–	–	–	–	–	–	–	–	–	–
0316-96-0049	16-02436	6.50-7.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0132	16-02547	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0133	16-02550	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzylphthalate	Chrysene	Dibenzofuran	Dichloroethene[cis-1,2-]	Di-n-butylphthalate	Dinitrotoluene[2,4-]
Industrial Worker SSL[a]:				**234**	**100,000[c,h]**	**1,370**	**2,100**	**240[b,c]**	**2,340**	**3,170**	**267**	**68,400**	**1,370**
0316-96-0134	16-02554	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0135	16-02555	0.67-1.17	Soil	–	–	–	–	–	0.065 (J)	0.073 (J)	0.001 (J)	–	–
0316-96-0136	16-02560	1.50-2.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0137	16-02563	1.50-2.00	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0138	16-02568	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0140	16-02572	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0141	16-02575	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0146	16-02595	6.50-7.50	Soil	–	–	–	–	–	–	–	–	–	–
0316-96-0119	16-02635	0.00-0.50	Soil	–	–	–	0.032 (J-)	–	–	–	–	–	–
0316-98-0418	16-02669	37.50-38.50	Qbt 4	–	–	–	–	–	–	–	–	–	–
0316-98-0419	16-02669	109-110	Qbt 4	–	–	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-octylphthalate	Fluoranthene	Fluorene	Hexanone[2-]	HMX	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylphenol[4-]	Nitrotoluene[2-]	Nitrotoluene[4-]
Industrial Worker SSL[a]:				**27,000[c]**	**24,400**	**29,400**	**2,100[k]**	**34,200**	**23.4**	**2,730[l]**	**440**	**3,400[c]**	**557[b]**	**557[b]**
SWMU16-008(a)-99														
0316-96-0080	16-02240	3.00-3.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0153	16-02240	4.50-5.50	Soil	–	–	–	–	1	–	–	–	–	–	–
0316-96-0110	16-02255	3.00-3.50	Soil	–	–	–	0.001 (J)	–	–	–	–	–	–	–
0316-96-0010	16-02340	4.00-4.50	Fill	–	–	–	–	–	–	–	–	–	–	–
0316-96-0011	16-02341	2.00-2.50	Fill	0.57 (J)	–	–	–	–	–	–	–	–	–	–
0316-96-0076	16-02346	0.00-0.50	Soil	–	0.18 (J)	–	–	–	–	–	–	–	–	–
0316-96-0077	16-02347	0.00-0.50	Soil	–	–	–	–	–	–	0.003 (J+)	–	–	–	–
0316-96-0078	16-02348	0.00-0.50	Soil	–	–	–	–	–	–	0.001 (J+)	–	–	–	–
0316-96-0079	16-02349	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0022	16-02350	3.00-3.50	Fill	–	–	–	–	0.9	–	–	–	–	–	–
0316-96-0023	16-02351	3.00-3.50	Fill	–	–	–	–	0.484	–	–	–	–	–	–
0316-96-0024	16-02352	2.00-2.50	Fill	–	–	–	–	0.343	–	–	–	–	–	–
0316-96-0147	16-02354	6.00-7.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0086	16-02356	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0087	16-02357	0.00-0.50	Soil	–	–	–	–	–	–	0.001 (J)	–	–	–	–
0316-96-0088	16-02358	0.00-0.50	Soil	–	–	–	–	–	–	0.005	–	–	–	–
0316-96-0089	16-02359	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0095	16-02361	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-octylphthalate	Fluoranthene	Fluorene	Hexanone[2-]	HMX	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylphenol[4-]	Nitrotoluene[2-]	Nitrotoluene[4-]
Industrial Worker SSL[a]:				**27,000[c]**	**24,400**	**29,400**	**2,100[k]**	**34,200**	**23.4**	**2,730[l]**	**440**	**3,400[c]**	**557[b]**	**557[b]**
0316-96-0160	16-02361	7.00-7.50	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0102	16-02362	6.00-6.50	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0161	16-02362	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0033	16-02363	4.50-5.00	Soil	–	–	–	–	1.34	–	–	–	–	–	–
0316-96-0154	16-02363	6.50-7.50	Soil	–	–	–	–	0.548	–	–	–	–	–	–
0316-96-0092	16-02364	4.50-5.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0157	16-02364	5.00-6.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0096	16-02366	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0097	16-02367	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0098	16-02368	0.00-0.50	Soil	–	0.047 (J)	–	–	–	–	0.011	–	–	–	–
0316-96-0099	16-02369	0.00-0.50	Soil	–	–	–	–	–	–	0.003 (J+)	–	–	–	–
0316-96-0100	16-02370	3.50-4.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0158	16-02370	4.00-5.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0148	16-02372	2.00-3.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0208	16-02373	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0149	16-02373	5.50-6.00	Soil	–	–	–	–	0.272	–	–	–	–	–	0.183 (J)
0316-96-0045	16-02375	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0108	16-02376	0.00-0.50	Soil	–	0.04 (J)	–	–	–	–	–	–	–	–	–
0316-96-0106	16-02377	0.00-0.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0107	16-02378	0.00-0.50	Soil	–	–	–	–	–	–	0.009 (J+)	–	–	–	–
0316-96-0109	16-02379	0.00-0.50	Soil	0.078 (J)	–	–	–	–	–	0.003 (J)	–	–	–	–
0316-96-0053	16-02381	3.00-3.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0054	16-02383	2.50-3.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0055	16-02384	3.50-4.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0056	16-02386	1.50-2.00	Soil	–	–	–	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-octylphthalate	Fluoranthene	Fluorene	Hexanone[2-]	HMX	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylphenol[4-]	Nitrotoluene[2-]	Nitrotoluene[4-]
Industrial Worker SSL[a]:				**27,000[c]**	**24,400**	**29,400**	**2,100[k]**	**34,200**	**23.4**	**2,730[l]**	**440**	**3,400[c]**	**557[b]**	**557[b]**
0316-96-0116	16-02388	0.00-0.50	Soil	–	–	–	–	–	–	0.016	–	–	–	–
0316-96-0117	16-02389	0.00-0.50	Soil	–	–	–	–	–	–	0.003 (J)	–	0.8	–	–
0316-96-0118	16-02390	0.00-0.50	Soil	–	–	–	–	–	–	0.012 (J-)	–	0.43 (J)	–	–
0316-96-0051	16-02392	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0052	16-02393	4.00-4.50	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0058	16-02393	7.00-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0059	16-02394	7.50-8.00	Qbt 4	–	–	–	–	–	–	–	0.01	–	–	–
0316-96-0201	16-02415	7.50-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0202	16-02418	7.00-7.50	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0020	16-02421	4.00-4.50	Soil	–	–	–	–	0.712	–	–	–	–	0.159	–
0316-96-0028	16-02421	7.00-8.00	Soil	–	–	–	–	0.379	–	–	–	–	–	–
0316-96-0021	16-02422	4.00-4.50	Fill	–	–	–	–	1.61	–	–	–	–	–	–
0316-96-0203	16-02422	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0029	16-02422	7.00-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0030	16-02425	4.00-4.50	Soil	–	0.53	0.048 (J)	–	–	0.082 (J)	–	–	–	–	–
0316-96-0031	16-02427	4.00-4.50	Soil	–	0.057 (J)	–	–	0.601	0.043 (J)	–	–	–	–	0.182 (J)
0316-96-0038	16-02427	7.00-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	0.18 (J)
0316-96-0032	16-02430	4.00-4.50	Soil	–	–	–	–	0.723	–	–	–	–	–	–
0316-96-0039	16-02430	7.00-8.00	Qbt 4	–	0.14 (J)	–	–	–	–	–	–	–	–	–
0316-96-0041	16-02433	4.00-4.50	Soil	–	–	–	–	0.218	–	–	–	–	–	–
0316-96-0048	16-02433	7.00-8.00	Soil	–	–	–	–	0.253	–	–	–	–	–	–
0316-96-0042	16-02434	4.00-4.50	Fill	–	–	–	–	–	–	–	–	–	–	–
0316-96-0049	16-02436	6.50-7.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0132	16-02547	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0133	16-02550	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-octylphthalate	Fluoranthene	Fluorene	Hexanone[2-]	HMX	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylphenol[4-]	Nitrotoluene[2-]	Nitrotoluene[4-]
Industrial Worker SSL[a]:				**27,000[c]**	**24,400**	**29,400**	**2,100[k]**	**34,200**	**23.4**	**2,730[l]**	**440**	**3,400[c]**	**557[b]**	**557[b]**
0316-96-0134	16-02554	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0135	16-02555	0.67-1.17	Soil	–	0.28 (J)	0.14 (J)	–	–	–	–	–	–	–	–
0316-96-0136	16-02560	1.50-2.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0137	16-02563	1.50-2.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0138	16-02568	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0140	16-02572	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0141	16-02575	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0146	16-02595	6.50-7.50	Soil	–	–	–	–	0.823	–	–	–	–	–	–
0316-96-0119	16-02635	0.00-0.50	Soil	–	–	–	–	–	–	0.03 (J-)	–	1.3	–	–
0316-98-0418	16-02669	37.50-38.50	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-98-0419	16-02669	109-110	Qbt 4	–	–	–	–	–	–	–	–	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Phenanthrene	Pyrene	RDX	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trinitrobenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
Industrial Worker SSL[a]:				**20,500**	**31,300**	**174**	**24.6**	**248[b]**	**100,000[h]**	**551[b]**	**1.59**	**959[b]**	**21,000[c]**	**342**
SWMU 16-008(a)-99														
0316-96-0080	16-02240	3.00-3.50	Soil	–	–	1.21	–	–	–	–	–	–	0.451	0.313
0316-96-0153	16-02240	4.50-5.50	Soil	–	–	3.12	–	–	–	–	–	–	10.4	0.276
0316-96-0110	16-02255	3.00-3.50	Soil	–	–	–	–	0.001 (J)	–	–	–	–	–	–
0316-96-0010	16-02340	4.00-4.50	Fill	–	–	0.176 (J)	0.005 (J+)	–	–	–	–	–	–	–
0316-96-0011	16-02341	2.00-2.50	Fill	–	–	–	–	–	–	–	–	–	–	–
0316-96-0076	16-02346	0.00-0.50	Soil	–	0.14 (J)	–	–	0.002 (J)	–	–	0.007	0.001 (J)	–	–
0316-96-0077	16-02347	0.00-0.50	Soil	–	–	–	0.007 (J+)	0.009 (J+)	–	–	0.016 (J+)	0.002 (J+)	–	–
0316-96-0078	16-02348	0.00-0.50	Soil	–	–	–	0.002 (J+)	0.017 (J+)	–	–	0.017	0.002 (J+)	–	–
0316-96-0079	16-02349	0.00-0.50	Soil	–	–	–	–	0.008 (J+)	–	–	0.008 (J+)	0.002 (J+)	–	–
0316-96-0022	16-02350	3.00-3.50	Fill	–	–	8.28	–	–	–	–	–	–	1.08	10.7
0316-96-0023	16-02351	3.00-3.50	Fill	–	–	2.18	–	–	–	–	–	–	0.113	1.16
0316-96-0024	16-02352	2.00-2.50	Fill	–	–	2.19	–	–	–	–	–	–	0.248	1.18
0316-96-0147	16-02354	6.00-7.00	Soil	–	–	1.75	–	–	–	–	–	0.002 (J+)	3.3	0.28
0316-96-0086	16-02356	0.00-0.50	Soil	–	–	–	–	0.002 (J)	0.002 (J)	–	0.01	–	–	–
0316-96-0087	16-02357	0.00-0.50	Soil	–	–	–	–	0.003 (J)	–	–	0.002 (J)	0.003 (J)	–	–
0316-96-0088	16-02358	0.00-0.50	Soil	–	–	–	–	0.006	–	–	0.004 (J)	0.002 (J)	–	–
0316-96-0089	16-02359	0.00-0.50	Soil	–	–	–	–	0.004 (J)	–	–	0.006	–	–	–
0316-96-0095	16-02361	6.50-7.00	Qbt 4	–	–	2.1	–	–	–	–	–	–	0.55	1.3

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Phenanthrene	Pyrene	RDX	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trinitrobenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
Industrial Worker SSL[a]:				**20,500**	**31,300**	**174**	**24.6**	**248[b]**	**100,000[h]**	**551[b]**	**1.59**	**959[b]**	**21,000[c]**	**342**
0316-96-0160	16-02361	7.00-7.50	Qbt 4	–	–	2.1	–	–	–	–	–	–	0.36	1.4
0316-96-0102	16-02362	6.00-6.50	Qbt 4	–	–	–	–	–	–	–	–	–	1.5	0.72
0316-96-0161	16-02362	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	1.7	0.32
0316-96-0033	16-02363	4.50-5.00	Soil	–	–	8.89	–	–	–	–	–	–	6.08	22.5
0316-96-0154	16-02363	6.50-7.50	Soil	–	–	3.59	–	–	–	–	–	–	0.275	2.79
0316-96-0092	16-02364	4.50-5.00	Soil	–	–	0.485	–	–	–	–	–	–	–	–
0316-96-0157	16-02364	5.00-6.00	Soil	–	–	0.974	–	–	–	–	–	0.001 (J)	0.373	–
0316-96-0096	16-02366	4.00-4.50	Soil	–	–	–	–	–	–	–	0.001 (J)	–	–	–
0316-96-0097	16-02367	0.00-0.50	Soil	–	–	–	–	–	–	–	0.005 (J)	0.002 (J)	–	–
0316-96-0098	16-02368	0.00-0.50	Soil	–	–	–	–	0.019	–	–	0.005 (J)	0.002 (J)	–	–
0316-96-0099	16-02369	0.00-0.50	Soil	–	–	–	–	0.005 (J+)	–	–	0.004 (J+)	0.005 (J+)	–	–
0316-96-0100	16-02370	3.50-4.00	Soil	–	–	–	–	–	–	–	–	–	–	0.155
0316-96-0158	16-02370	4.00-5.00	Soil	–	–	0.341	–	–	–	–	–	–	–	–
0316-96-0148	16-02372	2.00-3.00	Soil	–	–	–	–	–	–	–	–	–	–	0.174
0316-96-0208	16-02373	4.00-4.50	Soil	–	–	2.38	–	–	–	–	–	–	–	0.184
0316-96-0149	16-02373	5.50-6.00	Soil	–	–	1.01	–	–	–	–	–	–	–	0.294
0316-96-0045	16-02375	0.00-0.50	Soil	–	–	0.395	–	–	–	–	–	–	–	–
0316-96-0108	16-02376	0.00-0.50	Soil	–	0.044 (J)	1	–	0.005 (J+)	–	–	0.011 (J+)	0.001 (J)	–	–
0316-96-0106	16-02377	0.00-0.50	Soil	–	–	–	–	0.007 (J+)	–	–	0.008 (J+)	0.002 (J+)	–	–
0316-96-0107	16-02378	0.00-0.50	Soil	–	–	–	–	0.016 (J+)	–	–	0.013 (J+)	0.002 (J+)	–	–
0316-96-0109	16-02379	0.00-0.50	Soil	–	–	–	–	0.006	–	–	0.006	0.002 (J)	–	–
0316-96-0053	16-02381	3.00-3.50	Soil	–	–	–	–	–	–	0.001 (J)	–	–	–	–
0316-96-0054	16-02383	2.50-3.00	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0055	16-02384	3.50-4.00	Soil	–	–	–	0.009	–	–	–	0.011	–	–	–
0316-96-0056	16-02386	1.50-2.00	Soil	–	–	–	0.16	–	–	–	0.12	–	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Phenanthrene	Pyrene	RDX	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trinitrobenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
Industrial Worker SSL[a]:				**20,500**	**31,300**	**174**	**24.6**	**248[b]**	**100,000[h]**	**551[b]**	**1.59**	**959[b]**	**21,000[c]**	**342**
0316-96-0116	16-02388	0.00-0.50	Soil	–	–	–	0.001 (J)	0.006	–	–	0.004 (J)	0.003 (J)	–	–
0316-96-0117	16-02389	0.00-0.50	Soil	–	–	–	–	0.016	–	–	–	0.002 (J)	–	–
0316-96-0118	16-02390	0.00-0.50	Soil	–	–	–	–	0.006 (J-)	–	–	–	0.003 (J-)	–	–
0316-96-0051	16-02392	4.00-4.50	Soil	–	–	–	–	–	–	0.003 (J)	–	–	–	–
0316-96-0052	16-02393	4.00-4.50	Soil	–	–	0.741	–	–	–	–	–	–	–	0.215
0316-96-0058	16-02393	7.00-8.00	Qbt 4	–	–	–	0.002 (J)	–	–	–	0.003 (J)	0.001 (J)	–	–
0316-96-0059	16-02394	7.50-8.00	Qbt 4	–	–	–	0.013	–	–	–	0.016	–	–	–
0316-96-0201	16-02415	7.50-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0202	16-02418	7.00-7.50	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0020	16-02421	4.00-4.50	Soil	–	–	8.13	–	–	–	–	–	–	2.53	9.57
0316-96-0028	16-02421	7.00-8.00	Soil	–	–	2.35	–	–	–	–	–	–	0.323	1.53
0316-96-0021	16-02422	4.00-4.50	Fill	–	–	1.75	–	–	–	–	–	–	0.375	–
0316-96-0203	16-02422	6.50-7.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–
0316-96-0029	16-02422	7.00-8.00	Qbt 4	–	–	–	–	–	–	–	–	–	2.7	–
0316-96-0030	16-02425	4.00-4.50	Soil	0.58	0.75	1.2	0.001 (J)	–	–	0.002 (J)	–	–	–	0.382
0316-96-0031	16-02427	4.00-4.50	Soil	0.053 (J)	0.046 (J)	5.84	0.002 (J)	–	–	–	–	–	–	26.4
0316-96-0038	16-02427	7.00-8.00	Qbt 4	–	–	0.671	–	–	–	–	–	–	1.09	0.472
0316-96-0032	16-02430	4.00-4.50	Soil	–	–	8.92	0.003 (J)	–	–	0.001 (J)	–	–	–	0.219
0316-96-0039	16-02430	7.00-8.00	Qbt 4	0.11 (J)	0.1 (J)	0.814	–	–	–	–	–	0.002 (J)	–	–
0316-96-0041	16-02433	4.00-4.50	Soil	–	–	2.05	–	–	–	–	–	–	–	0.654
0316-96-0048	16-02433	7.00-8.00	Soil	–	–	1.28	–	–	–	–	–	–	–	1.14
0316-96-0042	16-02434	4.00-4.50	Fill	–	–	–	–	–	–	–	–	–	–	0.091
0316-96-0049	16-02436	6.50-7.00	Soil	–	–	–	–	–	–	–	–	–	0.425	–
0316-96-0132	16-02547	0.67-1.17	Soil	–	–	–	–	0.002 (J)	–	–	0.001 (J)	0.004 (J)	–	–

Table B-23 (continued)

Sample ID	Location ID	Depth (ft)	Media	Phenanthrene	Pyrene	RDX	Tetrachloroethene	Toluene	Trichloro-1,2,2-trifluoroethane[1,1,2-]	Trichloroethane[1,1,1-]	Trichloroethene	Trichlorofluoromethane	Trinitrobenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
Industrial Worker SSL[a]:				**20,500**	**31,300**	**174**	**24.6**	**248[b]**	**100,000[h]**	**551[b]**	**1.59**	**959[b]**	**21,000[c]**	**342**
0316-96-0133	16-02550	0.67-1.17	Soil	–	–	–	–	–	–	–	–	0.004 (J)	–	–
0316-96-0134	16-02554	0.67-1.17	Soil	0.14 (J)	0.078 (J)	–	–	0.004 (J)	–	–	0.006	–	–	–
0316-96-0135	16-02555	0.67-1.17	Soil	0.47	0.18 (J)	–	–	0.006	–	–	0.005 (J)	0.004 (J)	–	–
0316-96-0136	16-02560	1.50-2.00	Soil	–	–	–	–	–	–	–	–	0.001 (J)	–	0.317
0316-96-0137	16-02563	1.50-2.00	Soil	–	–	0.774	–	–	–	–	–	–	–	–
0316-96-0138	16-02568	0.67-1.17	Soil	–	–	–	–	–	–	–	–	–	–	–
0316-96-0140	16-02572	0.67-1.17	Soil	–	–	–	–	–	–	–	–	0.003 (J)	–	–
0316-96-0141	16-02575	0.67-1.17	Soil	–	–	–	–	–	–	–	0.002 (J)	0.003 (J)	–	–
0316-96-0146	16-02595	6.50-7.50	Soil	–	–	8.4	–	–	–	–	–	–	0.729	3.62
0316-96-0119	16-02635	0.00-0.50	Soil	–	–	–	–	0.008 (J-)	–	–	–	0.004 (J-)	–	–
0316-98-0418	16-02669	37.5-38.5	Qbt 4	–	–	2.18	–	–	–	–	–	–	–	–
0316-98-0419	16-02669	109-110	Qbt 4	–	–	–	–	–	0.0052	–	–	–	–	–

Notes: Units are mg/kg.

[a] SSLs reflecting a 10^{-5} cancer risk or noncarcinogenic hazard quotient of 1 (whichever is lower) were obtained from NMED 2004, 85615, unless otherwise noted.

[b] Soil saturation limit basis.

[c] SSL obtained from EPA Region 6 (EPA 2004, 87478); carcinogenic SSLs adjusted to 10-5 risk level.

[d] Dinitrotoluene[2,6-] used as surrogate for amino-2,6-dinitrotoluene[4-], amino-4,6-dinitrotoluene[2-], and amino-DNTs.

[e] Pyrene used as a surrogate for benzo(g,h,i)perylene.

[f] — = Not detected.

[g] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[h] Low-toxicity maximum, health-based SSL exceeds 10 mg/kg.

[i] J+ = The analyte was positively identified, and the result is likely to be biased high.

[j] J- = The analyte was positively identified, and the result is likely to be biased low.

[k] 2-Butanone used as a surrogate for 2-hexanone.

[l] Isopropylbenzene (cumene) used as surrogate for 4-isopropyltoluene.

Table B-24
Surface Water and Groundwater Samples Collected at 90s Line Pond

Sample ID	Location ID	Field Preparation	Anions	Oxalate	Perchlorate	Ammonia	Nitrate/Nitrite	Alkalinity	Iodide	Ortho-phosphate	Total Phosphorus	Tritium	Metals	VOCs	SVOCs	HE	Cyanide	Total Organic Carbon
0316-98-0420 [a]	16-02669	Unfiltered	—	—	—	—	—	—	—	—	—	—	—	—	—	4163R	—	—
0316-98-0426 [a]	16-02669	Unfiltered	—	—	—	—	—	—	—	—	—	—	4164R	—	—	—	—	—
RE16-00-3143	16-05826	Unfiltered	—	—	—	—	—	—	—	—	—	—	6599R 6602R	—	—	6597R	—	—
RE16-01-3128	16-05826	Unfiltered	8660R	8660R	8660R	—	—	8659R	—	—	—	8662R	8659R	8657R	8657R	8658R	—	—
RE16-01-3129	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	8659R	—	—	—	—	—
RE16-02-45913	16-05826	Unfiltered	893S	893S	893S	—	893S	893S	—	—	—	895S	893S	891S	—	891S 892S	—	—
RE16-02-45917	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	893S	—	—	—	—	—
RE16-02-49400	16-05826	Unfiltered	1318S	1318S	1318S	—	1318S	1318S	—	—	—	1322S	1318S	1316S	1316S	1316S 1317S	—	—
RE16-02-49401	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	1318S	—	—	—	—	—
RE16-03-50749	16-05826	Unfiltered	1632S	1632S	1632S	—	1632S	1632S	—	—	—	1634S	1632S	1630S	—	—	—	—
RE16-03-50750	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	1632S	—	—	—	—	—
RE16-04-53152	16-05826	Unfiltered	2059S	2059S	2057S	—	2059S	2059S	—	—	—	2063S	2059S	2057S	2057S	—	2059S	—
RE16-04-53153	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	2059S	—	—	—	—	—
RE16-04-53777	16-05826	Unfiltered	2419S	2419S	2418S	—	2419S	2419S	—	—	—	2422S	2419S	2418S	—	—	2419S	—
RE16-04-53778	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	2419S	—	—	—	—	—
RE16-98-3046	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	4356R	—	—	4357R	—	—
RE16-98-3047	16-05826	Unfiltered	4358R	—	—	4358R	—	4358R	—	4358R	4358R	—	4356R 4358R	4355R	—	4357R	4356R	4358R
RE16-98-3075	16-05826	Unfiltered	5096R	—	—	—	5096R	—	—	5096R	—	5098R	5097R 5096R	5094R	5094R	5095R	—	—
RE16-99-3026	16-05826	Unfiltered	5348R	—	5348R	5348R	5348R	5348R	5348R	—	—	—	5348R 5349R	5347R	—	5351R	—	—
RE16-99-3027	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	5348R	—	—	—	—	—
RE16-99-3056	16-05826	Unfiltered	5731R	—	5731R	5731R	5731R	5731R	5731R	—	—	5736R	5731R 5735R	5730R	—	5732R	—	—
RE16-99-3057	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	5731R	—	—	—	—	—
RE16-99-3211	16-05826	Unfiltered	6076R	—	—	6076R	—	6076R	—	—	6076R	6081R	6076R 6078R	6075R	6075R	6077R	—	—
RE16-99-3212	16-05826	Filtered	—	—	—	—	—	—	—	—	—	—	6076R	—	—	—	—	—

Note: Numbers in the analysis columns are analytical request numbers.

[a] Sample medium is groundwater; sample depth is 150 ft.

Table B-25
Frequency of Detected Inorganic Chemicals in Surface Water and Groundwater at 90s Line Pond

Analyte	Field Preparation	Media	Number of Analyses	Number of Detects	Concentration Range [a] (µg/L)	Frequency of Detects
Alkalinity-CO_3	Unfiltered	Surface Water	2	0	[5000 to 5000]	0/2
Alkalinity-CO_3+HCO_3	Unfiltered	Surface Water	5	5	21,400 to 66,100	5/5
Alkalinity-HCO_3	Unfiltered	Surface Water	5	5	24,000 to 73,000	5/5
Aluminum	Filtered	Surface Water	10	10	418 to 4770	10/10
Aluminum	Unfiltered	Surface Water	12	12	4330 to 390,000	12/12
Ammonia	Unfiltered	Surface Water	4	1	[500] to 6100	1/4
Antimony	Filtered	Surface Water	10	4	[0.45] to [20]	4/10
Antimony	Unfiltered	Surface Water	12	5	0.296 to [20]	5/12
Arsenic	Filtered	Surface Water	10	4	[2] to [5]	4/10
Arsenic	Unfiltered	Surface Water	11	11	3.8 to 80	11/11
Barium	Unfiltered	Groundwater, intermediate	1	1	200 to 200	1/1
Barium	Unfiltered	Surface Water	12	12	3170 to 67,000	12/12
Barium	Filtered	Surface Water	10	10	1260 to 6700	10/10
Beryllium	Filtered	Surface Water	10	4	[0.06] to [4]	4/10
Beryllium	Unfiltered	Surface Water	12	11	[0.28] to 24	11/12
Boron	Filtered	Surface Water	7	7	8.74 to 43.7	7/7
Boron	Unfiltered	Surface Water	9	8	10.7 to [500]	8/9
Bromide	Unfiltered	Surface Water	11	2	20 to 660	2/11
Cadmium	Filtered	Surface Water	10	5	0.059 to [5]	5/10
Cadmium	Unfiltered	Surface Water	12	7	[0.2] to 5.9	7/12
Calcium	Filtered	Surface Water	10	10	4180 to 16,000	10/10
Calcium	Unfiltered	Surface Water	12	12	10,300 to 67,000	12/12
Chloride	Unfiltered	Surface Water	11	11	1180 to 22,000	11/11
Chromium	Unfiltered	Surface Water	12	11	2.6 to [180]	11/12
Chromium	Filtered	Surface Water	10	5	[0.5] to [10]	5/10

Table B-25 (continued)

Analyte	Field Preparation	Media	Number of Analyses	Number of Detects	Concentration Range [a] (µg/L)	Frequency of Detects
Cobalt	Unfiltered	Surface Water	12	12	0.61 to 72	12/12
Cobalt	Filtered	Surface Water	10	7	1 to [20]	7/10
Copper	Unfiltered	Surface Water	12	11	4.7 to [240]	11/12
Copper	Filtered	Surface Water	10	8	1.7 to [20]	8/10
Cyanide (Total)	Unfiltered	Surface Water	3	1	3.8 to [10]	1/3
Fluoride	Unfiltered	Surface Water	11	10	[100] to 391	10/11
Iodide	Unfiltered	Surface Water	2	0	[100 to 100]	0/2
Iron	Unfiltered	Surface Water	12	12	4500 to 310,000	12/12
Iron	Filtered	Surface Water	10	10	380 to 2540	10/10
Lead	Unfiltered	Surface Water	12	12	4.8 to 520	12/12
Lead	Filtered	Surface Water	10	7	0.67 to 5.3	7/10
Lithium	Unfiltered	Surface Water	1	1	234 to 234	1/1
Magnesium	Unfiltered	Surface Water	12	11	3690 to [47,000]	11/12
Magnesium	Filtered	Surface Water	10	9	1220 to [3800]	9/10
Manganese	Filtered	Surface Water	10	10	14.5 to 520	10/10
Manganese	Unfiltered	Surface Water	12	12	81.2 to 3800	12/12
Mercury	Unfiltered	Surface Water	12	8	[0.02] to 1	8/12
Mercury	Filtered	Surface Water	10	1	[0.02] to [0.2]	1/10
Molybdenum	Unfiltered	Surface Water	1	1	10 to 10	1/1
Nickel	Filtered	Surface Water	10	7	1.6 to [40]	7/10
Nickel	Unfiltered	Surface Water	12	12	4.4 to 150	12/12
Nitrate	Unfiltered	Surface Water	3	0	[200 to 200]	0/3
Nitrate-Nitrite as N	Unfiltered	Surface Water	6	3	[20] to 4100	3/6
Nitrite	Unfiltered	Surface Water	3	0	[100 to 100]	0/3
Oxalate	Unfiltered	Surface Water	6	0	[190 to 1000]	0/6
Perchlorate	Unfiltered	Surface Water	6	0	[4 to 100]	0/6

Table B-25 (continued)

Analyte	Field Preparation	Media	Number of Analyses	Number of Detects	Concentration Range [a] (µg/L)	Frequency of Detects
Orthophosphate	Unfiltered	Surface Water	3	0	[200 to 200]	0/3
Potassium	Unfiltered	Surface Water	12	12	6160 to 60,000	12/12
Potassium	Filtered	Surface Water	10	10	4780 to 9400	10/10
Selenium	Filtered	Surface Water	10	1	[1.2] to [5]	1/10
Selenium	Unfiltered	Surface Water	12	3	[1.2] to [8]	3/12
Silver	Filtered	Surface Water	10	0	[0.5 to 10]	0/10
Silver	Unfiltered	Surface Water	12	1	[0.5] to [10]	1/12
Sodium	Filtered	Surface Water	10	10	2790 to 10,000	10/10
Sodium	Unfiltered	Surface Water	12	12	3140 to 9300	12/12
Strontium	Unfiltered	Surface Water	1	1	1360 to 1360	1/1
Sulfate	Unfiltered	Surface Water	11	11	1130 to 18,000	11/11
Thallium	Unfiltered	Surface Water	12	7	0.064 to 5.3	7/12
Thallium	Filtered	Surface Water	10	3	0.033 to [5]	3/10
Total Phosphorus	Unfiltered	Surface Water	2	1	[50] to 88	1/2
Uranium	Filtered	Surface Water	1	1	0.14 to 0.14	1/1
Uranium	Unfiltered	Surface Water	7	6	0.5 to [378]	6/7
Vanadium	Filtered	Surface Water	10	8	0.97 to [10]	8/10
Vanadium	Unfiltered	Surface Water	12	12	6.3 to 380	12/12
Zinc	Filtered	Surface Water	10	9	1.5 to 37	9/10
Zinc	Unfiltered	Surface Water	12	12	15.5 to 670	12/12

[a] Values in brackets are detection limits.
[b] MCL = Maximum contaminant level.
[c] n/a = Not applicable.

Table B-26
Summary of Samples with Detected Inorganic Chemicals in Surface Water and Groundwater at 90s Line Pond

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Alkalinity-CO_3+HCO_3	Surface Water	Unfiltered	16-05826	RE16-02-45913	37400	n/a [e]	n/a	n/a	n/a
Alkalinity-CO_3+HCO_3	Surface Water	Unfiltered	16-05826	RE16-02-49400	66100	n/a	n/a	n/a	n/a
Alkalinity-CO_3+HCO_3	Surface Water	Unfiltered	16-05826	RE16-03-50749	44200	n/a	n/a	n/a	n/a
Alkalinity-CO_3+HCO_3	Surface Water	Unfiltered	16-05826	RE16-04-53152	21400	n/a	n/a	n/a	n/a
Alkalinity-CO_3+HCO_3	Surface Water	Unfiltered	16-05826	RE16-04-53777	33400 (J-) [f]	n/a	n/a	n/a	n/a
Alkalinity-HCO_3	Surface Water	Unfiltered	16-05826	RE16-01-3128	24000	n/a	n/a	n/a	n/a
Alkalinity-HCO_3	Surface Water	Unfiltered	16-05826	RE16-98-3047	73000	n/a	n/a	n/a	n/a
Alkalinity-HCO_3	Surface Water	Unfiltered	16-05826	RE16-99-3026	28000	n/a	n/a	n/a	n/a
Alkalinity-HCO_3	Surface Water	Unfiltered	16-05826	RE16-99-3056	67000	n/a	n/a	n/a	n/a
Alkalinity-HCO_3	Surface Water	Unfiltered	16-05826	RE16-99-3211	69000	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Unfiltered	16-05826	RE16-00-3143	64000	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Unfiltered	16-05826	RE16-01-3128	17700	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Filtered	16-05826	RE16-01-3129	4490	50	5000	n/a	5000
Aluminum	Surface Water	Unfiltered	16-05826	RE16-02-45913	38800	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Filtered	16-05826	RE16-02-45917	797	50	5000	n/a	5000
Aluminum	Surface Water	Unfiltered	16-05826	RE16-02-49400	12200	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Filtered	16-05826	RE16-02-49401	4670	50	5000	n/a	5000
Aluminum	Surface Water	Unfiltered	16-05826	RE16-03-50749	181000	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Filtered	16-05826	RE16-03-50750	4770	50	5000	n/a	5000
Aluminum	Surface Water	Unfiltered	16-05826	RE16-04-53152	84200	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Filtered	16-05826	RE16-04-53153	3300	50	5000	n/a	5000
Aluminum	Surface Water	Unfiltered	16-05826	RE16-04-53777	110000	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Filtered	16-05826	RE16-04-53778	4060	50	5000	n/a	5000
Aluminum	Surface Water	Filtered	16-05826	RE16-98-3046	500	50	5000	n/a	5000
Aluminum	Surface Water	Unfiltered	16-05826	RE16-98-3047	390000	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Unfiltered	16-05826	RE16-98-3075	24600	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Unfiltered	16-05826	RE16-99-3026	80400	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Filtered	16-05826	RE16-99-3027	990 (J+) [g]	50	5000	n/a	5000

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Aluminum	Surface Water	Unfiltered	16-05826	RE16-99-3056	26400	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Filtered	16-05826	RE16-99-3057	1580	50	5000	n/a	5000
Aluminum	Surface Water	Unfiltered	16-05826	RE16-99-3211	4330	n/a	n/a	n/a	n/a
Aluminum	Surface Water	Filtered	16-05826	RE16-99-3212	418	50	5000	n/a	5000
Ammonia	Surface Water	Unfiltered	16-05826	RE16-99-3211	6100	n/a	n/a	n/a	n/a
Antimony	Surface Water	Unfiltered	16-05826	RE16-00-3143	1.9 (J) [h]	n/a	n/a	n/a	n/a
Antimony	Surface Water	Unfiltered	16-05826	RE16-01-3128	3.8 (J)	n/a	n/a	n/a	n/a
Antimony	Surface Water	Filtered	16-05826	RE16-01-3129	2.8 (J)	6	n/a	n/a	n/a
Antimony	Surface Water	Unfiltered	16-05826	RE16-02-45913	0.923 (J)	n/a	n/a	n/a	n/a
Antimony	Surface Water	Filtered	16-05826	RE16-02-45917	6.44	6	n/a	n/a	n/a
Antimony	Surface Water	Unfiltered	16-05826	RE16-02-49400	0.296 (J)	n/a	n/a	n/a	n/a
Antimony	Surface Water	Filtered	16-05826	RE16-02-49401	4.11	6	n/a	n/a	n/a
Antimony	Surface Water	Unfiltered	16-05826	RE16-03-50749	1.04 (J-)	n/a	n/a	n/a	n/a
Antimony	Surface Water	Filtered	16-05826	RE16-03-50750	0.496 (J-)	6	n/a	n/a	n/a
Arsenic	Surface Water	Unfiltered	16-05826	RE16-01-3128	3.8 (J)	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Filtered	16-05826	RE16-01-3129	2 (J)	10	200	n/a	100
Arsenic	Surface Water	Unfiltered	16-05826	RE16-02-45913	10.4	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Filtered	16-05826	RE16-02-45917	3.04 (J)	10	200	n/a	100
Arsenic	Surface Water	Unfiltered	16-05826	RE16-02-49400	12.2	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Filtered	16-05826	RE16-02-49401	2.92 (J)	10	200	n/a	100
Arsenic	Surface Water	Unfiltered	16-05826	RE16-03-50749	13.5	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Unfiltered	16-05826	RE16-04-53152	5.98	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Unfiltered	16-05826	RE16-04-53777	12.1	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Unfiltered	16-05826	RE16-98-3047	80	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Unfiltered	16-05826	RE16-98-3075	6.7 (J)	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Unfiltered	16-05826	RE16-99-3026	21.4	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Filtered	16-05826	RE16-99-3027	2.4 (J)	10	200	n/a	100
Arsenic	Surface Water	Unfiltered	16-05826	RE16-99-3056	8.3 (J)	n/a	n/a	n/a	n/a
Arsenic	Surface Water	Unfiltered	16-05826	RE16-99-3211	5.6 (J)	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Barium	Groundwater, intermediate	Unfiltered	16-02669	0316-98-0426	200	n/a	n/a	n/a	n/a
Barium	Surface Water	Unfiltered	16-05826	RE16-00-3143	20000	n/a	n/a	n/a	n/a
Barium	Surface Water	Unfiltered	16-05826	RE16-01-3128	3170	n/a	n/a	n/a	n/a
Barium	Surface Water	Filtered	16-05826	RE16-01-3129	2370	2000	n/a	n/a	1000
Barium	Surface Water	Unfiltered	16-05826	RE16-02-45913	4440	n/a	n/a	n/a	n/a
Barium	Surface Water	Filtered	16-05826	RE16-02-45917	1910	2000	n/a	n/a	1000
Barium	Surface Water	Unfiltered	16-05826	RE16-02-49400	26200	n/a	n/a	n/a	n/a
Barium	Surface Water	Filtered	16-05826	RE16-02-49401	3540	2000	n/a	n/a	1000
Barium	Surface Water	Unfiltered	16-05826	RE16-03-50749	14300	n/a	n/a	n/a	n/a
Barium	Surface Water	Filtered	16-05826	RE16-03-50750	3250	2000	n/a	n/a	1000
Barium	Surface Water	Unfiltered	16-05826	RE16-04-53152	7200	n/a	n/a	n/a	n/a
Barium	Surface Water	Filtered	16-05826	RE16-04-53153	1610	2000	n/a	n/a	1000
Barium	Surface Water	Unfiltered	16-05826	RE16-04-53777	11300	n/a	n/a	n/a	n/a
Barium	Surface Water	Filtered	16-05826	RE16-04-53778	2190	2000	n/a	n/a	1000
Barium	Surface Water	Filtered	16-05826	RE16-98-3046	6700	2000	n/a	n/a	1000
Barium	Surface Water	Unfiltered	16-05826	RE16-98-3047	67000	n/a	n/a	n/a	n/a
Barium	Surface Water	Unfiltered	16-05826	RE16-98-3075	4400	n/a	n/a	n/a	n/a
Barium	Surface Water	Unfiltered	16-05826	RE16-99-3026	15100	n/a	n/a	n/a	n/a
Barium	Surface Water	Filtered	16-05826	RE16-99-3027	1260	2000	n/a	n/a	1000
Barium	Surface Water	Unfiltered	16-05826	RE16-99-3056	5620	n/a	n/a	n/a	n/a
Barium	Surface Water	Filtered	16-05826	RE16-99-3057	2740	2000	n/a	n/a	1000
Barium	Surface Water	Unfiltered	16-05826	RE16-99-3211	3520	n/a	n/a	n/a	n/a
Barium	Surface Water	Filtered	16-05826	RE16-99-3212	2980	2000	n/a	n/a	1000
Beryllium	Surface Water	Unfiltered	16-05826	RE16-00-3143	4.7	n/a	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-01-3128	0.75 (J)	n/a	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-02-45913	1.41	n/a	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-02-49400	6.74	n/a	n/a	n/a	n/a
Beryllium	Surface Water	Filtered	16-05826	RE16-02-49401	0.186 (J)	4	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-03-50749	7.66	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Beryllium	Surface Water	Filtered	16-05826	RE16-03-50750	0.162 (J)	4	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-04-53152	3.64	n/a	n/a	n/a	n/a
Beryllium	Surface Water	Filtered	16-05826	RE16-04-53153	0.144 (J)	4	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-04-53777	4.4	n/a	n/a	n/a	n/a
Beryllium	Surface Water	Filtered	16-05826	RE16-04-53778	0.15 (J)	4	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-98-3047	24	n/a	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-98-3075	2.5 (J)	n/a	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-99-3026	8.6	n/a	n/a	n/a	n/a
Beryllium	Surface Water	Unfiltered	16-05826	RE16-99-3056	2.2 (J)	n/a	n/a	n/a	n/a
Boron	Surface Water	Unfiltered	16-05826	RE16-01-3128	43.3 (J)	n/a	n/a	n/a	n/a
Boron	Surface Water	Filtered	16-05826	RE16-01-3129	42 (J)	n/a	5000	n/a	750
Boron	Surface Water	Unfiltered	16-05826	RE16-02-45913	28.1 (J)	n/a	n/a	n/a	n/a
Boron	Surface Water	Filtered	16-05826	RE16-02-45917	43.7 (J)	n/a	5000	n/a	750
Boron	Surface Water	Unfiltered	16-05826	RE16-02-49400	10.7 (J)	n/a	n/a	n/a	n/a
Boron	Surface Water	Filtered	16-05826	RE16-02-49401	8.74 (J)	n/a	5000	n/a	750
Boron	Surface Water	Unfiltered	16-05826	RE16-03-50749	60	n/a	n/a	n/a	n/a
Boron	Surface Water	Filtered	16-05826	RE16-03-50750	19.6 (J)	n/a	5000	n/a	750
Boron	Surface Water	Unfiltered	16-05826	RE16-98-3047	87.8 (J)	n/a	n/a	n/a	n/a
Boron	Surface Water	Unfiltered	16-05826	RE16-99-3026	37.6 (J)	n/a	n/a	n/a	n/a
Boron	Surface Water	Filtered	16-05826	RE16-99-3027	19.1 (J)	n/a	5000	n/a	750
Boron	Surface Water	Unfiltered	16-05826	RE16-99-3056	25.5 (J)	n/a	n/a	n/a	n/a
Boron	Surface Water	Filtered	16-05826	RE16-99-3057	16.4 (J)	n/a	5000	n/a	750
Boron	Surface Water	Unfiltered	16-05826	RE16-99-3211	16.8 (J)	n/a	n/a	n/a	n/a
Boron	Surface Water	Filtered	16-05826	RE16-99-3212	17.8 (J)	n/a	5000	n/a	750
Bromide	Surface Water	Unfiltered	16-05826	RE16-01-3128	20	n/a	n/a	n/a	n/a
Bromide	Surface Water	Unfiltered	16-05826	RE16-98-3047	660	n/a	n/a	n/a	n/a
Cadmium	Surface Water	Unfiltered	16-05826	RE16-00-3143	3.8 (J)	n/a	n/a	n/a	n/a
Cadmium	Surface Water	Unfiltered	16-05826	RE16-02-45913	0.879 (J)	n/a	n/a	n/a	n/a
Cadmium	Surface Water	Filtered	16-05826	RE16-02-45917	0.109 (J)				

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Cadmium	Surface Water	Unfiltered	16-05826	RE16-02-49400	0.997 (J)	n/a	n/a	n/a	n/a
Cadmium	Surface Water	Filtered	16-05826	RE16-02-49401	0.16 (J)				
Cadmium	Surface Water	Unfiltered	16-05826	RE16-03-50749	1.88	n/a	n/a	n/a	n/a
Cadmium	Surface Water	Filtered	16-05826	RE16-03-50750	0.065 (J)				
Cadmium	Surface Water	Unfiltered	16-05826	RE16-04-53152	1.23	n/a	n/a	n/a	n/a
Cadmium	Surface Water	Filtered	16-05826	RE16-04-53153	0.074 (J)				
Cadmium	Surface Water	Unfiltered	16-05826	RE16-04-53777	0.39 (J)	n/a	n/a	n/a	n/a
Cadmium	Surface Water	Filtered	16-05826	RE16-04-53778	0.059 (J)				
Cadmium	Surface Water	Unfiltered	16-05826	RE16-98-3047	5.9	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-00-3143	38000	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-01-3128	15900	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-01-3129	9890	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-02-45913	11500	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-02-45917	8050	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-02-49400	36900	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-02-49401	10200	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-03-50749	22100	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-03-50750	8560	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-04-53152	10300	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-04-53153	4210	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-04-53777	19000	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-04-53778	6520	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-98-3046	16000	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-98-3047	67000	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-98-3075	14100	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-99-3026	23300	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-99-3027	4180 (J)	n/a	n/a	n/a	n/a
Calcium	Surface Water	Unfiltered	16-05826	RE16-99-3056	22700	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-99-3057	15600	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Calcium	Surface Water	Unfiltered	16-05826	RE16-99-3211	14900	n/a	n/a	n/a	n/a
Calcium	Surface Water	Filtered	16-05826	RE16-99-3212	14200	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-01-3128	16700	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-02-45913	4280	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-02-49400	5790	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-03-50749	5160	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-04-53152	1180	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-04-53777	2660	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-98-3047	22000	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-98-3075	2900	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-99-3026	3400	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-99-3056	2500	n/a	n/a	n/a	n/a
Chloride	Surface Water	Unfiltered	16-05826	RE16-99-3211	2800	n/a	n/a	n/a	n/a
Chromium	Surface Water	Unfiltered	16-05826	RE16-00-3143	45	n/a	n/a	n/a	n/a
Chromium	Surface Water	Unfiltered	16-05826	RE16-01-3128	9.1 (J)	n/a	n/a	n/a	n/a
Chromium	Surface Water	Filtered	16-05826	RE16-01-3129	2.2 (J)	100	1000	n/a	50
Chromium	Surface Water	Unfiltered	16-05826	RE16-02-45913	19.7	n/a	n/a	n/a	n/a
Chromium	Surface Water	Filtered	16-05826	RE16-02-45917	1.19 (J)	100	1000	n/a	50
Chromium	Surface Water	Unfiltered	16-05826	RE16-02-49400	4.12 (J)	n/a	n/a	n/a	n/a
Chromium	Surface Water	Filtered	16-05826	RE16-02-49401	2.76 (J)	100	1000	n/a	50
Chromium	Surface Water	Unfiltered	16-05826	RE16-03-50749	93.7	n/a	n/a	n/a	n/a
Chromium	Surface Water	Unfiltered	16-05826	RE16-04-53152	45.7	n/a	n/a	n/a	n/a
Chromium	Surface Water	Filtered	16-05826	RE16-04-53153	1.83 (J)	100	1000	n/a	50
Chromium	Surface Water	Unfiltered	16-05826	RE16-04-53777	55.8	n/a	n/a	n/a	n/a
Chromium	Surface Water	Filtered	16-05826	RE16-04-53778	2.5 (J)	100	1000	n/a	50
Chromium	Surface Water	Unfiltered	16-05826	RE16-98-3075	14.6	n/a	n/a	n/a	n/a
Chromium	Surface Water	Unfiltered	16-05826	RE16-99-3026	52.8	n/a	n/a	n/a	n/a
Chromium	Surface Water	Unfiltered	16-05826	RE16-99-3056	16	n/a	n/a	n/a	n/a
Chromium	Surface Water	Unfiltered	16-05826	RE16-99-3211	2.6 (J)	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Cobalt	Surface Water	Unfiltered	16-05826	RE16-00-3143	18 (J)	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Unfiltered	16-05826	RE16-01-3128	2.9 (J)	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Unfiltered	16-05826	RE16-02-45913	5.19	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Filtered	16-05826	RE16-02-45917	1.46 (J)	n/a	1000	n/a	50
Cobalt	Surface Water	Unfiltered	16-05826	RE16-02-49400	17.3	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Unfiltered	16-05826	RE16-03-50749	23.2	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Filtered	16-05826	RE16-03-50750	2.13 (J)	n/a	1000	n/a	50
Cobalt	Surface Water	Unfiltered	16-05826	RE16-04-53152	8.59	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Filtered	16-05826	RE16-04-53153	11	n/a	1000	n/a	50
Cobalt	Surface Water	Unfiltered	16-05826	RE16-04-53777	10.6	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Filtered	16-05826	RE16-04-53778	2.4 (J)	n/a	1000	n/a	50
Cobalt	Surface Water	Unfiltered	16-05826	RE16-98-3047	72	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Unfiltered	16-05826	RE16-98-3075	7.5 (J)	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Unfiltered	16-05826	RE16-99-3026	27.4 (J)	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Filtered	16-05826	RE16-99-3027	1 (J)	n/a	1000	n/a	50
Cobalt	Surface Water	Unfiltered	16-05826	RE16-99-3056	7.7 (J)	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Filtered	16-05826	RE16-99-3057	5.6 (J)	n/a	1000	n/a	50
Cobalt	Surface Water	Unfiltered	16-05826	RE16-99-3211	0.61 (J)	n/a	n/a	n/a	n/a
Cobalt	Surface Water	Filtered	16-05826	RE16-99-3212	6.3 (J)	n/a	1000	n/a	50
Copper	Surface Water	Unfiltered	16-05826	RE16-00-3143	83	n/a	n/a	n/a	n/a
Copper	Surface Water	Unfiltered	16-05826	RE16-01-3128	23 (J)	n/a	n/a	n/a	n/a
Copper	Surface Water	Filtered	16-05826	RE16-01-3129	7.8 (J)	n/a	1000	n/a	50
Copper	Surface Water	Unfiltered	16-05826	RE16-02-45913	21.2	n/a	n/a	n/a	n/a
Copper	Surface Water	Unfiltered	16-05826	RE16-02-49400	59.4	n/a	n/a	n/a	n/a
Copper	Surface Water	Filtered	16-05826	RE16-02-49401	11.4	n/a	1000	n/a	50
Copper	Surface Water	Unfiltered	16-05826	RE16-03-50749	64.3	n/a	n/a	n/a	n/a
Copper	Surface Water	Filtered	16-05826	RE16-03-50750	4.47 (J)	n/a	1000	n/a	50
Copper	Surface Water	Unfiltered	16-05826	RE16-04-53152	33.7	n/a	n/a	n/a	n/a
Copper	Surface Water	Filtered	16-05826	RE16-04-53153	4.7 (J)	n/a	1000	n/a	50

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Copper	Surface Water	Unfiltered	16-05826	RE16-04-53777	48	n/a	n/a	n/a	n/a
Copper	Surface Water	Filtered	16-05826	RE16-04-53778	4 (J)	n/a	1000	n/a	50
Copper	Surface Water	Unfiltered	16-05826	RE16-98-3075	14.3 (J)	n/a	n/a	n/a	n/a
Copper	Surface Water	Unfiltered	16-05826	RE16-99-3026	75.3	n/a	n/a	n/a	n/a
Copper	Surface Water	Filtered	16-05826	RE16-99-3027	4.6 (J)	n/a	1000	n/a	50
Copper	Surface Water	Unfiltered	16-05826	RE16-99-3056	19.6 (J)	n/a	n/a	n/a	n/a
Copper	Surface Water	Filtered	16-05826	RE16-99-3057	3.1 (J)	n/a	1000	n/a	50
Copper	Surface Water	Unfiltered	16-05826	RE16-99-3211	4.7 (J)	n/a	n/a	n/a	n/a
Copper	Surface Water	Filtered	16-05826	RE16-99-3212	1.7 (J)	n/a	1000	n/a	50
Cyanide (Total)	Surface Water	Unfiltered	16-05826	RE16-04-53777	3.8 (J)	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-01-3128	391	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-02-45913	257	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-02-49400	280	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-03-50749	261	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-04-53152	153	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-98-3047	380	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-98-3075	150	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-99-3026	220	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-99-3056	220	n/a	n/a	n/a	n/a
Fluoride	Surface Water	Unfiltered	16-05826	RE16-99-3211	240	n/a	n/a	n/a	n/a
Iron	Surface Water	Unfiltered	16-05826	RE16-00-3143	55000	n/a	n/a	n/a	n/a
Iron	Surface Water	Unfiltered	16-05826	RE16-01-3128	10500 (J-)	n/a	n/a	n/a	n/a
Iron	Surface Water	Filtered	16-05826	RE16-01-3129	2260 (J-)	300	n/a	n/a	1000
Iron	Surface Water	Unfiltered	16-05826	RE16-02-45913	22100	n/a	n/a	n/a	n/a
Iron	Surface Water	Filtered	16-05826	RE16-02-45917	492	300	n/a	n/a	1000
Iron	Surface Water	Unfiltered	16-05826	RE16-02-49400	11200	n/a	n/a	n/a	n/a
Iron	Surface Water	Filtered	16-05826	RE16-02-49401	2540	300	n/a	n/a	1000
Iron	Surface Water	Unfiltered	16-05826	RE16-03-50749	102000	n/a	n/a	n/a	n/a
Iron	Surface Water	Filtered	16-05826	RE16-03-50750	2510	300	n/a	n/a	1000

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Iron	Surface Water	Unfiltered	16-05826	RE16-04-53152	47100	n/a	n/a	n/a	n/a
Iron	Surface Water	Filtered	16-05826	RE16-04-53153	1650	300	n/a	n/a	1000
Iron	Surface Water	Unfiltered	16-05826	RE16-04-53777	60200	n/a	n/a	n/a	n/a
Iron	Surface Water	Filtered	16-05826	RE16-04-53778	2020	300	n/a	n/a	1000
Iron	Surface Water	Filtered	16-05826	RE16-98-3046	380	300	n/a	n/a	1000
Iron	Surface Water	Unfiltered	16-05826	RE16-98-3047	310000	n/a	n/a	n/a	n/a
Iron	Surface Water	Unfiltered	16-05826	RE16-98-3075	26100	n/a	n/a	n/a	n/a
Iron	Surface Water	Unfiltered	16-05826	RE16-99-3026	79800	n/a	n/a	n/a	n/a
Iron	Surface Water	Filtered	16-05826	RE16-99-3027	549	300	n/a	n/a	1000
Iron	Surface Water	Unfiltered	16-05826	RE16-99-3056	26600	n/a	n/a	n/a	n/a
Iron	Surface Water	Filtered	16-05826	RE16-99-3057	1220	300	n/a	n/a	1000
Iron	Surface Water	Unfiltered	16-05826	RE16-99-3211	4500	n/a	n/a	n/a	n/a
Iron	Surface Water	Filtered	16-05826	RE16-99-3212	387	300	n/a	n/a	1000
Lead	Surface Water	Unfiltered	16-05826	RE16-00-3143	85.8	n/a	n/a	n/a	n/a
Lead	Surface Water	Unfiltered	16-05826	RE16-01-3128	9.4	n/a	n/a	n/a	n/a
Lead	Surface Water	Filtered	16-05826	RE16-01-3129	1.9 (J)	15	100	n/a	50
Lead	Surface Water	Unfiltered	16-05826	RE16-02-45913	20.3	n/a	n/a	n/a	n/a
Lead	Surface Water	Filtered	16-05826	RE16-02-45917	0.733 (J)	15	100	n/a	50
Lead	Surface Water	Unfiltered	16-05826	RE16-02-49400	72	n/a	n/a	n/a	n/a
Lead	Surface Water	Filtered	16-05826	RE16-02-49401	1.95 (J)	15	100	n/a	50
Lead	Surface Water	Unfiltered	16-05826	RE16-03-50749	56.8 (J)	n/a	n/a	n/a	n/a
Lead	Surface Water	Filtered	16-05826	RE16-03-50750	1.23 (J)	15	100	n/a	50
Lead	Surface Water	Unfiltered	16-05826	RE16-04-53152	34.7	n/a	n/a	n/a	n/a
Lead	Surface Water	Filtered	16-05826	RE16-04-53153	0.956 (J)	15	100	n/a	50
Lead	Surface Water	Unfiltered	16-05826	RE16-04-53777	26	n/a	n/a	n/a	n/a
Lead	Surface Water	Filtered	16-05826	RE16-04-53778	0.67 (J)	15	100	n/a	50
Lead	Surface Water	Filtered	16-05826	RE16-98-3046	5.3	15	100	n/a	50
Lead	Surface Water	Unfiltered	16-05826	RE16-98-3047	520	n/a	n/a	n/a	n/a
Lead	Surface Water	Unfiltered	16-05826	RE16-98-3075	19.8	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Lead	Surface Water	Unfiltered	16-05826	RE16-99-3026	112	n/a	n/a	n/a	n/a
Lead	Surface Water	Unfiltered	16-05826	RE16-99-3056	26.5	n/a	n/a	n/a	n/a
Lead	Surface Water	Unfiltered	16-05826	RE16-99-3211	4.8	n/a	n/a	n/a	n/a
Lithium	Surface Water	Unfiltered	16-05826	RE16-98-3047	234	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-00-3143	16000	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-01-3128	5130	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Filtered	16-05826	RE16-01-3129	2270 (J)	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-02-45913	6280	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Filtered	16-05826	RE16-02-45917	1960	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-02-49400	9110	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Filtered	16-05826	RE16-02-49401	3080	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-03-50749	22200	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Filtered	16-05826	RE16-03-50750	2610	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-04-53152	10200	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Filtered	16-05826	RE16-04-53153	1260	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-04-53777	14400	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Filtered	16-05826	RE16-04-53778	2060	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-98-3075	5920	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-99-3026	14500	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Filtered	16-05826	RE16-99-3027	1220 (J)	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-99-3056	7890	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Filtered	16-05826	RE16-99-3057	3640 (J)	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Unfiltered	16-05826	RE16-99-3211	3690 (J)	n/a	n/a	n/a	n/a
Magnesium	Surface Water	Filtered	16-05826	RE16-99-3212	3130 (J)	n/a	n/a	n/a	n/a
Manganese	Surface Water	Unfiltered	16-05826	RE16-00-3143	1400	n/a	n/a	n/a	n/a
Manganese	Surface Water	Unfiltered	16-05826	RE16-01-3128	81.2	n/a	n/a	n/a	n/a
Manganese	Surface Water	Filtered	16-05826	RE16-01-3129	14.5 (J)	50	n/a	n/a	200
Manganese	Surface Water	Unfiltered	16-05826	RE16-02-45913	462	n/a	n/a	n/a	n/a
Manganese	Surface Water	Filtered	16-05826	RE16-02-45917	235	50	n/a	n/a	200

