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Justification for Class III Permit Modification April 2001 SWMU 111 Operable Unit 1306 Building 6715 Sump/Drains

Sandia National Laboratories/NM

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NFA Originally Submitted June 1996
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Environmental Restoration Project

United States Department of Energy
Albuquerque Operations Office

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Solid Waste Management Unit 111 Operable Unit 1306

(RCRA Permit No. NM5890110518)

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1.0 INTRODUCTION

1.1 Site Background

The Sandia National Laboratories/New Mexico (SNL/NM) Environmental Restoration (ER) Project is chartered with the assessment and cleanup of inactive waste sites at its facilities. This document presents the results of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) of the SNL/NM sites within Technical Areas III and V (TA-III/V). The sites were identified during a preliminary assessment/site investigation (PA/SI) (DOE 1987) as potential areas of concern or as solid waste management units (SWMUs) as a result of past practices in TA-III/V. Detailed descriptions of these sites are found in the TA-III/V RFI Work Plan (SNL/NM 1993a, 1993b). The purpose of the RFI was to determine the presence or absence of contamination at each of the TA-III/V ER sites.

Sandia Corporation, a subsidiary of Lockheed Martin Corporation, operates SNL/NM as a prime contractor to the U.S. Department of Energy (DOE), which owns SNL/NM. SNL/NM conducts research, development, design, and testing of nuclear and conventional weapons, energy systems, and other programs. Figure 1-1 identifies SNL/NM and its technical areas in relation to Kirtland Air Force Base (KAFB) and the city of Albuquerque, and several surrounding physical features. TA-III/V were established in 1953 for testing weapons components in a variety of natural and simulated environments. TA-III/V are located approximately 6 kilometers (km) south of the main laboratories and offices known as Technical Area I (TA-I) (Figure 1-1).

1.2 RFI Work Plan Overview and Objectives

This RFI has been conducted in accordance with the U.S. Environmental Protection Agency (EPA)-approved TA-III/V RFI Work Plan (SNL/NM 1993a) and its amendment (SNL/NM 1993b). A total of 19 sites in TA-III/V were originally identified as requiring investigation. Varying levels of investigation were conducted at all sites originally identified in the RFI Work Plan. Table 1-1 provides a summary of the sites, their status, and the field investigations conducted at each site and Figure 1-2 shows the location of each site.

Sites were classified as active and inactive, based on use at the time of this RFI. Both active and inactive sites were investigated but full investigation and remediation of active sites was postponed until facility decommissioning. Two sites that were originally grouped together in the Work Plan were subdivided based on physical separation and difference in historical activities: Site 18 was divided into Site 18 (Concrete Pad) and Site 241 (Storage Yard); Site 83 was divided into Site 83 (Long Sled Track) and Site 240 (Short Sled Track).

The objectives of the RFI were to identify the nature and extent of contamination at sites within TA-III/V, evaluate potential risks posed by the contamination, and provide guidance for selecting remedial alternatives. The objective of this RFI report is to document and transmit this information to all stakeholders, including SNL/NM, the DOE, the EPA, the New Mexico Environment Department (NMED), and the general public.

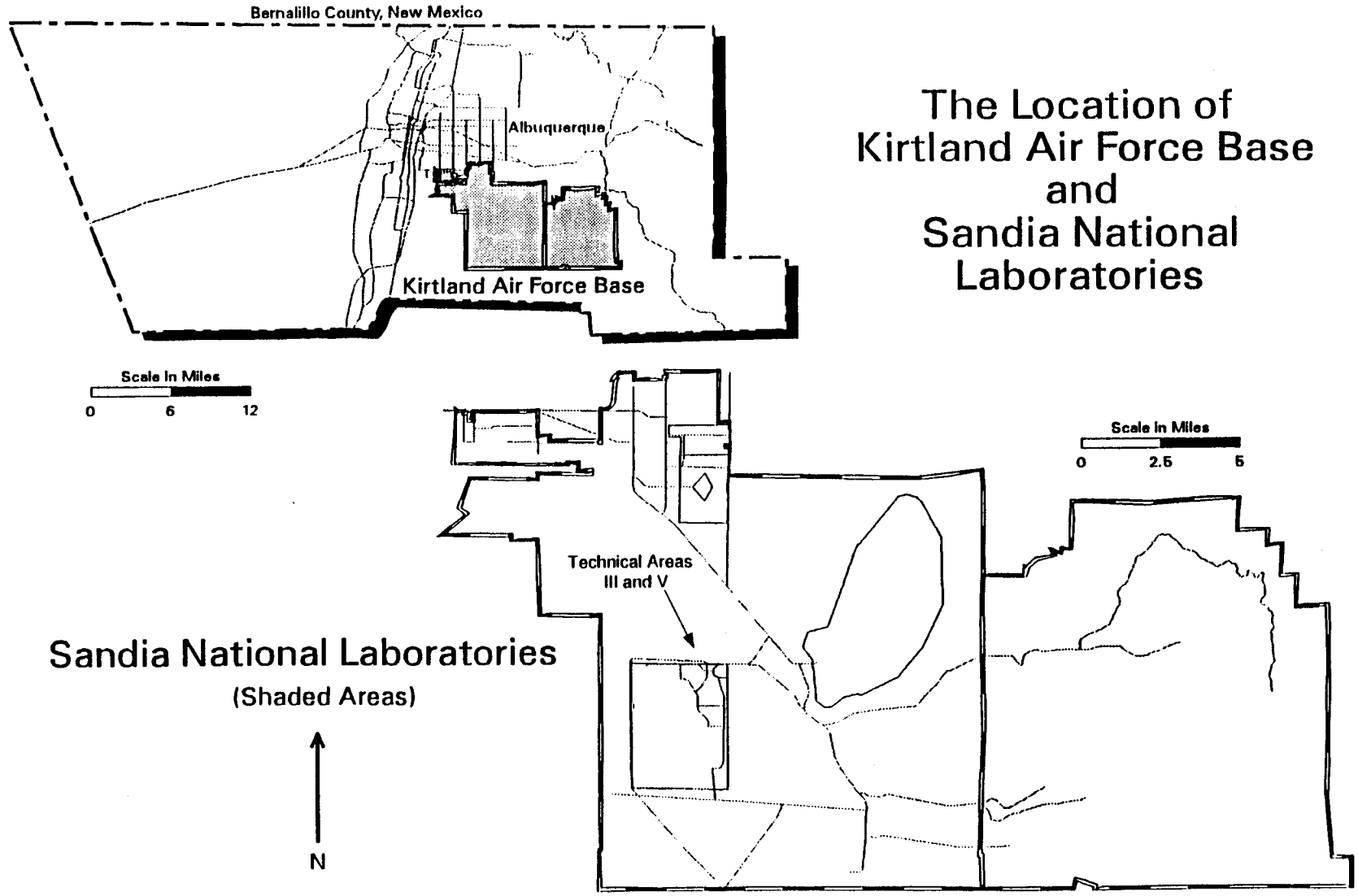


Figure 1-1 Location of Technical Areas III and V at Sandia National Laboratories, Albuquerque

Table 1-1
Summary of Environmental Restoration Sites Within Technical Areas III and V

Site Number	Site Name	Location	Areal Extent	Potential Contaminants[a]/ Detected During RFI?	Period of Operation (Status)	Sampling Method and Date	Total Samples	Field Screen Samples	Off-Site Analyses	Notes[b]
18	Concrete Pad	Central TA-III; South of Short Sled Track.	125 ft by 400 ft	Metals/Yes Radionuclides/Yes HEs/No Oil/Yes PCBs/Yes	1979 - present (Active).	Phase I: Surface, 04/27/94.	43	43	12	Rad. VCM completed. Extent of contamination defined for metals, PCBs, and TPH.
						Phase II: Auger, 01/24/95.	13	13	9	VCM planned.
26	Burial Site	West TA-III; West of Long Sled Track.	145 acres	Metals/NA[c] Radionuclides/Yes	Prior to 1989 (Inactive). Co-located with active Long Sled Track.	NA	NA	NA	NA	Geophysics done; found potential burials. These to be investigated with Site 83. Proposed for NFA.
31	Transformer Oil Spill	Central TA-III; Centrifuge Facility.	20 ft by 20 ft	Oil/No PCBs/No	1971 - present (Active).	Surface, 03/29/94.	11	3	11	No COCs above background. Proposed for NFA.
34	Centrifuge Oil Spill	Central TA-III; Centrifuge Facility.	90-ft diameter	Oil/No	1955 - present (Active).	Shallow subsurface, 05/20/95.	18	18	10	No COCs above background. Proposed for NFA.
35	Vibration Facility Oil Spill	Central TA-III.	20 ft by 50 ft	Oil/Yes PCBs/No	1955 - present (Active).	Phase I: Surface, 04/15/94.	4	0	4	Extent of oil defined. Proposed for NFA.
						Phase II: Shallow subsurface, 06/29/94.	13	13	4	

[a]Contaminants as follows: HEs = high explosives; PCBs = polychlorinated biphenyls; VOCs = volatile organic compounds.
[b]VCM = Voluntary Corrective Measure; TPH = Total petroleum hydrocarbons; NFA = No Further Action; COC = constituent of concern.
[c]NA = Not applicable. These sites were not sampled during the RCRA Facility Investigation (RFI); see Notes column.

Table 1-1
Summary of Environmental Restoration Sites Within Technical Areas III and V (Continued)

Site Number	Site Name	Location	Areal Extent	Potential Contaminants[a]/ Detected During RFI?	Period of Operation (Status)	Sampling Method and Date	Total Samples	Field Screen Samples	Off-Site Analyses	Notes[b]
36	HERMES Oil Spill	Central TA-V; North of Bldg 6596.	1 acre	Oil/Yes VOCs/Yes	1968 - 1989 (Inactive).	Phase I: Shallow subsurface, 07/6/94.	28	28	11	No oil detected in shallow subsurface. Defined extent of oil and VOCs.
						Phase II: Drilling, 03/10/95.	40	40	36	Proposed for NFA.
37	PROTO Oil Spill	Central TA-V; East of Bldg 6597.	1 acre	Oil/No	1978 - 1989 (Inactive).	Auger, 06/9/94.	23	23	8	No COCs above background. Proposed for NFA.
51	Bldg 6924 Pad, Tank, Pit	Southeast TA-III; Northwest of Site 241.	1/2 acre	Metals/Yes HEs/No VOCs/No	1963 - 1990 (Inactive).	Excavation, 09/6/94.	5	4	5	No COCs above background. Proposed for NFA.
78	Gas Cylinder Disposal Pit	Southeast TA-III; East of Chemical Waste Landfill.	80 ft by 180 ft	Toxic, corrosive, reactive, and flammable gases/Yes Radionuclides/Yes Metals/Yes HEs/Yes	1963 - 1984 (Inactive).	Phase I: Excavation - Radioactive.	94	386	91	Health and safety and geophysics surveys. Began VCM 07/94; finished 02/95.
						Phase I: Excavation - Chemical.	94	37	186	Detected chromium, thorium, gases, and reactive chemicals.
						Phase II: Gas analyses.	97	0	97	
						Phase II: Reactive chemicals.	32	32	0	No off-site analysis of reactive chemicals was feasible.
						Phase III: Confirmatory shallow subsurface.	20	0	20	No COCs above background during Phase III. Proposed for NFA.

[a]Contaminants as follows: HEs = high explosives; PCBs = polychlorinated biphenyls; VOCs = volatile organic compounds.
[b]VCM = Voluntary Corrective Measure; TPH = Total petroleum hydrocarbons; NFA = No Further Action; COC = constituent of concern.
[c]NA = Not applicable. These sites were not sampled during the RCRA Facility Investigation (RFI); see Notes column.

Table 1-1
Summary of Environmental Restoration Sites Within Technical Areas III and V (Continued)

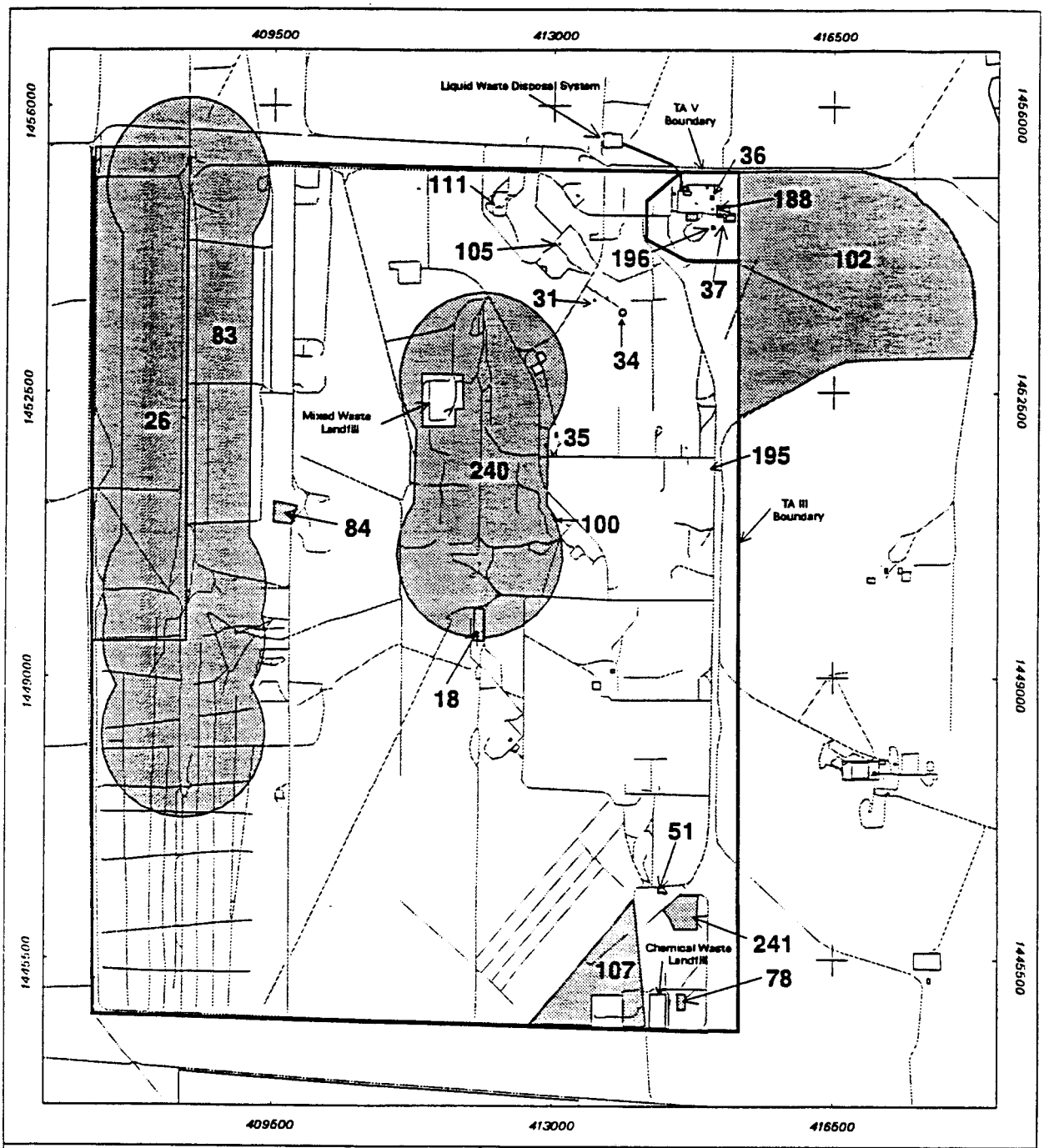
Site Number	Site Name	Location	Areal Extent	Potential Contaminants[a]/ Detected During RFI?	Period of Operation (Status)	Sampling Method and Date	Total Samples	Field Screen Samples	Off-Site Analyses	Notes[b]
83	Long Sled Track	West TA-III boundary.	350 acres	Metals/NA[c] HEs/NA Radionuclides/Yes	1966 - present (Active).	Surface, 04/15/94.	6	0	6	Minor surface sampling done. Rad. VCM completed. Full RFI when site deemed inactive.
84	Gun Facilities	West-central TA-III; East of Long Sled Track.	2 acres	Metals/NA HEs/NA Radionuclides/Yes	1965 - present (Active).	NA	NA	NA	NA	Rad. VCM completed. Full RFI when site deemed inactive.
100	Bldg 6620 Drain/Sump	Central TA-III, immediately southeast of Short Sled Track.	25 ft by 60 ft	Metals/NA HEs/NA	1958 - unknown (Inactive).	Exploratory trenching, 07/25/94.	0	0	0	Site not located during RFI. Proposed for NFA.
102	Radioactive Disposal Area	East of TA-V.	155 acres	Radionuclides/No	Unknown - 1967 (Inactive).	Excavation, 07/25/94.	3	0	3	Rad. survey done. No COCs above background. Proposed for NFA.
105	Mercury Spill at Bldg 6536	North-central TA-III.	20 ft by 20 ft	Mercury/NA	1972 - 1985 (Inactive).	Document search.	NA	NA	NA	Administrative NFA approved July 1995.
107	Explosives Test Area	Southeast TA-III; West of Chemical Waste Landfill.	25 acres	Metals/No HEs/No Nitrate and nitrite/No Radionuclides/No	1953 - 1972 (Inactive).	Surface, 05/17/94.	11	11	11	No COCs above background. Proposed for NFA. Future site of TU-CAMU.

[a]Contaminants as follows: HEs = high explosives; PCBs = polychlorinated biphenyls; VOCs = volatile organic compounds.
[b]VCM = Voluntary Corrective Measure; TPH = Total petroleum hydrocarbons; NFA = No Further Action; COC = constituent of concern.
[c]NA = Not applicable. These sites were not sampled during the RCRA Facility Investigation (RFI); see Notes column.

Table 1-1
Summary of Environmental Restoration Sites Within Technical Areas III and V (Concluded)

Site Number	Site Name	Location	Areal Extent	Potential Contaminants[a]/ Detected During RFI?	Period of Operation (Status)	Sampling Method and Date	Total Samples	Field Screen Samples	Off-Site Analyses	Notes[b]
111	Bldg 6715 Sump/Drain	North-central TA-III.	20 ft by 20 ft	Silver/No HEs/No VOCs/No	1971 - 1988 (Inactive).	Shallow subsurface, 06/17/94.	10	9	4	No COCs above background. Proposed for NFA.
188	Bldg 6597 Aboveground Spill Contain.	TA-V; co-located with Site 37.	15 ft by 25 ft	Used oil/NA[c]	1983 - 1986 (?) (Inactive).	Aerial photographs; confirmatory sampling.	37	22	22	Administrative NFA approved July 1995 - water tanks.
195	Experimental Test Pit	East-central TA-III.	6 ft by 6 ft	Cobalt-60/NA	1955 - 1956 (Inactive).	Document search.	NA	NA	NA	Administrative NFA approved July 1995.
196	TA-V Cistern	South TA-V; West of Bldg 6597.	25-ft diameter	Metals/Yes Oil/Yes VOCs/No	Unknown - 1989 (Inactive).	Phase I: Sludge sampling, 06/27/94 and 10/10/94.	4	3	1	Defined extent of metals in soil. No VOCs or PCBs. Proposed for NFA.
						Phase II: Excavation, 05/95.	2	0	2	
						Phase III: Auger, 06/5/95.	26	26	3	
240	Short Sled Track	Central TA-III.	160 acres	Metals/Yes HEs/No Radionuclides/Yes	1951 - 1966 (Inactive).	Surface, 06/13/94 and 06/22/94.	201	40	40	Rad. VCM completed. Detected rad. and lead.
241	Storage Yard	Southeast TA-III, North of Site 78.	3 acres	Metals/Yes HEs/No Radionuclides/No	1953 - 1994 (Inactive).	Surface, 05/24/94.	29	29	16	Defined extent of lead. Proposed for NFA.

[a]Contaminants as follows: HEs = high explosives; PCBs = polychlorinated biphenyls; VOCs = volatile organic compounds.
[b]VCM = Voluntary Corrective Measure; TPH = Total petroleum hydrocarbons; NFA = No Further Action; COC = constituent of concern.
[c]NA = Not applicable. Thzese sites were not sampled during the RCRA Facility Investigation (RFI); see Notes column.



Legend

- TA-III/V ER Sites
- Technical Area Boundary
- Roads

Buildings, Elevation Contours and Drainages not shown.

Sandia National Laboratories, New Mexico
Environmental Restoration Geographic Information System

Figure 1-2
ER Sites within
Technical Areas III/V

0 1000 2000
Scale in Feet

0 240 480
Scale in Meters

Unclassified

FINAL

1:24000

Transverse Mercator Projection, New Mexico State Plane Coordinate System, Central Zone
1927 North American Horizontal Datum, 1929 North American Vertical Datum

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This RFI report consists of an executive summary, an introduction, a discussion of the Sampling and Analysis Program, descriptions of investigations conducted at individual sites, Voluntary Corrective Measures (VCMs) conducted at several sites, a summary and conclusion, a list of references, and supporting documentation in several appendices.

1.3 Facility Setting

SNL/NM consists of 2,820 acres of research laboratories and office facilities entirely contained within the 52,223-acre confines of KAFB (Figure 1-1). KAFB is bounded on the north and northwest by the city of Albuquerque, on the east by the Cibola National Forest, on the south by the Isleta Indian Reservation, and on the west by land owned by the State of New Mexico, the KAFB buffer zones, and the Albuquerque International Airport. Cibola National Forest access is controlled by the U.S. Forest Service (USFS) and is restricted within the buffer zones on the southwest corner of the base and within the Isleta Indian Reservation.

KAFB is located on a high, arid mesa (mean elevation of 5,350 feet [ft]) approximately 5 miles (mi) east of the Rio Grande. The mesa is cut by Tijeras Arroyo, which runs east-west and ultimately drains into the Rio Grande. The east side of KAFB is bounded by the southern end of the Sandia Mountains and the Manzanita Mountains. Most of the area is relatively flat, although the eastern portions of KAFB and SNL/NM extend into the Manzanita Mountains where some of the terrain is precipitous, rough, and cut by numerous arroyos (ERDA 1977).

1.4 Climate

The climate for SNL/NM is typical of high altitude, dry continental climates with a normal daily winter temperature range of 23 degrees Fahrenheit (°F) to 52°F and a normal daily summer temperature range of 57°F to 91°F (Bonzon et al. 1974). The average annual precipitation for the Albuquerque area is 8.54 inches (in.), and most rain occurs in the summer months (Williams 1986). Wind speeds seldom exceed 32 miles per hour (mph) but strong east winds, often accompanied by blowing dust, can occur (Bonzon et al. 1974).

1.5 Geology

The Albuquerque-Belen structural basin is one of the largest north- to south-trending basins in the Rio Grande Rift. The basin is a compound graben measuring 90 mi long and 30 mi wide, bordered by uplifted fault blocks to the east and west (Bjorklund and Maxwell 1961). The eastern boundary is marked by the Sandia, Manzanita, and Manzano mountains. The western side of the basin is bounded by the Lucero uplift, with the Ladron Mountains to the south and minor physiographic relief on the northwest side of the basin.

During the Miocene and Pliocene epochs, erosion from the surrounding highlands filled the Albuquerque Basin with up to 10,000 ft of sediments. This sequence of sediments is called the Santa Fe Group and consists of debris flows and channel, floodplain, and aeolian deposits; the Santa Fe Group thins toward the edges of the basin and is truncated by the bounding uplifts. The Santa Fe Group sediments are

interbedded with Tertiary and Quaternary basalts and pyroclastics, and are overlain in places by the Pliocene-age Ortiz gravel deposits and Rio Grande fluvial deposits (Bjorklund and Maxwell 1961).

1.6 Soil Characteristics

According to the Bernalillo County Soil Survey (USDA 1977), soils in TA-III/V consist of the Tijeras Series. The Tijeras Series is a deep, well-drained soil formed in decomposed granitic alluvium on old alluvial fans. The surface layer is a 4-in.-thick, brown, gravelly, sandy loam. The subsoil consists of 15 in. of brown, sandy loam, with some accumulation of calcium carbonate in the lower part. Below 19 in. is a pale brown, very gravelly, loamy sand extending to a depth of 5 ft. The gravel is angular and derived from granite (USDA 1977).

The Tijeras Series is a level to gently sloping soil (0 to 5 percent) subject to moderate runoff and water erosion. Permeability is moderate, with an available water capacity of 0.10 to 0.16 in. This soil is moderately alkaline and the effective rooting depth is 5 ft deep or more (USDA 1977).

1.7 Hydrogeology

The Rio Grande flows in a southerly direction and is the primary surface drainage feature in the Albuquerque-Belen Basin. In the basin, the ground-water system is controlled by the Rio Grande and its floodplain, tributary inflow, mountain front runoff, and recharge.

The principal aquifer in the area occurs in the unconsolidated and semiconsolidated sands, gravels, silts, and clays of the Santa Fe Group. The aquifer is generally unconfined, although semiconfined conditions may exist locally because of discontinuous, lenticular silt and clay-rich deposits.

Beneath KAFB, the regional aquifer generally flows toward the Rio Grande at an average gradient of approximately 10 ft/mi; however, local perturbations in the water table exist near municipal wells and as a result of lithologic and structural controls. Prior to extensive development of the regional aquifer by the city of Albuquerque and KAFB, the predominant ground-water flow direction in the SNL/NM KAFB area was west-southwest (Bjorklund and Maxwell 1961); however, pumping by the city of Albuquerque and KAFB has substantially affected the natural ground-water flow regime (Reeder et al. 1967; Kues 1987). The production wells have a substantial effect on the hydraulic gradient in the area, creating a depression in the potentiometric surface in the northern portion of KAFB. U.S. Geological Survey (USGS) projections indicate that, by the end of the century, the water table in the Albuquerque area will drop an estimated 30 to 50 ft from 1989 levels (Reeder et al. 1967).

Major structural controls on the local flow regime are in the form of a complex assemblage of faults along the margin of the basin. These fault systems include the Manzano, Hubbell Springs, Sandia, and Tijeras faults, all of which are expressed within a zone 1.5 mi east of TA-V. The specific impact of local faulting on ground-water flow is largely unknown; however, the Tijeras and Hubbell Springs faults may control ground-water movement. It has been postulated that travertine deposition (precipitation of calcium carbonate from solution in ground water) within fault fractures has reduced permeabilities such that the faults act as barriers to ground-water movement. Springs have been observed along the fault alignments, and there is a shallow water table east of the faults. The primary regional aquifer, the valley

fill, underlies KAFB west of the Hubbell Springs fault at a depth of 400 to 600 ft and east of the fault at a depth of 50 to 150 ft (DOE 1987).

The primary source of ground water in the TA-III/V area is the unconsolidated and semiconsolidated sedimentary deposits of the basin-fill aquifer. A relatively thick unsaturated zone of approximately 460 ft overlies the Santa Fe Group deposits. The basin-fill aquifer underlying TA-III/V is recharged primarily by inflow from the mountain areas to the east. Recharge resulting from direct infiltration of precipitation is inferred to be minor because of high surface coverage, high evaporation, low precipitation, and an extensive vadose zone.

Based on water levels measured in monitoring wells near the Liquid Waste Disposal System (LWDS) in TA-V and near the Chemical Waste Landfill (CWL) and MWL in TA-III, the depth to ground water is approximately 480 to 490 ft below ground surface (bgs) in TA-III/V. Water levels measured in all wells in TA-III indicate the general ground-water flow direction is west-northwest.

2.0 SAMPLING AND ANALYSIS PROGRAM

The sampling and analysis program for the sites in TA-III/V followed standard EPA procedures for sample collection (EPA 1987a), quality assurance/quality control (QA/QC) protocols (EPA 1987b, 1980), and statistical analysis (EPA 1992a). Each of these is discussed in the following sections.

2.1 Field Methods

Field investigations at the ER sites within TA-III/V followed phased approaches according to those proposed in the RFI Work Plan (SNL/NM 1993a, 1993b), except at six sites. Field conditions dictated that methods other than those specified in the Work Plan be used at Sites 34, 36, 78, 102, 111, and 196. Deviations from the Work Plan are noted in the individual descriptions of site activities (Sections 6.0, 8.0, 11.0, 15.0, 18.0, and 21.0).

The methods of investigation used during the TA-III/V RFI included the following:

- Aerial photograph analysis and ground-truthing;
- Nonintrusive geophysical investigations;
- Radiological surveying and scrap/debris removal;
- Surface soil sampling;
- Shallow subsurface soil sampling and deep subsurface soil sampling; and
- Trenching and excavation.

Protocols for sampling and analysis at SNL/NM followed the methodologies in the ER Project Quality Assurance Project Plan (QAPjP) and Operating Procedures (OPs) developed specifically for the ER Project. A complete list of OPs used during this project is provided in Table 2-1. Although much of the field work was done before the formal issuance of the SNL/NM ER OPs, activities were conducted in accordance with generally accepted practices and professional experience and judgment (i.e., American Society for Testing and Materials [ASTM] procedures, best engineering practices, and draft OPs), which ultimately formed the basis of the final OPs. All work was conducted following the requirements of site-specific Health and Safety Plans (HASPs), which are available for review in the Environmental Operations Records Center (EORC).

The following activities were conducted at the sites noted:

- Aerial photographic interpretation—all sites;
- Geophysical surveys—Sites 26, 78, and 84;
- Radiation surveys and associated removal of radioactive anomalies—Sites 18, 83, 84, 102, 240, and 241;

Table 2-1
Sandia National Laboratories/New Mexico Environmental Restoration Project Operating Procedures Applicable to Technical Areas III and V RFI Work

Operating Procedure (OP) Number	Title
AOP 94-40	ER Project Site Posting and Security
FOP 94-01	Safety Meetings, Inspections, and Pre-Entry Briefings
FOP 94-05	Borehole Lithologic Logging
FOP 94-22	Deep Soil Gas Sampling
FOP 94-23	Hand Auger and Thin-Wall Tube Sampler
FOP 94-25	Documentation of Field Activities
FOP 94-26	General Equipment Decontamination
FOP 94-27	Thin-Walled Tube Sampling of Soils
FOP 94-28	Health and Safety Monitoring of Organic Vapors (Flame Ionization Detector [FID] and Photoionization Detector [PID])
FOP 94-30	Health and Safety Monitoring of Combustible Gas Levels
FOP 94-34	Field Sample Management and Custody
FOP 94-38	Drilling Methods and Drill Site Management
FOP 94-39	Excavating Methods
FOP 94-40	Test Pit Logging, Mapping, and Sampling
FOP 94-52	Spade and Scoop Method for Collection of Soil Samples
FOP 94-57	Decontaminating Drilling and Other Field Equipment
FOP 94-68	Field Change Control
FOP 94-69	Personnel Decontamination (Level D, C & B Protection)
FOP 94-71	Land Surveying
FOP 94-78	Environmental Restoration Project Waste Management and Characterization Procedure
FOP 94-81	Establishment and Management of Less-Than-90-Day Accumulation Areas for Environmental Restoration Project Sites
FOP 95-23	Shallow Subsurface Drilling and Soil Sampling Using Mechanized Hydraulic Augers or the Geoprobe® Soil Core Sampler

Source: SNL/NM (1995a).

- Sampling of surface soils—Sites 18, 31, 35, 78, 107, 240, and 241;
- Subsurface sampling using augers, a hydraulic probe, or a full-size drill rig—Sites 18, 34, 35, 36, 37, 78, and 111;
- Trenching, excavation, and other cleaning—Sites 51, 78, 100, 102, 196, and 241; and
- Voluntary removal actions or cleanups (excluding the radiological removals)—Site 78.

Further investigation of Sites 26, 83, 84, and 240 (active sites) will be postponed until site decommissioning in the future. Site 26 is proposed in this RFI report (Section 4.0) to be combined with Site 83 for future investigation. No schedule for decommissioning or corrective action at these sites has been identified at this time.

Two VCMs were conducted during the course of the RFI. One was performed to survey and remove radiological constituents at the six sites listed above; details of this VCM are provided in Section 24.0. The second was performed at Site 78 to remove gas cylinders and mitigate health and safety hazards; the details of this VCM are provided in Section 11.0.

Subsurface and ground-water investigations conducted at the neighboring LWDS in TA-V are detailed in the RFI report submitted for that site in September 1995 (SNL/NM 1995b). Because no ground-water investigations were conducted during the TA-III/V RFI, the LWDS RFI report should be consulted for information on this subject. Reports on the ongoing investigation at the CWL in TA-III also should be consulted for ground-water information.

2.1.1 Aerial Photograph Analysis and Ground-Truthing

An examination of aerial photographs was conducted to locate possible additional ER sites within TA-III/V and to gather supplemental data on existing sites. Aerial photographs from 1973 to 1990 were assembled and digitized using an Arc/Info Geographic Information System (GIS) and were used to produce a set of year-specific overlays. A base photographic image was combined with the year-specific overlays to illustrate the changes in surface features over time (Plate I). All of the sites were evaluated within 1,000 ft of the site boundaries (unless noted otherwise) for signs of soil disturbance, vegetation changes, or new construction. Surface features were grouped into eight categories including cleared or disturbed surface, concrete pad, landfill, pile, possible excavation, tank/concrete target, trench, and unknown. An attempt was made to further subcategorize features, but no additional or valuable information was revealed.

After the aerial photograph interpretation was completed, ground-truthing (field verification) was performed to determine whether the interpretations were valid. Field personnel inspected the suspect areas for evidence of potential site impacts; e.g., cleared or disturbed surfaces were located to within 10 ft of the area seen on the photographs and were examined for signs of burning, scraping, or blading for road or facility construction, and were validated as such. In a few instances, revegetation and cultural activities did not permit the unequivocal verification of features identified in early photographs. Site-specific discussions of the aerial photograph interpretation are included in each site section.

2.1.2 Nonintrusive Geophysical Investigations

Nonintrusive electromagnetic (EM) conductivity (metal detection) and vertical-gradient magnetometer surveys were conducted at ER Sites 26, 78, and 84 to locate any potential subsurface objects. The sites were gridded to detect objects of a certain size and are listed below.

- Site 26, Northern Portion—Locate and map any objects equivalent to or larger than two 55-gallon (gal.) drums buried at a depth of 5 ft.
- Site 26, Southern Portion—Locate and map any objects equivalent to or larger than one 55-gal. drum buried at a depth of 5 ft.
- Site 78—Locate and map subsurface concentrations of metal, particularly cylinders with dimensions of 12 in. by 2 in.
- Site 84—Locate major fragments of depleted uranium (DU), lead, and metallic materials larger than 3 in. by 3 in. buried to a depth of 1.5 ft; and significant burials equivalent to a 5-gal. bucket buried to a depth of 3 ft.

Wooden stakes and plastic pin flags were used to delineate the traverse spacings. Electromagnetic data were gathered using a Geonics Ltd.™ EM-61 high-precision metal detector; magnetic data were gathered using a Geometrics™ G-856-AX proton precession magnetometer deployed in the vertical mode. A brief description of each follows.

The EM-61 generates EM pulses by passing a current through a 1-square-meter (m^2) coil. These pulses penetrate the subsurface and briefly induce secondary EM fields; soil has relatively low conductivity, and the secondary fields dissipate rapidly. Buried metallic objects have essentially infinite conductivity when compared to soil, and their secondary fields persist much longer. The EM-61 measures the strength of the secondary fields during the "off time" between the primary pulses. The measurement is delayed until the response from the soil has dissipated and only the response of buried metal is present. The secondary EM fields are measured by a 1-m^2 main sensor which is coincident with the transmitter coil, and by a second focusing coil positioned 40 centimeters (cm) above the main coil. Each sensor coil measures the secondary field strength during a time period between the primary pulses. Two sensor coils are used to allow differentiation between shallow objects and deeper objects. The EM-61 was deployed in the trailer mode, towed on wheels behind the operator, with data acquisition triggered by the wheel approximately every 20 cm.

The G-856-AX consists of two magnetic sensors mounted on the same vertical staff separated by a known distance. The instrument generates a pulse and registers the difference in time for the return magnetic pulse to be recorded by the top and bottom sensors. This difference is then converted to a standard reading. The G-856-AX was held vertically, and moved along the traverse manually, from grid node to grid node. Data acquisition was performed manually or programmed to be collected at regular intervals (every few seconds [sec]).

2.1.3 Surface Radiological Survey and Scrap/Debris Removal

Nonintrusive surface radiological surveys were performed at 64 sites at SNL/NM including six sites within TA-III/V, as part of a coordinated facility-wide assessment and removal VCM. Surveys were conducted in a manual sweep pattern using a line of five to six 2-in. by 2-in. sodium iodide (NaI) detectors optimized to detect DU. Gridded areas were surveyed by technicians in straight traverses, each covering a 6-ft-wide swath.

A list of radioactive anomalies (both point and area sources) at each site was compiled. After the surveys were complete, all the point sources and the majority of the area sources were removed by hand and placed in a container. Subsequent to the removal action, soil samples were collected to confirm effective cleanup. Brief discussions of results are included in the individual site sections, and a more detailed description of the radiological surveys conducted at the sites within TA-III/V that were suspected of exhibiting radioactive soil contamination is provided in Section 24.0.

2.1.4 Surface Soil Sampling

Surface soil samples were collected from a depth of 0 to 1 ft bgs using a stainless-steel trowel and bowl. All sampling equipment was cleaned between samples using dry decontamination methods (i.e., paper towels, brushing, etc.) where possible or rinsed with distilled water. Sample location coordinates are provided in Appendix A.

2.1.5 Shallow Subsurface Soil Sampling

Shallow subsurface soil sampling was accomplished using either hand or power augers or a small-diameter hydraulic probe. Discussions of these techniques follow.

Auger Sampling

Augering using a hand bucket or power auger and thin-walled stainless-steel samplers was generally performed at sites where sampling depth was a maximum of 10 ft bgs. Soil augering was performed to a predetermined depth approximately 6 in. above the level to be sampled, and the bucket auger was extracted. Loose soil was removed, and a separate sampling auger was used to collect the sample. All augering and sampling equipment was cleaned between sample locations using dry decontamination methods where possible or rinsed with distilled water.

Small-Diameter Boring

At sites where augering techniques would not attain the desired depths (generally greater than 10 ft bgs), a vehicle-mounted, hydraulically powered soil probing machine that uses static force and a percussion hammer was utilized to advance small-diameter sampling tools into the subsurface to collect soil samples to 30 ft bgs. The unit used was manufactured by Geoprobe™. The probe produced no drill cuttings and obtained samples through probe holes of 1 to 1.5 in. diameter with typical penetration rates of 1 to 2 ft per minute.

Small quantities of soil were obtained by driving the probe to a predetermined depth, disengaging an expendable drive point at the target depth and pulling back 3 to 6 in. on the probe rods, and then redriving the hollow rods. The end of the rod was filled with soil cut from the wall of the hole.

2.1.6 Deep Subsurface Sampling

Drilling was conducted at Site 36 using an air rotary casing hammer rig to drill to depths of greater than 300 ft bgs. A more detailed discussion of the drilling and sampling procedures used at the site is included with the Site 36 activity description in Section 8.0.

2.1.7 Excavation and Trenching

Excavation, trenching, and cleanouts were accomplished using a backhoe, trackhoe, clamshell, or front-end loader at several sites. Details of the excavations and cleanouts are provided in the individual site sections for Sites 51, 78, 100, 102, 196, and 241.

2.2 Field Screening and On-Site Laboratory Analysis Methods

Where feasible, field screening was conducted on approximately 100 percent of the collected soil samples from all sites investigated in TA-III/V. At least 20 percent of these were submitted for confirmatory analysis at an EPA-approved Contract Laboratory Program (CLP) laboratory (Section 2.3). The field screening data for each site are included in Appendix B. Discussions of the following field-screening methods used during the RFI are included in subsequent sections:

- Photoionization detection (PID) and flame ionization detection (FID) of volatile organic compounds (VOCs);
- Soil vapor detection of VOCs;
- Thermal desorption detection of mineral oil;
- Immunoassay detection of polychlorinated biphenyls (PCBs) and high explosives (HEs);
- X-ray fluorescence (XRF) analysis of metals;
- Direct current plasma (DCP) and inductively coupled plasma (ICP) analysis of metals; and
- Gamma spectroscopic analysis of radionuclides.

2.2.1 Photoionization Detection and Flame Ionization Detection of Volatile Organic Compounds

Screening for VOCs in the field was generally accomplished using hand-held PIDs and FIDs. The units used were manufactured by HNU and Foxboro. Soil samples were placed in a glass jar, sealed, agitated, and warmed to allow volatile constituents to develop in the headspace of the jar. The PID or FID sample probe was placed in the headspace, where a sample of vapor was drawn into a chamber, ionized, and interpreted by the instrument. The low sample rate allowed for only very localized readings. Monitoring for health and safety levels was also performed during drilling activities at 5-ft intervals downhole, as well as in the breathing zone. Where elevated organic vapor levels were encountered, monitoring was

performed continuously in the breathing zone. The instrument calibrations and readings were recorded in the field logbook.

2.2.2 Soil Vapor Analysis

Soil samples were collected for on-site analysis of soil vapor for the presence of VOCs during drilling activities at Site 36 and were immediately transported to the TA-III ER Field Laboratory for analysis. Soil vapors were collected by polyethylene tubing connected to a glass bulb using a pump under vacuum.

Soil vapor analyses were conducted by purging a 500-milliliter (mL) gas bulb for 20 minutes (min) with helium onto a trap and desorbing the trap onto a gas chromatograph equipped with a mass selective detector (MSD). Purging the entire contents of the sample bulb allowed attainment of lower detection levels for the sensitive soil vapor analysis. All analyses were performed on an HP 5972 MSD with an HP 5890 Series II plus gas chromatograph. EPA Methods 8240/8260 (EPA 1986) procedures were used for calibration and quantitation. The target analyte list (TAL) for EPA Method 8240 was used. For heavily contaminated soils, a smaller aliquot of gas was subsampled from the 500-mL bulb.

2.2.3 Thermal Desorption/Gas Chromatography

SNL/NM ER personnel conducted an investigation of available technologies to locate an alternative heavy-end total petroleum hydrocarbon (TPH) field-screening technique that was more reliable than the Hanby Method. Neither the Hanby Method nor field screening using immunoassay kits was effective because neither is sensitive to the nonaromatic High Energy Radiation Megavolt Electron Source (HERMES) transformer oil (discussed below). As a response to these ineffective screening methods, SNL/NM developed a technique that employs thermal desorption/gas chromatography (TD/GC) to rapidly quantify non-PCB-containing transformer oil in soil.

The transformer oil used at the HERMES-II facility is primarily a mixture of aliphatic and alicyclic hydrocarbons, and contains no significant quantities of EPA-regulated hazardous constituents as manufactured (e.g., PCBs or VOCs). Indeed, any appreciable amount of VOCs in the dielectric oil would have significantly altered the insulating properties of the oil. The boiling point for the mineral oil ranges from approximately 120 degrees Celsius (°C) to 365°C; its relatively low volatility makes it undetectable by real-time field monitoring instruments such as PIDs and FIDs, which rely on volatilization of contaminants at ambient conditions.

TD/GC has been used to characterize fuel-contaminated soils (i.e., those containing volatile and/or semivolatile constituents) and soils containing PCBs (Goldsmith 1994). The technique utilizes the direct injection of organic contaminants from soil onto a GC column, avoiding the use of environmentally harmful solvents. The method detection limit (MDL) is 10 milligrams per kilogram (mg/kg). The low MDL is a result of direct sample analysis without the potential dilution problems associated with sample preparation. Method sensitivity is also enhanced by analysis of the soil sample within hours of field collection, which minimizes potential storage loss and cross-contamination.

TD/GC analyses for mineral oil were performed using an SRI Model 8610 GC equipped with a TD oven and a manual sampling valve. The system was equipped with an FID that was used for the detection and quantitation of the oil after it had passed through the TD/GC sequence. An aliquot of soil

(approximately 1.0 gram [g]) was placed in the desorption chamber for 1 min at 325°C to vaporize organic constituents. The vapors were then swept onto the GC column for separation. A relatively nonpolar megabore capillary column (J&W Scientific, DB-5, 8 ft by 0.53 millimeter [mm]) was used for constituent separation and quantitation. A five-point calibration curve was generated by spiking clean sand with a mixture of HERMES oil in toluene (10 to 500 mg/kg). The curve was linear with a correlation coefficient of $r^2 = 0.998$. TPH in soil was quantified by "pattern recognition" using the total area under the distinctive mineral oil chromatogram. An external standard (dodecane) was added to determine sample matrix interference and injection efficacy. QA samples included replicate analyses for every 10 samples and a mid-range calibration check standard prior to daily sample analyses, after every 20 samples, or at the end of a 12-hour (hr) period.

2.2.4 Immunoassay Tests for Polychlorinated Biphenyls and High Explosives

Immunoassay tests for chemical constituents are based on the antibody response of mammalian immune systems to the introduction of chemical contaminants. To produce the desired antibodies in the kit, predetermined concentrations of specific chemicals are introduced into a test animal, causing the animal's immune system to produce antibodies to that chemical. Antibodies are extracted, separated, purified, and encapsulated for test kits. The antibodies in the test kits respond to varying concentrations of chemical compounds by giving varying responses. The test kits for PCBs and HEs, both manufactured by EnSys Inc., are discussed below.

PCBs

The protocol for PCB test kits conforms to SW-4020, immunoassay-based field screening for PCBs in soil. Detection limits range from 400 microgram per kilogram (µg/kg) for Aroclors 1254 and 1260 (prevalent Aroclors in dielectric fluids at SNL/NM) to 1, 2, 4, and 4 mg/kg for Aroclors 1248, 1242, 1016, and 1232, respectively. The test is specific to PCBs and has no anticipated interferences. The field test is positively biased for PCBs. Rigorous testing against lab-GC SW-8080 (prior to commercial availability of the test kit) resulted in false negatives in less than 1 percent of field tests performed. When testing samples, the method requires standard replicate analysis with each environmental sample analyzed; the relative standard deviation must be within ±20 percent, or the sample analysis will be repeated.

HEs

The field test kit for HE conforms to proposed SW-8515 for field screening for trinitrotoluene (TNT) in soil and can detect TNT, dinitrotoluene (DNT) isomers, and trinitrobenzene at concentrations of approximately 1 mg/kg in soil as measured by colorimetric reaction. The test is positively biased for HEs. Prior to commercialization of the test kit, false negatives were identified by SW-8515 in less than one percent of the field samples.

2.2.5 X-Ray Fluorescence

XRF was conducted using a Spectrace® 6000 Spectrometer. XRF is a whole-rock quantitation method for analyzing concentrations of elemental metals in environmental samples. Characteristic X-ray spectra are emitted when a specimen is irradiated with a beam of sufficiently short wavelength X-radiation. Standard reference materials of the National Institute of Standards and Testing (NIST) are used to verify the accuracy of the calibration. XRF can analyze metals with detection limits of 10 to 60 mg/kg. XRF is

a nondestructive method for analyzing environmental samples and generates no waste; samples are dried and ground prior to analysis. XRF was used during sampling activities as a field-screening tool for metals to direct the sampling for off-site laboratory analyses.

2.2.6 Direct Current Plasma/Inductively-Coupled Plasma

DCP and ICP elemental analyses for metals concentrations were conducted in accordance with SW-6010A using a Leeman PS 1000 sequential ICP. Soil samples were prepared by microwave-assisted acid digestion (EPA Methods 3051 and 6010 QA requirements). An aerosolized sample is introduced into a plasma of argon gas, producing characteristic spectra.

2.2.7 Mercury Analysis

Soil samples were analyzed for mercury content following EPA SW-7471A, "Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique)" (EPA 1994). The instruments used were a Leeman AP200 Automated Mercury Preparation System and a Leeman PS200 Automated Mercury Analyzer. A 0.1-g aliquot of soil was used for sample preparation and analysis. The practical limit of quantitation (PLQ) was 0.3 µg/kg.

2.2.8 Gamma Spectroscopy

All soil samples collected from areas suspected to be impacted by radioactive compounds were screened for radiological constituents using gamma spectroscopy. In some instances, these screens were mandatory to allow samples to be shipped to an off-site laboratory for chemical analysis. In other cases, the only analysis of the samples was the gamma spectroscopy.

Soil samples were collected in 500-mL Marinelli beakers, sealed, swiped, and counted in the field for loose, surface, radioactive contamination. Upon completion of the field check, the samples were transported to the SNL/NM 7715 laboratory for fixed gamma spectroscopic analysis.

The equipment used by the SNL/NM 7715 laboratory consists of a Canberra high purity germanium (HPGE) detector shielded by 4 in. of lead lined with cadmium and copper sheets. Twelve samples in Marinelli beakers can be run unattended using an autosampler. A typical sample is counted for 600 sec. Peaks generated during the gamma spectroscopy are matched against a user-defined library to identify individual radionuclides. Laboratory control sample (LCS) analyses are performed for americium-241, cesium-137, and cobalt-60 with identical analytical methods to monitor routine sample analysis data usability.