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Manganese	Surface Water	Unfiltered	16-05826	RE16-02-49400	1250	n/a	n/a	n/a	n/a
Manganese	Surface Water	Filtered	16-05826	RE16-02-49401	238	50	n/a	n/a	200
Manganese	Surface Water	Unfiltered	16-05826	RE16-03-50749	554	n/a	n/a	n/a	n/a
Manganese	Surface Water	Filtered	16-05826	RE16-03-50750	37.4	50	n/a	n/a	200
Manganese	Surface Water	Unfiltered	16-05826	RE16-04-53152	254	n/a	n/a	n/a	n/a
Manganese	Surface Water	Filtered	16-05826	RE16-04-53153	26.9	50	n/a	n/a	200
Manganese	Surface Water	Unfiltered	16-05826	RE16-04-53777	221	n/a	n/a	n/a	n/a
Manganese	Surface Water	Filtered	16-05826	RE16-04-53778	33.3	50	n/a	n/a	200
Manganese	Surface Water	Filtered	16-05826	RE16-98-3046	520	50	n/a	n/a	200
Manganese	Surface Water	Unfiltered	16-05826	RE16-98-3047	3800	n/a	n/a	n/a	n/a
Manganese	Surface Water	Unfiltered	16-05826	RE16-98-3075	392	n/a	n/a	n/a	n/a
Manganese	Surface Water	Unfiltered	16-05826	RE16-99-3026	1100	n/a	n/a	n/a	n/a
Manganese	Surface Water	Filtered	16-05826	RE16-99-3027	69.7	50	n/a	n/a	200
Manganese	Surface Water	Unfiltered	16-05826	RE16-99-3056	606	n/a	n/a	n/a	n/a
Manganese	Surface Water	Filtered	16-05826	RE16-99-3057	48.9	50	n/a	n/a	200
Manganese	Surface Water	Unfiltered	16-05826	RE16-99-3211	128	n/a	n/a	n/a	n/a
Manganese	Surface Water	Filtered	16-05826	RE16-99-3212	28.4	50	n/a	n/a	200
Mercury	Surface Water	Unfiltered	16-05826	RE16-00-3143	0.13 (J)	n/a	10	0.77	2
Mercury	Surface Water	Unfiltered	16-05826	RE16-02-49400	0.245	n/a	10	0.77	2
Mercury	Surface Water	Unfiltered	16-05826	RE16-03-50749	0.065 (J)	n/a	10	0.77	2
Mercury	Surface Water	Unfiltered	16-05826	RE16-04-53777	0.067 (J)	n/a	10	0.77	2
Mercury	Surface Water	Unfiltered	16-05826	RE16-98-3047	1	n/a	10	0.77	2
Mercury	Surface Water	Unfiltered	16-05826	RE16-98-3075	0.06 (J)	n/a	10	0.77	2
Mercury	Surface Water	Unfiltered	16-05826	RE16-99-3026	0.22	n/a	10	0.77	2
Mercury	Surface Water	Filtered	16-05826	RE16-99-3027	0.04 (J)	2	n/a	n/a	n/a
Mercury	Surface Water	Unfiltered	16-05826	RE16-99-3056	0.07 (J)	n/a	10	0.77	2
Molybdenum	Surface Water	Unfiltered	16-05826	RE16-98-3047	10 (J)	n/a	n/a	n/a	n/a
Nickel	Surface Water	Unfiltered	16-05826	RE16-00-3143	32 (J)	n/a	n/a	n/a	n/a
Nickel	Surface Water	Unfiltered	16-05826	RE16-01-3128	7.7 (J)	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Nickel	Surface Water	Filtered	16-05826	RE16-01-3129	1.8 (J)	100	n/a	n/a	200
Nickel	Surface Water	Unfiltered	16-05826	RE16-02-45913	13.7	n/a	n/a	n/a	n/a
Nickel	Surface Water	Unfiltered	16-05826	RE16-02-49400	15.9	n/a	n/a	n/a	n/a
Nickel	Surface Water	Filtered	16-05826	RE16-02-49401	5.55	100	n/a	n/a	200
Nickel	Surface Water	Unfiltered	16-05826	RE16-03-50749	55.7	n/a	n/a	n/a	n/a
Nickel	Surface Water	Unfiltered	16-05826	RE16-04-53152	26.8	n/a	n/a	n/a	n/a
Nickel	Surface Water	Filtered	16-05826	RE16-04-53153	2.98 (J)	100	n/a	n/a	200
Nickel	Surface Water	Unfiltered	16-05826	RE16-04-53777	34.1	n/a	n/a	n/a	n/a
Nickel	Surface Water	Filtered	16-05826	RE16-04-53778	3.3 (J)	100	n/a	n/a	200
Nickel	Surface Water	Unfiltered	16-05826	RE16-98-3047	150	n/a	n/a	n/a	n/a
Nickel	Surface Water	Unfiltered	16-05826	RE16-98-3075	15.8 (J)	n/a	n/a	n/a	n/a
Nickel	Surface Water	Unfiltered	16-05826	RE16-99-3026	56.2	n/a	n/a	n/a	n/a
Nickel	Surface Water	Filtered	16-05826	RE16-99-3027	1.6 (J)	100	n/a	n/a	200
Nickel	Surface Water	Unfiltered	16-05826	RE16-99-3056	17.7 (J)	n/a	n/a	n/a	n/a
Nickel	Surface Water	Filtered	16-05826	RE16-99-3057	3.8 (J)	100	n/a	n/a	200
Nickel	Surface Water	Unfiltered	16-05826	RE16-99-3211	4.4 (J)	n/a	n/a	n/a	n/a
Nickel	Surface Water	Filtered	16-05826	RE16-99-3212	3 (J)	100	n/a	n/a	200
Nitrate-Nitrite as N	Surface Water	Unfiltered	16-05826	RE16-02-45913	30 (J)	n/a	n/a	n/a	n/a
Nitrate-Nitrite as N	Surface Water	Unfiltered	16-05826	RE16-02-49400	160	n/a	n/a	n/a	n/a
Nitrate-Nitrite as N	Surface Water	Unfiltered	16-05826	RE16-98-3047	4100	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-00-3143	22000	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-01-3128	7080	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-01-3129	4890 (J)	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-02-45913	11100	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-02-45917	6840	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-02-49400	13300	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-02-49401	8690	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-03-50749	22100 (J)	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-03-50750	5330	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Potassium	Surface Water	Unfiltered	16-05826	RE16-04-53152	14800	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-04-53153	4830	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-04-53777	18200	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-04-53778	5500	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-98-3046	9400	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-98-3047	60000	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-98-3075	9480	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-99-3026	17400	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-99-3027	4780 (J)	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-99-3056	8810	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-99-3057	5230	n/a	n/a	n/a	n/a
Potassium	Surface Water	Unfiltered	16-05826	RE16-99-3211	6160	n/a	n/a	n/a	n/a
Potassium	Surface Water	Filtered	16-05826	RE16-99-3212	5560	n/a	n/a	n/a	n/a
Selenium	Surface Water	Filtered	16-05826	RE16-02-49401	3.49 (J)	50	50	n/a	50
Selenium	Surface Water	Unfiltered	16-05826	RE16-04-53152	4.06 (J)	n/a	n/a	n/a	n/a
Selenium	Surface Water	Unfiltered	16-05826	RE16-98-3075	3.6 (J)	n/a	n/a	n/a	n/a
Selenium	Surface Water	Unfiltered	16-05826	RE16-99-3056	3.7 (J)	n/a	n/a	n/a	n/a
Silver	Surface Water	Unfiltered	16-05826	RE16-00-3143	0.64 (J)	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-00-3143	7700	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-01-3128	9050	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-01-3129	8350	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-02-45913	3200	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-02-45917	2790	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-02-49400	5540	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-02-49401	5400	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-03-50749	5370	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-03-50750	5010	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-04-53152	3140	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-04-53153	2820	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Sodium	Surface Water	Unfiltered	16-05826	RE16-04-53777	3330	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-04-53778	2960	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-98-3046	10000	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-98-3047	9300	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-98-3075	5110	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-99-3026	5150	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-99-3027	3790 (J)	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-99-3056	7020	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-99-3057	5710	n/a	n/a	n/a	n/a
Sodium	Surface Water	Unfiltered	16-05826	RE16-99-3211	5330	n/a	n/a	n/a	n/a
Sodium	Surface Water	Filtered	16-05826	RE16-99-3212	5260	n/a	n/a	n/a	n/a
Strontium	Surface Water	Unfiltered	16-05826	RE16-98-3047	1360	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-01-3128	10600	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-02-45913	3100	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-02-49400	2830	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-03-50749	1130	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-04-53152	2330	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-04-53777	1550	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-98-3047	18000	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-98-3075	1900	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-99-3026	2900	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-99-3056	7600	n/a	n/a	n/a	n/a
Sulfate	Surface Water	Unfiltered	16-05826	RE16-99-3211	2700	n/a	n/a	n/a	n/a
Thallium	Surface Water	Unfiltered	16-05826	RE16-00-3143	3.6 (J)	n/a	n/a	n/a	n/a
Thallium	Surface Water	Unfiltered	16-05826	RE16-02-45913	0.433 (J)	n/a	n/a	n/a	n/a
Thallium	Surface Water	Unfiltered	16-05826	RE16-02-49400	0.064 (J)	n/a	n/a	n/a	n/a
Thallium	Surface Water	Filtered	16-05826	RE16-02-49401	0.037 (J)	2	n/a	n/a	n/a
Thallium	Surface Water	Unfiltered	16-05826	RE16-03-50749	1.35	n/a	n/a	n/a	n/a
Thallium	Surface Water	Unfiltered	16-05826	RE16-04-53152	0.797	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Thallium	Surface Water	Filtered	16-05826	RE16-04-53153	0.033 (J)	2	n/a	n/a	n/a
Thallium	Surface Water	Unfiltered	16-05826	RE16-04-53777	0.097 (J)	n/a	n/a	n/a	n/a
Thallium	Surface Water	Filtered	16-05826	RE16-04-53778	0.039 (J)	2	n/a	n/a	n/a
Thallium	Surface Water	Unfiltered	16-05826	RE16-98-3047	5.3	n/a	n/a	n/a	n/a
Total Phosphorus	Surface Water	Unfiltered	16-05826	RE16-99-3211	88	n/a	n/a	n/a	n/a
Uranium	Surface Water	Unfiltered	16-05826	RE16-00-3143	9.63	n/a	n/a	n/a	n/a
Uranium	Surface Water	Unfiltered	16-05826	RE16-04-53152	2.67	n/a	n/a	n/a	n/a
Uranium	Surface Water	Filtered	16-05826	RE16-04-53153	0.14 (J)	30	n/a	n/a	n/a
Uranium	Surface Water	Unfiltered	16-05826	RE16-98-3075	86.5 (J)	n/a	n/a	n/a	n/a
Uranium	Surface Water	Unfiltered	16-05826	RE16-99-3026	9.57	n/a	n/a	n/a	n/a
Uranium	Surface Water	Unfiltered	16-05826	RE16-99-3056	1.44	n/a	n/a	n/a	n/a
Uranium	Surface Water	Unfiltered	16-05826	RE16-99-3211	0.5	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-00-3143	100	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-01-3128	18.3 (J)	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Filtered	16-05826	RE16-01-3129	6.4 (J)	n/a	100	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-02-45913	39.6	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Filtered	16-05826	RE16-02-45917	3.9 (J)	n/a	100	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-02-49400	63.5	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Filtered	16-05826	RE16-02-49401	5.51	n/a	100	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-03-50749	159	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Filtered	16-05826	RE16-03-50750	4.84 (J)	n/a	100	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-04-53152	77.8	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Filtered	16-05826	RE16-04-53153	4.28 (J)	n/a	100	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-04-53777	101	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Filtered	16-05826	RE16-04-53778	3.9 (J)	n/a	100	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-98-3047	380	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-98-3075	30.5 (J)	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-99-3026	125	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Filtered	16-05826	RE16-99-3027	1.6 (J)	n/a	100	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Vanadium	Surface Water	Unfiltered	16-05826	RE16-99-3056	32.1 (J)	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Unfiltered	16-05826	RE16-99-3211	6.3 (J)	n/a	n/a	n/a	n/a
Vanadium	Surface Water	Filtered	16-05826	RE16-99-3212	0.97 (J)	n/a	100	n/a	n/a
Zinc	Surface Water	Unfiltered	16-05826	RE16-00-3143	200	n/a	n/a	n/a	n/a
Zinc	Surface Water	Unfiltered	16-05826	RE16-01-3128	46.3	n/a	n/a	n/a	n/a
Zinc	Surface Water	Filtered	16-05826	RE16-01-3129	10.7 (J)	5000	25000	n/a	10000
Zinc	Surface Water	Unfiltered	16-05826	RE16-02-45913	82.6	n/a	n/a	n/a	n/a
Zinc	Surface Water	Unfiltered	16-05826	RE16-02-49400	127	n/a	n/a	n/a	n/a
Zinc	Surface Water	Filtered	16-05826	RE16-02-49401	21.8	5000	25000	n/a	10000
Zinc	Surface Water	Unfiltered	16-05826	RE16-03-50749	314	n/a	n/a	n/a	n/a
Zinc	Surface Water	Filtered	16-05826	RE16-03-50750	9.33	5000	25000	n/a	10000
Zinc	Surface Water	Unfiltered	16-05826	RE16-04-53152	148	n/a	n/a	n/a	n/a
Zinc	Surface Water	Filtered	16-05826	RE16-04-53153	7.05 (J)	5000	25000	n/a	10000
Zinc	Surface Water	Unfiltered	16-05826	RE16-04-53777	214	n/a	n/a	n/a	n/a

Table B-26 (continued)

Analyte	Media	Field Preparation	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Zinc	Surface Water	Filtered	16-05826	RE16-04-53778	9.1	5000	25000	n/a	10000
Zinc	Surface Water	Filtered	16-05826	RE16-98-3046	37	5000	25000	n/a	10000
Zinc	Surface Water	Unfiltered	16-05826	RE16-98-3047	670	n/a	n/a	n/a	n/a
Zinc	Surface Water	Unfiltered	16-05826	RE16-98-3075	452	n/a	n/a	n/a	n/a
Zinc	Surface Water	Unfiltered	16-05826	RE16-99-3026	272	n/a	n/a	n/a	n/a
Zinc	Surface Water	Filtered	16-05826	RE16-99-3027	5.1 (J)	5000	25000	n/a	10000
Zinc	Surface Water	Unfiltered	16-05826	RE16-99-3056	81.2	n/a	n/a	n/a	n/a
Zinc	Surface Water	Filtered	16-05826	RE16-99-3057	12.7 (J)	5000	25000	n/a	10000
Zinc	Surface Water	Unfiltered	16-05826	RE16-99-3211	15.5 (J)	n/a	n/a	n/a	n/a
Zinc	Surface Water	Filtered	16-05826	RE16-99-3212	1.5 (J)	5000	25000	n/a	10000

[a] MCL = EPA SDWA maximum contaminant level.

[b] LW = NMED surface water standard for livestock.

[c] WH = NMED surface water standard for wildlife.

[d] GW = NMED groundwater standard.

[e] n/a = Not available.

[f] J- = The analyte was positively identified, and the result is likely to be biased low.

[g] J+ = The analyte was positively identified, and the result is likely to be biased high.

[h] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

Table B-27
Frequency of Detected Organic Chemicals in Surface Water and Groundwater at 90s Line Pond

Analyte	Field Preparation	Media	Number of Analyses	Number of Detects	Concentration Range* (µg/L)	Frequency of Detects
Acetone	Unfiltered	Surface Water	11	6	3.1 to 89	6/11
Butanone[2-]	Unfiltered	Surface Water	11	1	4.4 to [20]	1/11
Chloroform	Unfiltered	Surface Water	11	2	0.57 to [5]	2/11
Dinitrotoluene[2,4-]	Unfiltered	Groundwater, intermediate	1	1	4.03 to 4.03	1/1
Dinitrotoluene[2,6-]	Filtered	Surface Water	1	1	0.22 to 0.22	1/1
HMX	Unfiltered	Surface Water	9	6	0.56 to 4.9	6/9
HMX	Unfiltered	Groundwater, intermediate	1	1	21 to 21	1/1
HMX	Filtered	Surface Water	1	1	14 to 14	1/1
Methyl-2-pentanone[4-]	Unfiltered	Surface Water	11	1	1.5 to [20]	1/11
RDX	Unfiltered	Groundwater, intermediate	1	1	281 to 281	1/1
RDX	Filtered	Surface Water	1	1	23 to 23	1/1
RDX	Unfiltered	Surface Water	9	8	[0.84] to 10	8/9
Toluene	Unfiltered	Surface Water	11	2	0.79 to [5]	2/11
Total Organic Carbon	Unfiltered	Surface Water	1	1	97,000 to 97,000	1/1
Trinitrotoluene[2,4,6-]	Unfiltered	Groundwater, intermediate	1	1	1.27 to 1.27	1/1

* Values in brackets are detection limits.

Table B-28
Summary of Samples with Detected Organic Chemicals in Surface Water and Groundwater at 90s Line Pond

Analyte	Media	Field Prep	Location ID	Sample ID	Concentration (µg/L)	MCL[a]	LW[b]	WH[c]	GW[d]
Acetone	Surface Water	Unfiltered	16-05826	RE16-02-45913	22.5	n/a[e]	n/a	n/a	n/a
Acetone	Surface Water	Unfiltered	16-05826	RE16-02-49400	3.1 (J)[f]	n/a	n/a	n/a	n/a
Acetone	Surface Water	Unfiltered	16-05826	RE16-03-50749	8.3	n/a	n/a	n/a	n/a
Acetone	Surface Water	Unfiltered	16-05826	RE16-04-53152	10.1	n/a	n/a	n/a	n/a
Acetone	Surface Water	Unfiltered	16-05826	RE16-98-3047	89 (J-)[g]	n/a	n/a	n/a	n/a
Acetone	Surface Water	Unfiltered	16-05826	RE16-99-3056	17 (J)	n/a	n/a	n/a	n/a
Butanone[2-]	Surface Water	Unfiltered	16-05826	RE16-03-50749	4.4 (J)	n/a	n/a	n/a	n/a
Chloroform	Surface Water	Unfiltered	16-05826	RE16-99-3056	1.3 (J)	80	n/a	n/a	n/a
Chloroform	Surface Water	Unfiltered	16-05826	RE16-99-3211	0.57 (J)	80	n/a	n/a	n/a
Dinitrotoluene[2,4-]	Groundwater, intermediate	Unfiltered	16-02669	0316-98-0420	4.03	n/a	n/a	n/a	n/a
Dinitrotoluene[2,6-]	Surface Water	Filtered	16-05826	RE16-98-3046	0.22	n/a	n/a	n/a	n/a
HMX	Groundwater, intermediate	Unfiltered	16-02669	0316-98-0420	21	n/a	n/a	n/a	n/a
HMX	Surface Water	Unfiltered	16-05826	RE16-01-3128	4.9	n/a	n/a	n/a	n/a
HMX	Surface Water	Unfiltered	16-05826	RE16-02-45913	2.4 (J-)	n/a	n/a	n/a	n/a
HMX	Surface Water	Unfiltered	16-05826	RE16-02-49400	0.56 (J-)	n/a	n/a	n/a	n/a
HMX	Surface Water	Filtered	16-05826	RE16-98-3046	14	n/a	n/a	n/a	n/a
HMX	Surface Water	Unfiltered	16-05826	RE16-98-3047	2.3	n/a	n/a	n/a	n/a
HMX	Surface Water	Unfiltered	16-05826	RE16-99-3056	3.2	n/a	n/a	n/a	n/a
HMX	Surface Water	Unfiltered	16-05826	RE16-99-3211	3.1	n/a	n/a	n/a	n/a
Methyl-2-pentanone[4-]	Surface Water	Unfiltered	16-05826	RE16-98-3075	1.5 (J)	n/a	n/a	n/a	n/a
RDX	Groundwater, intermediate	Unfiltered	16-02669	0316-98-0420	281	n/a	n/a	n/a	n/a
RDX	Surface Water	Unfiltered	16-05826	RE16-00-3143	1	n/a	n/a	n/a	n/a
RDX	Surface Water	Unfiltered	16-05826	RE16-01-3128	4.1	n/a	n/a	n/a	n/a
RDX	Surface Water	Unfiltered	16-05826	RE16-02-45913	2.5 (J-)	n/a	n/a	n/a	n/a
RDX	Surface Water	Unfiltered	16-05826	RE16-02-49400	0.96 (J-)	n/a	n/a	n/a	n/a
RDX	Surface Water	Filtered	16-05826	RE16-98-3046	23	n/a	n/a	n/a	n/a
RDX	Surface Water	Unfiltered	16-05826	RE16-98-3047	2.7	n/a	n/a	n/a	n/a

Table B-28 (continued)

Analyte	Media	Field Prep	Location ID	Sample ID	Concentration	MCL	LW	WH	GW
RDX	Surface Water	Unfiltered	16-05826	RE16-98-3075	1.3	n/a	n/a	n/a	n/a
RDX	Surface Water	Unfiltered	16-05826	RE16-99-3056	2.6	n/a	n/a	n/a	n/a
RDX	Surface Water	Unfiltered	16-05826	RE16-99-3211	10	n/a	n/a	n/a	n/a
Specific Conductance	Surface Water	Unfiltered	16-05826	RE16-98-3047	280				
Toluene	Surface Water	Unfiltered	16-05826	RE16-98-3075	1.7 (J)	n/a	n/a	n/a	n/a
Toluene	Surface Water	Unfiltered	16-05826	RE16-99-3026	0.79 (J)	n/a	n/a	n/a	n/a
Total Organic Carbon	Surface Water	Unfiltered	16-05826	RE16-98-3047	97000	n/a	n/a	n/a	n/a
Trinitrotoluene[2,4,6-]	Groundwater, intermediate	Unfiltered	16-02669	0316-98-0420	1.27	n/a	n/a	n/a	n/a

[a] MCL = EPA SDWA maximum contaminant level.

[b] LW = NMED surface water standard for livestock.

[c] WH = NMED surface water standard for wildlife.

[d] GW = NMED groundwater standard.

[e] n/a = Not available.

[f] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[g] J- = The analyte was positively identified, and the result is likely to be biased low.

Table B-29
Frequency of Detected Radionuclides in Surface Water at 90s Line Pond

Analyte	Field Preparation	Media	Number of Analyses	Number of Detects	Concentration Range (pCi/L)	Frequency of Detects
Tritium	Unfiltered	Surface Water	9	9	34 to 326.4	9/9

Table B-30
Summary of Samples with Detected Radionuclides in Surface Water at 90s Line Pond

Analyte	Media	Field Prep	Location ID	Sample ID	Concentration (pCi/L)	MCL[a]	LW[b]	WH[c]	GW[d]	DCG[e]
Tritium	Surface Water	Unfiltered	16-05826	RE16-01-3128	326.4	20000	20000	n/a[f]	n/a	n/a
Tritium	Surface Water	Unfiltered	16-05826	RE16-02-45913	37.12	20000	20000	n/a	n/a	n/a
Tritium	Surface Water	Unfiltered	16-05826	RE16-02-49400	131.2	20000	20000	n/a	n/a	n/a
Tritium	Surface Water	Unfiltered	16-05826	RE16-03-50749	175.04	20000	20000	n/a	n/a	n/a
Tritium	Surface Water	Unfiltered	16-05826	RE16-04-53152	125.76	20000	20000	n/a	n/a	n/a
Tritium	Surface Water	Unfiltered	16-05826	RE16-04-53777	79.04	20000	20000	n/a	n/a	n/a
Tritium	Surface Water	Unfiltered	16-05826	RE16-98-3075	260	20000	20000	n/a	n/a	n/a
Tritium	Surface Water	Unfiltered	16-05826	RE16-99-3056	184.64	20000	20000	n/a	n/a	n/a
Tritium	Surface Water	Unfiltered	16-05826	RE16-99-3211	34.0	20000	20000	n/a	n/a	n/a

[a] MCL = EPA SDWA maximum contaminant level.
[b] LW = NMED surface water standard for livestock.
[c] WH = NMED surface water standard for wildlife.
[d] GW = NMED groundwater standard.
[e] DCG = Dose concentration guideline (DOE).
[f] n/a = Not available.

Table B-31
2004 RFI Screening Data from SWMU 16-007(a)-99

Field Screening Sample ID	Location ID	Date Collected	Depth Interval (ft)	Screening Method/Result [a]
RE16-05-56096	16-23739	10/19/2004	0-0.5	PID: 0.1 ppm; D TECH: <0.5 ppm
RE16-05-56097	16-23737	10/19/2004	2-2.5	PID: 0.2 ppm; D TECH: <0.5 ppm
RE16-05-56098	16-23737	10/19/2004	3-3.5	PID: 0.2 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56099	16-23737	10/19/2004	5-6	PID: 0.2 ppm; D TECH: <0.5 ppm
RE16-05-56100	16-23737	10/19/2004	7-8	PID: 0.3 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56101	16-23737	10/19/2004	8-9	PID: 0.3 ppm; D TECH: <0.5 ppm
RE16-05-56102	16-23738	10/19/2004	0-1.5	PID: 0.4 ppm; D TECH: <0.5 ppm
RE16-05-56103	16-23738	10/19/2004	5-5.5	PID: 0.1 ppm; D TECH: <0.5 ppm
RE16-05-56104	16-23737	10/19/2004	0-0.5	PID: 0.5 ppm; D TECH: <0.5 ppm
RE16-05-56105	16-23739	10/19/2004	2-3	PID: 0.8 ppm; D TECH: <0.5 ppm
RE16-05-56106	16-23739	10/19/2004	3-4	PID: 0.5 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56107	16-23739	10/19/2004	5-6	PID: 1.2 ppm; D TECH: 2.5-4.5 ppm
RE16-05-56108	16-23740	10/20/2004	0-1	PID: 0.7 ppm; D TECH: <0.5 ppm
RE16-05-56109	16-23740	10/20/2004	2-3	PID: 0.9 ppm; D TECH: <0.5 ppm
RE16-05-56110	16-23740	10/20/2004	5-6	PID: 0.7 ppm; D TECH: <0.5 ppm
RE16-05-56111	16-23740	10/20/2004	7-8	PID: 1.0 ppm; D TECH: 1.5-2.5 ppm
RE16-05-56160	16-23738	10/19/2004	5.5-6.5	PID: 0.9 ppm; D TECH: <0.5 ppm
RE16-05-56161	16-23738	10/19/2004	7.5-8.5	PID: 0.9 ppm; D TECH: <0.5 ppm
RE16-05-56162	16-23739	10/19/2004	7.5-8	PID: 0.6 ppm; D TECH: 2.5-4.5 ppm
RE16-05-56164	16-23740	10/20/2004	19-20	PID: 1.1 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56171	16-23740	10/20/2004	8-9	PID: 0.6 ppm; D TECH: 1.5-2.5 ppm
RE16-05-56172	16-23740	10/20/2004	10-11	PID: 0.1 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56173	16-23740	10/20/2004	12-13	PID: 0.1 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56174	16-23740	10/20/2004	14-15	PID: 0.3 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56175	16-23740	10/20/2004	17-18	PID: 0.6 ppm; D TECH: 1.5-2.5 ppm
RE16-05-56197	16-23741	10/20/2004	0-1	PID: 0.9 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56198	16-23741	10/20/2004	2-3	PID: 0.6 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56199	16-23741	10/20/2004	3.5-4.5	PID: 0.7 ppm; D TECH: <0.5 ppm
RE16-05-56200	16-23741	10/20/2004	6-7	PID: 0.5 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56201	16-23741	10/20/2004	7-8	PID: 0.8 ppm; D TECH: <0.5 ppm
RE16-05-56202	16-23741	10/20/2004	8-9	PID: 1.0 ppm; D TECH: <0.5 ppm
RE16-05-56203	16-23741	10/20/2004	10.5-11.5	PID: 0.8 ppm; D TECH: <0.5 ppm
RE16-05-56204	16-23741	10/20/2004	13-14	PID: 0.4 ppm; D TECH: <0.5 ppm
RE16-05-56427	16-23749	11/15/2004	0-2	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56428	16-23749	11/15/2004	5.5-7.5	PID: 0.0 ppm; D TECH: 1.5-2.5 ppm
RE16-05-56429	16-23749	11/15/2004	11-13	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56430	16-23749	11/15/2004	18-20	PID: 0.0 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56535	16-23742	10/21/2004	0-1	PID: 0.5 ppm; D TECH: <0.5 ppm
RE16-05-56536	16-23742	10/21/2004	6-7	PID: 0.3 ppm; D TECH: <0.5 ppm
RE16-05-56537	16-23742	10/21/2004	7-8	PID: 0.5 ppm; D TECH: <0.5 ppm
RE16-05-56538	16-23742	10/21/2004	10-11	PID: 0.4 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56539	16-23742	10/21/2004	12-13	PID: 0.3 ppm; D TECH: 0.5-1.5 ppm

Table B-31 (continued)

Field Screening Sample ID	Location ID	Date Collected	Depth Interval (ft)	Screening Method/Result [a]
RE16-05-56540 [b]	16-23742	10/21/2004	14-15	PID: 0.3 ppm; D TECH: <0.5 ppm
RE16-05-56541	16-23743	10/21/2004	0-1	PID: 0.4 ppm; D TECH: <0.5 ppm
RE16-05-56542	16-23743	10/21/2004	2-3	PID: 0.5 ppm; D TECH: <0.5 ppm
RE16-05-56543	16-23743	10/21/2004	3.5-4.5	PID: 0.2 ppm; D TECH: <0.5 ppm
RE16-05-56544	16-23743	10/21/2004	5-6	PID: 0.5 ppm; D TECH: <0.5 ppm
RE16-05-56545	16-23743	10/21/2004	6-7	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56546 [b]	16-23743	10/21/2004	8-9	PID: 0.1 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56547	16-23743	10/21/2004	10-11	PID: 0.0 ppm; D TECH: 1.5-2.5 ppm
RE16-05-56548	16-23743	10/21/2004	12-13	PID: 0.0 ppm; D TECH: 1.5-2.5 ppm
RE16-05-56549 [b]	16-23743	10/21/2004	14-15	PID: 0.8 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56550	16-23744	10/21/2004	0-1	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56551	16-23744	10/21/2004	2-3	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56552	16-23744	10/21/2004	3.5-4.5	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56553	16-23744	10/21/2004	5-6	PID: 0.5 ppm; D TECH: <0.5 ppm
RE16-05-56554	16-23744	10/21/2004	7-8	PID: 0.5 ppm; D TECH: <0.5 ppm
RE16-05-56555 [b]	16-23744	10/21/2004	8-9	PID: 0.3 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56556 [b]	16-23744	10/21/2004	10-11	PID: 0.2 ppm; D TECH: <0.5 ppm
RE16-05-56557	16-23744	10/21/2004	12-13	PID: 0.3 ppm; D TECH: <0.5 ppm
RE16-05-56558	16-23744	10/21/2004	14-15	PID: 0.3 ppm; D TECH: <0.5 ppm
RE16-05-56559	16-23745	10/21/2004	0-1	PID: 0.7 ppm; D TECH: <0.5 ppm
RE16-05-56560	16-23745	10/21/2004	2-3	PID: 1.1 ppm; D TECH: <0.5 ppm
RE16-05-56561	16-23745	10/21/2004	3.5-4	PID: 0.2 ppm; D TECH: <0.5 ppm
RE16-05-56562 [b]	16-23745	10/21/2004	5.5-6.5	PID: 0.3 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56563 [b]	16-23745	10/21/2004	6.5-7.5	PID: 1.4 ppm; D TECH: <0.5 ppm
RE16-05-56564	16-23745	10/21/2004	8-9	PID: 0.7 ppm; D TECH: <0.5 ppm
RE16-05-56565	16-23745	10/21/2004	10-11	PID: 0.3 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56566	16-23745	10/21/2004	12-13	PID: 1.0 ppm; D TECH: <0.5 ppm
RE16-05-56567	16-23745	10/21/2004	14-15	PID: 0.7 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56568	16-23746	10/21/2004	0-1	PID: 0.3 ppm; D TECH: <0.5 ppm
RE16-05-56569 [b]	16-23746	10/21/2004	2-3	PID: 0.4 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56570	16-23746	10/21/2004	3.5-4.5	PID: 0.3 ppm; D TECH: <0.5 ppm
RE16-05-56571	16-23746	10/21/2004	5-6	PID: 0.1 ppm; D TECH: <0.5 ppm
RE16-05-56572	16-23746	10/21/2004	7-8	PID: 0.3 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56573	16-23746	10/21/2004	8-9	PID: 0.4 ppm; D TECH: 1.5-2.5 ppm
RE16-05-56574	16-23746	10/21/2004	10-11	PID: 1.1 ppm; D TECH: 1.5-2.5 ppm
RE16-05-56575 [b]	16-23746	10/21/2004	12-13	PID: 1.3 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56576 [b]	16-23746	10/21/2004	14-15	PID: 0.8 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56577	16-23747	10/22/2004	0-2	PID: 0.2 ppm; D TECH: <0.5 ppm
RE16-05-56578	16-23747	10/22/2004	0-2	PID: 0.4 ppm; D TECH: <0.5 ppm
RE16-05-56579	16-23747	10/22/2004	3-4	PID: 0.3 ppm; D TECH: <0.5 ppm
RE16-05-56580	16-23747	10/22/2004	5-6	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56581 [b]	16-23747	10/22/2004	6.5-7.5	PID: 0.4 ppm; D TECH: 1.5-2.5 ppm
RE16-05-56582 [b]	16-23747	10/22/2004	8.5-9.5	PID: 0.0 ppm; D TECH: 0.5-1.5 ppm

Table B-31 (continued)

Field Screening Sample ID	Location ID	Date Collected	Depth Interval (ft)	Screening Method/Result [a]
RE16-05-56583 [b]	16-23747	10/22/2004	10-12	PID: 0.1 ppm; D TECH: <0.5 ppm
RE16-05-56584	16-23747	10/22/2004	10-12	PID: 0.2 ppm; D TECH: <0.5 ppm
RE16-05-56585	16-23747	10/22/2004	14-15	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56586 [b]	16-23748	10/22/2004	0-2	PID: 0.0 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56587 [b]	16-23748	10/22/2004	0-2	PID: 0.3 ppm; D TECH: <0.5 ppm
RE16-05-56588	16-23748	10/22/2004	2.5-3.5	PID: 0.1 ppm; D TECH: <0.5 ppm
RE16-05-56589 [b]	16-23748	10/22/2004	5-6	PID: 0.3 ppm; D TECH: 0.5-1.5 ppm
RE16-05-56590 [b]	16-23748	10/22/2004	7-8	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56591	16-23748	10/22/2004	8-9	PID: 0.6 ppm; D TECH: <0.5 ppm
RE16-05-56592	16-23748	10/22/2004	10-12	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56593	16-23748	10/22/2004	10-12	PID: 0.0 ppm; D TECH: <0.5 ppm
RE16-05-56594	16-23748	10/22/2004	14-15	PID: 0.0 ppm; D TECH: <0.5 ppm

[a] All radiation screening results were nondetect.

[b] Submitted for fixed laboratory confirmation analysis.

Table B-32
Frequency of Inorganic Chemicals Above
BVs in Soil, Sediment, and Tuff at the 30s Line

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Aluminum	Soil	19	19	7170 to 29200	29200	0/19	0/19
	Fill	3	3	6180 to 10100	29200	0/3	0/3
	Qbt 4	9	9	419 to 8450	7340	2/9	0/9
Antimony	Soil	15	0	[0.403 to 0.71]	0.83	0/15	0/15
	Fill	3	0	[5.7 to 5.9]	0.83	0/3	3/3
	Qbt 4	7	0	[0.417 to 0.437]	0.5	0/7	0/7
Arsenic	Soil	19	19	1.68 to 5.2	8.17	0/19	0/19
	Fill	3	3	2.3 to 2.8	8.17	0/3	0/3
	Qbt 4	9	8	[1.49] to 4.73	2.79	2/9	0/9
Barium	Soil	19	19	89.2 to 2270	295	7/19	0/19
	Fill	3	3	133 to 163	295	0/3	0/3
	Qbt 4	9	9	14.3 to 1100	46	5/9	0/9
Beryllium	Soil	19	19	0.484 to 1.78	1.83	0/19	0/19
	Fill	3	3	0.98 to 1.5	1.83	0/3	0/3
	Qbt 4	9	9	0.183 to 0.695	1.21	0/9	0/9
Bromide	Soil	18	0	[2.01 to 2.33]	n/a [b]	0/18	n/a
	Qbt 4	9	0	[2.04 to 2.18]	n/a	0/9	n/a
Cadmium	Soil	19	0	[0.08 to 1.15]	0.4	0/19	18/19
	Fill	3	1	[0.59] to 1.1	0.4	1/3	2/3
	Qbt 4	9	0	[0.517 to 0.551]	1.63	0/9	0/9
Calcium	Soil	19	19	1690 to 3140	6120	0/19	0/19
	Fill	3	3	2000 to 2930	6120	0/3	0/3
	Qbt 4	9	9	321 to 2740	2200	1/9	0/9
Chloride	Soil	18	7	1.37 to 9.65	231	0/18	0/18
	Qbt 4	9	6	[2.04] to 3.77	94.6	0/9	0/9
Chromium	Soil	19	19	6.97 to 19.2	19.3	0/19	0/19
	Fill	3	3	5.8 to 8.9	19.3	0/3	0/3
	Qbt 4	9	8	[0.577] to 4.95	7.14	0/9	0/9
Cobalt	Soil	19	19	3.26 to 13.8	8.64	2/19	0/19
	Fill	3	3	4.9 to 6.4	8.64	0/3	0/3
	Qbt 4	9	9	0.109 to 4.42	3.14	1/9	0/9
Copper	Soil	19	19	6.75 to 17	14.7	1/19	0/19
	Fill	3	3	5.9 to 8.3	14.7	0/3	0/3
	Qbt 4	9	9	0.606 to 6.26	4.66	1/9	0/9

Table B-32 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Cyanide (Total)	Soil	18	6	[0.049] to [0.29]	0.5	6/18	0/8
	Fill	3	0	[1.2 to 1.2]	0.5	0/3	3/3
	Qbt 4	9	2	0.0495 to [0.269]	0.5	2/9	0/9
Fluoride	Soil	18	16	[1.01] to 9.02	n/a[b]	16/18	n/a
	Qbt 4	9	4	[1.02] to 3.76	n/a	4/9	n/a
Iron	Soil	19	19	11500 to 20500	21500	0/19	0/19
	Fill	3	3	9600 to 12100	21500	0/3	0/3
	Qbt 4	9	9	4130 to 8310	14500	0/9	0/9
Lead	Soil	19	19	4.63 to 50.9	22.3	2/19	0/19
	Fill	3	3	11.5 to 12.6	22.3	0/3	0/3
	Qbt 4	9	8	1.24 to 8.7	11.2	0/9	0/9
Magnesium	Soil	19	19	1040 to 3590	4610	0/19	0/19
	Fill	3	3	1270 to 1800	4610	0/3	0/3
	Qbt 4	9	9	255 to 1220	1690	0/9	0/9
Manganese	Soil	19	19	230 to 1550	671	2/19	0/19
	Fill	3	3	304 to 414	671	0/3	0/3
	Qbt 4	9	9	28.9 to 796	482	1/9	0/9
Mercury	Soil	19	18	0.0075 to 0.0244	0.1	0/19	0/19
	Fill	3	3	0.06 to 0.06	0.1	0/3	0/3
	Qbt 4	9	9	0.0015 to 0.0563	0.1	0/9	0/9
Nickel	Soil	19	19	5.68 to 12.5	15.4	0/19	0/19
	Fill	3	3	6.5 to 9.1	15.4	0/3	0/3
	Qbt 4	9	9	0.53 to 4.89	6.58	0/9	0/9
Nitrate	Soil	1	0	[1.08 to 1.08]	n/a	0/1	n/a
	Qbt 4	1	0	[1.07 to 1.07]	n/a	0/1	n/a
Oxalate	Soil	17	0	[10.1 to 11.7]	n/a	0/17	n/a
	Qbt 4	8	0	[10.2 to 10.9]	n/a	0/8	n/a
Perchlorate	Soil	35	9	0.000575 to [0.0467]	n/a	9/35	n/a
	Qbt 4	21	1	0.000616 to [0.0437]	n/a	1/21	n/a
Potassium	Soil	19	19	758 to 2880	3460	0/19	0/19
	Fill	3	3	945 to 1130	3460	0/3	0/3
	Qbt 4	9	9	156 to 921	3500	0/9	0/9
Selenium	Soil	19	6	0.219 to 0.762	1.52	0/19	0/19
	Fill	3	0	[0.29 to 0.29]	1.52	0/3	0/3
	Qbt 4	9	1	0.351 to [0.551]	0.3	1/9	8/9

Table B-32 (continued)

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	BV (mg/kg)	Frequency of Detects Above BV	Frequency of Nondetects Above BV
Silver	Soil	19	18	0.0475 to [0.25]	1	0/19	0/19
	Fill	3	1	[0.59] to 0.63	1	0/3	0/3
	Qbt 4	9	9	0.0108 to 0.072	1	0/9	0/9
Sodium	Soil	19	19	49.2 to 318	915	0/19	0/19
	Fill	3	3	275 to 386	915	0/3	0/3
	Qbt 4	9	9	58.8 to 311	2770	0/9	0/9
Sulfate	Soil	18	15	4.1 to 99	293	0/18	0/18
	Qbt 4	9	3	[4.07] to 14.6	157	0/9	0/9
Thallium	Soil	19	18	[0.046] to 0.433	0.73	0/19	0/19
	Fill	3	0	[0.29 to 0.29]	0.73	0/3	0/3
	Qbt 4	9	8	0.0232 to 0.857	1.1	0/9	0/9
Uranium	Soil	18	18	0.256 to 1.17	1.82	0/18	0/18
	Fill	3	3	2.43 to 2.95	1.82	3/3	0/3
	Qbt 4	9	9	0.138 to 0.606	2.4	0/9	0/9
Vanadium	Soil	19	19	18.9 to 32.4	39.6	0/19	0/19
	Fill	3	3	18.8 to 23.4	39.6	0/3	0/3
	Qbt 4	9	9	1.79 to 13.2	17	0/9	0/9
Zinc	Soil	19	19	29 to 51.9	48.8	1/19	0/19
	Fill	3	3	27.4 to 30.5	48.8	0/3	0/3
	Qbt 4	9	9	6.61 to 34.7	63.5	0/9	0/9

[a] Values in brackets are detection limits.

[b] n/a = Not available.

Table B-33
Summary of Samples with Inorganic Chemicals Above BVs in Soil, Sediment, and Tuff at the 30s Line

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Cobalt	Copper	Cyanide (Total)
Soil BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**8.64**	**14.7**	**0.5**
Qbt 2,3,4 BV				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**3.14**	**4.66**	**0.5**
Fill BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**8.64**	**14.7**	**0.5**
Industrial Worker SSL[a]:				**100,000[b]**	**454**	**17.7**	**78,300**	**2,250**	**1,128[c]**	**NA[d]**	**20,500**	**45,400**	**22,700**
SWMU 16-007(a)-99													
0316-95-0002	16-01560	3.00-4.00	Fill	– [e]	5.9 (U) [f]	–	–	–	0.59 (U)	–	–	–	1.2(U)
0316-95-0003	16-01561	6.00-7.40	Fill	–	5.9 (U)	–	–	–	0.59 (U)	–	–	–	1.2(U)
0316-95-0001	16-01562	5.00-6.00	Fill	–	5.7 (U)	–	–	–	1.1	–	–	–	1.2(U)
0316-97-0549	16-04110	0.00-1.00	Soil	–	–	–	–	–	–	–	–	17	–
RE16-05-56098	16-23737	3.00-3.50	Soil	–	–	–	–	–	0.542 (U)	–	–	–	–
RE16-05-56100	16-23737	7.00-8.00	Soil	–	–	–	1270	–	0.563 (U)	–	–	–	–
RE16-05-56101	16-23737	8.00-9.00	Soil	–	–	–	1290	–	0.586 (U)	–	–	–	–
RE16-05-56161	16-23738	7.50-8.50	Soil	–	–	–	–	–	0.509 (U)	–	–	–	–
RE16-05-56106	16-23739	3.00-4.00	Soil	–	–	–	–	–	0.564 (U)	–	–	–	–
RE16-05-56162	16-23739	7.50-8.00	Soil	–	–	–	839	–	0.499 (U)	–	–	–	–
RE16-05-56111	16-23740	7.00-8.00	Soil	–	–	–	2270	–	0.529 (U)	–	–	–	–
RE16-05-56113	16-23741	0.00-1.00	Soil	–	–	–	307	–	0.524 (U)	–	9.59	–	–
RE16-05-56112	16-23741	6.00-7.00	Soil	–	–	–	–	–	0.54 (U)	–	13.8	–	–
RE16-05-56114	16-23741	7.00-8.00	Soil	–	–	–	–	–	0.535 (U)	–	–	–	–
RE16-05-56116	16-23742	12.00-13.00	Qbt 4	7410 (J) [g]	–	–	132	–	–	2740 (J)	–	6.26	–
RE16-05-56117	16-23742	14.00-15.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
RE16-05-56120	16-23743	14.00-15.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
RE16-05-56125	16-23744	10.00-11.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
RE16-05-56128	16-23745	5.50-6.50	Soil	–	–	–	–	–	0.536 (U)	–	–	–	–
RE16-05-56129	16-23745	6.50-7.50	Soil	–	–	–	–	–	0.551 (U)	–	–	–	–
RE16-05-56134	16-23746	2.00-3.00	Soil	–	–	–	–	–	0.548 (U)	–	–	–	–
RE16-05-56132	16-23746	12.00-13.00	Qbt 4	–	–	4.73	1100	–	–	–	–	–	–
RE16-05-56133	16-23746	14.00-15.00	Qbt 4	–	–	–	807	–	–	–	4.42	–	–
RE16-05-56136	16-23747	6.50-7.50	Soil	–	–	–	732	–	1.14 (U)	–	–	–	–

Table B-33 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Cobalt	Copper	Cyanide (Total)
Soil BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**8.64**	**14.7**	**NA**
Qbt 2,3,4 BV				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**3.14**	**4.66**	**NA**
Fill BV				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**8.64**	**14.7**	**NA**
Industrial Worker SSL[a]:				**100,000[b]**	**454**	**17.7**	**78,300**	**2,250**	**1,128[c]**	**NA[d]**	**20,500**	**45,400**	**22,700**
RE16-05-56137	16-23747	8.50-9.50	Qbt 4	8450	–	–	762	–	–	–	–	–	–
RE16-05-56138	16-23747	10.00-12.00	Qbt 4	–	–	2.88	119	–	–	–	–	–	–
RE16-05-56140	16-23748	0.00-2.00	Soil	–	–	–	–	–	1.09 (U)	–	–	–	_
RE16-05-56142	16-23748	5.00-6.00	Soil	–	–	–	–	–	1.15 (U)	–	–	–	–
RE16-05-56143	16-23748	7.00-8.00	Soil	–	–	–	825	–	1.13 (U)	–	–	–	_
RE16-05-56148	16-23749	5.50-7.50	Soil	–	–	–	–	–	0.546 (U)	–	–	–	–
RE16-05-56149	16-23749	18.00-20.00	Qbt 4	–	–	–	–	–	–	–	–	–	–

Table B-33 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoride	Lead	Manganese	Perchlorate	Selenium	Silver	Sodium	Thallium	Uranium	Zinc
Soil BV				**NA**	**22.3**	**671**	**NA**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Qbt 2,3,4 BV				**NA**	**11.2**	**482**	**NA**	**0.3**	**1**	**2770**	**1.1**	**2.4**	**63.5**
Fill BV				**NA**	**22.3**	**671**	**NA**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Industrial Worker SSL[a]:				**41,000[h]**	**750**	**21,800**	**110[h]**	**5,680**	**5,680**	**NA**	**74.9**	**200[i]**	**100,000[b]**
SWMU 16-007(a)-99													
0316-95-0002	16-01560	3.00-4.00	Fill	–	–	–	–	–	–	–	–	2.43	–
0316-95-0003	16-01561	6.00-7.40	Fill	–	–	–	–	–	–	–	–	2.95	–
0316-95-0001	16-01562	5.00-6.00	Fill	–	–	–	–	–	–	–	–	2.84	–
0316-97-0549	16-04110	0.00-1.00	Soil	–	–	–	–	–	–	–	–	–	–
RE16-05-56098	16-23737	3.00-3.50	Soil	3.74	–	–	0.000953 (J)	–	–	–	–	–	–
RE16-05-56100	16-23737	7.00-8.00	Soil	1.2	–	–	–	–	–	–	–	–	–
RE16-05-56101	16-23737	8.00-9.00	Soil	1.82	–	–	–	–	–	–	–	–	51.9
RE16-05-56161	16-23738	7.50-8.50	Soil	3.04	–	–	–	–	–	–	–	–	–
RE16-05-56106	16-23739	3.00-4.00	Soil	2.37	–	–	–	–	–	–	–	–	–
RE16-05-56162	16-23739	7.50-8.00	Soil	–	–	–	–	–	–	–	–	–	–
RE16-05-56111	16-23740	7.00-8.00	Soil	3.85	–	–	–	–	–	–	–	–	–
RE16-05-56113	16-23741	0.00-1.00	Soil	3.14	–	805	–	–	–	–	–	–	–
RE16-05-56112	16-23741	6.00-7.00	Soil	9.02	23.8	1550	0.000625 (J)	–	–	–	–	–	–
RE16-05-56114	16-23741	7.00-8.00	Soil	8.61	–	–	0.000575 (J)	–	–	–	–	–	–
RE16-05-56116	16-23742	12.00-13.00	Qbt 4	1.55	–	–	–	0.546 (U)	–	–	–	–	–
RE16-05-56117	16-23742	14.00-15.00	Qbt 4	–	–	–	–	0.546 (U)	–	–	–	–	–
RE16-05-56120	16-23743	14.00-15.00	Qbt 4	1.34	–	–	–	0.543 (U)	–	–	–	–	–
RE16-05-56125	16-23744	10.00-11.00	Qbt 4	–	–	–	0.000616 (J)	0.526 (U)	–	–	–	–	–
RE16-05-56128	16-23745	5.50-6.50	Soil	1.56	–	–	–	–	–	–	–	–	–
RE16-05-56129	16-23745	6.50-7.50	Soil	1.72	–	–	–	–	–	–	–	–	–
RE16-05-56134	16-23746	2.00-3.00	Soil	3.2	–	–	0.000743 (J)	–	–	–	–	–	–
RE16-05-56132	16-23746	12.00-13.00	Qbt 4	–	–	–	–	0.545 (U)	–	–	–	–	–
RE16-05-56133	16-23746	14.00-15.00	Qbt 4	–	–	796 (J-)[j]	–	0.351 (J)	–	–	–	–	–
RE16-05-56136	16-23747	6.50-7.50	Soil	3.89	–	–	0.00103 (J)	–	–	–	–	–	–

Table B-33 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoride	Lead	Manganese	Perchlorate	Selenium	Silver	Sodium	Thallium	Uranium	Zinc
Soil BV				**NA**	**22.3**	**671**	**NA**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Qbt 2,3,4 BV				**NA**	**11.2**	**482**	**NA**	**0.3**	**1**	**2770**	**1.1**	**2.4**	**63.5**
Fill BV				**NA**	**22.3**	**671**	**NA**	**1.52**	**1**	**915**	**0.73**	**1.82**	**48.8**
Industrial Worker SSL[a]:				**41,000[h]**	**750**	**21,800**	**110[h]**	**5,680**	**5,680**	**NA**	**74.9**	**200[i]**	**100,000[b]**
RE16-05-56137	16-23747	8.50-9.50	Qbt 4	3.76	–	–	–	0.517 (U)	–	–	–	–	–
RE16-05-56138	16-23747	10.00-12.00	Qbt 4	1.15	–	–	–	0.533 (U)	–	–	–	–	–
RE16-05-56140	16-23748	0.00-2.00	Soil	–	50.9	–	0.00586	–	–	–	–	–	–
RE16-05-56142	16-23748	5.00-6.00	Soil	8.72	–	–	0.000993 (J)	–	–	–	–	–	–
RE16-05-56143	16-23748	7.00-8.00	Soil	4.38	–	–	0.000895 (J)	–	–	–	–	–	–
RE16-05-56148	16-23749	5.50-7.50	Soil	5.38	–	–	0.00073 (J)	–	–	–	–	–	–
RE16-05-56149	16-23749	18.00-20.00	Qbt 4	–	–	–	–	0.551 (U)	–	–	–	–	–

Note: Units are mg/kg.

[a] SSLs reflecting a 10^{-5} cancer risk or noncarcinogenic hazard quotient of 1 (whichever is lower) were obtained from NMED 2004, 85615, unless otherwise noted.

[b] Low-toxicity maximum, health-based SSL exceeds 10^5 mg/kg.

[c] Cadmium SSL incorrectly calculated in NMED 2004, 85615; recalculated to obtain SSL presented.

[d] Not available.

[e] — = Value not above BV for corresponding media.

[f] U = The analyte was analyzed for but not detected.

[g] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[h] SSL obtained from EPA Region 6 (EPA 2004, 87478); carcinogenic SSLs adjusted to 10^{-5} risk level.

[i] SSL obtained from EPA Region 9 2004 preliminary remediation goal table http://www.epa.gov/Region9/waste/sfund/prg/files/04prgtable.pdf.

[j] J- = The analyte was positively identified, and the result is likely to be biased low.

Table B-34
Frequency of Detected Organic Chemicals in Soil, Sediment, and Tuff at the 30s Line

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (mg/kg)	Frequency of Detects	Quantitation Limit [b]
Acenaphthene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Acetone	Soil	18	5	[0.0051] to 0.194	5/18	0.037
	Qbt 4	13	7	0.0039 to 0.01	7/13	0.037
Amino-2,6-dinitrotoluene[4-]	Soil	19	3	0.193 to 64.1	3/19	0.375
	Qbt 4	13	1	[0.375] to 0.965	1/13	0.375
Amino-4,6-dinitrotoluene[2-]	Soil	19	5	6.92E-02 to 3.15	5/19	0.25
	Qbt 4	13	6	0.0883 to 1.58	6/13	0.25
Benzo(a)pyrene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Benzo(k)fluoranthene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Bis(2-ethylhexyl)phthalate	Soil	19	1	0.0325 to [3.81]	1/19	3.81
Chrysene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Di-n-butylphthalate	Qbt 4	13	1	0.0445 to [0.387]	1/13	3.81
Dinitrotoluene[2,4-]	Qbt 4	26	3	0.03 to [0.75]	3/26	3.81
Di-n-octylphthalate	Fill	3	1	0.18 to [0.4]	1/3	3.81
Fluoranthene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
HMX	Soil	19	5	[0.25] to 84.4	5/19	2.2
	Qbt 4	13	11	0.121 to 3.05	11/13	2.2
Methylene Chloride	Fill	3	1	0.002 to [0.006]	1/3	0.0064
Phenanthrene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
Pyrene	Soil	19	1	[0.0337] to [0.381]	1/19	0.4
RDX	Soil	19	5	[0.25] to 1040	5/19	1
	Qbt 4	13	11	[0.25] to 5.43	11/13	1
Tetrachloroethene	Soil	18	2	0.00082 to 0.0045	2/18	0.006
Toluene	Soil	18	4	0.00059 to 0.0015	4/18	0.006
Trichlorofluoromethane	Fill	3	3	0.01 to 0.011	3/3	0.0013
Trinitrobenzene[1,3,5-]	Soil	19	3	0.0704 to 8.59	3/19	0.25
	Qbt 4	13	11	0.0867 to 8.03	11/13	0.25
Trinitrotoluene[2,4,6-]	Soil	19	4	0.121 to 359	4/19	0.25
	Qbt 4	13	6	0.0716 to 4.97	6/13	0.25

[a] Values in brackets are detection limits.

[b] Maximum nondetect quantitation limit reported in milligrams per kilogram for each analyte detected.

Table B-35
Summary of Samples with Detected Organic Chemicals in Soil, Sediment, and Tuff at the 30s Line SWMUs

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	Benzo(a)pyrene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Dinitrotoluene[2,4-]
Industrial Worker SSL[a]:				**34,800**	**100,000[b]**	**680[c,d]**	**680[c,d]**	**2.34**	**234**	**1,370**	**2,340**	**68,400**	**1,370**
SWMU 16-007(a)-99													
0316-95-0002	16-01560	3.00-4.00	Fill	– [e]	–	–	–	–	–	–	–	–	–
0316-95-0003	16-01561	6.00-7.40	Fill	–	–	–	–	–	–	–	–	–	–
0316-95-0001	16-01562	5.00-6.00	Fill	–	–	–	–	–	–	–	–	–	–
RE16-05-56098	16-23737	3.00-3.50	Soil	–	–	–	–	–	–	–	–	–	–
RE16-05-56100	16-23737	7.00-8.00	Soil	–	–	–	–	0.0409	0.239	–	0.333	–	–
RE16-05-56161	16-23738	7.50-8.50	Soil	–	–	–	–	–	–	0.0325 (J)	–	–	–
RE16-05-56162	16-23739	7.50-8.00	Soil	–	–	64.1	3.15	–	–	–	–	–	–
RE16-05-56111	16-23740	7.00-8.00	Soil	–	–	0.955 (J) [f]	1.11	–	–	–	–	–	–
RE16-05-56164	16-23740	19.00-20.00	Qbt 4	–	0.01	–	0.252	–	–	–	–	–	–
RE16-05-56112	16-23741	6.00-7.00	Soil	–	0.009	–	–	–	–	–	–	–	–
RE16-05-56114	16-23741	7.00-8.00	Soil	–	0.0167	–	–	–	–	–	–	–	–
RE16-05-56118	16-23742	10.00-11.00	Qbt 4	–	–	–	–	–	–	–	–	–	0.107 (J)
RE16-05-56116	16-23742	12.00-13.00	Qbt 4	–	–	–	–	–	–	–	–	–	0.252 (J)
RE16-05-56117	16-23742	14.00-15.00	Qbt 4	–	–	–	–	–	–	–	–	–	–
RE16-05-56121	16-23743	8.00-9.00	Qbt 4	–	–	0.965	0.39	–	–	–	–	–	–
RE16-05-56120	16-23743	14.00-15.00	Qbt 4	–	0.0041 (J)	–	0.0883 (J)	–	–	–	–	–	–
RE16-05-56124	16-23744	8.00-9.00	Qbt 4	–	0.0053 (J)	–	–	–	–	–	–	–	–
RE16-05-56125	16-23744	10.00-11.00	Qbt 4	–	0.0042 (J)	–	–	–	–	–	–	–	–
RE16-05-56128	16-23745	5.50-6.50	Soil	–	–	–	–	–	–	–	–	–	–
RE16-05-56134	16-23746	2.00-3.00	Soil	–	–	–	–	–	–	–	–	–	–
RE16-05-56132	16-23746	12.00-13.00	Qbt 4	–	0.0055	–	0.575	–	–	–	–	0.0445 (J+) [g]	–
RE16-05-56133	16-23746	14.00-15.00	Qbt 4	–	–	–	0.384	–	–	–	–	–	–
RE16-05-56136	16-23747	6.50-7.50	Soil	–	0.0154	–	0.107 (J)	–	–	–	–	–	–
RE16-05-56137	16-23747	8.50-9.50	Qbt 4	–	0.0039 (J)	–	–	–	–	–	–	–	–

Table B-35 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Amino-2,6-dinitrotoluene[4-]	Amino-4,6-dinitrotoluene[2-]	Benzo(a)pyrene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Dinitrotoluene[2,4-]
RE16-05-56138	16-23747	10.00-12.00	Qbt 4	–	0.007	–	–	–	–	–	–	–	–
RE16-05-56140	16-23748	0.00-2.00	Soil	0.0404	–	–	–	–	–	–	–	–	–
RE16-05-56142	16-23748	5.00-6.00	Soil	–	0.194	–	–	–	–	–	–	–	–
RE16-05-56143	16-23748	7.00-8.00	Soil	–	0.0342	0.193 (J)	0.606	–	–	–	–	–	–
RE16-05-56148	16-23749	5.50-7.50	Soil	–	–	–	6.92E-02 (J)	–	–	–	–	–	–
RE16-05-56149	16-23749	18.00-20.00	Qbt 4	–	–	–	1.58	–	–	–	–	–	–

Table B-35 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-octylphthalate	Fluoranthene	HMX	Methylene Chloride	Phenanthrene	Pyrene	RDX	Tetrachloroethene	Toluene	Trichlorofluoromethane	Trinitrobenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
Industrial Worker SSL[a]:				**27,000[c]**	**24,400**	**34,200**	**440**	**20,500**	**31,300**	**174**	**24.6**	**248[b]**	**959[b]**	**21,000[c]**	**342**
SWMU 16-007(a)-99															
0316-95-0002	16-01560	3.00-4.00	Fill	0.18 (J)	–	–	–	–	–	–	–	–	0.01	–	–
0316-95-0003	16-01561	6.00-7.40	Fill	–	–	–	–	–	–	–	–	–	0.011	–	–
0316-95-0001	16-01562	5.00-6.00	Fill	–	–	–	0.002 (J)	–	–	–	–	–	0.011	–	–
RE16-05-56098	16-23737	3.00-3.50	Soil	–	–	–	–	–	–	–	0.00082 (J)	0.00064 (J)	–	–	–
RE16-05-56100	16-23737	7.00-8.00	Soil	–	0.296	–	–	0.0545	0.307	–	0.0045	0.00059 (J)	–	–	–
RE16-05-56161	16-23738	7.50-8.50	Soil	–	–	–	–	–	–	–	–	–	–	–	–
RE16-05-56162	16-23739	7.50-8.00	Soil	–	–	84.4	–	–	–	1040	–	–	–	8.59	359
RE16-05-56111	16-23740	7.00-8.00	Soil	–	–	4.65	–	–	–	60.7	–	–	–	2.1	3.23
RE16-05-56164	16-23740	19.00-20.00	Qbt 4	–	–	1.32	–	–	–	2.62	–	–	–	3.38	–
RE16-05-56112	16-23741	6.00-7.00	Soil	–	–	–	–	–	–	–	–	–	–	–	–
RE16-05-56114	16-23741	7.00-8.00	Soil	–	–	–	–	–	–	–	–	–	–	–	–
RE16-05-56118	16-23742	10.00-11.00	Qbt 4	–	–	0.47	–	–	–	1.92	–	–	–	0.9	0.0854 (J)
RE16-05-56116	16-23742	12.00-13.00	Qbt 4	–	–	0.244 (J)	–	–	–	3.05	–	–	–	0.764	0.0716 (J)
RE16-05-56117	16-23742	14.00-15.00	Qbt 4	–	–	0.294	–	–	–	1.97	–	–	–	0.843	–
RE16-05-56121	16-23743	8.00-9.00	Qbt 4	–	–	0.675	–	–	–	5.43	–	–	–	4.44	4.97
RE16-05-56120	16-23743	14.00-15.00	Qbt 4	–	–	0.336	–	–	–	3.93	–	–	–	0.832	0.214 (J)
RE16-05-56124	16-23744	8.00-9.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–	–
RE16-05-56125	16-23744	10.00-11.00	Qbt 4	–	–	–	–	–	–	–	–	–	–	–	–
RE16-05-56128	16-23745	5.50-6.50	Soil	–	–	–	–	–	–	–	–	0.00087 (J)	–	–	–
RE16-05-56134	16-23746	2.00-3.00	Soil	–	–	–	–	–	–	–	–	0.0015	–	–	–
RE16-05-56132	16-23746	12.00-13.00	Qbt 4	–	–	0.571	–	–	–	4.39	–	–	–	8.03	0.262
RE16-05-56133	16-23746	14.00-15.00	Qbt 4	–	–	0.537	–	–	–	3.85	–	–	–	4.49	0.135 (J)
RE16-05-56136	16-23747	6.50-7.50	Soil	–	–	1.4	–	–	–	3.7	–	–	–	0.0704 (J)	0.121 (J)
RE16-05-56137	16-23747	8.50-9.50	Qbt 4	–	–	0.121 (J)	–	–	–	0.495	–	–	–	0.0867 (J)	–

Table B-35 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-octylphthalate	Fluoranthene	HMX	Methylene Chloride	Phenanthrene	Pyrene	RDX	Tetrachloroethene	Toluene	Trichlorofluoromethane	Trinitrobenzene[1,3,5-]	Trinitrotoluene[2,4,6-]
RE16-05-56138	16-23747	10.0-12.0	Qbt 4	–	–	0.127 (J)	–	–	–	0.431	–	–	–	0.483	–
RE16-05-56140	16-23748	0.00-2.00	Soil	–	–	–	–	–	–	–	–	–	–	–	–
RE16-05-56142	16-23748	5.00-6.00	Soil	–	–	–	–	–	–	–	–	–	–	–	–
RE16-05-56143	16-23748	7.00-8.00	Soil	–	–	0.771	–	–	–	2	–	–	–	–	0.192 (J)
RE16-05-56148	16-23749	5.50-7.50	Soil	–	–	0.258	–	–	–	1.08	–	–	–	–	–
RE16-05-56149	16-23749	18.0-20.0	Qbt 4	–	–	3.05	–	–	–	4.79	–	–	–	5.88	–

Notes: Units are mg/kg.