2.3 Off-Site Laboratory Chemical Analyses

Off-site laboratory analyses for constituents of concern (COCs) from each site were conducted in accordance with the EPA-approved protocols listed in SW-846 (EPA 1986). The COCs, field-screening techniques, laboratory analysis methods, and the corresponding method numbers are listed in Table 2-2. The data are provided in electronic format in Appendix C.

Table 2-2
Field Screening and Laboratory Analyses for Constituents of Concern[a]

Constituent of Concern	Field-Screening Techniques	On-Site Laboratory Analysis Methods	Off-Site Laboratory Analysis Methods	EPA Method Number
Metals	NA[a]	X-ray Fluorescence/ Directly Coupled Plasma	Inductively Coupled Plasma/Atomic Absorption	6010/7000
Volatile Organic Compounds (VOCs)	Photoionization Detector/ Flame Ionization Detector	Gas Chromatography/ Mass Spectrometry	Gas Chromatography/ Mass Spectrometry/ Toxicity Characteristic Leaching Procedure	8240 1311
Total Petroleum Hydrocarbons (TPH)	NA	Thermal Desorption/Gas Chromatography	Infrared	418.1
High Explosives (HEs)	Colorimetry	High-Performance Liquid Chromatography	High-Performance Liquid Chromatography	8330
Polychlorinated Biphenyls (PCBs)	Immunoassay	NA	Gas Chromatography	8080
Nitrates/Nitrites	NA	Colorimetry	Colorimetry	353.2
Radionuclides	G-M Pancake Probe/Sodium Iodide (NaI) Scintillometer	Gamma Spectroscopy	Gamma Spectroscopy/ Isotopic Analyses	6010

Source: EPA 1986.

[a]NA = Not applicable.

2.4 Summary of Quality Assurance/Quality Control Activities

As part of the sampling activities conducted in support of the RFI, a plan for QA/QC was developed to ensure that sampling procedures and laboratory analyses were performed to a rigid standard. The following QA/QC soil and water samples were collected to assure sampling procedure integrity and laboratory quality:

- Field Blank—Water poured directly from a freshly opened bottle of distilled water into laboratory-prepared sample bottles to determine whether any field conditions affected sample collection.

- Trip Blank—Laboratory-prepared water sample for analysis of VOCs to determine whether any VOCs were inadvertently introduced during sampling or shipment.

- Equipment Blank—Water sample prepared in the field after decontaminating equipment to determine whether any contaminants were introduced from improperly cleaned equipment.

- Duplicate—Soil sample split from an original field sample to determine reproducibility of laboratory analytical results.

- Matrix Spike/Matrix Spike Duplicate—Soil sample split from an original field sample to determine effects of matrix (e.g., soil) on laboratory results (i.e., whether any interference occurred); sample is spiked with a known concentration of a reference chemical, then analyzed to ascertain recovery of that chemical.

Results of the QA/QC program indicated very few problems with the collection of the data. Some general trends in laboratory QC were noted. The off-site laboratory used for the chemical analyses has consistently shown levels of VOCs (primarily acetone and methylene chloride) in their method blanks; however, this mainly impacted the data collected for Site 36, where elevated levels of several VOCs were noted (see Section 8.0). Independent analyses conducted by the on-site SNL/NM laboratory confirmed the presence of contamination in the samples, however, so the impact of laboratory contamination is somewhat lessened.

Some elevated levels of VOCs were noted in some soil trip blanks submitted for Site 78. Preparation of the soil trip blanks involved collection of soil from an area known to be uncontaminated, followed by heating of the sample to drive off any potential VOCs, which effectively removed any moisture that might have been in the sample. It is believed that, because the sample was dehydrated, when it reached the laboratory, the ambient humidity and vapor-phase VOCs typical of many laboratories (i.e., those VOCs commonly used for sample preparation [acetone, methylene chloride, toluene, etc.]) caused rapid adsorption of the laboratory chemicals onto the soil matrix, producing erroneous results. The process for preparing soil blanks on-site is currently under review, because it does not appear to be a useful tool in its present form, given the problems cited above. Regardless of the results of the trip blanks for Site 78, no elevated VOCs were noted in the soil samples collected for confirmatory analyses.

The same laboratory exhibited low concentrations of lead in their blanks, affecting the data for the rinsate and field blanks from Sites 18 and 107, but at concentrations too low to account for the concentrations detected above the statistical background levels for Site 18.

Matrix spike/matrix spike duplicate (ms/msd) data indicated occasional elevated recoveries for some metals (antimony, barium, beryllium, and zinc) that are ubiquitous in the surrounding granite-derived soils. No general problems with the laboratory's recovery were noted, however. The single exception is for the ms/msd data for antimony at Site 241. Because of apparent erroneous recovery data, the sample that had been split for a ms/msd had an anomalously high antimony concentration (29.6 mg/kg). The location (plus two others) was resampled and found to have nondetectable antimony. The results of the QA/QC program are provided in electronic format in Appendix D.

2.5 Statistical Analysis of Background Data

To determine whether the soil sampling results for potentially contaminated sites within TA-III/V indicated the presence of COCs, the results were compared to the samples collected from TA-III and TA-V during the site-wide investigation of background concentrations at SNL/NM (IT 1994a). Thus, a subset of the full site-wide background data set was selected for the TA-III/V evaluation. The COCs for

evaluation (barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, uranium, and zinc) were chosen based on site knowledge and their likelihood of being a site contaminant within TA-III/V. At the time the statistical tests were completed, no site-wide background data sets existed for other COCs of interest (e.g., antimony, mercury, PCBs, etc.); thus a direct comparison to the applicable site-wide upper tolerance limits (UTLs, discussed below) updated in January 1996 was made for those COCs.

2.5.1 Background Concentration Determinations

To determine the range of background concentrations, the 95th UTL and 95th percentile were calculated for parametric and nonparametric data sets, respectively. The following steps were completed: (1) a priori screening of the data; (2) determination of the percentage of nondetects in the data sets, with a cutoff level of 15 percent; (3) distribution analysis of the portion of the data set that exhibited less than 15 percent nondetects, including coefficients of skewness, histograms, and probability plots; (4) a second screening of the data performed by the calculation of the T_n statistic for parametric data; and finally (5) calculation of the UTL for parametric data sets or the 95th percentile for nonparametric data sets. Each is discussed in the following sections, and example calculations, together with histograms and probability plots, are provided in Appendix E.

A Priori Screening

The a priori test involved a visual inspection of the data to eliminate any outliers. The data values were sorted from highest to lowest to facilitate the inspection. Maximum values that were a factor of three higher than their nearest neighbor were removed from the data set before the next test in the sequence was applied.

Determination of Parametric Versus Nonparametric Data

The data sets were divided into parametric or nonparametric by this process (discussed in the following paragraphs):

- Initial division based on the percentage of nondetect data; and
- Subdivision of the data sets with fewer than 15 percent nondetect values into normal, lognormal, or nonparametric.

First, the percentage of nondetect data in each of the data sets was determined. Raw nondetect data were not equated with "zero" values; rather, they were replaced with a coded value of one-half of the PLQ (EPA 1992a). Those sets with fewer than 15 percent nondetect values were identified as eligible for parametric distribution analysis; those sets with greater than 15 percent nondetect values were identified as eligible for nonparametric analysis. Coded data sets tend to skew the data toward zero and decrease the effectiveness of reporting the mean. Therefore, the median is reported as the measure of central tendency when greater than 15 percent of the data are nondetects (i.e., the data set appears nonparametric).

Distribution analyses then were conducted on the data to determine whether the data were parametric (normal or lognormal) or nonparametric. The distribution analyses included computing the coefficients of skewness and producing the histograms and probability plots for each COC for normal and lognormal (i.e., log transformed) data; the histograms and probability plots for each tested COC are included in Appendix E.

Calculation of T_n Statistic

The T_n statistic test was performed on data determined to be parametric (normal or lognormal) after the distribution analysis was completed to verify that no other statistical outliers existed. The datum was considered an outlier if the T_n statistic exceeded the critical number (C_n) identified in the EPA guidance for a given sample size (EPA 1992a). The test was run iteratively until the largest value in the data set passed. A new mean and standard deviation were calculated for each data set that had outliers removed in the T_n statistic analysis before the test was run again.

Calculation of UTL and 95th Percentile

Basic statistical parameters, including the mean, standard deviation, and UTL, were calculated for each normal or lognormal parametric population data set. The UTL establishes a concentration range that is constructed to contain a specified proportion of the population with a specified confidence. The proportion of the population included is referred to as the coverage, and the probability with which the tolerance interval includes the proportion is referred to as the tolerance coefficient. The EPA-recommended coverage value of 95 percent and tolerance coefficient value of 95 percent were used to calculate the UTLs (EPA 1992a). Most elementary statistical textbooks provide detailed descriptions of basic parametric statistics.

Nonparametric statistics were used when data sets did not exhibit normal or lognormal distributions, or when the percentage of nondetects exceeded 15 percent. The data sets examined exhibited fewer than 90 percent nondetects, so the median (50th percentile) was used to describe central tendency, and the 95th percentile was used for background comparison. Most elementary statistical textbooks provide detailed descriptions of basic nonparametric statistics.

Results

Table 2-3 presents the results of the a priori tests conducted on the data sets. None of the COCs examined were determined a priori to be outliers.

Table 2-4 provides the results of the probability plot, coefficient of skewness, and histogram for determination of the distribution type for each TA-III/V background data set. Background distributions for barium, beryllium, cadmium, copper, lead, nickel, and zinc were lognormal. The data set for silver was nonparametric, and the data set for total uranium (U_{tot}) was normally distributed.

Tests were performed for outliers using the T_n statistic (Table 2-5). Only the nickel data set was censored for the calculation of TA-III/V background values by removing the three highest values for nickel (30.9, 30.0, and 29.5 mg/kg. Three possible reasons for the anomalously high nickel data are noted. Nickel might exhibit a wide natural variation, and this sampling effort happened to access areas that were relatively mineral rich. Alternatively, laboratory error might have produced elevated analytical results. It is also possible that the higher nickel concentrations are anthropogenic, although these higher concentrations are well below the proposed RCRA Subpart S soil action level for nickel (2,000 mg/kg). To be conservative, these values were removed from the data set, and the censored data set was used for all subsequent comparisons for TA-III/V sites.

The natural logs of the means and standard deviations of the TAL metals and their corresponding UTLs or 95th percentiles are provided in Table 2-6. Proposed RCRA Subpart S soil action levels for the COCs detected during the RFI sampling effort are provided in Table 2-7. As stated earlier, only those COCs

Table 2-3
Technical Areas III and V Background Samples - A Priori Sampling

Parameter	Maximum Value	Next Maximum	X Factor[a]	Result
Barium	730	320	2.28	Pass
Beryllium	1.1	1.1	1.00	Pass
Cadmium	8.5	7.7	1.10	Pass
Chromium	58.1	57.3	1.01	Pass
Copper	29	27.5	1.05	Pass
Lead	73	73	1.00	Pass
Nickel	30.9	30	1.03	Pass
Silver	10	9.7	1.03	Pass
Uranium (total)	4.66	4.61	1.01	Pass
Zinc	59.9	56	1.07	Pass

[a]X factor is the ratio of the maximum value to the next maximum. If the ratio is greater than or equal to 3, it indicates the maximum value is anomalously high.

Table 2-4
Results of the Distribution Analysis for Technical Areas III and V

Parameter	Probability Plot	Coefficient of Skewness[a]	Histogram	Distribution Type
Barium	Lognormal	-2.3	Lognormal	Lognormal
Beryllium	Lognormal	-0.30	Lognormal	Lognormal
Cadmium	Lognormal	0.49	Lognormal	Lognormal
Chromium	Lognormal	-1.72	Lognormal	Lognormal
Copper	Lognormal	-0.15	Lognormal	Lognormal
Lead	Lognormal	0.50	Lognormal	Lognormal
Nickel	Lognormal	-0.48	Lognormal	Lognormal
Silver	Nonparametric	-0.59	Nonparametric	Nonparametric
Uranium (total)	Normal	-0.23	Lognormal	Normal
Zinc	Lognormal	0.69	Lognormal	Lognormal

[a]Critical Coefficient of Skewness is -1 to 1.

Table 2-5
Technical Areas III and V T_n Statistic Analysis for Target Analyte List Metals

Parameter	Distribution	Natural Log (Ln) of Maximum Value	Natural Log Mean	Natural Log Standard Deviation	T_n Statistic	Number of Samples	Critical Value[a]	Pass or Fail T_n Statistic
Barium	Lognormal	6.59	3.84	1.13	2.44	503	3.74	Pass
Beryllium	Lognormal	0.10	-1.14	0.43	2.87	331	3.60	Pass
Cadmium	Lognormal	2.14	-0.89	0.99	3.06	176	3.39	Pass
Chromium	Lognormal	4.06	1.86	0.8	2.75	538	3.76	Pass
Copper	Lognormal	3.37	1.82	0.48	3.22	392	3.66	Pass
Lead	Lognormal	4.29	1.89	0.73	3.29	259	3.52	Pass
Nickel (first iteration)	Lognormal	3.43	1.84	0.43	3.70	403	3.67	Fail
Nickel (second iteration)	Lognormal	3.40	1.83	0.42	3.74	402	3.67	Fail
Nickel (third iteration)	Lognormal	3.38	1.83	0.42	3.70	401	3.67	Fail
Nickel (fourth iteration)	Lognormal	3.31	1.83	0.41	3.62	400	3.67	Pass
Silver	Nonparametric	ND[b]	ND	ND	ND	247	ND	ND
Uranium (total)	Normal	4.66[c]	2.05[c]	0.99[c]	2.64	81	3.13	Pass
Zinc	Lognormal	4.09	3.1	0.34	2.89	158	3.36	Pass

[a]One-sided critical values for the upper 5 percent significance level; critical values derived from Table 8 (EPA 1992a) for given number of samples.
[b]ND = Not determined.
[c]Normal maximum values (i.e., actual values) provided for normally distributed uranium.

Table 2-6
Upper Tolerance Limits for Target Analyte List Metals in Technical Areas III and V Soil

Target Analyte List (TAL) Metal	Distribution	Censored?	Natural Log Mean	Natural Log Standard Deviation	Mean	Standard Deviation	One-Sided Tolerance Factor (K)	Natural Log UTL	UTL	Number of Samples
Barium	Lognormal	No	3.84	1.13	NA[a]	NA	1.76	5.83	341.0	503
Beryllium	Lognormal	No	-1.14	0.43	NA	NA	1.79	-0.37	0.7	331
Cadmium	Lognormal	No	-0.89	0.99	NA	NA	1.85	0.94	2.6	176
Chromium	Lognormal	No	1.86	0.8	NA	NA	1.76	3.27	26.2	538
Copper	Lognormal	No	1.82	0.48	NA	NA	1.78	2.67	14.5	392
Lead	Lognormal	No	1.89	0.73	NA	NA	1.81	3.21	24.8	259
Nickel	Lognormal	Yes	1.83	0.4	NA	NA	1.78	4.40	81.3	400
Silver[a]	Nonparametric	NA	NA	NA	NA	NA	NA	NA	NA	247
Uranium (total)	Normal	No	NA	NA	2.05	0.99	1.96	NA	4.0	81
Zinc	Lognormal	No	3.1	0.34	NA	NA	1.86	3.73	41.8	158

[a]NA = Not applicable.
[b]For silver, the 50th percentile value was 1 mg/kg and the 95th percentile value was 4 mg/kg; these describe the central tendency for nonparametrically distributed parameters.

Table 2-7
Generic Proposed Soil Action Levels Under Proposed RCRA Subpart S

Analyte	Proposed RCRA Subpart S Soil Action Level (mg/kg)
1,2-Dichloroethane	8
Acetone	8,000
Aluminum	NA[a]
Antimony	30
Arsenic	20
Barium	6,000
Beryllium	0.2
Bis (2-Ethylhexyl) Phthalate	50
2-Butanone	50,000
Cadmium	80
Calcium	NA
Chromium (VI)	400
Cobalt	NA
Copper	NA
2-Hexanone	NA
Iron	NA
Lead	2,000[b]
Lithium	NA
Magnesium	NA
Manganese	NA
Mercury	20
Nickel	2,000
Nitrate	100,000
Nitrite	8,000
Polychlorinated Biphenyls	0.1
Potassium	NA
Selenium	400
Silver	400
Sodium	NA
Toluene	20,000
Total Petroleum Hydrocarbon	100[c]
Uranium	NA
Vanadium	600
Xylenes (total)	200,000
Zinc	20,000

[a]NA = No proposed RCRA Subpart S soil action level is currently listed for the analyte.
[b]Lead action level not formally promulgated; proposed 2,000 mg/kg (EPA 1996).
[c]Not EPA-regulated. Standard from New Mexico Environmental Improvement Board Underground Storage Tank Regulations (NMEIB/USTR 1990).

for which site-wide background data sets existed (at the time of this RFI) were analyzed for statistical significance. The proposed RCRA Subpart S soil action levels for the remaining COCs are provided for comparison to site sampling data.

2.5.2 Comparison Tests: Background Data Versus Environmental Restoration Site Data

Two nonparametric, two parametric tests, and one test that utilized both parametric and nonparametric analyses were used to compare TA-III/V background data to data from potentially contaminated TA-III/V ER sites (Appendix E). The nonparametric tests included the Wilcoxon Rank Sum (WRS) Test and the Quantile test. The parametric tests included Student's t-tests using assumptions of equal and of unequal variance. The hot-measurement comparison uses either the 95th UTL calculation (for parametric data) or the 95th percentile calculation (in the case of nonparametric data) as recommended by the EPA (EPA 1992a). Nonparametric tests were applied to all soil data; however, parametric tests were not applied to nonparametric data.

The WRS test is performed by ordering all observations from background and the potentially contaminated site according to their magnitude and then assigning a rank from lowest to highest. The ranks in the potentially contaminated area are summed and compared to a table of critical values to determine whether the site is contaminated.

The WRS test is a nonparametric test more powerful than the Quantile test (described below) in determining whether the potentially contaminated area has concentrations uniformly higher than background (EPA 1992a). However, the WRS test allows for fewer less-than measurements than the Quantile test. As a general rule, the WRS test should be avoided if more than 40 percent of the measurements taken at the potentially contaminated area or at background areas are nondetects. All soil analytical data were subjected to the WRS test in this analysis, although the test power was known to be greatly reduced when the nondetect percent was greater than 40.

The Quantile test is performed by separating background data and individual site data. The data are then ordered from highest to lowest. The number of background and individual site data points are calculated. The number of data points for background and the selected potentially contaminated site is then compared to a table that identifies how many of the highest measurements must come from the potentially contaminated site versus background to indicate contamination.

The Quantile test is a nonparametric test that has more power than the WRS test to detect when only a small portion of the remediated site has not been completely cleaned up. Also, the Quantile test can be used even when a fairly large proportion of the measurements is below the limit of detection (EPA 1992a).

The hot-measurement comparison consists of comparing each measurement from the potentially contaminated area with an upper-limit concentration value. This upper-limit concentration value is such that any measurement from the potentially contaminated area that is equal to or greater than this value indicates an area of relatively high concentrations that must be further investigated (EPA 1992a). Concentrations exceeding the upper-limit value may indicate inappropriate sample collection, handling, or analysis procedures, or actual contamination. The upper-limit concentration value was calculated as previously described based on the 95th percentile for nonparametric data and the 95th UTL for parametric data.

The t-test is a parametric test that compares the means of two samples. To use the t-test statistic, both sampled populations must be approximately normally (or lognormally) distributed with approximately equal population variances, and the random samples must be selected independently of each other. The equations and methodology for applying the t-test are explained in most statistics books, including McClave and Dietrich (1982) and Mendenhall (1975).

Results

Comparison tests between background data and the maximum concentrations for TA-III/V site data were performed for metals at Sites 18, 51, 107, 111, 240, and 241 in accordance with the RFI Work Plan (SNL/NM 1993a). In the case of Site 78, a simple comparison of maximum metal concentrations to the TA-III/V background UTLs were made for the samples collected during the confirmatory sampling event. These were the only sites where metals were regarded as suspect contamination. The respective text sections herein contain discussions of the significance of the statistical tests on data for each site and comparisons to the relevant proposed RCRA Subpart S soil action levels (Table 2-7) for each constituent.

2.6 Contaminant Fate and Transport/Risk Assessment

The majority of contaminants detected at sites in TA-III/V were restricted to the upper 2 ft of surface soils. No conclusive evidence has been found that any sites investigated during this RFI have had an impact on the local ground water (at depths of 480 to 500 ft bgs).

For those sites at which contaminants were elevated with respect to background, a comparison was made of each elevated constituent relative to its proposed RCRA Subpart S soil action level. All COCs were at least one to two orders of magnitude below their corresponding action levels, except at Site 18 (which displayed PCBs above the proposed RCRA Subpart S soil action level). As indicated in the individual section for this site, the efficacy of conducting a VCM was evaluated. Three other sites (35, 36, and 196) also exhibited TPH above the New Mexico Underground Storage Tank Regulations (NMUSTR) standard, but each of these is proposed for NFA because TPH is in the form of a nonhazardous mineral oil.

18.0 ER SITE 111: BUILDING 6715 SUMP/DRAIN

Building 6715, located in the northern portion of TA-III (Figure 18-1), was constructed in 1971 and is used for conducting structural response experiments with HEs. Until 1988, wastes were discharged to a 4-ft by 8-ft stainless-steel tank, from which overflow was discharged through a polyvinyl chloride (PVC) pipe to a gravel and sand-filled pit. Although VOCs were reported to have been added to the waste water at one time, sampling of the waste water revealed no organic compounds (SNL/NM 1993a). In 1988, the tank, PVC pipe, and pit were excavated to a depth of 6 ft and removed.

Potential COCs include silver, HEs, and VOCs. Discussions of the field investigation protocols and results follow.

18.1 Field Investigation Protocols

Field investigation protocols at Site 111 included aerial photograph analysis and subsurface soil sampling. Each is discussed below.

18.1.1 Aerial Photograph Analysis

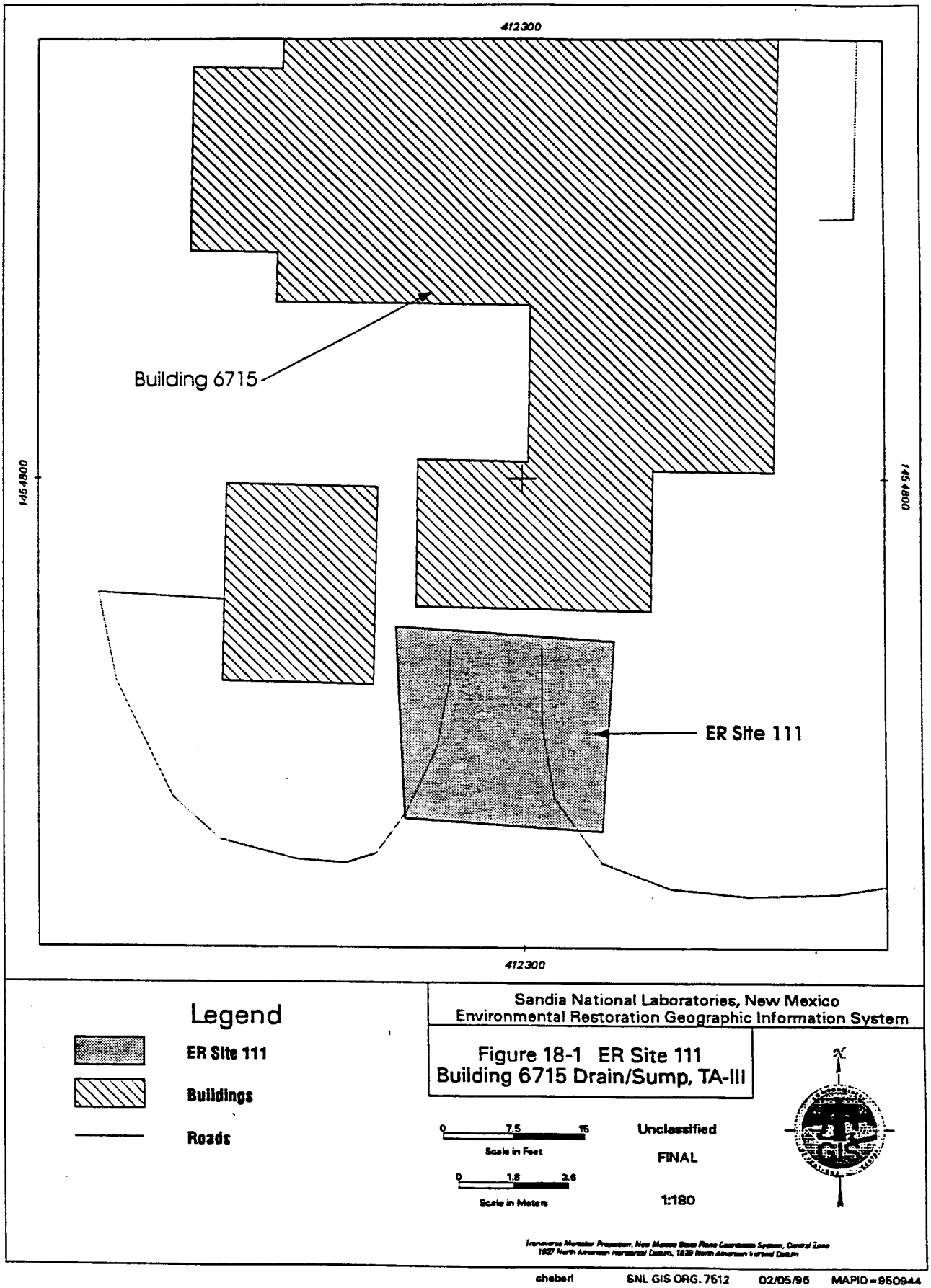
Aerial photographs from 1973 to 1990 were assembled, digitized, and compared for changes in surface features during successive years at the site. The area within 1,000 ft of the site boundaries was studied for signs of soil disturbance, vegetation changes, or new construction.