[a] SSLs reflecting a 10^{-5} cancer risk or noncarcinogenic hazard quotient of 1 (whichever is lower) were obtained from NMED 2004, 85615, unless otherwise noted.

[b] Soil saturation limit basis.

[c] SSL obtained from EPA Region 6 (EPA 2004, 87478); carcinogenic SSLs adjusted to 10-5 risk level.

[d] Dinitrotoluene[2,6-] used as a surrogate for amino-2,6 dinitrotoluene[4-] and amino-4,6-dinitrotoluene[2-].

[e] — = Not detected.

[f] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

[g] J+ = The analyte was positively identified, and the result is likely to be biased high.

Table B-36
Frequency of Radionuclides Detected Above
BVs or Fallout Values or Detected in Soil and Tuff at the 30s Line

Analyte	Media	Number of Analyses	Number of Detects	Concentration Range [a] (pCi/g)	BV (pCi/g)	Frequency of Detects Above BV
Americium-241	Fill	3	0	[-0.226 to 0.115]	0.013	0/3
Cesium-137	Fill	3	0	[0.001 to 0.072]	1.65	0/3
Cobalt-60	Fill	3	0	[-0.031 to -0.007]	n/a [b]	0/3
Europium-152	Fill	3	0	[0.012 to 0.163]	n/a	0/3
Ruthenium-106	Fill	3	0	[-0.252 to 0.068]	n/a	0/3
Sodium-22	Fill	3	0	[-0.042 to -0.015]	n/a	0/3

[a] Values in brackets are detection limits.
[b] n/a = Not applicable.

Attachment B1

Field-Screening Data from 1996 VCA
(on CD enclosed with this report)

CONTROLLED FIELD LOGBOOK 282

PID Readings Logbook

3/6/96 This log book will be dedicated to PID readings during screening sample collection and analytical sample collection. The following readings will cover all readings taken during sample collection activity even if the reading is at background.

Russell H Abell

3/6/96

1100 PID calibrated to 58 ppm with Isobutylene gas.

1110 Will take headspace readings on the samples from the sample bags.

3/7/96

1030 ~~1045~~ RHH 3/7/96 PID calibrated to 56 ppm with isobutylene gas

1045 0316-96-1097 0.4 ppm RHH 3/7/96 reading, headspace from sample bag

1115 0316-96-1098 0.4 ppm reading from headspace

1200 0316-96-1099 0.4 ppm reading from headspace

1230 0316-96-1100 0.4 ppm reading from headspace

1245 0316-96-1101 0.4 ppm reading from headspace

Russell H. Holly

~~3/11/96~~ RHR 3/12/96

3/12/96 PID calibrated to 56 ppm isobutylene at 0917

0943 Tailgate safety meeting conducted.

1021 AOC C-16-064 sample 0316-96-0130 0.5 ppm bkg.

1033 AOC C-16-064 sample 0316-96-1524 0.5 ppm bkg.

1042 AOC C-16-064 sample 0316-96-1525 0.5 ppm bkg.

1050 AOC C-16-064 sample 0316-96-1526 0.5 ppm bkg.

Russell H Ahn

3/13/96

1035 The NaI_2 detector was response checked using the DU source for use at PRS 16-029(9) for sample biasing only. The instrument will not be needed for H_2S screening because there are no RAD COPCs at this PRS.

1045 PID calibrated to 56 ppm with isobutylene in air : span 9.88.

1059 Tailgate Safety Meeting was conducted.

[illegible]

3/18/96

PID calibrated to 56 ppm for isobutylene gas.

1125 Tailgate Safety Meeting conducted.

1205 Reading of 0.2 ppm (background) during RHA 3/18/96 collection of the water screening sample.

Russell H Abell

3-22-96

(0855) Arrived on-site

(0930) Prepared Tail gate safety meeting. Crew to collect 2 subsurface soil samples at Building 99 sump locations. Then crew will perform HE spot tests in the North sump trench. Sub surface samples to be collected by backhoe.

(1020) HNU calibration check: 5.4 ppm at span

(1103) Conducted Tail gate safety meeting with backhoe operator present.

(1116) Crew entered EZ

(1125) Started excavating for collecting subsurface sample below the S.E. sump of building 99

(1135) HNU Readings for sample# 96-0068
0.2 ppm in bucket while sampling
Background = 0.2 ppm
Homogenizing = 0.2 ppm
while collecting sample into Aliquot = 0.2 ppm

(1140) Backfilled the hole

3-22-96 (CONT.)
1147 KAM 3-22-96 TA-16

(1241) STARTED EXCAVATING FOR subsurface sample below North sump at bldg 99.

(1154) HNU Readings for sample # 96-0069
In Bucket = 0.2 PPM
Background = 0.2 PPM
Homogenizing = 0.2 PPM
while collecting aliquot = 0.2 PPM

(1200) Backhoe Operator Exited CEZ

(1210) HNU Reading will collecting HC spot test kit
All readings were 0.2 PPM

(1230) Crew to decon sampling items in CEZ. Decon water was poured into HE trough.

(1250) Crew exits CEZ following DECON

(1345) Crew exited the site for the day.

3/26/96

1230 Prepared TAILGATE SAFETY MEETING FOR COLLECTING SCREENING SAMPLES FROM THE NW AND SE SUMP EXCAVATIONS AT BUILDING 93 (PRS 16-029(k)).

1250 CONDUCTED TAILGATE SAFETY MEETING.

1252 CALIBRATED PID : 56 ppm at SPAN 9.52

1320 CREW ENTERED CRZ to depart for 16-029(k).

1341 PID reading of 0.2 ppm(bkg) as sample 0316-96-1054 was collected from the TRACK HOE BUCKET. SAMPLE AT INLET OF SUMP. (FORMER)

1359 PID reading of 0.2 ppm(bkg) as sample 0316-96-1055 was collected from the TRACK HOE BUCKET. SAMPLE AT CENTER AREA OF SUMP. (FORMER)

1407 PID READING OF 0.2 ppm (bkg) AS SAMPLE 0316-96-1056 WAS COLLECTED FROM THE TRACK HOE BUCKET. SAMPLE AT OUTLET AREA OF SUMP. (FORMER)

1450 CREW IS OUT OF CRZ FOR THE DAY. RESPONSE CHECKED THE NAT2 DETECTOR

Russell H Abell

3/27/96

0850 Prepared the TAILGATE SAFETY MEETING FOR TRENCH AND BACKHOE SAMPLING AT BLDG. 93, PRS 16-029(K). SAMPLING WILL CONSIST OF SCREENING SAMPLES WITHIN THE SE DRAIN LINE TRENCH, THE DRAINAGE, AND POSSIBLY THE NW SUMP EXCAVATION (USING THE TRACK HOE).

0905 TAILGATE SAFETY MEETING WAS CONDUCTED.

0915 PID CALIBRATION CHECK: 56 ppm at SPAN 9.50.

1022 CREW ENTERS THE CRZ. to DECON EQUIPMENT.

1130 CREW DEPARTS FOR THE EZ.

RHA 3/27/96

1155 ~~1215~~ CREW CONDUCTS HE SPOT TEST SURVEY OF THE NW AND SE DRAIN LINE TRENCHES.

1215 SAMPLE 0316-96-1047 PID READING 0.4 ppm

1227 SAMPLE 0316-96-1041 PID READING 0.4 ppm

1236 SAMPLE 0316-96-1042 PID READING 0.4 ppm

Russell H Ably

3/27/96

1244 0316-96-1043 PID READING 0.4 ppm

1255 SAMPLE 0316-96-1044 PID READING 0.4 ppm

1300 SAMPLE 0316-96-1045 PID READING 0.4 ppm

1308 SAMPLE 0316-96-1046 PID READING 0.4 ppm

1325 CREW DEPARTS THE CRZ.

1415 NaI_2 WAS RESPONSED CHECKED. WILL RUN 1 MINUTE COUNT ON THE SEVEN SAMPLES COLLECTED EARLIER TODAY.

[illegible] 4 Aby

3-28-96 (THURSDAY) TA-16 Ken H. McFadden

(0900) ARRIVED ON-SITE AND PREPARED THE TAIL GATE SAFETY MEETING FORM. CREW TO COLLECT 3 SUBSURFACE SOIL SAMPLES FROM THE BLDG 93 SUMP AND 3 SURFACE SOIL SAMPLES FROM THE OUTFALL DRAINAGE.

(0930) HNU CALIBRATION CHECK: 56 PPM AT 9.50 SPAN

(1015) CONDUCTED TAIL GATE SAFETY MEETING

(1026) CREW ENTERS CRZ TO DON PPE

(1049) HNU reading for sample # 0316-96-1051 = 0.2 PPM

(1058) HNU reading for sample # 0316-96-1052 = 0.2 PPM

(1102) HNU reading for sample # 0316-96-1053 = 0.2 PPM

(1127) HNU reading for sample # 0316-96-1048 = 0.2 PPM

(1139) HNU reading for sample # 0316-96-1049 = 0.2 PPM

(1149) HNU reading for sample # 0316-96-1050 = 0.2 PPM

(1220) CREW EXITS CRZ FOLLOWING DECON

(1400) Peter & I left the site for the day. Randy and Dwight TO START AND RUN sample analysis. Ken H. McFadden

3-29-96 (Friday) TA-16 Ken H. Tibbles

(0900) Arrived on-site and prepared Tail Gate Safety Meeting Form. Peter & I to collect 4 surface soil samples from the Bldg 99 outfall drainage. Randy & Dwight to run field tests on previously obtained samples.

(1025) HNU calibration check: 56 ppm cal 9.50 span

(1030) Todays weather is cold ~ 40° with overcast skies, possibility of snow today.

(1037) Conducted Tail Gate Safety meeting

(1055) Peter Gram entered CRZ to down PPE

(1110) HNU Readings for sample # 0316-96-1517 = 0.2 ppm

(1130) HNU Readings for sample # 0316-96-1518 = 1 ppm sustained

(1146) HNU Readings for sample # 0316-96-1519 = 0.2 ppm

(1215) HNU Readings for sample # 0316-96-1520 = 0.2 ppm

(1200) Peter exited CRZ following Decon. Crew to take lunch then process samples for delivery to SMO.

Ken H. Tibbles

4/1/96

0905 Proposed TAILGATE SAFETY FORM FOR TODAY'S ACTIVITIES. WE WILL PERFORM SURFACE SCREENING SAMPLING IN THE OUTFALL DRAINAGE FOR PRS 16-029(k), ASSOCIATED WITH THE FORMER BLDG. 93. IF THE DED CREW PULL A SUMP AT BLDG 91 (PRS 16-029(S) THEN WE WILL TAKE 3 SUBSURFACE SCREENING SAMPLES USING THE TRACK HOE.

0920 PID CALIBRATION: CHECK: 56 ppm at SPAN 6.80

0930 RESPONSE CHECKED THE NAI_2 DETECTOR FOR FIELD SCREENING USE ONLY.

1110 CONDUCTED THE TAILGATE SAFETY MEETING.

1127 CREW ENTERS CRZ TO DRESS OUT.

~~1324 CREW EXITS CRZ AND EIA COMPLETED SAMPLES FOR PRS 16-029(K).~~ RHA 4/1/96

1201 PID READING FOR SAMPLE 0316-96-1523
0.8 ppm bkg.

1224 PID READING FOR SAMPLE 0316-96-1522
0.8 ppm bkg

Russell H Abell

1242 PID READING FOR SAMPLE 0316-96-1521
0.6 ppm bkg

1324 CREW EMTS CRZ. HAS COMPLETED COLLECTING THE THREE SURFACE DRAINAGE SCREENING SAMPLES AT PRS 16-029(k).

Russell H Ahern

4/2/96

0900 PREPARED TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. WE HAVE SET UP FOR THE SUMP SCREENING AND DRAINLINE SCREENING AT BLDG 91 (PRS 16-029(s) & 16-026(n)). THE TOTAL NUMBER OF SCREENING SAMPLES WILL BE 16. WE MAY NOT BE ABLE TO COLLECT THEM ALL. IT DEPENDS HOW MUCH THE D&D CREW CAN FINISH TODAY. ALL THE SAMPLES ARE SUBSURFACE AND SOME WILL BE COLLECTED FROM THE BUCKET OF THE TRACK HOE (THE SUMP SAMPLES).

0925 PID CALIBRATION CHECK: 56 ppm at span or 7.20

1015 UPDATED TAILGATE FOR PRS 16-029(Q). WE WILL TAKE THE 4 SURFACE LATERAL BOUNDING SAMPLES AT 16-2404.

~~CREW ENTERS CAZ TO DRESS OUT.~~ RHA 4/2/96

1040 TAILGATE SAFETY MEETING CONDUCTED

1048 CREW ENTERS CAZ TO DRESS OUT.

~~1335 CREW EXIT~~ RHA 4/2/96

1100 SAMPLE 0316-96-1178 PID READING 0.5 bkg

Russell H Ahm

4/2/96

1106 SAMPLE 0316-96-1179 PID READING
0.5 ppm bkg

1110 SAMPLE 0316-96-1180 PID READING
0.5 ppm bkg

1113 SAMPLE 0316-96-1181 PID READING
0.5 ppm bkg

1152 0316-96-1079 (SAMPLE 4) PID READING
0.5 ppm bkg

1205 SAMPLE 0316-96-1080 PID READING
0.5 ppm bkg

1216 SAMPLE 0316-96-1081 PID READING
0.5 ppm bkg

1237 SAMPLE 0316-96-1082 PID READING
0.5 ppm bkg

1244 SAMPLE 0316-96-1083 PID READING
0.5 ppm bkg

1252 SAMPLE 0316-96-1084 PID READING 0.5 ppm bkg

Russell H Abell

18

4/2/96

1335 CREW EXITS CRZ: SAMPLE COLLECTION FOR TODAY COMPLETE.

1455 RESPONSE CHECKED THE NaI DETECTOR FOR FIELD SCREENING ONLY.

0316-96-1178 10.29K cpm
0316-96-1179 10.44K cpm
0316-96-1180 10.25K cpm
0316-96-1181 9.95K cpm
0316-96-1079 9.96K cpm
0316-96-1080 10.02K cpm
0316-96-1081 9.93K cpm
0316-96-1082 10.00K cpm
0316-96-1083 10.12K cpm
0316-96-1084 9.99K cpm

Russell A. Abely

4/3/96

0915 PREPARED TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. WE WILL SAMPLE THE DRAIN LINES AND DRAINAGE FOR PRS ~~16-029(s)~~ RHA 4/3/96 16-026(n) (Bldg 91). The SAMPLING EFFORT WILL CONSIST OF BOTH SURFACE AND SUBSURFACE SAMPLES. THE SURFACE SAMPLES WILL BE IN THE DRAINAGE AND THE SUBSURFACE SAMPLES WILL BE COLLECTED IN THE DRAIN LINE TRENCHES.

0925 PID CALIBRATION CHECK: 56 ppm at SPAN 6.83

1015 CONDUCTED TAILGATE SAFETY MEETING

1025 CREW OF RANDY JOHNSON AND ROSS ABELL ENTER CRZ TO GO TO PRS 16-026(n).

1105 SAMPLE 0316-96-1013 PID READING
0.2 ppm bkg

1125 SAMPLE 0316-96-1014 PID READING
0.6 ppm ~~bkg~~ RHA 4/3/96

1151 SAMPLE 0316-96-1010 PID READING
0.6 ppm

Russell H Abell

4/3/96

1200 SAMPLE 0316-96-1011 PID Reading
0.6 ppm

PHA 4/3/96
~~1224 SAMPLE 0316-96~~
1214 SAMPLE 0316-96-UK PID READING
0.6 ppm

1224 SAMPLE 0316-96-1012 PID READING
0.4 ppm

1232 SAMPLE 0316-96-1015 PID READING
0.4 ppm

1425 RESPONSE CHECKED THE NaI_2 DETECTOR FOR FIELD SCREENING ONLY.

Susan H Aly

4/4/96

0930 PREPARED TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT FOUR SURFACE SCREENING SAMPLES IN THE DRAINAGE FOR PRS 16-028(n). THIS AFTERNOON WE WILL ATTEMPT TO COLLECT SUBSURFACE SCREENING IN THE SUMP EXCAVATION FOR 16-029(1) AT FORMER BLDG 92.

0950 PID CALIBRATION CHECK: 56 ppm at SPAN 6.84
Background = 0.5 ppm

1138 TAILGATE SAFETY MEETING CONDUCTED.

1325 CREW ENTERS THE CRZ TO DRESS OUT.

1343 SAMPLE 0316-96-1016 PID READING 16-2356
0.5 ppm bkg

1400 SAMPLE 0316-96-1017 PID READING 16-2357
0.5 ppm bkg

1410 SAMPLE 0316-96-1018 PID READING 16-2358

1428 SAMPLE 0316-96-1019 PID READING 16-2359

1458 CREW EXITS CRZ SAMPLING COMPLETED

Russell H Abell

4/4/96

1515 RESPONDE CHECKED THE NaI2 DETECTOR FOR FIELD SCREENING ONLY.

Russell H Aben

4/5/96

1000 PREPARED THE TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT ~~TEN~~ TWELVE (RHA 4/5/96) SUBSURFACE SCREENING SAMPLES FROM THE EXCAVATIONS ASSOCIATED WITH BLDG (PALMER) 92. SIX SAMPLES WILL COLLECTED IN PCS 16-029(1) AND SIX SAMPLES WILL BE COLLECTED IN PCS 16-026(m). WE MAY COLLECT ONE SURFACE SAMPLE AT THE OUTFALL IF THE OUTFALL IS SITUATED ON THE BLDG SIDE OF THE 90s LINE SECURITY FENCE.

1030 PID CALIBRATION CHECK: 56 ppm AT SPAN 6.50

1143 CONDUCTED TAILGATE SAFETY MEETING.

1145 RESPONSE CHECKED THE NaI2 AND THE HP 360 FOR H2S AND FIELD SCREENING. BOTH ISTRUMENTS WERE PERFORMANCE CHECKED EARLIER TODAY.

1155 CREW ENTERS CRZ TO DRESS OUT.

1228 PID READING SAMPLE 0316-96-1076 0.2 ppm bkg.

1234 SAMPLE 0316-96-1077 PID READING 0.2 ppm bkg.

Russell H Able

4/5/96

1238 SAMPLE 0316-96-1078 PID READING
0.2 ppm bkg

1244 SAMPLE 0316-96-1003 PID READING
0.2 ppm bkg

1251 SAMPLE 0316-96-1004 PID READING
0.2 ppm bkg

1255 SAMPLE 0316-96-1005 PID READING
0.2 ppm bkg

1328 SAMPLE 0316-96-1073 PID READING
0.2 ppm bkg

1331 SAMPLE 0316-96-1074 PID READING
0.2 ppm bkg

1339 SAMPLE 0316-96-1075 PID READING
0.2 ppm bkg

1342 SAMPLE 0316-96-1000 PID READING
0.2 ppm bkg

1348 SAMPLE 0316-96-1001 PID READING 0.2 ppm bkg
Thomas H Abbh

4/5/96

1353 SAMPLE 0316-96-1002 PID READING
0.2 ppm bkg
1405 CREW DEPARTS CR2, BLDG 92 SUMPS & DRAIN LINES COMPLETE.

Thomas H. Abell

4/10/96

0900 PREPARING THE TAILGATE SAFETY MEETING FORM FOR TODAY'S ACTIVITIES. TODAY WE WILL PERFORM SUB-SURFACE SCREENING USING A BACKHOE AT AOC C-16-067. THERE WILL BE FIVE LOCATIONS AND THEY WILL BE SCREENED ON 1 FOOT INTERVALS UNTIL THE SOIL/TUFF INTERFACE. WE ARE EXPECTING APPROXIMATELY 20 SAMPLES. BTEX IS THE ONLY COPC AT THIS AREA.

0925 PID CALIBRATION CHECK: 56 ppm at SPAN OF 6.49

1042 TAILGATE SAFETY MEETING CONDUCTED.

1046 CREW ENTERS CAZ TO DRESS OUT. NO SAMPLES WERE TAKEN BECAUSE D&D CREW WENT TO LUNCH. THE SPOT TEST SCREENING WAS DONE ON NW DRAIN LINE OF BLDG 90.

1229 CREW EXITS CAZ

1333 CREW RE-ENTERS CAZ TO COLLECT SAMPLES AT AOC C-16-067.

1349 SAMPLE 0316-96-1102 PID READING 0.5 ppm bkg

[illegible]

4/10/96

1354 SAMPLE 0316-96-1103 PID READING
0.5 ppm bkg

1400 SAMPLE 0316-96-1104 PID READING
0.5 ppm bkg

1404 SAMPLE 0316-96-1105 PID READING
0.5 ppm bkg

1409 SAMPLE 0316-96-1106 PID READING
0.5 ppm bkg

1415 SAMPLE 0316-96-1107 PID READING
0.5 ppm bkg

1432 SAMPLE 0316-96-1108 PID READING
0.5 ppm bkg

1445 SAMPLE 0316-96-1109 PID READING
0.5 ppm bkg

1457 SAMPLE 0316-96-1110 PID READING
0.5 ppm bkg

1505 SAMPLE 0316-96-1111 PID READING 0.5 ppm bkg

Russell H Abbey

4/10/96

1510 SAMPLE 0316-96-1112 PID READING
0.5 ppm bkg

1514 SAMPLE 0316-96-1113 PID READING
0.5 ppm bkg

1519 SAMPLE 0316-96-1114 PID READING
0.5 ppm bkg

1527 SAMPLE 0316-96-1115 PID READING
0.5 ppm bkg

1541 SAMPLE 0316-96-1116 PID READING
0.5 ppm bkg

1547 SAMPLE 0316-96-1117 PID READING
0.5 ppm bkg

1625 CREW EMTS CRZ FOR THE DAY.

Russell H Abely

4/11/96

0915 PREPARING TAILGATE SAFETY FORM FOR TODAY'S ACTIVITIES. WE WILL MOSTLY WORK ON ANALYTICAL WORK AND SAMPLE SUBMITTAL. WE WILL COLLECT SIX SUBSURFACE SCREENING SAMPLES IN PRS 16-029(t) ASSOCIATED WITH FORMER BUILDING 90. THESE SAMPLES ARE THE SCREENING SAMPLES FROM THE SUMP EXCAVATIONS.

0930 PID CALIBRATION CHECK: 56ppm at SPAN = 6.52

RHA 4/11/96

~~TAILGATE SAFETY MEETING CONDUCTED.~~

1035 RESPONSE CHECKED THE NaI_2 detector FOR FIELD SCREENING.

1131 CONDUCTED TAILGATE SAFETY MEETING.

1230 DID NOT COLLECT SAMPLES TODAY. D&O CREW WERE BUSY AT THE PRS WE PLANNED TO SAMPLE. WE WILL SAMPLE PRS 16-029(t) TOMORROW.

Randy H Abby

4/12/96

0915 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL TAKE 6 SUBSURFACE SAMPLES AT PRS 16-029(t) AND 4 SURFACE SAMPLES IN THE LOWER DRAINAGE OF PRS 16-026(m).

0930 PID CALIBRATION CHECK: 56 ppm AT SPAN 6.30

1010 TAILGATE SAFETY MEETING WAS CONDUCTED.

1032 CREW ENTERS CRZ TO DRESS OUT.

1140 RANDY ~~SOURCE~~ RESPONSE RHA 4/12/96 CHECKS THE NaI_2 DETECTOR FOR FIELD SCREENING PURPOSES.

1206 SAMPLE 0316-96-1085 PID READING 0.5 ppm bkg

1218 SAMPLE 0316-96-1086 PID READING 0.5 ppm bkg

1222 SAMPLE 0316-96-1087 PID READING 0.5 ppm bkg

1310 SAMPLE 0316-96-1088 PID READING 0.5 ppm bkg

Russell H Abell

4/12/96

1321 SAMPLE 0316-96-1089 PID READING
0.5 ppm bkg

1329 SAMPLE 0316-96-1090 PID READING
0.5 ppm bkg

1412 CREW EXITS CRZ. DID NOT SAMPLE AT BUILDING 92, PRS 16-026(m), THEREFORE H&S PRISMING IS NOT NECESSARY.

Russell H Abell

4/15/96

0900 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT 4 ~~SOB~~ SURFACE SCREENING SAMPLES IN THE LOWER DRAINAGE OF PCS 16-02~~8~~(m). 4/15/96

0915 PID CALIBRATION CHECK: 56 ppm at SPAN = 6.38

0930 RESPONSE CHECKED THE NaI_2 DETECTOR AND THE HP 360 FOR FIELD SCREENING AND H_2S SCREENING.

1003 TAILGATE SAFETY MEETING CONDUCTED.

1025 CREW ENTERS CRZ TO DRESS OUT.

1044 SAMPLE 0316-96-1008 PID READING 1.0 ppm

1101 SAMPLE 0316-96-1009 PID READING 0.8 ppm bkg

1147 SAMPLE 0316-96-1006 PID READING 0.4 ppm

1204 SAMPLE 0316-96-1007 PID READING 0.8 ppm bkg

Thomas H Abell

1230 CROWERNTS OFF - SAMPLE COLLECTION COMPLETE.

Russell & Allen

4/16/96

0925 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT 12 surface lateral boundary screening samples in PRSs ~~16-029(i), 16-029~~ 16-029(k) and 411619 16-026(m), and 16-026(n).

1000 PID CALIBRATION CHECK: 56 ppm AT SPAN = 6.10

1055 TAILGATE SAFETY MEETING WAS CONDUCTED

1230 CREW ENTERS CRZ TO DRESS OUT

1313 SAMPLE 0316-96-1186 PID READING
0.2 ppm bkg

1321 SAMPLE 0316-96-1187 PID READING
0.2 ppm bkg

1324 SAMPLE 0316-96-1188 PID READING
0.2 ppm bkg

1326 SAMPLE 0316-96-1189 PID READING
0.2 ppm bkg

Russell H Abell

4/16/96

1340 SAMPLE 0316-96-1182 PID READING
0.2 ppm bkg

1345 SAMPLE 0316-96-1183 PID READING
0.2 ppm bkg

1348 SAMPLE 0316-96-1184 PID READING
0.2 ppm bkg

1353 SAMPLE 0316-96-1185 PID READING
0.2 ppm bkg

1406 SAMPLE 0316-96-1194 PID READING
0.2 ppm bkg

1412 ~~1420~~ RHA 4/16/96 SAMPLE 0316-96-1195 PID READING
0.2 ppm bkg

1420 SAMPLE 0316-96-1196 PID READING
0.2 ppm bkg

1425 SAMPLE 0316-96-1197 PID READING
0.2 ppm bkg

1439 SAMPLE 0316-96-1190 PID READING
0.2 ppm bkg

Russell H Abey

4/16/96

1445 SAMPLE 0316-96-1191 PID READING
0.2 ppm bkg

RHA 4/16/96 1448 ~~1450~~ SAMPLE 0316-96-1192 PID READING
0.2 ppm bkg

1450 SAMPLE 0316-96-1193 PID READING
0.2 ppm bkg

1504 SAMPLE 0316-96-1198 PID READING
0.2 ppm bkg

1509 SAMPLE 0316-96-1199 PID READING
0.2 ppm bkg

1514 SAMPLE 0316-96-1200 PID READING
0.2 ppm bkg

1519 SAMPLE 0316-96-1201 PID READING
0.2 ppm bkg

1600 CREW EXITS THE CRZ - SAMPLE COLLECTION IS COMPLETE.

Russell H Abler

4/18/96

0915 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT THE SIX SUBSURFACE SCREENING SAMPLES IN THE SUMP EXCAVATIONS FOR PRS 16-029(u) ASSOCIATED WITH FORMER BUILDING 89. WE WILL ALSO SCREEN THE TWO DRAIN LINES USING HE SPOT TEST KIT TO CHECK FOR RESIDUAL HE.

0935 PID CALIBRATION CHECK: 56 ppm AT SPAN = 7.88

0955 TAILGATE SAFETY MEETING CONDUCTED.

1050 CREW ENTERS CRZ TO DRESS OUT.

1136 SAMPLE 0316-96-1091 PID READING
0.2 ppm bkg

1144 SAMPLE 0316-96-1092 PID READING
0.2 ppm bkg

1153 SAMPLE 0316-96-1093 PID READING
0.2 ppm bkg

1215 SAMPLE 0316-96-1094 PID READING
0.2 ppm bkg

Russell H Able

4/18/96

1221 SAMPLE 0316-96-1095 PID READING
0.2 ppm bkg

1230 SAMPLE 0316-96-1096 PID READING
0.2 ppm bkg

1300 CREW EXITS CRZ - SAMPLE COLLECTION COMPLETE

Russell H Abey

4/22/96

0855 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT 15 SUBSURFACE AND SURFACE SCREENING SAMPLES. THEY ARE SEVEN SUBSURFACE SAMPLES AT PRS 16-029(q), AND 4 SURFACE SAMPLES EACH IN THE DRAINAGES FOR PRSs 16-026(o) & 16-026(p)

0910 ~~PID CALIBRATION CHECK: 56 ppm AT SPAN =~~ RHA 4/22/96 PID WILL NOT WORK PROPERLY. THERE APPEARS TO BE A BAD CONNECTION BETWEEN THE PROBE CABLE AND THE MACHINE. I WILL TAKE THIS PID BACK TO THE OFFICE AND GET A NEW, OPERATING MACHINE.

1015 THE NEW PID WAS A SERIAL NUMBER = 301024 AND THE CALIBRATION DUE DATE IS 1/11/97.

1030 PID CALIBRATION CHECK; 56 ppm AT SPAN = 9.11

1200 CONDUCTED TAILGATE SAFETY MEETING

1230 CREW ENTERS CRZ TO DRESS OUT.

1250 SAMPLE 0316-96-1060 PID READING 0.2 ppm bkg

1303 SAMPLE 0316-96-1061 PID READING 0.2 ppm bkg

Russell H Able

4/22/96

1320 SAMPLE 0316-96-1062 PID READING
0.2 ppm bkg

1329 SAMPLE 0316-96-1057 PID READING
0.2 ppm bkg

1345 SAMPLE 0316-96-1058 PID READING
0.2 ppm bkg

1356 SAMPLE 0316-96-1059 PID READING
0.2 ppm bkg

1407 SAMPLE 0316-96-1063 PID READING
0.2 ppm bkg

1430 SAMPLE 0316-96-1037 PID READING
0.2 ppm bkg

1446 SAMPLE 0316-96-1038 PID READING
0.2 ppm bkg

1459 SAMPLE 0316-96-1039 PID READING
0.2 ppm bkg

Russell A Abell

4/20/96

1509 SAMPLE 0316-96-1036 PID READING
0.2 ppm bkg

1528 SAMPLE 0316-96-1027 PID READING
0.2 ppm bkg

1538 SAMPLE 0316-96-1028 PID READING
0.2 ppm bkg

1547 SAMPLE 0316-96-1029 PID READING
0.2 ppm bkg

1625 CREW EXITS CAZ.

Russell H Abby

4/23/96

1050 PREPARING TAILGATE SAFETY MEETING FOR TODAY ACTIVITIES. TODAY WE WILL COLLECT SIX SUBSURFACE SAMPLES IN THE SUMP EXCAVATIONS ~~FOR~~ RAM 4/23 OF ARSs 16-029(K), 16-029(I), 16-029(S), & 16-029(U). THESE SAMPLES ARE THE SUMP BOUND AND WILL BE COLLECTED USING THE TRACK HOE

1105 PID CALIBRATION CHECK: 56 ppm AT SPAN = 9.10

1205 RESPONSE CHECKED THE NaI_2 DETECTOR AND THE PANCAKE GM DETECTOR FOR H&S FRISKING AND FIELD SCREENING.

1215 TAILGATE SAFETY MEETING CONDUCTED.

1245 CREW ENTERS THE CRZ.

1308 SAMPLE 0316-96-0049 PID READING 0.2 bkg

1323 SAMPLE 0316-96-0048 PID READING 0.2 bkg

1348 SAMPLE 0316-96-0029 PID READING 0.2 bkg

Russell A Abell

4/23/96

1412 SAMPLE 0316-96-0019 PID READING
0.2 ppm bkg

1430 SAMPLE 0316-96-0018 PID READING
NO READING

1454 SAMPLE 0316-96-0059 PID READING
NO READING

1530 CREW EXITS CRZ - SAMPLE COLLECTION COMPLETE.

Russell H Abell

4/24/96

0945 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT SUBSURFACE & SURFACE SCREENING SAMPLES IN PAS 16-029(g) & 16-017. THE SUBSURFACE SAMPLES IN PAS 16-029(g) WILL BE COLLECTED USING A BACK HOE.

1010 PID CALIBRATION CHECK: 56 ppm AT SPAN = 8.71

1015 TAILGATE SAFETY MEETING CONDUCTED.

~~1230~~ 1030 CREW ENTERS CRZ TO DRESS OUT.

1049 SAMPLE 0316-96-1531 PID READING
0.2 ppm bkgd

1059 SAMPLE 0316-96-1532 PID READING
0.2 ppm bkgd

1121 SAMPLE 0316-96-1176 PID READING
0.2 ppm bkgd.

1128 SAMPLE 0316-96-1177 PID READING
0.2 ppm bkgd.

4/24/96

1136 SAMPLE 0316-96-1175 PID READING
0.2 ppm bkgd

1151 SAMPLE 0316-96-1172 PID READING
0.2 ppm bkgd

1200 SAMPLE 0316-96-1173 PID READING
0.2 ppm bkgd

1207 SAMPLE 0316-96-~~1175~~ 1174 RHA 4/24/96 PID READING
0.2 ppm bkgd

1225 CREW EXITS THE CRZ - SAMPLE COLLECTION COMPLETE.

1435 RESPONSE CHECKED THE NaI_2 DETECTOR FOR FIELD SCREENING ONLY.

Russell H Abell

4/25/96

1100 PREPARING TAILGATE SAFETY MEETING FORM FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT ~~4~~ RHA 4/25/96 THREE SUBSURFACE SCREEN SAMPLES AT PRS 16-029(q) IN THE LOWER DRAINAGE (AND ALSO ONE ANALYTICAL SUBSURFACE SAMPLE THERE). IF THE BACKHOE REPAIRS ARE NOT COMPLETED, THEN WE WILL COLLECT EIGHT SUBSURFACE SCREENING SAMPLES IN THE SUMP EXCAVATIONS FOR PRS 16-029(t).

1111 PID CALIBRATION CHECK: 56 ppm AT SPAN = 8.60

1125 TAILGATE SAFETY MEETING CONDUCTED.

CREW ENTERS CRZ TO DRESS OUT.

1326 SAMPLE 0316-96-1207 PID READING 0.2 ppm bkgd.

1333 SAMPLE 0316-96-1208 PID READING 0.2 ppm bkgd.

1338 SAMPLE 0316-96-1209 PID READING 0.2 ppm bkgd.

Russell H Abel

4/25/96

1343 SAMPLE 0316-96-1206 PID READING
0.2 ppm bkgd.

1425 CREW EXITS CRZ - SAMPLE COLLECTION COMPLETE.

Russell H Abell

4/26/96

1050 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT EIGHT (8) SUBSURFACE DELINEATION SCREENING SAMPLES IN PRSs 16-026(n) & 16-029(t). THESE PRSs ARE ASSOCIATED WITH BUILDINGS 91 & 90 RESPECTIVELY.

1105 PID CALIBRATION CHECK: 56 ppm AT SPAN = 8.38.

1113 TAILGATE SAFETY MEETING WAS CONDUCTED.

1125 CREW ENTERS CRZ TO DRESS OUT

1200 SAMPLE 0316-96-1204 PID READING
0.2 ppm bkgd.

1210 SAMPLE 0316-96-1202 PID READING
0.2 ppm bkgd.

1215 SAMPLE 0316-96-1203 PID READING
0.4 ppm

SAMPLE 0316-96-1205 PID READING
0.2 ppm bkgd.

Russell H Hall

4/26/96

1250 SAMPLE 0316-96-1210 PID READING
0.2 ppm bkgd

1256 SAMPLE 0316-96-1211 PID READING
0.2 ppm bkgd

1300 SAMPLE 0316-96-1212 PID READING
0.2 ppm bkgd

1315 SAMPLE 0316-96-1213 PID READING
NR

1345 CREW EXITS CRZ - SAMPLE COLLECTION COMPLETE.

Russell H Abell

4/29/96

0915 PREPARING TAILGATE SAFETY FORM FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT ONE SURFACE ANALYTICAL SAMPLE FROM PRS 16-029(q). WE WILL ALSO COLLECT THE SIX SUBSURFACE/SURFACE SCREENING SAMPLES IN PRS 16-026(p) - Bldg 89 drain lines.

0925 PID BATTERY IS DEAD, HOWEVER THE PID WILL WORK ON THE CHARGER - IT RESPONDS ACCURATELY TO THE CALIBRATION GAS AND READS FULL BATTERY. DEWIGHT IS GOING INTO THE OFFICE SOON TO GET ANOTHER PID.

1240 PID CALIBRATION CHECK: 56 ppm AT SPAN = 5.52 PID SERIAL NUMBER IS 401084 & THE CALIBRATION DATE IS

1315 CREW ENTERS THE CRZ TO DRESS OUT.

1335 SAMPLE 0316-96-0063 PID READING 0.2 ppm bkgd

1431 SAMPLE 0316-96-1469 PID READING 0.2 ppm bkgd

Russell H Abell

4/29/96

1443 SAMPLE 0316-96-0144 PID READING
0.2 ppm bkgd.

1453 SAMPLE 0316-96-1529 PID READING
0.2 ppm bkgd

1504 SAMPLE 0316-96-1530 PID READING
0.2 ppm bkgd

1545 CREW EXITS CRZ - SAMPLE COLLECTION COMPLETE.

Russell H Abell

4/30/96

1015 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT ~~FIVE~~ FOUR SUBSURFACE AND TWO SURFACE SAMPLES AT THE BLDG DRAIN LINES. WE WILL BE SPOT TEST THE ~~TWO~~ NW RHA DRAIN LINES, FIRST, TO ENSURE THAT THE D&D CLEAN-UP WAS SUCCESSFUL.

1052 PID CALIBRATION CHECK FOR DL 101 : 56 ppm ~~AT SP.~~ RHA 4/30 SERIAL #: 167128

1055 TAILGATE SAFETY MEETING WAS CONDUCTED.

1125 CREW ENTERS CRZ TO DRESS OUT

1204 SAMPLE 0316-96-1033 PID READING 1.0 ppm bkgd

1213 SAMPLE 0316-96-1034 PID READING 1.0 ppm bkgd.

1221 SAMPLE 0316-96-1035 PID READING 1.0 ppm bkgd

1300 CREW EXITS CRZ

Russell H Abell

5/1/96

1000 PREPARING THE TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT 8 SUBSURFACE DELINEATION SCREENING SAMPLES - 4 EACH AT PRS 16-029(t) & 16-026(p). WE WILL ALSO HE SPOT TEST PRS 16-026(o) FOR RESIDUAL D&D HE CONTAMINATION.

1030 RANDY HAS LEFT TO GET A NEW PID - ONE THAT IS IN WORKING ORDER. WE WILL USE THE NEW DL 101 FOR THE REST OF THE PROJECT (HOPEFULLY!).

1058 PID CALIBRATION CHECK: 67 ppm (11.7 bulb)
SERIAL # IS: 87062 ; CALIBRATION DATE IS: 4/4/96
THIS DL 101 HAS AN 11.7 LAMP. WE HAVE BEEN USING A 10.2 LAMP DURING THIS FIELD CAMPAIGN.

1105 TAILGATE SAFETY MEETING WAS CONDUCTED.

1240 CREW ENTERS CRZ TO DRESS OUT.

1325 SAMPLE 0316-96-1214 PID READING
1.5 ppm bkgd

Russell H Able

5/1/96

1336 SAMPLE 0316-96-1215 PID READING
1.5 ppm bkgd

1348 SAMPLE 0316-96-1216 PID READING
1.5 ppm bkgd

1406 SAMPLE 0316-96-1217 PID READING
1.5 ppm bkgd

1417 SAMPLE 0316-96-1218 PID READING
1.5 ppm bkgd

1423 SAMPLE 0316-96-1219 PID READING
1.5 ppm bkgd

1437 SAMPLE 0316-96-1220 PID READING
1.5 ppm bkgd

1450 SAMPLE 0316-96-1221 PID READING
1.5 ppm bkgd

1530 CREW EXITS CRZ

Russell T Abey

5/2/96

0925 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ~~MEETING~~ PRA 5/2/96 ACTIVITIES. TODAY WE WILL COLLECT 12 SUBSURFACE SCREENING SAMPLES IN THE RODTRENTS OF BLDGS 89 & 90 (PRS 16-017).

0935 PID CALIBRATION CHECK: 67ppm.

0945 TAILGATE SAFETY MEETING WAS CONDUCTED.

1000 CREWENTERS CRZ TO DRESS OUT.

1030 SAMPLE 0316-96-1154 PID READING
1.3 ppm bkgd

1044 SAMPLE 0316-96-1159 PID READING
1.1 ppm bkgd

1114 SAMPLE 0316-96-1157 PID READING
1.2 ppm bkgd

1126 SAMPLE 0316-96-1158 PID READING
1.2 ppm bkgd

1144 SAMPLE 0316-96-1156 PID READING
1.3 ppm

[illegible] H [illegible]

5/2/96

1159 SAMPLE 0316-96-1155 PID READING 1.1 ppm bkgd

1240 CREW EXITS CRZ FOR LUNCH

5/2/96

1350 RANDY AND RUSS RE-ENTER CRZ ~~TO~~ AND DRESS OUT RAH 5/2/96 TO RETURN SOILS TO THE WASTE PILE FOR THE 905 LINE AREA.

1401 RUSS EXITS CRZ TO GO ESCORT DONNA SHARP ON TO THE SITE.

1515 RUSS RESPONSE CHECKS THE NaI_2 DETECTOR FOR SAMPLE SCREENING ONLY.

RANDY EXITS CRZ AFTER RETURNING SOILS.

Russell A Abey

5/6/96

0900 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT 4 SUBSURFACE DELINEATIONS SAMPLES IN PRS 16-029(1) AND SIX SUBSURFACE SAMPLES IN THE FOOTPRINT OF BLDG 89 IN PRS 16-017. U is A COPC IN PRS 16-029(1) SO WE WILL BE FRISKING FOR RAD TODAY.

0915 PID CALIBRATION CHECK: 67 ppm

0925 RWA 5/6/96 ~~SOURCE~~ RESPONSE CHECKED THE NaI DETECTOR AND THE HP 360 FOR H&S SCREENING AND FIELD SCREENING.

1001 TAILGATE SAFETY MEETING WAS CONDUCTED.

1005 CREW OF RANDY JOHNSON AND I ENTER THE CRZ TO DRESS OUT.

1041 SAMPLE 0316-96-1224 PID READING
1.4 ppm bkgd

1056 SAMPLE 0316-96-1222 PID READING
1.2 ppm bkgd

1124 SAMPLE 0316-96-1223 PID READING
1.3 bkgd

Russell H Abbey

5/6/96

1203 SAMPLE 0316-96-1225 PID READING
1.2 ppm bkgd

1230 CREW EXITS THE CRZ.

Russell T. Abbott

5/7/96

0900 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. WE WILL COLLECT 6 SUBSURFACE SCREENING SAMPLES IN EACH FOOTPRINT FOR BLDGS ~~[illegible]~~ [illegible] 5/7/96 89 & [illegible] 5/7/96 & 90 (PRS 16-017).

0915 PID CALIBRATION CHECK: 67 ppm.

0928 TAILGATE MEETING CONDUCTED.

0955 CREW OF PETER AND I ENTER THE CRZ TO DRESS OUT.

1040 SAMPLE 0316-96-1160 PID READING
1.4 ppm bkgd

1051 SAMPLE 0316-96-1164 PID READING
1.4 ppm bkgd

1103 SAMPLE 0316-96-1163 PID READING
1.4 ppm bkgd

1116 SAMPLE 0316-96-1165 PID READING
1.4 ppm bkgd

1126 SAMPLE 0316-96-1162 PID READING
1.4 ppm bkgd

Russell H Abell

5/7/96

1138 SAMPLE 0316-96-1161 PID READING
1.4 ppm bkgd

1305 CREW EXITS CRZ.

1455 RESPONSE CHECKED THE NaI_2 DETECTOR FOR FIELD SCREENING PURPOSES ONLY.

Thurnell H Abell

5/8/96

0850 PREPARING TAILGATE SAFETY MEETING FORM FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT 42 SUBSURFACE SCREENING SAMPLES FROM THE SOIL PILE PILES AT EACH BUILDING. WE WILL COLLECT 7 SAMPLES FROM VARIOUS PILES AT EACH BUILDING. THE BUILDINGS ARE 99, 93, 92, 91, 90, & 89.

0905 PID CALIBRATION CHECK: 67 ppm.

0910 RESPONSE CHECKED THE HP-360 PANCAKE PROBE FOR H^{3}S SCREENING PURPOSES ONLY. BACKGROUND = 107 cpm

0935 TAILGATE SAFETY MEETING WAS CONDUCTED.

0953 CREW OF RANDY AND I ENTER CRZ TO DRESS OUT.

1015 SAMPLE 91A PID READING
1.1 ppm bkgd

1017 SAMPLE 91B PID READING
1.1 ppm bkgd

1018 SAMPLE 91C PID READING
1.1 ppm bkgd

Russell H Aben

5/8/96

1020 SAMPLE 91D PID READING
1.1 ppm bkgd

1021 SAMPLE 91E PID READING
1.1 ppm bkgd

1023 SAMPLE 91F PID READING
1.1 ppm bkgd

1025 SAMPLE 91G PID READING
1.2 ppm bkgd

1031 SAMPLE 90A PID READING
1.1 ppm bkgd

1034 SAMPLE 90B PID READING
1.2 ppm bkgd

1035 SAMPLE 90C PID READING
1.2 ppm bkgd

1037 SAMPLE 90D PID READING
1.2 ppm bkgd

Russell H Abau

5/8/96

1043 SAMPLE 90E PID READING
1.1 ppm bkgd

1045 SAMPLE 90F PID READING
1.1 ppm bkgd.

1048 SAMPLE 90G PID READING
1.2 ppm bkgd.

1056 SAMPLE 89A PID READING
1.1 ppm bkdg

1057 SAMPLE 89B PID READING
1.1 ppm bkgd

1058 SAMPLE 89C PID READING
1.3 ppm bkgd

1100 SAMPLE 89D PID READING
1.1 ppm bkgd

1102 SAMPLE 89E PID READING
1.2 ppm bkgd

Russell H Abbott

5/8/94

1104 SAMPLE 89F PID READING
1.3 ppm bkgd

1106 SAMPLE 89G PID READING
1.2 ppm bkgd

1111 SAMPLE 92A
1.0 ppm bkgd PID READING
129 cpm HP-360 RAD BETA/GAMMA SCREEN

1117 SAMPLE 92B
1.1 ppm bkgd PID READING
106 cpm HP-360 BETA/GAMMA SCREEN

1122 SAMPLE 92C
1.2 ppm bkgd PID READING
111 cpm HP-360 BETA/GAMMA SCREEN

1125 SAMPLE 92D
1.0 ppm bkgd PID READING
99 cpm HP-360 BETA/GAMMA SCREEN

1130 SAMPLE 92E
1.0 ppm bkgd PID READING
123 cpm HP-360 BETA/GAMMA SCREEN
Russell H Abell

5/8/96

1134 SAMPLE 92F
1.2 ppm bkgd PID READING
117 cpm HP-360 BETA/GAMMA SCREEN

1137 SAMPLE 92G
1.2 ppm bkgd PID READING
122 cpm HP-360 BETA/GAMMA SCREEN

1153 SAMPLE 93A PID READING
1.1 ppm bkgd.

1155 SAMPLE ~~93B~~ RWA 5/8/96 93B PID READING
1.1 ppm bkgd.

1156 ~~1.2~~ RWA 5/8/96 SAMPLE 93C PID READING
1.2 ppm bkgd

1158 SAMPLE 93D PID READING
1.2 ppm bkgd.

1201 SAMPLE 93E PID READING
1.2 ppm bkgd.

1203 SAMPLE 93F PID READING
1.2 ppm bkgd.
Thursah H Abell

66

5/8/96

1205 SAMPLE 93G PID READING
1.2 ppm bkgd.

1211 SAMPLE 99A PID READING
1.1 ppm bkgd.

1213 SAMPLE 99B PID READING
1.0 ppm bkdg.

1215 SAMPLE 99C AREA WHERE HE WATER PAN SAT.
1.0 ppm bkdg. (PID READING)

1218 SAMPLE 99D PID READING
1.0 ppm bkgd.

1220 SAMPLE 99E PID READING
1.1 ppm bkgd.

1222 SAMPLE 99F PID READING
1.0 ppm bkgd.

1224 SAMPLE 99G PID READING
1.0 ppm bkgd.

1245 CREW EXITS CRZ - SAMPLE COLLECTION IS COMPLETE.

Russell H Abell

5/8/94

1300 GORDON AND RANDY ENTER CRZ TO DECON THE SAMPLES AND EQUIPMENT FROM TODAY'S ACTIVITIES.

1415 CREW EXITS CRZ.

Russell H Abell.

68

5/9/94

0845 PREPARING THE TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT FIVE SUMP BOUNDING SAMPLES (USING THE TRACK HOE). THESE SAMPLES WILL BE COLLECTED FROM PRSs 16-029(1) [both sumps], 16-029(5) [~~ATV~~ SW sump], AND 16-029(4) [both sumps]. RWA 5/9/96

0854 TAILGATE MEETING WAS CONDUCTED.

0905 PID CALIBRATION CHECK: 67 ppm.

0910 RESPONSE CHECKED THE NaI DETECTOR AND HP-360 FOR FIELD SCREENING AND HES FRISKING.

0915 CREW OF RANDY AND I ENTER THE CRZ TO DRESS OUT.

1004 SAMPLE 0316-96-0202 PID READING 1.1 ppm bkgd.

RWA 5/9/96 ~~1030~~ 1015 GORDON ARRIVES AND ENTERS THE EZ.

1025 SAMPLE 0316-96-0201 PID READING 1.2 ppm bkgd

Russell H Abell

5/9/96

1048 SAMPLE 0316-96-0203 PID READING
1.3 ppm bkgd

1100 RANDY IS DRIVEN BACK TO CRZ by Gordon. RANDY WILL LEAVE THE ZONE TO MAKE AN 1130 APPOINTMENT.

1106 SAMPLE 0316-96-0204 PID READING
1.2 ppm bkgd

1122 SAMPLE 0316-96-0205 PID READING
1.2 ppm bkgd.

1155 GORDON AND I EXIT THE CRZ - SAMPLING COMPLETE.

1240 ~~1315~~ I REENTER THE CRZ TO PREPARE 4 SAMPLES FOR SUBMITTAL:

0316-96-0136	FROM SCREENING SAMPLE:	0316-96-1155
0316-96-0137		0316-96-1158
0316-96-0138		0316-96-1163
0316-96-0139		0316-96-1165

1315 I EXITED THE CRZ.

Russell H Abell

5/10/96

0920 PREPARING THE TAILGATE SAFETY FORM FOR TODAY'S ACTIVITIES. TODAY WE WILL UNDERTAKE THREE ER SOIL CLEAN-UPS USING THE TRACK HOE. THERE WILL BE SIX SUBSURFACE SAMPLES ASSOCIATED WITH THIS OPERATION. EACH CLEAN-UP LOCATION WILL HAVE 1 SCREENING SAMPLE AND 1 ANALYTICAL BOUNDING SAMPLES. THE THREE LOCATIONS ARE: AT SITE ID 16-2393 IN PRS 16-029(k), AT SITE ID 16-2350 IN PRS 16-026(n) (this LOCATION IS A COMBINATION OF SITE ID 16-2421 & 16-2350), AND AT SITE ID 16-2354 IN PRS 16-026(n). SITE ID 16-2421 IS IN PRS 16-029(s).

0935 PID CALIBRATION CHECK: 67 ppm

1017 TAILGATE SAFETY MEETING CONDUCTED.

1022 CREW OF RANDY, GORDON, AND I ENTER CRZ TO DRESSOUT

1118 SAMPLE 0316-96-1471 PID READING 1.2 ppm bkgd

1132 SAMPLE 0316-96-0146 PID READING 1.2 ppm bkgd

Russell H Abby

1145 SAMPLE 0316-96-0028 PID READING
1.2 ppm bkgd

14 CREW EXITS CRZ TO BREAK FOR LUNCH.

1330 CREW OF RANDY, GORDON, AND I ENTER CRZ TO DRESS OUT

1400 SAMPLE 0316-96-1472 PID READING
1.2 ppm bkgd

1417 SAMPLE 0316-96-0147 PID READING
1.2 ppm bkgd

1445 CREW EXITS CRZ FOR THE AFTERNOON.

Thursday 4 April

5/13/96

0840 PREPARING THE TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL ATTEMPT TO COMPLETE 3 ER CLEAN-UPS: ONE IN PRS 16-029(k) and two IN PRS 16-029(t). THE CLEAN-UP ASSOCIATED WITH 16-029(k) IS AT SITE ID 16-2393 IN THE NW SUMP. THE TWO CLEAN-UPS IN PRS 16-029(t) ARE AT SITE ID 16-2427 IN THE NW SUMP AND AT SITE ID 16-2430 IN THE SE SUMP. THERE WILL BE ONE SCREENING SAMPLE AND TWO ANALYTICAL SAMPLES ASSOCIATED WITH EACH CLEAN-UP.

0900 PID CALIBRATION CHECK: 67 ppm.

0930 TAILGATE SAFETY MEETING WAS CONDUCTED.

0935 CREW OF RANDY, GORDON, AND I ENTERED THE CRZ TO DRESS OUT.

1020 SAMPLE 0316-96-1470 PID READING 1.3 ppm bkgd

1030 SAMPLE 0316-96-1473 PID READING 1.3 ppm bkgd

Russell H Abell

5/13/94

1040 SAMPLE 0316-96-0058 PID READING
1.2 ppm bkgd

1100 SAMPLE 0316-96-1476 PID READING
1.2 ppm bkgd

1110 SAMPLE 0316-96-1477 PID READING
1.2 ppm bkgd

1125 SAMPLE 0316-96-0039 PID READING
1.2 ppm bkgd.

1145 CREW EXITS CRZ TO BREAK FOR LUNCH.

1305 RANDY AND GORDON ENTER CRZ TO DRESS OUT, AND TO COMPLETE THE CLEAN-UP AT BLDG. 90.

1348 SAMPLE 0316-96-1474 PID READING
1.4 ppm bkgd.

1359 SAMPLE 0316-96-1475 PID READING
1.3 ppm bkgd

1409 SAMPLE 0316-96-0038 PID READING
1.3 ppm bkgd

Russell H Abell

5/15/96

0945 PREPARING TODAYS TAILGATE SAFETY MEETING. TODAY WE WILL COLLECT CORE SAMPLES IN THE BLDG 50 & 87 DRAIN LINES. THREE SUBSURFACE SCREENING SAMPLES WILL BE COLLECTED IN PRS 16-026(o) AND THREE SUBSURFACE SCREENING SAMPLES WILL BE COLLECTED IN PRS 16-026(p).

0955 PID CALIBRATION CHECK: 67 ppm.

TAILGATE SAFETY MEETING CONDUCTED.

1035 CREW OF RANDY, PETER, AND MYSELF ENTER THE CRZ TO DRESS OUT.

1129 SAMPLE 0316-96-1024 PID READING 2.2 ppm

1141 SAMPLE 0316-96-1025 PID READING 1.3 ppm bkgd

1149 SAMPLE 0316-96-1026 PID READING 1.2 ppm bkgd

Runzen H Abq

5/15/94

1204 SAMPLE 0316-96-1030 PID READING
1.4 ppm bkgd

1210 SAMPLE 0316-96-1031 PID READING
1.4 ppm bkgd

1217 SAMPLE 0316-96-1032 ~~1.2 ppm~~ RHA 5/15/94 PID READING
1.2 ppm bkgd

1245 CREW EXITS CR2 - SAMPLING COMPLETE.

1350 RANDY AND I RE-ENTER CR2 TO DECON SAMPLES AND SAMPLE EQUIPMENT

1415 CREW EXITS CR2 -

Randy + Abel

5/17/96

0845 PREPARING TAILGATE SAFETY FORM FOR TODAYS ACTIVITIES. TODAY WE WILL COLLECT COPC ANALYTICAL SUBSURFACE SAMPLES IN THE DRAIN LINES AND SUMPS OF BLDG 89 AND RECOLLECT TWO SUMP ANALYTICAL COPC SAMPLES FROM THE SUMP EXCAVATIONS. THE SAMPLES WILL BE COLLECTED FROM PRS 16-029(u) AND 16-026(p).

0900 PID CALIBRATION CHECK: 67 ppm.
TAILGATE SAFETY MEETING WAS CONDUCTED.

0930 CREW OF RANDY AND MYSELF ENTER THE CRZ TO DRESS OUT.

0938 SAMPLE 0316-96-0044 PID READING 1.3 ppm bkgd

0938 SAMPLE 0316-96-2001 PID READING 1.3 ppm bkdg (duplicate of 0316-96-0044)

0948 SAMPLE 0316-96-0045 PID READING 1.3 ppm

1007 SAMPLE 0316-96-0206 PID READING 1-3 ppm

Russell H Abbey

5/17/96

1018 SAMPLE 0316-96-0207 PID READING
1.3 ppm bkgd

1052 SAMPLE 0316-96-0042 PID READING
1.3 ppm bkgd

1125 CREW EXITS CRZ - SAMPLING COMPLETED

1305 RANDY AND I RE-ENTER CRZ TO DECON SAMPLES AND SAMPLE EQUIPMENT.

1340 CREW EXITS CRZ.

1344 DEWIGHT RESPONSE CHECKED THE NaI_2 DETECTOR FOR FIELD SCREENING PURPOSES ONLY.

Russell H Abell

5/20/94

1100 PETER PREPARED THE TAILGATE MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL CONDUCTED HOT SPOT DELINEATION SCREENING SAMPLES AT PRS 16-026(P) (BLDG 89.)

1115 PID CALIBRATION CHECK: 67 ppm

1245 TAILGATE SAFETY MEETING WAS CONDUCTED

1305 CREW ENTERS CRZ TO DRESS OUT.

1337 SAMPLE 0316-96-1226 PID READING 1.3 ppm bkgd

1344 SAMPLE 0316-96-1227 PID READING 1.4 ppm bkgd

1350 SAMPLE 0316-96-1228 PID READING 1.3 ppm bkgd

1410 SAMPLE 0316-96-1229 PID READING 1.3 ppm bkgd

1435 CREW EXITS CRZ- SAMPLING COMPLETE.

5/21/96

1003 PID CALIBRATION CHECK; 100 ppm

1015 PETER PREPARES THE TAILGATE MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL DO TWO ER SOIL REMOVALS IN PAS 16-026 (p) AND COLLECT CLEAN-UP BOUNDING SAMPLES. ALSO, COPC ANALYTICAL SAMPLES WILL BE RE-SAMPLED AT PAS 16-026 (p).

1227 TAILGATE SAFETY MEETING WAS CONDUCTED.

1245 CREW OF PETER AND RANDY ENTER CAZ.

1315 SAMPLE 0316-96-0043 PID READING
1.8 ppm bkgd

1315 SAMPLE 0316-96-2000 PID READING
1.8 ppm bkgd (duplicate of 0316-96-0043)

1338 SAMPLE 0316-96-1478 PID READING
1.8 ppm bkgd

1345 SAMPLE 0316-96-0148 PID READING
1.8 ppm bkgd

1400 SAMPLE 0316-96-0208 PID READING
1.8 ppm bkgd

5/21/96

1400 SAMPLE 0316-96-2002 PID READING
1.8 ppm bkgd (duplicate of 0316-96-0208)

1420 SAMPLE 0316-96-1479 PID READING
1.9 ppm

1427 SAMPLE 0316-96-0149 PID READING
1.8 ppm bkgd

1505 CREW EXITS CR2 - SAMPLING COMPLETE.

5/22/96

1015 PID CALIBRATION CHECK: 100 ppm

1045 PETER PREPARES THE TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT COARSE SCREENING SAMPLES IN PRS 16-026(O) AND HOT SPOT DELINEATION SAMPLES IN PRS 16-026(P).

1104 TAILGATE SAFETY MEETING WAS CONDUCTED.

1110 CREW OF PETER AND RANDY ENTER CRZ TO DRESS OUT.

1129 SAMPLE 0316-96-1023 PID READING
1.0 ppm bkgd

1143 SAMPLE 0316-96-1022 PID READING
1.0 ppm bkgd

1151 SAMPLE 0316-96-1021 PID READING
1.1 ppm bkgd

1201 SAMPLE 0316-96-1020 PID READING
1.1 ppm bkgd

Russell A Abey

5/22/96

1230 SAMPLE 0316-96-1230 PID READING
1.0 ppm bkgd

1235 SAMPLE 0316-96-1231 PID READING-
1.0 ppm bkgd

1245 CREW EXITS CRZ - SAMPLING COMPLETE.

1355 RANDY RE-ENTERS CRZ TO DECON SAMPLES AND
SAMPLING EQUIPMENT.

1433 RANDY EXITS CRZ.

Randy H. Abby

5/23/94

0915 RANDY PREPARES THE TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT CLEAN-UP BOUNDING SAMPLES AND EU VERIFICATION SAMPLES IN PRSs 16-026(n), 16-029(q) & 16-029(s).

0926 PID CALIBRATION CHECK: 67 ppm

0957 RANDY CONDUCTS THE TAILGATE SAFETY MEETING.

1005 RANDY AND PETER ENTER THE CRZ TO DRESS OUT.

1025 SAMPLE 0316-96-0120 PID READING
1.3 ppm bkgd

1033 SAMPLE 0316-96-0150 PID READING
1.3 ppm bkgd

1043 SAMPLE 0316-96-0121 PID READING
1.4 ppm bkgd

1053 SAMPLE 0316-96-0151 PID READING
1.7 ppm

5/23/96

1105 SAMPLE 0316-96-0122 PID READING
1.8 ppm

1113 SAMPLE 0316-96-0152 PID READING
1.7 ppm

1130 SAMPLE 0316-96-0080 PID READING
1.0 ppm bkgd

1141 SAMPLE 0316-96-0153 PID READING
1.1 ppm bkgd.

1223 CREW EXITS CRZ - SAMPLING COMPLETE.

5/24/96

0815 RANDY PREPARES THE TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT FOUR HOT SPOT DELINEATION SAMPLES AT PRS 16-026(o).

0830 PID CALIBRATION CHECK: 67 ppm

0950 I CONDUCTED THE TAILGATE SAFETY MEETING.

0955 RANDY AND I ENTER THE CRZ TO DRESS OUT.

1019 SAMPLE 0316-96-1232 PID READING
1.5 ppm bkgd

1033 SAMPLE 0316-96-1234 PID READING
1.2 ppm bkgd

1036 SAMPLE 0316-96-1235 PID READING
1.2 ppm bkgd.

1108 SAMPLE 0316-96-1233 PID READING
1.3 ppm bkgd

1141 CREW EXITS CRZ - SAMPLING COMPLETE.

Russell H Abell

5/28/96

0845 I PREPARED THE TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COMPLETE TWO GR SOIL REMOVALS AND COLLECT THE ASSOCIATED SUBSURFACE SCREENING SAMPLES AND THE ASSOCIATED CLEAN-UP BOUNDING SAMPLES.

0855 PID CALIBRATION CHECK: 100 ppm

1223 I CONDUCTED THE TAILGATE SAFETY MEETING.

1228 CREW OF GORDON AND RANDY ENTER CRZ TO DRESS OUT.

1331 SAMPLE 0316-96-1236 PID READING 1.9 ppm bkgd

1344 SAMPLE 0316-96-1237 PID READING 2.3 ppm

PHA 5/28/96 ~~1355~~

1355 SAMPLE 0316-96-1480 PID READING 1.9 ppm

1408 SAMPLE 0316-96-0154 PID READING 1.9 ppm

Russell H Abell

5/28/96

1440 SAMPLE 0316-96-1481 PID READING
1.7 ppm bkgd

1453 SAMPLE 0316-96-1482 PID READING
1.9 ppm bkgd

1502 SAMPLE 0316-96-1483 PID READING
2.1 ppm

1510 SAMPLE 0316-96-1484 PID READING
1.9 ppm bkgd.

1519 SAMPLE 0316-96-1485 PID READING
1.9 ppm bkgd

1522 SAMPLE 0316-96-0144 PID READING
1.7 ppm bkgd

1556 CREW EXITS CR2 - SAMPLING COMPLETE

Russell A Abell

5/29/96

1250 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT EU VERIFICATION SAMPLES AND CLEAN-UP BOUNDING SAMPLES IN AREAS 16-026(o) & 16-026(p).

1251 TAILGATE SAFETY MEETING WAS CONDUCTED

1300 NO SAMPLING WORK WILL BE DONE TODAY. THE TRACK HOE IS NEEDED TO DO D&D WORK AT 826-91 AND WE CANNOT SAMPLE WITHOUT THE TRACK HOE.

Russell H Abell

5/30/96

0920 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COMPLETE THE WORK WE HAD PLANNED TO DO YESTERDAY (5/29/96). REFER TO PAGE 88 OF THIS VOLUME FOR DETAILS OF THE SAMPLING.

0923 PID CALIBRATION CHECK: 100 ppm

0934 TAILGATE SAFETY MEETING CONDUCTED.

0947 CREW OF RANDY AND GORDON ENTER CEL TO DRESS OUT.

1026 SAMPLE 0316-96-0090 PID READING 1.9 ppm bkgd.

1040 SAMPLE 0316-96-0155 PID READING 1.9 ppm bkgd

1050 SAMPLE 0316-96-0091 PID READING 1.9 ppm bkgd

1105 SAMPLE 0316-96-0156 PID READING 1.7 ppm

Russell H Abell

5/30/96

1114 SAMPLE 0316-96-0092 PID READING
NO READING (NR) - PROBLEM WITH PID:
INSTRUMENT MALFUNCTION

1128 SAMPLE 0316-96-0157 PID READING
1.7 ppm bkgd

1145 CREW EXITS CRZ - WE WILL BREAK FOR
LUNCH AND COMPLETE SAMPLING AFTER LUNCH.

1258 RANDY AND GORDON ENTER CRZ TO DRESS OUT.

1312 SAMPLE 0316-96-0100 PID READING
1.9 ppm bkgd

1325 SAMPLE 0316-96-0158 PID READING
1.9 ppm bkgd

1424 CREW EXITS CRZ - SAMPLING COMPLETE

Russell H Stell

5/31/96

0945 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES, TODAY WE WILL COLLECT TWO EU VERIFICATION SAMPLES AT PRS 16-029 (K) (BLDG. 93).

PID CALIBRATION CHECK:

1252 TAILGATE SAFETY MEETING WAS CONDUCTED.

1258 PETER AND GORDON ENTER CRZ TO DRESS OUT.

1310 SAMPLE 0316-96-0110 PID READING
1.1 ppm bkgd

1320 SAMPLE 0316-96-0111 PID READING
1.3 ppm bkgd.

1358 CREW EXITS CRZ - SAMPLING COMPLETE.

Russell H Abell

6/3/96

0915 PREPARING THE TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL TRY TO COLLECT THE REMAINING FOOTPRINT SCREENING SAMPLES (ALL SUBSURFACE). ALL EIGHTEEN SAMPLES ARE IN PRS 16-017; SIX EACH AT FORMER BLDGS 91, 92, & 93.

0925 PID CALIBRATION CHECK: 100 ppm

0932 RESPONSE CHECKED THE NaI_2 detector for field screening purposes ONLY.

0959 TAILGATE SAFETY MEETING WAS CONDUCTED.

1006 CREW OF RANDY AND GORDON ENTER CRZ TO DRESS OUT.

1027 SAMPLE 0316-96-1151 PID READING
1.8 ppm bkgd

1041 SAMPLE 0316-96-1152 PID READING
RHA 6/3/96 ~~1.8~~ 1.6 ppm bkgd

1058 SAMPLE 0316-96-1153 PID READING
1.6 ppm bkgd

Russell H Abbott

6/3/96

1112 SAMPLE 0316-96-1148 PID READING
1.6 ppm bkgd

1121 SAMPLE 0316-96-1149 PID READING
1.6 ppm bkgd

1126 SAMPLE 0316-96-1150 PID READING
1.5 ppm bkgd

1155 CREW EXITS CRZ TO BREAK FOR LUNCH. WE WILL FINISH THE SAMPLING AFTER LUNCH.

1319 CREW OF RANDY AND MYSELF ENTER CRZ TO DRESS OUT.

1331 SAMPLE 0316-96-1142 PID READING
1.5 ppm bkgd

1344 SAMPLE 0316-96-1143 PID READING
1.5 ppm bkgd

1355 SAMPLE 0316-96-1144 PID READING
1.5 ppm bkgd

Russell H Abey

6/3/96

1409 SAMPLE 0316-96-1145 PID READING
1.6 ppm bkgd

1420 SAMPLE 0316-96-1146 PID READING
1.6 ppm bkgd

1430 SAMPLE 0316-96-1147 PID READING
1.5 ppm bkgd

1445 SAMPLE 0316-96-1166 PID READING
1.5 ppm bkgd

1453 SAMPLE 0316-96-1167 PID READING
1.5 ppm bkgd

1501 SAMPLE 0316-96-1168 PID READING
1.5 ppm bkgd

1511 SAMPLE 0316-96-1169 PID READING
1.5 ppm bkgd

1521 SAMPLE 0316-96-1170 PID READING
1.5 ppm bkgd

Russell A Abel

6/3/94

1530 SAMPLE 0316-96-1171 PID READING
1.5 ppm bkgd

1602 PETER TRIES TO SOURCE CHECK THE HP-260 PROBE FOR THE SAMPLING TEAM TO FRISK OUT. THE INSTRUMENT HAS A MALFUNCTION AND CANNOT BE USED. THE INSTRUMENT READS THAT THE PROBE IS "OUT OF CALIBRATION." HOWEVER, THERE WERE NO ABOVE BACKGROUND READINGS DURING SAMPLING. THE NaI_2 DETECTOR WAS RESPONSE CHECKED AND IS WORKING WELL. THERE IS NO EVIDENCE THAT THE SAMPLING TEAM ENCOUNTERED ANY RAD CONTAMINATION. THE CREW WILL EXIT WITHOUT FRISKING FOR RAD.

1611 CREW EXITS CRZ - SAMPLING COMPLETE.

Russell H. Hall

6/4/96

0935 PREPARING TODAY'S TAILGATE SAFETY MEETING. TODAY WE WILL COLLECT 12 SURFACE EU VERIFICATION SAMPLES. THERE ARE FOUR SAMPLES EACH IN THE LOWER DRAINAGES OF PRS 16-029(q), 16-025(k), AND 16-026(n).

0950 PID CALIBRATION CHECK: 100 ppm

0955 RESPONSE CHECKED THE NaI, DETECTOR FOR FIELD SCREENING PURPOSES ONLY.

1005 TAILGATE SAFETY MEETING WAS CONDUCTED.

1011 RANDY AND GORDON ENTER CRZ TO DRESS OUT.

1030 SAMPLE 0316-96-0116 PID READING
1.6 ppm bkgd

1044 SAMPLE 0316-96-0117 PID READING
1.6 ppm bkgd

1058 SAMPLE 0316-96-0118 PID READING
1.8 ppm bkgd

Russell H Abbott

4/96

1110 SAMPLE 0316-96-0119 PID READING
1.8 ppm bkgd

1133 CREW EXITS CRZ TO BREAK FOR LUNCH.

1303 RANDY AND I ENTER CRZ TO DRESS OUT.

1319 SAMPLE 0316-96-0086 PID READING
1.8 ppm bkgd

1330 SAMPLE 0316-96-0087 PID READING
1.6 ppm bkgd

1337 SAMPLE 0316-96-0088 PID READING
1.8 ppm bkgd

1345 SAMPLE 0316-96-0089 PID READING
1.6 ppm bkgd

1404 SAMPLE 0316-96-0126 PID READING
1.8 ppm bkgd

1415 SAMPLE 0316-96-0127 PID READING
1.8 ppm bkgd

Russell H Abby

6/4/96

1424 SAMPLE 0316-96-0128 PID READING
1.8 ppm bkgd

1439 SAMPLE 0316-96-0129 PID READING
1.6 ppm bkgd

1528 CREW EXITS CRZ - SAMPLING COMPLETE.

Russell H Abell

6/5/94

0920 PID CALIBRATION CHECK: 100 ppm

0925 PREPARING TAILGATE SAFETY MEETING FOR TODAY'S ACTIVITIES. TODAY WE WILL COLLECT 12 SURFACE EU VERIFICATION SAMPLES. FOUR EACH WILL BE COLLECTED IN THE LOWER DRAINAGES OF PRSs 16-026(m), 16-026(o), & 16-026(p).

0930 RESPONSE CHECKED THE NaI_2 DETECTOR FOR FIELD SCREENING PURPOSES.

1013 TAILGATE SAFETY MEETING WAS CONDUCTED

1017 CREW OF RANDY, GORDON, AND I ENTER THE CRZ TO DRESS OUT.

1037 SAMPLE 0316-96-0106 PID READING
2.0 ppm bkgd

1051 SAMPLE 0316-96-0107 PID READING
2.0 ppm bkgd

1102 SAMPLE 0316-96-0109 PID READING
2.0 ppm bkgd

Russell H Abell

100

6/5/96

1110 SAMPLE 0316-96-0708 PID READING
1.8 ppm bkgd

1143 CREWERUTS CRZ, CAMERA BATTERIES DIED, CANNOT
COMPLETE SAMPLING EFFORT PLANNED FOR TODAY.

Russell H Abell

6/6/94

0855 PREPARING TODAY'S TAILGATE SAFETY MEETING: TODAY WE WILL COLLECT 8 SURFACE EU VERIFICATION SAMPLES IN PRS 16-026(m) AND 16-026(o). THIS AFTERNOON WE WILL COLLECT 6 SUBSURFACE EU VERIFICATION SAMPLE IN THE SPOILS PILES: 1 SAMPLE PER BUILDING.

0905 PID CALIBRATION CHECK: ~~100~~ 67 ppm
RWA 6/6/94

0910 RESPONSE CHECKED THE NaI_2 DETECTOR FOR FIELD SCREENING PURPOSES.

0928 TAILGATE MEETING WAS CONDUCTED.

0940 CREW OF RANDY, GORDON, AND PETER ENTER CRZ TO DRESS OUT.

0954 SAMPLE 0316-96-0097 PID READING
1.3 ppm bkgd

1006 SAMPLE 0316-96-0098 PID READING
1.5 ppm bkgd

1018 SAMPLE 0316-96-0099 PID READING
1.3 ppm bkgd

Russell A Abely

6/6/96

1038 SAMPLE 0316-96-0078 PID READING
1.3 ppm bkgd

1051 SAMPLE 0316-96-0079 PID READING
1.2 ppm bkgd

1111 SAMPLE 0316-96-0077 PID READING
1.1 ppm bkgd

1123 SAMPLE 0316-96-0076 PID READING
1.1 ppm bkgd

1140 SAMPLE 0316-96-0096 PID READING
1.2 ppm bkgd

1205 CREW EXITS CRZ - COMPLETED THIS MORNING'S SAMPLING.
WE WILL BREAK FOR LUNCH.

1442 DOE TOUR HAS ARRIVED SO THE SAMPLING CREW
ENTER CRZ TO DRESS OUT. CREW OF RANDY,
GORDON, AND MYSELF WILL COLLECT THE 6
SUBSURFACE EU SAMPLES IN THE SPOILS PILES.

1453 SAMPLE 0316-96-0101 PID READING
1.2 ppm bkgd

Russell H Abell

6/6/96

1502 SAMPLE 0316-96-0093 PID READING
1.3 ppm bkgd

1515 SAMPLE 0316-96-0081 PID READING
1.2 ppm bkgd

1529 SAMPLE 0316-96-0070 PID READING
1.2 ppm bkgd

1539 SAMPLE 0316-96-0112 PID READING
1.2 ppm bkgd

1547 SAMPLE 0316-96-0123 PID READING
1.2 ppm bkgd

1638 CREW EXITS GRZ - SAMPLING COMPLETE

Russell H. Abell

CONTROLLED FIELD LOGBOOK 283

Sample ID prefix:

0316-96- XXXX

NOTE: DTECH ROX AND TNT TESTS ARE NOT CONTROLLED BY LANL-ER-SOPs. THE MANUFACTURE SOPs WILL BE FOLLOWED.

Peter M. Gram
03/06/96

D-Tech Data For RDX and TNT Explosives

Sample # 96-1097 3-7-96 10:45 AM
TNT D-Tech Results = 4 ppb
RDX D-Tech Results = LO

Sample # 96-1098 3-7-96 11:15 AM
TNT D-Tech Results = 10 ppb
RDX D-Tech Results = LO

Sample # 96-1099 3-7-96 12:00 PM (Noon)
TNT D-Tech Results = LO
RDX D-Tech Results = 2 ppb

Sample # 96-1100 3-7-96 12:30 PM
TNT D-Tech Results = LO
RDX D-Tech Results = LO

Sample # 96-1101 3-7-96 12:45 PM
TNT D-Tech Results = 2 ppb
RDX D-Tech Results = 67 ppb (1st Run)
RDX D-Tech Results = Failed on 2nd run to double check the high reading on the 1st run.
A new Bottle #2 was mixed with the liquid from the original soil extraction bottle to verify the results of the 1st run.
RDX D-Tech Results = Hi on the 3rd run at 14:35 PM

L.D. Bazzell 3-7-96

Sample # 96-1526 3-12-96 13:50 PM
TNT D-Tech Results = 0 ppm
RDX D-Tech Results = LO

Sample # 96-1525 3-12-96 14:02 PM
TNT D-Tech Results = LO
RDX D-Tech Results = LO

Sample # 96-1524 3-12-96 14:30 PM
TNT D-Tech Results = LO
RDX D-Tech Results = LO

L. Dwight Bazzell 3-12-96

Sample # 96-1070 3-14-96 1150
TNT D-Tech Results 4%
RDX D-Tech Results LO
Sample # 96-1071 3-14-96 1158
TNT D-Tech Results 3%
RDX D-Tech Results LO%
Sample # 96-1072 3-14-96 1209
TNT D-Tech Results 5%
RDX D-Tech Results LO
Sample # 96-1067 3-14-96 1525
TNT DTech Results 11%
RDX DTech Results LO
Sample # 96-1068 3-14-96 1542
TNT DTech Results 4%
RDX DTech Results LO
Sample # 96-1069 3-14-96 1550
TNT DTech Results 3%
RDX DTech Results LO

Randall Lathrop 3-14-96

4

Sample # 96-1527 3-18-96 2:45 PM

TNT Detech Results = 70 ppb

RDX D-Tech Results = 29 ppb

This was a water sample.

R. Dewright Bazzell 3-18-96

03-20-96 1437

SAMPLE FROM OUTLET OF EAST SUMP BLDG 99 (D&D SAMPLE)

TNT HI

RDX HI

SAMPLE 1064

TNT 40%

RDX HI

SAMPLE 1065

TNT 2%

RDX LO

SAMPLE 1066

TNT 1%

RDX LO

03-20-96 1532

SAMPLE FROM OUTLET OF EAST SUMP BLDG 99 (D&D SAMPLE)

* 1:100 DILUTION

TNT 58% → 300-400 ppm

RDX 59% → 300-450 ppm

SAMPLE 1064

* 1:100 DILUTION

TNT 2% → 50-150 ppm

RDX LO

R Sothusen

Sample # 96-YYYY 3-25-96 11:30 A

TNT D-Tech Results = Ni

RDX D-Tech Results = 7870

From the sump line of the western sump of TA-16, located half way between the sump and main li

Sample # 96-YYYY 12:15-PM

1:100 Dilution

TNT D-Tech Results = 470 = 70 PPM

L. Dewayne Bazzell 3-25-96

Sample # 96-1054

TNT D-Tech Results = 3.70	3-27-96	9:10 AM
RDX D-Tech Results = L0	3-26-96	15:00 PM

Sample # 96-1055

TNT D-Tech Results = 0.70	3-27-96	9:25 AM
RDX D-Tech Results = L0	3-26-96	15:30 PM

Sample # 96-1056

TNT D-Tech Results = 1.70	3-27-96	9:35 AM
RDX D-Tech Results = L0	3-26-96	16:15 PM

The TNT solutions were prepared on 3-26-96 and then run through the checking process on the morning of 3-27-96. There was not sufficient time to complete the process on 3-26-96

L. Dwight Bazzell 3-27-96

Sample #96-1041 3-28-96

TNT D-Tech Results = L0 11:00 AM

RDX D-Tech Results = 190 13:15 PM

Sample #96-1042 3-28-96

TNT D-Tech Results = L0 11:20 AM

RDX D-Tech Results = 690 13:35 PM

Sample #96-1043 3-28-96 11:42 AM

TNT D-Tech Results = L0 11:42 AM

RDX D-Tech Results = L0 13:55 PM

Sample #96-1044 3-28-96

TNT D-Tech Results = 390 11:50 AM

RDX D-Tech Results = L0 14:17 PM

Sample #96-1045 3-28-96

TNT D-Tech Results = L0 12:05 P

RDX D-Tech Results = L0 14:29 P

Sample #96-1046 3-28-96

TNT D-Tech Results = 590 12:10 P

RDX D-Tech Results = L0 14:35 P

Sample #96-1047 3-28-96

TNT D-Tech Results = 490 12:40 PM

RDX D-Tech Results = L0 14:55 PM

Lin Bazzell
3-28-96

Sample #96-1048 3-29-96
TNT D-Tech Results = 2 ppb 12:10 PM
RDX D-Tech Results = Lo 12:15 PM

Sample # 96-1049 3-29-96
TNT D-Tech Results = 1 ppb 12:20 PM
RDX D-Tech Results = Lo 12:16 PM

Sample # 96-1050 3-29-96
TNT D-Tech Results = Lo 12:30 PM
RDX D-Tech Results = Lo 12:17 PM

Sample # 96-1051 3-29-96
TNT D-Tech Results = 5 ppb 12:55 PM
RDX D-Tech Results = Lo 12:18 PM

Sample # 96-1052 3-29-96
TNT D-Tech Results = 1 ppb 12:50 PM
RDX D-Tech Results = Lo 12:19 PM

Sample # 96-1053 3-29-96
TNT D-Tech Results = 3 ppb 13:05 PM
RDX D-Tech Results = Hi 12:20 PM
First check of RDX was at 10 min after mixing with the reagent, At 11 min and 12 min it still checked Hi. At 15 min it checked 79 ppb

T. Dwight Bazzell 3-29-96

Sample # 96-1517 4-1-96

TNT D-Tech Results = 2 ppb 12:50 PM

RDX D-Tech Results = 2 ppb 11:50 AM

Sample # 96-1518 4-1-96

TNT D-Tech Results = 2 ppb 12:52 PM

RDX D-Tech Results = L0 11:52 AM

Sample # 96-1519 4-1-96

TNT D-Tech Results = D ppb 12:54 PM

RDX D-Tech Results = L0 11:54 AM

Sample # 96-1520 4-1-96

TNT D-Tech Results = 3 ppb 12:56 PM

RDX D-Tech Results = L0 11:56 AM

L. Dwight Bazzell 4-1-96

Sample # 96-1179 ~~North~~ West 04-02-96 1530

RDX D-Tech Results = 4%

Sample # 96-1180 South

RDX D Tech Results = 33%

Sample #96-1181 East

RDX D Tech Results = LO

Sample #96-1178 North

RDX D-Tech Results = LO

Sample #96-1079

RDX D-Tech Results = 23%

Rejected A-0296

Sample #96-1080 04-03-96 09AS
RDX D-Tech Results = LO ~~IND~~
Sample #96-1081
RDX Results = HI
Sample #96-1082
RDX Results = 26%
Sample #96-1083
RDX Results = LO
Sample #96-1084
RDX Results = LO

Sample # 96-1079 4-3-96 11:21 A
TNT D-Tech Results = 470

Sample # 96-1080 4-3-96 11:42
TNT D-Tech Results = 390

Sample # 96-1081 4-3-96 12:01 P
TNT D-Tech Results = Hi

Sample # 96-1082 4-3-96 12:23
TNT D-Tech Results = 470

Sample # 96-1083 4-3-96 12:4
TNT D-Tech Results = 390

L. Marty W Bazzell 4-3-96

Sample # 96-1084 4-3-96 12:45 PM
TNT D-Tech Results = L.O

Sample # 96-1178 4-3-96 2:11 PM
TNT D-Tech Results = 0.90

Sample # 96-1179 4-3-96 2:13 PM
TNT D-Tech Results = L.O

Sample # 96-1180 4-3-96 2:34 PM
TNT D-Tech Results = 0.90

Sample # 96-1181 4-3-9 2:37 PM
TNT D-Tech Results = L.O

(96-1528)
SAMPLE #1528 04-05-96

RDX D-TECH RESULTS = H1 TIME 0947

TNT D-TECH RESULTS = H1 TIME 1015

SAMPLE #96-1010 SECOND RUN QA #96-1010

RDX = H1 RDX = H1

TNT = H1

SAMPLE #96-1011

RDX = 66%

TNT = 12%

SAMPLE #96-1012

RDX = 36%

TNT = 22%

SAMPLE #96-1013

RDX = 57%

TNT = 8%

SAMPLE #96-1014

RDX = H1

TNT = 20%

SAMPLE #96-1015

RDX = LO

TNT = 6%

R Sattison

Sample # 96-1016 4-5-96
TNT D-Tech Results = 490 2:00 PM
RDX D-Tech Results = L0 1:05 PM

Sample # 96-1017 4-5-96
TNT D-Tech Results = 390 2:01 PM
RDX D-Tech Results = L0 1:07 PM

Sample # 96-1018 4-5-96
TNT D-Tech Results = 290 2:02 PM
RDX D-Tech Results = L0 1:08 PM

Sample # 96-1019 4-5-96
TNT D-Tech Results = 490 2:03 PM
RDX D-Tech Results = L0 1:09 PM

Sample # 96-1521 4-5-96
TNT D-Tech Results = 490 2:10 PM
RDX D-Tech Results = L0 1:26 PM

Sample # 96-1522 4-5-96
TNT D-Tech Results = 290 2:11 PM
RDX D-Tech Results = L0 1:28 PM

Sample # 96-1523 4-5-96
TNT D-Tech Results = 390 2:15 PM
RDX D-Tech Results = L0 1:30 PM

L. Dwight Bazzell 4-5-96

Sample # 96-1000 4-9-96
TNT D-Tech Results = 1ppb 10:25 A
RDX D-Tech Results = <1 10:55 AM

Sample # 96-1001 4-9-96
TNT D-Tech Results = 1ppb 10:26 AM
RDX D-Tech Results = 4ppb 10:56 AM

Sample # 96-1002 4-9-96
TNT D-Tech Results = 1ppb 10:27 A
RDX D-Tech Results = <1 11:05 A

Sample # 96-1003 4-9-96
TNT D-Tech Results = 0ppb 10:28 A
RDX D-Tech Results = 1ppb 10:57 A

Sample # 96-1004 4-9-96
TNT D-Tech Results = <1 2:06 PM
RDX D-Tech Results = 6ppb 2:33 PM

Sample # 96-1005 4-9-96
TNT D-Tech Results = <1 2:07 P
RDX D-Tech Results = <1 2:34 PM

Sample # 96-1073 4-9-96
TNT D-Tech Results = 0ppb 2:08 PM
RDX D-Tech Results = <1 2:35 PM

L. Dwight Russell 4-9-96

Sample # 96-1074 4-9-96
TNT D-Tech Results = L0 2:09 PM
RDX D-Tech Results = L0 2:36 PM

Sample # 96-1075 4-9-96
TNT D-Tech Results = 290 2:57 PM
RDX D-Tech Results = L0 3:12 PM

Sample # 96-1076 4-9-96
TNT D-Tech Results = 090 2:58 PM
RDX D-Tech Results = L0 3:15 PM

Sample # 96-1077 4-9-96
TNT D-Tech Results = 190 2:59 PM
RDX D-Tech Results = L0 3:16 PM

Sample # 96-1078 4-9-96
TNT D-Tech Results = 190 3:00 PM
RDX D-Tech Results = 6190 3:17 PM

L. Wright Bassell 4-9-96

Sample # 96-1085 4-15-96

TNT D-Tech Results = 5ppb 2:45PM

RDX D-Tech Results = 13ppb 2:11 PM

Sample # 96-1086 4-15-96

TNT D-Tech Results = 5ppb 2:46 PM

RDX D-Tech Results = 2c 2:12 PM

Sample # 96-1087 4-15-96

TNT D-Tech Results = Hi 2:47PM

RDX D-Tech Results = Hi 2:13PM

Sample # 96-1088 4-15-96

TNT D-Tech Results = 6ppb 2:48PM

RDX D-Tech Results = 0ppb 2:14PM

Sample # 96-1089 4-15-96

TNT D-Tech Results = 20ppb 2:49PM

RDX D-Tech Results = 12ppb 2:15PM

Sample # 96-1090 4-15-96

TNT D-Tech Results = 7ppb 2:50PM

RDX D-Tech Results = Hi 2:16PM

L. Dwight Bazzell 4-15-96

Sample # 96-1006 4-16-96

TNT D-Tech Results = 100 12:30 PM

RDX D-Tech Results = L0 12:34 PM

Sample # 96-1007 4-16-96

TNT D-Tech Results = 100 12:31 PM

RDX D-Tech Results = L0 12:35 PM

Sample # 96-1008 4-16-96

TNT D-Tech Results = 100 12:32 PM

RDX D-Tech Results = L0 12:36 PM

Sample # 96-1009 4-16-96

TNT D-Tech Results = 100 12:33 PM

RDX D-Tech Results = L0 12:37 PM

L. Dwight Bazzell 4-16-96

Sample # 96-1182 4-18-96
TNT D-Tech Results = 1 ppb 1:02 PM
RDX D-Tech Results = L0 12:42 PM

Sample # 96-1183 4-18-96
TNT D-Tech Results = L0 1:03 PM
RDX D-Tech Results = L0 12:41 PM

Sample # 96-1184 4-18-96
TNT D-Tech Results = 6 ppb 1:05 PM
RDX D-Tech Results = 35 ppb 12:40 P

Sample # 96-1185 4-18-96
TNT D-Tech Results = 3 ppb 1:05 P
RDX D-Tech Results = 10 ppb 12:39 P

Sample # 96-1186 4-18-96
TNT D-Tech Results = 3 ppb 3:07
RDX D-Tech Results = 12 ppb 2:39

Sample # 96-1187 4-18-96
TNT D-Tech Results = 3 ppb 3:07
RDX D-Tech Results = 10 ppb 2:39

Sample # 96-1188 4-18-96
TNT D-Tech Results = 3 ppb 3:08
RDX D-Tech Results = L0 2:4

Sample # 96-1189 4-18-96

INT D-Tech Results = 1 ppb 3:09 PM

RDX D-Tech Results = <0 2:42 PM

L. Haverty Barrell 4-18-96

Sample # 96-1190 4-19-96

INT D-Tech Results = 15 ppb 9:59 AM

RDX D-Tech Results = 57 ppb 10:03 AM

Sample # 96-1191 4-19-96

INT D-Tech Results = 4 ppb 9:59 AM

RDX D-Tech Results = <0 10:03 AM

Sample # 96-1192 4-19-96

INT D-Tech Results = 6 ppb 10:00 AM

RDX D-Tech Results = 42 ppb 10:04 AM

Sample # 96-1193 4-19-96

INT D-Tech Results = 6 ppb 10:01 AM

RDX D-Tech Results = 7 ppb 10:04 AM

Sample # 96-1194 4-19-96

INT D-Tech Results = Hi 10:45 AM

RDX D-Tech Results = Hi 10:43 AM

Sample # 96-1195 4-19-96

INT D-Tech Results = Hi 10:46 AM

RDX D-Tech Results = Hi 10:43 AM

L. Haverty Barrell 4-19-96

Sample # 96-1196 4-19-96
TNT D-Tech Results = 58 ppb 10:46 A.
RDX D-Tech Results = 79 ppb 10:44 A.

Sample # 96-1197 4-19-96
TNT D-Tech Results = Hi 10:47 A
RDX D-Tech Results = Hi 10:44 A

Sample # 96-1198 4-19-96
TNT D-Tech Results = 13 ppb 11:32 A
RDX D-Tech Results = Hi 11:29 A

Sample # 96-1199 4-19-96
TNT D-Tech Results = 14 ppb 11:32
RDX D-Tech Results = 44 ppb 11:30 A

Sample # 96-1200 4-19-96
TNT D-Tech Results = 14 ppb 11:33 A
RDX D-Tech Results = 53 ppb 11:30 A

Sample # 96-1201 4-19-96
TNT D-Tech Results = 10 ppb 11:33 A
RDX D-Tech Results = Lo 11:31 A

L. Dwight Bazzell 4-19-96

Sample # 96-1091 4-22-96
TNT D-Tech Results = 2 ppb 1:47 PM
RDX D-Tech Results = L0 1:21 PM

Sample # 96-1092 4-22-96
TNT D-Tech Results = 6 ppb 1:47 PM
RDX D-Tech Results = 0 ppb 1:21 PM

Sample # 96-1093 4-22-96
TNT D-Tech Results = 5 ppb 1:48 PM
RDX D-Tech Results = 24 ppb 1:22 PM

Sample # 96-1094 4-22-96
TNT D-Tech Results = 2 ppb 1:48 PM
RDX D-Tech Results = L0 1:22 PM

Sample # 96-1095 4-22-96
TNT D-Tech Results = 3 ppb 1:48 PM
RDX D-Tech Results = 0 ppb 1:23 PM

Sample # 96-1096 4-22-96
TNT D-Tech Results = 4 ppb 4-23-96 9:05 AM
RDX D-Tech Results = L0 1:24 PM

L Dwight Buzzell 4-23-96

Sample # 96-1057 4-24-96

TNT D-Tech Results = 4 ppb 2:29 PM

RDX D-Tech Results = <1 2:01 PM

Sample # 96-1058 4-24-96

TNT D-Tech Results = 1 ppb 2:29 PM

RDX D-Tech Results = <1 2:02 PM

Sample # 96-1059 4-24-96

TNT D-Tech Results = 0 ppb 2:30 PM

RDX D-Tech Results = <1 2:02 PM

Sample # 96-1060 4-24-96

TNT D-Tech Results = 4 ppb 2:30 PM

RDX D-Tech Results = 19 ppb 2:03 PM

Sample # 96-1061 4-24-96

TNT D-Tech Results = 5 ppb 2:31 PM

RDX D-Tech Results = 12 ppb 2:03 PM

Sample # 96-1062 4-24-96

TNT D-Tech Results = 2 ppb 2:31 PM

RDX D-Tech Results = 6 ppb 2:04 PM

Sample # 96-1063 4-24-96

TNT D-Tech Results = 1 ppb 2:32 PM

RDX D-Tech Results = 0 ppb 2:04 PM

[illegible] 4-24-96

Sample # 96-1027 4-24-96

TNT D-Tech Results = L0 3:41 PM

RDX D-Tech Results = L0 3:18 PM

Sample # 96-1028 4-24-96

TNT D-Tech Results = L0 3:42 PM

RDX D-Tech Results = 5 ppb 3:18 PM

Sample # 96-1029 4-24-96

TNT D-Tech Results = 1 ppb 3:42 PM

RDX D-Tech Results = 0 ppb 3:18 PM

Sample # 96-1036 4-24-96

TNT D-Tech Results = 1 ppb 3:42 PM

RDX D-Tech Results = 64 ppb 3:19 PM

Sample # 96-1037 4-24-96

TNT D-Tech Results = 1 ppb 3:43 PM

RDX D-Tech Results = 57 ppb 3:19 PM

Sample # 96-1038 4-24-96

TNT D-Tech Results = L0 3:44 PM

RDX D-Tech Results = 0 ppb 3:20 PM

Sample # 96-1039 4-24-96

TNT D-Tech Results = 0 ppb 3:44 PM

RDX D-Tech Results = 8 ppb 3:20 PM

Darrell Beard 3-24-96

Sample # 96-1172 4-26-96
TNT D-Tech Results = L0 8:55 AM
RDX D-Tech Results = L0 8:50 AM

Sample # 96-1173 4-26-96
TNT D-Tech Results = L0 8:55 AM
RDX D-Tech Results = L0 8:51 AM

Sample # 96-1174 4-26-96
TNT D-Tech Results = L0 8:56 AM
RDX D-Tech Results = L0 8:51 AM

Sample # 96-1175 4-26-96
TNT D-Tech Results = L0 8:56 AM
RDX D-Tech Results = L0 8:51 AM

Sample # 96-1176 4-26-96
TNT D-Tech Results = L0 9:33 AM
RDX D-Tech Results = L0 9:30 AM

Sample # 96-1177 4-26-96
TNT D-Tech Results = L0 9:34 AM
RDX D-Tech Results = L0 9:31 AM

Sample # 96-1531 4-26-96
TNT D-Tech Results = 290 9:34 AM
RDX D-Tech Results = L0 9:31 AM

L. Dwight Bazell 4-26-96

Sample # 96-1532 4-26-96

TNT D-Tech Results = Lo 9:34 AM

RDX D-Tech Results = Lo 9:32 AM

Sample # 96-1206 4-26-96

TNT D-Tech Results = 290 10:34 AM

RDX D-Tech Results = Lo 10:36 AM

Sample # 96-1207 4-26-96

TNT D-Tech Results = 390 10:35 AM

RDX D-Tech Results = Hi 10:37 AM

Sample # 96-1208 4-26-94

TNT D-Tech Results = 390 11:46 AM

RDX D-Tech Results = Lo 11:50 AM

Sample # 96-1209 4-26-94

TNT D-Tech Results = 290 10:35 AM

RDX D-Tech Results = Lo 10:37 AM

L. Newy M. Bazzell 4-26-96

Sample # 96-1202 4-29-96
TNT D-Tech Results = Hi
RDX D-Tech Results = Hi

Sample # 96-1203 4-29-96
TNT D-Tech Results = Hi
RDX D-Tech Results = Hi

Sample # 96-1204 4-29-96
TNT D-Tech Results = 47 ppb
RDX D-Tech Results = 15 ppb

Sample # 96-1205 4-29-96
TNT D-Tech Results = Hi
RDX D-Tech Results = 78 ppb

Sample # 96-1210 4-29-96
TNT D-Tech Results = Lo
RDX D-Tech Results = Lo

Sample # 96-1211 4-29-96
TNT D-Tech Results = 10 ppb
RDX D-Tech Results = 36 ppb

L. Dwight Bazzell 4-29-96

Sample # 96-1212 4-29-96
TNT D-Tech Results = 13 ppb
RDX D-Tech Results = <LO

Sample # 96-1213 4-29-96
TNT D-Tech Results = 1 ppb
RDX D-Tech Results = 16 ppb

L. Wayne M. Bazzell 4-29-96

Sample # 96-1469 4-30-96

TNT D-Tech Results = Lo 10:25 AM

RDX D-Tech Results = 60 ppb 10:35 AM

Sample # 96-1529 4-30-96

TNT D-Tech Results = 1 ppb 10:27 AM

RDX D-Tech Results = 70 ppb 10:35 AM

Sample # 96-1530 4-30-96

TNT D-Tech Results = 1 ppb 10:27 AM

RDX D-Tech Results = Lo 10:36 AM

L Dwight Bazell 4-30-96

Sample # 96-1033 5-1-96

TNT D-Tech Results = 7000 9:36 AM

RDX D-Tech Results = Hi 9:37 AM

Sample # 96-1034 5-1-96

TNT D-Tech Results = 40 ppb 9:36 AM

RDX D-Tech Results = 41 ppb 9:38 AM

Sample # 96-1035 5-1-96

TNT D-Tech Results = 0 ppb 9:37 AM

RDX D-Tech Results = 2 ppb 9:38 AM

Sample # 96-0144 5-1-96

TNT D-Tech Results = 51 ppb 10:48 AM

RDX D-Tech Results = Hi 10:51 AM

Sample # PE-1 5-1-96

TNT D-Tech Results = Hi 12:43 PM

RDX D-Tech Results = Hi 12:47 PM

L. Dwight Bazzell 5-1-96

Sample # 96-1214 5-2-96
TNT D-Tech Results = 21 ppb 11:00 AM
RDX D-Tech Results = <1 10:47 AM

Sample # 96-1215 5-2-96
TNT D-Tech Results = 18 ppb 11:00 AM
RDX D-Tech Results = <1 10:48 AM

Sample # 96-1216 5-2-96
TNT D-Tech Results = 18 ppb 11:01 AM
RDX D-Tech Results = 2 ppb 10:48 AM

Sample # 96-1217 5-2-96
TNT D-Tech Results = 1 ppb 11:01 AM
RDX D-Tech Results = <1 10:49 AM

Sample # 96-1218 5-2-96
TNT D-Tech Results = 2 ppb 11:33 AM
RDX D-Tech Results = <1 11:39 AM

Sample # 96-1219 5-2-96
TNT D-Tech Results = 1 ppb 11:33 AM
RDX D-Tech Results = 28 ppb 11:39 AM

Sample # 96-1220 5-2-96
TNT D-Tech Results = 2 ppb 11:33 AM
RDX D-Tech Results = 1 ppb 11:40 AM

Dwight Barrell 5-2-96

Sample # 96-1221 5-2-96

INT D-Tech Results = 1290 11:34 AM

RDK D-Tech Results = 2690 11:41 AM

Robert Wright Bazzell 5-2-96

Sample # 96-1154 5-3-96
TNT D-Tech Results = L0 11:31 AM
RDX D-Tech Results = L0 10:47 AM

Sample # 96-1155 5-3-96
TNT D-Tech Results = 0 ppb 11:31 AM
RDX D-Tech Results = L0 10:48 AM

Sample # 96-1156 5-3-96
TNT D-Tech Results = L0 11:31 AM
RDX D-Tech Results = L0 10:48 AM

Sample # 96-1157 5-3-96
TNT D-Tech Results = L0 11:32 AM
RDX D-Tech Results = 4 ppb 10:48 AM

Sample # 96-1158 5-3-96
TNT D-Tech Results = L0 11:32 AM
RDX D-Tech Results = 7 ppb 10:49 AM

Sample # 96-1159 5-3-96
TNT D-Tech Results = L0 11:33 AM
RDX D-Tech Results = L0 10:49 AM

L. Marigth Burrell 5-3-96

Sample # 96-1222 5-6-96

TNT D-Tech Results = L0 3:14 PM

RDX D-Tech Results = L0 3:34 PM

Sample # 96-1223 5-6-96

TNT D-Tech Results = 570 3:14 PM

RDX D-Tech Results = L0 3:34 PM

Sample # 96-1224 5-6-96

TNT D-Tech Results = 870 3:15 PM

RDX D-Tech Results = L0 3:35 PM

Sample # 96-1225 5-6-96

TNT D-Tech Results = L0 3:15 PM

RDX D-Tech Results = L0 3:35 PM

L. Dwight Bazzell 5-6-96

Sample # PE-2 5-7-96

TNT D-Tech Results = Hi 9:13 AM

RDX D-Tech Results = Hi 9:28 AM

Sample # PE-3 5-7-96

TNT D-Tech Results = 5300 3:33 PM

RDX D-Tech Results = Hi 3:36 PM

L. Dwight Bussell 5-7-96

Sample # PE-4 5-8-96
TNT D-Tech Results = Not Required
RDX D-Tech Results = Hi 11:28AM

Sample # PE-5 5-8-96
TNT D-Tech Results = Not Required
RDX D-Tech Results = Hi 12:22 PM

Sample # 96-1160 5-8-96
TNT D-Tech Results = Lo 1:51 PM
RDX D-Tech Results = Lo 3:12 PM

Sample # 96-1161 5-8-96
TNT D-Tech Results = Lo 1:51 PM
RDX D-Tech Results = Lo 3:12 PM

Sample # 96-1162 5-8-96
TNT D-Tech Results = Lo 1:51 PM
RDX D-Tech Results = Lo 3:12 PM

Sample # 96-1163 5-8-96
TNT D-Tech Results = Lo 1:52 PM
RDX D-Tech Results = 0.70 3:13 PM

Sample # 96-1164 5-8-96
TNT D-Tech Results = Lo 1:52 PM
RDX D-Tech Results = Lo 3:13 PM
Lillewright Barrett 5-8-96

Sample # 96-1165 5-8-96

TNT D-Tech Results = Lo 1:53 PM

RDX D-Tech Results = Lo 3:14 PM

Sample # PE-6 5-8-96

TNT D-Tech Results = NOT Required

RDX D-Tech Results = Hi 2:45 PM

C. Dwight Bazzell 5-8-96

Sample # 96-89A 5-10-96

TNT D-Tech Results = L0 11:16 AM

RDX D-Tech Results = L0 11:53 AM

Sample # 96-89B 5-10-96

TNT D-Tech Results = L0 11:16 AM

RDX D-Tech Results = L0 11:54 AM

Sample # 96-89C 5-10-96

TNT D-Tech Results = L0 11:16 AM

RDX D-Tech Results = L0 11:54 AM

Sample # 96-89D 5-10-96

TNT D-Tech Results = 28 ppb 11:17 AM

RDX D-Tech Results = 59 ppb 11:55 AM

Sample # 96-89E 5-10-96

TNT D-Tech Results = L0 11:17 AM

RDX D-Tech Results = L0 11:55 AM

Sample # 96-89F 5-10-96

TNT D-Tech Results = 67 ppb 11:18 AM

RDX D-Tech Results = 46 ppb 11:56 AM

Sample # 96-89G 5-10-96

TNT D-Tech Results = L0 11:18 AM

RDX D-Tech Results = 12 ppb L. Dwight Bazell 5-10-96 11:56 AM

Sample # 96-90A 5-10-96
TNT D-Tech Results = Hi 2:35 PM
RDX D-Tech Results = 26 ppb 3:07 PM

Sample # 96-90B 5-10-96
TNT D-Tech Results = Hi 2:36 PM
RDX D-Tech Results = Hi 3:08 PM

Sample # 96-90C 5-10-96
TNT D-Tech Results = Hi 2:36 PM
RDX D-Tech Results = Hi 3:08 PM

Sample # 96-90D 5-10-96
TNT D-Tech Results = <10 2:37 PM
RDX D-Tech Results = 5 ppb 3:08 PM

Sample # 96-90E 5-10-96
TNT D-Tech Results = <10 2:38 PM
RDX D-Tech Results = <10 3:09 PM

Sample # 96-90F 5-10-96
TNT D-Tech Results = <10 2:38 PM
RDX D-Tech Results = <10 3:09 PM

Sample # 96-90G 5-10-96
TNT D-Tech Results = <10 2:38 PM
RDX D-Tech Results = 9 ppb 3:09 PM
L. Dwight Bazzell 5-10-96

Sample # 96-91A 5-13-96
TNT D-Tech Results = L0 11:38 AM
RDX D-Tech Results = 1 ppb 12:18 PM

Sample # 96-91B 5-13-96
TNT D-Tech Results = 3 ppb 11:38 AM
RDX D-Tech Results = 54 ppb 12:18 PM

Sample # 96-91C 5-13-96
TNT D-Tech Results = L0 11:38 AM
RDX D-Tech Results = 2 ppb 12:18 PM

Sample # 96-91D 5-13-96
TNT D-Tech Results = L0 11:39 AM
RDX D-Tech Results = 10 ppb 12:19 PM

Sample # 96-91E 5-13-96
TNT D-Tech Results = L0 11:39 AM
RDX D-Tech Results = 12 ppb 12:20 PM

Sample # 96-91F 5-13-96
TNT D-Tech Results = 4 ppb 11:39 AM
RDX D-Tech Results = 3 ppb 12:20 PM

Sample # 96-91G 5-13-96
TNT D-Tech Results = L0 11:40 AM
RDX D-Tech Results = L0 12:20 PM

[illegible] 5-13-96

Sample # 96-1471 5-13-96

THT D-Tech Results = 14 ng 2:03 PM

RDX D-Tech Results = 33 ng 2:04 PM

Sample # 96-1472 5-13-96

THT D-Tech Results = 7 ng 2:03 PM

RDX D-Tech Results = 9 ng 2:05 PM

L Wentworth Burrell 5-13-96

Sample # 96-92A 5-14-96
TNT D-Tech Results = <0 9:49 AM
RDX D-Tech Results = 6ppb 1:39 PM

Sample # 96-92B 5-14-96
TNT D-Tech Results = <0 9:49 AM
RDX D-Tech Results = 6ppb 1:39 PM

Sample # 96-92C 5-14-96
TNT D-Tech Results = <0 9:49 AM
RDX D-Tech Results = 2ppb 1:40 PM

Sample # 96-92D 5-14-96
TNT D-Tech Results = <0 9:50 AM
RDX D-Tech Results = 2ppb 1:40 PM

Sample # 96-92E 5-14-96
TNT D-Tech Results = <0 9:50 AM
RDX D-Tech Results = <0 1:40 PM

Sample # 96-92F 5-14-96
TNT D-Tech Results = <0 9:50 AM
RDX D-Tech Results = <0 1:41 PM

Sample # 96-92G 5-14-96
TNT D-Tech Results = <0 9:50 AM
RDX D-Tech Results = 7ppb 1:41 PM
L Dewight Bazell 5-14-96

Sample # 96-PE-7 5-14-96
TNT D-Tech Results: NrT required
RDX D-Tech Results: 7490 11:59 AM

Sample # 1470 5-14-96
TNT Results = LO
RDX Results = LO
Sample # 1471 5-14-96
TNT D-Tech Results = 7%
RDX D-Tech Results = 9%
Sample # 1472 5-14-96
TNT D-Tech Results = LO
RDX D-Tech Results = LO
Sample # 1473 5-14-96
TNT D-Tech Results = LO
RDX D-Tech Results = LO
Sample # 1474 5-14-96
TNT D-Tech Results = 3%
RDX D-Tech Results = 14%
Sample # 1475 5-14-96
TNT D-Tech Results = LO
RDX D-Tech Results = LO
Sample # 1476 5-14-96
TNT - D-Tech Results = LO
RDX D-Tech Results = LO
Sample # 1477 5-14-96
TNT D-Tech = LO RDX Tech = LO
L Dwight Bazzell 5-14-96

Sample # 96-PE-8 5-15-96 (RDX Soil Sample)
TNT D-Tech Results = NOT Required
RDX D-Tech Results = 71 ppb 10:56 AM

Sample # 96-PE-9 5-15-96 (TNT Soil Sample)
TNT D-Tech Results = Hi 11:00 AM
RDX D-Tech Results = NOT Required

Sample # 96-93 A 5-15-96
TNT D-Tech Results = <0 12:10 PM
RDX D-Tech Results = 10 ppb 12:44 PM

Sample # 96-93 B 5-15-96
TNT D-Tech Results = <0 12:10 PM
RDX D-Tech Results = 9 ppb 12:44 PM

Sample # 96-93 C 5-15-96
TNT D-Tech Results = <0 12:10 PM
RDX D-Tech Results = 7 ppb 12:45 PM

Sample # 96-93 D 5-15-96
TNT D-Tech Results = <0 12:11 PM
RDX D-Tech Results = 14 ppb 12:46 PM

Sample # 96-93 E 5-15-96
TNT D-Tech Results = <0 12:11 PM
RDX D-Tech Results = <0 12:48 PM
L. Dewight Bazzell 5-15-96

Sample # 96-93E 5-15-96
TNT D-Tech Results = Lo 12:11 PM
RDX D-Tech Results = Lo 12:48 PM

Sample # 96-93G 5-15-96
TNT D-Tech Results = Lo 12:12 PM
RDX D-Tech Results = Lo 12:49 PM

Sample # 96-PE-10 5-15-96 (RDX Soil Sample)
TNT D-Tech Results = Lo 2:08 PM
RDX D-Tech Results = NOT Required

Sample # 96-PE-11 5-15-96
TNT D-Tech Results = Lo 2:43 PM
RDX D-Tech Results = NOT Required

Sample # 96-99A 5-15-96
TNT D-Tech Results = Lo 3:10 PM
RDX D-Tech Results = 20 ppb 3:37 PM

Sample # 96-99B 5-15-96
TNT D-Tech Results = Lo 3:11 PM
RDX D-Tech Results = 1 ppb 3:38 PM

Sample # 96-99C 5-15-96
TNT D-Tech Results = Hi 3:11 PM
RDX D-Tech Results = Hi 3:38 PM
L Alexis W Barzell 5-15-96

Sample # 96-99 D 5-15-96

TNT D-Tech Results = L0 3:11 PM

RDX D-Tech Results = 13 ppb 3:39 PM

Sample # 96-99 E 5-15-96

TNT D-Tech Results = L0 3:12 PM

RDX D-Tech Results = L0 3:39 PM

Sample # 96-99 F 5-15-96

TNT D-Tech Results = L0 3:12 PM

RDX D-Tech Results = 4 ppb 3:39 PM

Sample # 96-99 G 5-15-96

TNT D-Tech Results = L0 3:12 PM

RDX D-Tech Results = 3 ppb 3:40 PM

L. Dwight Bazzell 5-15-96

Sample # 96-PE-12 5-16-96
TNT D-Tech Results = L0 12:14 PM
RDX D-Tech Results = NOT Required

Sample # 96-1024 5-16-96
TNT D-Tech Results = L0 2:58 PM
RDX D-Tech Results = 13 ng 3:25 PM

Sample # 96-1025 5-16-96
TNT D-Tech Results = L0 2:58 PM
RDX D-Tech Results = L0 3:25 PM

Sample # 96-1026 5-16-96
TNT D-Tech Results = L0 2:59 PM
RDX D-Tech Results = 17 ng 3:25 PM

Sample # 96-1030 5-16-96
TNT D-Tech Results = L0 2:59 PM
RDX D-Tech Results = L0 3:26 PM

Sample # 96-1031 5-16-96
TNT D-Tech Results = L0 2:59 PM
RDX D-Tech Results = 8 ng 3:26 PM

Sample # 96-1032 5-16-96
RDX D-Tech Results = 74 ng 3:26 PM
TNT D-Tech Results = Hi 3:00 PM
T. Dwight Bazell 5-16-96

Sample # 96-1226 5-21-96
TNT D-Tech Results = Hi 9:20AM
RDX D-Tech Results = 29 ppb 9:28AM

Sample # 96-1227 5-21-96
TNT D-Tech Results = Hi 9:20AM
RDX D-Tech Results = Hi 9:28AM

Sample # 96-1228 5-21-96
TNT D-Tech Results = 11 ppb 9:21AM
RDX D-Tech Results = 5 ppb 9:29AM

Sample # 96-1229 5-21-96
TNT D-Tech Results = 2 ppb 9:21AM
RDX D-Tech Results = 2 ppb 9:21AM

Sample # 96-PE-13 5-21-96
TNT D-Tech Results = 50 ppb 9:23AM
RDX D-Tech Results = NOT Required

Sample # 96-PE-14 5-21-96
TNT D-Tech Results = NOT Required
RDX D-Tech Results = 69 ppb 10:21AM

L. Dwight Bazzell 5-21-96

Sample # 0316-96-1478 5-22-96
TNT Detech Results - 23%
RDX D-Tech Results - LO
Sample # 0316-96-1479 5-22-96
TNT D-Tech Results - 6%
RDX D-Tech Results - 36%

Sample # PE-TNT 5-22-96
TNT D-Tech Results = Hi 11:20 AM

Sample # PE-RDX 5-22-96
RDX D-Tech Results = Hi 11:22 AM

Sample # PE-TNT 5-22-96
TNT D-Tech Results = 60% 1:48 PM

Sample # PE-RDX 5-22-96
RDX D-Tech Results = 78% 1:50 PM

L. Dwight Bazzell 5-22-96

Sample # PE-INT 5-23-96

INT D-Tech Results = 22 ppm 9:53 AM

Sample # PE-RDX 5-23-96

RDX D-Tech Results = ~~Hi~~ RLS 5-23-96 7800 10:07 AM

Sample # 96-1020 5-23-96

INT D-Tech Results = 54 ppm 10:41 AM

RDX D-Tech Results = 27 ppm 11:13 AM

Sample # 96-1021 5-23-96

INT D-Tech Results = 60 ppm 10:41 AM

RDX D-Tech Results = 32 ppm 11:14 AM

Sample # 96-1022 5-23-96

INT D-Tech Results = 52 ppm 10:42 AM

RDX D-Tech Results = 34 ppm 11:14 AM

Sample # 96-1023 5-23-96

INT D-Tech Results = Hi 10:42 AM

RDX D-Tech Results = Hi 11:14 AM

Sample # 96-1230 5-23-96

INT D-Tech Results = 18 ppm 10:43 AM

RDX D-Tech Results = 54 ppm 11:15 AM

Sample # 96-1231 5-23-96

INT D-Tech Results = 1 ppm 10:43 AM

RDX D-Tech Results = 21 ppm [signature] 5-23-96 11:15 AM

Sample # PE-TNT 5-24-96
TNT D-Tech Results = 22 ppb 9:44 AM

Sample # PE-RDX 5-24-96
RDX D-Tech Results = 77 ppb 9:49 AM

Sample # 96-1232 5-24-96
TNT D-Tech Results = Hi 12:23 PM
RDX D-Tech Results = 78 ppb 12:34 PM

Sample # 96-1233 5-24-96
TNT D-Tech Results = Lo 12:23 PM
RDX D-Tech Results = 21 ppb 12:35 PM

Sample # 96-1234 5-24-96
TNT D-Tech Results = Hi 12:23 PM
RDX D-Tech Results = Hi 12:35 PM

Sample # 96-1235 5-24-96
TNT D-Tech Results = 41 ppb 12:24 PM
RDX D-Tech Results = 12 ppb 12:35 PM

L. Dwight Brazell 5-24-96

Sample # PE-TNT 5-29-96
TNT D-Tech Results = 7490 10:02 AM

Sample # PE-RDX 5-29-96
RDX D-Tech Results = 7990 10:13 AM

Sample # 96-1236 5-29-96
TNT D-Tech Results = 2090 10:48 AM
RDX D-Tech Results = 3290 10:59 AM

Sample # 96-1237 5-29-96
TNT D-Tech Results = 2190 10:48 AM
RDX D-Tech Results = 4590 10:59 AM

Sample # 96-1480 5-29-96
TNT D-Tech Results = 32 90 10:49 AM
RDX D-Tech Results = 46 90 11:00 AM

Sample # 96-1481 5-29-96
TNT D-Tech Results = 20 10:49 AM
RDX D-Tech Results = 3090 11:00 AM

Sample # 96-1482 5-29-96
TNT D-Tech Results = 20 11:27 AM
RDX D-Tech Results = 7890 11:40 AM

L. Llewellyn Barnell 5-29-96

Sample # 96-1483 5-29-96

TNT D-Tech Results = 8 ug/g 11:27 AM

RDX D-Tech Results = L0 11:41 AM

~~Sample # 96-1483 5-29-96~~ LNB 5-29-96

~~TNT D-Tech Results =~~ LNB 5-29-96

~~RDX D-Tech Results =~~ LNB 5-29-96

Sample # 96-1484 5-29-96

TNT D-Tech Results = L0 11:28 AM

RDX D-Tech Results = L0 11:41 AM

Sample # 96-1485 5-29-96

TNT D-Tech Results = L0 11:28 AM

RDX D-Tech Results = 14 ug/g 11:42 AM

L. Dwight Brazell 5-29-96

Sample # PE-TNT 6-5-96
TNT D-Tech Results = 6 ppb 9:45 AM

Sample # PE-RDX 6-5-96
RDX D-Tech Results = 78 ppb 9:53 AM

Sample # 96-1142 6-5-96
TNT D-Tech Results = <10 1:22 PM
RDX D-Tech Results = 6 ppb 1:30 PM

Sample # 96-1143 6-5-96
TNT D-Tech Results = <10 1:22 PM
RDX D-Tech Results = 6 ppb 1:30 PM

Sample # 96-1144 6-5-96
TNT D-Tech Results = <10 1:23 PM
RDX D-Tech Results = <10 1:31 PM

Sample # 96-1145 6-5-96
TNT D-Tech Results = <10 1:23 PM
RDX D-Tech Results = 7 ppb 1:31 PM

Sample # 96-1146 6-5-96
TNT D-Tech Results = <10 2:28 PM
RDX D-Tech Results = <10 2:38 PM

L. Dwight Bazzell 6-5-96

Sample # 96-1147 6-5-96

TNT D-Tech Results = L0 2:28 PM

RDX D-Tech Results = 590 2:38 PM

Sample # 96-1148 6-5-96

TNT D-Tech Results = L0 2:29 PM

RDX D-Tech Results = 690 2:38 PM

Sample # 96-1149 6-5-96

TNT D-Tech Results = L0 2:29 PM

RDX D-Tech Results = 1190 2:39 PM

L. Dwight Bizzell 6-5-96

Sample # PE-TNT 6-6-96
TNT D-Tech Results = 20 9:50 AM

Sample # PE-RDX 6-6-96
RDX D-Tech Results = H: 9:51 AM

Sample # 96-1150 6-6-96
TNT D-Tech Results = 20 10:18 AM
RDX D-Tech Results = 0 ppb 10:29 AM

Sample # 96-1151 6-6-96
TNT D-Tech Results = 20 10:18 AM
RDX D-Tech Results = 6 ppb 10:29 AM

Sample # 96-1152 6-6-96
TNT D-Tech Results = 20 10:18 AM
RDX D-Tech Results = 20 10:30 AM

Sample # 96-1153 6-6-96
TNT D-Tech Results = 20 10:19 AM
RDX D-Tech Results = 1000 10:30 AM

Sample # 96-1166 6-6-96
TNT D-Tech Results = 20 12:02 PM
RDX D-Tech Results = 1000 12:19 PM

L. Dwight Bazzell 6-6-96

Sample # 96-1167 6-6-96

TNT D-Tech Results = L0 12:03 PM

RDX D-Tech Results = L0 12:19 PM

Sample # 96-1168 6-6-96

TNT D-Tech Results = L0 12:03 PM

RDX D-Tech Results = L0 12:19 PM

Sample # 96-1169 6-6-96

TNT D-Tech Results = L0 12:03 PM

RDX D-Tech Results = L0 12:20 PM

Sample # 96-1170 6-6-96

TNT D-Tech Results = L0 12:03 PM

RDX D-Tech Results = 0.90 12:20 PM

Sample # 96-1171 6-6-96

TNT D-Tech Results = L0 12:04 PM

RDX D-Tech Results = L0 12:20 PM

L. Wright Bizzell 6-6-96

CONTROLLED FIELD LOG BOOK # 295

Millipore's EnviroGard Soil Test Log Book

And

HNU - Handy Analytical Field Test Results

NOTE: MILLIPORE PAH SOIL TEST IS NOT CONTROLLED BY LANL-ER-SOPs. THE MANUFACTURER SOP WILL BE FOLLOWED

Peter J. M. Gram
03/06/96

Millipore Results 03-15-96 1305

NC = 1.06 %BO

C1 = 0.65 61.32% Between 66 to 93

C2 = 0.22 20.75% Between 16 to 43

1067 = 0.97

1068 = 0.92

1069 = 1.03

1070 = 0.96

1071 = 1.04

1072 = 1.08

Revised

MILLIPORE RESULTS 03-21-9 1435

NC - .76 %BO

C1 - 1.01 132% NOT BOILED 66 TO 93

C2 - .45 59% NOT BOILED 16 TO 43

SAMPLE FROM BLDG 99 SOUTHERN SUMP OUTLET - .49

96-1064 - 1.51

96-1065 - 1.25

96-1066 - 1.44

R Schulz

MILLIPORE RESULTS 03-26-96 ~~6~~ 1600

NC = 1.19 %BD

C1 = .75 63.02% NOT BRUN 16 to 93

C2 = .22 18.48% ~~NOT~~ BRUN 1 to 43

96-1054 = 1.08 <1.0 ppm

96-1055 = 1.10 <1.0 ppm

96-1056 = 0.93 <1.0 ppm

Nathan

Millipore Results on 03-29-96 @1134 A.M.