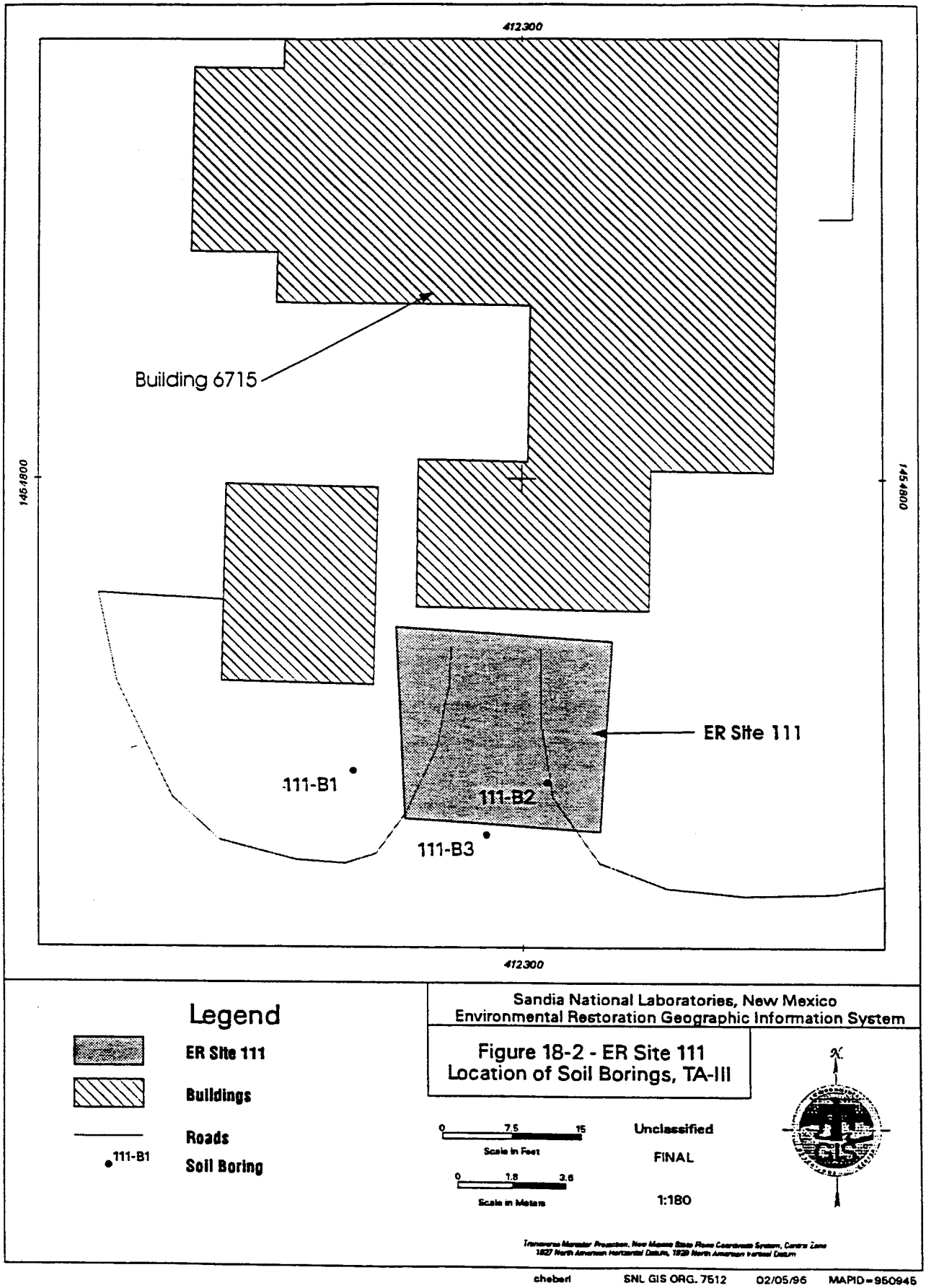
18.1.2 Previous Investigations

In 1988, the existing sump system at Building 6715 was removed and a new system was installed. The stainless-steel tank, PVC discharge pipe, and the gravel and sand from the drain pit were removed during this action. The stainless-steel tank, discharge pipe, and drain pit were excavated to a depth of approximately 6 ft and removed. Results for confirmatory soil samples analyzed for silver indicated that all samples taken after the system was removed were well below the 400-mg/kg action level for silver, with most samples at or below background concentrations (see RFI Work Plan, SNL/NM 1993a).

18.1.3 Sampling Strategies

In June 1994, three boreholes were advanced in the vicinity of the former drain pit using a vehicle-mounted, small-diameter hydraulic probe (Figure 18-2; sample location coordinates provided in Appendix A). Underground utilities dictated the actual locations where the probe could be placed; thus, a slight variation from the work plan was necessary but Boreholes 111-B1 and 111-B2 were moved only an approximate 5 ft from their proposed locations. Soil samples were collected at depths of 8, 12, and 15 ft bgs in accordance with the appropriate FOPs. Field screening of HEs (by immunoassay) and silver (by DCP analysis) was conducted on all samples. Off-site laboratory analysis of VOCs, SVOCs, HEs, and silver was conducted in accordance with the RFI Work Plan (SNL/NM 1993a, 1993b) and with EPA methods cited in Table 2-2.


412300
1454800
Building 6715
ER Site 111
1454800
412300
Legend
ER Site 111
Buildings
Roads
Sandia National Laboratories, New Mexico
Environmental Restoration Geographic Information System
Figure 18-1 ER Site 111
Building 6715 Drain/Sump, TA-III
0 7.5 15
Scale in Feet
0 1.8 2.6
Scale in Meters
Unclassified
FINAL
1:180
N
Transverse Mercator Projection, New Mexico State Plane Coordinate System, Central Zone
1927 North American Horizontal Datum, 1929 North American Vertical Datum
cheberl
SNL GIS ORG. 7512
02/05/96
MAPID=950944


412300
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1454800
Building 6715
ER Site 111
111-B1
111-B2
111-B3
412300
Legend
ER Site 111
Buildings
Roads
111-B1
Soil Boring
Sandia National Laboratories, New Mexico
Environmental Restoration Geographic Information System
Figure 18-2 - ER Site 111
Location of Soil Borings, TA-III
0 7.5 15
Scale in Feet
0 1.8 3.6
Scale in Meters
Unclassified
FINAL
1:180
cheberl SNL GIS ORG. 7512 02/05/96 MAPID=950945

18.2 Field Investigation Results

18.2.1 Aerial Photograph Interpretation

Examination of the aerial photographs available for Site 111 indicated a large (approximately 1.5-acre) excavation might have been present approximately 500 ft west of Site 111 in 1973. In 1978 and all subsequent years, the same feature as in the 1973 photograph is identified, but with only minor shape changes from year to year. An on-ground investigation of the area confirmed the presence of the excavation, but no indications of contamination were noted (i.e., no staining or obvious problems) and there was no evidence to suggest the excavation was connected to Site 111.

18.2.2 Nature and Extent of Contamination

Field screening results are provided in electronic format in Appendix B. Soil sample analytical results are summarized in Table 18-1 and are included in greater detail in Appendices C and D (electronic versions of sampling and QA/QC data). No VOCs or HEs were detected in any of the samples above their respective MDLs. The highest concentration of silver detected was 2.1 mg/kg at a depth of 8 ft; its duplicate contained 1.9 mg/kg silver. One sample exhibited a concentration of bis (2-ethylhexyl) phthalate slightly above the MDL. This compound is recognized by the EPA as a common laboratory contaminant because it is a breakdown product of polyethylene labware. It is therefore not considered a site contaminant at Site 111.

Table 18-1
Summary of Subsurface Soil Sample Analytical Results - Site 111

Analyte	Minimum/ Maximum	Sample ID	Result (mg/kg)	Detection Limit
Silver	Minimum	TA3/5-111-B2-8D	1.9	1
	Maximum	TA3/5-111-B2-8	2.1	1
Bis (2-Ethylhexyl) Phthalate	Single[a]	TA3/5-111-B3-15	0.350	0.330

[a]Single = Only one sample contained an analyte in excess of the MDL.

Table 18-2 summarizes the comparison of background levels to concentrations of silver detected at Site 111. Silver was determined not to be a site contaminant based on the statistical analysis conducted for Site 111. Table 18-3 compares the two potential contaminants (silver and bis [2-ethylhexyl] phthalate) with their corresponding proposed RCRA Subpart S soil action levels; neither exists at a concentration above its action level.

Table 18-2
Comparison of Site 111 Subsurface Soil Results to Technical Areas III and V Background Data

Parameter	Population Distribution	Statistical Test Applied					Maximum Concentration at Site 111 (mg/kg)	Site Contaminant[b]
		Student's t-test		Wilcoxon	Quantile	UTL[a] or 95th Percentile (mg/kg)		
		Equal Variance	Unequal Variance					
Silver	Nonparametric	NA[c]	NA	Pass[d]	Pass	4.0	2.1	No

[a]UTL = Upper Tolerance Limit.
[b]Assessment of site contaminant is based upon a qualitative evaluation of each statistical test applied to the data. For example: If all tests "fail," the highest concentration is statistically "greater" than background. If one or more tests "pass," other criteria may indicate that the highest concentration is not obviously, or statistically, greater than background. Other criteria include (1) the power of the individual statistical test, and (2) whether the maximum concentration exceeds the UTL or 95th percentile.
[c]NA = Not applicable because the constituent was distributed nonparametrically.
[d]Pass = Accept the null hypothesis that test statistics are equal.

Table 18-3
Comparison of Site 111 Soil Analytical Data to Proposed RCRA Subpart S Soil Action Levels

Parameter	Maximum Concentration at Site 111 (mg/kg)	Proposed RCRA Subpart S Soil Action Level (mg/kg)	Exceeds Proposed RCRA Subpart S Soil Action Level?
Silver	2.1	400	No
Bis (2-Ethylhexyl) Phthalate	0.35	50	No

18.3 Summary and Conclusions

Because the constituents noted above clearly were not elevated, nor carry human health or environmental consequences, no additional activities were conducted at this site, and no additional sampling or remediation appears to be warranted. This site is proposed for NFA in accordance with Criterion 3 listed in Section 4.4 of this RFI report.

Justification for
Class III Permit Modification

April 2001

Solid Waste Management Unit 111
Operable Unit 1306

NOD Originally Submitted November 1997

PLEASE NOTE

Only pages relevant to this SWMU are included in the binder.

sampling was conducted entirely within the site boundaries, thereby increasing the number of locations sampled from within the site boundaries from 27 (originally) to 48 for the Phase II RFI sampling. In accordance with the NOD comment responses of November 1993 and the approval letter of April 1994, an additional sample was collected from each grid. Rather than only submitting three soil samples for off-site laboratory analysis, as requested in the Work Plan NOD comments, all 11 samples collected were submitted for laboratory analysis.

Because the results of the Phase II RFI sampling indicated no samples above either TA-III/V or SNL/NM site-wide UTLs, SNL/NM believes Site 107 is appropriate for a decision of No Further Action.

XVI. ER Site 111, TA-III: Building 6715 Sump/Drain

Comment 29

Section 18.2, Field Investigation Results, Subsection 18.8.2, Nature and Extent of Contamination. SNL must submit copies of its three borehole logs; Subsection 19.6.1 of the approved Work Plan committed to provided a complete description of surface-soil samples, including a complete description of grain size, color, grain shape, lithology, moisture content, etc.

Response to Comment 29

All subsurface soil samples were examined by a geologist. The lithology of the samples from each of the three boreholes was almost identical, due to the close proximity of the boreholes (approximately 20 feet apart), therefore, full borehole lithologic logs were only completed for one borehole (111-B1). The borehole log for ER Site 111 (111-B1), including a complete description of grain size, color, grain shape, lithology, moisture content, etc., is attached (Attachment 5).

XIX. ER Site 196, TA-V: Building 6597 Cistern

Comment 30

Section 21.1, Field Investigation Protocols. The last sentence of Subsection 21.1.2.2. Sludge Thickness Determination, p. 21-1, seems to be missing a few words. Sandia should clarify this sentence.

Response to Comment 30

The sentence reads "This refusal was attributed to the concrete base then believed to exist." This sentence means that refusal of the auger was attributed at the time of drilling to contact with the concrete base of the cistern. It was subsequently found that the cistern did not have a concrete base.

Justification for
Class III Permit Modification

April 2001

Solid Waste Management Unit 111
Operable Unit 1306

NOD Originally Submitted July 1998

PLEASE NOTE

Only pages relevant to this SWMU are included in the binder.

Specific Comments

ER Site 111, TA-III: Building 6715 Sump/Drain

1. **DOE/SNL Response to Comment 29**

   Because the geologist did not log two of the three boreholes, there is no documented proof that strata encountered in all three boreholes were "almost identical". In most situations, all boreholes should be logged.

   Response: DOE/SNL agrees that borehole logging by a geologist can provide valuable information for site characterization; SNL/NM field operating procedures recommend lithologic logging of boreholes. In this case the boreholes were spaced so closely together that the soil composition was consistent in each of the boreholes.

2. **See additional concerns for ER Site 111 in Enclosure B.**

Enclosure B
Additional Concerns

ER Site 111, TA-III: Building 6715 Sump/Drain

1. **DOE/SNL must provide the complete data set (hard copy form), including the analytical results for all QA/QC samples.**

   Response: The analytical data, including QA/QC data, are included in Attachment 111-1.

2. **DOE/SNL must revise Figure 18-1 and 18-2 such that they show the locations of the steel tank, PVC discharge pipe, the drain pit, and sample locations.**

   Response: Figures 19-1 from the RFI Work Plan is included in Attachment 111-2 to show the location of the features requested. The actual sample locations are shown in Figure 18-2, also included in Attachment 111-2.

3. **What was the estimated total discharge (by volume) over the life of the unit?**

   Response: This information is unavailable.

4. **Analytical results in Table 18.1 indicate that soil at ER Site 111 is contaminated with silver in excess of the approved background level. HRMB will not support a NFA petition at this time, as further site characterization may be required. Additionally, because contaminated soil remains at the site, a risk assessment must be done after the site is fully characterized.**

   Response: Silver was found in only one sample and its duplicate at very low concentrations (1.9 and 2.1 mg/kg) in the uppermost sample at 8-feet. Silver was undetected in the 12-foot and 15-foot samples, thus defining the vertical extent of

contamination. Although silver exceeded approved MBLs (<1) directly below the former gravel drain pit, the DOE/SNL believes there is no need for additional investigation at this site. The need for a risk assessment at this site will be evaluated and discussed with NMED.

5. **Page 18-4, Section 18.2.1 -- DOE/SNL must submit a map showing the location of the 1.5 acre excavation site located 500 ft west of ER Site 111. The site must be investigated as a potential new solid waste management unit. DOE/SNL must provide a sampling and analysis plan to the NMED for review and approval prior to carrying out this investigation.**

Response: The DOE/SNL is unaware of an excavation site located 500 feet west of ER Site 111 and cannot address Comment 5 in this submittal. Visual field inspection was performed by SNL personnel, but no excavation was found. The DOE/SNL suggests the NMED should meet with DOE/SNL representatives to visit the area of concern. SNL will then follow the SNL procedures (ES&H Manual Form 2001 PWR) for reporting a potential past waste release site.

ER Site 196, TA-V: Building 6597 Cistern

1. **DOE/SNL Response to Comment 31**

The presence of "minor" VOC concentrations in both soil samples (on-site laboratory) and soil-gas samples indicates that hazardous constituents were released to the environment. The extent of contamination has not been determined. Contamination at the site is a potential threat to ground water.

Contaminants detected at the site include TPH, TCE, 1,1,1-TCA, benzene, toluene, methylene chloride, copper, lead, and zinc. This site may be the source or one of the sources of the TCE contamination seen in ground water at TA-V.

Additional site characterization, including the collection and analysis of soil samples from deep boreholes, is required.

Response: SNL/DOE will conduct further investigation of the Building 6597 Cistern to characterize the vertical extent of contamination.

2. **DOE/SNL Response to Comment 32**

This response relies on the assumption that only small quantities of waste transformer oil were discharged into the cistern (5 gal per week, page 21-1, paragraph 1). However, HRMB questions why such a large cistern (a seepage pit 20-ft deep by 25-ft diameter) and associated piping was constructed to discharge such small quantities of waste oil.

Attachment 111-1

Attachment 111-1

Laboratory Analytical Results for ER Site 111

Laboratory QA/QC – copied from laboratory reports

ER Site 111 RFI Analytical Results; Volatile Organics (EPA Method 8240)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Acetone	ug/kg	<10	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Benzene	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Bromodichloromethane	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Bromoform	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Bromomethane	ug/kg	<10	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Butanone, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Carbon disulfide	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Carbon tetrachloride	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Chlorobenzene	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Chloroethane	ug/kg	<10	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Chloroform	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Chloromethane	ug/kg	<10	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Dibromochloromethane	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Dichloroethane, 1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Dichloroethane, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Dichloroethene, 1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Dichloroethene, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	chloromethane-methylene chlorid	ug/kg	3.4	BJ	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Dichloropropane, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Dichloropropene, cis-1,3-	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Dichloropropene, trans-1,3-	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Ethyl benzene	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Hexanone, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Pentanone, 4-methyl-, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Styrene	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Tetrachloroethane, 1,1,2,2-	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Tetrachloroethene	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Toluene	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Trichloroethane, 1,1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Trichloroethane, 1,1,2-	ug/kg	<5	U	SOIL

ER Site 111 RFI Analytical Results; Volatile Organics (EPA Method 8240)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Trichloroethene	ug/kg	<5	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Vinyl acetate	ug/kg	<10	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Vinyl chloride	ug/kg	<10	U	SOIL
TA3/5-111-B1-12	SNL0130266	F	17-JUN-94	12	Xylenes, total	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Acetone	ug/kg	3.7	J	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Benzene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Bromodichloromethane	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Bromoform	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Bromomethane	ug/kg	<10	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Butanone, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Carbon disulfide	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Carbon tetrachloride	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Chlorobenzene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Chloroethane	ug/kg	<10	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Chloroform	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Chloromethane	ug/kg	<10	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Dibromochloromethane	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Dichloroethane, 1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Dichloroethane, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Dichloroethene, 1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Dichloroethene, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	chloromethane-methylene chlorid	ug/kg	3	BJ	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Dichloropropane, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Dichloropropene, cis-1,3-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Dichloropropene, trans-1,3-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Ethyl benzene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Hexanone, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Pentanone, 4-methyl-, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Styrene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Tetrachloroethane, 1,1,2,2-	ug/kg	<5	U	SOIL

ER Site 111 RFI Analytical Results; Volatile Organics (EPA Method 8240)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Tetrachloroethene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Toluene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Trichloroethane, 1,1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Trichloroethane, 1,1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Trichloroethene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Vinyl acetate	ug/kg	<10	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Vinyl chloride	ug/kg	<10	U	SOIL
TA3/5-111-B2-8	SNL0130274	F	17-JUN-94	8	Xylenes, total	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Acetone	ug/kg	5.5	J	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Benzene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Bromodichloromethane	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Bromoform	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Bromomethane	ug/kg	<10	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Butanone, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Carbon disulfide	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Carbon tetrachloride	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Chlorobenzene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Chloroethane	ug/kg	<10	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Chloroform	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Chloromethane	ug/kg	<10	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Dibromochloromethane	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Dichloroethane, 1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Dichloroethane, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Dichloroethene, 1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Dichloroethene, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	chloromethane-methylene chlorid	ug/kg	3.5	BJ	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Dichloropropane, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Dichloropropene, cis-1,3-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Dichloropropene, trans-1,3-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Ethyl benzene	ug/kg	<5	U	SOIL

ER Site 111 RFI Analytical Results; Volatile Organics (EPA Method 8240)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Hexanone, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Pentanone, 4-methyl-, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Styrene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Tetrachloroethane, 1,1,2,2-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Tetrachloroethene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Toluene	ug/kg	1.5	J	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Trichloroethane, 1,1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Trichloroethane, 1,1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Trichloroethene	ug/kg	<5	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Vinyl acetate	ug/kg	<10	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Vinyl chloride	ug/kg	<10	U	SOIL
TA3/5-111-B2-8D	SNL0130270	D	17-JUN-94	8	Xylenes, total	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Acetone	ug/kg	5.7	J	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Benzene	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Bromodichloromethane	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Bromoform	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Bromomethane	ug/kg	<10	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Butanone, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Carbon disulfide	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Carbon tetrachloride	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Chlorobenzene	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Chloroethane	ug/kg	<10	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Chloroform	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Chloromethane	ug/kg	<10	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Dibromochloromethane	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Dichloroethane, 1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Dichloroethane, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Dichloroethene, 1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Dichloroethene, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	chloromethane-methylene chlorid	ug/kg	3.6	BJ	SOIL

ER Site 111 RFI Analytical Results; Volatile Organics (EPA Method 8240)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Dichloropropane, 1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Dichloropropene, cis-1,3-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Dichloropropene, trans-1,3-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Ethyl benzene	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Hexanone, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Pentanone, 4-methyl-, 2-	ug/kg	<10	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Styrene	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Tetrachloroethane, 1,1,2,2-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Tetrachloroethene	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Toluene	ug/kg	1.8	J	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Trichloroethane, 1,1,1-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Trichloroethane, 1,1,2-	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Trichloroethene	ug/kg	<5	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Vinyl acetate	ug/kg	<10	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Vinyl chloride	ug/kg	<10	U	SOIL
TA3/5-111-B3-15	SNL0130278	F	17-JUN-94	15	Xylenes, total	ug/kg	<5	U	SOIL
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Acetone	ug/L	4.6	BJ	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Benzene	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Bromodichloromethane	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Bromoform	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Bromomethane	ug/L	<10	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Butanone, 2-	ug/L	<10	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Carbon disulfide	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Carbon tetrachloride	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Chlorobenzene	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Chloroethane	ug/L	<10	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Chloroform	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Chloromethane	ug/L	<10	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Dibromochloromethane	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Dichloroethane, 1,1-	ug/L	<5	U	WATER

ER Site 111 RFI Analytical Results; Volatile Organics (EPA Method 8240)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Dichloroethane, 1,2-	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Dichloroethene, 1,1-	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Dichloroethene, 1,2-	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	chloromethane-methylene chlorid	ug/L	1.5	J	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Dichloropropane, 1,2-	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Dichloropropene, cis-1,3-	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Dichloropropene, trans-1,3-	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Ethyl benzene	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Hexanone, 2-	ug/L	<10	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Pentanone, 4-methyl-, 2-	ug/L	<10	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Styrene	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Tetrachloroethane, 1,1,2,2-	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Tetrachloroethene	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Toluene	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Trichloroethane, 1,1,1-	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Trichloroethane, 1,1,2-	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Trichloroethene	ug/L	<5	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Vinyl acetate	ug/L	<10	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Vinyl chloride	ug/L	<10	U	WATER
TA3/5-111-B-RBA	SNL0130282	EB	17-JUN-94	0	Xylenes, total	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Acetone	ug/L	3.5	BJ	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Benzene	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Bromodichloromethane	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Bromoform	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Bromomethane	ug/L	<10	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Butanone, 2-	ug/L	<10	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Carbon disulfide	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Carbon tetrachloride	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Chlorobenzene	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Chloroethane	ug/L	<10	U	WATER