NC= 1.22 %80

C1 = 0.68 55.74% Bottles 66 to 93

C2 = 0.22 18.03% Bottles 16 to 43

1041 = 0.99 ; <1 ppm

1042 = 1.08 ; <1 ppm

1043 = 1.01 * 5ml Add Meth Added, Clay Sample ; <2ppm

1044 = 0.90 ; <1 ppm

1045 = 0.88 ; <1 ppm

1046 = 0.78 ; <1 ppm

1047 = 0.64 ; <1 ppm

1048 = 0.88 ; <1 ppm

1049 = 0.85 ; <1 ppm

1050 = 0.93 ; <1 ppm

1051 = 0.94 ; <1 ppm

1052 = 1.39 ; <1 ppm

1053 = 0.57 ; <1 ppm

Reviewed

Millipore Results 04-04-96

	%BO	INTERPRETATION
NC = 0.91		
C1 = 0.53	58.24%	NOT BRED - 66 TO 93
C2 = 0.22	24.17%	BRED 16 TO 43
1010 = 0.51	56.04%	<1 ppm
1011 = 0.77	84.62%	<1 ppm
1012 = 0.76	83.52%	<1 ppm
1013 = 0.75	82.42%	<1 ppm
1014 = 0.68	74.72%	<1 ppm
1015 = 0.65	71.43%	<1 ppm
1079 = 0.80	87.91%	<1 ppm
1080 = 0.88	96.70%	<1 ppm
1081 = 0.78	85.71%	<1 ppm
1082 = 0.88	96.70%	<1 ppm
1083 = 0.24	26.37%	<1 ppm
1084 = 0.72	79.12%	<1 ppm
1178 = 0.70	76.92%	<1 ppm
1179 = 0.62	68.13%	<1 ppm
1180 = 0.71	78.02%	<1 ppm
1181 = 0.76	83.52%	<1 ppm
16-UK(1528) = 0.47	51.64%	<1 ppm

RJ 8/4/20

Millipore Results 04-11-96 10.30 AM

NC = 1.48 70 BO

C1 = .84 56.76 % NOT BTWN 66 TO 93

C2 = .37 25.00 % BTWN 16 TO 43

96-1000 = .76

96-1001 = .60

96-1002 = .90

96-1003 = .90

96-1004 = .97

96-1005 = .34

96-1016 = .44

96-1017 = .65

96-1018 = .91

96-1019 = .92

NC = 1.15 4-11-96 14.45 PM

C1 = .89

C2 = .25 96-1521 = .89

96-1073 = .92 96-1522 = .55

96-1074 = 1.12 96-1523 = .39

96-1075 = 1.17

96-1076 = 1.11 70 BO

96-1077 = 1.14 C1 = 77.39 % ~~NOT~~ BTWN 66 TO 93

96-1078 = .79 C2 = 21.74 BTWN 16 TO 43

96-1517 = .97

96-1518 = 1.01

96-1519 = .33

96-1520 = .86

L. Dennis M. Bazzell 4-11-96

Millipore Results 4/12/96 NCH 3:20 PM

Nc = 1.09	90.80	
C1 = 0.67	61.47%	NOT BTWN 66 TO 93
C2 = 0.28	25.69%	BTWN 16 TO 43
96-1102 = 0.26		
96-1103 = 0.86		
96-1104 = 1.06		
96-1105 = 0.60		
96-1106 = 1.20		
96-1107 = 0.97		
96-1108 = 1.13		
96-1109 = 1.10		
96-1110 = 1.06		
96-1111 = 1.12		
96-1112 = 0.98		
96-1113 = 1.20		
96-1114 = 1.09		
96-1115 = 1.28		
96-1116 = 1.17		
96-1117 = 0.48		

L Dwight Bazzell 4-12-96

HNU HANDY RESULTS : 04-12-96 1430

BLANK	0ppm	
1102	500-1000 ppm	DIESEL
1103	RGN + + 10 ppm	DIESEL
1104	1-10 ppm	DIESEL
1105	50-100 ppm	DIESEL
1106	<1 ppm	DIESEL
1107	1 ppm	DIESEL
1108	10 ppm	DIESEL
1109	50-100 ppm	DIESEL
1110	1 ppm	DIESEL
1111	10 ppm	DIESEL
1112	50-100 ppm	DIESEL
1113	<1 ppm	DIESEL
1114	10-50 ppm	DIESEL
1115	1-10 ppm	DIESEL
1116	1-10 ppm	DIESEL
1117	500-1000 ppm	DIESEL

R Johnson

Millipore Results 4-16-96

10:30 AM

Nc = .82 % Bo

C1 = .68 82.93% BTWn 66 To 93

C2 = .23 28.05% BTWn 16 To 43

96-1085 = .12

96-1086 = .79

96-1087 = .35

96-1088 = .49

96-1089 = .68

96-1090 = .63

L Dwight Bussell 4-16-96

Millipore Results 4-17-96

NC = 1.25 % BO

C1 = .94 75.20% BTWN 66 TO 93

C2 = .28 22.40% BTWN 16 TO 43

96-1006 = .66

96-1007 = .91

96-1008 = .45

96-1009 = .60

L. Dwight Barrell 4-17-96

MILLIPORE RESULTS 04-22-96

NC	0.97	%80
C1	0.61	62.89% NOT BTWN 66 TO 93
C2	0.26	26.80% BTWN 16 TO 43
96-1091	0.13	MAYBE >1.0 ppm
96-1092	0.47	<1.0 ppm
96-1093	0.62	<1.0 ppm
96-1094	0.68	<1.0 ppm
96-1095	0.85	<1.0 ppm
96-1096	0.69	<1.0 ppm

R Johnson

Millipore Results 4-24-96 AM

NC = 1.17 90 BD

C1 = .66 59.46 % NOT BTWN 66 TO 93

C2 = .26 23.42 % BTWN 16 TO 43

96-1057 = .97

96-1058 = .39

96-1059 = .67

96-1060 = 1.03

96-1061 = 1.02

96-1062 = 1.08

96-1063 = 1.13

96-1027 = .41

96-1028 = .63

96-1029 = .84

96-1036 = .63

96-1037 = 1.17

96-1038 = .82

96-1039 = .81

L. Dwight Brazell 4-24-96

Millipore Results 4-25-96 AM

Run #1

NC = 1.86 90 BO

C1 = 1.33 71.5% BTWN 66 TO 93

C2 = .45 24.19% BTWN 16 TO 43

96-1172 = 1.65

96-1173 = 1.48

96-1174 = 1.24

96-1175 = ~~1.10 DS~~ .10

96-1176 = 1.10

96-1177 = 1.38

Run #2

NC = 1.28 90 BO

C1 = .91 71.09%

C2 = .33 36.26%

96-1175 = .18

L. Dwight Bazzell 4-25-96

Millipore Results 4-30-96

NC = 1.41 90 B6

C1 = .85 60,2890 NOT BTWN 66 TO 93

C2 = .26 18,4490 BTWN 16 to 43

96-1469 = 1.24

96-1529 = 1.46

96-1530 = .90

L Kenneth Bazzell 4-30-96

Millipore Results 5-1-96 1434

NC = .99 90 BOTH

C1 = .57 57, 58 90 NOT BTWN 66 to 93

C2 = .19 19, 19 90 BTWN 16 To 43

96-1033 = .84

96-1034 = .33

96-1035 = .63

L. Dwight Bazzell 5-1-96

MILLIPORE RESULTS 5-03-96 1202

NC	1.19	%BO	
C1	0.70	58.82%	NOT BTWN 66 TO 93
C2	0.31	26.05%	BTWN 16 TO 43
1154	0.55	<1 ppm	
1155	0.19	MAY BE >1.0 ppm	
1156	0.44	<1 ppm	
1157	0.41	<1 ppm	
1158	0.66	<1 ppm	
1159	0.39	<1 ppm	

R. Johnson

MILLIPORE RESULTS 5/08/96 1434

NC	1.15	80
C1	0.53	46%
C2	0.27	23%
1160	0.40	
1161	0.79	
1162	1.05	
1163	0.98	
1164	0.47	
1165	0.92	

Russell H Abell

Millipore Results 5-17-96

NC = .67	0.80	
C1 = .40	59.70%	NOT BTWN 66 TO 93
C2 = .21	31.34%	BTWN 16 TO 43
96-1024 = .65		
96-1025 = .69		
96-1026 = .53		
96-1030 = .70		
96-1031 = .22		
96-1032 = .35		

L. Llewellyn Buzzell 5-17-96

Millipore Results 5-23-96 11:M

NC = .81 90 BO

C1 = .47 58.02 90 NOT BTWN 66 TO 93

C2 = .17 20.99 90 BTWN 16 TO 43

96-1020 = .75

96-1021 = .69

96-1022 = .71

96-1023 = .71

R Dwight Bassell 5-23-96

Millipore Results

NC = .78 70 BO

C1 = .41 52.56 % NOT BTWN 66 to 93

C2 = .14 17.95 % BTWN 16 to 43

96-1142 = .41

96-1143 = .49

96-1144 = .27

96-1145 = .33

96-1146 = .24

96-1147 = .20

96-1148 = .27

96-1149 = .11 –

96-1150 = .09 –

96-1151 = .11 –

96-1152 = .16

96-1153 = .33

96-1166 = .67

96-1167 = .58

96-1168 = .17

96-1169 = .43

96-1170 = .45

96-1171 = .36

L. Wright Bazzel 6-6-96

CONTROLLED FIELD LOGBOOK # 296

90s LINE VCA

XRF I

3/14 to 4/8

X-Ray Flourescent (XRF) Results For OU-1082 VCA Fieldwork

Date		Sample Number	Element	PPM	Std. Dev.	
3/14	96	0316-96-1071	Cr HI	-100	185	1
			K	17400	259	2
			Ca	8690	130	3
			Ti	3107	88	4
			Cr LO	71	53.8	5
			Mn	2.2	200.19	6
			Fe	30390	483	7
			Co	-280	161	8
			Ni	60	55.1	9
			Cu	16	27.4	10
			Zn	163	27.1	11
			As	50	18.9	12
			Se	23	10.5	13
			Sr	157.8	7.74	14
			Zr	336.8	6.95	15
			Mo	2.7	3.15	16
			Hg	-52	21.4	17
			Pb	16	12.6	18
			Rb	102	11.1	19
			Cd	-9.1	31.62	20
			Sn	-91	17.2	21
			Sb	15	11.3	22
			Ba	453.9	8.2	23
			Ag	123	21.6	24
			U	29.3	8.01	25
			Th	31.7	5.34	26
						27
3/14	96	0316-96-1070	Cr HI	-160	186	28
			K	18990	270	29
			Ca	10300	141	30
			Ti	3259	90.8	31
			Cr Lo	103	56.3	32
			Mn	460	219	33

	Date	Sample Number	Element	PPM	Std. Dev
1	3/14 96	0316-96-1070	Fe	27870	465
2			Co	-350	155
3			Ni	21	53.3
4			Cu	74	30.7
5			Zn	125	26.6
6			As	6.5	17.86
7			Se	-6.5	9.48
8			Sr	147.4	7.52
9			Zr	405.6	7.53
10			Mo	4.7	3.36
11			Hg	-20	22.9
12			Pb	17	12.3
13			Rb	124	11.6
14			Cd	33	32.5
15			Sn	-39	17.9
16			Sb	17	11.6
17			Ba	598.9	9.31
18			Ag	86	21.7
19			U	26.5	8.39
20			Th	27.7	5.42
21					
22	3/14 96	0316-96-1072	CrHI	-880	125
23			K	16050	246
24			Ca	4034	95.7
25			Ti	624	57.1
26			CrLo	283	44.9
27			Mn	-9.8	166.58
28			Fe	17240	358
29			Co	-340	121
30			Ni	-82	40.2
31			Cu	27	24.3
32			Zn	91	21.6
33			As	41	14.5

te	Sample Number	Element	PPM	Std. Dev	
t 96	0316-96-1072	Se	-10.5	7.74	1
		Sr	42.3	4.27	2
		Zr	210.0	5.10	3
		Mo	-6.2	2.29	4
		Hg	-79	16.9	5
		Pb	-14.7	8.78	6
		Rb	73.5	8.88	7
		Cd	-9.6	20.81	8
		Sn	-45	11.5	9
		Sb	4.8	7.43	10
		Ba	133.6	4.38	11
		Ag	38	13.9	12
		U	17.8	6.99	13
		Th	27.3	4.70	14
					15
96	0316-96-1067	Cr HT	-300	160	16
		K	10810	208	17
		Ca	4619	96.1	18
		Ti	645	52.3	19
		Cr Lo	322	45.5	20
		Mn	62	169.3	21
		Fe	15770	340	22
		Co	-67	121.9	23
		Ni	-64	41.2	24
		Cu	-13	21.7	25
		Zn	118	22.1	26
		As	62	15.0	27
		Se	-1.1	7.96	28
		Sr	83.4	5.43	29
		Zr	215.9	5.14	30
		Mo	2.4	2.39	31
		Hg	-52	17.9	32
		Pb	-8.5	8.70	33

	Date	Sample Number	Element	PPM.	Std. Dev
1	3/14/96	0316-96-1067	Rb	44.5	7.78
2			Cd	-177	22.7
3			Sn	-114	12.5
4			Sb	14.8	8.22
5			Ba	282.7	6.05
6			Ag	40	15.5
7			U	16.7	6.64
8			Th	18.2	4.54
9					
10	3/14/96	0316-96-1068	Cr HI	-490	160
11			K	13580	232
12			Ca	7960	123
13			Ti	1532	69.5
14			Cr Lo	204	51
15			Mn	120	191
16			Fe	24310	427
17			Co	-270	144
18			Ni	-89	45
19			Cu	34	27
20			Zn	130	25.4
21			As	28	16.5
22			Se	8.5	9.54
23			Sr	140.3	7.14
24			Zr	284.8	6.19
25			Mo	4	2.87
26			Hg	-15	21.8
27			Pb	7.9	10.75
28			Rb	76.5	9.60
29			Cd	-31	28
30			Sn	-63	15.4
31			Sb	-34	9.86
32			Ba	648.2	9.31
33			Ag	34	18.6

e	Sample Number	Element	PPM	Std. Dev
96	0316-96-1068	U	17.7	7.45
		Th	21.2	4.91
96	0316-96-1069	CrHI	-630	150
		K	16340	249
		Ca	5080	105
		Ti	617	59.4
		CrLo	140	48.1
		Mn	1260	222
		Fe	16880	357
		Co	-210	125
		Ni	42	48.6
		Cu	-.7	24.79
		Zn	61	22.4
		As	12	15.4
		Se	7.3	9.19
		Sr	79.3	5.48
		Zr	207.5	5.19
		Mo	2.8	2.63
		Hg	-37	19.9
		Pb	-1.1	10.14
		Rb	63.5	9.19
		Cd	-87	23.9
		Sn	-34	13.5
		Sb	27.2	8.80
		Ba	560.7	8.39
		Ag	18	15.9
		U	31.7	7.54
		Th	27.2	4.92

A. Barrell 3-20-96

	Date	Sample Number	Element	PPM	Std Dev
1	3-20-96	Teflon Standard	Cr Hi	-250	185
2			K	-60	73.1
3		Parts Per Million	Ca	-248	31.4
4		should be less than 5	Cr Lo	139	52.2
5		Times above or below	Mn	-170	160
6		the standard deviation	Fe	-1.6	81.60
7		for a good background	Co	303	79.2
8			Ni	21	50.0
9			Cu	-43	30.1
10			Zn	-6.0	30.54
11			As	-0.6	19.13
12			Se	-10	11.2
13			Sr	-3.1	2.61
14			Zr	-0.2	1.65
15			Mo	-0.07	2.131
16			Hg	2.4	24.1
17			Pb	-5.0	10.01
18			Pb	-10.9	5.84
19			Cd	-47	27.8
20			Sn	-49	16.4
21			Sb	2.9	9.88
22			Ba	2.8	2.86
23			Ag	73	18.8
24			U	7.5	6.71
25			Th	9.6	5.04
26			Ti	48.	27.8
27	3-20-96	Fe Standard Intensities			
28		results (run at noon)	Mn = 0.00369		
29		Mn + Co should be less than	Fe = 0.99859		
30		0.010. Fe should be greater	Co = -0.00223		
31		than 0.95 for a good			
32		calibration.			
33			L.D. Bazell 3-20-96		

	Sample Number	Element	PPM	STd Dev
96	96-1064	Cr Hi	-420	172
		K	19,370	272
		Ca	7,720	127
		Cr Lo	215	62.5
		Mn	200	204
		Fe	24,400	438
		Co	-190	150
		Ni	-96	47.6
		Cu	37	28.6
		Zn	102	26.1
		As	52	18.4
		Se	9.7	10.25
		Sr	75.5	8.06
		Zr	346.0	6.97
		Mo	-1.2	3.06
		Hg	-52	21.5
		Pb	2.1	11.37
		Rb	77	10.2
		Cd	108.	32.3
		Sn	-45	17.7
		Sb	18	11.7
		Ba	2290	18.2
		Ag	48	20.9
		U	27.8	7.82
		Th	26.6	5.29
		Ti	3010	104

L. D. Bazell 3-20-96

	Date	Sample Number	Element	PPM	Std Dev
1	3-20-96	96-1065	Cr Hi	-440	173
2			K	19,860	275
3			Ca	8,460	131
4			Cr Lo	141	59.3
5			Mn	450	218
6			Fe	23,290	427
7			Co	2.5	151.06
8			Ni	-25	51.4
9			Cu	21	28.3
10			Zn	104	26.3
11			As	29	18.7
12			Se	21	10.8
13			Sr	142.6	7.45
14			Zr	341.7	6.90
15			Mo	0.5	3.10
16			Hg	-5.7	23.40
17			Pb	7.	12.3
18			Rb	111	11.0
19			Cd	86	32.0
20			Sn	-11	7.7
21			Sb	-3.2	11.27
22			Ba	925	11.3
23			Ag	83	21.1
24			U	21.0	8.21
25			Th	32.9	5.58
26			Ti	3124	91.8
27					
28					
29					
30					
31					
32					
33					

L. D. Bazell 3-20-96

	1	2	3	
te	Sample Number	Elements	PPM	Std. Dev.	
20-96	96-1066	Cr H.	36	19.56	1
		K	21,890	287	2
		Ca	8120	131	3
		Cr 20	23	58.7	4
		Mn	470	2.17	5
		Fe	22,460	42.1	6
		Co	-61	148.0	7
		Ni	-110	46.4	8
		Cu	72	29.9	9
		Zn	88	24.9	10
		As	19	17.5	11
		Se	2.7	9.72	12
		Sr	162.1	7.75	13
		Zr	428.6	7.66	14
		Mo	-2.2	3.18	15
		Hg	-10	22.9	16
		Pb	8.9	11.79	17
		Rb	72	10.3	18
		Cd	41	31.5	19
		Sn	-32	17.4	20
		Sb	4.5	11.21	21
		Ba	1125	12.5	22
		Ag	75	20.9	23
		U	37.5	8.04	24
		Th	33.7	5.54	25
		Ti	3123	94.2	26
					27
					28
					29
					30
					31
					32
		T.D. Bazzell 3-20-96			33

	Date	Sample Number	Element	PPM	Std Dev
1	3-20-96	96-XXXX	Cr Hi	-330	179
2		Trench Sample	K	19,800	275
3			Ca	9240	136
4			Cr Lo	90	56.5
5			Mn	390	219
6			Fe	31,780	498
7			Co	-120	170
8			Ni	-41	53.7
9			Cu	68	31.5
10			Zn	130	28.1
11			As	8.9	18.39
12			Se	22	11.2
13			Sr	116.6	6.94
14			Zr	299.3	6.68
15			Mo	-0.5	3.18
16			Hg	-4.5	22.9
17			Pb	-1.4	12.89
18			Rb	8.5	11.2
19			Cd	26	33.0
20			Sn	-34	18.1
21			Sb	4.1	11.65
22			Ba	551.4	9.03
23			Ag	94	22.0
24			U	37.9	8.06
25			Th	47.6	5.58
26			Ti	2312	80.2
27					
28					
29					
30					
31					
32					
33			L.D. Bazzell 3-20-96		

Fe	Sample Number	Element	PPM	Std. Dev	
1-96	Teflon Standard	CrH	-250	185	1
		K	2.9	74.77	2
	PPM of the elements	Ca	-170	33.3	3
	of interest should be	Ti	-15	27.5	4
	less than 5 times	CrLo	43	57.2	5
	above or below the	Mn	-430	149	6
	standard deviation	Fe	-52	78.7	7
	for a good background	Co	169	74.2	8
		Ni	-19	48.2	9
		Cu	-14	31.0	10
		Zn	-47	29.6	11
		As	6.7	19.15	12
		Se	19	12.6	13
		Sr	-1.1	2.68	14
		Zr	-1.5	1.64	15
		Mo	1.9	2.17	16
		Hg	-11	23.0	17
		Pb	-14	10.1	18
		Rb	-3.8	6.02	19
		Cd	-30	28.0	20
		Sn	-21	25.6	21
		Sb	24	10.2	22
		Ba	0.1	2.84	23
		Ag	52	18.7	24
		U	1.8	6.76	25
		Th	15.8	5.16	26
21-96	Fe Standard Intensities				27
	Results (run at 100 sec.)	Mn = 0.00098			28
	Mn + Co should be less	Fe = 1.01030			29
	than 0.10. Fe should be	Co = -0.00353			30
	greater than 0.95 for a				31
	good calibration.				32
		S. A. Bazzell 3-21-96			33

	Date	Sample Number	Element	PPM	Std. Dev.
1	3-21-96	96-1064 as a Dry	Cr Hi	-370	173
2		Sample	K	22,480	291
3			Ca	7,760	129
4			Ti	3100	107
5			Cr Lo	61	64.9
6			Mn	640	22.1
7			Fe	25,140	447
8			Co	-47	155.9
9			Ni	-136	45.2
10			Cu	104	30.5
11			Zn	114	24.4
12			As	46	16.8
13			Se	8.3	9.50
14			Sr	159.3	2.75
15			Zr	398.3	2.46
16			Mo	1.2	8.17
17			Hg	-75	19.7
18			Pb	-8.0	10.73
19			Rb	77	10.4
20			Cd	-18	27.4
21			Sn	-18	15.5
22			Sb	8.8	9.88
23			Ba	2150	17.6
24			Ag	12	17.7
25			U	33.1	2.79
26			Th	24.7	5.15
27					
28					
29					
30					
31					
32					
33			S.A. Bazzell	3-21-96	

	Sample Number	Element	PPM	Std. Dev.	
96	Teflon standard	CrKi	-280	185	1
		K	14	75.1	2
	Parts Per Million	Ca	-199	32.7	3
	should be less than 5	Ti	-12	28.0	4
	times above or below the	CrKo	44	51.3	5
	standard deviation of the	Mn	-140	163	6
	elements of concern for	Fe	8.3	82.41	7
	a good background.	Co	103	72.3	8
		Ni	-34	47.7	9
		Cu	-26	30.7	10
		Zn	-33	30.1	11
		As	-44	18.8	12
		Se	8.4	11.77	13
		Sr	-4.8	2.57	14
		Zr	2.3	1.66	15
		Mo	3.9	2.21	16
		Hg	48	24.9	17
		Pb	10	10.6	18
		Rb	1.9	6.23	19
		Cd	-31	27.9	20
		Sn	-17	15.6	21
		Sb	39	10.2	22
		Ba	1.0	2.84	23
		Ag	56	18.7	24
		U	0.5	6.82	25
		Th	-1.8	4.83	26
	Fe Standard Intensities				27
96	results (Run at 100 sec)	Mn = 0.00259			28
	Mn & Co should be less	Fe = 0.99476			29
	than 0.010. Fe should be	Co = 0.00065			30
	greater than 0.95 for a				31
	good calibration				32
		L Dwight Bezzell 3-24-96			33

	Date	Sample Number	Element	PPM	Std Dev.
1	3-26-96	96-1054	CrH	-130	177
2			K	17,910	261
3			Ca	5,070	106
4			Ti	755	52.2
5			Cr Lα	279	48.5
6			Mn	630	199
7			Fe	12,790	315
8			Co	52	119.1
9			Ni	57	49.1
10			Cu	16	25.6
11			Zn	133	25.0
12			As	23	15.6
13			Se	18.7	9.65
14			Sr	93.4	5.84
15			Zr	181.2	4.96
16			Mo	0.9	2.61
17			Ag	2.7	21.52
18			Pb	-14	10.5
19			Rb	100	10.4
20			Cd	-101	24.9
21			Sn	-120	13.4
22			Sb	MB ~~382~~ 9.1	8.98
23			Ba	382.3	6.99
24			Ag	58	17.0
25			U	35.9	8.36
26			Th	52.9	5.56
27					
28					
29					
30					
31					
32					
33					

L. Deing M Barrell 3-26-96

Te	Sample Number	Element	PPM	Std Dev
-26-96	96-1054	CrHi	-370	168
	Second run because	K	22,150	288
	the sample cup was	Ca	6550	121
	jarred out of position	Ti	994	58.7
	during the 1st run	CrLo	175	52.4
		Mn	340	190
		Fe	13,820	330
		Co	-180	118
		Ni	-82	43.0
		Cu	24	26.3
		Zn	93	24.2
		As	31	16.3
		Se	18.3	9.90
		Sr	955	5.97
		Zr	181.2	5.01
		Mo	-1.0	2.73
		Hg	53	22.12
		Pb	-9.2	10.59
		Rb	10.3	10.8
		Cd	12	29.1
		Sn	-8.7	16.35
		Sb	11	10.4
		Ba	573.2	8.65
		Ag	88	19.6
		U	52.2	8.81
		Th	44.3	5.50

L. Darryl M. Bissell 3-26-96

	Date	Sample Number	Element	PPM	Std Dev
1	3-26-96	96-1055	CrHi	-300	175
2			K	18,140	265
3			Ca	9,170	135
4			Ti	1242	71.3
5			CrLo	53	56.8
6			Mn	250	194
7			Fe	18,310	379
8			Co	52	138.0
9			Ni	6.0	50.47
10			Cu	32	28.6
11			Zn	125	26.4
12			As	13	17.1
13			Se	17	10.2
14			Sr	157.3	7.52
15			Zr	184.6	5.23
16			Mo	-1.9	2.80
17			Hg	-21	22.1
18			Pb	2.6	11.59
19			Rb	126	11.6
20			Cd	30	30.8
21			Sn	-9.1	17.22
22			Sb	2.4	10.95
23			Ba	1284	13.0
24			Ag	78	20.4
25			U	43.0	8.89
26			Th	42.1	5.53
27					
28					
29					
30					
31					
32					
33					

Mary W Barrett 3-26-96

Te	Sample Number	1 Element	2 PPM	3 Std Dev	
26-96	96-1056	CrH	-240	181	1
		K	24830	305	2
		Ca	9930	143	3
		Ti	1565	75.9	4
		CrL	86	56.6	5
		Mn	220	198	6
		Fe	18250	383	7
		Co	-37	137.6	8
		Ni	5.1	50.85	9
		Cu	26	28.1	10
		Zn	114	26.1	11
		As	43	17.9	12
		Se	9.4	10.08	13
		Sr	144.7	7.51	14
		Zr	221.9	5.69	15
		Mo	-2.0	2.87	16
		Hg	-55	20.9	17
		Pb	-2.6	11.40	18
		Rb	105	11.3	19
		Cd	64	31.7	20
		Sn	-26	17.5	21
		Sb	21	11.4	22
		Ba	1008	11.7	23
		Ag	51	20.8	24
		U	45.7	8.67	25
		Th	42.3	5.61	26
					27
					28
					29
					30
					31
					32
		L. Dwight Bazzell 3-26-96			33

	Date	Sample Number	Element	PPM	STd Dev
1	3-27-96	Teflon Standard	CrHi	-91	193.2
2			K	12	75.1
3		Parts Per Million	Ca	-176	33.2
4		should be less than	Ti	19	27.2
5		5 times above or below	CrLo	42	51.1
6		the standard deviation	Mn	-600	142
7		of the elements of concern	Fe	17	81.2
8		for a good background	Co	126	73.1
9			Ni	-23	48.1
10			Cu	15	32.1
11			Zn	0.2	30.82
12			As	-42	18.0
13			Se	17	12.0
14			Sr	-2.1	2.70
15			Zr	1.4	1.67
16			Mo	0.7	2.13
17			Hg	70	255
18			Pb	-14.5	9.77
19			Rb	-16.0	5.73
20			Cd	-30	27.9
21			Sn	-12	15.6
22			Sb	10	10.0
23			Ba	0.9	2.84
24			Ag	18	18.4
25			U	7.3	6.59
26			Th	4.3	4.86
27	3-27-96	Fe standard Intensities			
28		Results (run at 100 sec.)	Mn = 0.00108		
29		Mn + Co should be less	Fe = 0.99117		
30		than 0.010. Fe should	Co = -0.00567		
31		be greater than 0.95			
32		for a good calibration			
33			L. Dwight Sazzell 3-27-96		

e	Sample Number	1 Element	2 PPM	3 Std. Dev.	
7-96	96-1041	CrH	-220	180	1
		K	21,170	282	2
		Ca	6,990	123	3
		Ti	2757	84.9	4
		CrL	114	54.4	5
		Mn	420	208	6
		Fe	20510	402	7
		Co	-230	138	8
		Ni	11	50.2	9
		Cu	172	33.8	10
		Zn	89	24.5	11
		As	12	17.1	12
		Se	17	10.1	13
		Sr	140.2	7.21	14
		Zr	341.3	6.84	15
		Mo	1.3	3.09	16
		Hg	19	23.6	17
		Pb	7.1	11.97	18
		Rb	11.0	11.2	19
		Cd	16	29.9	20
		Sn	-65	16.4	21
		Sb	14	11.7	22
		Ba	523.4	8.57	23
		Ag	111	20.3	24
		U	33.7	8.52	25
		Th	44.2	5.71	26
					27
					28
					29
					30
					31
					32
					33

[illegible] 3-27-96

	Date	Sample Number	Element	PPM	Std. Dev.
1	3-27-96	96-1042	Cr H.	-160	189
2			K	20,250	279
3			Ca	9,100	136
4			Ti	3730	101
5			Cr Lo	-137	60.0
6			Mn	830	215
7			Fe	25,230	450
8			Co	-260	159
9			Ni	209	61.7
10			Cu	40	30.1
11			Zn	27	23.7
12			As	1.1	17.69
13			Se	33	11.3
14			Sr	241.1	8.69
15			Zr	393.5	7.53
16			Mo	0.1	3.32
17			Hg	-35	22.7
18			Pb	4.5	12.33
19			Rb	109	11.3
20			Cd	157	34.5
21			Sn	38	19.2
22			Sb	2.4	12.33
23			Ba	2,108	17.6
24			Ag	15	21.9
25			U	27.4	8.39
26			Th	31.0	5.57
27					
28					
29					
30					
31					
32					
33					

Sherry M Russell 3-27-96

e	Sample Number	Element	PPM	Std Dev
96	96-1043	CrH	-110	191
		K	21,810	287
		Ca	7,150	125
		Ti	5870	107
		CrLo	-91	63.5
		Mn	920	231
		Fe	19,780	400
		Co	220	149
		Ni	417	69.3
		Cu	452	45.5
		Zn	60	25.5
		As	-29	17.7
		Se	50	11.8
		Sr	193.5	8.45
		Zr	870.9	7.24
		Mo	-7.2	5.13
		Hg	-9.3	23.43
		Pb	24	13.1
		Rb	10.3	11.3
		Cd	20	32.5
		Sn	43	18.6
		Sb	17	11.8
		Ba	2,308	18.2
		Ag	37	21.2
		U	38.6	8.53
		Th	30.5	5.58

[illegible] 3-27-96

	Date	Sample Number	1 Elements	2 PPM	3 Std Dev
1	3-28-96	Teflon Standard	Cr Hi	-94	193.6
2			K	-66	75.4
3		Parts Per Million	Ca	-188	82.9
4		should be less than	Ti	-1.6	27.63
5		5 times above or below	Cr Lo	23	51.2
6		the standard deviation	Mn	-380	153
7		of the elements of concern	Fe	-29	80.2
8			Co	139	73.6
9			Ni	58	51.2
10			Cu	-11	31.4
11			Zn	-22	30.4
12			As	-28	18.8
13			Se	11	11.9
14			Sr	-5.5	2.53
15			Zr	0.6	1.64
16			Mo	0.4	2.18
17			Hg	43	24.8
18			Pb	-3.2	10.26
19			Rb	-1.2	6.20
20			Cd	-38	22.9
21			Sn	-16	15.6
22			Sb	-2.2	9.87
23			Ba	-2.3	2.78
24			Ag	56	18.7
25			U	2.5	6.97
26			Th	4.0	5.00
27	3-28-96	Fe Standard Intensities			
28		Results (run at 100 sec.)	Mn = 0.00144		
29		Mn + Co should be less	Fe = 0.99007		
30		than 0.010. Fe should be	Co = 0.00022		
31		greater than 0.95 for a			
32		good calibration.			
33					

[illegible] 3-28-96

Date	Sample Number	Element	PPM	Std. Dev
-28-96	96-1044	CrHi	-110	186
		K	17,400	261
		Ca	8,070	128
		Ti	1680	107
		CrLo	436	75.4
		Mn	530	212
		Fe	21,700	414
		Co	-94	145.4
		Ni	43	53.3
		Cu	77	30.7
		Zn	96	25.9
		As	47	19.0
		Se	15	10.4
		Sr	131.6	7.11
		Zr	209.5	5.60
		Mo	1.1	2.92
		Hg	-1.5	23.51
		Pb	12	12.5
		Rb	181	11.0
		Cd	29	30.5
		Sn	-79	16.7
		Sb	11	11.0
		Ba	2538	19.1
		Ag	82	20.1
		U	29.7	8.24
		Th	49.7	5.57

L. Merrill Bagwell

	Date	Sample Number	Element	PPM	Std. Dev
1	3-28-96	96-1045	Cr Hi	-480	165
2			K	18,300	265
3			Ca	6,990	121
4			Ti	2,137	82.5
5			Cr2O	172	58.6
6			Mn	682.0	208
7			Fe	17,640	372
8			Co	-170	131
9			Ni	20	50.1
10			Cu	26	27.7
11			Zn	114	26.0
12			As	38	17.8
13			Se	22	10.5
14			Sr	103.2	6.30
15			Zr	243.3	5.81
16			Mo	-0.8	2.85
17			Hg	24	23.8
18			Pb	-1.7	11.82
19			Rb	113	11.2
20			Cd	36	30.3
21			Sn	-68	16.6
22			Sb	9.8	10.82
23			Ba	964	11.2
24			Ag	129	20.5
25			U	34.1	8.56
26			Th	57.5	5.82
27					
28					
29					
30					
31					
32					
33			L Dennis Bartell	3-28-96	

Te	Sample Number	Element	PPM	Std. Dev
28-96	96-1046	CrH	140	201
		K	21,700	287
		Ca	7,610	128
		Ti	3330	100
		CrLo	20	62.0
		Mn	610	216
		Fe	41,200	339
		Co	-21	126.0
		Ni	215	58.5
		Cu	89	31
		Zn	140	26.8
		As	-21	17.4
		Se	21	10.3
		Sr	192.8	8.30
		Zr	425.3	7.50
		Mo	0.5	3.17
		Hg	14	23.3
		Pb	33	12.6
		Rb	180	10.6
		Cd	78	31.6
		Sn	-8.3	17.58
		Ba	1589	14.6
		Ag	68	20.7
		U	27.1	8.46
		Th	35.1	5.79
		Sb	15	11.4

L. Wayne Bazzell 3-28-96

	Date	Sample Number	Element	PPM	Std Dev
1	3-28-96	96-1047	CrHi	-170	185
2			K	17,730	262
3			Ca	8,800	132
4			Ti	8,798	84.8
5			CrLo	99	56.1
6			Mn	530	210
7			Fe	15,600	351
8			Co	82	132.5
9			Ni	226	59.5
10			Cu	199	35.9
11			Zn	339	33.5
12			As	12	18.6
13			Se	24	10.7
14			Sr	173.0	7.79
15			Zr	410.4	7.34
16			Mo	-2.5	3.05
17			Hg	-41	21.3
18			Pb	28	12.8
19			Rb	88	10.2
20			Cd	-47	29.9
21			Sn	-57	16.6
22			Sb	14	18.7
23			Ba	615.1	9.05
24			Ag	102	20.3
25			U	19.1	8.06
26			Th	40.4	5.84
27					
28					
29					
30					
31					
32					
33			Lillian M Bazell	3-28-96	

Date	Sample Number	Element	PPM	STd Dev
29-96	Teflon Standard	CrHi	-290	185
		K	-13	74.5
	Parts Per Million should	Ca	-206	32.6
	be less than 5 times	Ti	-13	27.7
	above or below the standard	CrLo	108	52.3
	deviation of the elements	Mn	-170	162
	of concern	Fe	110	86.5
		Co	69	71.6
		Ni	-55	46.9
		Cu	14	32.1
		Zn	-54	29.7
		As	-27	18.8
		Se	5.0	11.71
		Sr	0.8	2.82
		Zr	-0.6	1.64
		Mo	-0.8	2.18
		Hg	32	24.5
		Pb	-3.4	10.20
		Rb	-12.1	6.16
		Cd	-82	27.7
		Sn	-37	15.5
		Sb	26	10.1
		Ba	-0.4	2.82
		Ag	28	18.5
		U	21.6	7.14
		Th	4.4	5.62
3-29-96	Fe Standard Intensities			
	Results (run at 100sec.)	Mn = 0.00290		
	Mn & Co should be less	Fe = 0.99787		
	than 0.010. Fe should be	Co = -0.00335		
	greater than 0.95 for a			
	good calibration.			
		Margaret Barrell	3-29-96	

	Date	Sample Number	Element	PPM	Std Dev
1	3-29-96	96-1048	CrHi	-390	169
2			K	20,650	280
3		This was a dry	Ca	8,240	130
4		sample	Ti	5,149	87.3
5			CrLo	113	53.7
6			Mn	63	190.1
7			Fe	18,860	386
8			Co	110	141
9			Ni	88	53.7
10			Cu	172	33.2
11			Zn	228	28.2
12			As	0.4	16.77
13			Se	17.6	9.69
14			Sr	175.8	7.91
15			Zr	391.1	7.24
16			Mo	0.2	3.08
17			Hg	-31	20.8
18			Pb	27	12.0
19			Rb	87	10.2
20			Cd	2.0	26.27
21			Sn	-41	14.5
22			Sb	-1.7	9.27
23			Ba	472.3	7.97
24			Ag	40	17.4
25			U	30.0	8.13
26			Th	28.4	5.43
27					
28					
29					
30					
31					
32					
33			L. Meredith Barrett	3-29-96	

Date	Sample Number	Element	PPM	Std. Dev.	
3-29-96	96-1049	CrHi	-330	177	1
		K	18,840	269	2
		Ca	7900	128	3
		Ti	2,839	86.5	4
		CrLo	67	57.2	5
		Mn	850	222	6
		Fe	15,490	351	7
		Co	-150	126	8
		Ni	116	54.7	9
		Cu	121	32.9	10
		Zn	96	26.6	11
		As	14	18.8	12
		Se	41	11.4	13
		Sr	152.5	7.38	14
		Zr	401.1	7.21	15
		Mo	-3.8	3.02	16
		Ag	-47	21.3	17
		Pb	33	12.4	18
		Rb	106	10.5	19
		Cd	41	30.5	20
		Sn	-18	16.9	21
		Sb	0.9	16.79	22
		Ba	648.9	9.29	23
		Ag	.56	20.1	24
		U	18.1	8.27	25
		Th	23.3	5.58	26
					27
					28
					29
					30
					31
					32
		L. Dewitt Gazzell	3-29-96		33

	Date	Sample Number	Element	PPM	STd Dev
1	3-29-96	96-1050	CrH	-290	184
2			K	13,290	231
3			Ca	6,460	115
4			Ti	2,068	77.9
5			CrLo	42	57.8
6			Mn	1280	235
7			Fe	14,130	333
8			Co	75	126.8
9			Ni	145	57.9
10			Cu	47	32.1
11			Zn	43	28.2
12			As	-32	19.1
13			Se	10.0	11.21
14			Sr	129.7	6.84
15			Zr	293.5	6.17
16			Mo	1.6	2.98
17			Hg	-52	22.3
18			Pb	32	12.8
19			Rb	70.1	9.94
20			Cd	-34	29.0
21			Sn	-5.2	16.31
22			Sb	-4.6	10.20
23			Ba	485.6	7.98
24			Ag	49	19.3
25			U	28.4	8.4
26			Th	27.3	5.62
27					
28					
29					
30					
31					
32					
33			L Dwight Brazell	3-29-96	

e	Sample Number	Element	PPM	Std. Dev	
9-96	96-1051	CrHi	-710	153	1
		K	21,240	283	2
	This was a dry	Ca	7,590	127	3
	sample	Ti	2,811	82.6	4
		CrLo	23	54.2	5
		Mn	69	201.2	6
		Fe	28,770	476	7
		Co	100	167	8
		Ni	-64	50.7	9
		Cu	38	27.8	10
		Zn	121	24.9	11
		As	3.5	18.09	12
		Se	0.9	9.34	13
		Sr	163.1	2.91	14
		Zr	402.2	7.63	15
		Mo	8.9	8.31	16
		Ag	-37	21.7	17
		Pb	39	13.0	18
		Rb	100	10.7	19
		Cd	28	26.6	20
		Sn	-20	14.9	21
		Sb	7.3	9.47	22
		Ba	416.5	7.70	23
		Ag	91	18.0	24
		U	10.6	7.73	25
		Th	32.6	5.39	26
					27
					28
					29
					30
					31
					32
					33

L. Dwayne Bazzell 3-29-96

	Date	Sample Number	Element	PPM	Std Dev.
1	3-29-96	96-1052	CrH	-260	180
2			K	20,280	278
3			Ca	7,810	128
4			CrL	117 ~~113~~ 3,097	55.9 ~~100~~ ~~88.3~~
5			Mn	240	205
6			Fe	22,730	424
7			Co	170	153
8			Ni	-79	49.1
9			Cu	52	29.3
10			Zn	104	25.8
11			As	2.3	17.59
12			Se	4.8	9.90
13			Sr	168.3	7.89
14			Zr	352.5	7.01
15			Mo	3.2	3.24
16			Hg	-38	21.7
17			Pb	18	12.1
18			Rb	125	11.5
19			Cd	19	31.5
20			Sn	-80	17.1
21			Sb	12	11.2
22			Ba	544.4	8.75
23			Ag	107	21.2
24			U	38.6	8.92
25			Th	29.4	5.54
26			Ti	3097	88.3
27					
28					
29					
30					
31					
32					
33					

Ellen J. Barrett 3-29-96

Te	Sample Number	Element	DPM	Std Dev
29-96	96-1053	CrH	100	194
		K	16,310	251
		Ca	6,090	113
		Ti	1,960	26.7
		CrLo	101	53.5
		Mn	1120	232
		Fe	28,690	401
		Co	92	145.2
		Ni	3.6	50.70
		Cu	40	27.8
		Zn	95	24.4
		As	48	16.7
		Se	15.7	9.93
		Sr	152.8	7.01
		Zr	332.5	6.75
		Mo	4.5	3.06
		Hg	-33	21.1
		Pb	-15	10.4
		Rb	79	10.0
		Cd	-25	28.6
		Sn	-64	15.8
		Sb	9.4	10.21
		Ba	541.5	8.53
		Ag	128	19.7
		U	28.3	7.96
		Th	35.1	5.38

L. Henry W. Barrall 3-29-96

	Date	Sample Number	Element	PPM	Std Dev.
1	4-1-96	Teflon Standard	CrHi	-28	197.7
2			K	-64	75.5
3		Parts Per Million	Ca	142	33.8
4		should be less than	Ti	16	27.5
5		5 Times above or below	CrLo	24	50.9
6		the standard deviation	Mn	39	172.5
7		of the elements of	Fe	141	88.6
8		concern.	Co	62	71.8
9			Ni	-8.4	48.91
10			Cu	17	32.4
11			Zn	-40	30.1
12			As	-4.0	19.40
13			Se	4.1	11.73
14			Sr	-1.3	2.71
15			Zr	2.5	1.68
16			Mo	4.7	2.24
17			Hg	1.0	23.69
18			Pb	0.9	10.16
19			Rb	-4.1	5.91
20			Cd	-25	27.8
21			Sn	-34	15.6
22			Sb	27	10.1
23			Ba	-3.3	2.77
24			Ag	6.9	18.8
25			~~Ag~~ ~~Cd~~		
26			U	-0.7	6.95
27			Th	-1.3	4.84
28	4-1-96	Fe Standard Intensities			
29		Results (run at 100 sec.)	Mn = 0.00179		
30		Mn + Co should be less than	Fe = 0.99157		
31		0.010. Fe should be greater	Co = -0.00422		
32		than 0.95 for a good			
33		calibration	[illegible] 4-1-96		

Date	Sample Number	Element	PPM	Std Dev
4-1-96	96-1517	CrH	-320	122
		K	21,640	287
	This was a dry	Ca	2,990	130
	Sample	Ti	2710	98.8
		ErLo	131	62.6
		Mn	450	21.1
		Fe	20,060	401
		Co	-76	141.7
		Ni	-67	46.6
		Cu	-4.4	24.73
		Zn	74	22.4
		As	16	16.9
		Se	15.7	9.69
		Sr	177.9	8.03
		Zr	461.7	7.90
		Mo	1.8	3.16
		Hg	-33	21.1
		Pb	20	11.7
		Rb	82	10.0
		Cd	-61	26.2
		Sn	-33	14.9
		Sb	26.5	9.65
		Ba	1637	14.9
		Ag	56	17.5
		U	18.9	7.74
		Th	27.0	5.41

Kellary M. Barrell 4-1-96

#	Date	Sample Number	Element	P.P.M	Std. Dev
1	4-1-96	96-1518	CrH	-400	169
2			K	18,510	267
3		This was a dry	Ca	7,360	123
4		sample	Ti	2809	99.5
5			CrLo	118	60.1
6			Mn	380	211
7			Fe	26,700	459
8			Co	110	162
9			Ni	-43	49.9
10			Cu	58	27.6
11			Zn	130	23.7
12			As	28	16.8
13			Se	-6.8	8.42
14			Sr	154.0	7.65
15			Zr	443.1	7.89
16			Mo	1.2	3.18
17			Hg	-54	20.0
18			Pb	20	11.5
19			Rb	62.0	9.79
20			Cd	-47	25.9
21			Sn	-28	14.7
22			Sb	18.9	9.46
23			Ba	1559	14.7
24			Ag	37	17.1
25			U	27.8	7.61
26			Th	28.8	5.37
27					
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L. Beverly M. Barrell 4-1-96

	Sample Number	Element	PPM	Std Dev	
96	96-1519	CrAl	170	203	1
		K	20,430	279	2
		Ca	7,280	125	3
		Ti	3,135	94.3	4
		CrLo	73	60.2	5
		Mn	410	212	6
		Fe	18,740	387	7
		Co	210	144	8
		Ni	-8.2	57.70	9
		Cu	39	29.1	10
		Zn	147	27.7	11
		As	9.6	18.07	12
		Se	28	10.9	13
		Sr	172.6	2.92	14
		Zr	365.1	2.06	15
		Mo	1.8	3.09	16
		Hg	-9.6	22.94	17
		Pb	21	12.1	18
		Rb	103	10.6	19
		Cd	-2.0	31.05	20
		Sn	-55	17.1	21
		Sb	4.1	11.04	22
		Ba	1036	11.8	23
		Ag	83	20.8	24
		U	16.0	8.11	25
		Th	25.3	5.43	26
					27
					28
					29
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					31
					32
		L. Dewey M. Bazzell	4-1-96		33

	Date	Sample Number	Element	PPM	Std. Dev.
1	4-1-96	96-1520	CrH	-340	182
2			K	12,460	225
3			Ca	6,360	114
4			Ti	1,620	75.9
5			CrLo	148	59.6
6			Mn	1,920	254
7			Fe	13,200	329
8			Co	64	125.5
9			Ni	-79	48.8
10			Cu	24	31.1
11			Zn	125	31.0
12			As	13	19.6
13			Se	7.5	11.29
14			Sr	114.3	6.49
15			Zr	209.1	5.31
16			Mo	-0.6	2.76
17			Hg	-31	23.1
18			Pb	15	11.8
19			Pb	52.0	9.01
20			Cd	-2.9	26.83
21			Sb	3.9 ~~-65~~ 106	9.54 ~~14.7~~ 106
22			Ba	549.9	8.32
23			Ag	84	18.1
24			U	20.8	7.79
25			Th	26.6	5.47
26			Sn	-65	14.7
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L Darryl W Barrell 4-1-96

Te	Sample Number	Element	PPM	Std. Dev	
2-96	Teflon Standard	CrH	-310	184	1
		K	-100	72.6	2
	Parts Per Million	Ca	-146	33.6	3
	should be less than	Ti	-0.02	27.180	4
	5 times above or below	CrLo	12	50.6	5
	the standard deviation	Mn	-400	151	6
	of the elements of	Fe	-2.0	81.30	7
	concern.	Co	39	69.9	8
		Ni	-35	47.5	9
		Cu	-0.4	31.60	10
		Zn	-68	29.3	11
		As	-33	19.0	12
		Se	1.9	11.60	13
		Sr	-3.5	2.62	14
		Zr	1.1	1.69	15
		Mo	3.6	2.22	16
		Hg	33	24.5	17
		Pb	3.5	10.66	18
		Rb	-4.2	6.22	19
		Cd	-53	27.8	20
		Sn	-37	15.4	21
		Sb	6.2	9.91	22
		Ba	-0.8	2.80	23
		Ag	52	18.6	24
		W	7.0	6.93	25
		Th	10.3	5.13	26
					27
2-96	Fe Standard Intensities				28
	Results (run at 100 sec)	Mn = 0.00833			29
	Mn + Co should be less than	Fe = 0.99033			30
	0.010. Fe should be greater	Co = -0.00065			31
	than 0.95 for a good				32
	calibration.				33

	Date	Sample Number	Element	PPM	Std Dev
1	4-2-9	96-1178 N	CrHi	-150	188
2			K	19,780	276
3			Ca	8,610	133
4			Ti	3,053	97.0
5			CrLo	21	61.3
6			Mn	460	217
7			Fe	23,900	437
8			Co	-340	147
9			Ni	60	54.7
10			Cu	73	31.2
11			Zn	176	29.0
12			As	15	18.2
13			Se	13	14.5
14			Sr	156.7	7.73
15			Zr	338.5	6.97
16			Mo	2.9	9.12
17			Hg	-29	22.7
18			Pb	9.1	12.39
19			Rb	91	10.8
20			Cd	39	32.4
21			Sn	12	18.2
22			Sb	19	11.7
23			Ba	1,393	14.0
24			Ag	73	21.4
25			W	22.6	7.95
26			Th	37.2	5.52
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L. Dwight Bazzell 4-2-96

Te	Sample Number	1 Element	2 PPM	3 Std Dev	
2-96	96-1179 W	CrH	-480	163	1
		K	19,010	269	2
		Ca	6,680	119	3
		Ti	2,571	81.1	4
		Crho	141	52.1	5
		Mn	720	212	6
		Fe	16,470	361	7
		Co	-200	127	8
		Ni	-13	47.0	9
		Cu	17	25.8	10
		Zn	63	22.3	11
		As	35	16.5	12
		Se	9.6	9.36	13
		Sr	164.6	7.59	14
		Zr	371.3	6.94	15
		Mo	2.6	2.97	16
		Hg	-20	20.9	17
		Pb	5.0	10.37	18
		Rb	68.5	9.23	19
		Cd	-53	24.4	20
		Sn	-53	13.6	21
		Sb	9.9	8.78	22
		Ba	457.7	7.71	23
		Ag	44	16.5	24
		W	19.8	7.68	25
		Th	21.6	5.20	26
					27
					28
					29
					30
					31
					32
		L Dwight Bazzell	4-2-96		33

	Date	Sample Number	Element	PPM	Std Dev
1	4-2-96	96-1079	CrHi	-100	190
2			K	22,160	290
3			Ca	8,410	133
4			Ti	2,588	86.8
5			CrLo	105	57.6
6			Mn	950	234
7			Fe	22,890	429
8			Co	81	153.7
9			Ni	-2.8	52.70
10			Cu	78	30.7
11			Zn	96	25.4
12			As	27	18.0
13			Se	20	10.5
14			Sr	218.0	8.94
15			Zr	354.0	7.17
16			Mo	3.3	3.28
17			Hg	-19	22.9
18			Pb	4.9	12.33
19			Rb	9.1	11.1
20			Cd	43	31.0
21			Sn	-52	17.0
22			Sb	8.7	11.06
23			Ba	755	10.2
24			Ag	113	20.9
25			U	38.6	8.51
26			Th	39.9	5.64
27					
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Dwight W. Burrell 4-2-96

e	Sample Number	1 Element	2 PPM	3 Std. Dev.	
96	Teflon Standard	CrH	-130	193	1
		K	-62	73.6	2
	Part Per Million should	Ca	-170	33.3	3
	be less than 5 times	Ti	25	27.3	4
	above or below the	CrKo	112	52.2	5
	standard deviation of	Mn	-260	159	6
	the elements of concern	Fe	-56	79.8	7
		Co	126	73.3	8
		Ni	41	50.8	9
		Cu	17	32.4	10
		Zn	-63	29.5	11
		As	-11	19.3	12
		Se	-4.0	11.51	13
		Sr	-8.0	2.45	14
		Zr	0.6	1.67	15
		Mo	2.0	2.19	16
		Hg	87	26.2	17
		Pb	0.6	10.44	18
		Rb	-9.3	6.04	19
		Cd	-59	27.9	20
		Sn	-61	15.4	21
		Sb	12.4	9.99	22
		Ba	-1.5	2.80	23
		Ag	50	18.7	24
		U	6.5	6.81	25
		Th	8.6	5.03	26
96	Fe Standard Intensities				27
	Results (run at 100 sec)	Mn = 0.00370			28
	Mn + Co should be less	Fe = 0.99709			29
	than 0.010, Fe should be	Co = -0.00241			30
	greater than 0.095 for a				31
	good calibration				32
		L. Dwight Bassett	4-3-96		33

	Date	Sample Number	Element	PPM	Std Dev
11	4-3-96	96-1180 S	CrHi	-340	176
12			K	20,730	281
13			Ca	7,410	126
14			Ti	3,030	99.3
15			CrLo	49	62.5
16			Mn	380	206
17			Fe	18,260	384
18			Co	-160	135
19			Ni	6.8	50.74
10			Cu	38	28.8
11			Zn	156	27.8
12			As	2.9	17.77
13			Se	16	10.4
14			Sr	169.1	7.83
15			Zr	311.0	6.59
16			Mo	-1.2	2.96
17			Hg	-73	20.1
18			Pb	15	12.1
19			Rb	73	10.1
20			Cd	-26	43.3
21			Sn	-20	24.5
22			Sb	26	15.8
23			Ba	1,979	22.8
24			Ag	90	29.0
25			U	30.8	8.00
26			Th	39.1	5.60
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L. Wayne W. Cassidy 4-3-96

Te	Sample Number	Element	PPM	Std Dev	
-96	96-1181 E	CrH	-470	172	1
		K	20,160	279	2
		Ca	8,140	131	3
		Ti	2,850	104	4
		CrLo	-13	66.0	5
		Mn	200	206	6
		Fe	21,680	418	7
		Co	-52	147.9	8
		Ni	-3.6	52.51	9
		Cu	82	31.5	10
		Zn	129	27.6	11
		As	25	18.4	12
		Se	26	11.0	13
		Sr	148.0	7.53	14
		Zr	415.0	7.52	15
		Mo	-3.6	3.18	16
		Hg	-33 ~~0.8~~	22.6 ~~12.44~~	17
		Pb	0.8	12.44	18
		Rb	103	11.2	19
		Cd	115	45.7	20
		Sn	37	25.8	21
		Sb	-11	16.2	22
		Ba	2,697	27.3	23
		Ag	76	29.7	24
		U	27.9	8.25	25
		Th	36.6	5.64	26
					27
					28
					29
					30
					31
					32
	L. Marquette Bazzell		4-3-96		33

	Date	Sample Number	Element	PPM	Std. Dev
1	4-3-96	96 - 1080	CrM	-62	189.2
2			K	20,910	282
3			Ca	7,590	127
4			Ti	2,172	80.2
5			CrLo	134	55.0
6			Mn	550	2.14
7			Fe	20,110	401
8			Co	-13	143.1
9			Ni	-50	48.3
10			Cu	25	27.3
11			Zn	114	25.3
12			As	6.6	16.90
13			Se	24	10.4
14			Sr	231.9	9.05
15			Zr	324.8	6.81
16			Mo	3.8	3.09
17			Hg	-15	22.2
18			Pb	7.8	11.81
19			Rb	111	10.9
20			Cd	19	42.6
21			Sn	-51	23.4
22			Sb	26	15.4
23			Ba	988	16.1
24			Ag	82	28.4
25			U	18.0	8.32
26			Th	37.9	5.58
27					
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[illegible] 4-3-96

Te	Sample Number	Element	PPM	STd. Dev.	
:-96	96-1081	CrHi	61	197.3	1
		K	20,720	281	2
		Ca	2,440	12.6	3
		Ti	2,249	98.0	4
		CrLo	39	63.7	5
		Mn	480	2.16	6
		Fe	21,210	414	7
		Co	-220	142	8
		Ni	-16	50.1	9
		Cu	32	28.2	10
		Zn	131	26.4	11
		As	45	17.1	12
		Se	26	10.7	13
		Sr	226.6	9.04	14
		Zr	364.0	7.22	15
		Mo	-3.0	3.15	16
		Hg	-39	21.7	17
		Pb	-19	10.9	18
		Rb	86	10.8	19
		Cd	-66	41.8	20
		Sn	-80	23.2	21
		Sb	23	15.3	22
		Ba	2,543	26.2	23
		Ag	58	27.7	24
		U	38.4	8.42	25
		Th	37.8	5.62	26
					27
					28
					29
					30
					31
					32
		L. Dwight Burrell	7-3-96		33

	Date	Sample Number	Element	PPM	Std. Dev
1	4-3-96	96-1082	CrHi	-160	186
2			K	20,440	280
3			Ca	8,950	135
4			Ti	2,292	86.1
5			CrLo	144	58.7
6			Mn	340	2.13
7			Fe	25,040	447
8			Co	-280	1.51
9			Ni	-42	49.8
10			Cu	35	28.5
11			Zn	98	25.3
12			As	40	12.7
13			Se	28	10.8
14			Sr	241.6	9.38
15			Zr	353.5	7.18
16			Mo	3.5	3.16
17			Hg	-37	21.9
18			Pb	-1.9	11.39
19			Rb	80	10.2
20			Cd	50	30.9
21			Sn	-67	16.8
22			Sb	4.0	10.96
23			Ba	1,061	12.1
24			Ag	94	20.6
25			U	19.1	7.83
26			Th	25.4	5.28
27					
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Lu Dwight M Brazell 4-3-96

	Sample Number	Element	PPM	Std. Dev.	
96	96-1089	CrHi	-69	192.8	1
		K	21,120	285	2
		Ca	11,240	149	3
		Ti	8,256	87.5	4
		CrLo	-18	58.5	5
		Mn	1,240	243	6
		Fe	21,820	420	7
		Co	200	154	8
		Ni	-46	51.4	9
		Cu	59	30.2	10
		Zn	127	27.1	11
		As	12	18.3	12
		Se	25	10.9	13
		Sr	192.0	8.45	14
		Zr	287.4	6.51	15
		Mo	-0.5	9.00	16
		Hg	-30	22.6	17
		Pb	20	12.5	18
		Rb	104	11.0	19
		Cd	-46	31.6	20
		Sn	-42	17.6	21
		Sb	24	11.4	22
		Ba	1136	12.5	23
		Ag	77	21.2	24
		U	25.2	8.22	25
		Th	32.0	5.45	26
					27
					28
					29
					30
					31
					32
		L. Dwight Barrell	4-3-96		33

	Date	Sample Number	Element	PPM	Std Dev
1	4-3-96	96-1084	CrH	-260	180
2			K	23,800	299
3			Ca	8,330	134
4			Ti	2,410	85.1
5			CrLo	42	55.9
6			Mn	150	199
7			Fe	19,880	400
8			Co	240	149
9			Ni	-160	43.9
10			Cu	30	27.4
11			Zn	185	27.8
12			As	37	17.2
13			Se	17	10.1
14			Sr	194.9	8.37
15			Zr	338.2	6.91
16			Mo	-5.2	2.97
17			Hg	-60	29.3
18			Pb	-5.2	11.33
19			Rb	81	10.4
20			Cd	12	29.6
21			Sn	-37	16.3
22			Sb	-5.6	10.42
23			Ba	712.6	9.82
24			Ag	43	19.5
25			U	34.9	8.17
26			Th	49.3	5.61
27					
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29					
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31					
32					
33			L. Wright Barrett	4-3-96	

Te	Sample Number	1 Element	2 PPM	3 STd. Dev.	
96	Teflon Standard	CrH	-41	197.2	1
		K	-146	71.7	2
	Parts Per Million	Ca	-155	33.6	3
	should be less than	Ti	18	27.3	4
	5 times above or below	CrHo	103	52.2	5
	the standard deviation	Mn	-520	148	6
	of the elements of	Fe	181	88.6	7
	concern	Co	263	79.3	8
		Ni	-14	49.3	9
		Cu	-20	31.2	10
		Zn	-44	30.0	11
		As	1.6	19.50	12
		Se	-17	11.2	13
		Sr	-0.7	2.76	14
		Zr	0.09	1.709	15
		Mo	5.5	2.26	16
		Hg	26	24.5	17
		Pb	-4.8	10.36	18
		Rb	-6.0	6.20	19
		Cd	-73	27.8	20
		Sn	-41	15.5	21
		Sb	7.6	9.93	22
		Ba	3.2	2.88	23
		Ag	48	18.7	24
		W	5.2	6.92	25
		Th	15.8	5.22	26
96	Fe Standard Intensities				27
	Results (run at 110 sec.)	Mn = 0.00328			28
	Mn+Co should be less than	Fe = 0.99393			29
	0.010. Fe should be greater	Co = 0.00134			30
	than 0.95 for a good				31
	calibration.				32
					33

K. Dwight Razzell

	Date	Sample Number	Element	PPM	Std. Dev
1	4-4-96	96-1528	CrHi	160	204
2			K	22,710	294
3			Ca	8030	132
4			Ti	2780	103
5			CrLo	169	67.1
6			Mn	290	2.12
7			Fe	21,000	415
8			Co	260	154
9			Ni	72	53.83
10			Cu	50	28.8
11			Zn	150	27.6
12			As	65	18.5
13			Se	13	10.4
14			Sr	208.3	8.78
15			Zr	363.9	7.27
16			Mo	-0.9	3.25
17			Hg	-24	22.9
18			Pb	-13	11.6
19			Rb	100	11.4
20			Cd	12	31.1
21			Sn	-17	17.5
22			Sb	22	11.3
23			Ba	2790	20.3
24			Ag	69	20.5
25			U	39.4	8.61
26			Th	42.3	5.71
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L. Dewright Bassell 4-4-96

Date	Sample Number	Element	PPM	std. Dev.	
4-96	96-1010	CrH	-240	187	1
		K	23,260	298	2
		Ca	9,600	142	3
		Ti	2,680	107	4
		CrLo	87	69.7	5
		Mn	1,030	239	6
		Fe	21,510	422	7
		Co	39	151.6	8
		Ni	-23	52.4	9
		Cu	16	28.3	10
		Zn	77	25.3	11
		As	5.6	18.52	12
		Se	16	10.7	13
		Sr	243.4	9.48	14
		Zr	352.9	7.26	15
		Mo	6.3	3.28	16
		Hg	-13	23.6	17
		Pb	18	13.2	18
		Rb	86	10.9	19
		Cd	41	32.2	20
		Sn	-6.6	18.18	21
		Sb	2.3	11.56	22
		Ba	3,343	22.6	23
		Ag	81	21.1	24
		U	25.6	8.16	25
		Th	43.8	5.25	26
					27
					28
					29
					30
					31
					32
					33

	Date	Sample Number	Element	PPM	Std Dev
1	4-4-96	96 - 1011	CrH	-260	183
2			K	21,790	288
3			Ca	8,350	133
4			Ti	2,766	93.7
5			CrLo	90	61.0
6			Mn	180	205
7			Fe	22,170	422
8			Co	140	153
9			Ni	-22	52.1
10			Cu	2.4	27.28
11			Zn	111	26.2
12			As	38	17.7
13			Se	18	10.6
14			Sr	207.3	8.22
15			Zr	369.4	7.27
16			Mo	8.0	3.27
17			Hg	-58	21.2
18			Pb	-7.8	11.33
19			Rb	110	11.2
20			Cd	59	31.8
21			Sn	-20	17.7
22			Sb	-24	11.0
23			Ba	1689	15.4
24			Ag	113	21.2
25			U	16.9	8.28
26			Th	37.6	5.57
27					
28					
29					
30					
31					
32					
33					

L. Dean W. Bozzell 4-4-96

Ter	Sample Number	Element	PPM	Std. Dev	
4-96	96-1012	dNH	-170	188	1
		K	20,730	282	2
		Ca	8,090	131	3
		Ti	2,360	108	4
		dNO	201	72.5	5
		Mn	300	211	6
		Fe	22,390	427	7
		Co	-310	145	8
		Ni	20	52.8	9
		Cu	36	29.2	10
		Zn	121	26.9	11
		As	29	18.3	12
		Se	26	11.0	13
		Sr	208.3	8.80	14
		Zr	353.2	7.17	15
		Mo	1.0	3.22	16
		Hg	-42	22.2	17
		Pb	3.0	12.27	18
		Pb	89	11.0	19
		Cd	42	31.8	20
		Sn	-13	17.9	21
		Sb	24	11.6	22
		Ba	3742	24.1	23
		Ag	84	20.8	24
		U	33.7	8.30	25
		Th	35.3	5.57	26
					27
					28
					29
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					31
					32
					33

Dwight Bazell 4-4-96

	Date	Sample Number	Element	PPM	Std Dev
1	4-4-96	96-1013	CaHi	-240	184
2			K	20,120	278
3			Ca	9,120	136
4			Ti	2,430	92.6
5			CrLo	70	61.8
6			Mn	230	208
7			Fe	23,030	431
8			Co	-77	150.9
9			Ni	29	54.2
10			Cu	59	30.6
11			Zn	97	26.5
12			As	22	18.1
13			Se	4.2	10.21
14			Sr	202.7	8.67
15			Zr	346.3	7.10
16			Mo	-3.8	3.11
17			Hg	-18	23.3
18			Pb	1.2	12.14
19			Rb	86	10.8
20			Cd	-20	31.3
21			Sn	-19	17.7
22			Sb	20	11.3
23			Ba	2,038	17.6
24			Ag	74	20.8
25			U	31.1	8.22
26			Th	42.2	5.72
27					
28					
29					
30					
31					
32					
33					

R. Dennis M. Bazzell 4-4-96

e	Sample Number	Element	PPM	STd Dev
-96	96-1014	CrHi	-210	183
		K	19,160	272
		Ca	8,190	130
		Ti	2,422	89.1
		CrLo	122	60.6
		Mn	450	2.12
		Fe	20,880	40.9
		Co	10	146.2
		Ni	-37	50.0
		Cu	8.6	27.27
		Zn	126	26.7
		As	24	17.0
		Se	24	10.7
		Sr	194.6	8.42
		Zr	348.9	7.03
		Mo	-2.0	9.08
		Hg	6.5	23.64
		Pb	-13	11.3
		Rb	8.5	10.5
		Cd	80	32.2
		Sn	32	18.2
		Sb	17	11.6
		Ba	1674	15.2
		Ag	64	21.1
		U	29.9	8.19
		Th	38.7	5.62

L. Wright Gazell 4-4-96

	Date	Sample Number	Element	PPM	Std. Dev.
1	4-4-96	96-1015	CrHi	-300	179
2			K	19,870	277
3			Ca	8,520	133
4			Ti	2,526	96.1
5			CrLo	-16	62.9
6			Mn	940	210
7			Fe	23,140	431
8			Co	67	153.7
9			Ni	3.2	53.20
10			Cu	113	32.6
11			Zn	115	26.7
12			As	42	18.8
13			Se	13	10.4
14			Sr	196.6	8.54
15			Zr	307.6	6.72
16			Mo	0.7	3.11
17			Hg	-9.7	23.43
18			Pb	2.0	12.34
19			Rb	102	11.1
20			Cd	34	32.5
21			Sn	11	18.3
22			Sb	16	11.7
23			Ba	1598	15.0
24			Ag	46	21.2
25			U	30.0	8.36
26			Th	37.1	5.59
27					
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33			L. Dwayne Bazzell	4-4-96	

Te	Sample Number	Element	PPM	Std. Dev.	
5-96	Teflon Standard	CrAl	-0.7	198.94	1
		K	119	77.8	2
	Part Per Million should	Ca	-168	33.7	3
	be less than 5 times	Ti	-10	28.0	4
	above or below the	CrLo	148	52.9	5
	standard deviation of	Mn	-280	159	6
	the elements of concern	Fe	70	85.1	7
		Co	170	75.7	8
		Ni	89	52.8	9
		Cu	31	33.1	10
		Zn	13	31.5	11
		As	-18	19.0	12
		Se	13	12.0	13
		Sr	-1.5	2.72	14
		Zr	3.3	1.67	15
		Mo	-2.3	2.14	16
		Hg	18	24.2	17
		Pb	-4.4	10.13	18
		Rb	-0.7	6.29	19
		Cd	-105	27.7	20
		Sn	-55	15.5	21
		Sb	19	10.0	22
		Ba	-0.2	2.83	23
		Ag	[illegible]	18.8	24
		U	10.9	6.97	25
		Th	-8.8	4.73	26
					27
5-96	Fe Standard Intensities				28
	Results (run at 100 sec.)	Mn = 0.00175			29
	Mn + Co should be less than	Fe = 0.98962			30
	0.010. Fe should be greater	Co = -0.00073			31
	than 0.95 for a good				32
	calibration.	L. Dwight Broadl 4-5-96			33

	Date	Sample Number	Element	PPM	Std Dev
1	4-5-96	96-1016	CrH	-240	183
2			K	21,260	285
3			Ca	7,550	128
4			Ti	2,964	94.8
5			CrLo	-216	57.4
6			Mn	330	204
7			Fe	16,740	368
8			Co	150	138
9			Ni	61	53.9
10			Cu	61	30.2
11			Zn	228	30.3
12			As	5.4	18.05
13			Se	47	11.5
14			Sr	148.7	7.40
15			Zr	358.2	6.97
16			Mo	-0.1	3.13
17			Hg	-2.6	23.17
18			Pb	17	12.6
19			Rb	68	10.2
20			Cd	23	31.6
21			Sn	11	17.8
22			Sb	18	11.4
23			Ba	1184	12.6
24			Ag	76	21.0
25			U	43.0	8.34
26			Th	36.9	5.70
27					
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[illegible] 4-5-96

Te	Sample Number	Element	PPM	Std Dev
5-96	96-1017	CrH	-350	176
		K	22,060	289
		Ca	7,340	127
		Ti	2,694	90.3
		CrLo	103	60.1
		Mn	290	203
		Fe	19,300	394
		Co	-95	139.7
		Ni	-67	48.1
		Cu	42	29.3
		Zn	234	30.7
		As	15	18.2
		Se	17	10.6
		Sr	145.5	7.38
		Zr	253.6	6.03
		Mo	-2.0	2.94
		Hg	-33	22.2
		Pb	17	12.2
		Rb	125	11.5
		Cd	27	31.1
		Sn	-31	17.2
		Sb	-4.2	10.98
		Ba	1257	13.0
		Ag	92	20.7
		U	29.3	8.63
		Th	32.8	5.48

L. Dwight Barrell 4-5-96

	Date	Sample Number	Element	PPM	Std Dev
1	4-5-96	96-1018	CrHi	-31	192.4
2			K	23,300	296
3			Ca	7,420	128
4			Ti	2525	89.2
5			CrLo	164	58.7
6			Mn	1300	242
7			Fe	20,120	404
8			Co	86	147.0
9			Ni	-69	48.3
10			Cu	-12	25.5
11			Zn	52	23.1
12			As	19	18.1
13			Se	29	16.7
14			Sr	181.0	8.17
15			Zr	247.3	6.05
16			Mo	0.6	2.91
17			Hg	-17	22.5
18			Pb	21	12.4
19			Rb	94	10.7
20			Cd	47	30.3
21			Sn	-65	16.5
22			Sb	-6.4	10.67
23			Ba	1209	12.8
24			Ag	91	20.2
25			U	27.2	8.10
26			Th	36.6	5.40
27					
28					
29					
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31					
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L. Kenneth Bassett 4-5-96

Te	Sample Number	Element	PPM	Std Dev	
96	96-1019	Cr H.	-220	177	1
		K	20,590	279	2
		Ca	4660	107	3
		Ti	1,385	87.2	4
		Cr Lo	273	62.1	5
		Mn	330	193	6
		Fe	12,720	321	7
		Co	-170	116	8
		Ni	-17	45.9	9
		Cu	49	27.2	10
		Zn	53	22.0	11
		As	20	17.2	12
		Se	30	10.2	13
		Sr	107.0	6.27	14
		Zr	270.0	5.99	15
		Mo	0.5	2.90	16
		Hg	-25	20.7	17
		Pb	13	12.2	18
		Rb	113	11.1	19
		Cd	-29	25.9	20
		Sn	~~-53 22.1 2.113~~	14.6	21
		Sb	22.1	9.57	22
		Ba	2,589	18.5	23
		Ag	48	17.1	24
		U	41.8	8.77	25
		Th	48.7	5.74	26
					27
					28
					29
					30
					31
					32
		L. Dwight Bezell	4-5-96		33

	Date	Sample Number	Element	PPM	STd Dev
1	4-5-96	96-1521	Cr	-540	154
2			K	14,080	236
3			Cu	6,570	115
4			Ti	1,669	67.7
5			CrLo	263	50.4
6			Mn	1,000	212
7			Fe	14,450	336
8			Co	-97	121.6
9			Ni	44	48.4
10			Cu	93	28.9
11			Zn	81	22.7
12			As	13	16.4
13			Se	-0.6	8.69
14			Sr	117.7	6.45
15			Zr	197.7	5.15
16			Mo	2.9	2.53
17			Hg	-40	19.6
18			Pb	25	11.0
19			Rb	73.8	9.08
20			Sn	-39	13.7
21			Sb	9.3	8.83
22			Ba	384.2	7.02
23			Ag	32	16.4
24			U	16.0	7.42
25			Th	25.1	5.03
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L. Kewyll Bazzell 4-5-96

Date	Sample Number	Element	PPM	Std Dev
-5-96	96-1522	CrH	-320	181
		K	15,040	244
		Ca	6,620	127
		Ti	2,260	80.3
		CrLo	89	58.5
		Mn	500	216
		Fe	14,660	341
		Co	35	128.0
		Ni	151	58.0
		Cu	148	35.6
		Zn	21	26.9
		As	18	18.7
		Se	24	11.5
		Sr	144.9	7.22
		Zr	297.6	6.28
		Mo	0.5	3.03
		Ag	-20	23.2
		Pb	-24	11.45
		Rb	85	10.1
		Cd	21	29.5
		Sn	3.3	16.59
		Sb	2.6	10.49
		Ba	663.3	9.27
		Ag	61	19.6
		U	23.2	8.41
		Th	29.5	5.63

L. Dewitt Bazzell 4-5-96

	Date	Sample Number	1 Element	2 PPM	3 STD Dev
1	4-5-96	96-1523	CrAi	-260	184
2			K	25,190	307
3			Ca	6,490	123
4			Ti	1909	74.6
5			CrLo	-17	54.2
6			Mn	590	213
7			Fe	13,990	338
8			Co	240	132
9			Ni	23	52.9
10			Cu	38	30.1
11			Zn	77	27.0
12			As	25	18.3
13			Se	15	10.8
14			Sr	114.1	6.58
15			Zr	287.6	6.23
16			Mo	0.2	2.97
17			Ag	-18	22.9
18			Pb	-6.0	11.85
19			Rb	77	10.3
20			Cd	27	29.7
21			Sn	-21	16.5
22			Sb	14	10.6
23			Ba	423.6	7.61
24			Ag	60	19.7
25			U	33.0	8.23
26			Th	45.5	5.70
27					
28					
29					
30					
31					
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[illegible] 4-5-96

Date	Sample Number	Element	PPM	Std Dev.	
-8-96	Teflon Standard	CrHi	-280	186	1
		K	96	77.2	2
	Part Per Million	Cu	-195	32.9	3
	should be less than	Ti	-13	28.1	4
	5 times above or below	CrLo	54	51.5	5
	the standard deviation	Mn	-320	156	6
	of the elements of	Fe	75	85.2	7
	concern for a good	Co	158	75.3	8
	background.	Ni	-55	47.4	9
		Cu	-24	31.0	10
		Zn	-1.8	31.04	11
		As	-55	18.2	12
		Se	-0.04	11.613	13
		Sr	-9.5	2.34	14
		Zr	2.4	1.68	15
		Mo	1.6	2.19	16
		Hg	29	24.5	17
		Pb	-6.1	10.25	18
		Rb	-4.0	5.94	19
		Cd	-46	27.7	20
		Sn	-2.1	15.61	21
		Sb	-1.2	9.83	22
		Ba	-1.3	2.80	23
		Ag	6.3	18.33	24
		U	8.7	6.70	25
		Th	4.5	4.90	26
-8-96	Fe Standard Intensities				27
	Results (run at 100 sec.)	Mn = 0.00319			28
	Mn + Co should be less	Fe = 0.99051			29
	than 0.010. Fe should be	Co = -0.00065			30
	greater than 0.95 for a				31
	good calibration.				32
		L. Llewelyn M. Barrett 4-8-96			33

	Date	Sample Number	1 Element	2 PPM	3 Std Dev
1	4-8-96	96-1000	CrH	-140	188
2			K	21,590	280
3			Ca	6,350	219
4			Ti	2,434	82.9
5			CrL	-30	55.3
6			Mn	-230	184
7			Fe	18,390	383
8			Co	-50	137.3
9			Ni	243	61.0
10			Cu	31	29.1
11			Zn	75	25.2
12			As	-7.2	17.77
13			Se	18	10.5
14			Sr	139.6	7.22
15			Zr	390.8	7.25
16			Mo	4.5	3.49
17			Ag	-35	21.7
18			Pb	22	12.4
19			Rb	80	11.5
20			Cd	39	31.2
21			Sn	-44	17.1
22			Sb	6.1	11.10
23			Ba	660.1	9.46
24			Ag	62	20.6
25			U	88.6	9.74
26			Th	34.1	5.90
27					
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32					
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[illegible] 4-8-96

Date	Sample Number	Element	PPM	Std Dev
-8-96	96-1001	CrH'	-680	161
		K	16,760	256
		Ca	6,600	119
		Ti	2,473	84.1
		CrLo	145	60.0
		Mn	19	183.9
		Fe	10,480	291
		Co	24	113.9
		Ni	-70	46.7
		Cu	69	31.3
		Zn	14	25.7
		As	-17	17.3
		Se	28	11.3
		Sr	138.6	6.94
		Zr	339.4	6.52
		Mo	0.5	3.04
		Hg	-43	21.4
		Pb	-1.7	11.46
		Rb	76.7	9.88
		Cd	14	28.0
		Sn	-44	15.4
		Sb	14	16.1
		Ba	535.7	8.24
		Ag	77	18.7
		U	34.8	8.65
		Th	32.8	5.85

L. Henry H. Brazell 4-8-96

	Date	Sample Number	Element	PPM	Std Dev
1	4-8-96	96-1002	CrAl	-220	182
2			K	21,660	287
3			Ca	6,600	121
4			Ti	3,449	90.6
5			CrLo	129	56.2
6			Mn	-45	186.8
7			Fe	15,790	357
8			Co	-280	124
9			Ni	-21	47.6
10			Cu	156	33.1
11			Zn	154	27.0
12			As	5.2	19.34
13			Se	9.0	9.79
14			Sr	157.3	7.39
15			Zr	381.1	7.11
16			Mo	5.1	5.21
17			Hg	-22	21.7
18			Pb	64	13.7
19			Rb	86	10.6
20			Cd	30	28.1
21			Sn	12	15.9
22			Sb	-3.9	9.92
23			Ba	505.9	8.23
24			Ag	95	19.0
25			U	45.7	8.75
26			Th	36.6	5.88
27					
28					
29					
30					
31					
32					
33					

T. Dwight Bazzell 4-8-96

Date	Sample Number	Element	PPM	STd Dev
4-8-96	96-1003	CrHi	-200	187
		K	22,660	294
		Ca	8,510	135
		Ti	3,991	97.6
		CrLo	-77	57.6
		Mn	550	218
		Fe	21,000	414
		Co	-27	147.3
		Ni	347	66.7
		Cu	789	54.9
		Zn	93	26.6
		As	2.4	17.71
		Se	31	11.0
		Sr	225.1	9.09
		Zr	332.9	7.04
		Mo	-0.8	3.18
		Hg	-39	22.1
		Pb	15	12.3
		Rb	63	10.6
		Cd	108	33.3
		Sn	-9.2	18.35
		Sb	21	12.0
		Ba	806	10.6
		Ag	92	22.0
		U	52.2	8.48
		Th	32.8	5.61

L Dwight Barrell 4-8-96

	Date	Sample Number	Element	PPM	STD Dev
1	4-8-96	96-1004	Cr Hi	-390	174
2			K	21,210	284
3			Cu	7,240	125
4			Ti	2,469	83.7
5			CrLo	10	55.6
6			Mn	910	222
7			Fe	22,550	425
8			Co	-240	146
9			Ni	405	67.8
10			Cu	293	40.1
11			Zn	148	27.8
12			As	39	18.4
13			Se	22	10.7
14			Sr	174.2	8.[illegible]
15			Zr	325.2	6.[illegible]
16			Mo	0.9	3.10
17			Hg	-54	21.4
18			Pb	5.1	12.07
19			Rb	77	10.6
20			Cd	-7.3	31.47
21			Sn	-16	17.6
22			Sb	32	11.4
23			Ba	573.1	8.98
24			Ag	87	21.1
25			U	32.8	8.09
26			Th	38.6	5.52
27					
28					
29					
30					
31					
32					
33			L. Dwight Bazzell	4-8-96	

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Item No. 56-304	"	4 Column
Item No. 56-306	"	6 Column
Item No. 56-308	"	8 Column
Item No. 56-312	"	12 Column

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X-Ray Flourescent (XRF) Results for OU-1082 VCA Field work

Date	Sample Number	Element	PPM	Std Dev
4-8-96	96-1005	Cr Hi	-160	186
		K	18,490	268
		Ca	8,000	128
		Ti	2,397	80.8
		Cr Lo	98	56.5
		Mn	470	209
		Fe	17,900	378
		Co	-150	134
		Ni	378	65.6
		Cu	170	35.5
		Zn	159	28.7
		As	30	18.4
		Se	15	10.5
		Sr	156.3	7.56
		Zr	302.0	6.52
		Mo	1.0	3.02
		Hg	-30	22.1
		Pb	13	11.8
		Pb	81	16.2
		Cd	-56	30.2
		Sn	-13	17.0
		Sb	8.1	10.24
		Ba	502.1	8.30
		Ag	69	20.3
		U	30.8	8.28
		Th	35.6	5.63

L. Dwight Burrell 4-8-96

CONTINUED FROM LAB BOOK # 292

Date	Sample Number	Element	PPM	Std Dev
4-8-96	96-1073	CrHi	-570	161
		K	7420	260
		Ca	6,550	117
		Cr+6	50	49.1
		Mn	640	21.7
		Fe	24,020	435
		Co	100	15.5
		Ni	-2.9	51.92
		Cu	7.6	26.63
		Zn	119	25.5
		As	74	17.8
		Se	4.6	9.69
		Sr	113.8	6.71
		Zr	369.4	7.08
		Mo	-5.1	3.03
		Hg	-30	21.9
		Pb	-20	10.9
		Rb	90	10.9
		Cd	-36	22.7
		Sn	-18	15.6
		Sb	5.3	9.85
		Ba	457.8	7.96
		Ag	70	18.7
		U	35.6	8.23
		Th	49.9	5.69
		Ti	1848	72.1

L. Newight Gazzola 4-8-96

Date	Sample Number	Element	PPM	STD. DEV.
4-8-96	96-1074	CrHi	-330	175
		K	19,300	272
		Ca	6,690	120
		Ti	1,779	72.7
		CrLo	57	52.0
		Mn	330	205
		Fe	20,850	407
		Co	340	152
		Ni	127	57.7
		Cu	80	30.6
		Zn	114	25.8
		As	-42	12.3
		Se	22	10.4
		Sr	129.7	7.02
		Zr	363.5	7.06
		Mo	-1.6	3.07
		Hg	-23	22.2
		Pb	-13	11.2
		Rb	93	10.8
		Cd	71	29.5
		Sn	-52	16.0
		Sb	-17	10.2
		Ba	417.7	2.63
		Ag	97	19.8
		U	32.8	8.24
		Th	36.6	5.51

L. Dwight Bizzell 4-8-96

Date	Sample Number	Element	P.P.M.	Std Dev
4-8-96	96-1075	Cr Hi	-120	188
		K	19,120	271
		Ca	6,760	121
		Ti	1,893	24.7
		Cr Lo	38	53.7
		Mn	100	204
		Fe	26,290	456
		Co	280	165
		Ni	-9.0	54.50
		Cu	33	29.4
		Zn	146	28.1
		As	31	18.4
		Se	15	10.7
		Sr	91.9	6.24
		Zr	306.3	6.65
		Mo	4.0	3.13
		Hg	-27	22.9
		Pb	-4.1	12.45
		Rb	93	11.0
		Cd	-2.2	30.02
		Sn	-37	16.6
		Sb	2.2	10.65
		Ba	318.4	6.90
		Ag	70	20.1
		U	24.0	7.99
		Th	50.3	5.65

J. Dwight Brazell 4-8-96

Date	Sample Number	Elements	PPM	Std. Dev.
-9-96	Teflon Standard	Cr H	-290	98.6
		K	-39	74.3
	Parts Per Million should be	Cu	-163	33.6
	less than 3 times above or	Ti	-8.9	27.94
	below the standard deviation	CrHO	72	52.0
	of the elements of concern.	Mn	-300	157
		Fe	126	87.4
		Co	165	75.9
		Ni	-18	49.0
		Cu	-43	30.5
		Zn	-9.0	31.00
		As	-30	19.0
		Se	-8.6	11.45
		Br	-0.5	2.81
		Zr	2.0	1.69
		Mo	1.7	2.20
		Hg	92	26.5
		Pb	1.2	10.36
		Rb	-9.6	5.96
		Cd	-12	28.1
		Sn	-27	15.6
		Sb	14	10.1
		Ba	2.8	2.88
		Ag	28	18.6
		U	4.0	6.76
-9-96	Fe Standard Intensities Results	Th	0.8	4.91
	(run at 100 sec.) Mn + Co should be			
	less than 0.010. Fe should be greater	Mn = 0.00531		
	than 0.95 for a good calibration.	Fe = 0.99695		
		Co = 0.00094		
	L. Dwight Bazzell	4-9-96		

Date	Sample Number	Element	PPM	Std. Dev
4-9-96	96 - 1076	Cr Hi	-250	180
		K	9,630	275
		Ca	8,330	130
		Ti	1,235	22.9
		Cr2o	-26	49.7
		Mn	630	222
		Fe	26,870	463
		Co	-330	155
		Ni	-77	47.9
		Cu	8.2	26.61
		Zn	139	26.2
		As	19	17.6
		Se	12	10.0
		Sr	197.2	8.61
		Zr	299.6	6.66
		Mo	1.5	3.03
		Hg	-45	21.4
		Pb	17	11.9
		Rb	75	10.3
		Cd	26	30.0
		Sn	-19	16.7
		Sb	18	11.8
		Ba	653.0	9.56
		Ag	48	19.8
		U	28.8	7.89
		Th	29.8	5.29

[illegible] 4-9-96

Date	Sample Number	Element	PPM	Std Dev
4-9-96	96-4077	Cr	-324	180
		K	24,440	305
		Ca	8,520	136
		Ti	8,623	96.1
		CrLO	10	57.4
		Mn	790	228
		Fe	19,470	400
		Co	4.2	144.10
		Ni	240	62.5
		Cu	822	55.3
		Zn	106	26.5
		As	-0.08	17.227
		Se	25	10.6
		Sr	204.9	8.70
		Zr	443.3	7.91
		Mo	0.6	5.29
		Hg	-5.0	23.21
		Sb	14	12.1
		Pb	100	11.0
		Cd	0.8	31.51
		Sn	-24	17.6
		Sb	4.7	11.18
		Ba	218.8	9.99
		Ag	83	21.1
		U	26.7	8.38
		Th	32.8	5.67

L. Wright Bazell 4-9-96

Date	Sample Number
4-9-96	1096-1078

Element	PPM	Std Dev
Cr Hi	-160	188
K	20,190	275
Ti	2,809	87.9
Cr Lo	-11	56.5
Mn	220	205
Fe	21,910	419
Co	-6.8	150.80
Ni	3,790	146
Cu	2,244	87.5
Zn	89	29.4
As	16	19.4
Se	9.7	10.52
Sr	203.0	8.87
Zr	338.1	7.19
Mo	11.4	3.65
Hg	-52	22.3
Pb	31	13.4
Rb	75	12.2
Cd	25	33.3
Sn	-26	18.4
Sb	19	11.9
Ba	664.2	9.83
Ag	80	22.2
U	87.6	9.57
Th	33.9	5.77
Ca	8,300	132

Lillwright Bassett 4-9-96

Date	Sample Number	Element	PPM	Std Dev
-10-96	Teflon Standard	Cl	-360	183
		K	113	77.6
	Parts Per Million should be	Ca	-205	32.7
	less than 5 times above or	Ti	-49	28.2
	below the standard deviation	Cr	84	52.1
	of the elements of concern.	Mn	76	72.8
		Fe	4.0	83.98
		Co	307	80.7
		Ni	25	51.0
		Cu	-91	31.1
		Zn	11	31.5
		As	-37	19.1
		Se	8.5	11.93
		Sr	0.2	2.82
		Zr	0.5	1.66
		Mo	1.2	2.27
		Hg	27	24.5
		Pb	6.7	10.55
		Rb	1.7	6.54
		Cd	-29	22.9
		Sn	-57	15.3
		Sb	3.5	9.94
		Ba	4.8	2.90
		Ag	43	18.6
		U	18.8	7.47
4-10-96	Fe Standard Intensities Results	Th	21.5	5.04
	(run at 100 sec.) Mn + Co should be			
	less than 0.010. Fe should be greater	Mn = 0.00147		
	than 0.95 for a good calibration	Fe = 0.99399		
		Co = 0.00034		
	L Newitt Bassett 4-10-96			

Date	Sample Number	Element	PPM	Std Dev
4-15-96	Teflon Standard	CrHi	-430	180
		K	85	72.5
	Parts Per Million should be less	Ca	-71	35.8
	than 5 times above or below	Ti	23	22.5
	the standard deviation of the	CrLo	95	52.1
	elements of concern.	Mn	-440	150
		Fe	52	84.2
		Co	166	75.8
		Ni	-8.5	49.46
		Cu	14	32.5
		Zn	-27	30.6
		As	-41	18.7
		Se	-12	11.3
		Sr	-4.7	2.60
		Zr	1.2	1.68
		Mo	2.6	2.23
		Hg	39	24.9
		Pb	-1.4	10.28
		Rb	-3.2	6.32
		Cd	-65	27.8
		Sn	-41	15.5
		Sb	17	10.0
		Ba	1.3	2.85
		Ag	42	18.6
		U	9.8	7.08
4-15-96	Fe Standard Intensities Results	Th	3.9	5.05
	(run at 100 sec.) Mn & Cu should be			
	less than 0.010, Fe should be greater	Mn = 0.00285		
	than 0.95 for a good calibration.	Fe = 0.98955		
		Cu = -0.00097		
	L. Kenneth Bazzell	4-15-96		

Date	Sample Number	Element	PPM	Std. Dev
15-96	96/1085	Cr	160	188
		K	16,330	257
		Ca	12,960	155
		Ti	2,294	88.2
		CrAl	87	57.4
		Mn	1020	246
		Fe	33490	522
		Co	190	183
		Ni	-50	54.7
		Cu	-18	26.7
		Zn	157	22.3
		As	12	19.0
		Se	1.3	9.79
		Sr	223.4	9.39
		Zr	323.1	7.16
		Mo	2.6	3.04
		Hg	-85	20.6
		Pb	38	13.2
		Rb	56.3	9.67
		Cd	52	51.7
		Sn	-76	17.2
		Sb	13	11.3
		Ba	1065	12.4
		Ag	120	21.4
		U	11.7	6.96
		Th	21.6	5.07

L. Dwight Russell 4-15-96

Date	Sample Number	Element	PPM	Std Dev
4-15-96	96-1086	CrH	-460	167
		K	22,300	291
		Ca	5,250	117
		Ti	758	86.1
		CrL	241	64.5
		Mn	35	191.1
		Fe	20,480	408
		Co	-270	139
		Ni	13	50.8
		Cu	68	29.8
		Zn	111	25.7
		As	32	16.8
		Se	7.9	9.90
		Sr	122.5	6.89
		Zr	253.9	6.06
		Mo	-4.2	2.72
		Hg	-28	21.9
		Pb	-13	10.8
		Rb	72.9	9.89
		Cd	-28	22.7
		Sn	-49	15.5
		Sb	18	10.1
		Ba	2,239	17.6
		Ag	36	18.2
		U	22.7	7.61
		Th	42.6	5.45

[illegible] 4-15-96

Date	Sample Number	Element	PPM	Std Dev
4-15-96	96-1087	Cr Hi	570	16.0
		K	17,360	261
		Ca	9,440	136
		Ti	1,632	80.9
		Cr Lo	175	55.5
		Mn	670	219
		Fe	25,760	454
		Co	-42	158.0
		Ni	96	47.2
		Cu	21	26.6
		Zn	119	24.7
		As	41	16.0
		Se	16.5	9.92
		Sr	149.6	7.59
		Zr	290.2	6.51
		Mo	0.9	2.97
		Hg	-52	20.7
		Pb	-21	10.1
		Rb	85	10.3
		Cd	-43	27.5
		Sn	-68	15.1
		Sb	9.0	9.84
		Ba	1,013	11.7
		Ag	52	18.4
		U	23.9	7.78
		Th	26.6	5.09

L. Dwight Burrell 4-15-96

Date	Sample Number
4-15-96	96-1088

Element	PPM	Std. Dev
Cr H	-20	198.6
K	17,290	269
Ca	26,150	212
Ti	2,243	80.3
CrLo	147	55.7
Mn	280	2.4
Fe	24,070	448
Co	33	158.7
Ni	-68	50.7
Cu	20	28.3
Zn	101	25.9
As	17	16.9
Se	16	10.6
Sr	184.7	8.49
Zr	313.7	6.90
Mo	-3.7	3.00
Hg	-30	22.8
Pb	-2.3	17.08
Rb	26	10.4
Cd	8.3	31.15
Sn	-48	17.1
Sb	12	11.1
Ba	589.1	9.18
Ag	48	20.6
U	26.1	2.83
Th	33.2	5.41

L. Dwight Brazell 4-15-96

Te	Sample Number	Element	PPM	Std Dev
5.96	-96-1089	Cr	-100	80.1
		K	16,910	266
		Ca	11,440	148
		Ti	2,526	96.4
		CrLo	83	62.8
		Mn	760	23.3
		Fe	27,900	497
		Co	230	17.1
		Ni	-46	53.4
		Cu	20	28.3
		Zn	131	26.8
		As	30	12.7
		Se	18	11.6
		Sr	238.8	9.55
		Zr	273.4	6.59
		Mo	5.5	3.04
		Hg	-47	22.3
		Pb	-5.7	11.70
		Rb	81	11.5
		Cd	56	32.9
		Sn	-45	17.6
		Sb	12	11.4
		Ba	1,243	15.9
		Ag	63	21.0
		U	15.0	7.58
		Th	32.9	5.27

L. Dwight Bazzell 4-15-96

Date	Sample Number
4-15-96	96-1090

Element	PPM	Std Dev.
Cr	-130	192
K	18,030	267
Ca	10,210	142
Ti	2,880	91.1
Cr	37	58.9
Mn	430	223
Fe	29,010	485
Co	-200	165
Ni	61	57.7
Cu	-5.5	28.46
Zn	148	28.8
As	12	19.1
Se	41	12.0
Sr	158.7	7.98
Zr	308.0	6.86
Mo	6.3	3.27
Hg	-39	23.1
Pb	14	13.2
Rb	95	11.0
Cd	-1.3	32.58
Sn	-32	18.1
Sb	15	11.7
Ba	946	11.6
Ag	86	21.8
U	20.4	8.05
Th	32.9	5.58

L. Davis W. Burrell 4-15-96

Ta	Sample Number	Element	RPM	STd Dev
16-96	Teflon Standard	Cr	-130	39.5
		K	164	78.9
	Parts Per Million should be	Cu	-208	32.8
	less than 3 times above or	Ti	45	27.8
	below the standard deviation	Cl	112	52.2
	of the elements of concern.	Mn	-500	150
		Fe	104	86.3
		Co	181	76.6
		Ni	-29	46.9
		Cu	-18	31.4
		Zn	-15	30.9
		As	-22	19.2
		Se	-11	11.4
		Sr	-1.1	2.76
		Zr	1.6	1.72
		Mo	6.3	2.28
		Hg	35	24.8
		Pb	3.6	10.38
		Rb	-2.0	6.25
		Cd	-45	27.8
		Sn	-63	15.3
		Sb	-1.1	9.86
		Ba	-0.7	2.81
		Ag	29	18.5
		U	4.3	2.06
16-96	Fe Standard Intensities Results	Th	6.1	5.12
	(run at 100 sec.) ~~Fe~~ Mn + Co should be			
	less than 0.010. Fe should be	Mn = 0.00276		
	greater than 0.95 for a good	Fe = 0.98566		
	calibration	Co = -0.00125		
	L. Dwight Bazell	4-16-96		

Date	Sample Number	Element	PPM	Std Dev
4-16-96	96-1006	CrH	-240	175
		K	19370	272
		Cu	5,870	114
		Ti	1431	65.8
		CrLo	131	49.0
		Mn	130	186
		Fe	16,220	360
		Co	-190	127
		Ni	195	56.1
		Cu	100	30.1
		Zn	248	28.8
		As	39	17.0
		Se	2.7	8.99
		Sr	121.6	6.69
		Zr	237.0	5.71
		Mo	4.6	2.79
		Hg	-52	19.6
		Pb	11	11.1
		Rb	101	10.4
		Cd	15	26.9
		Sn	-52	14.8
		Sb	9.7	9.63
		Ba	412.2	7.41
		Ag	91	18.2
		U	24.8	8.16
		Th	32.7	5.30

T. Dwight Bazzell 4-16-96

Date	Sample Number	Element	PPM	Std Dev
4-16-96	96-1007	Cr	-11	190.8
		K	23,610	298
		Ca	6,500	122
		Ti	2,270	28.8
		Co	66	52.2
		Mn	320	201
		Fe	14,350	343
		Co	-130	124
		Ni	216	57.3
		Cu	164	33.0
		Zn	83	23.0
		As	33	15.9
		Se	1.4	8.91
		Sr	149.5	7.32
		Zr	407.7	7.52
		Mo	3.2	3.05
		Ag	-38	20.1
		Pb	-5.6	10.22
		Rb	57.0	9.13
		Cd	-29	24.5
		Sn	-39	13.7
		Sb	25.1	8.99
		Ba	421.6	7.43
		Ag	76	16.7
		W	24.3	7.68
		Th	30.6	5.42

L. Henry W. Barrett 4-16-96

Date	Sample Number	Element	PPM	Std Dev
4-16-96	96-1008	CrH	-300	193
		K	20,830	281
		Ca	5730	110
		Ti	1,681	68.1
		CrL	168	49.3
		Mn	330	19.3
		Fe	12,950	324
		Co	-7.4	121.52
		Ni	662	32.6
		Cu	489	44.7
		Zn	249	29.3
		As	14	16.0
		Se	18.3	9.64
		Sr	133.6	6.91
		Zr	318.9	6.48
		Mo	6.06	2.828
		Hg	-84	17.9
		Pb	8.5	10.76
		Rb	61.9	9.32
		Cd	-7.1	25.36
		Sn	-16	14.3
		Sb	5.2	9.05
		Ba	490.8	7.95
		Ag	52	16.9
		U	32.1	2.86
		Th	30.5	5.39

L. Aaron W. Sizoli

Date	Simple Number	Element	PPM	Std Dev.
-16-96	96-1009	Ti	1610	155
		K	25,150	308
		Ca	2,300	128
		V	1,970	75.2
		Cr	33	50.9
		Mn	370	19.4
		Fe	13,600	335
		Co	-150	121
		Ni	243	58.3
		Cu	382	41.1
		Zn	122	25.0
		As	14	16.5
		Se	8.6	9.28
		Sr	152.2	2.47
		Zr	226.3	5.61
		Mo	5.0	2.68
		Hg	-48	19.8
		Pb	21	11.0
		Rb	54.0	8.79
		Cd	-64	25.1
		Sn	-40	14.1
		Sb	8.7	9.01
		Ba	477.2	7.88
		Ag	41	16.9
		U	18.8	2.28
		Th	21.8	4.97

L. Dwight Bazell 4-16-96

Date	Sample Number	Element	PPM	Std Dev.
4-17-96	Teflon Standard	CrKl	8.5	204.7
		K	116	78.0
	Parts Per Million should be	Cu	-174	33.6
	less than 5 times above or	Ti	84	27.4
	below the standard deviation	CrKo	-2.0	50.50
	of the elements of concern.	Mn	-62.0	145
		Fe	9.1	82.27
		Co	192	76.9
		Ni	108	54.0
		Cu	-13	31.9
		Zn	-62	29.9
		As	-3.4	19.83
		Se	4.8	11.87
		Sr	-2.1	2.71
		Zr	4.8	1.79
		Mo	6.8	2.31
		Hg	16	24.4
		Pb	5.8	16.66
		Rb	-5.1	6.00
		Cd	-57	27.9
		Sn	-26	16.6
		Sb	11	10.0
		Ba	2.6	2.88
		Ag	48	18.7
		U	-1.0	6.84
4-17-96	Fe Standard Intensities Results	Th	5.3	5.07
	(run at 100 sec.) Mn + Co should be			
	less than 0.010. Fe should be	Mn = 0.00046		
	greater than 0.95 for a good	Fe = 0.99233		
	calibration.	Co = -0.00215		
		[illegible]	4-17-96	

Date	Sample Number	Element	PPM	Std Dev
-17-96	96-1182	CrH.P	-260	1485
		K	21,810	289
		Ca	7,370	127
		Ti	2,930	89.6
		CrLo	1.1	56.42
		Mn	810	234
		Fe	24,110	4414
		Co	130	159
		Ni	-48	52.1
		Cu	46	29.8
		Zn	105	26.5
		As	10	19.0
		Se	24	10.9
		Sr	157.5	7.86
		Zr	462.1	8.11
		Mo	1.4	3.43
		Hg	-3.3	23.86
		Pb	34	13.0
		Rb	101	11.1
		Cd	-47	37.7
		Sn	-15	17.8
		Sb	5.2	11.24
		Ba	636.5	9.48
		Ag	72	21.3
		U	28.4	8.46
		Th	21.0	5.54

L. Dwight Bassett 4-17-96

Date	Sample Number	Element	PPM	Std Dev.
4-17-96	96-1183	CrHi	-240	185
		K	23,390	299
		Ca	9,720	142
		Ti	3,066	92.9
		CrLo	12	58.1
		Mn	410	214
		Fe	21,270	419
		Co	-200	145
		Ni	-48	49.5
		Cu	51	29.5
		Zn	57	24.1
		As	24	18.8
		Se	-3.6	9.57
		Sr	157.5	7.78
		Zr	340.4	6.95
		Mo	4.3	3.20
		Ag	-26	22.5
		Pb	31	12.5
		Pb	133	11.6
		Cd	19	30.4
		Sn	-0.2	17.10
		Sb	1.2	10.80
		Ba	1,059	12.0
		Ag	58	20.1
		Li	13.8	8.45
		Th	24.6	5.40

L. Dwight Brazell 4-17-96

Date	Sample Number	Element	PPM	Std Dev
4-17-96	96-1184	Cr	-200	180
		K	2,040	285
		Ca	9,780	141
		Ti	3,053	90.2
		CrLo	-38	56.2
		Mn	230	212
		Fe	25,230	454
		Co	-85	161.2
		Ni	-95	58.6
		Cu	113	33.3
		Zn	99	26.4
		As	21	18.3
		Se	51	12.0
		Sr	152.0	2.77
		Zr	370.2	7.35
		Mo	-6.1	3.11
		Ag	-22	23.3
		Pb	7.5	12.29
		Rb	89	11.0
		Cd	43	32.4
		Sn	-16	18.0
		Sb	-8.5	11.34
		Ba	603.5	9.30
		Ag	93	21.7
		W	31.6	8.16
		Th	28.6	5.45

Ludwig M. Bazell 4-17-96

Date	Sample Number	Element	PPM	Std Dev
4-17-96	96-1185	Cr Hi	-430	470
		K	17,590	262
		Ca	7,430	124
		Ti	2,510	84.2
		Cr Lo	97	54.4
		Mn	130	2.03
		Fe	26,500	461
		Co	-28	160.2
		Ni	287	64.9
		Cu	39	29.4
		Zn	93	25.0
		As	15	16.4
		Se	6.3	9.86
		Sr	162.0	7.92
		Zr	337.2	7.01
		Mo	-0.4	3.02
		Hg	-38	21.9
		Pb	-7.2	10.81
		Pb	76	10.2
		Cd	-18	29.2
		Sn	-32	16.3
		Sb	-17	10.1
		Ba	723.7	9.99
		Ag	73	19.6
		U	20.1	7.64
		Th	27.0	5.20

L. Dwight Barrell 4-17-96

Date	Sample Number	Element	PPM	Std Dev
4-17-96	96-1186	Cr. Hi	-20	495.7
		K	23,680	295
		Ca	8,320	134
		Ti	1,825	93.6
		Cr-Lo	403	67.2
		Mn	98	196.5
		Fe	18,470	391
		Co	-150	138
		Ni	-9.4	50.13
		Cu	46	28.9
		Zn	134	26.7
		As	27	18.4
		Se	20	10.5
		Sr	143.9	7.41
		Zr	247.8	6.04
		Mo	-4.2	2.85
		Hg	-17	22.7
		Pb	18	12.5
		Rb	85	10.8
		Cd	20	30.0
		Sn	-30	16.8
		Sb	29	11.0
		Ba	2,121	17.1
		Ag	98	20.0
		U	39.3	8.31
		Th	44.9	5.65

L Hewight Bazell 4-17-96

Date	Sample Number	Element	PPM	Std. Dev.
4-17-96	96-1187	CrHi	-290	175
		K	16,610	255
		Ca	7,590	124
		Ti	1,872	25.3
		CrLo	233	52.2
		Mn	370	20.6
		Fe	23,050	42.9
		Co	360	15.9
		Cu	29	22.2
		Zn	110	24.4
		As	25	16.7
		Se	6.0	9.44
		Sr	222.0	8.97
		Zr	286.9	6.51
		Mo	0.5	2.84
		Hg	-33	21.3
		Pb	6.7	11.11
		Rb	60.3	9.40
		Cd	-48	22.9
		Sn	-69	15.4
		Sb	8.1	9.95
		Ba	726.7	9.86
		Ag	82	18.9
		U	18.4	7.46
		Th	32.6	5.31
		Ni	19	53.3

L. Dwight Bazzell 4-17-96

Date	Sample Number	Element	RPM	Std Dev
4-18-96	Teflon Standard	BCr Hi	-14	200.6
		K	242	80.9
	Parts Per Million should be	Ca	-17	35.1
	less than 15 times above or	Ti	-17	27.6
	below the standard deviation	Cr Lo	80	52.0
	of the elements of concern.	Mn	-270	161
		Fe	-67	85.9
		Co	97	73.6
		Ni	-58	47.7
		Cu	-24	31.3
		Zn	-48	30.2
		As	-2.8	19.44
		Se	19	12.3
		Sr	0.5	2.84
		Zr	0.3	1.69
		Mo	1.8	2.24
		Hg	21	24.6
		Pb	-9.5	10.27
		Rb	-8.2	6.13
		Cd	-17	28.1
		Sn	29	15.6
		Sb	11	10.1
		Ba	5.2	2.92
		Ag	38	18.7
		U	10.6	7.06
4-17-96	Fe Standard Intensities Results	Th	7.3	5.12
	(run at 100 sec.) Mn+Co should be			
	less than 0.010. Fe should be	Mn = 0.00404		
	greater than 0.95 for a good	Fe = 0.98978		
	calibration	Co = 0.00045		
		[illegible] 4-18-96		

Date	Sample Number	Element	PPM	Std Dev
4-18-96	96-1188	Cr H.	-97	192.1
[illegible]		K	23,470	299
[illegible]		Ca	930	139
[illegible]		Ti	3,036	88.3
[illegible]		Cr Lo	109	56.8
[illegible]		Mn	410	216
[illegible]		Fe	22,220	429
[illegible]		Co	~~-230 29 118~~	50.31
[illegible]		Ni	-29	50.3
[illegible]		Cu	41	28.8
[illegible]		Zn	90	24.9
[illegible]		As	17	19.4
[illegible]		Se	37	10.9
[illegible]		Sr	208.2	8.83
[illegible]		Zr	362.1	7.27
[illegible]		Mo	3.0	3.20
[illegible]		Hg	-31	22.3
[illegible]		Pb	45	13.6
[illegible]		Rb	17	11.4
[illegible]		Cd	39	30.5
[illegible]		Sn	-21	17.0
[illegible]		Sb	9.9	10.89
[illegible]		Ba	671.6	9.67
[illegible]		Ag	93	20.4
[illegible]		U	18.4	8.38
[illegible]		Th	30.6	5.58

LaWright Barnett

Date	Sample Number	Element	PPM	Std Dev
4-18-96	96-1189	Cr Hi	-110	188
		K	21,540	287
		Ca	6,820	123
		Ti	1,807	72.6
		CrLo	149	53.2
		Mn	90	193.5
		Fe	18,770	890
		Co	110	143
		Ni	57	53.8
		Cu	62	29.8
		Zn	130	26.5
		As	21	22.7
		Se	54	11.8
		Sr	1133	6.67
		Zr	234.7	5.85
		Mo	-2.0	2.93
		Hg	-54	21.1
		Pb	270	20.3
		Rb	112	11.4
		Cd	-11	29.6
		Sn	-15	16.6
		Sb	11	18.6
		Ba	377.5	7.32
		Ag	82	19.9
		U	39.2	8.78
		Th	20.9	6.09

L. Dwight Barrett 4-18-96

Date	Sample Number	Element	PPM	STD Dev
4-18-96	96-1190	CrHi	-29	194.7
		K	20,180	279
		Ca	2,610	127
		Ti	2,653	83.0
		CrLo	137	54.4
		Mn	730	229
		Fe	25,570	456
		Co	150	16.3
		Ni	-121	48.5
		Cu	26	28.3
		Zn	184	28.7
		As	26	17.5
		Se	19	10.6
		Sr	182.0	8.39
		Zr	305.9	6.81
		Mo	5.3	9.16
		Hg	-11	23.6
		Pb	-7.7	12.11
		Rb	107	11.5
		Cd	-17	30.0
		Sn	-8.8	16.83
		Sb	20	10.8
		Ba	600.2	9.18
		Ag	50	19.9
		U	20.8	8.24
		Th	50.2	5.72

[illegible] 4-18-96

Date	Sample Number	Element	PPM	STD DEV.
4-18-96	96-7191	Cr	-21.0	7.86
		K	23,650	300
		Ca	9,260	140
		Ti	2,870	88.2
		CrO	93	57.2
		Mn	550	2.7
		Fe	19,780	404
		Co	-160	14.1
		Ni	-1.5	50.5
		Cu	87	31.0
		Zn	105	25.7
		As	8.9	16.75
		Se	4.5	9.85
		Sr	235.6	9.25
		Zr	346.4	6.76
		Mo	8.1	3.16
		Hg	-22	22.5
		Pb	-4.1	11.52
		Rb	78	10.5
		Cd	-11	30.7
		Sn	-24	17.2
		Sb	-5.2	10.80
		Ba	207.4	9.84
		Ag	121	20.9
		U	225	8.24
		Th	465	5.75

L. Dwight Bazell 4-18-96

Date	Sample Number	Element	PPM	Std Dev
4-18-96	96-1192	CrHi	37	200.7
[illegible]	[illegible]	K	23,740	301
[illegible]	[illegible]	Ca	8,570	136
[illegible]	[illegible]	Ti	2,450	107
[illegible]	[illegible]	CrLo	-40	68.3
[illegible]	[illegible]	Mn	550	22.3
[illegible]	[illegible]	Fe	29,640	416
[illegible]	[illegible]	Co	-96	146.6
[illegible]	[illegible]	Ni	-14	51.8
[illegible]	[illegible]	Cu	55	29.9
[illegible]	[illegible]	Zn	70	24.7
[illegible]	[illegible]	As	13	18.1
[illegible]	[illegible]	Se	20	10.7
[illegible]	[illegible]	Sr	253.5	9.67
[illegible]	[illegible]	Zr	373.9	7.48
[illegible]	[illegible]	Mo	-1.7	3.22
[illegible]	[illegible]	Hg	-44	22.0
[illegible]	[illegible]	Pb	6.3	12.84
[illegible]	[illegible]	Rb	95	11.4
[illegible]	[illegible]	Cd	66	91.3
[illegible]	[illegible]	Sn	-29	17.5
[illegible]	[illegible]	Sb	15	11.3
[illegible]	[illegible]	Ba	2,734	20.0
[illegible]	[illegible]	Ag	110	20.8
[illegible]	[illegible]	U	37.4	8.60
[illegible]	[illegible]	Th	47.1	5.96

Gilbert W. Barrell 4-18-96

Date	Sample Number	Element	PPM	STD Dev.
4-18-96	96-1193	Al	-80	793.2
		K	21,060	285
		Ca	2,900	130
		Ti	2,464	98.0
		Cr	128	64.3
		Mn	340	21.4
		Fe	22,360	430
		Co	300	159
		Ni	-94	49.8
		Cu	67	30.4
		Zn	115	26.3
		As	46	18.4
		Se	8.2	10.14
		Sr	234.0	9.34
		Zr	372.0	7.42
		Mo	4.7	3.29
		Hg	-57	21.4
		Pb	1.7	11.92
		Rb	106	11.3
		Cd	23	30.6
		Sn	-35	17.2
		Sb	1.8	10.96
		Ba	2,542	19.2
		Ag	124	20.6
		U	20.8	8.35
		Th	35.4	5.60

[illegible] 4-18-96

Date	Sample Number	Element	PPM	Std Dev
4-18-96	96-1294	CrHi	75	199.5
		K	20,180	2.79
		Ca	2,450	127
		Ti	2,370	95.7
		CrLo	-12	61.1
		Mn	560	21.9
		Fe	20,020	4.06
		Co	280	1.52
		Ni	12	53.4
		Cu	7.9	27.24
		Zn	118	26.0
		As	28	18.1
		Se	20	10.5
		Sr	198.7	8.58
		Zr	360.3	7.22
		Mo	3.4	3.24
		Hg	-15	22.8
		Pb	10	12.3
		Pb	123	11.4
		Cd	34	30.4
		Sn	-31	16.9
		Sb	5.0	10.90
		Ba	2221	17.7
		Ag	65	20.0
		U	18.0	8.55
		Th	38.1	5.72

L. Meredith Bissell 4-18-96

Date	Sample Number	Element	PPM	Std. Dev.
-18-96	96-1195	CrHi	-120	188
		K	21,190	285
		Ca	7,630	128
		Ti	2,632	83.0
		CrLo	62	54.0
		Mn	690	222
		Fe	20,170	406
		Co	3.9	146.30
		Ni	-18	50.4
		Cu	-9.0	25.82
		Zn	115	25.5
		As	44	12.1
		Se	8.4	9.88
		Sr	186.5	8.27
		Zr	960.4	2.16
		Mo	-0.4	3.08
		Hg	-77	19.7
		Pb	-16	10.9
		Rb	110	11.0
		Cd	-27	29.1
		Sn	-12	16.5
		Sb	21	10.5
		Ba	600.2	9.04
		Ag	91	19.8
		U	18.5	8.27
		Th	40.0	5.65