ER Site 111 RFI Analytical Results; Volatile Organics (EPA Method 8240)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Chloroform	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Chloromethane	ug/L	<10	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Dibromochloromethane	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Dichloroethane, 1,1-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Dichloroethane, 1,2-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Dichloroethene, 1,1-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Dichloroethene, 1,2-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	chloromethane-methylene chlorid	ug/L	1.4	J	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Dichloropropane, 1,2-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Dichloropropene, cis-1,3-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Dichloropropene, trans-1,3-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Ethyl benzene	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Hexanone, 2-	ug/L	<10	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Pentanone, 4-methyl-, 2-	ug/L	<10	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Styrene	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Tetrachloroethane, 1,1,2,2-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Tetrachloroethene	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Toluene	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Trichloroethane, 1,1,1-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Trichloroethane, 1,1,2-	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Trichloroethene	ug/L	<5	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Vinyl acetate	ug/L	<10	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Vinyl chloride	ug/L	<10	U	WATER
TA3/5-111-B-FBA	SNL0130286	FB	17-JUN-94	0	Xylenes, total	ug/L	<5	U	WATER
TA3/5-111-B3-15	SNLA016889-1	SD	17-JUN-94	15	Benzene	ug/kg	50		SOIL
TA3/5-111-B3-15	SNLA016889-1	SD	17-JUN-94	15	Chlorobenzene	ug/kg	51		SOIL
TA3/5-111-B3-15	SNLA016889-1	SD	17-JUN-94	15	Dichloroethene, 1,1-	ug/kg	45		SOIL
TA3/5-111-B3-15	SNLA016889-1	SD	17-JUN-94	15	Methylbenzene	ug/kg	48		SOIL
TA3/5-111-B3-15	SNLA016889-1	SD	17-JUN-94	15	Trichloroethene	ug/kg	50		SOIL
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Acetone	ug/L	2.8	BJ	WATER

ER Site 111 RFI Analytical Results; Volatile Organics (EPA Method 8240)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Benzene	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Bromodichloromethane	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Bromoform	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Bromomethane	ug/L	<10	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Butanone, 2-	ug/L	<10	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Carbon disulfide	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Carbon tetrachloride	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Chlorobenzene	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Chloroethane	ug/L	<10	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Chloroform	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Chloromethane	ug/L	<10	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Dibromochloromethane	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Dichloroethane, 1,1-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Dichloroethane, 1,2-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Dichloroethene, 1,1-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Dichloroethene, 1,2-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	chloromethane-methylene chlorid	ug/L	2.1	J	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Dichloropropane, 1,2-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Dichloropropene, cis-1,3-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Dichloropropene, trans-1,3-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Ethyl benzene	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Hexanone, 2-	ug/L	<10	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Pentanone, 4-methyl-, 2-	ug/L	<10	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Styrene	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Tetrachloroethane, 1,1,2,2-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Tetrachloroethene	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Toluene	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Trichloroethane, 1,1,1-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Trichloroethane, 1,1,2-	ug/L	<5	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Trichloroethene	ug/L	<5	U	WATER

ER Site 111 RFI Analytical Results; Volatile Organics (EPA Method 8240)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Vinyl acetate	ug/L	<10	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Vinyl chloride	ug/L	<10	U	WATER
TA3/5-111-B-TBA	SNL0130290	TB	17-JUN-94	0	Xylenes, total	ug/L	<5	U	WATER

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	2,4-Dinitrotoluene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Acenaphthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Acenaphthylene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Benzo(a)anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Benzo(a)pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Benzo(b)fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Benzo(ghi)perylene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Benzo(k)fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Benzoic acid	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Benzyl alcohol	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Bromophenyl phenyl ether, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Butylbenzyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Carbazole	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Chloro-3-methylphenol, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Chloroaniline, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Chloroethoxy)methane, bis(2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Chloroethyl)ether, bis(2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Chloronaphthalene, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Chlorophenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Chlorophenyl phenyl ether, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Chloropropane), 2,2'-oxybis(1-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Chrysene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dibenz[a,h]anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dibenzofuran	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dichlorobenzene, 1,2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dichlorobenzene, 1,3-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dichlorobenzene, 1,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dichlorobenzidine, 3,3'-	8270	ug/kg	<660	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dichlorphenol, 2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Diethylphthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dimethylphenol, 2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dimethylphthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Di-n-butyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dinitro-o-cresol, 4,6-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dinitrophenol, 2,4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Dinitrotoluene, 2,6-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Di-n-octyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Ethylhexyl)phthalate, bis(2-	8270	ug/kg	70	J	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Fluorene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Hexachlorobenzene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Hexachlorobutadiene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Hexachlorocyclopentadiene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Hexachloroethane	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Indeno(1,2,3-c,d)pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Isophorone	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Methylnaphthalene, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Methylphenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Methylphenol, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Naphthalene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Nitroaniline, 2-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Nitroaniline, 3-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Nitroaniline, 4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Nitro-benzene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Nitrophenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Nitrophenol, 4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Nitrosodiphenylamine, n-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Nitrosodipropylamine, n-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Pentachlorophenol	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Phenanthrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Phenol	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Trichlorobenzene, 1,2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Trichlorophenol, 2,4,5-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B1-12	SNL0130268	F	17-JUN-94	12	Trichlorophenol, 2,4,6-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	2,4-Dinitrotoluene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Acenaphthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Acenaphthylene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Benzo(a)anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Benzo(a)pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Benzo(b)fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Benzo(ghi)perylene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Benzo(k)fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Benzoic acid	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Benzyl alcohol	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Bromophenyl phenyl ether, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Butylbenzyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Carbazole	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Chloro-3-methylphenol, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Chloroaniline, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Chloroethoxy)methane, bis(2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Chloroethyl)ether, bis(2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Chloronaphthalene, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Chlorophenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Chlorophenyl phenyl ether, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Chloropropane), 2,2'-oxybis(1-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Chrysene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dibenz[a,h]anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dibenzofuran	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dichlorobenzene, 1,2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dichlorobenzene, 1,3-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dichlorobenzene, 1,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dichlorobenzidine, 3,3'-	8270	ug/kg	<660	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dichlorphenol, 2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Diethylphthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dimethylphenol, 2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dimethylphthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Di-n-butyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dinitro-o-cresol, 4,6-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dinitrophenol, 2,4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Dinitrotoluene, 2,6-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Di-n-octyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Ethylhexyl)phthalate, bis(2-	8270	ug/kg	87	J	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Fluorene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Hexachlorobenzene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Hexachlorobutadiene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Hexachlorocyclopentadiene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Hexachloroethane	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Indeno(1,2,3-c,d)pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Isophorone	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Methylnaphthalene, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Methylphenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Methylphenol, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Naphthalene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Nitroaniline, 2-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Nitroaniline, 3-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Nitroaniline, 4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Nitro-benzene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Nitrophenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Nitrophenol, 4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Nitrosodiphenylamine, n-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Nitrosodipropylamine, n-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Pentachlorophenol	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Phenanthrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Phenol	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Trichlorobenzene, 1,2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Trichlorophenol, 2,4,5-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130276	F	17-JUN-94	8	Trichlorophenol, 2,4,6-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	2,4-Dinitrotoluene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Acenaphthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Acenaphthylene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Benzo(a)anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Benzo(a)pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Benzo(b)fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Benzo(ghi)perylene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Benzo(k)fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Benzoic acid	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Benzyl alcohol	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Bromophenyl phenyl ether, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Butylbenzyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Carbazole	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Chloro-3-methylphenol, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Chloroaniline, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Chloroethoxy)methane, bis(2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Chloroethyl)ether, bis(2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Chloronaphthalene, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Chlorophenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Chlorophenyl phenyl ether, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Chloropropane), 2,2'-oxybis(1-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Chrysene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dibenz[a,h]anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dibenzofuran	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dichlorobenzene, 1,2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dichlorobenzene, 1,3-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dichlorobenzene, 1,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dichlorobenzidine, 3,3'-	8270	ug/kg	<660	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dichlorphenol, 2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Diethylphthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dimethylphenol, 2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dimethylphthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Di-n-butyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dinitro-o-cresol, 4,6-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dinitrophenol, 2,4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Dinitrotoluene, 2,6-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Di-n-octyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Ethylhexyl)phthalate, bis(2-	8270	ug/kg	51	J	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Fluorene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Hexachlorobenzene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Hexachlorobutadiene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Hexachlorocyclopentadiene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Hexachloroethane	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Indeno(1,2,3-c,d)pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Isophorone	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Methylnaphthalene, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Methylphenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Methylphenol, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Naphthalene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Nitroaniline, 2-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Nitroaniline, 3-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Nitroaniline, 4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Nitro-benzene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Nitrophenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Nitrophenol, 4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Nitrosodiphenylamine, n-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Nitrosodipropylamine, n-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Pentachlorophenol	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Phenanthrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Phenol	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Trichlorobenzene, 1,2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Trichlorophenol, 2,4,5-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130272	D	17-JUN-94	8	Trichlorophenol, 2,4,6-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	2,4-Dinitrotoluene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Acenaphthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Acenaphthene	8270	ug/kg	2200		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Acenaphthylene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Benzo(a)anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Benzo(a)pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Benzo(b)fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Benzo(ghi)perylene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Benzo(k)fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Benzoic acid	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Benzyl alcohol	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Bromophenyl phenyl ether, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Butylbenzyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Carbazole	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Chloro-3-methylphenol, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Chloro-3-methylphenol, 4-	8270	ug/kg	4100		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Chloroaniline, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Chloroethoxy)methane, bis(2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Chloroethyl)ether, bis(2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Chloronaphthalene, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Chlorophenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Chlorophenol, 2-	8270	ug/kg	4300		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Chlorophenyl phenyl ether, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Chloropropane), 2,2'-oxybis(1-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Chrysene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dibenz[a,h]anthracene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dibenzofuran	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dichlorobenzene, 1,2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dichlorobenzene, 1,3-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dichlorobenzene, 1,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Dichlorobenzene, 1,4-	8270	ug/kg	2100		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dichlorobenzidine, 3,3'-	8270	ug/kg	<660	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dichlorphenol, 2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Diethylphthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dimethylphenol, 2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dimethylphthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Di-n-butyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dinitro-o-cresol, 4,6-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dinitrophenol, 2,4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Dinitrotoluene, 2,6-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Di-n-octyl phthalate	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Ethylhexyl)phthalate, bis(2-	8270	ug/kg	350		111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Fluoranthene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Fluorene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Hexachlorobenzene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Hexachlorobutadiene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Hexachlorocyclopentadiene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Hexachloroethane	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Indeno(1,2,3-c,d)pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Isophorone	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Methylnaphthalene, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Methylphenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Methylphenol, 4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Naphthalene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Nitroaniline, 2-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Nitroaniline, 3-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Nitroaniline, 4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Nitro-benzene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Nitrophenol, 2-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Nitrophenol, 4-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Nitrophenol, 4-	8270	ug/kg	5100		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Nitrosodiphenylamine, n-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Nitrosodipropylamine, n-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Nitrosodipropylamine, n-	8270	ug/kg	2400		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Pentachlorophenol	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Pentachlorophenol	8270	ug/kg	2800		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Phenanthrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Phenol	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Phenol	8270	ug/kg	3900		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Pyrene	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Pyrene	8270	ug/kg	2900		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Trichlorobenzene, 1,2,4-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Trichlorobenzene, 1,2,4-	8270	ug/kg	2100		111	SOIL	
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Trichlorophenol, 2,4,5-	8270	ug/kg	<1600	U	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130280	F	17-JUN-94	15	Trichlorophenol, 2,4,6-	8270	ug/kg	<330	U	111	SOIL	QUANTERRA
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	2,4-Dinitrotoluene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Acenaphthene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Acenaphthylene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Anthracene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Benzo(a)anthracene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Benzo(a)pyrene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Benzo(b)fluoranthene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Benzo(ghi)perylene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Benzo(k)fluoranthene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Benzoic acid	8270	ug/L	<50	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Benzyl alcohol	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Bromophenyl phenyl ether, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Butylbenzyl phthalate	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Carbazole	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Chloro-3-methylphenol, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Chloroaniline, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Chloroethoxy)methane, bis(2-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Chloroethyl)ether, bis(2-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Chloronaphthalene, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Chlorophenol, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Chlorophenyl phenyl ether, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Chloropropane), 2,2'-oxybis(1-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Chrysene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dibenz[a,h]anthracene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dibenzofuran	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dichlorobenzene, 1,2-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dichlorobenzene, 1,3-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dichlorobenzene, 1,4-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dichlorobenzidine, 3,3'-	8270	ug/L	<20	U	111	WATER	QUANTERRAINE

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dichlorphenol, 2,4-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Diethylphthalate	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dimethylphenol, 2,4-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dimethylphthalate	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Di-n-butyl phthalate	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dinitro-o-cresol, 4,6-	8270	ug/L	<50	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dinitrophenol, 2,4-	8270	ug/L	<50	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Dinitrotoluene, 2,6-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Di-n-octyl phthalate	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Ethylhexyl)phthalate, bis(2-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Fluoranthene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Fluorene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Hexachlorobenzene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Hexachlorobutadiene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Hexachlorocyclopentadiene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Hexachloroethane	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Indeno(1,2,3-c,d)pyrene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Isophorone	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Methylnaphthalene, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Methylphenol, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Methylphenol, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Naphthalene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Nitroaniline, 2-	8270	ug/L	<50	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Nitroaniline, 3-	8270	ug/L	<50	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Nitroaniline, 4-	8270	ug/L	<50	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Nitro-benzene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Nitrophenol, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Nitrophenol, 4-	8270	ug/L	<50	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Nitrosodiphenylamine, n-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Nitrosodipropylamine, n-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Pentachlorophenol	8270	ug/L	<50	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Phenanthrene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Phenol	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Pyrene	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Trichlorobenzene, 1,2,4-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Trichlorophenol, 2,4,5-	8270	ug/L	<50	U	111	WATER	QUANTERRAINE
TA3/5-111-B-FBA	SNL0130287	FB	17-JUN-94	0	Trichlorophenol, 2,4,6-	8270	ug/L	<10	U	111	WATER	QUANTERRAINE
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	2,4-Dinitrotoluene	8270	ug/L	<10	U	111	WATER	QUANTERRA

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Acenaphthene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Acenaphthylene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Anthracene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Benzo(a)anthracene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Benzo(a)pyrene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Benzo(b)fluoranthene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Benzo(ghi)perylene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Benzo(k)fluoranthene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Benzoic acid	8270	ug/L	<50	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Benzyl alcohol	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Bromophenyl phenyl ether, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Butylbenzyl phthalate	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Carbazole	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Chloro-3-methylphenol, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Chloroaniline, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Chloroethoxy)methane, bis(2-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Chloroethyl)ether, bis(2-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Chloronaphthalene, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Chlorophenol, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Chlorophenyl phenyl ether, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Chloropropane), 2,2'-oxybis(1-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Chrysene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dibenz[a,h]anthracene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dibenzofuran	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dichlorobenzene, 1,2-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dichlorobenzene, 1,3-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dichlorobenzene, 1,4-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dichlorobenzidine, 3,3'-	8270	ug/L	<20	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dichlorphenol, 2,4-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Diethylphthalate	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dimethylphenol, 2,4-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dimethylphthalate	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Di-n-butyl phthalate	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dinitro-o-cresol, 4,6-	8270	ug/L	<50	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dinitrophenol, 2,4-	8270	ug/L	<50	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Dinitrotoluene, 2,6-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Di-n-octyl phthalate	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Ethylhexyl)phthalate, bis(2-	8270	ug/L	12		111	WATER	QUANTERRA

ER Site 111 RFI Analytical Results; Semi-Volatile Organics (EPA Method 8270)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Fluoranthene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Fluorene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Hexachlorobenzene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Hexachlorobutadiene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Hexachlorocyclopentadiene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Hexachloroethane	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Indeno(1,2,3-c,d)pyrene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Isophorone	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Methylnaphthalene, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Methylphenol, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Methylphenol, 4-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Naphthalene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Nitroaniline, 2-	8270	ug/L	<50	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Nitroaniline, 3-	8270	ug/L	<50	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Nitroaniline, 4-	8270	ug/L	<50	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Nitro-benzene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Nitrophenol, 2-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Nitrophenol, 4-	8270	ug/L	<50	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Nitrosodiphenylamine, n-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Nitrosodipropylamine, n-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Pentachlorophenol	8270	ug/L	<50	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Phenanthrene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Phenol	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Pyrene	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Trichlorobenzene, 1,2,4-	8270	ug/L	<10	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Trichlorophenol, 2,4,5-	8270	ug/L	<50	U	111	WATER	QUANTERRA
TA3/5-111-B-RBA	SNL0130283	EB	17-JUN-94	0	Trichlorophenol, 2,4,6-	8270	ug/L	<10	U	111	WATER	QUANTERRA

ER Site 111 RFI Analytical Results for Soil Samples; HE (EPA Method 8080; HPLC)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	2,4-Dinitrotoluene	ug/g	<.25	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Amino-2,6-dinitrotoluene, 4-	ug/g	<.25	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Amino-4,6-dinitrotoluene, 2-	ug/g	<.25	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Dinitrobenzene, 1,3-	ug/g	<.25	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Dinitrotoluene, 2,6-	ug/g	<.26	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	HMX	ug/g	<2.2	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Nitro-benzene	ug/g	<.26	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Nitrotoluene, m-	ug/g	<.25	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Nitrotoluene, o-	ug/g	<.25	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Nitrotoluene, p-	ug/g	<.25	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	RDX	ug/g	<1	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Tetryl	ug/g	<.65	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Trinitrobenzene, 1,3,5-	ug/g	<.25	U	SOIL
TA3/5-111-B1-12	SNL0130269	F	17-JUN-94	12	Trinitrotoluene, 2,4,6-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	2,4-Dinitrotoluene	ug/g	<.25	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Amino-2,6-dinitrotoluene, 4-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Amino-4,6-dinitrotoluene, 2-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Dinitrobenzene, 1,3-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Dinitrotoluene, 2,6-	ug/g	<.26	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	HMX	ug/g	<2.2	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Nitro-benzene	ug/g	<.26	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Nitrotoluene, m-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Nitrotoluene, o-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Nitrotoluene, p-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	RDX	ug/g	<1	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Tetryl	ug/g	<.65	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Trinitrobenzene, 1,3,5-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8	SNL0130277	F	17-JUN-94	8	Trinitrotoluene, 2,4,6-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	2,4-Dinitrotoluene	ug/g	<.25	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Amino-2,6-dinitrotoluene, 4-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Amino-4,6-dinitrotoluene, 2-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Dinitrobenzene, 1,3-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Dinitrotoluene, 2,6-	ug/g	<.26	U	SOIL

ER Site 111 RFI Analytical Results for Soil Samples; HE (EPA Method 8080; HPLC)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	HMX	ug/g	<2.2	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Nitro-benzene	ug/g	<.26	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Nitrotoluene, m-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Nitrotoluene, o-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Nitrotoluene, p-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	RDX	ug/g	<1	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Tetryl	ug/g	<.65	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Trinitrobenzene, 1,3,5-	ug/g	<.25	U	SOIL
TA3/5-111-B2-8D	SNL0130273	D	17-JUN-94	8	Trinitrotoluene, 2,4,6-	ug/g	<.25	U	SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	2,4-Dinitrotoluene	ug/g	<.25	U	SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	2,4-Dinitrotoluene	ug/kg	2900		SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	2,4-Dinitrotoluene	ug/g	6.2		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Amino-2,6-dinitrotoluene, 4-	ug/g	<.25	U	SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Amino-2,6-dinitrotoluene, 4-	ug/g	6.4		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Amino-4,6-dinitrotoluene, 2-	ug/g	<.25	U	SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Amino-4,6-dinitrotoluene, 2-	ug/g	6.3		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Dinitrobenzene, 1,3-	ug/g	<.25	U	SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Dinitrobenzene, 1,3-	ug/g	6.2		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Dinitrotoluene, 2,6-	ug/g	<.26	U	SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Dinitrotoluene, 2,6-	ug/g	5.8		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	HMX	ug/g	<2.2	U	SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	HMX	ug/g	5.8		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Nitro-benzene	ug/g	<.26	U	SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Nitro-benzene	ug/g	6.9		SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Nitrotoluene, 2-	ug/g	5.8		SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Nitrotoluene, 3-	ug/g	4.6		SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Nitrotoluene, 4-	ug/g	6		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Nitrotoluene, m-	ug/g	<.25	U	SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Nitrotoluene, o-	ug/g	<.25	U	SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Nitrotoluene, p-	ug/g	<.25	U	SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	RDX	ug/g	<1	U	SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	RDX	ug/g	5.7		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Tetryl	ug/g	<.65	U	SOIL

ER Site 111 RFI Analytical Results for Soil Samples; HE (EPA Method 8080; HPLC)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Tetryl	ug/g	3.3		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Trinitrobenzene, 1,3,5-	ug/g	<.25	U	SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Trinitrobenzene, 1,3,5-	ug/g	5.6		SOIL
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Trinitrotoluene	ug/g	5.2		SOIL
TA3/5-111-B3-15	SNL0130281	F	17-JUN-94	15	Trinitrotoluene, 2,4,6-	ug/g	<.25	U	SOIL
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	2,4-Dinitrotoluene	ug/L	<.02	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Amino-2,6-dinitrotoluene, 4-	ug/L	<.06	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Amino-4,6-dinitrotoluene, 2-	ug/L	<.035	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Dinitrobenzene, 1,3-	ug/L	<.11	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Dinitrotoluene, 2,6-	ug/L	<.31	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	HMX	ug/L	<.8	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Nitro-benzene	ug/L	<.25	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Nitrotoluene, m-	ug/L	<.25	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Nitrotoluene, o-	ug/L	<.25	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Nitrotoluene, p-	ug/L	<.25	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	RDX	ug/L	<.84	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Tetryl	ug/L	<.8	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Trinitrobenzene, 1,3,5-	ug/L	<.26	U	WATER
TA3/5-111-B-RBA	SNL0130284	EB	17-JUN-94	0	Trinitrotoluene, 2,4,6-	ug/L	<.11	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	2,4-Dinitrotoluene	ug/L	<.02	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Amino-2,6-dinitrotoluene, 4-	ug/L	<.06	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Amino-4,6-dinitrotoluene, 2-	ug/L	<.035	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Dinitrobenzene, 1,3-	ug/L	<.11	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Dinitrotoluene, 2,6-	ug/L	<.31	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	HMX	ug/L	<.8	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Nitro-benzene	ug/L	<.25	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Nitrotoluene, m-	ug/L	<.25	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Nitrotoluene, o-	ug/L	<.25	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Nitrotoluene, p-	ug/L	<.25	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	RDX	ug/L	<.84	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Tetryl	ug/L	<.8	U	WATER
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Trinitrobenzene, 1,3,5-	ug/L	<.26	U	WATER

ER Site 111 RFI Analytical Results for Soil Samples; HE (EPA Method 8080; HPLC)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Units	Amount Detected	QC Flag	Material Description
TA3/5-111-B-FBA	SNL0130288	FB	17-JUN-94	0	Trinitrotoluene, 2,4,6-	ug/L	<.11	U	WATER

ER Site 111 RFI Analytical Results for Soil Samples; Metals (EPA Method 6010)

ER Sample ID	Sample Number	Sample Type	Sample Date	Sample Depth (Feet)	Analyte	Analytical Method	Units	Amount Detected	QC Flag	ER Site	Material Description	Laboratory
TA3/5-111-B1-12	SNL0130267	F	17-JUN-94	12	Silver	6010	mg/kg	<1	U	111	SOIL	QUANTERRA
TA3/5-111-B2-8	SNL0130275	F	17-JUN-94	8	Silver	6010	mg/kg	2.1		111	SOIL	QUANTERRA
TA3/5-111-B2-8D	SNL0130271	D	17-JUN-94	8	Silver	6010	mg/kg	1.9		111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNL0130279	F	17-JUN-94	15	Silver	6010	mg/kg	.54	J	111	SOIL	QUANTERRA
TA3/5-111-B3-15	SNLA016889-2	SD	17-JUN-94	15	Silver	6010	mg/kg	5.2		111	SOIL	
TA3/5-111-B-FBA	SNL0130289	FB	17-JUN-94	0	Silver	6010	mg/L	<.01	U	111	WATER	QUANTERRAINE
TA3/5-111-B-RBA	SNL0130285	EB	17-JUN-94	0	Silver	6010	mg/L	<.01	U	111	WATER	QUANTERRA

SNL/NM 010000 SNL/NM 010001 SNL/NM 010002 SNL/NM 010003

National Laboratories

SF 2001-SCL (12-93)

ENVIRONMENTAL PROGRAMS SAMPLE COLLECTION LOG

SCL- 00620

AR/COC No.: AR/COC- 00346/00347

PAGE 1 OF 3

GENERAL INFORMATION

DATE: 6-17-94 | WEATHER: CLOUDY, 80-90

SAMPLING PROCEDURE REFERENCE: TA 3/5 RFI SAP

PURPOSE OF SAMPLING: PHASE I RFI

SAMPLING INFORMATION

ON-SITE CONTACT: PAULA SLAVIN | ORG.: 7582 | PHONE: 848-0334

AREA: TA 3 | LOCATION: SITE 111 - BLDG 6715 SUMP/DRAIN

SAMPLE DESCRIPTION

MATRIX: ☐ GAS ☐ LIQUID ☐ SLUDGE ☐ SOLID ☐ WATER ☐ OIL ☑ SOIL ☐ HAZ WASTE ☐ OTHER

COLLECTED FROM: ☐ DRUM ☐ TANK ☐ SURFACE WATER ☑ SOIL ☐ WASTE WATER ☐ GROUND WATER ☐ OTHER GEOPROBE

Sample Number - Fraction SNL/NM	Time	LOCATION	COMMENTS	ARCOC #	Sample Type Grab/Comp.	QC Sample (Y/N)	ANALYSES: VOC (8240)	SVOC (8270)	EXPLOSIVE RESIDUE (8330)	SILVER (6010)
016880-1	0825	111-B1-8		00347	G	N	X			
016880-2	↓	111-B1-8		00347		N		X	X	X
016881-1	0835	111-B1-12		00346 ~~00347~~		N	X			
016881-2	↓	111-B1-12		00346 ~~00347~~		N		X	X	X
016882-1	0847	111-B1-15		00347		N	X			
016882-2	↓	111-B1-15		00347		N		X	X	X
016883-1	1035	111-B2-8D	DUPLICATE OF SNL/NM 016880-1	00346		Y	X			
016883-2	↓	111-B2-8D	DUPLICATE OF SNL/NM 016880-2	00346		Y		X	X	X

PROJECT

PROJECT NAME: TA 3/5 - SITE 111 | CASE NUMBER: 3617.300 | PROJECT CONTACT: PAULA SLAVIN | ORG.: 7582 | PHONE: 848-0334

ADDITIONAL INFORMATION: ARCOC # 00347 SAMPLE ARCHIVED AT BLDG 6540. ARCOC # 00346 SENT TO ENSECO/RMAL

(Log Book Ref. #) PROJECT NO: 301455.152.02

SAMPLE TEAM MEMBERS

	NAME	SIGNATURE	INIT	COMPANY/ORGANIZATION
1.	Tim Jackson	Tim Jackson	TJ	IT CORP
2.	John Boyd			↓
3.				

SAMPLE TRACKING

SAMPLE DISTRIBUTION: ENSECO/RMAL | TRANSPORTED BY: A 44334 | SPECIAL HANDLING:

DATE SHIPPED (MM-DD-YY): 6/20/94 | DATA ENTERED (MM-DD-YY): 6/30/94 | BY:

*NOTE: Any additional sampling information must be recorded in an SNL-Issued Log Book or SCL Continuation Form with a Reference No. entered in this space.

WHITE - To Sample Management Office PINK- Originator ☐ TO BE COMPLETED BY SMO

Sandia National Laboratories

SNL/NM 016884 SNL/NM 016889 SNL/NM 016890 SNL/NM 016891
SNL/NM 016885
SNL/NM 016886
SNL/NM 016887
SNL/NM 016888

ENVIRONMENTAL PROGRAMS SAMPLE COLLECTION LOG

(Continuation)

SF 2001-SCC (4-94)

SCL- 00620

AR/COC No.: AR/COC- 00346

Sample Number - Fraction SNL/NM	Time	LOCATION	COMMENTS	Sample Type Grab/Comp.	QC Sample (Y/N)	ANALYSES: VOA (8240)	SVOA (8270)	Gamma Residue (8330)	Silver (6010)
016884-1	0950	111-B2-8	AR COC # 00346	G	N	X			
016884-2	↓	111-B2-8	↓				X	X	X
016885-1	0955	111-B2-12	AR COC # 00347 00346			X			
016885-2	↓	111-B2-12	↓				X	X	X
016886-1	1003	111-B2-15	00347			X			
016886-2	↓	111-B2-15					X	X	X
016887-1	1105	111-B3-5				X			
016887-2	↓	111-B3-5					X	X	X
016888-1	1113	111-B3-10				X			
016888-2	↓	111-B3-10			↓		X	X	X
016889-1	1120	111-B3-15	MATRIX SPIKE / MATRIX SPIKE DUPLICATE		Y	X			
016889-2	↓	111-B3-15	MATRIX SPIKE / MATRIX SPIKE DUPLICATE		Y		X	X	X
016890-1	1200	111-B - RBA	RINSATE BLANK (WATER MATRIX)		Y	X			
016890-2	↓	111-B - RBA	↓		Y		X		
016890-3		111-B - RBA			Y			X	
016890-4		111-B - RBA			Y				X
016891-1	1207	111-B - FBA	FIELD BLANK (WATER MATRIX)		Y	X			
016891-2	↓	111-B - FBA	↓		Y		X		
016891-3		111-B - FBA			Y			X	
016891-4		111-B - FBA			Y				X

WHITE - To Sample Management Office PINK - Originator

6/30/04 DQ

Sandia National Laboratories

SNL/NM 016892

F 2001-SCC (4-94)

ENVIRONMENTAL PROGRAMS SAMPLE COLLECTION LOG

(Continuation)

SCL- 00620

AR/COC No.: AR/COC- 00346

PAGE 3 OF 3

Sample Number - Fraction	Time	LOCATION	COMMENTS	Sample Type Grab/Comp.	QC Sample (Y/N)	ANALYSES: VOC (8240)	SVOC (8270)	Explosives/Rocket (8330)	Silver (6010)				
SNLNM 016892-1	1210	111-83-TBA	TRIP BLANK (WATER MATRIX) AR/COC # 00346	NA	Y	X							
			LAST LINE										

WHITE - To Sample Management Office PINK - Originator

6/30/94 RQ

Enseco

July 19, 1994

Mr. Jim Fish
c/o Ms. Katherine M. Becker
Sandia National Laboratory SMO
Organization 7576, Mail Stop 1305
BDM Building
2301 Buena Vista SE
Albuquerque, NM 87106

Dear Mr. Fish:

Enclosed is the report for eight soil samples and nine aqueous samples received at Enseco-Rocky Mountain Analytical Laboratory on June 21, 1994. Included with the report is a quality control summary.

Please call if you have any questions.

Sincerely,

Ellen La Riviere

Ellen La Riviere
Program Administrator

EL
Enclosures

RMAL #036355

DATA REVIEWED
By: MB Garcia Date: 8-5-94
Checked: _____
Approved: _____

Enseco
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

ANALYTICAL RESULTS

FOR

SANDIA NATIONAL LABORATORY

ENSECO-RMAL NO. 036355

JULY 19, 1994

Reviewed by: Ellen La Riviere

Ellen La Riviere

Enseco
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

I. OVERVIEW

On June 21, 1994, Enseco-Rocky Mountain Analytical Laboratory received eight soil samples and nine aqueous samples from Sandia National Laboratory.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

I. Overview
II. Sample Description Information/Analytical Test Requests
III. Analytical Results
IV. Quality Control Report

"J" values have been reported for the volatiles, semivolatiles, and metals analyses. A "J" value indicates an estimated value. For Methods 8240 and 8270 a "J" value is where the mass spectra data indicate the presence of a compound which meets identification criteria; however, the result is less than the reporting limit but greater than the method detection limit (MDL). For metals analyses "J" values are reported for those analytes which lie between the instrument detection limit (IDL) and the Enseco reporting limit. Analytes which were not detected at or below the reporting limit are reported as "ND" and do not have "J" flags. Because "J values" may represent false positive concentrations, care should be used when interpreting these data.

Organic Data Review

Due to instrument failure, al quality control samples associated with Method 8270 analysis of Rocky Mountain Analytical Laboratory (RMAL) sample 036355-0010-SA could not be completed. Because there was insufficient sample for repreparation and reanalysis, and the sample surrogates were within acceptable limits, the data were reported.

The Method 8330 QC lot 27 JUN 94-N1 shows the average percent accuracy for nitrobenzene exceeding the control limits. In addition the Method 8330 QC lot 23 JUN 94-N1 has the average percent accuracy and relative percent difference for

1,3,5-trinitrobenzene and the percent accuracy for 4-amino-2,6-dinitrotoluene exceeding the control limits. Because no target compounds were detected in any of the samples associated with these QC lots, no further action was required and the data were deemed acceptable for reporting.

Metals Data Review

The Method 6010 QC lot 01 JUL 94-9C has the relative percent difference for chromium exceeding control limits. Because chromium was not a target analyte for this method, no further action was required.

II. SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Enseco - RMAL is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

SAMPLE DESCRIPTION INFORMATION
for
Sandia National Laboratory

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
036355-0001-SA	SNLA016881-1	SOIL	17 JUN 94	08:35	21 JUN 94
036355-0002-SA	SNLA016881-2	SOIL	17 JUN 94	08:35	21 JUN 94
036355-0003-SA	SNLA016883-1	SOIL	17 JUN 94	10:35	21 JUN 94
036355-0004-SA	SNLA016883-2	SOIL	17 JUN 94	10:35	21 JUN 94
036355-0005-SA	SNLA016884-1	SOIL	17 JUN 94	09:50	21 JUN 94
036355-0006-SA	SNLA016884-2	SOIL	17 JUN 94	09:50	21 JUN 94
036355-0007-SA	SNLA016889-1	SOIL	17 JUN 94	11:20	21 JUN 94
036355-0007-MS	SNLA016889-1	SOIL	17 JUN 94	11:20	21 JUN 94
036355-0007-SD	SNLA016889-1	SOIL	17 JUN 94	11:20	21 JUN 94
036355-0008-SA	SNLA016889-2	SOIL	17 JUN 94	11:20	21 JUN 94
036355-0008-MS	SNLA016889-2	SOIL	17 JUN 94	11:20	21 JUN 94
036355-0008-SD	SNLA016889-2	SOIL	17 JUN 94	11:20	21 JUN 94
036355-0009-SA	SNLA016890-1	AQUEOUS	17 JUN 94	12:00	21 JUN 94
036355-0010-SA	SNLA016890-2	AQUEOUS	17 JUN 94	12:00	21 JUN 94
036355-0011-SA	SNLA016890-3	AQUEOUS	17 JUN 94	12:00	21 JUN 94
036355-0012-SA	SNLA016890-4	AQUEOUS	17 JUN 94	12:00	21 JUN 94
036355-0013-SA	SNLA016891-1	AQUEOUS	17 JUN 94	12:07	21 JUN 94
036355-0014-SA	SNLA016891-2	AQUEOUS	17 JUN 94	12:07	21 JUN 94
036355-0015-SA	SNLA016891-3	AQUEOUS	17 JUN 94	12:07	21 JUN 94
036355-0016-SA	SNLA016891-4	AQUEOUS	17 JUN 94	12:07	21 JUN 94
036355-0017-TB	SNLA016892-1	AQUEOUS	17 JUN 94	12:10	21 JUN 94

ANALYTICAL TEST REQUESTS
for
Sandia National Laboratory

Lab ID: 036355	Group Code	Analysis Description	Custom Test?
0001 , 0003, 0005 , 0007	A	Volatile Organics	N
		Target Compound List (TCL)	N
		GC Screen For Low Level Soils	N
0002 , 0004, 0006 , 0008	B	TCL Semivolatile Organics	N
		Prep - Semivolatile Organics by GC/MS	N
		Explosives by HPLC - Low Level	N
		Prep - Explosives by HPLC - Low Level	N
		ICP Metals (Total)	Y
		Prep - Total Metals, ICP	N
0009 , 0013, 0017	C	Volatile Organics	N
		Target Compound List (TCL)	N
		Screen - Volatile Organics	N
0010 , 0014	D	Semivolatile Organics	N
		Target Compound List (TCL)	
		Prep - Semivolatile Organics by GC/MS	N
0011 , 0015	E	Explosives by HPLC - Low Level	N
		Prep - Explosives by HPLC - Low Level	N
0012 , 0016	F	ICP Metals (Total)	Y
		Prep - Total Metals, ICP	N

III. ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization date is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e., no correction is made for moisture content.

IV. QUALITY CONTROL REPORT

The Enseco laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

1) establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data;

2) assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix;

3) establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench; and

4) provide a standard set of reportables which assures the client of the quality of his data.

The Enseco QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{\left| \text{Measured Concentration DCS1} - \text{Measured Concentration DCS2} \right|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
036355-0001-SA	SOIL	8240-SL	29 JUN 94-D	29 JUN 94-D
036355-0003-SA	SOIL	8240-SL	29 JUN 94-D	29 JUN 94-D
036355-0005-SA	SOIL	8240-SL	29 JUN 94-D	29 JUN 94-D
036355-0007-SA	SOIL	8240-SL	29 JUN 94-D	29 JUN 94-D
036355-0007-MS	SOIL	8240-SL	29 JUN 94-D	29 JUN 94-D
036355-0007-SD	SOIL	8240-SL	29 JUN 94-D	29 JUN 94-D
036355-0009-SA	AQUEOUS	624-A	23 JUN 94-D	23 JUN 94-D
036355-0013-SA	AQUEOUS	624-A	23 JUN 94-D	23 JUN 94-D
036355-0017-TB	AQUEOUS	624-A	23 JUN 94-D	23 JUN 94-D

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 8240-SL Matrix: SOIL QC Lot: 29 JUN 94-D Concentration Units: ug/kg								
1,1-Dichloroethene	50.0	51.6	43.8	47.7	95	65-137	16	20
Trichloroethene	50.0	52.8	50.8	51.8	104	83-118	3.9	12
Benzene	50.0	51.8	50.5	51.2	102	80-119	2.5	10
Toluene	50.0	53.9	48.5	51.2	102	80-119	11	12
Chlorobenzene	50.0	50.1	49.6	49.8	100	80-119	1.0	12
Category: 624-A Matrix: AQUEOUS QC Lot: 23 JUN 94-D Concentration Units: ug/L								
1,1-Dichloroethene	50.0	38.5	40.3	39.4	79	74-124	4.6	17
Trichloroethene	50.0	43.7	44.7	44.2	88	77-119	2.3	13
Benzene	50.0	43.0	44.5	43.8	88	80-117	3.4	12
Toluene	50.0	42.1	44.4	43.2	87	80-119	5.3	1[illegible]
Chlorobenzene	50.0	40.7	43.7	42.2	84	81-120	7.1	[illegible]

Calculations are performed before rounding to avoid round-off errors in calculated results.

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 8240-SL				
Matrix: SOIL				
QC Lot: 29 JUN 94-D QC Run: 29 JUN 94-D				
Concentration Units: ug/kg				
1,2-Dichloroethane-d4	50.0	48.1	96	82-112
4-Bromofluorobenzene	50.0	48.4	97	84-109
Toluene-d8	50.0	49.2	98	90-112
Category: 624-A				
Matrix: AQUEOUS				
QC Lot: 23 JUN 94-D QC Run: 23 JUN 94-D				
Concentration Units: ug/L				
1,2-Dichloroethane-d4	50.0	49.8	100	85-111
4-Bromofluorobenzene	50.0	50.5	101	86-110
Toluene-d8	50.0	49.5	99	91-110

Calculations are performed before rounding to avoid round-off errors in calculated results

METHOD BLANK REPORT
Volatile Organics by GC/MS

Test: 8240CPL-TCL-S
Matrix: SOIL
QC Lot: 29 JUN 94-D QC Run: 29 JUN 94-D

Analyte	Result	Units	Reporting Limit	
Acetone	ND	ug/kg	10	
Benzene	ND	ug/kg	5.0	
Bromodichloromethane	ND	ug/kg	5.0	
Bromoform	ND	ug/kg	5.0	
Bromomethane	ND	ug/kg	10	
2-Butanone (MEK)	ND	ug/kg	10	
Carbon disulfide	ND	ug/kg	5.0	
Carbon tetrachloride	ND	ug/kg	5.0	
Chlorobenzene	ND	ug/kg	5.0	
Chloroethane	ND	ug/kg	10	
Chloroform	ND	ug/kg	5.0	
Chloromethane	ND	ug/kg	10	
Dibromochloromethane	ND	ug/kg	5.0	
1,1-Dichloroethane	ND	ug/kg	5.0	
1,2-Dichloroethane	ND	ug/kg	5.0	
1,1-Dichloroethene	ND	ug/kg	5.0	
1,2-Dichloroethene (total)	ND	ug/kg	5.0	
1,2-Dichloropropane	ND	ug/kg	5.0	
cis-1,3-Dichloropropene	ND	ug/kg	5.0	
trans-1,3-Dichloropropene	ND	ug/kg	5.0	
Ethylbenzene	ND	ug/kg	5.0	
2-Hexanone	3.7	ug/kg	10	J
Methylene chloride	2.2	ug/kg	5.0	J
4-Methyl-2-pentanone (MIBK)	1.6	ug/kg	10	J
Styrene	ND	ug/kg	5.0	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0	
Tetrachloroethene	ND	ug/kg	5.0	
Toluene	ND	ug/kg	5.0	
1,1,1-Trichloroethane	ND	ug/kg	5.0	
1,1,2-Trichloroethane	ND	ug/kg	5.0	
Trichloroethene	ND	ug/kg	5.0	
Vinyl acetate	ND	ug/kg	10	
Vinyl chloride	ND	ug/kg	10	
Xylenes (total)	ND	ug/kg	5.0	

J = Result is detected below the reporting limit or is an estimated concentration.

Duplicate of page 00053

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METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: 8240CPL-TCL-S
Matrix: SOIL
QC Lot: 29 JUN 94-D QC Run: 29 JUN 94-D

Analyte	Result	Units	Reporting Limit	
Acetone	ND	ug/kg	10	
Benzene	ND	ug/kg	5.0	
Bromodichloromethane	ND	ug/kg	5.0	
Bromoform	ND	ug/kg	5.0	
Bromomethane	ND	ug/kg	10	
2-Butanone (MEK)	ND	ug/kg	10	
Carbon disulfide	ND	ug/kg	5.0	
Carbon tetrachloride	ND	ug/kg	5.0	
Chlorobenzene	ND	ug/kg	5.0	
Chloroethane	ND	ug/kg	10	
Chloroform	ND	ug/kg	5.0	
Chloromethane	ND	ug/kg	10	
Dibromochloromethane	ND	ug/kg	5.0	
1,1-Dichloroethane	ND	ug/kg	5.0	
1,2-Dichloroethane	ND	ug/kg	5.0	
1,1-Dichloroethene	ND	ug/kg	5.0	
1,2-Dichloroethene (total)	ND	ug/kg	5.0	
1,2-Dichloropropane	ND	ug/kg	5.0	
cis-1,3-Dichloropropene	ND	ug/kg	5.0	
trans-1,3-Dichloropropene	ND	ug/kg	5.0	
Ethylbenzene	ND	ug/kg	5.0	
2-Hexanone	3.7	ug/kg	10	J
Methylene chloride	2.2	ug/kg	5.0	J
4-Methyl-2-pentanone (MIBK)	1.6	ug/kg	10	J
Styrene	ND	ug/kg	5.0	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0	
Tetrachloroethene	ND	ug/kg	5.0	
Toluene	ND	ug/kg	5.0	
1,1,1-Trichloroethane	ND	ug/kg	5.0	
1,1,2-Trichloroethane	ND	ug/kg	5.0	
Trichloroethene	ND	ug/kg	5.0	
Vinyl acetate	ND	ug/kg	10	
Vinyl chloride	ND	ug/kg	10	
Xylenes (total)	ND	ug/kg	5.0	

J = Result is detected below the reporting limit or is an estimated concentration.

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: 8240CP-TCL-AP
Matrix: AQUEOUS
QC Lot: 23 JUN 94-D QC Run: 23 JUN 94-D

Analyte	Result	Units	Reporting Limit	
Acetone	5.4	ug/L	10	J
Benzene	ND	ug/L	5.0	
Bromodichloromethane	ND	ug/L	5.0	
Bromoform	ND	ug/L	5.0	
Bromomethane	ND	ug/L	10	
2-Butanone (MEK)	ND	ug/L	10	
Carbon disulfide	ND	ug/L	5.0	
Carbon tetrachloride	ND	ug/L	5.0	
Chlorobenzene	ND	ug/L	5.0	
Chloroethane	ND	ug/L	10	
Chloroform	ND	ug/L	5.0	
Chloromethane	ND	ug/L	10	
Dibromochloromethane	ND	ug/L	5.0	
1,1-Dichloroethane	ND	ug/L	5.0	
1,2-Dichloroethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	5.0	
1,2-Dichloroethene (total)	ND	ug/L	5.0	
1,2-Dichloropropane	ND	ug/L	5.0	
cis-1,3-Dichloropropene	ND	ug/L	5.0	
trans-1,3-Dichloropropene	ND	ug/L	5.0	
Ethylbenzene	ND	ug/L	5.0	
2-Hexanone	6.0	ug/L	10	J
Methylene chloride	ND	ug/L	5.0	
4-Methyl-2-pentanone (MIBK)	2.2	ug/L	10	J
Styrene	ND	ug/L	5.0	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	
Tetrachloroethene	ND	ug/L	5.0	
Toluene	ND	ug/L	5.0	
1,1,1-Trichloroethane	ND	ug/L	5.0	
1,1,2-Trichloroethane	ND	ug/L	5.0	
Trichloroethene	ND	ug/L	5.0	
Vinyl acetate	ND	ug/L	10	
Vinyl chloride	ND	ug/L	10	
Xylenes (total)	ND	ug/L	5.0	

J = Result is detected below the reporting limit or is an estimated concentration.

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Volatile Organics by GC/MS

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE DUPLICATE	8240CPL-TCL-S	036355-0007-SD	29 JUN 94-D
MATRIX SPIKE	8240CPL-TCL-S	036355-0007-MS	29 JUN 94-D

Enseco

MATRIX SPIKE / MATRIX SPIKE DUPLICATE REPORT
Volatile Organics by GC/MS

Analyte	Sample	Concentration Matrix Spike	Matrix Spike Dup	Spiked MS	Spiked MSD	%Recovery MS	%Recovery MSD	% RPD
Test: 8240CPL-TCL-S Matrix SOIL Sample: 036355-0007 Units: ug/kg								
Benzene	ND	46	50	50	50	92	99	7
Chlorobenzene	ND	47	51	50	50	94	102	8
1,1-Dichloroethene	ND	45	45	50	50	89	89	0
Toluene	1.8 J	46	48	50	50	89	92	3
Trichloroethene	ND	48	50	50	50	96	100	4

J = Result is detected below the reporting limit or is an estimated concentration.
ND = Not detected
NC = Not calculated, calculation not applicable

All calculations are performed before rounding to avoid round-off errors in calculated results.

QC LOT ASSIGNMENT REPORT
Semivolatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
036355-0002-SA	SOIL	8270-S	23 JUN 94-N1	23 JUN 94-N1
036355-0004-SA	SOIL	8270-S	23 JUN 94-N1	23 JUN 94-N1
036355-0006-SA	SOIL	8270-S	23 JUN 94-N1	23 JUN 94-N1
036355-0008-SA	SOIL	8270-S	23 JUN 94-N1	23 JUN 94-N1
036355-0008-MS	SOIL	8270-S	23 JUN 94-N1	23 JUN 94-N1
036355-0008-SD	SOIL	8270-S	23 JUN 94-N1	23 JUN 94-N1
036355-0014-SA	AQUEOUS	625-A	24 JUN 94-N1	24 JUN 94-N1

DUPLICATE CONTROL SAMPLE REPORT
Semivolatile Organics by GC/MS

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 8270-S Matrix: SOIL QC Lot: 23 JUN 94-N1 Concentration Units: ug/kg								
Phenol	6670	5210	4900	5060	76	45-107	6.1	19
2-Chlorophenol	6670	5460	5080	5270	79	46-112	7.2	17
1,4-Dichlorobenzene	3330	2770	2550	2660	80	58-101	8.3	22
N-Nitroso-di-n-propylamine	3330	2790	2660	2720	82	58-101	4.8	18
1,2,4-Trichlorobenzene	3330	2690	2500	2600	78	59-103	7.3	24
4-Chloro-3-methylphenol	6670	5020	4800	4910	74	41-123	4.5	16
Acenaphthene	3330	2570	2400	2480	75	54-110	6.8	15
4-Nitrophenol	6670	6070	5630	5850	88	30-132	7.5	22
2,4-Dinitrotoluene	3330	3270	3130	3200	96	51-117	4.4	17
Pentachlorophenol	6670	4800	4660	4730	71	32-130	3.0	29
Pyrene	3330	3100	2920	3010	90	52-115	6.0	20
Category: 625-A Matrix: AQUEOUS QC Lot: 24 JUN 94-N1 Concentration Units: ug/L								
Phenol	100	76.6	62.6	69.6	70	45-109	20	29
2-Chlorophenol	100	92.0	72.2	82.1	82	47-111	24	29
1,4-Dichlorobenzene	50	37.3	31.3	34.3	69	32-103	17	28
N-Nitroso-di-n-propylamine	50	37.2	30.3	33.8	68	49-107	20	24
1,2,4-Trichlorobenzene	50	35.3	30.9	33.1	66	44-102	13	27
4-Chloro-3-methylphenol	100	82.4	71.9	77.2	77	50-115	14	27
Acenaphthene	50	37.3	33.1	35.2	70	47-109	12	24
4-Nitrophenol	100	74.7	74.5	74.6	75	40-127	0.3	51
2,4-Dinitrotoluene	50	40.9	37.8	39.4	79	46-118	7.9	22
Pentachlorophenol	100	85.3	82.9	84.1	84	30-136	2.9	34
Pyrene	50	41.9	42.1	42.0	84	52-115	0.5	23

Calculations are performed before rounding to avoid round-off errors in calculated results.