L. Dwight Bassell 4-18-96

Date	Sample Number	Element	PPM	Std Dev
4-18-96	96-1196	Cr(H)	-210	186
		K	22,760	295
		Ca	7,690	130
		Ti	2,339	89.5
		Cr(o)	12.0	59.6
		Mn	600	222
		Fe	21,420	420
		Co	-220	145
		Ni	-7.6	51.12
		Cu	63	30.0
		Zn	82	24.8
		As	45	17.7
		Se	6.2	8.91
		Sr	199.7	8.62
		Zr	350.3	7.13
		Mo	4.5	3.22
		Hg	-60	20.9
		Pb	-8.4	11.42
		Rb	101	11.1
		Cd	10.0	29.87
		Sn	-25	16.6
		Sb	4.0	10.64
		Ba	1,324	13.5
		Ag	51	19.7
		U	23.7	8.33
		Th	38.4	5.58

L. Wright Bazzell 4-18-96

Date	Sample Number	Element	PPM	Std Dev
4-18-96	96-1197	Cr H.S	-156	186
		K	19,510	275
		Ca	2,490	126
		Ti	2,164	86.1
		Cr(o	156	58.0
		Mn	310	207
		Fe	21,220	415
		Co	-270	142
		Ni	-2.1	50.29
		Cu	-6.2	25.87
		Zn	97	24.8
		As	3.9	16.89
		Se	-2.5	9.11
		Sr	201.7	8.58
		Zr	322.6	6.83
		Mo	9.0	3.11
		Ag	-30	21.8
		Pb	12	11.6
		Rb	89	10.3
		Cd	-8.5	29.09
		Sn	-47	16.2
		Sb	14	10.5
		Ba	1317	13.3
		Ag	92	19.6
		U	-13.0	2.91
		Th	35.1	5.48

L. Wright Bazzell 4-18-96

Date	Sample Number	Element	PPM	Std Dev
4-18-96	96-1198	CrHi	97	262.3
		K	19,980	279
		Ca	9,150	137
		Ti	2,096	87.9
		CrLo	-38	59.3
		Mn	580	226
		Fe	25,640	459
		Co	-90	159.3
		Ni	-1.9	53.53
		Cu	53	30.3
		Zn	122	26.9
		As	8.5	18.14
		Se	6.9	10.27
		Sr	196.2	8.71
		Zr	319.8	6.97
		Mo	1.0	3.15
		Hg	-24	23.2
		Pb	17	12.4
		Pb	70	10.3
		Cd	95	32.0
		Sn	-40	12.8
		Sb	6.0	11.42
		Ba	2,089	17.4
		Ag	136	21.6
		U	28.2	7.95
		Th	33.3	5.50

L. Dwight Bassett 4-18-96

Date	Sample Number	Element	PPM	Std. Dev
4-18-96	96-1199	Cr H	-260	184
		K	19,680	272
		Ca	8,420	131
		Ti	1,800	76.0
		CrLo	135	53.9
		Mn	310	207
		Fe	22,950	431
		Co	120	155
		Ni	-94	48.0
		Cu	-0.5	26.27
		Zn	122	25.9
		As	6.7	16.95
		Se	24	10.5
		Sr	230.1	9.17
		Zr	300.6	6.65
		Mo	0.4	2.94
		Hg	-19	22.6
		Pb	11	11.4
		Rb	63.6	9.72
		Cd	-1.2	29.73
		Sn	-28	16.6
		Sb	12	16.6
		Ba	1,007	11.7
		Ag	102	20.1
		U	23.8	7.67
		Th	16.9	5.07

L. Kenyatta Bazzell 4-18-96

Date	Sample Number	Element	PPM	Std Dev
4-18-96	96-1200	CrHi	-480	171
		K	19,180	274
		Ca	9,070	136
		Ti	2,283	86.5
		CrLo	78	59.4
		Mn	480	217
		Fe	24,630	447
		Co	-63	156.0
		Ni	-66	50.1
		Cu	67	30.6
		Zn	64	24.8
		As	16	18.2
		Se	3.7	10.08
		Sr	223.1	9.14
		Zr	316.5	6.89
		Mo	-3.0	3.09
		Hg	-28	22.7
		Pb	19	12.1
		Rb	82	10.7
		Cd	66	32.4
		Sn	-15	17.9
		Sb	-33	11.1
		Ba	1104	12.4
		Ag	84	21.4
		U	33.5	8.32
		Th	29.5	5.48

L. Dwight Barzell 4-18-96

Date	Sample Number	Element	PPM	Std Dev
4-18-96	96-1201	CrH	-550	164
		K	19,990	277
		Ca	2,490	126
		Ti	1,547	70.3
		CrLo	154	53.4
		Mn	870	226
		Fe	22,160	423
		Co	-250	145
		Ni	26	52.2
		Cu	23	28.0
		Zn	115	26.1
		As	15	16.9
		Se	25	10.7
		Sr	180.1	8.19
		Zr	282.7	6.42
		Mo	2.2	2.92
		Hg	-11	22.9
		Pb	-1.7	11.14
		Rb	97	10.5
		Sn	-72	16.5
		Sb	10	10.9
		Ba	503.6	8.37
		Ag	93	20.4
		U	12.4	7.89
		Th	31.7	5.35
		Cd	48	30.5

L. Dwight Brazell 4-18-96

Date	Sample Number	Element	PPM	Std Dev
4-22-96	Teflon Standard	Cr	-140	196
		K	61	77.0
	Parts Per Million should be	Ca	-131	34.7
	less than 5 times above or	Ti	5.6	27.68
	below the standard deviation	Cr	-3.1	51.09
	of the elements of concern.	Mn	-170	165
		Fe	47	55.8
		Co	236	79.0
		Ni	-134	45.1
		Cu	9.2	35.52
		Zn	2.9	31.66
		As	21	20.1
		Se	9.8	12.10
		Sr	-4.4	2.65
		Zr	-0.5	1.67
		Mo	2.8	2.26
		Hg	54	25.7
		Pb	-8.9	10.43
		Rb	-8.5	6.26
		Cd	-14	28.0
		Sn	-15	15.6
		Sb	7.8	10.04
		Ba	7.3	2.95
		Ag	16	18.5
		U	10.1	7.02
4-22-96	Fe standard Intensities,	Th	7.8	5.11
	Results (run at 100 Sec.) Mn+Co			
	Should be less than 0.010, Fe should be	Mn = 0.00235		
	greater than 0.95 for a good	Fe = 0.98424		
	calibration	Co = -0.00225		
		[illegible]	4-22-96	

Date	Sample Number	Element	PPM	Std Dev
4-22-96	96-10.91	CrHi	-290	30.183
		K	25,580	294
		Ca	6,500	122
		Ti	3,527	96.3
		CrLo	-102	56.5
		Mn	620	22.4
		Fe	21,290	424
		Co	120	15.4
		Ni	-1.1	53.41
		Cu	39	29.1
		Zn	74	24.8
		As	11	18.1
		Se	30	11.0
		Sr	143.4	7.50
		Zr	424.4	7.74
		Mo	1.8	3.39
		Hg	-49	21.5
		Pb	16	12.4
		Rb	122	11.9
		Cd	8.0	31.15
		Sn	-48	17.2
		Sb	-10	10.9
		Ba	586.8	9.66
		Ag	92	20.9
		U	39.8	8.98
		Th	28.3	5.68

L. Newright Barrett 4-22-96

Date	Sample Number
4-22-96	96-1092

Element	PPM	STD Dev
Cr-Hi	-190	187
K	20,800	283
Ca	7,190	125
Ti	3,358	92.5
Mn	360	21.0
Fe	18,840	394
Co	39	42.9
Ni	-2.1	51.49
Cu	85	30.9
Zn	86	25.2
As	5.2	17.90
Se	17	10.3
Sr	155.0	7.65
Zr	400.0	7.43
Mo	1.0	3.24
Hg	-33	21.8
Pb	25	12.5
Rb	104	11.0
Cd	13	30.9
Sn	-38	17.1
Sb	-5.5	10.87
Ba	254	10.1
Ag	84	20.7
U	28.3	8.55
Th	24.2	5.50
Cr-Lo	82	67.1

L. Dwight Bissell 4-22-96

Date	Sample Number	Element	PPM	SD Dev
4-22-96	S-96-1093	CrH	-400	475
		K	29,600	2.82
		Ca	2,120	125
		CrH6	-71	54.8
		Mn	620	220
		Fe	18,970	395
		Co	-130	139
		Ni	31	52.4
		Cu	71	30.3
		Zn	41	23.4
		As	28	12.5
		Se	32	10.9
		Sr	146.0	2.45
		Zr	425.2	2.67
		Mo	6.0	3.28
		Hg	9.6	23.68
		Pb	-4.9	11.78
		Rb	103	10.8
		Cd	9.6	30.41
		Sn	-69	16.6
		Sb	31	11.1
		Ba	902	11.0
		Ag	87	20.4
		U	12.5	8.18
		Th	92.5	1580
		Ti	3306	91.9

Date	Sample Number	Element	PPM	Std Dev
4-22-96	96-1094	CrH	-250	186
58.9		K	18,450	270
25		Ca	11,430	149
3.4		Ti	2,623	86.9
45		Cr Lo	74	57.9
22		Mn	560	227
PE		Fe	29,930	496
4.5		Co	220	176
2.3		Ni	-12	56.6
4.E		Cu	-1.4	28.58
2.5		Zn	86	26.7
P.3		As	2.0	18.80
24		Se	23	11.3
5.5		Sr	175.4	8.43
8.5		Zr	242.7	6.23
3.8		Mo	-5.8	2.95
8.C		Ag	-2.7	24.93
3.1		Pb	21	12.8
14		Pb	90	11.0
0.1		Cd	-15	33.2
1.1		Sn	-34	18.5
1.1		Sb	1.5	11.69
4.3		Ba	24	10.1
8.3		Ag	113	22.5
08.3		U	27.3	7.99
P.1		Th	21.8	5.15

L. Wright Barrell 4-22-96

Date	Sample Number	Element	PPM	Std Dev
4-22-96	96-1095	CrH	210	12.08
		K	20,250	281
		Ca	9,440	139
		Ti	2,539	88.4
		CrLo	0.4	57.59
		Mn	150	2.09
		Fe	24,030	445
		Co	69	158.1
		Ni	-81	50.4
		Cu	80	31.6
		Zn	96	26.4
		As	30	18.3
		Se	12	10.5
		Sr	183.6	8.38
		Zr	299.1	6.70
		Mo	3.2	3.17
		Hg	-70	21.1
		Pb	1.7	11.90
		Rb	104	11.1
		Cd	96	32.2
		Sn	-50	17.5
		Sb	-3.0	11.35
		Ba	870	11.0
		Ag	77	21.2
		U	22.6	8.29
		Th	28.4	5.42

L. Henright Bazzell 4-22-96

Date	Sample Number	Element	PPM	Std Dev
4-22-96	96-9096	CrAl	-470	173
		K	19,030	273
		Ca	9,980	141
		Ti	2,941	87.8
		CrLo	60	56.7
		Mn	150	21.1
		Fe	30,860	502
		Co	-170	170
		Ni	35	57.1
		Cu	30	29.9
		Zn	88	26.4
		As	21	18.2
		Se	30	11.5
		Sr	149.5	2.83
		Zr	288.6	6.70
		Mo	0.6	3.20
		Hg	-48	22.8
		Pb	-4.1	12.08
		Rb	118	11.8
		Cd	162	32.7
		Sn	-42	17.7
		Sb	5.1	11.54
		Ba	351.9	7.39
		Ag	87	21.7
		U	26.5	8.44
		Th	33.3	5.47

L. Wright Bazzell 4-22-96

Date	Sample Number	Element	PPM	Std. Dev
-23-96	Teflon Standard	Cr	-230	191
		K	168	77.0
	Parts Per Million should be	Ca	-212	32.7
	less than 5 times above or	Ti	-49	28.5
	below the Standard deviation	Cr/Co	-3.3	51.28
	of the elements of concern.	Mn	-190	16.3
		Fe	105	87.7
		Co	172	96.7
		Ni	-127	45.1
		Cu	67	34.3
		Zn	-18	31.1
		As	13	19.4
		Se	10	12.0
		Sr	0.6	2.85
		Zr	-0.2	1.69
		Mo	3.8	2.24
		Hg	40	25.2
		Pb	-23.4	9.82
		Rb	-8.7	6.11
		Cd	-82	27.8
		Sn	-38	15.5
		Sb	6.8	9.91
		Ba	-0.9	2.81
		Ag	62	18.8
		W	4.8	6.86
-23-96	Fe Standard Intensities Results	Th	9.0	5.08
	(run at 100 sec.) Mn + Co should be			
	less than 0.010. Fe should be	Mn = 0.00148		
	greater than 0.95 for a good	Fe = 0.99461		
	calibration.	Co = -0.00135		

[illegible] 4-23-96

Date	Sample Number	Element	PPM	Std Dev
4-23-96	SES-96-1027	CrH	-240	1986
		K	20490	282
		Ca	7,650	128
		Ti	8182	97.1
		CrLo	-45	60.2
		Mn	110	201
		Fe	17,530	381
		Co	220	143
		Ni	-70	49.2
		Cu	17	28.1
		Zn	288	32.3
		As	14	17.3
		Se	36	11.3
		Sr	181.4	8.17
		Zr	428.0	7.71
		Mo	4.0	3.37
		Hg	-43	21.7
		Pb	-5.3	11.70
		Rb	97	10.5
		Cd	43	31.9
		Sn	-6.9	17.82
		Sb	6.7	11.38
		Ba	1234	12.9
		Ag	80	21.2
		U	38.1	8.64
		Th	40.4	6.93

ARREST [illegible] 4-23-96

Date	Sample Number	Element	PPM	Std Dev
4-23-96	96-1028	Cr Hi	-260	1726
		K	19,610	275
		Ca	6,550	120
		Ti	2,961	87.1
		Cr L	111	55.0
		Mn	160	188
		Fe	13,270	318
		Co	-150	116
		Ni	-71	43.2
		Cu	0.2	24.66
		Zn	178	26.5
		As	32	16.6
		Se	16.6	9.58
		Sr	158.1	7.44
		Zr	342.4	6.68
		Mo	6.0	8.98
		Hg	-24	20.6
		Pb	9.2	10.81
		Rb	91.3	9.85
		Cd	13	24.0
		Sn	-38	13.3
		Sb	-0.9	8.51
		Ba	212.9	9.34
		Ag	45	15.9
		U	15.1	8.06
		Th	25.1	5.35

L. Dwight Brisell 4-23-96

Date	Sample Number	Element	PPM	Std Dev
4-23-96	96-1029	CrHi	-510	166
		K	19,610	276
		Ca	7,500	126
		Ti	9,069	96.9
		CrLo	54	55.7
		Mn	380	206
		Fe	17,990	383
		Co	-87	136.5
		Ni	-85	45.8
		Cu	49	28.4
		Zn	189	22.9
		As	15	17.2
		Se	21	10.2
		Sr	136.7	7.18
		Zr	386.3	7.24
		Mo	2.7	3.11
		Hg	-52	20.5
		Pb	21	11.7
		Rb	100	10.6
		Cd	-45	22.5
		Sn	-36	15.4
		Sb	-2.5	9.72
		Ba	632.5	9.17
		Ag	54	18.5
		U	24.2	8.19
		Th	38.9	5.55

L. Dwight Smith 4-23-96

Date	Sample Number	Element	PPM	Std Dev
4-23-96	96-1036	CrHi	960	200.3
		K	17,570	264
		Ca	9,160	136
		Ti	5,807	87.6
		CrLo	104	58.4
		Mn	-41	196.3
		Fe	21,960	418
		Co	97	151.0
		Ni	-85	49.6
		Cu	28	32.4
		Zn	1329	55.7
		As	5.3	18.85
		Se	23	11.2
		Sr	142.0	7.61
		Zr	280.6	6.45
		Mo	-4.0	3.03
		Hg	-21	23.9
		Pb	19	12.9
		Rb	88	11.0
		Cd	107	31.5
		Sn	-7.9	17.32
		Sb	2.0	11.14
		Ba	712.9	9.93
		Ag	55	20.6
		U	34.9	8.55
		Th	35.5	5.55

L. Dwight Brazell 4-23-96

Date	Sample Number	Element	PPM	Std Dev
4-23-96	1096-2037	Cr Hi	-190	186
		K	16,440	269
		Ca	9,210	136
		Ti	2,744	87.3
		Cr lo	-27	55.6
		Mn	250	202
		Fe	17,900	383
		Co	-28	137.9
		Ni	-93	46.6
		Cu	60	30.1
		Zn	596	40.1
		As	32	18.3
		Se	32	11.0
		Sr	138.6	7.26
		Zr	336.1	6.82
		Mo	4.9	3.14
		Hg	-21	22.6
		Pb	13	11.8
		Rb	95	10.6
		Cd	-38	27.7
		Sn	-43	15.4
		Sb	29	10.7
		Ba	569.2	8.71
		Ag	68	18.7
		U	23.7	8.32
		Th	26.4	5.46

L. Dwight Baldwin 4-23-96

Date	Sample Number	Element	PPM	Std Dev
4-23-96	96-1038	Cr	-470	1.764
		K	19,650	275
		Ca	5,910	115
		Ti	2,897	88.1
		CrO	83	53.7
		Mn	360	200
		Fe	15,200	352
		Co	-210	124
		Ni	-67	43.8
		Cu	-45	26.7
		Zn	126	24.1
		As	6.0	16.39
		Se	3.7	8.88
		Sr	141.1	7.16
		Zr	418.1	7.39
		MO	2.3	3.05
		Hg	-53	19.2
		Pb	23	11.2
		Rb	85.0	9.79
		Cd	-48	25.1
		Sn	-53	14.6
		Sb	-3.7	8.86
		Ba	240.8	9.69
		Ag	77	17.1
		U	17.0	7.91
		Th	24.7	5.38

L. Dewayne Barrett 4-23-96

Date	Sample Number	Element	PPM	Std Dev
4-23-96	[illegible]-96-1039	CrHi	-450	167
		K	19,840	277
		Ca	6,910	122
		Ti	2,842	87.2
		CrLo	98	54.0
		Mn	570	209
		Fe	16,470	367
		Co	-150	130
		Ni	4.8	48.73
		Cu	38	27.3
		Zn	(191)	27.2
		As	29	16.6
		Se	21.2	9.94
		Sr	177.6	7.98
		Zr	345.6	6.89
		Mo	2.6	3.03
		Hg	-29	21.0
		Pb	2.1	11.10
		Rb	117	10.9
		Cd	-89	24.2
		Sn	-67	13.5
		Sb	10.4	8.72
		Ba	(639.0)	9.04
		Ag	57	16.5
		U	23.1	8.56
		Th	30.9	5.60

[signature] 4-23-96

Date	Sample Number	Element	PPM	Std Dev
4-24-96	Teflon Standard	CrKα	-280	489.
		K	62	77.1
	Parts Per Million should be	Ca	-149	34.3
	less than 5 times above or	Ti	4.2	27.24
	below the standard deviation	CrLα	127	52.9
	of the elements of concern.	Mn	-230	162
		Fe	143	89.2
		Co	145	76.1
		Ni	-11	49.7
		Cu	0.2	32.35
		Zn	-55	50.2
		As	-44	19.0
		Se	-2.7	11.72
		Sr	-5.1	2.60
		Zr	6.0	1.76
		Mo	0.5	2.19
		Ag	33	25.0
		Pb	2.0	10.43
		Rb	-5.9	6.09 ~~8.04~~
		Cd	-6.9	28.04
		Sn	-58	15.3
		Sb	-12.6	9.84
		Ba	-2.5	2.78
		Ag	57	18.7
		U	5.2	6.88
4-24-96	Fe standard Intensities Results	Th	-6.2	4.83
	(run at 100 sec.) Mn+Co should			
	be less than 0.010. Fe should be	Mn = 0.00165		
	greater than 0.95 for a good	Fe = 0.99364		
	calibration.	Co = -0.00073		
	L. Meredyth Bassett 4-24-96			

Date	Sample Number	Element	PPM	Std De
4-24-96	96-1057	CrHi	-240	179
		K	28,840	306
		Ca	5180	114
		Ti	845	58.1
		CrLo	203	49.5
		Mn	320	199
		Fe	16,290	366
		Co	-150	130
		Ni	-66	45.3
		Cu	-1.9	25.2
		Zn	87	23.8
		As	22	14.8
		Se	-1.2	9.07
		Sr	88.8	5.94
		Zr	253.7	5.91
		Mo	-2.0	2.71
		Hg	-52	19.9
		Pb	-27.6	9.45
		Pb	45.8	9.13
		Cd	8.4	25.5
		Sn	-36	14.1
		Sb	21.5	9.29
		Ba	492.7	8.01
		Ag	50	12.0
		U	35.6	7.56
		Th	38.1	5.26

L. Henry W. Bennell 4-24-96

Date	Sample Number	Element	PPM	Std Dev
4-24-96	96-1058	Crl	-520	162
		K	30,910	338
		Ca	3,420	105
		Ti	444	57.2
		CrLo	208	51.6
		Mn	320	195
		Fe	13,000	330
		Co	-150	120
		Ni	-84	43.3
		Cu	-40	22.6
		Zn	144	25.4
		As	43	15.9
		Se	6.2	9.22
		Sr	63.3	5.16
		Zr	251.9	5.81
		Mo	-0.1	2.75
		Hg	-72	18.6
		Pb	-19	10.1
		Rb	76.0	9.85
		Cd	-55	24.0
		Sn	-41	13.4
		Sb	14.6	8.69
		Ba	530.2	8.27
		Ag	28	16.0
		U	32.4	7.91
		Th	39.3	5.35

L. Dwight Bazzell 4-24-96

Date	Sample Number	Element	PPM	Std Dev
4-24-96	-96-1059	CrHi	-320	175
		K	23,330	298
		Ca	5,300	114
		Ti	685	81.7
		CrLo	335	62.8
		Mn	500	206
		Fe	15,620	359
		Co	-0.4	131.77
		Ni	-128	42.8
		Cu	18	26.2
		Zn	103	24.4
		As	24	16.2
		Se	-10.1	8.64
		Sr	119.8	6.72
		Zr	298.9	6.38
		Mo	9.3	2.98
		Hg	-50	20.1
		Pb	-1.6	10.51
		Rb	47.0	9.01
		Cd	-17	26.0
		Sn	-58	14.5
		Sb	6.9	9.37
		Ba	1673	14.7
		Ag	71	17.4
		U	23.3	7.41
		TA	29.0	5.13

L Wright Barrett 4-24-96

Date	Sample Number	Element	PPM	Std Dev
4-24-96	96-70060	Cr	-370	173
		K	24300	304
		Ca	8670	136
		Ti	1186	66.6
		CrLo	39	48.9
		Mn	760	222
		Fe	20,890	415
		Co	-97	145.8
		Ni	-44	48.4
		Cu	-14	24.6
		Zn	85	23.8
		As	12	16.0
		Se	12.8	9.68
		Sr	145.8	7.45
		Zr	266.4	6.23
		Mo	-2.9	2.24
		Hg	-54	20.3
		Pb	-1.3	10.95
		Rb	53.6	9.24
		Cd	-73	26.8
		Sn	-22	15.2
		Sb	12.3	9.62
		Ba	590.5	8.91
		Ag	36	12.9
		U	23.1	9.23
		Th	25.9	5.03

L. Dwight Bazzell 4-24-96

Date	Sample Number	Element	PPM	Std Dev
4-24-96	96-1061	Cr(H)	-220	184
		K	23,110	297
		Cu	8,190	133
		Ti	1,406	80.6
		Cr(L)	236	57.4
		Mn	1,140	242
		Fe	24,500	450
		Co	-220	154
		Ni	-72	48.0
		Cu	22	26.9
		Zn	147	25.9
		As	45	16.1
		Se	-9.0	8.79
		Sr	139.6	7.44
		Zr	344.0	7.07
		Mo	1.1	2.95
		Ag	-25	22.0
		Pb	-14.8	9.70
		Pb	58.0	9.22
		Cd	25	27.6
		Sn	-48	15.1
		Sb	4.9	9.83
		Ba	1,039	12.9
		Ag	38	18.0
		U	13.1	7.16
		Th	20.2	4.95

Lillian M. Bassett 4-24-96

Date	Sample Number	Element	PPM	Std Dev
4-24-96	96-1062	CrHi	-420	469
		K	22,290	292
		Ca	6,716	123
		CrLo	301	62.2
		Mn	760	21.9
		Fe	18,980	395
		Co	-190	137
		Ni	-70	45.6
		Cu	-10	24.3
		Zn	105	23.7
		As	15	15.1
		Se	7.6	9.29
		Sr	142.6	7.33
		Zr	317.3	6.67
		Mo	2.5	2.88
		Hg	-48	20.1
		Pb	-10	10.1
		Rb	38.8	8.84
		Cd	-37	26.5
		Sn	-81	14.6
		Sb	15.9	9.64
		Ba	1,876	15.9
		Ag	68	17.7
		U	26.9	7.24
		Th	27.7	5.10
		Ti	730	83.2

L. Dwight Russell 4-24-96

Date	Sample Number	Element	PPM	Std Dev
4-24-96	SK-96-1063	CrH	-420	167
		K	18,890	271
		Ca	7,170	123
		Ti	890	60.2
		CrLo	174	49.4
		Mn	1,040	22.5
		Fe	18,090	383
		Co	-130	13.5
		Ni	-105	43.2
		Cu	23	25.8
		Zn	92	23.2
		As	-5.5	15.18
		Se	7.4	9.22
		Sr	170.0	7.83
		Zr	266.4	6.13
		Mo	5.0	2.76
		Hg	-8.5	21.69
		Pb	5.8	10.57
		Rb	50.5	8.55
		Sn	-36	14.7
		Sb	2.2	9.40
		Ba	462.0	9.25
		Ag	74	12.8
		U	11.3	7.08
		Th	227	5.05
		Cd	13	26.5

L. Vaughn Bassell 4-24-96

Date	Sample Number	Element	(PPM	Std Dev
4-25-96	Teflon Standard	CrKi	-310	188
		K	202	84.2
	Parts Per Million should be	Ca	-145	34.6
	less than 5 times above or	Ti	-9.0	28.21
	below the standard deviation	CrKb	153	53.3
	of the elements of concern.	Mn	-300	159
		Fe	-62	84.6
		Co	73	72.3
		Ni	-6.0	49.67
		Cu	-8.8	32.02
		Zn	23	32.0
		As	-32	19.4
		Se	-2.5	11.70
		Sr	-0.3	2.82
		Zr	3.6	1.73
		Mo	3.7	2.24
		Ag	38	25.2
		Pb	9.3	10.81
		Rb	-8.5	6.14
		Cd	-23	28.0
		Sn	-72	15.5
		Sb	17	10.1
		Ba	4.5	2.90
		Ag	60	18.8
		U	5.4	6.84
4-25-96	Fe Standard Intensities Results	Th	-1.9	4.91
	(run at 100 sec.) Mn + Co should be			
	less than 0.010. Fe should be	Mn = 0.00168		
	greater than 0.95 for a good	Fe = 0.98858		
	calibration	Co = -0.00372		
	Allwright Bazell 4-25-96			

Date	Sample Number
5-13-96	96-92 A

Element	PPM	STD Dev
CrHi	-510	163
K	20,410	282
Ca	5,480	113
Ti	2,257	79.0
CrLo	90	50.3
Mn	270	19.4
Fe	11,960	318
Co	-300	112
Ni	-53	43.6
Cu	12	25.1
Zn	95	23.2
As	42	16.5
Se	5.1	9.00
Sr	156.6	7.45
Zr	382.3	7.15
Mo	1.7	5.02
Hg	-72	18.1
Pb	0.8	10.61
Rb	86.6	9.85
Cd	26	25.2
Sn	-40	13.8
Sb	-7.8	8.85
Ba	467.9	7.71
Ag	42	16.7
U	21.8	8.30
Th	32.9	5.71

L. Dwight Bazzell 5-13-96

Date	Sample Number
5-13-96	96-92B

Element	PPM	Std Dev
CrHi	-330	176
K	19,030	273
Ca	6,590	120
Ti	1,966	26.6
CrLo	80	51.2
Mn	900	226
Fe	17,490	383
Co	-11	138.5
Ni	164	57.5
Cu	46	28.5
Zn	114	25.0
As	29	17.1
Se	11.5	9.72
Sr	171.6	8.00
Zr	328.2	6.[illegible]
Mo	4.0	3.05
Hg	-13	22.2
Pb	6.2	11.38
Rb	74	10.1
Cd	-16	27.4
Sn	-12	15.4
Sb	17.9	9.90
Ba	560.5	8.60
Ag	22	18.0
U	27.4	8.10
Th	28.0	5.41

L. Dwight Brazell 5-13-96

Date	Sample Number	Element	PPM	STd Dev
5-13-96	96-92C	CrHi	-270	176
		K	17,620	263
		Ca	4,830	106
		Ti	1,218	72.4
		CrLo	62	49.3
		Mn	200	191
		Fe	13,460	334
		Co	-210	119
		Ni	-102	41.5
		Cu	12	25.1
		Zn	51	21.7
		As	27	16.2
		Se	4.4	9.05
		Sr	154.5	7.44
		Zr	346.7	6.79
		Mo	5.2	2.94
		Hg	4.2	21.92
		Pb	7.3	10.55
		Rb	22.2	9.49
		Cd	9.8	25.54
		Sn	-38	14.1
		Sb	-2.4	9.02
		Ba	498.6	7.95
		Ag	77	12.2
		U	16.7	7.98
		Th	23.9	5.41

L. Dwight Bazzell 5-13-96

Date	Sample Number	Element	PPM	Std Dev
5-13-96	96-92D	CrHi	-20	199.0
		K	22530	296
		Ca	8,050	133
		Ti	3,030	93.1
		CrLo	-104	56.7
		Mn	200	210
		Fe	20,900	421
		Co	180	154
		Ni	21	56.2
		Cu	1,721	76.6
		Zn	101	28.5
		As	7.9	18.95
		Se	29	11.2
		Sr	150.1	7.21
		Zr	301.4	7.
		Mo	1.0	3.32
		Hg	-17	23.5
		Pb	28	13.3
		Pb	92	11.3
		Cd	33	31.9
		Sn	-57	17.4
		Sb	22	11.5
		Ba	609.7	9.25
		Ag	64	21.2
		U	37.5	8.61
		Th	30.8	5.65

L. Wright Bassill 5-13-96

Date	Sample Number	Element	PPM	Std Dev
5-13-96	96-92E	CrH	-240	182
		K	20,020	282
		Ca	6,550	121
		Ti	2,449	83.1
		CrL	2.8	52.12
		Mn	290	203
		Fe	16,490	372
		Co	-320	127
		Ni	25	49.7
		Cu	56	28.5
		Zn	48	22.3
		As	54	17.2
		Se	15.3	9.86
		Sr	140.2	7.27
		Zr	381.1	7.27
		Mo	-0.2	3.08
		Hg	-1.7	22.45
		Pb	-12	11.1
		Rb	82	10.2
		Cd	-35	27.2
		Sn	-40	15.2
		Sb	30.9	9.97
		Ba	463.4	7.86
		Ag	55	18.3
		U	26.4	8.27
		Th	44.6	5.90

L. Dwight Bazzell 5-13-96

Date	Sample Number	Element	PPM	Std Dev
4-25-96	[illegible]-96-1172	CrHi	-14	200.2
[illegible]	[illegible]	K	12,420	263
[illegible]	[illegible]	Ca	9,490	137
[illegible]	[illegible]	Ti	3,589	96.4
[illegible]	[illegible]	CrLo	-79	57.3
[illegible]	[illegible]	Mn	610	237
[illegible]	[illegible]	Fe	33,170	522
[illegible]	[illegible]	Co	-37	179.7
[illegible]	[illegible]	Ni	-35	56.1
[illegible]	[illegible]	Cu	31	30.5
[illegible]	[illegible]	Zn	124	28.3
[illegible]	[illegible]	As	26	18.7
[illegible]	[illegible]	Se	50	12.5
[illegible]	[illegible]	Sr	159.5	[illegible]
[illegible]	[illegible]	Zr	358.2	7.48
[illegible]	[illegible]	Mo	7.9	3.42
[illegible]	[illegible]	Hg	-17	24.7
[illegible]	[illegible]	Pb	-2.8	12.23
[illegible]	[illegible]	Rb	114	11.7
[illegible]	[illegible]	Cd	49	34.1
[illegible]	[illegible]	Sn	-45	18.6
[illegible]	[illegible]	Sb	-6.5	11.90
[illegible]	[illegible]	Ba	456.4	8.37
[illegible]	[illegible]	Ag	109	22.9
[illegible]	[illegible]	U	14.8	8.20
[illegible]	[illegible]	Th	31.6	5.48

L. Darryl Barrill 4-25-96

Date	Sample Number	Element	PPM	Std Dev
4-25-96	96-1173	CrH	-230	187
		K	12,620	262
		Ca	4,960	108
		Ti	3,305	91.8
		CrLo	45	56.6
		Mn	570	231
		Fe	31,860	509
		Co	150	178
		Ni	-11	57.0
		Cu	24	30.0
		Zn	140	28.7
		As	-2.3	19.27
		Se	13	10.9
		Sr	139.6	7.64
		Zr	358.4	7.37
		Mo	5.9	3.39
		Hg	-55	22.6
		Pb	30	13.5
		Rb	96	11.3
		Cd	-5.9	33.07
		Sn	-44	18.2
		Sb	11	11.8
		Ba	520.9	8.80
		Ag	81	22.2
		U	27.4	8.25
		Th	27.2	5.45

L. Dwight Burrell 4-25-96

Date	Sample Number	Element	PPM	Std. Dev
4-25-96	96-1174	Cr	-510	966
		K	19,230	276
		Ca	6,380	119
		Ti	5,245	91.0
		Cr	30	55.2
		Mn	496	208
		Fe	15,130	353
		Co	-190	126
		Ni	-10	48.5
		Cu	92	30.6
		Zn	54	23.6
		As	35	17.5
		Se	23	16.4
		Br	152.4	7.15
		Zr	376.9	7.11
		Mo	0.8	5.02
		Hg	-24	21.7
		Pb	0.9	11.39
		Rb	83	16.0
		Cd	28	29.6
		Sn	-51	16.2
		Sb	-5.2	10.42
		Ba	572.1	8.85
		Mg	39	19.5
		U	19.8	8.08
		Th	38.4	5.74

L. Dwight Barrett 4-25-96

Date	Sample Number	Element	PPM	Std. Dev.
4-25-96	96-1175	Cr	2.6	495.2
		K	19,660	277
		Ca	8350	132
		Ti	3,331	91.3
		CrL	116	55.8
		Mn	380	209
		Fe	16,120	365
		Co	-270	127
		Ni	28	50.4
		Cu	59	29.2
		Zn	70	24.1
		As	-16	17.3
		Se	4.6	9.64
		Sr	181.5	8.10
		Zr	404.5	7.42
		Mo	2.3	3.13
		Hg	-8.0	22.46
		Pb	31	12.5
		Pb	103	10.7
		Cd	-17	29.4
		Sn	-42	16.3
		Sb	-2.8	10.37
		Ba	559.2	8.66
		Ag	54	19.6
		U	17.5	8.32
		Th	30.3	6.69

Lillwright Bazell

Date	Sample Number
4-25-96	5-96-1176
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Element	P.P.M.	Std. Dev.
Al	5,444	195.2
K	21,180	286
Ca	6,960	124
Ti	3,081	90.6
Cr/o	53	56.5
Mn	070	226
Fe	17,400	380
Co	11	138.4
Ni	-32	49.8
Cu	33	28.7
Zn	64	24.7
As	20	17.8
Se	-5.4	9.54
Sr	161.9	2.77
Zr	375.7	2. [illegible]
Mo	0.09	9.216
Ag	-24	22.3
Pb	7.1	11.74
Pb	106	11.1
Cd	37	30.4
Sn	-69	16.6
Sb	3.7	10.80
Ba	587.6	8.92
Ag	98	20.4
U	33.5	8.77
Th	33.6	5.77

[illegible] 4-25-96

Date	Sample Number	Element	PPM	Std Dev
4-25-96	96-1177	CaH	-390	473
		K	21,400	287
		Ca	6,180	119
		Ti	9,534	95.2
		CrLo	6.5	55.69
		Mn	350	201
		Fe	15,110	354
		Co	41	131.3
		Ni	26	50.6
		Cu	22	26.9
		Zn	84	23.9
		As	48	17.1
		Se	26	10.3
		Sr	174.5	7.93
		Zr	334.0	6.78
		Mo	0.4	3.01
		Hg	-22	21.6
		Pb	-6.4	10.82
		Pb	99	10.7
	All XRF Data was	Cd	-2.9	28.07
	downloaded to an IBM Disk	Sn	-27	15.7
	labeled TA-16 90's Line	Sb	-0.09	9.946
	XRF Data 1996. The file	Ba	669.2	9.35
	name is 16-0313.96	Ag	67	18.8
		U	30.6	8.54
		Th	34.8	6.62

L. Dwight Bazell 4-25-96

Date	Sample Number	Element	PPM	Std Dev
4-30-96	Teflon Standard	CrAl	26	204.1
		K	19	76.1
	Parts Per Million should be	Ca	-180	33.5
	less than 5 Times above or	Ti	17	27.4
	below the standard deviation	CrLo	-13	50.9
	of the elements of concern,	Mn	-170	167
		Fe	132	89.7
		Co	314	82.7
		Ni	-1.7	50.90
		Cu	48	34.2
		Zn	-77	29.9
		As	-14	20.0
		Se	8.1	12.11
		Sr	-4.0	2.68
		Zr	4.0	[illegible]
		Mo	-0.5	2.22
		Hg	27	25.0
		Pb	8.4	10.93
		Pb	-11.4	6.27
		Cd	-117	27.6
		Sn	-16	15.6
		Sb	31	10.1
		Ba	1.4	2.85
		Ag	4.7	18.37
		U	16.5	7.25
4-30-96	Fe Standard Intensities Results	Th	6.3	5.18
	(run at 100 sec.) Mn+Co should be			
	less than 0.010. Fe should be	Mn = 0.00127		
	greater than 0.96 for a good	Fe = 0.998990		
	calibration	Co = -0.004477		
		[illegible]		4-30

Date	Sample Number	Element	PPM	STD DEV
4-30-96	96-1469	CrH	270	209
		K	22,840	296
		Ca	7,700	130
		Ti	1382	84.7
		CrLo	50	58.2
		Mn	490	2.18
		Fe	19,370	403
		Co	-140	141
		Ni	-34	49.0
		Cu	15	26.8
		Zn	118	25.3
		As	16	17.9
		Se	-2.3	9.27
		Sr	152.9	2.67
		Zr	346.5	2.03
		Mo	-0.7	2.58
		Hg	0.9	23.12
		Pb	32	11.9
		Rb	56.4	9.33
		Cd	-18	29.6
		Sn	-52	16.5
		Sb	21	10.8
		Ba	1629	14.9
		Ag	77	19.8
		U	21.1	2.51
		Th	21.7	5.19

L. Sherry W. Bardell 4-30-96

Date	Sample Number	Element	PPM	Std Dev
4-30-96	96-7529	Cr H	-300	177
		K	24,080	303
		Ca	6,710	124
		Ti	1103	77.2
		Cr Lo	121	55.0
		Mn	500	213
		Fe	19,790	406
		Co	-140	142
		Ni	-67	46.7
		Cu	41	27.3
		Zn	84	23.1
		As	36	16.5
		Se	3.7	9.19
		Sr	123.3	[illegible]
		Zr	321.5	[illegible]
		Mo	6.4	8.01
		Hg	-43	20.6
		Pb	-5.1	10.76
		Rb	53.7	9.13
		Cd	-69	25.6
		Sn	-60	14.3
		Sb	29.4	9.40
		Ba	1247	12.8
		Ag	37	17.3
		U	19.7	7.35
		Th	29.9	5.24

L. Dean M. Bassett 4-30-96

Date	Sample Number	Element	PPM	Std. Dev
4-30-96	96-4530	SCRN	4990	4807
		K	21,380	288
		Ca	5,860	118
		Ti	1,760	12.3
		Cr Lo	221	80.7
		Mn	-27	200.6
		Fe	21,680	429
		Co	-0.8	152.65
		Ni	-61	50.3
		Cu	33	28.7
		Zn	110	25.9
		As	71	18.5
		Se	45	11.6
		Sr	137.5	7.46
		Zr	321.6	6.92
		Mo	5.5	9.19
		Hg	-46	22.1
		Pb	-13	11.3
		Rb	89	10.8
		Cd	20	29.4
		Sn	-48	16.5
		Sb	31	11.0
		Ba	5,263	29.6
		Ag	59	18.9
		U	23.4	8.00
		Th	29.1	5.30

L. Henry N. Brazell 4-30-96

Date	Sample Number	Element	PPM	Std Dev
4-30-96	96-1033	Cr(tot)	-260	178
		K	15530	249
		Ca	6,550	117
		Ti	1,983	75.2
		CrO	138	50.7
		Mn	130	199
		Fe	24,890	348
		Co	100	159
		Ni	-31	51.1
		Cu	18	27.0
		Zn	61	23.1
		As	51	17.2
		Se	18	10.2
		Sr	157.8	7.65
		Zr	271.6	[illegible]
		Mo	1.7	2.12
		Ag	-41	21.3
		Pb	-18	10.8
		Rb	103	10.6
		Cd	-0.3	27.48
		Sn	-68	14.9
		Sb	3.9	9.74
		Ba	427.2	7.68
		Ag	53	18.3
		U	9.6	7.86
		Th	37.2	5.41

L. Neigh Bazell 4-30-96

Date	Sample Number	Element	PPM	Std. Dev
4-30-96	96-1034	CrH	-110	1195
		K	20,090	280
		Ca	2,320	127
		Ti	3,030	107
		CrLo	-104	65.5
		Mn	530	225
		Fe	29450	444
		Co	140	160
		Ni	34	56.5
		Cu	33	29.9
		Zn	85	26.3
		As	5.5	18.55
		Se	33	11.5
		Sr	152.0	2.84
		Zr	352.6	2.27
		Mo	-2.4	3.30
		Hg	-20	23.6
		Pb	12	13.0
		Rb	91	11.4
		Cd	12	31.2
		Sn	-52	12.3
		Sb	36	11.5
		Ba	2775	20.3
		Ag	66	20.5
		U	-457	8.73
		Th	36.9	5.77

L. Dwight Baird 4-30-96

Date	Sample Number	Element	PPM	Std Dev
4-30-96	96-1035	Al	-89	993.8
		K	16,950	261
		Ca	8,120	130
		Ti	2,030	113
		CrO	203	94.1
		Mn	410	219
		Fe	24,630	454
		Co	180	164
		Ni	-17	54.4
		Cu	46	30.2
		Zn	103	26.6
		As	24	18.2
		Se	13	10.7
		Sr	136.6	7.51
		Zr	293.8	6.69
		Mo	5.7	3.2
		Hg	-2.3	24.47
		Pb	3.9	11.92
		Rb	115	11.6
		Cd	-19	29.9
		Sn	-26	17.0
		Sb	32	11.1
		Ba	4042	25.4
		Ag	92	19.8
		U	23.9	8.46
		Th	29.9	5.42

[illegible] 4-30-96

X-Ray Flourescent (XRF) Results for OU-1082 VCA Field Work

Date	Sample Number	Element	PPM	Std Dev
5-3-96	Teflon Standard	Cr	-310	1.89
		K	195	78.1
	Parts Per Million should be	Cu	-125	34.5
	less than 5 times above or	Ti	13	28.1
	below the standard deviation	Cr+6	-20	51.0
	of the elements of concern.	Mn	-210	164
		Fe	-9.3	83.80
		Co	31.5	82.1
		Ni	-25	50.0
		Cu	18	33.1
		Zn	-50	51.0
		As	-37	19.2
		Se	1.3	11.90
		Sr	-2.3	2.75
		Zr	5.1	1.81
		Mo	6.7	2.34
		Hg	24	24.9
		Pb	1.5	10.58
		Rb	-0.8	6.49
		Cd	-20	27.9
		Sn	0.5	15.63
		Sb	-9.4	9.83
		Ba	-0.4	2.82
		Ag	16	18.4
		U	6.6	7.20
5-3-96	Fe Standard Intensities Results	Th	2.6	5.08
	(run at 100 sec.) Mn & Co should			
	be less than 0.010. Fe should	Mn = -0.000444		
	be greater than 0.95 for a	Fe = 0.98779		
	good calibration.	Co = -0.00638		
	[illegible]	[illegible] 5-3-96 13:19		

Date	Sample Number	Element	PPM	Std Dev
5-3-96	96-1154	CrHi	-400	171
		K	19,510	276
		Ca	2,130	124
		Ti	1,903	75.8
		CrLo	102	57.1
		Mn	490	208
		Fe	18,460	390
		Co	-250	134
		Ni	4.7	49.12
		Cu	-22	24.2
		Zn	119	24.7
		As	34	17.3
		Se	14.2	9.74
		Sr	134.5	7.14
		Zr	299.7	6
		Mo	3.9	2.77
		Hg	-63	19.6
		Pb	10.0	11.53
		Pb	86	10.3
		Cd	-7.8	26.13
		Sn	-32	14.5
		Sb	-1.4	9.22
		Ba	435.2	7.62
		Ag	30	17.3
		U	24.7	8.11
		Th	37.5	5.53

L. Wright Sassell 5-3-96

Date	Sample Number	Element	PPM	Std Dev
5-3-96	96-1155	CrHi	-610	161
		K	17,400	264
		Ca	11,800	150
		Ti	1,459	71.3
		CrLo	60	49.3
		Mn	1,550	252
		Fe	24,150	446
		Co	-220	153
		Ni	-28	50.1
		Cu	29	27.5
		Zn	124	25.3
		As	48	18.1
		Se	-14.8	8.65
		Sr	156.1	7.83
		Zr	319.7	6.90
		Mo	2.4	2.97
		Hg	-14	22.7
		Pb	14	11.5
		Rb	84	10.2
		Cd	-37	26.3
		Sn	-51	14.6
		Sb	24.9	9.59
		Ba	450.4	7.86
		Ag	37	17.6
		U	9.0	7.53
		Th	33.2	5.34

Lillaright Burrell 5-3-96

Date	Sample Number	Element	PPM	Std Dev
5-3-96	96-H56	Cr-H	-360	173
		K	15,830	252
		Ca	8,110	127
		Ti	1,219	23.8
		Cr-Lo	159	50.8
		Mn	660	22.1
		Fe	25,990	460
		Co	120	16.3
		Ni	-88	48.9
		Cu	24	27.2
		Zn	145	26.2
		As	57	18.1
		Se	16	10.1
		Sr	151.6	7.72
		Zr	266.1	6
		Mo	5.8	2.94
		Hg	-42	21.4
		Pb	8.6	11.19
		Rb	93	10.1
		Cd	-78	26.5
		Sn	-56	14.7
		Sb	17.0	9.57
		Ba	500.2	8.27
		Ag	22	17.7
		U	4.8	7.52
		Th	22.4	5.05

L. Dewayne Bazzell 5-3-96

Date	Sample Number	Element	PPM	Std Dev
5-3-96	-96-V157	CrHi	-140	186
		K	17,990	267
		Ca	9,060	135
		Ti	2,041	72.1
		CrLo	98	51.5
		Mn	120	200
		Fe	22,050	426
		Co	-220	146
		Ni	-73	47.0
		Cu	5.3	24.06
		Zn	89	24.1
		As	39	16.6
		Se	6.5	9.60
		Sr	162.1	7.84
		Zr	316.1	6.77
		Mo	4.3	3.07
		Hg	-68	19.8
		Pb	-17	10.7
		Pb	90	10.4
		Cd	-59	26.9
		Sn	-66	14.8
		Sb	25.9	9.79
		Ba	487.5	8.13
		Ag	48	18.1
		U	14.9	7.90
		Th	37.0	6.45

L. Dwight Bennett 5-3-96

Date	Sample Number	Element	PPM	Std Dev
5-3-96	96-1158	Cr Hi	-100	186
		K	14,960	249
		Ca	13,860	159
		Ti	1,579	69.9
		Cr Lo	137	48.7
		Mn	190	19.8
		Fe	20,980	415
		Co	-56	146.2
		Ni	-66	47.1
		Cu	13	26.0
		Zn	109	24.3
		As	11	16.1
		Se	23	10.1
		Sr	149.3	[illegible]
		Zr	240.5	5.[illegible]
		Mo	-2.6	2.70
		Hg	-58	20.0
		Pb	2.7	11.05
		Rb	88	10.1
		Cd	-54	27.1
		Sn	-48	15.0
		Sb	20.1	9.80
		Br	495.2	8.17
		Ag	38	18.1
		U	15.0	7.64
		Th	27.8	5.12

L. Reinig M. Farrell 5-3-96

Date	Sample Number	Element	PPM	Std Dev %
5-3-96	96-059	CrHi	330	213
		K	19,450	277
		Ca	10,760	146
		Ti	2,364	84.4
		CrLo	66	54.7
		Mn	370	217
		Fe	22,110	430
		Co	15	152.7
		Ni	-76	48.9
		Cu	39	28.6
		Zn	126	26.3
		As	27	12.7
		Se	-4.2	9.40
		Sr	162.5	7.95
		Zr	354.1	7.21
		Mo	-2.9	3.13
		Hg	-27	22.4
		Pb	3.6	11.90
		Pb	79	10.6
		Cd	21	29.9
		Sn	-35	16.5
		Sb	2.5	10.58
		Ba	698.9	9.79
		Ag	60	19.8
		U	35.4	8.26
		Th	33.5	5.61

LeNeight Burrell 5-3-96

Date	Sample Number	Element	PPM	Std Dev
5-6-96	Teflon Standard	CrHi	-32	202.0
		K	12	76.2
	Parts Per Million should	Cu	-169	33.8
	be less than 5 times	Ti	-20	28.4
	above or below the standard	CrLo	9.3	57.63
	deviation of the elements	Mn	-230	165
	of concern.	Fe	-24	83.2
		Co	166	76.7
		Ni	-30	49.4
		Cu	-37	31.2
		Zn	-9.9	31.44
		As	-24	19.5
		Se	9.8	12.14
		Sr	-2.0	[illegible]
		Zr	3.8	[illegible]
		Mo	1.6	2.22
		Hg	-10	23.9
		Pb	-0.3	10.60
		Rb	-5.7	6.05
		Cd	7.5	28.11
		Sn	-37	15.4
		Sb	13	10.1
		Ba	3.6	2.89
		Ag	16	18.5
		U	-2.4	6.78
5-6-96	Fe Standard Intensities	Th	7.4	5.13
	Results (run at 100 sec.) Mn + Co			
	should be less than 0.010. Fe	Mn = 0.00282		
	should be greater than 0.95 for	Fe = 0.99182		
	a good calibration.	Co = -0.00191		

L. David Brazell 5-6-95

Date	Sample Number	Element	PPM	Std Dev
5-6-96	96-1222	CrHi	-8.9	195.63
		K	25,700	301
		Ca	6,330	122
		Ti	987	63.8
		CrLo	134	52.4
		Mn	440	215
		Fe	21,130	420
		Co	-4.5	149.43
		Ni	229	61.1
		Cu	34	29.1
		Zn	115	26.0
		As	30	18.5
		Se	24	10.7
		Sr	117.1	6.90
		Zr	289.1	6.52
		Mo	1.4	3.07
		Ag	-6.3	23.16
		Pd	20	12.4
		Rh	78	10.5
		Cd	-70	27.3
		Sn	-45	15.3
		Sb	12.0	9.77
		Ba	428.9	7.70
		Ag	70	18.6
		U	34.3	8.25
		Th	37.2	5.53

L. Dwight Bazzell 5-6-96

Date	Sample Number
5-6-96	96-1223

Element	PPM	STD Dev
CrHi	-99	189.0
K	18,020	26.7
Ca	7,850	12.7
Ti	1508	72.1
CrLo	48	50.9
Mn	440	21.4
Fe	23,540	44.8
Co	-120	153
Ni	613	75.7
Cu	102	32.9
Zn	86	24.6
As	22	16.6
Se	-1.1	9.41
Sr	226.8	9.
Zr	254.1	6.28
Mo	2.4	2.95
Hg	-71	20.1
Pb	-2.9	10.72
Rb	65.7	9.66
Cd	-8.7	29.08
Sn	-57	16.08
Sb	-5.1	10.22
Ba	638.9	9.35
Ag	84	19.6
U	18.4	7.65
Th	22.3	5.10

L. Dwight Bazzell 5-6-96

Date	Sample Number
5-6-96	96-1224

Element	RPM	Std Dev.
CrH	-320	17.8
K	20,070	280
Ca	8,570	133
Ti	2,737	85.8
CrLo	-8.8	57.70
Mn	150	200
Fe	19,100	899
Co	-29	142.5
Ni	50	53.4
Cu	500	45.9
Zn	61	23.5
As	53	17.5
Se	0.2	9.31
Sr	186.9	8.35
Zr	363.7	2.23
Mo	-0.3	3.07
Hg	-28	21.7
Pb	-0.3	10.89
Rb	95	10.5
Cd	37	28.4
Sn	-19	15.7
Sb	9.8	16.14
Ba	535.5	8.67
Ag	43	18.7
U	19.0	8.19
Th	32.1	5.58

L. Dwight Bezell 5-6-96

Date	Sample Number	Element	PPM	Std Dev
5-6-96	96-1225	CrHi	-37	194.9
		K	16,850	263
		Ca	14,950	166
		Ti	1586	78.3
		CrLo	52	54.4
		Mn	-100	197
		Fe	26,840	473
		Co	-500	154
		Ni	13	52.7
		Cu	85	31.3
		Zn	70	24.3
		As	5.7	17.11
		Se	20	10.6
		Sr	240.8	9.14
		Zr	234.3	6.[illegible]
		Mo	1.2	2.97
		Hg	-50	21.7
		Pb	6.3	11.71
		Rb	68	10.0
		Cd	-25	29.8
		Sn	-24	16.6
		Sb	9.4	10.61
		Ba	722	10.1
		Ag	26	19.6
		U	23.6	7.82
		Th	27.4	5.27

L. Wright Barrett 5-6-96

Date	Sample Number	Element	PPM	Std. Dev.
5-7-96	Teflon Standard	Cr Al	-76	200.4
		K	144	79.3
	Parts Per Million should be	Ca	-108	35.4
	less than 5 times above or	Ti	26	28.2
	below the standard deviation	Cr Lo	-22	52.0
	of the elements of concern.	Mn	-240	164
		Fe	-84	80.8
		Co	228	78.9
		Ni	-31	49.6
		Cu	7.6	32.82
		Zn	-56	30.4
		As	-14	19.3
		Se	2.9	11.99
		Sr	-2.0	2.54
		Zr	3.3	1.76
		Mo	4.6	2.32
		Hg	67	26.2
		Pb	-9.7	10.15
		Rb	-1.8	6.40
		Cd	-23	28.0
		Sn	-15	15.6
		Sb	11	10.0
		Ba	4.6	2.90
		Ag	4.9	18.37
		U	8.2	2.28
		Th	3.9	5.15
5-7-96	Fe Standard Intensities Results (run at 100 sec.) Mn + Co should be less than 0.010. Fe should be greater than 0.95 for a good calibration.	Mn = 0.00056		
		Fe = 0.99280		
		Co = -0.00399		
	L. Wright Burrell 5-7-96			

Date	Sample Number	Element	PPM	Std Dev
5-7-96	96-1160	CrHi	-87	195.0
		K	21,290	288
		Ca	8,390	134
		Ti	2,501	87.9
		CrLo	-124	56.0
		Mn	490	22.1
		Fe	22,240	43.2
		Co	-62	151.9
		Ni	-122	47.3
		Cu	60	30.4
		Zn	69	25.4
		As	58	18.4
		Se	22	11.0
		Sr	142.0	7.
		Zr	325.5	6.91
		Mo	-4.9	8.20
		Hg	-22	23.2
		Pb	-22	11.6
		Rb	106	11.7
		Cd	61	31.4
		Sn	-27	17.2
		Sb	10.0	11.17
		Ba	517.8	8.55
		Ag	45	20.6
		U	43.3	8.95
		Th	49.8	5.96

L. Dwight Barrett 5-7-96

Date	Sample Number	Element	PPM	Std Dev
5-7-96	96-1161	CrHi	-63	193.0
		K	12,280	266
		Ca	8,210	130
		Ti	3,744	82.4
		CrLo	69	55.1
		Mn	340	21.1
		Fe	29,710	414
		Co	260	15.4
		Ni	-109	47.7
		Cu	54	29.2
		Zn	60	25.9
		As	14	17.0
		Se	13	10.2
		Sr	154.6	2.72
		Zr	359.9	2.19
		Mo	-0.9	3.18
		Hg	-64	20.3
		Pb	-3.2	11.65
		Rb	98	12.0
		Cd	-42	29.8
		Sn	-49	16.5
		Sb	24	10.8
		Ba	524.7	8.49
		Ag	69	20.0
		U	32.9	8.60
		Th	39.1	5.28

L. Dwight Bazzell 5-7-96

Date	Sample Number	Element	PPM	Std Dev
5-7-96	96-1162	CrHi	-140	194
		K	14,300	242
		Ca	8,530	180
		Ti	3,198	94.3
		CrLo	-86	57.5
		Mn	820	245
		Fe	36,230	547
		Co	250	192
		Ni	9.5	60.53
		Cu	21	30.7
		Zn	136	29.3
		As	30	19.8
		Se	20	11.6
		Sr	130.0	7.62
		Zr	303.5	7.0
		Mo	-8.2	3.13
		Hg	-51	23.8
		Pb	5.4	13.16
		Rb	97	11.8
		Cd	26	33.5
		Sn	-69	18.2
		Sb	9.2	11.84
		Ba	515.5	8.76
		Ag	96	22.4
		U	28.9	8.09
		Th	35.1	5.43

L. Alonzo N. Bazzell 5-7-96

Date	Sample Number	Element	PPM	Std Dev
5-2-96	96-1163	CrHi	61	204.8
		K	21,290	28.8
		Ti	3,207	95.2
		CrLo	-100	57.9
		Ca	8,360	13.4
		Mn	-66	209.1
		Fe	27,820	48.4
		Co	-80	166.8
		Ni	9.2	56.22
		Cu	-35	26.8
		Zn	59	25.6
		As	6.2	19.31
		Se	-5.1	10.24
		Sr	150.9	7.89
		Zr	381.7	7.63
		Mo	-1.0	3.38
		Hg	-53	22.6
		Pb	27	13.2
		Rb	105	11.5
		Cd	80	33.4
		Sn	-12	18.4
		Sb	15	11.9
		Ba	627.2	9.56
		Ag	60	21.9
		U	28.9	8.58
		Th	34.9	5.80

L. Dwight Barrett 5-7-96

Date	Sample Number	Element	PPM	Std Dev
5-7-96	96-1164	Cr Hi	-370	173
		K	18,460	270
		Cu	7,450	125
		Ti	1,954	77.3
		Cr Lo	127	52.2
		Mn	-190	182
		Fe	20,640	41.2
		Co	-98	144.2
		Ni	-93	46.0
		Cu	37	27.7
		Zn	81	24.0
		As	23	16.9
		Se	6.5	9.66
		Sr	138.0	7.31
		Zr	268.6	6.26
		Mo	5.5	3.60
		Hg	-18	22.2
		Pb	-1.8	11.35
		Rb	94	10.6
		Cd	-92	27.3
		Sn	-46	15.4
		Sb	36	10.0
		Ba	449.0	7.81
		Ag	87	18.8
		U	21.0	8.17
		Th	41.6	5.57

L. Dwight Bazell 5-7-96

Date	Sample Number	Element	PPM	STd Dev
5-7-96	96-7165	CrHi	350	2.18
		K	20,020	281
		Ca	9,680	141
		Ti	2,985	92.5
		CrLo	-66	56.9
		Mn	-150	204
		Fe	25,600	464
		Co	-160	159
		Ni	51	56.9
		Cu	-10.0	27.97
		Zn	89	26.6
		As	8.5	18.68
		Se	31	11.5
		Sr	119.4	2.10
		Zr	370.9	2.44
		Mo	2.7	3.34
		Hg	1.8	24.68
		Pb	10	12.9
		Rb	112	11.5
		Cd	27	32.4
		Sn	-26	17.9
		Sb	5.2	11.45
		Ba	519.9	8.69
		Ag	64	21.5
		U	21.4	8.46
		Th	36.4	5.76