SINGLE CONTROL SAMPLE REPORT
Semivolatile Organics by GC/MS

Analyte	Concentration Spiked	Measured	Accuracy(%) SCS	Limits
Category: 8270-S				
Matrix: SOIL				
QC Lot: 23 JUN 94-N1 QC Run: 23 JUN 94-N1				
Concentration Units: ug/kg				
Nitrobenzene-d5	1670	1340	80	62-110
2-Fluorobiphenyl	1670	1300	78	61-114
Terphenyl-d14	1670	1580	95	49-137
2-Fluorophenol	3330	2630	79	60-115
Phenol-d5	3330	2720	82	61-111
2,4,6-Tribromophenol	3330	2660	80	44-110
Category: 625-A				
Matrix: AQUEOUS				
QC Lot: 24 JUN 94-N1 QC Run: 24 JUN 94-N1				
Concentration Units: ug/L				
Nitrobenzene-d5	100	78.4	78	49-113
2-Fluorobiphenyl	100	63.7	64	43-104
Terphenyl-d14	100	74.1	74	33-139
2-Fluorophenol	200	138	69	42-100
Phenol-d5	200	145	72	50- 94
2,4,6-Tribromophenol	200	118	59	33-123

Calculations are performed before rounding to avoid round-off errors in calculated results

METHOD BLANK REPORT
Semivolatile Organics by GC/MS

Test: 8270-TCL-S
Matrix: SOIL
QC Lot: 23 JUN 94-N1 QC Run: 23 JUN 94-N1

Analyte	Result	Units	Reporting Limit
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330
2,4-Dinitrotoluene	ND	ug/kg	330

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8270-TCL-S Matrix: SOIL QC Lot: 23 JUN 94-N1 QC Run: 23 JUN 94-N1			
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Carbazole	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330
Test: 8270-TCL-S Matrix: SOIL QC Lot: 23 JUN 94-N1 QC Run: 23 JUN 94-N1			
Phenol	ND	ug/kg	330
bis(2-Chloroethyl) ether	ND	ug/kg	330
2-Chlorophenol	ND	ug/kg	330

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: 8270-TCL-S
Matrix: SOIL
QC Lot: 23 JUN 94-N1 QC Run: 23 JUN 94-N1

Analyte	Result	Units	Reporting Limit
1,3-Dichlorobenzene	ND	ug/kg	330
1,4-Dichlorobenzene	ND	ug/kg	330
Benzyl alcohol	ND	ug/kg	330
1,2-Dichlorobenzene	ND	ug/kg	330
2-Methylphenol	ND	ug/kg	330
bis(2-Chloroisopropyl) ether	ND	ug/kg	330
4-Methylphenol	ND	ug/kg	330
N-Nitroso-di-n-propylamine	ND	ug/kg	330
Hexachloroethane	ND	ug/kg	330
Nitrobenzene	ND	ug/kg	330
Isophorone	ND	ug/kg	330
2-Nitrophenol	ND	ug/kg	330
2,4-Dimethylphenol	ND	ug/kg	330
Benzoic acid	ND	ug/kg	1600
bis(2-Chloroethoxy) methane	ND	ug/kg	330
2,4-Dichlorophenol	ND	ug/kg	330
1,2,4-Trichlorobenzene	ND	ug/kg	330
Naphthalene	ND	ug/kg	330
4-Chloroaniline	ND	ug/kg	330
Hexachlorobutadiene	ND	ug/kg	330
4-Chloro-3-methylphenol	ND	ug/kg	330
2-Methylnaphthalene	ND	ug/kg	330
Hexachlorocyclopentadiene	ND	ug/kg	330
2,4,6-Trichlorophenol	ND	ug/kg	330
2,4,5-Trichlorophenol	ND	ug/kg	1600
2-Chloronaphthalene	ND	ug/kg	330
2-Nitroaniline	ND	ug/kg	1600
Dimethyl phthalate	ND	ug/kg	330
Acenaphthylene	ND	ug/kg	330
3-Nitroaniline	ND	ug/kg	1600
Acenaphthene	ND	ug/kg	330
2,4-Dinitrophenol	ND	ug/kg	1600
4-Nitrophenol	ND	ug/kg	1600
Dibenzofuran	ND	ug/kg	330
2,4-Dinitrotoluene	ND	ug/kg	330
2,6-Dinitrotoluene	ND	ug/kg	330
Diethyl phthalate	ND	ug/kg	330
4-Chlorophenyl phenyl ether	ND	ug/kg	330

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8270-TCL-S			
Matrix: SOIL			
QC Lot: 23 JUN 94-N1 QC Run: 23 JUN 94-N1			
Fluorene	ND	ug/kg	330
4-Nitroaniline	ND	ug/kg	1600
4,6-Dinitro-2-methylphenol	ND	ug/kg	1600
N-Nitrosodiphenylamine	ND	ug/kg	330
4-Bromophenyl phenyl ether	ND	ug/kg	330
Hexachlorobenzene	ND	ug/kg	330
Pentachlorophenol	ND	ug/kg	1600
Phenanthrene	ND	ug/kg	330
Anthracene	ND	ug/kg	330
Carbazole	ND	ug/kg	330
Di-n-butyl phthalate	ND	ug/kg	330
Fluoranthene	ND	ug/kg	330
Pyrene	ND	ug/kg	330
Butyl benzyl phthalate	ND	ug/kg	330
3,3'-Dichlorobenzidine	ND	ug/kg	660
Benzo(a)anthracene	ND	ug/kg	330
Bis(2-Ethylhexyl) phthalate	ND	ug/kg	330
Chrysene	ND	ug/kg	330
Di-n-octyl phthalate	ND	ug/kg	330
Benzo(b)fluoranthene	ND	ug/kg	330
Benzo(k)fluoranthene	ND	ug/kg	330
Benzo(a)pyrene	ND	ug/kg	330
Indeno(1,2,3-cd)pyrene	ND	ug/kg	330
Dibenz(a,h)anthracene	ND	ug/kg	330
Benzo(g,h,i)perylene	ND	ug/kg	330
Test: 8270CP-TCL-A			
Matrix: AQUEOUS			
QC Lot: 24 JUN 94-N1 QC Run: 24 JUN 94-N1			
Acenaphthene	ND	ug/L	10
Acenaphthylene	ND	ug/L	10
Anthracene	ND	ug/L	10
Benzo(a)anthracene	ND	ug/L	10
Benzo(b)fluoranthene	ND	ug/L	10
Benzo(k)fluoranthene	ND	ug/L	10
Benzo(g,h,i)perylene	ND	ug/L	10

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: 8270CP-TCL-A
Matrix: AQUEOUS
QC Lot: 24 JUN 94-N1 QC Run: 24 JUN 94-N1

Analyte	Result	Units	Reporting Limit
Benzo(a)pyrene	ND	ug/L	10
Benzoic acid	ND	ug/L	50
Benzyl alcohol	ND	ug/L	10
4-Bromophenyl phenyl ether	ND	ug/L	10
Butyl benzyl phthalate	ND	ug/L	10
Carbazole	ND	ug/L	10
4-Chloroaniline	ND	ug/L	10
bis(2-Chloroethoxy) methane	ND	ug/L	10
bis(2-Chloroethyl) ether	ND	ug/L	10
bis(2-Chloroisopropyl) ether	ND	ug/L	10
4-Chloro-3-methylphenol	ND	ug/L	10
2-Chloronaphthalene	ND	ug/L	10
2-Chlorophenol	ND	ug/L	10
4-Chlorophenyl phenyl ether	ND	ug/L	10
Chrysene	ND	ug/L	10
Dibenz(a,h)anthracene	ND	ug/L	10
Dibenzofuran	ND	ug/L	10
Di-n-butyl phthalate	ND	ug/L	10
1,2-Dichlorobenzene	ND	ug/L	10
1,3-Dichlorobenzene	ND	ug/L	10
1,4-Dichlorobenzene	ND	ug/L	10
3,3'-Dichlorobenzidine	ND	ug/L	20
2,4-Dichlorophenol	ND	ug/L	10
Diethyl phthalate	ND	ug/L	10
2,4-Dimethylphenol	ND	ug/L	10
Dimethyl phthalate	ND	ug/L	10
4,6-Dinitro-2-methylphenol	ND	ug/L	50
2,4-Dinitrophenol	ND	ug/L	50
2,4-Dinitrotoluene	ND	ug/L	10
2,6-Dinitrotoluene	ND	ug/L	10
Di-n-octyl phthalate	ND	ug/L	10
bis(2-Ethylhexyl) phthalate	ND	ug/L	10
Fluoranthene	ND	ug/L	10
Fluorene	ND	ug/L	10
Hexachlorobenzene	ND	ug/L	10

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: 8270CP-TCL-A
Matrix: AQUEOUS
QC Lot: 24 JUN 94-N1 QC Run: 24 JUN 94-N1

Analyte	Result	Units	Reporting Limit
Hexachlorobutadiene	ND	ug/L	10
Hexachlorocyclopentadiene	ND	ug/L	10
Hexachloroethane	ND	ug/L	10
Indeno(1,2,3-cd)pyrene	ND	ug/L	10
Isophorone	ND	ug/L	10
2-Methylnaphthalene	ND	ug/L	10
2-Methylphenol	ND	ug/L	10
4-Methylphenol	ND	ug/L	10
Naphthalene	ND	ug/L	10
2-Nitroaniline	ND	ug/L	50
3-Nitroaniline	ND	ug/L	50
4-Nitroaniline	ND	ug/L	50
Nitrobenzene	ND	ug/L	10
2-Nitrophenol	ND	ug/L	10
4-Nitrophenol	ND	ug/L	50
N-Nitrosodiphenylamine	ND	ug/L	10
N-Nitroso-di-n-propylamine	ND	ug/L	10
Pentachlorophenol	ND	ug/L	50
Phenanthrene	ND	ug/L	10
Phenol	ND	ug/L	10
Pyrene	ND	ug/L	10
1,2,4-Trichlorobenzene	ND	ug/L	10
2,4,5-Trichlorophenol	ND	ug/L	50
2,4,6-Trichlorophenol	ND	ug/L	10

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Semivolatile Organics by GC/MS

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE DUPLICATE	8270-TCL-S	036355-0008-SD	23 JUN 94-N1
MATRIX SPIKE	8270-TCL-S	036355-0008-MS	23 JUN 94-N1

MATRIX SPIKE / MATRIX SPIKE DUPLICATE REPORT
Semivolatile Organics by GC/MS

Analyte	Sample	Concentration Matrix Spike	Matrix Spike Dup	Spiked MS	Spiked MSD	%Recovery MS	%Recovery MSD	% RPD
Test: 8270-TCL-S Matrix SOIL Sample: 036355-0008 Units: ug/kg								
Phenol	ND	4400	3900	6700	6700	67	59	12
2-Chlorophenol	ND	5000	4300	6700	6700	76	64	16
1,4-Dichlorobenzene	ND	2400	2100	3300	3300	73	62	16
N-Nitroso-di-n-propylamine	ND	2900	2400	3300	3300	86	72	17
1,2,4-Trichlorobenzene	ND	2500	2100	3300	3300	75	62	19
4-Chloro-3-methylphenol	ND	4700	4100	6700	6700	71	62	14
Acenaphthene	ND	2400	2200	3300	3300	72	66	9
4-Nitrophenol	ND	5600	5100	6700	6700	84	77	9
2,4-Dinitrotoluene	ND	3200	2900	3300	3300	96	88	9
Pentachlorophenol	ND	3200	2800	6700	6700	48	42	13
Pyrene	ND	3400	2900	3300	3300	100	86	15

ND = Not detected
NC = Not calculated, calculation not applicable

All calculations are performed before rounding to avoid round-off errors in calculated results.

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
036355-0002-SA	SOIL	8330-LL-S	27 JUN 94-N1	27 JUN 94-N1
036355-0004-SA	SOIL	8330-LL-S	27 JUN 94-N1	27 JUN 94-N1
036355-0006-SA	SOIL	8330-LL-S	27 JUN 94-N1	27 JUN 94-N1
036355-0008-SA	SOIL	8330-LL-S	27 JUN 94-N1	27 JUN 94-N1
036355-0008-MS	SOIL	8330-LL-S	27 JUN 94-N1	27 JUN 94-N1
036355-0008-SD	SOIL	8330-LL-S	27 JUN 94-N1	27 JUN 94-N1
036355-0011-SA	AQUEOUS	8330-LL-A	23 JUN 94-N1	23 JUN 94-N1
036355-0015-SA	AQUEOUS	8330-LL-A	23 JUN 94-N1	23 JUN 94-N1

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 8330-LL-S Matrix: SOIL QC Lot: 27 JUN 94-N1 Concentration Units: ug/g								
HMX	5.00	5.74	5.84	5.79	116	82-153	1.7	10
RDX	5.00	5.86	5.97	5.92	118	62-176	1.9	17
1,3,5-Trinitrobenzene	5.00	5.54	5.48	5.51	110	60-149	1.1	19
1,3-Dinitrobenzene	5.00	6.12	6.20	6.16	123	73-145	1.3	10
Tetryl	5.00	2.27	2.47	2.37	47	1-115	8.4	50
Nitrobenzene	5.00	6.75	6.89	6.82	136	73-135	2.1	10
2,4,6-Trinitrotoluene	5.00	5.02	5.15	5.08	102	1-160	2.6	15
4-Amino-2,6-dinitrotoluene	5.00	6.84	6.86	6.85	137	84-181	0.3	22
2-Amino-4,6-dinitrotoluene	5.00	6.28	6.38	6.33	127	82-140	1.6	14
2,6-Dinitrotoluene	5.00	5.68	5.73	5.70	114	85-120	0.9	10
2,4-Dinitrotoluene	5.00	6.23	6.27	6.25	125	78-133	0.6	10
2-Nitrotoluene	5.00	5.72	5.86	5.79	116	81-126	2.4	10
4-Nitrotoluene	5.00	6.03	6.13	6.08	122	79-125	1.6	10
3-Nitrotoluene	5.00	4.51	4.58	4.54	91	78-131	1.5	10
Category: 8330-LL-A Matrix: AQUEOUS QC Lot: 23 JUN 94-N1 Concentration Units: ug/L								
HMX	2.50	2.48	2.21	2.34	94	58-131	12	27
RDX	2.50	1.78	1.83	1.80	72	67-149	2.8	26
1,3,5-Trinitrobenzene	2.50	4.02	3.63	3.82	153	44-140	10	23
1,3-Dinitrobenzene	2.50	2.11	1.93	2.02	81	41-110	8.9	30
Tetryl	12.5	2.92	2.65	2.78	22	1-104	9.7	38
Nitrobenzene	2.50	1.69	1.51	1.60	64	24- 80	11	50
2,4,6-Trinitrotoluene	12.5	1.29	1.15	1.22	10	1-113	11	22
4-Amino-2,6-dinitrotoluene	2.50	7.40	6.59	7.00	280	65-160	12	38
2-Amino-4,6-dinitrotoluene	2.50	2.77	2.46	2.62	105	50-121	12	35
2,6-Dinitrotoluene	2.50	1.81	1.67	1.74	70	39- 94	8.0	35
2,4-Dinitrotoluene	2.50	2.12	1.80	1.96	78	46-102	16	27
2-Nitrotoluene	2.50	1.62	1.34	1.48	59	23- 84	19	50
4-Nitrotoluene	2.50	1.78	1.47	1.62	65	26- 86	19	50
3-Nitrotoluene	2.50	1.87	1.57	1.72	69	23- 86	17	45

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 8330-COE-LL-S Matrix: SOIL QC Lot: 27 JUN 94-N1 QC Run: 27 JUN 94-N1			
HMX	ND	ug/g	2.2
RDX	ND	ug/g	1.0
1,3,5-Trinitrobenzene	ND	ug/g	0.25
1,3-Dinitrobenzene	ND	ug/g	0.25
Tetryl	ND	ug/g	0.65
Nitrobenzene	ND	ug/g	0.26
2,4,6-Trinitrotoluene	ND	ug/g	0.25
4-Amino-2,6-dinitrotoluene	ND	ug/g	0.25
2-Amino-4,6-dinitrotoluene	ND	ug/g	0.25
2,6-Dinitrotoluene	ND	ug/g	0.26
2,4-Dinitrotoluene	ND	ug/g	0.25
2-Nitrotoluene	ND	ug/g	0.25
4-Nitrotoluene	ND	ug/g	0.25
3-Nitrotoluene	ND	ug/g	0.25
Test: 8330-COE-LL-S Matrix: SOIL QC Lot: 27 JUN 94-N1 QC Run: 27 JUN 94-N1			
HMX	ND	ug/g	2.2
RDX	ND	ug/g	1.0
1,3,5-Trinitrobenzene	ND	ug/g	0.25
1,3-Dinitrobenzene	ND	ug/g	0.25
Tetryl	ND	ug/g	0.65
Nitrobenzene	ND	ug/g	0.26
2,4,6-Trinitrotoluene	ND	ug/g	0.25
4-Amino-2,6-dinitrotoluene	ND	ug/g	0.25
2-Amino-4,6-dinitrotoluene	ND	ug/g	0.25
2,6-Dinitrotoluene	ND	ug/g	0.26
2,4-Dinitrotoluene	ND	ug/g	0.25
2-Nitrotoluene	ND	ug/g	0.25
4-Nitrotoluene	ND	ug/g	0.25
3-Nitrotoluene	ND	ug/g	0.25

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8330-COE-LL-A			
Matrix: AQUEOUS			
QC Lot: 23 JUN 94-N1 QC Run: 23 JUN 94-N1			
HMX	ND	ug/L	0.80
RDX	ND	ug/L	0.84
1,3,5-Trinitrobenzene	ND	ug/L	0.26
1,3-Dinitrobenzene	ND	ug/L	0.11
Tetryl	ND	ug/L	0.80
Nitrobenzene	ND	ug/L	0.25
2,4,6-Trinitrotoluene	ND	ug/L	0.11
4-Amino-2,6-dinitrotoluene	ND	ug/L	0.060
2-Amino-4,6-dinitrotoluene	ND	ug/L	0.035
2,6-Dinitrotoluene	ND	ug/L	0.31
2,4-Dinitrotoluene	ND	ug/L	0.020
2-Nitrotoluene	ND	ug/L	0.25
4-Nitrotoluene	ND	ug/L	0.25
3-Nitrotoluene	ND	ug/L	0.25

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Organics by Chromatography

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE DUPLICATE	8330-COE-LL-S	036355-0008-SD	27 JUN 94-N1
MATRIX SPIKE	8330-COE-LL-S	036355-0008-MS	27 JUN 94-N1

MATRIX SPIKE / MATRIX SPIKE DUPLICATE REPORT
Organics by Chromatography

Analyte	Sample	Concentration Matrix Spike	Matrix Spike Dup	Spiked MS	Spiked MSD	%Recovery MS	%Recovery MSD	% RPD
Test: 8330-COE-LL-S								
Matrix SOIL								
Sample: 036355-0008								
Units: ug/g								
HMX	ND	6.0	5.8	5.0	5.0	120	115	4
RDX	ND	6.0	5.7	5.0	5.0	121	113	6
1,3,5-Trinitrobenzene	ND	5.8	5.6	5.0	5.0	116	113	3
1,3-Dinitrobenzene	ND	6.4	6.2	5.0	5.0	129	123	4
Tetryl	ND	3.4	3.3	5.0	5.0	68	66	3
Nitrobenzene	ND	7.2	6.9	5.0	5.0	144	137	5
2,4,6-Trinitrotoluene	ND	5.4	5.2	5.0	5.0	109	104	4
4-Amino-2,6-dinitrotoluene	ND	6.8	6.4	5.0	5.0	135	129	5
2-Amino-4,6-dinitrotoluene	ND	6.6	6.3	5.0	5.0	132	127	4
2,6-Dinitrotoluene	ND	6.0	5.8	5.0	5.0	121	116	4
2,4-Dinitrotoluene	ND	6.5	6.2	5.0	5.0	130	124	4
2-Nitrotoluene	ND	6.2	5.8	5.0	5.0	125	116	8
4-Nitrotoluene	ND	6.5	6.0	5.0	5.0	130	120	8
3-Nitrotoluene	ND	4.8	4.6	5.0	5.0	97	91	6

ND = Not detected
NC = Not calculated, calculation not applicable

All calculations are performed before rounding to avoid round-off errors in calculated results.

QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
036355-0002-SA	SOIL	ICP-S	27 JUN 94-9D	27 JUN 94-9D
036355-0004-SA	SOIL	ICP-S	27 JUN 94-9D	27 JUN 94-9D
036355-0006-SA	SOIL	ICP-S	27 JUN 94-9D	27 JUN 94-9D
036355-0008-SA	SOIL	ICP-S	27 JUN 94-9D	27 JUN 94-9D
036355-0008-MS	SOIL	ICP-S	27 JUN 94-9D	27 JUN 94-9D
036355-0008-SD	SOIL	ICP-S	27 JUN 94-9D	27 JUN 94-9D
036355-0012-SA	AQUEOUS	ICP-AT	01 JUL 94-9C	01 JUL 94-9C
036355-0016-SA	AQUEOUS	ICP-AT	01 JUL 94-9C	01 JUL 94-9C

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: ICP-S Matrix: SOIL QC Lot: 27 JUN 94-9D Concentration Units: mg/kg								
Aluminum	200	184	187	186	93	80-120	1.7	20
Antimony	50	46.0	47.3	46.7	93	80-120	2.6	20
Arsenic	50	42.2	43.8	43.0	86	80-120	3.8	20
Barium	200	185	186	186	93	80-120	1.0	20
Beryllium	5.0	5.08	5.39	5.23	105	80-120	5.8	20
Cadmium	5.0	4.42	4.42	4.42	88	80-120	0.0	20
Calcium	10000	9610	9510	9560	96	80-120	1.0	20
Chromium	20	18.3	18.8	18.6	93	80-120	2.4	20
Cobalt	50	45.1	47.1	46.1	92	80-120	4.4	20
Copper	25	23.1	24.4	23.8	95	80-120	5.7	20
Iron	100	87.0	89.8	88.4	88	80-120	3.2	20
Lead	50	44.5	46.8	45.6	91	80-120	5.0	20
Magnesium	5000	4970	4940	4960	99	80-120	0.5	20
Manganese	50	46.1	48.1	47.1	94	80-120	4.3	20
Nickel	50	44.0	46.0	45.0	90	80-120	4.4	20
Potassium	5000	4760	4710	4730	95	80-120	1.0	20
Silver	5	4.85	4.80	4.82	96	80-120	0.9	20
Sodium	10000	10200	10100	10200	102	80-120	1.0	20
Vanadium	50	44.7	45.3	45.0	90	80-120	1.4	20
Zinc	50	43.9	44.8	44.4	89	80-120	2.1	20
Category: ICP-AT Matrix: AQUEOUS QC Lot: 01 JUL 94-9C Concentration Units: mg/L								
Aluminum	2.00	2.10	2.11	2.10	105	80-116	0.3	10
Antimony	0.500	0.557	0.563	0.560	112	80-115	1.1	14
Arsenic	0.500	0.490	0.503	0.496	99	80-115	2.5	17
Barium	2.00	2.13	2.13	2.13	106	80-114	0.0	10
Beryllium	0.0500	0.0593	0.0598	0.0596	119	80-120	1.0	10
Cadmium	0.0500	0.0526	0.0562	0.0544	109	80-119	6.7	16
Calcium	100	107	108	107	107	80-114	0.7	10
Chromium	0.200	0.207	0.243	0.225	112	80-116	16	11
Cobalt	0.500	0.535	0.531	0.533	107	80-114	0.7	10
Copper	0.250	0.267	0.275	0.271	109	80-120	2.9	10
Iron	1.00	0.975	1.09	1.03	103	80-120	11	11
Lead	0.500	0.498	0.537	0.518	104	80-119	7.6	10

Calculations are performed before rounding to avoid round-off errors in calculated results.