L Dewight Brazell 5-7-96

Date	Sample Number	Element	PPM	Std Dev
5-8-96	Teflon Standard	CrHi	-470	181
		K	119	78.8
	Parts Per Million should be	Ca	-113	36.2
	less than 5 times above or	Ti	-5.5	28.29
	below the standard deviation	CrLo	-4.1	51.30
	of the elements of concern.	Mn	-270	160
		Fe	8.3	84.37
		Co	308	82.0
		Ni	-98	47.0
		Cu	1.2	32.44
		Zn	-29	31.0
		As	23	19.8
		Se	12	12.2
		Sr	0.4	2.89
		Zr	2.9	1.77
		Mo	0.5	2.22
		Hg	74	26.5
		Pb	-19.3	9.95
		Rb	-2.0	6.39
		Cd	-30	27.9
		Sn	-7.6	16.60
		Sb	25	10.1
		Ba	4.2	2.89
		Ag	23	18.4
		U	7.4	7.13
5-8-96	Fe standard Intensities Results	Th	3.9	5.07
	(run at 100 sec) Mn & Co should			
	be less than 0.010, Fe should be	Mn = 0.00218		
	greater than 0.95 for a good	Fe = 0.98282		
	calibration.	Co = -0.00196		

L. Dwight Bazzell 5-8-96

Date	Sample Number	Element	PPM	Std. Dev
9-96	Teflon Standard	CrH	-220	194
		K	103	78.6
	Parts Per Million should be	Ca	-49	36.6
	less than 5 times above or	Ti	16	28.2
	below the standard deviation	CrLo	45	57.9
	of the elements of concern.	Mn	120	179
		Fe	8.4	8592
		Co	148	76.5
		Ni	-56	48.5
		Cu	21	33.3
		Zn	-36	30.9
		As	-26	19.3
		Se	9.1	12.18
		Sr	-5.5	2.61
		Zr	-1.8	1.70
		Mo	6.8	2.32
		Hg	49	25.8
		Pb	-8.9	10.54
		Rb	-4.1	6.25
		Cd	-42	29.9
		Sn	-55	15.3
		Sb	21	10.1
		Ba	1.1	2.84
		Ag	21	18.5
		U	-0.7	7.00
9-96	Fe Standard Intensities Results	Th	18.6	5.37
	(run at 100 sec.) Mn + Co should			
	be less than 0.010. Fe should be	Mn = 0.00087		
	greater than 0.95 for a good	Fe = 0.99227		
	calibration	Co = -0.00266		
	L. Dwight Bazzell 5-9-96			

Date	Sample Number
5-9-96	-96-89A

Element	PPM	Std Dev
Cr hi	-370	176
K	19,500	277
Ca	7,530	127
Ti	2,313	81.9
Cr lo	-25	52.2
Mn	220	2.06
Fe	22,460	432
Co	68	154.2
Ni	-128	46.5
Cu	44	28.9
Zn	118	26.2
As	27	17.4
Se	20	10.5
Sr	161.8	7.01
Zr	317.7	6.[illegible]
Mo	-1.4	3.02
Hg	-46	21.5
Pb	-4.1	11.59
Rb	94	10.8
Cd	-1.5	29.26
Sn	-4.9	16.43
Sb	1.5	10.35
Ba	492.1	8.26
Ag	62	19.5
U	22.4	8.17
Th	37.2	5.61

L. Newyth Barrett 5-9-96

Date	Sample Number	Element	PPM	Std Dev
5-9-96	96-89B	CrHS	-210	185
		K	29,120	298
		Ca	2,190	127
		Ti	2,717	85.9
		CrLo	133	55.3
		Mn	546	213
		Fe	15,790	366
		Co	-7.0	133.94
		Ni	-32	48.3
		Cu	2.7	25.79
		Zn	43	22.0
		As	35	16.5
		Se	0.5	9.26
		Sr	141.5	2.33
		Zr	351.7	2.01
		Mo	1.1	3.10
		Hg	-43	20.8
		Pb	-13	10.7
		Rb	96	10.9
		Cd	-37	27.0
		Sn	-19	15.2
		Sb	20.1	9.79
		Ba	463.2	2.87
		Ag	37	18.0
		U	35.1	8.62
		Th	42.3	5.74

L. Llewellyn Russell 5-9-96

Date	Sample Number
5-9-96	96-89C

Element	PPM	Std Dev
CrH	-580	158
K	19,150	274
Ca	6,420	119
Ti	2,087	74.9
CrL	172	50.7
Mn	310	196
Fe	15,700	362
Co	-330	124
Ni	-79	43.6
Cu	56	28.0
Zn	133	25.4
As	25	16.5
Se	9.0	9.45
Sr	125.6	6.8
Zr	274.3	6.15
Mo	-3.9	2.77
Hg	-74	18.7
Pb	4.9	14.77
Rb	72.5	9.62
Cd	-15	27.0
Sn	-38	15.0
Sb	3.5	9.60
Ba	412.6	7.47
Ag	32	17.9
U	29.8	8.02
Th	27.8	5.36

L. Dwight Bozzell 5-9-96

Date	Sample Number	Element	PPM	STd Dev
5-9-96	96-89D	CrH	-110	189
		K	23,200	299
		Ca	6,930	126
		Ti	3,110	91.0
		CrLo	35	54.9
		Mn	320	207
		Fe	17,550	385
		Co	1.3	139.50
		Ni	34	51.8
		Cu	4.7	25.78
		Zn	87	23.4
		As	48	16.9
		Se	9.2	9.48
		Sr	143.9	7.41
		Zr	362.8	7.15
		Mo	-2.2	3.08
		Hg	-41	20.8
		Pb	-10	11.0
		Rb	121	11.4
		Cd	-35	26.5
		Sn	-50	14.7
		Sb	16.2	9.58
		Ba	486.6	8.07
		Ag	38	17.7
		U	27.0	8.63
		Th	33.6	5.61

L. Dwight Bazzell 5-9-96

Date	Sample Number
5-9-96	96-89E

Element	PPM	Std Dev
CrH	-470	167
K	21,880	290
Ca	6,200	119
Ti	1,983	25.7
CrO	104	51.1
Mn	340	20.1
Fe	17,580	38.3
Co	1.4	138.50
Ni	-81	45.8
Cu	42	27.6
Zn	154	26.2
As	53	16.1
Se	2.3	9.25
Sr	125.0	6.95
Zr	261.5	6.1
Mo	-4.7	2.83
Hg	-53	20.2
Pb	-30	10.1
Rb	110	11.3
Cd	-37	25.9
Sn	-38	14.5
Sb	6.0	9.24
Ba	337.8	6.79
Ag	54	12.5
U	35.6	8.61
Th	44.1	5.58

L. Dwight Bazzell 5-9-96

Date	Sample Number	Element	PPM	Std Dev
5-9-96	96-89F	CrHi	-47	191.1
		K	17,370	262
		Ca	5,750	113
		Ti	1,137	86.5
		CrLo	262	61.7
		Mn	-27	194.4
		Fe	23,600	442
		Co	61	56.7
		Ni	51	55.1
		Cu	14	27.5
		Zn	83	24.5
		As	27	17.8
		Se	7.5	9.89
		Sr	144.6	7.54
		Zr	222.5	5.85
		Mo	-0.6	2.79
		Hg	-79	19.7
		Pb	14	11.6
		Rb	73.9	9.97
		Cd	-2.9	27.77
		Sn	-48	15.5
		Sb	29	10.2
		Ba	2,030	16.8
		Ag	56	18.3
		U	22.8	7.70
		Th	23.5	5.14

L. Dwight Barrett 5-9-96

Date	Sample Number	Element	PPM	Std Dev
5-9-96	96-89G	Cr-Hi	59	18.8
		K	20,290	282
		Ca	7,390	127
		Ti	3,055	91.6
		Cr-Lo	-16	54.9
		Mn	150	200
		Fe	17,260	381
		Co	-250	132
		Ni	11	50.6
		Cu	53	28.7
		Zn	80	23.9
		As	-3.5	16.34
		Se	2.6	9.41
		Sr	174.0	8.[illegible]
		Zr	363.6	[illegible]
		Mo	6.0	3.22
		Hg	-28	21.4
		Pb	8.9	11.55
		Rb	85	10.5
		Cd	-47	27.0
		Sn	-34	15.1
		Sb	18.2	9.78
		Ba	774	10.1
		Ag	24	17.9
		U	31.2	8.50
		Th	32.9	5.66

L. Wright Barrell 5-9-96

Date	Sample Number	Element	RPM	Std Dev
5-9-96	96-90A	CrA	-250	183
		K	21,070	286
		Ca	2,030	125
		Ti	8,666	95.7
		CrLo	52	59.2
		Mn	620	224
		Fe	20,890	420
		Co	-230	144
		Ni	-52	47.9
		Cu	55	28.4
		Zn	150	25.8
		As	23	16.3
		Se	25	10.3
		Sr	176.4	8.22
		Zr	451.7	8.06
		Mo	2.2	3.28
		Hg	-49	20.6
		Pb	-6.0	11.13
		Rb	86	10.6
		Cd	15	26.6
		Sn	-39	14.8
		Sb	8.7	9.56
		Ba	1,463	14.1
		Ag	97	17.9
		U	25.4	8.22
		Th	33.8	5.70

F. Dwight Bazzell 5-9-96

Date	Sample Number	Element	PPM	Std Dev
5-9-96	96-90B	CrAl	-270	185
		K	18,390	271
		Ca	8,440	133
		Ti	1,940	101
		CrLo	-3.1	65.68
		Mn	1,440	259
		Fe	27,690	483
		Co	-330	160
		Ni	46	56.1
		Cu	68	31.1
		Zn	65	24.6
		As	25	17.8
		Se	31	11.3
		Sr	164.4	8.22
		Zr	331.0	7
		Mo	0.05	3.138
		Hg	-18	23.7
		Pb	0.6	11.71
		Rb	80	10.7
		Cd	6.1	38.51
		Sn	-35	17.0
		Sb	15	11.0
		Br	2,215	18.1
		Ag	55	20.0
		U	23.1	7.90
		Th	28.6	5.35

L. Dwight Burrell 5-9-96

Date	Sample Number	Element	PPM	Std Dev
5-9-96	96-90C	CrH	-92	190.0
		K	20,170	281
		Ca	7,090	124
		Ti	2,031	81.7
		CrHO	33	52.9
		Mn	330	21.0
		Fe	21,270	421
		Co	220	15.4
		Ni	-56	49.7
		Cu	19	26.8
		Zn	107	24.5
		As	7.7	16.55
		Se	7.8	9.58
		Sr	146.5	7.55
		Zr	361.2	7.21
		Mo	4.0	5.14
		Hg	-75	19.5
		Pb	7.2	11.57
		Rb	97	10.8
		Cd	-7.1	27.17
		Sn	-55	14.9
		Sb	9.1	9.72
		Ba	731.6	9.87
		Ag	53	18.1
		U	21.6	8.18
		Th	32.8	5.52

L. Dwight Bizzell 5-9-96

Date	Sample Number	Element	PPM	Std Dev
5-10-96	Teflon Standard	CrHi	-47	201.9
		K	102	78.6
	Parts Per Million should be	Ca	-56	36.5
	less than 5 Times above or	Ti	4.7	27.83
	below the standard deviation	CrLo	-2.1	51.33
	of the elements of concern.	Mn	-50	172.8
		Fe	-61	82.4
		Co	25	91.2
		Ni	-48	48.4
		Cu	25	33.4
		Zn	-30	31.1
		As	-44	19.0
		Se	10	12.2
		Sr	-5.0	2[illegible].4
		Zr	1.4	[illegible].8
		Mo	0.7	2.20
		Hg	60	26.1
		Pb	-1.5	10.59
		Rb	0.5	6.37
		Cd	-47	27.9
		Sn	-55	15.3
		Sb	33	10.2
		Ba	-1.2	2.81
		Ag	5.2	18.3[illegible]
		U	2.2	6.9[illegible]
5-10-96	Fe Standard Intensities Results	Th	-1.5	4.98
	(run at 100 sec.) Mn + Co should be			
	less than 0.010. Fe should be	Mn = 0.00066		
	greater than 0.95 for a	Fe = 0.98165		
	good calibration.	Co = -0.00416		

K. Dwight Bassell 5-10-96

Date	Sample Number	Element	PPM	Std De
5-14-96	Teflon Standard	CrKi	-391	186
		K	40	77,1
	Parts Per Million should be	Cu	-139	34,1
	less than 5 times above or	Ti	24	28,2
	below the standard deviation	CrKo	-113	49,1
	of the elements of concern.	Mn	-250	162
		Fe	-129	78,2
		Co	152	76,6
		Ni	-43	49,1
		Cu	5,2	32,8
		Zn	7,7	32,0
		As	-37	18,3
		Se	6,6	12,1
		Sr	-3,3	2,71
		Zr	2,1	1,73
		Mo	1,9	2,2
		Hg	38	25,4
		Pb	-11	10,1
		Rb	-9,9	6,0
		Cd	-64	27,
		Sn	-0,7	15,6
		Sb	28	10,1
		Ba	-1,0	2,8
		Ag	20	18,1
		U	8,2	7,0
5-14-96	Fe standard Intensities Results	Th	2,3	5,0
	(run at 100 sec.) Mn + Co should be			
	less than 0.010. Fe should be	Mn = -0,00021		
	greater than 0.95 for a	Fe = 0,98610		
	good calibration.	Co = -0,00450		
	L. Dwight Siwell	5-14-96		

Date	Sample Number	Element	PPM	Std Dev
5-14-96	-96-936	CrHi	-460	172
		K	26,490	320
		Ca	12,550	161
		Ti	2,184	85.6
		CrLo	-147	54.3
		Mn	500	214
		Fe	18,230	398
		Co	-270	137
		Ni	-88	45.6
		Cu	20	24.8
		Zn	79	23.5
		As	41	18.1
		Se	8.7	9.69
		Sr	191.8	8.53
		Zr	267.8	6.38
		Mo	-0.9	2.91
		Hg	-51	20.8
		Pb	18	11.8
		Rb	97	10.7
		Cd	36	28.6
		Sn	42	16.3
		Sb	39	10.5
		Ba	519.0	8.45
		Ag	-8.1	18.38
		U	24.2	8.22
		Th	24.8	5.35

L. Dirk W. Bissell 5-14-96

Date	Sample Number	Element	PPM	Std Dev
5-14-96	96-99 A	CrHo	-430	173
		K	18,960	274
		Ca	7,750	128
		Ti	2,495	83.1
		CrLo	77	63.8
		Mn	740	224
		Fe	20,690	416
		Co	-97	146.3
		Ni	-12	50.7
		Cu	8.3	26.65
		Zn	119	25.5
		As	18	12.9
		Se	-6.2	9.13
		Sr	162.1	7.91
		Zr	334.1	6.97
		Mo	0.9	5.08
		Hg	-45	21.2
		Pb	29	12.0
		Rb	65	10.1
		Cd	51	28.8
		Sn	-34	15.8
		Sb	1.1	10.19
		Ba	460.4	7.96
		Ag	64	19.1
		U	35.7	8.19
		Th	25.8	5.45

L. Dewight Bartell 5-14-96

Date	Sample Number	Element	PPM	STd Dev
5-14-96	-96-99B	CrH	-450	168
		K	16,890	260
		Ca	7,440	124
		Ti	2,635	82.6
		CrLo	96	50.3
		Mn	1,050	229
		Fe	17,430	382
		Co	-110	136
		Ni	-29	47.4
		Cu	41	26.9
		Zn	91	22.8
		As	-6.0	16.54
		Se	10.6	9.29
		Sr	143.4	7.36
		Zr	343.4	6.91
		Mo	1.7	3.02
		Hg	-56	19.6
		Pb	30	12.0
		Pb	58.2	9.69
		Cd	-6.9	25.39
		Sn	-41	14.1
		Sb	-6.3	8.99
		Ba	580.5	8.66
		Ag	6.0	17.0
		U	98.5	8.05
		Th	24.6	5.37

L. Dwight Russell 5-14-96

Date	Sample Number	Element	PPM	Std Dev
5-14-96	96-1470	CrAl	-160	189
		K	16,330	256
		Ca	7,990	128
		Ti	1,856	77.2
		CrLo	91	52.6
		Mn	1,120	246
		Fe	27,520	478
		Co	170	170
		Ni	-85	51.1
		Cu	47	29.3
		Zn	114	25.9
		As	29	17.5
		Se	17	10.4
		Sr	158.7	8.02
		Zr	368.3	7.45
		Mo	2.3	9.23
		Hg	-15	23.3
		Pb	0.5	11.46
		Pb	52.2	9.71
		Cd	-6.4	29.56
		Sn	-55	16.2
		Sb	25	10.7
		Ba	594.7	9.12
		Ag	70	19.8
		U	26.7	7.63
		Th	18.9	5.15

L Dwight Bazzell 5-14-96

Date	Sample Number	Element	PPM	STd Dev
5-14-96	96-1471	CrHi	-94	191.1
		K	18,190	270
	The printed data on the XRF print out will read 96-1171. The title on the XRF print out is incorrect.	Ti	2,087	86.2
		CrLo	76	56.9
		Mn	-120	192
		Fe	22,130	431
		Co	-280	146
		Ni	-72	47.6
		Cu	29	28.0
		Zn	70	24.1
		As	51	17.9
		Se	11	10.1
		Sr	182.9	8.36
		Zr	272.2	6.49
		Mo	-2.0	2.96
		Hg	-85	19.5
		Pb	-5.4	11.34
		Rb	94	10.9
		Cd	-1.5	28.25
		Sn	-44	15.6
		Sb	15	10.2
		Ba	935	11.2
		Ag	26	18.5
		U	28.8	8.34
		Th	34.7	5.57
		Ca	9,130	136

L David W Barnett 5-14-96

Date	Sample Number	Element	PPM	Std Dev
5-14-96	96-1472	CrHi	-410	120
		K	15,250	248
		Ca	6,610	117
		Ti	1,172	67.9
		CrLo	72	48.6
		Mn	410	8.07
		Fe	21,990	425
		Co	-240	14.5
		Ni	-73	46.6
		Cu	15	26.5
		Zn	138	26.0
		As	50	17.0
		Se	14.7	9.93
		Sr	169.7	8.01
		Zr	260.6	6.23
		Mo	2.1	2.88
		Hg	-35	21.3
		Pb	-13	10.6
		Rb	73.7	9.87
		Cd	-22	26.5
		Sn	-54	14.6
		Sb	23.6	9.64
		Ba	733.0	9.80
		Ag	57	17.7
		U	19.8	9.79
		Th	30.3	5.31

L. Dwight Brazell

Date	Sample Number	Element	PPM	STD. DEV.
5-14-96	-96-1473	CrHi	-370	169
		K	14,070	239
		Ca	5,330	107
		Ti	1,472	70.6
		CrLo	143	50.1
		Mn	230	196
		Fe	19,820	402
		Co	-91	141.2
		Ni	-33	47.8
		Cu	8.1	25.50
		Zn	89	23.4
		As	12	15.4
		Se	9.5	9.41
		Sr	139.4	7.25
		Zr	279.1	6.29
		Mo	-6.8	2.81
		Hg	-60	19.5
		Pb	-8.9	10.42
		Rb	72.4	9.83
		Cd	-19	25.1
		Sn	-39	14.0
		Sb	11.3	9.03
		Ba	535.7	8.32
		Ag	49	16.8
		U	27.9	7.91
		Th	28.7	5.32

L. Dwight Bazzell 5-14-96

Date	Sample Number	Element	PPM	Std Dev
5-14-96	96-1474	Cr	-360	176
		K	18,410	269
	The printed data on the	Ca	6,690	120
	XRF print out will	Ti	1,346	20.5
	read 96-1174. The	CrO	174	51.5
	title on the XRF printout	Mn	348	20.5
	is <u>incorrect</u>.	Fe	21,620	417
		Co	120	15.1
		Ni	-101	46.4
		Cu	36	22.3
		Zn	160	26.4
		As	35	16.4
		Se	4.5	9.37
		Sr	129.7	7.13
		Zr	268.6	6.30
		Mo	6.0	3.03
		Hg	-57	20.0
		Pb	-12	10.9
		Rb	90	10.5
		Cd	-83	26.1
		Sn	-44	14.7
		Sb	18.4	9.43
		Ba	523.1	8.34
		Ag	71	17.8
		U	23.9	8.20
		Th	44.9	5.65

L. Alan McBazzell 5-14-96

Date	Sample Number
5-14-96	96-1175

The printed data on the XRF printout will read 96-1175. The title on the XRF printout is incorrect.

Element	PPM	STD DEV.
CrHi	-390	171
K	14,730	244
Ca	6,690	118
Ti	1,409	70.4
CrLo	160	52.3
Mn	930	230
Fe	24,500	449
Co	-29	156.9
Ni	-7.9	51.54
Cu	40	22.9
Zn	60	22.5
As	34	16.3
Se	37	10.8
Sr	171.1	8.12
Zr	267.3	6.34
Mo	1.6	2.79
Hg	-43	21.2
Pb	-11	10.4
Rb	74.5	9.71
Cd	-30	28.0
Sn	-57	15.5
Sb	3.0	9.91
Ba	669.2	9.48
Ag	83	18.9
U	8.0	7.28
Th	19.7	4.94

L. Dwight Bazzell

Date	Sample Number	Element	PPM	Std Dev
5-14-96	96-1476	CrHi	-43	191.2
		K	13,670	239
		Ca	9,530	135
		Ti	1,656	29.5
		CrLo	155	55.4
		Mn	380	2.13
		Fe	26,340	467
		Co	-27	162.1
		Ni	-97	48.1
		Cu	85	30.4
		Zn	128	25.7
		As	0.9	16.27
		Se	14	10.0
		Sr	175.8	8.29
		Zr	237.5	6.12
		Mo	2.1	2.78
		Hg	-65	20.2
		Pb	6.6	11.22
		Rb	66.4	9.34
		Cd	18	28.5
		Sn	-52	15.6
		Sb	9.7	10.17
		Ba	952	11.4
		Ag	68	18.9
		U	6.0	7.15
		Th	27.0	5.15

L. David N. Bazzell 5-14-96

Date	Sample Number
5-14-96	96-1477

Element	PPM	Std Dev
CrHi	-360	475
K	14,760	249
Ca	14,120	161
Ti	1,372	69.0
CrLo	154	51.2
Mn	1,080	235
Fe	22,600	435
Co	-340	146
Ni	-78	46.5
Cu	-0.06	25.769
Zn	149	26.4
As	24	16.4
Se	9.0	9.76
Sr	191.8	8.56
Zr	236.1	6.07
Mo	1.9	2.73
Hg	-19	22.3
Pb	-4.2	10.73
Rb	49.8	9.00
Cd	-26	27.6
Sn	-40	15.3
Sb	9.2	9.86
Ba	686.0	9.59
Ag	53	18.4
U	11.6	7.06
Th	22.7	5.11

L. Dwight Bazzell 5-14-96

Date	Sample Number	Element	PPM	Std Dev
5-15-96	Teflon Standard	CrHi	-14	204.4
		K	112	78.9
	Parts Per Million should be	Ca	-57	36.5
	less than 5 times above or	Ti	50	28.8
	below the standard deviation	CrLo	-23	51.0
	of the elements of concern.	Mn	-240	165
		Fe	81	58.2
		Co	193	78.9
		Ni	65	53.5
		Cu	-18	32.4
		Zn	-51	30.8
		As	-41	19.1
		Se	-7.5	11.77
		Sr	-4.4	2.67
		Zr	1.6	1.74
		Mo	2.0	2.28
		Ag	26	25.1
		Pb	-3.1	10.44
		Rb	-1.5	6.26
		Cd	-28	28.0
		Sn	9.3	15.77
		Sb	11	10.0
		Ba	-3.1	2.78
		Ag	21	18.5
		U	1.1	7.05
5-15-96	Fe Standard Intensities Results	Th	6.0	5.16
	(run at 100 sec.) Mn & Co should			
	be less than 0.010. Fe should be	Mn = 0.00246		
	greater than 0.95 for a	Fe = 0.99145		
	good calibration.	Co = -0.00041		

L. Marigold Bissell 5-15-96

Date	Sample Number	Element	PPM	Std Dev
5-15-96	-96-99C	CrHi	-680	1459
		K	22,600	297
		Ca	9,750	148
		Ti	2,911	92.7
		CrLo	31	57.2
		Mn	290	209
		Fe	21,810	431
		Co	-130	150
		Ni	-21	50.8
		Cu	30	27.6
		Zn	171	27.0
		As	41	17.5
		Se	15.0	9.98
		Sr	159.5	7.94
		Zr	388.1	7.55
		Mo	7.5	3.30
		Hg	-43	21.3
		Pb	2.8	11.58
		Rb	96	11.0
		Cd	51	26.5
		Sn	-33	14.5
		Sb	-0.6	9.36
		Ba	662.1	9.45
		Ag	39	12.3
		U	22.3	8.24
		Th	31.7	5.52

L. Dwight Bazzell 5-25-96

Date	Sample Number	Element	PPM	Std Dev
5-15-96	96-99D	CrHi	-540	161
		K	19,260	275
		Ca	6,020	116
		Ti	1,918	77.4
		CrLo	32	50.7
		Mn	-33	183.4
		Fe	16,530	371
		Co	-130	132
		Ni	-48	46.3
		Cu	30	26.7
		Zn	161	26.2
		As	36	16.5
		Se	0.9	9.05
		Sr	119.2	6.77
		Zr	319.9	6.64
		Mo	-0.7	2.94
		Hg	-41	20.5
		Pb	-2.7	10.59
		Rb	51.5	9.55
		Cd	-4.6	26.22
		Sn	-14	14.7
		Sb	14.5	9.45
		Ba	423.2	7.48
		Ag	43	12.4
		U	42.8	8.07
		Th	29.4	5.38

L Marie W Bazzell 5-15-96

Date	Sample Number	Element	PPM	Std Dev
5-15-96	96-99 E	CrH	+260	9.81
		K	25,970	3.16
		Ca	7,990	13.5
		Ti	2,293	82.3
		CrLo	50	53.6
		Mn	170	19.7
		Fe	16,250	37.4
		Co	-220	13.1
		Ni	-63	45.8
		Cu	39	27.3
		Zn	88	23.4
		As	41	16.2
		Se	9.0	9.50
		Sr	146.0	2.47
		Zr	286.7	6.46
		Mo	6.3	3.06
		Hg	6.2	22.71
		Pb	-16	10.6
		Rb	114	11.1
		Cd	-0.2	26.13
		Sn	-30	14.5
		Sb	12.3	9.46
		Ba	444.9	2.22
		Ag	53	17.4
		U	21.6	8.56
		Th	43.0	5.70

L. Dwight Barrell 5-15-96

Date	Sample Number	Element	PPM	STd Dev
5-15-96	96-99F	Cr Hi	71	204.9
		K	17,920	268
		Ca	9,350	138
		Ti	2,985	91.2
		Cr Lo	-31	56.6
		Mn	260	223
		Fe	30,660	509
		Co	230	180
		Ni	3.6	58.18
		Cu	9.4	29.34
		Zn	104	27.4
		As	37	18.4
		Se	2.7	16.51
		Sr	145.2	7.88
		Zr	343.8	7.35
		Mo	-2.2	3.21
		Hg	-2.7	25.22
		Pb	-15	11.7
		Rb	109	11.5
		Cd	37	32.8
		Sn	-96	17.6
		Sb	5.9	11.61
		Ba	516.5	8.75
		Ag	80	21.9
		U	12.2	7.99
		Th	29.6	5.39

L Dwight Barrett 5-15-96

Date	Sample Number	Element	PPM	STD Dev
5-15-96	96-99G	CrHi	-580	159
		K	17,590	264
		Ca	6,050	115
		Ti	2,136	78.8
		CrLo	123	51.1
		Mn	660	213
		Fe	16,420	370
		Co	-330	126
		Ni	-99	42.7
		Cu	59	28.0
		Zn	25	23.0
		As	-3.8	15.94
		Se	12.4	9.53
		Sr	186.5	2.18
		Zr	3346	6.99
		Mo	5.6	2.99
		Hg	-62	19.4
		Pb	13	11.2
		Rb	86.0	9.89
		Cd	-37	25.5
		Sn	-48	14.2
		Sb	-9.9	8.92
		Ba	463.1	7.76
		Ag	99	17.6
		U	15.8	2.97
		Th	22.4	5.35

L. Dwight Bazell 5-15-96

Date	Sample Number	Element	PPM	Std Dev
5-16-96	Teflon Standard	CrHi	-210	195
		K	329	83.7
	Parts Per Million should be	Ca	-85	36.4
	less than 5 Times above or	Ti	12	29.0
	below the standard deviation	CrLo	-85	50.5
	of the elements of concern.	Mn	-230	165
		Fe	60	87.4
		Co	72	94.1
		Ni	25	51.7
		Cu	11	33.3
		Zn	-68	30.4
		As	-22	20.1
		Se	18	12.5
		Sr	-2.3	2.78
		Zr	2.9	1.74
		Mo	-0.03	2.25
		Hg	51	26.0
		Pb	12	11.2
		Rb	-7.6	6.28
		Cd	-35	27.9
		Sn	2.3	15.67
		Sb	13	10.0
		Ba	6.0	2.93
		Ag	2.5	18.35
		U	12.3	7.17
5-16-96	Fe Standard Intensities Results	Th	-4.5	5.02
	(run at 100 sec.) Mn & Co should be			
	less than 0.010. Fe should be	Mn = 0.00023		
	greater than 0.95 for a	Fe = 0.99041		
	good calibration.	Co = -0.00188		

L. Dwight Bazzell 5-16-96

Date	Sample Number	Element	PPM	STD Dev
5-16-96	96-1024	CrHi	-170	190
		K	13,750	239
		Ca	7,950	126
		Ti	2,034	87.0
		CrLo	-12	56.9
		Mn	200	216
		Fe	27,760	479
		Co	-230	162
		Ni	4.9	54.19
		Cu	48	30.1
		Zn	60	24.6
		As	39	18.8
		Se	27	11.1
		Sr	191.3	8.70
		Zr	466.4	8.39
		Mo	-6.8	3.28
		Hg	-52	22.0
		Pb	-1.2	12.74
		Rb	53	10.1
		Cd	36	30.8
		Sn	-59	17.0
		Sb	20	11.1
		Ba	1203	13.0
		Ag	102	20.6
		U	30.0	7.87
		Th	42.2	5.94

L. Dwight Bozell 5-16-96

Date	Sample Number	Elements	PPM	Std Dev
5-16-96	96-1025	CrHi	-22	196.3
		K	12,850	232
		Ca	8,330	127
		Ti	1,898	81.5
		CrLo	109	54.3
		Mn	1000	247
		Fe	33,940	531
		Co	62	183.4
		Ni	-85	53.0
		Cu	-0.9	27.25
		Zn	137	27.1
		As	4.5	17.22
		Se	19	10.8
		Sr	201.7	9.10
		Zr	300.2	7.00
		Mo	0.1	3.01
		Hg	-40	22.8
		Pb	3.9	11.85
		Rb	40.6	9.45
		Cd	-58	29.1
		Sn	-63	16.1
		Sb	1.9	16.27
		Ba	855	11.0
		Ag	71	19.6
		U	20.9	7.18
		Th	26.0	5.19

L. Dwight Bozzell 5-16-96

Date	Sample Number	Element	PPM	Std Dev
5-16-96	96-1026	CrH	-210	205
		K	14,120	240
		Ti	1,670	96.3
		CrLo	194	53.1
		Cr	6,930	119
		Mn	630	227
		Fe	27,330	475
		Co	-87	163.6
		Ni	-108	48.0
		Cu	8.9	26.79
		Zn	75	24.0
		As	25	17.1
		Se	4.7	9.82
		Sr	175.5	8.35
		Zr	279.5	6.59
		Mo	2.7	2.92
		Hg	7.1	24.07
		Pb	-0.8	11.26
		Rb	43.1	9.18
		Cd	-20	28.4
		Sn	-40	15.8
		Sb	15	10.2
		Ba	766.5	9.83
		Ag	48	18.9
		U	18.6	7.23
		Th	30.9	5.27

L. Dwight Pruitt 5-16-96

Date	Sample Number	Element	PPM	Std Dev
5-16-96	96-1030	CrHi	-400	199
		K	22,670	297
		Ca	2,140	128
		Ti	3,368	96.7
		CrLo	-145	56.7
		Mn	230	210
		Fe	19,300	406
		Co	-120	143
		Ni	48	54.4
		Cu	51	30.0
		Zn	88	25.5
		As	30	18.1
		Se	46	11.6
		Sr	134.1	2.29
		Zr	449.3	8.00
		Mo	1.2	3.88
		Hg	-69	20.6
		Pb	-4.3	12.28
		Rb	113	11.4
		Cd	59	31.0
		Sn	-54	16.8
		Sb	13	11.1
		Ba	602.3	9.11
		Ag	51	20.4
		U	25.7	8.73
		Th	39.4	5.99

L Marsh Bassett 5-16-96

Ray Flourescent (XRF) Results for OU-1082 VCA Field Work

Te	Sample Number	Element	PPM	Std Dev
6-96	96-1031	Cr(t)	-420	176
		K	17,020	261
		Ca	6,140	116
		Ti	2,994	88.8
		Cr(t)	84	55.0
		Mn	270	208
		Fe	20,380	413
		Co	110	150
		Ni	-102	47.8
		Cu	97	31.6
		Zn	82	25.3
		As	10	18.3
		Se	12	10.3
		Sr	157.1	7.81
		Zr	388.0	7.49
		Mo	0.7	3.23
		Hg	-5.8	23.37
		Pb	19	12.7
		Rb	109	11.3
		Cd	28	30.1
		Sn	-35	16.7
		Sb	15	10.8
		Ba	1,385	13.7
		Ag	73	19.9
		U	25.0	8.65
		Th	34.5	5.85

L Dwight Brizzell 5-16-96

Date	Sample Number
5-16-96	-96-1032

Element	PPM	Std Dev
Cr Hi	1.6	193.19
K	12,590	228
Ca	5,930	111
Ti	2,121	81.3
Cr Lo	203	53.2
Mn	830	227
Fe	22,260	428
Co	-190	147
Ni	-66	47.4
Cu	-0.8	25.74
Zn	64	23.2
As	47	17.1
Se	5.1	9.59
Sr	145.7	7.51
Zr	293.7	6.59
Mo	-2.2	2.92
Hg	-52	20.7
Pb	-16	11.1
Rb	77	10.3
Cd	-33	25.8
Sn	-51	14.3
Sb	16.8	9.36
Ba	893	10.8
Ag	26	17.1
U	27.1	8.02
Th	46.0	5.70

L Margaret Bassett 5-16-96

Date	Sample Number	Element	PPM	Std Dev
5-22-96	Teflon Standard	CrHi	-110	201
		K	380	85.1
	Parts Per Million should be	Ca	31	38.9
	less than 5 times above or	Ti	13	28.8
	below the standard deviation	CrLo	-35	51.1
	of the elements of concern.	Mn	-300	163
		Fe	117	89.8
		Co	98	75.7
		Ni	62	53.4
		Cu	31	34.2
		Zn	30	32.9
		As	-5.4	19.94
		Se	18	12.5
		Sr	0.2	2.89
		Zr	3.5	1.81
		Mo	4.0	2.30
		Hg	6.7	24.70
		Pb	-6.7	10.61
		Rb	-2.0	6.46
		Cd	-43	28.0
		Sn	-45	15.4
		Sb	-6.2	9.89
		Ba	-0.6	2.83
		Ag	8.8	18.49
		U	3.1	7.08
5-22-96	Fe Standard Intensities Results	Th	4.8	5.13
	(run at 100 sec.) Mn & Co should be			
	less than 0.010. Fe should be	Mn = 0.00135		
	greater than 0.95 for a good	Fe = 0.98165		
	calibration.	Co = -0.00185		

L. Dwight Burrell 5-22-96

Date	Sample Number	Element	PPM	Std Dev
5-22-96	96-1020	CrHi	-110	191
		K	15,200	249
		Ca	8,780	132
		Ti	1,318	72.4
		CrLo	134	51.8
		Mn	1,060	242
		Fe	26,520	472
		Co	-110	163
		Ni	12	53.9
		Cu	20	27.8
		Zn	85	24.4
		As	21	17.2
		Se	17	10.3
		Sr	203.0	8.92
		Zr	301.4	6.86
		Mo	-1.5	2.88
		Hg	-36	22.1
		Pb	4.2	11.35
		Rb	40.7	8.91
		Cd	-20	27.8
		Sn	-41	15.5
		Sb	24	10.1
		Ba	708.5	9.83
		Ag	67	18.7
		U	18.0	7.17
		Th	21.4	5.20

RJ Hanson
05-22-96

Jc	Sample Number	Element	PPM	Std Dev
2296	96-102i	CrTi	668	195.98
		K	19120	275
		Ca	6640	121
		Ti	1001	67.9
		CrLo	152	52.8
		Mn	810	229
		Fe	22200	433
		Co	-50	152.2
		Ni	-100	47.1
		Cu	55	29.2
		Zn	144	26.8
		As	39	17.1
		Se	19	10.3
		Sr	119.1	6.99
		Zr	238.2	5.71
		Mo	1.6	2.83
		Hg	-34	21.9
		Pb	-6.0	10.60
		Rb	58.1	9.47
		Cd	-83	27.6
		Sn	-38	15.6
		Sb	13.1	9.70
		Ba	804	10.3
		Ag	95	18.7
		U	20.7	7.43
		Th	19.6	4.92

R. Dwight Bazzell 5-22-96

Date	Sample Number	Element	PPM	Std. Dev.
5-22-96	96-1022	CrHi	-210	185
		K	15080	250
		Ca	8330	130
		Ti	1180	107
		CrLo	325	72.8
		Mn	1040	240
		Fe	26310	473
		Co	-380	157
		Ni	31	53.8
		Cu	12	27.1
		Zn	156	26.9
		As	33	16.4
		Se	17	10.3
		Sr	194.1	8.71
		Zr	216.3	6.0
		Mo	5.0	2.84
		Hg	-46	21.7
		Pb	-19	10.8
		Rb	38.7	9.04
		Cd	1.0	28.10
		Sn	-15	15.9
		Sb	22	10.3
		Ba	280.9	20.5
		Ag	50	18.4
		U	17.9	7.03
		Th	33.3	5.19

R. Johnson
5-22-96

Te	Sample Number	Element	PPM	STd Dev
22-96	96-1023	CrHi	-510	170
		K	20,310	283
		Ca	7,480	128
		Ti	1,591	84.1
		CrLo	55	57.7
		Mn	730	227
		Fe	22,320	436
		Co	-170	151
		Ni	-23	51.2
		Cu	12	27.5
		Zn	92	25.2
		As	9.6	15.86
		Se	15	10.3
		Sr	184.9	8.50
		Zr	308.5	6.86
		Mo	-3.7	2.95
		Hg	-45	21.9
		Pb	-20	10.6
		Rb	77	10.5
		Cd	18	28.6
		Sn	-70	15.6
		Sb	3.8	10.20
		Ba	1499	14.3
		Ag	66	18.9
		U	26.4	8.00
		Th	29.4	6.40

L. Dwight Russell 5-22-96

Date	Sample Number	Element	PPM	Std Dev
6-4-96	Teflon Standard	Cr+Ti	-220	197
		K	289	83.3
	Parts Per Million should be	Ca	-111	35.9
	less than 5 times above or	Ti	-3.4	29.17
	below the standard deviation	Cr+o	-9.1	57.74
	of the elements of concern.	Mn	-280	164
		Fe	-95	81.4
		Co	57	73.5
		Ni	-104	46.9
		Cu	-11	32.5
		Zn	-39	31.2
		As	-20	20.0
		Se	-0.9	12.05
		Sr	-3.9	2.77
		Zr	0.9	1.71
		Mo	3.1	2.32
		Hg	36	25.8
		Pb	8.2	10.75
		Rb	-4.8	6.07
		Cd	13	28.0
		Sn	-37	15.4
		Sb	1.3	9.97
		Ba	-2.6	2.78
		Ag	1.3	18.30
		U	14.0	7.26
6-4-96	Fe Standard Intensities Results	Th	-1.9	5.10
	(run at 100 sec.) Mn & Co should be			
	less than 0.010. Fe should be	Mn = 6.50698-05		
	greater than 0.95 for a good	Fe = 0.98715		
	calibration.	Co = -0.00311		

L. Dwight Barrett 6-4-96

Date	Sample Number	Element	PPM	Std. Dev
6-4-96	96-1142	CrHi	-88	198.6
		K	18,130	277
		Ca	8,850	136
		Ti	3,630	101
		CrLo	-199	57.6
		Mn	440	227
		Fe	26,170	477
		Co	260	172
		Ni	-16	56.1
		Cu	27	29.8
		Zn	63	25.4
		As	29	17.9
		Se	54	12.5
		Sr	186.2	8.76
		Zr	320.9	7.23
		Mo	-7.2	3.21
		Hg	-40	23.2
		Pb	-28	12.4
		Rb	93	11.8
		Cd	-60	31.6
		Sn	-24	12.7
		Sb	27	11.4
		Ba	539.8	8.82
		Ag	54	21.2
		U	42.2	8.85
		TA	55.6	6.15

G. Dwight Burrell 6-4-96

Date	Sample Number	Elements	PPM	Std Dev
6-5-96	96-1150	Cr(Ti)	-470	173
		K	25,410	315
		Ca	7,430	132
		Ti	2,651	88.2
		Cr(Co)	25	55.6
		Mn	390	213
		Fe	18,180	401
		Co	-32	143.8
		Ni	-114	45.7
		Cu	23	27.2
		Zn	82	24.0
		As	25	17.7
		Se	7.7	9.75
		Sr	145.9	7.65
		Zr	345.2	7.17
		Mo	2.5	3.18
		Hg	-36	21.7
		Pb	7.8	12.34
		Rb	102	11.3
		Cd	-8.5	26.77
		Sn	-43	14.8
		Sb	27.5	9.77
		Ba	458.0	7.88
		Ag	78	18.1
		U	27.4	8.56
		Th	41.1	5.78

L. Dwight Bazzell 6-5-96

Te	Sample Number	Element	PPM	STD Dev
-96	96-1151	CrHi	-140	192
		K	23,280	303
		Ca	8,190	135
		Ti	2,379	85.5
		CrLo	86	55.7
		Mn	130	204
		Fe	18,630	404
		Co	210	151
		Ni	-73	49.0
		Cu	9.8	26.59
		Zn	91	24.2
		As	54	18.0
		Se	2.6	9.50
		Sr	175.5	8.28
		Zr	340.6	7.16
		Mo	5.8	3.21
		Hg	-65	20.3
		Pb	1.5	11.44
		Rb	1.03	11.2
		Sn	-23	14.9
		Sb	12.4	9.57
		Ba	521.6	8.37
		Ag	44	17.7
		U	25.1	8.63
		Th	36.3	5.77
		Cd	-0.4	26.62

L. Dewight Bazzell 6-5-96

Date	Sample Number
6-5-96	96-1152

Element	PPM	Std Dev.
CrHi	-170	190
K	22,680	299
Ca	7,830	132
Ti	2,285	85.5
CrLo	-21	54.3
Mn	160	204
Fe	18,510	402
Co	-25	144.3
Ni	-39	49.5
Cu	18	27.1
Zn	94	24.4
As	3.3	16.74
Se	17	10.1
Sr	178.5	8.33
Zr	326.0	7.01
Mo	1.1	3.12
Hg	-45	21.1
Pb	6.6	11.95
Rb	99	11.0
Cd	39	26.5
Sn	-19	14.6
Sb	-4.6	9.33
Ba	543.3	8.51
Ag	18	17.2
U	27.3	8.59
Th	36.0	5.74

L. Dwight Bezzell 6-5-96

Date	Sample Number
6-5-96	96-1153

Element	PPM	Std Dev
CrHi	-306	176
K	16,790	26.0
Ca	5,670	113
Ti	1,512	71.9
CrLo	50	48.5
Mn	430	203
Fe	14,660	354
Co	15	130.6
Ni	-145	40.9
Cu	3.2	24.77
Zn	85	23.1
As	50	16.5
Se	1.5	8.99
Sr	165.4	7.81
Zr	284.0	6.37
Mo	0.4	2.84
Hg	-45	20.1
Pb	-9.3	10.25
Rb	85	10.1
Cd	-69	24.5
Sn	-26	13.9
Sb	41.2	9.17
Ba	442.9	7.53
Ag	23	16.3
U	24.0	8.28
Th	30.1	5.50

L Dwight Bazzell 6-5-96

Date	Sample Number
6-5-96	96-1166

Element	PPM	Std Dev
CrHi	-230	181
K	14,730	245
Ca	4,890	105
Ti	1,952	24.9
CrLo	142	49.2
Mn	92	195.2
Fe	19,030	400
Co	-240	137
Ni	-42	47.3
Cu	57	28.4
Zn	110	24.6
As	19	16.0
Se	-4.6	8.89
Sr	133.8	7.22
Zr	338.9	6.95
Mo	6.3	3.09
Hg	-45	20.4
Pb	-2.8	10.60
Rb	103	10.7
Cd	-85	24.8
Sn	-74	13.7
Sb	13.6	8.92
Ba	394.3	7.21
Ag	60	16.9
U	17.3	8.39
Th	26.9	5.50

L. Dwight Bazzell 6-5-96

Date	Sample Number	Element	PPM	Std Dev
6-5-96	96-1167	CrHi	-280	177
		K	14,430	242
		Ca	4,133	98.8
		Ti	1,722	74.8
		CrLo	-48	48.2
		Mn	230	198
		Fe	16,660	375
		Co	8.7	136.07
		Ni	-82	45.2
		Cu	-7.7	24.62
		Zn	88	23.6
		As	45	16.9
		Se	9.1	9.48
		Sr	125.8	6.97
		Zr	357.5	7.05
		Mo	2.4	3.01
		Hg	-39	20.4
		Pb	-1.7	10.68
		Rb	102	10.4
		Cd	-25	21.1
		Sn	-54	13.9
		Sb	6.7	8.98
		Ba	419.2	7.37
		Ag	77	17.1
		U	15.2	8.33
		Th	32.6	5.70

L. Dwight Barrell 6-5-96

Date	Sample Number	Element	PPM	Std. Dev
6-5-96	96-1168	CrHi	-470	167
		K	14,360	245
		Ca	8,800	132
		Ti	1,358	70.0
		CrLo	-1.7	48.46
		Mn	47	188.8
		Fe	17,610	386
		Co	-150	136
		Ni	-69	45.9
		Cu	22	26.7
		Zn	238	29.3
		As	2.0	21.8
		Se	12.9	9.85
		Sr	124.6	7.00
		Zr	277.0	6.37
		Mo	1.6	2.92
		Hg	-39	21.1
		Pb	11.5	15.6
		Rb	95	10.5
		Cd	-44	25.0
		Sn	-30	14.0
		Sb	15.5	9.04
		Ba	386.3	7.14
		Ag	45	16.8
		U	19.5	8.32
		Th	36.0	5.84

L. Dwight Bazzell 6-5-96

Date	Sample Number	Element	PPM	Std Dev
6-5-96	96-1169	CrHi	-400	171
		K	16,000	256
		Ca	8,590	132
		Ti	1,415	68.3
		CrLo	150	49.3
		Mn	-30	184.5
		Fe	17,880	390
		Co	-350	132
		Ni	-42	46.4
		Cu	-0.5	25.25
		Zn	130	25.3
		As	39	16.7
		Se	12.8	9.70
		Sr	140.4	2.37
		Zr	220.0	5.77
		Mo	3.6	2.79
		Hg	-23	21.7
		Pb	-9.1	10.95
		Rb	82	10.2
		Cd	-56	24.2
		Sn	-49	13.5
		Sb	10.5	8.68
		Ba	314.7	6.49
		Ag	53	16.4
		U	21.8	8.03
		Th	36.8	5.45

L. Dwight Bassett 6-5-96

Date	Sample Number	Element	PPM	Std Dev
6-5-96	96-1170	CrH	-350	176
		K	16,270	257
		Ca	7,790	127
		Ti	1,797	25.9
		CrL	105	49.9
		Mn	500	2.13
		Co	-270	137
		Ni	-34	47.9
		Cu	39	27.7
		Zn	93	24.0
		As	40	17.1
		Se	-0.3	9.17
		Sr	135.4	7.30
		Zr	351.7	7.09
		Mo	4.3	3.09
		Ag	-40	20.8
		Pb	4.5	10.70
		Rb	114	10.7
		Cd	-21	25.5
		Sn	-71	14.0
		Sb	23.5	9.31
		Ba	400.4	7.30
		Ag	70	17.3
		U	7.5	8.29
		Th	19.9	5.39
		Fe	18730	400

L. Kaveigh Bazzell 6-5-96

Te	Sample Number	Element	PPM	Std Dev
5-96	96-1171	CrHi	-240	181
		K	18,600	273
		Ca	7,250	125
		Ti	1,263	68.3
		CrLo	160	50.3
		Mn	250	200
		Fe	17,510	388
		Co	34	140.8
		Ni	-135	43.1
		Cu	4.3	25.35
		Zn	161	26.4
		As	7.6	16.60
		Se	6.5	9.39
		Sr	143.1	7.45
		Zr	252.9	6.13
		Mo	-1.9	2.81
		Ag	-35	21.1
		Pb	14	11.5
		Rb	76	10.2
		Cd	-10	24.9
		Sn	-53	13.7
		Sb	21.2	9.07
		Ba	371.8	2.02
		Ag	53	16.7
		U	31.4	8.20
		Th	28.3	5.41

All XRF Data was down loaded to an IBM Disk labeled TA-16 90's Line XRF Data 1996. The file name is 16-0430.96

L Dwight Barrell 6-5-96

Date	Sample Number
6-5-96	96-1148

Element	PPM	Std Dev
CrHi	-85	196.5
K	25,000	313
Ca	8,970	141
Ti	2,767	90.3
CrLo	-89	54.3
Mn	460	219
Fe	17,270	392
Co	-350	133
Ni	14	50.8
Cu	30	27.8
Zn	81	23.7
As	28	18.6
Se	19	10.2
Sr	209.0	8.95
Zr	387.4	7.60
Mo	3.1	3.25
Hg	-30	21.9
Pb	33	12.8
Rb	109	11.3
Cd	2.4	27.56
Sn	-73	14.9
Sb	15.0	9.92
Ba	597.6	8.95
Ag	20	18.0
U	26.3	8.78
Th	24.9	5.72

L. Dwight Burrell 6-5-96

Date	Sample Number
6-5-96	96-1149

Element	PPM	Std Dev
Cl	-430	175
K	23,600	304
Ca	7,810	133
Ti	2,403	87.1
Cr	-52	54.2
Mn	54	192.5
Fe	18,040	39.8
Co	2.7	143.55
Ni	-26	50.1
Cu	15	26.8
Zn	84	23.9
As	16	12.5
Se	12.7	9.90
Sr	176.2	8.27
Zr	346.7	7.18
Mo	0.5	3.22
Hg	-36	21.4
Pb	15	12.2
Rb	101	11.3
Cd	-24	26.6
Sn	-37	14.9
Sb	-4.7	9.36
Ba	550.1	8.56
Ag	75	18.0
U	35.6	8.88
Th	32.5	5.73

L. Dwight Bazzell 6-5-96

Appendix C

Data
(on CD included with this report)

TO VIEW THE DATABASE THAT ACCOMPANIES THIS DOCUMENT PLEASE CALL THE HAZARDOUS WASTE BUREAU AT 505-476-6000 TO MAKE AN APPOINMENT

Appendix D

Management Plan for Investigation-Derived Waste

D-1.0 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

This appendix describes how investigation-derived waste (IDW) generated during the investigation into the Technical Area 16 (TA-16) ponds at Los Alamos National Laboratory (LANL or the Laboratory) will be managed. IDW is waste generated by field-investigation activities and may include, but is not limited to, drill cuttings; purge water; contaminated personal protective equipment (PPE), sampling supplies, and plastic; fluids from the decontamination of PPE and sampling equipment; and all other wastes that may potentially come in contact with contaminants from the site investigation.

All IDW generated during the TA-16 ponds site-investigation activities will be managed in accordance with applicable Environmental Stewardship–Remediation Services (ENV-RS) standard operating procedures (SOPs). These SOPs incorporate the requirements of all applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (NMED) waste-management regulations, U.S. Department of Energy (DOE) orders, and Laboratory implementation requirements.

The following ENV-RS SOPs apply to the characterization and management of IDW:

- SOP-01.06, Management of Environmental Restoration Project Waste
- SOP-01.08, Field Decontamination of Drilling and Sampling Equipment
- SOP-01.10, Waste Characterization
- SOP-01.12, Field Site Closeout Checklist

The above procedures are some of the SOPs that apply to the investigation at the TA-16 ponds and are available at the following URL: http://erproject.lanl.gov/documents/procedures.html.

Field-investigation activities may also displace environmental media, which are defined as naturally occurring materials indigenous to the environment and which include groundwater, surface water, surface and subsurface soils, rocks, bedrock, and gravel. In most cases, environmental media are not subject to Resource Conservation and Recovery Act (RCRA) regulation because they do not meet the definition of solid waste (i.e., they are not discarded, abandoned, recycled, or inherently waste-like). Consistent with EPA area of contamination (AOC) policy, environmental media are not considered to be waste—and, therefore, not IDW—if they are returned to their point of origin (EPA, 1996, 82288). EPA AOC guidance indicates that placement of hazardous waste from an AOC into a drum, followed by replacement in the AOC, does not constitute “land disposal” for RCRA purposes (Wehling, 1991, 87382). Therefore, nonhazardous media that meet the conditions described in SOP-1.06 will be returned to their points of origin. A request for approval of an AOC designation will be submitted to NMED before implementation of the work plan.

IDW generated during the investigation of the TA-16 ponds will be managed in a manner that protects human health and the environment, complies with applicable regulatory requirements, and adheres to the Laboratory’s waste-minimization goals. Investigation activities will be conducted in a manner that minimizes the generation of waste. Waste minimization is accomplished by implementing the requirements of the ENV-RS portion of the “2003 Pollution Prevention Roadmap” (Los Alamos National Laboratory, 2003, 85205, or the most recent version), which is updated annually as a requirement of Module VIII of the Laboratory’s Hazardous Waste Facility Permit, ID# NM0890010515-1 issued by the EPA on May 23, 1990, and modified May 19, 1994 (EPA, 1990, 01585; EPA, 1994, 44146).

All IDW will be managed in accordance with applicable federal, state, DOE, and Laboratory requirements. Waste streams, expected waste type, estimated volumes, characterization method, and on-site management are listed in Table D-1.

Table D-1
Summary of Anticipated Waste Generation and Management for the TA-16 Ponds Investigation

Waste Stream	Expected Waste Type	Estimated Volume	Characterization Method	On-Site Management and Final Disposition
Decontamination water	Liquid, nonhazardous, nonradioactive	< 300 gal. (<6 gal. per day)	Disposal per SOP-01.06	On-site infiltration of < 6 gal. per day
Spent acetone	Liquid hazardous F003, D001	< 4 L	Acceptable knowledge	Containment in polyethylene bottles stored in a sealed secondary container at a registered satellite accumulation area (SAA) on-site Disposal off-site at an appropriate permitted treatment storage and disposal facility (TSDF)
Plastics, PPE, and sample equipment waste	Solid nonhazardous, nonradioactive	< 110 gal.	Acceptable knowledge	Accumulation in 55-gal. drums with drum liners Disposal off-site at an industrial waste landfill
Borehole drill cuttings*	Solid nonhazardous, nonradioactive	< 20 yd^3	Analytical results from site-characterization samples	Accumulation in 55-gal steel drums, covered roll-off containers, or cubic-yd soft-sided, strong, tight containers with liners If waste is confirmed to be nonhazardous, off-site disposal at an industrial waste landfill; otherwise, disposal at an appropriate permitted TSDF
Empty sodium azide containers	Solid nonhazardous, nonradioactive	< 25 gal.	Acceptable knowledge	Accumulation in 55-gal. drums with drum liners Disposal off-site at an industrial waste landfill
Residual sodium azide buffer solution	Liquid hazardous (P105)	< 1 L	Acceptable knowledge	Containment in polyethylene bottles stored in a sealed secondary container at a registered SAA on-site Disposal off-site at an appropriate permitted TSDF

* Estimated total volume of drill cuttings anticipated to be generated when, based on field-screening results, this environmental medium would not be returned to its point of origin.

The waste streams described below will be generated and managed during the field investigation at the TA-16 ponds.

Decontamination water—To the extent possible, sampling equipment will be decontaminated using the dry techniques described in SOP-01.08, Field Decontamination of Drilling and Sampling Equipment. If the dry techniques are not applicable or prove to be ineffective, decontamination water/liquids will be used to

achieve complete decontamination. The decontamination water will be discharged on-site, provided that the requirements of SOP-01.06, Management of Environmental Restoration Project Waste, are met.

Spent acetone—Soil screening will include an extraction step using acetone as a solvent. Acetone, as a spent solvent, is a listed hazardous waste (EPA Hazardous Waste Number F003) based on ignitability. This waste stream will be stored in sealed secondary containers at a registered SAA on-site until a waste profile form and a consolidated remote waste storage site disposal request are approved.

Plastics, PPE, and sampling equipment waste (including spent immunoassay [D TECH and Ensys] test kits)—This waste stream will include various types of plastic sheeting (e.g., tarps and contamination control covers); disposable gloves and coveralls; and sampling supplies, such as plastic scoops, plastic bags, jars, containers and materials from used test kits, and dry decontamination waste such as paper towels. These materials have the potential to become contaminated through direct contact with contaminated environmental media. Incidental contact between these materials and the environmental media is not expected to result in residual contamination at levels constituting hazardous waste. Because this waste is generated only during fieldwork activities, it is assumed that the waste contaminants will be identical to the contaminants found in the sediment, soil, and tuff at the site. Therefore, characterization of this waste will be based on analytical results from the waste-characterization and confirmation samples collected from the sediment, soil, and tuff. The waste will be placed in two 55-gal. drums with polyethylene liners and stored in a secure storage area pending the results of analyses. The analytical results from characterizing the associated environmental media will be used to confirm that the waste stream is nonhazardous, nonradioactive solid waste. The immunoassay test kits have reagent bottles and ampules containing acetic acid; typically this is entirely used up during the screening process.

Borehole drill cuttings—This waste stream will be composed of sediment, soil, and tuff that has been removed as drill cuttings during borehole drilling activities and that cannot be returned to their points of origin at the investigation site. The characterization of this waste stream will be based primarily on analytical data obtained from confirmation/verification sampling associated with the 90s Line/30s Line ponds investigation. Depending upon the overall volume, drill cuttings will be containerized in 55-gal. Department of Transportation–approved steel drums, covered roll-off containers, or cubic-yd soft-sided, strong, tight containers with liners, and stored in a controlled/secure area pending the results of confirmation analyses. This waste stream will be managed as nonhazardous, nonradioactive solid waste pending analysis.

Empty sodium azide containers—The D TECH test kits include buffer solution bottles containing sodium azide; however, these components are typically used up completely during the screening process and will likely only exist as residual material inside the bottles. The empty containers from the transfer of the sodium azide buffer solution are considered to be nonhazardous solid waste because they contained a product used for its intended purpose per the field analytical method. The waste will be placed in one 55-gal. drum with a polyethylene liner and stored in a secure storage area. The activities associated with this project are anticipated to generate less than 25 gal. of empty sodium azide containers.

Residual sodium azide buffer solution—Approximately 1 mL of residual sodium azide buffer solution is left over per sample analysis and will be transferred into a 1-L polyethylene bottle. The residual sodium azide buffer solution is listed as acutely hazardous waste code P105 and will be segregated and stored in a sealed container within a registered SAA in a secure area adjacent to the project support trailers on-site, pending transportation to a hazardous waste disposal facility.

A waste characterization strategy form (WCSF) has been prepared (per SOP-01.10, R1) for this investigation. The WCSF provides detailed information about IDW characterization and management.

D-2.0 REFERENCES

EPA (U.S. Environmental Protection Agency), April 1990, U.S. Environmental Protection Agency Region 6 hazardous waste permit (Hazardous and Solid Waste Amendments), 65 p. (EPA 1990, 01585)

EPA (U.S. Environmental Protection Agency), April 1994, Module VIII, special conditions pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for Los Alamos National Laboratory: Dallas, Tex., EPA ID NM0890010515 38817, module of EPA Hazardous Waste Facility Permit issued to Los Alamos National Laboratory, 70 p. (EPA 1994, 44146)

EPA (U.S. Environmental Protection Agency), March 1996, Use of the area of contamination (AOC) concept during RCRA cleanups: U.S. Environmental Protection Agency memorandum from M. Shapiro and S. Luftig, RCRA Chiefs, 16 p. (EPA, 1996, 82288)

LANL (Los Alamos National Laboratory), December 2003, 2003 pollution prevention roadmap: Los Alamos National Laboratory document LA-UR-03-9021, 97 p. (LANL, 2003, 85205)

Wehling, C., April 16, 1991, LDR applicability for investigation derived waste: Washington, D.C, U.S. Environmental Protection Agency memorandum to S. Golian, Chief, Remedial Guidance Section, from C. Wehling, Solid Waste and Emergency Response Division, 2 p. (Wehling 1991, 87382)