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: ICP-AT Matrix: AQUEOUS QC Lot: 01 JUL 94-9C Concentration Units: mg/L								
Magnesium	50.0	57.0	57.3	57.2	114	81-120	0.6	10
Manganese	0.500	0.533	0.536	0.534	107	80-116	0.6	10
Nickel	0.500	0.515	0.525	0.520	104	80-114	2.0	10
Potassium	50.0	52.9	52.8	52.8	106	80-120	0.2	13
Selenium	0.500	0.471	0.477	0.474	95	80-120	1.2	20
Silver	0.050	0.0530	0.0550	0.0540	108	80-119	3.8	15
Sodium	100	115	116	115	115	80-120	0.9	10
Vanadium	0.500	0.501	0.499	0.500	100	80-116	0.4	10
Zinc	0.500	0.528	0.534	0.531	106	80-120	1.0	13

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-S Matrix: SOIL QC Lot: 27 JUN 94-9D QC Run: 27 JUN 94-9D			
Silver	ND	mg/kg	1.0
Test: ICP-S Matrix: SOIL QC Lot: 27 JUN 94-9D QC Run: 27 JUN 94-9D			
Silver	ND	mg/kg	1.0
Test: ICP-AT Matrix: AQUEOUS QC Lot: 01 JUL 94-9C QC Run: 01 JUL 94-9C			
Silver	ND	mg/L	0.010

Enseco

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Metals Analysis and Preparation

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE DUPLICATE	ICP-S	036355-0008-SD	27 JUN 94-9D
MATRIX SPIKE	ICP-S	036355-0008-MS	27 JUN 94-9D

MATRIX SPIKE / MATRIX SPIKE DUPLICATE REPORT
Metals Analysis and Preparation

Analyte	Sample	Concentration Matrix Spike	Matrix Spike Dup	Spiked MS	Spiked MSD	%Recovery MS	%Recovery MSD	% RPD
Test: ICP-S Matrix SOIL Sample: 036355-0008 Units: mg/kg								
Silver	0.54 J	5.1	5.2	5.0	5.0	90	93	3

J = Result is detected below the reporting limit or is an estimated concentration.

All calculations are performed before rounding to avoid round-off errors in calculated results.

Sandia National Laboratories

F 2001-COC (12-93)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

AR/COC- 00346

PAGE 1 OF 2

Department No.: 7582
Project/Task Manager: CHRIS ABEL / PAULA SLAVIN
Project Name: TA 3/5 - SITE 111
Sample Team Members: TIM JACKSON, JOHN BOYD
SCL or Logbook Ref. No.: 00620

Date Samples Shipped: A-44334 6/20/94
Carrier/Waybill No.: A44334
Lab Destination: ENSECO/RMAL
Lab Contact: ELLEN LA RIVIERE
SMO Contact/Phone: (505) 848-0402
Send Report to SMO: PAM PUISSANT
SMO Reference No.: 30145.162.02

Bill to: Sandia National Laboratories
Supplier Services Department
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154
Contract No.: 67-9736 8
Case No.: 3617.300
SMO Authorization: D. M. Layne

Sample Number - Fraction	Sample Matrix	Date/Time Collected	Container Type	Sample Volume	Preservative	Required Analytical Testing	Lab Sample Number	Condition on Receipt
NT/NM 016888-1	SOIL	6-14-94/0835	GLASS	4 oz	ICE, 4°C	VOC (8240)	36355 1	good
016888-2		1035		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)	2	
016883-1		0835 TD		4 oz		VOC (8240)	3	
016883-2		0935		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)	4	
016888-1		0847 TD		4 oz		VOC (8240)	5	
016888-2		0950		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)	6	
016889-1		1120		2 x 4 oz		VOC (8240) MS/MSD	7	MS/SD
016889-2				2 x 16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010) MS/MSD	8	MS/SD
016890-1	WATER	1200		3 x 40 mL	HCL	VOC (8240)	9	
016890-2				2 x 1 L	ICE, 4°C	SVOC (8270)	10	
016890-3				2 x 1 L		EXPLOSIVE RESIDUE (8330)	11	

Possible Hazard Identification
☑ Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Radiological

*Reference attached radiological screening for specific contact readings.

Turnaround Time
☑ Normal ☐ Rush _____ Required Report Date PER CONTRACT

Sample Disposal
☐ Return to Client ☑ Disposal by Lab Archive Until PER CONTRACT

Special Instructions/QC Requirements
- PLEASE FAX COPY OF RESULTS TO PAULA SLAVIN @ (505) 848-0417
- ENVIRONMENTAL SAMPLES - NO CONTAMINATION SUSPECTED
- MS/MSD = MATRIX SPIKE / MATRIX SPIKE DUPLICATE

Relinquished by Tim Jackson	Org. ITC	Date 6-20-94	Time 0945
Received by	Org. GMO ITC	Date 6-21-94	Time 0945
Relinquished by	Org. [illegible] 7536	Date 6/21/94	Time 1500
Received by Bonnie Hager	Org. RMAL	Date 6/21/94	Time 0845
Relinquished by	Org.	Date	Time
Received by	Org.	Date	Time

4. Relinquished by	Org.	Date	Time
4. Received by	Org.	Date	Time
5. Relinquished by	Org.	Date	Time
5. Received by	Org.	Date	Time
6. Relinquished by	Org.	Date	Time
6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Laboratory
BLUE - To Accompany Samples, Return to SMO
YELLOW - SMO Defense Copy
PINK - Field Copy

National Laboratories

SF 2001 COD (12-93)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD
(continuation)

AR/COC- 00346

PAGE 2 OF 2

Project Name: TA 3/5 - SITE 111 Project/Task Manager: CHRIS ARAS / PAULA SLAVIN Case No.: 3617.300

Sample Number - Fraction	Sample Matrix	Date/Time Collected	Container Type	Sample Volume	Preservative	Required Analytical Testing	Lab Sample Number	Condition on Receipt
016890 - 4	WATER	6-17-99/1200	POLY	500mL	HNO_3	SILVER (6010)	3635512	good
016891 - 1	↓	1207	GLASS	3X40mL	HCL	VOC (8240)	13	↓
016891 - 2		↓	↓	2X1L	ICE, 4°C	SVOC (8270)	14	
016891 - 3				2X1L	ICE, 4°C	EXPLOSIVE RESIDUE (8330)	15	
016891 - 4			POLY	500mL	HNO_3	SILVER (6010)	16	
016892 - 1	↓	1210	GLASS	40mL	HCL	VOC (8240) TRIP BLANK	17	↓
			TP					
						Rec'd by LMC Bonnie Mayer 6/21/99 0845		

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples, Return to SMO YELLOW- SMO Suspense Copy PINK- Field Copy

RMAL Industrial Sample Checklist **Revision 6.0 January 24, 1994**

Project #: 36355 Date/Time Received: 6/21/94 0845

Company Name & Sampling Site: Sandia

*Cooler #(s): Trip Blank _____ _____ _____ * Place copy of airbill inside all non-RMAL coolers. Describe here.

Temperatures: 6.1 _____ _____ _____

UNPACKING & LABELING CHECK POINTS:	Y	N	INITIALS
1. Radiation Checked; (record reading if > 0.5 mR/hr):	✓		BM
2. Cooler seals Intact:	✓		
3. Chain of Custody Present:	✓		
4. Bottles broken or leaking (comment if Y): **-photograph broken bottles-**		✓	
5. Containers labeled (comment if N):	✓		
6. Chain of Custody includes "received by" and "relinquished by" signatures, dates, and times:	✓		
7. CoC agrees with bottle count (comment if N):	✓		
8. CoC agrees with labels (comment if N):	✓		
9. VOA samples filled completely (comment if N):	✓		
10. Are VOA samples preserved? (Check for bottle labels)	✓		
11. Sediment present in "D" bottles:	NA		
12. Are analyses with short holding times requested?		✓	
13. Is extra sample volume provided for Matrix Spike and/or matrix replicates?	✓		
14. Multi phase samples present (comment if Y): **-photograph multiphase samples-**	NA		
15. Clear picture taken, labeled, and stapled to project folder?	✓		✓

Comments: include action taken to resolve discrepancies/problems. Include a hard copy of VAX mail or extra paper if more space is needed.

_____

_____

_____

_____ Initials: _____

Rocky Mountain Analytical Laboratory
4955 Yarrow Street, Arvada, CO 80002 (303) 421-6611

A DIVISION OF
ENSECO
INCORPORATED

06/21/94

Jim Fish
Sandia National Laboratory - Department 7576
PO Box 5800
Albuquerque, NM 871851305

Dear Mr. Fish:

This letter acknowledges the acceptance of 21 samples at Rocky Mountain Analytical Laboratory (RMAL) which have been assigned to project number 036355. Attached are the Sample Description Information form, cross-referencing the RMAL sample numbers to client descriptions, and a copy of the signed Chain of Custody.

If you have any questions or need additional information, please contact me at (303)421-6611. Thank you.

Sincerely,

Ellen La Riviere

Ellen La Riviere
Program Administrator

Rocky Mountain Analytical Laboratory

06/21/94

SAMPLE DESCRIPTION INFORMATION

for

Sandia National Laboratory

Sample No.	Sample Description	Sample Type	Date Sampled	Time Sampled	Date Receive
036355-0001-SA	SNLA016881-1	SOIL	06/17/94	08:35	06/21/94
036355-0002-SA	SNLA016881-2	SOIL	06/17/94	08:35	06/21/94
036355-0003-SA	SNLA016883-1	SOIL	06/17/94	10:35	06/21/94
036355-0004-SA	SNLA016883-2	SOIL	06/17/94	10:35	06/21/94
036355-0005-SA	SNLA016884-1	SOIL	06/17/94	09:50	06/21/94
036355-0006-SA	SNLA016884-2	SOIL	06/17/94	09:50	06/21/94
036355-0007-SA	SNLA016889-1	SOIL	06/17/94	11:20	06/21/94
036355-0007-MS	SNLA016889-1	SOIL	06/17/94	11:20	06/21/94
036355-0007-SD	SNLA016889-1	SOIL	06/17/94	11:20	06/21/94
036355-0008-SA	SNLA016889-2	SOIL	06/17/94	11:20	06/21/94
036355-0008-MS	SNLA016889-2	SOIL	06/17/94	11:20	06/21/94
036355-0008-SD	SNLA016889-2	SOIL	06/17/94	11:20	06/21/94
036355-0009-SA	SNLA016890-1	AQUEOUS	06/17/94	12:00	06/21/94
036355-0010-SA	SNLA016890-2	AQUEOUS	06/17/94	12:00	06/21/94
036355-0011-SA	SNLA016890-3	AQUEOUS	06/17/94	12:00	06/21/94
036355-0012-SA	SNLA016890-4	AQUEOUS	06/17/94	12:00	06/21/94
036355-0013-SA	SNLA016891-1	AQUEOUS	06/17/94	12:07	06/21/94
036355-0014-SA	SNLA016891-2	AQUEOUS	06/17/94	12:07	06/21/94
036355-0015-SA	SNLA016891-3	AQUEOUS	06/17/94	12:07	06/21/94
036355-0016-SA	SNLA016891-4	AQUEOUS	06/17/94	12:07	06/21/94
036355-0017-TB	SNLA016892-1	AQUEOUS	06/17/94	12:10	06/21/94

Laboratories

SF 2001-COC (12-93)

ANALYSIS R UEST AND CHAIN OF CUSTODY RECORD

AR/COC- 0 .546

PAGE 1 OF 2

Department No.:	7582	Date Samples Shipped:	~~A 44334~~ 6/20/94	Bill to:	Sandia National Laboratories
Project/Task Manager:	CHRIS AAS/ PAULA SLAVIN	Carrier/Waybill No.:	A 44334		Supplier Services Department
Project Name:	TA 3/5 - SITE 111	Lab Destination:	ENSECO/RMAL		P.O. Box 5800 MS 0154
Sample Team Members	TIM JACKSON	Lab Contact:	ELLEN LA RIVIERE		Albuquerque, NM 87185-0154
	JOHN BOYD	SMO Contact/Phone:	(505) 848-0402	Contract No.:	67-9736 B
		Send Report to SMO:	PAM PUSSANT	Case No.:	3617.300
SCL or Logbook Ref. No.:	00620	SMO Reference No.:	301455.152.02	SMO Authorization:	D M Layle

Sample Number - Fraction	Sample Matrix	Date/Time Collected	Container Type	Sample Volume	Preservative	Required Analytical Testing	Lab Sample Number	Condition on Receipt
SNL/NM 016884 - 1	SOIL	6-17-94/1035	GLASS	4 oz	ICE, 4°C	VOC (8240)	36355 1	good
016884 - 2		↓		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)	2	
016883 - 1		1035 + 035 TU		4 oz		VOC (8240)	3	
016883 - 2		↓		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)	4	
016885 - 1		0950 + 047 TU		4 oz		VOC (8240)	5	
016885 - 2		0950 ↓		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)	6	
016889 - 1		1120		2 x 4 oz		VOC (8240) MS/MSD	7	MS/MSD
016889 - 2		↓ 1200		2 x 16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010) MS/MSD	8	MS/MSD
016890 - 1	WATER			3 x 40 mL	HCL	VOC (8240)	9	
016890 - 2				2 x 1 L	ICE, 4°C	SVOC (8270)	10	
016890 - 3	↓	↓	↓	2 x 1 L	↓	EXPLOSIVE RESIDUE (8330)	11	↓

Possible Hazard Identification

☑ Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Radiological

*Reference attached radiological screening for specific contact readings.

Turnaround Time

☑ Normal ☐ Rush _____ Required Report Date PER CONTRACT

Sample Disposal

☐ Return to Client ☑ Disposal by Lab Archive Until PER CONTRACT

Special Instructions/QC Requirements

- PLEASE FAX COPY OF RESULTS TO PAULA SLAVIN @ (505) 848-0417
- ENVIRONMENTAL SAMPLES - NO CONTAMINATION SUSPECTED
- MS/MSD = MATRIX SPIKE / MATRIX SPIKE DUPLICATE

1. Relinquished by	Tim Jackson	Org.	ITC	Date	6-20-94	Time	0945	4. Relinquished by	Org.	Date	Time
1. Received by		Org.	SMO ITC	Date	6-20-94	Time	0945	4. Received by	Org.	Date	Time
2. Relinquished by		Org.	SMO 2526	Date	6/21/94	Time	1500	5. Relinquished by	Org.	Date	Time
2. Received by	Roxane Hayes	Org.	RMAL	Date	6/21/94	Time	0845	5. Received by	Org.	Date	Time
3. Relinquished by		Org.		Date		Time		6. Relinquished by	Org.	Date	Time
3. Received by		Org.		Date		Time		6. Received by	Org.	Date	Time

WHITE - To Accompany Samples, Labo[illegible] Copy

BLUE- To Accompany Samples, Return to SMO

YELLOW- S[illegible] Suspense Copy

PINK- Field Copy

Sandia National Laboratories

SF 2001-COD (12-93)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD
(continuation)

AR/COC- 00346

Project Name: TA 3/5 - SITE 111   Project/Task Manager: CHRIS AAS / PAULA SLAVIN   Case No.: 3617.300

Sample Number - Fraction	Sample Matrix	Date/Time Collected	Container Type	Sample Volume	Preservative	Required Analytical Testing	Lab Sample Number	Condition on Receipt
016890 - 4	WATER	6-17-94/1200	POLY	500mL	HNO_3	SILVER (6010)	363551 2	Good
016891 - 1	↓	1207	GLASS	3X40mL	HCL	VOC (8240)	13	↓
016891 - 2	↓	↓	↓	2X1L	ICE, 4°C	SVOC (8270)	14	↓
016891 - 3	↓	↓	↓	2X1L	ICE, 4°C	EXPLOSIVE RESIDUE (8330)	15	↓
016891 - 4	↓	↓	POLY	500mL	HNO_3	SILVER (6010)	16	↓
016892 - 1	↓	1210	GLASS	40mL	HCL	VOC (8240) TRIP BLANK	17	✓

Rec'd by [illegible] 6/21/94 0845

WHITE - To Accompany Samples, Laboratory Copy   BLUE- To Accompany Samples Return to SMO   YELLOW- SMO Suspense Copy   PINK- F[illegible] Copy

Sandia National Laboratories

SF 2001-COC (12-93)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

AR/COC- 0 546

Department No.: 7582	Date Samples Shipped: A41534 6/20/94	Bill to:	Sandia National Laboratories
Project/Task Manager:	Carrier/Waybill No.: A41534		Supplier Services Department
Project Name:	Lab Destination: ENSECO/RMAL		P.O. Box 5800 MS 0154
Sample Team Members	Lab Contact: ELLEN LA RIVIERE		Albuquerque, NM 87185-0154
	SMO Contact/Phone: (505) 848-0402	Contract No.:	67-4736 3
	Send Report to SMO: PAM PUISSANT	Case No.:	3617.300
SCL or Logbook Ref. No.: 00620	SMO Reference No.: 301455.152.02	SMO Authorization:	D M [signature]

Sample Number - Fraction	Sample Matrix	Date/Time Collected	Container Type	Sample Volume	Preservative	Required Analytical Testing	Lab Sample Number	Condition on Receipt
016887-1	SOIL	6-17-94 1025	GLASS	4 oz	ICE, 4°C	VOC (8240)		
016887-2	↓	1035	↓	16 oz	↓	SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)		
016883-1		1055		4 oz		VOC (8240)		
016883-2				16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)		
016884-1		0930 / 1047		4 oz		VOC (8240)		
016884-2		1015		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)		
016889-1		1120		2x4 oz		VOC (8240) MS/MSD		
016889-2	↓	↓		2x16 oz	↓	SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010) MS/MSD		
016890-1	WATER	1200		3x40 ml	HCL	VOC (8240)		
016890-2	↓	↓		2x1L	ICE, 4°C	SVOC (8270)		
016890-3	↓	↓	↓	2x1L	↓	EXPLOSIVE RESIDUE (8330)		

Possible Hazard Identification
☒ Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Radiological

*Reference attached radiological screening for specific contact readings.

Turnaround Time
☒ Normal ☐ Rush ______ Required Report Date PER CONTRACT

Sample Disposal
☐ Return to Client ☒ Disposal by Lab Archive Until PER CONTRACT

Special Instructions/QC Requirements
- PLEASE FAX COPY OF RESULTS TO PAMELA SLAVIN @ (505) 848-0417
- ENVIRONMENTAL SAMPLES - NO CONTAMINATION SUSPECTED
- MS/MSD = MATRIX SPIKE / MATRIX SPIKE DUPLICATE

	Org.	Date	Time		Org.	Date	Time
1. Relinquished by [signature]	7582	6-20-94	0945	4. Relinquished by			
1. Received by [signature]	4000 LTC	6-20-94	0945	4. Received by			
2. Relinquished by [signature]	[illegible]	6-20-94	1500	5. Relinquished by			
2. Received by				5. Received by			
3. Relinquished by				6. Relinquished by			
3. Received by				6. Received by			

WHITE - To Accompany Samples, Lab Copy   BLUE - To Accompany Samples, Return to SMO   YELLOW - SMO Suspense Copy   PINK - Field Copy

Sandia National Laboratories

SF 2001-COD (12-93)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD
(continuation)

AR/COC- [illegible]

Project Name: [illegible] Project/Task Manager: [illegible] Case No.: [illegible]

Sample Number - Fraction	Sample Matrix	Date/Time Collected	Container Type	Sample Volume	Preservative	Required Analytical Testing	Lab Sample Number	Condition on Receipt
[illegible] -4	WATER	6-17-97/1207	Poly	500ml	HNO_3	Metals ([illegible])		
[illegible] 891- 1	↓	1207	GLASS	3×40ml	HCl	VOC (8260)		
[illegible] 891- 2		↓	↓	2×1L	[illegible]	SVOC (8270)		
[illegible] 891- 3			↓	2×1L	[illegible] 4°C	Explosive Residue (8330)		
[illegible] -4		↓	Poly	500ml	HNO_3	Metals (6010)		
[illegible] 891-1	↓	1210	GLASS	40ml	HCl	VOC (8260) Trip Blank		

WHITE - To Accompany Samples, Laboratory Copy BLUE- To Accompany Samples Return to SMO YELLOW- SMO Suspense Copy PINK- F[illegible] Copy

CUSTOMER:
PLEASE REMOVE ONE OF THESE LABELS AND PLACE IT ABOVE THE AIRBILL ON YOUR PACKAGE.

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5273
6055

1 SENDER'S FEDERAL EXPRESS ACCOUNT NUMBER: 1516-4690-5
Date: 6/20/94

From (Your Name) Please Print: FELIX GUTIERREZ
Your Phone Number (Very Important): (505) 844-3462
Company: SANDIA LABS US/DOE
Department/Floor No.:
Street Address: 1515 EUBANK BLVD SE
City: ALBUQUERQUE
State: NM
ZIP Required: 8 7 1 2 3

2 To (Recipient's Name) Please Print: ELLEN LA RIVIERE
Recipient's Phone Number (Very Important): ( )
Company: ENSECO/ROCKY MTN. ANAL. LABORATORY
Department/Floor No.:
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes): 4955 YARROW ST. CONTRACT #67-9736B
City: ARVADA
State: CO
ZIP Required: 80002

338
500

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 7576/6987.200/C50070

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City
State
ZIP Required

3 PAYMENT
1 [X] Bill Sender Acct No Req'd
2 [ ] Bill Recipient's FedEx Acct No Fill in Account Number below
3 [ ] Bill 3rd Party FedEx Acct No Fill in Account Number below (req'd)
4 [ ] Bill Credit Card Fill in Credit Card No below (req'd)
5 [ ] Cash/Check
Acct /Credit Card No
Exp Date

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning)
11 [ ] YOUR PACKAGING
16 [ ] FEDEX LETTER *
12 [ ] FEDEX PAK *
13 [ ] FEDEX BOX
14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon)
51 [ ] YOUR PACKAGING
56 [ ] FEDEX LETTER *
52 [ ] FEDEX PAK *
53 [ ] FEDEX BOX
54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day)
30 [ ] ECONOMY

Government Overnight (Restricted to authorized users only)
46 [ ] GOVT LETTER
41 [X] GOVT PACKAGE

Freight Service (for Extra Large or any package over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT **
80 [ ] TWO-DAY FREIGHT **
† Delivery commitment may be later in some areas
* Declared Value Limit $100
** Call for delivery schedule

5 DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [X] DELIVER WEEKDAY
3 [ ] DELIVER SATURDAY (Extra charge) (Not available to all locations)
4 [ ] DANGEROUS GOODS (Extra charge)
5 [ ]
6 [ ] DRY ICE .... Lbs
7 [ ] OTHER SPECIAL SERVICE
8 [ ]
9 [ ] SATURDAY PICK-UP (Extra charge)
10 [ ]
11 [ ]
12 [ ] HOLIDAY DELIVERY (if offered) (Extra charge)

6
PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
1	68	
Total 1	Total 68	Total

DIM SHIPMENT (Chargeable Weight)
[ ] ___ x ___ x ___ lbs

Received At
1 [ ] Regular Stop
3 [ ] Drop Box
2 [ ] On-Call Stop
4 [ ] B.S.C.
5 [ ] Station

SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY

Use of this airbill constitutes your agreement to the service conditions in our current Service Guide, available upon request. See back of sender's copy of this airbill for information. Service conditions may vary for Government Overnight Service. See U.S. Government Service Guide for details.

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Release Signature

FedEx Emp. No.
Date/Time

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 6/91
PART #137204 FXEM 8/91
FORMAT #099
099
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ENVIRONMENTAL PROGRAMS DEPARTMENT

SANDIA NATIONAL LABORATORIES

SAMPLE DATA REVIEW CHECKLIST

DATE 8-4-94
CASE NO. 3617.300
PROJECT NAME TA 3/5 Site III
LABORATORY Enseco
CHECKED BY MD Garcia
APPROVAL/DATE

SAMPLE IDENTIFICATION	SAMPLE COLLECTION LOG: SAMPLE ID	SAMPLING PURPOSE	SAMPLE LOCATION	COLLECTION DATE AND TIME	SAMPLE MATRIX	COLLECTION TECHNIQUE	SAMPLE CONTAINERS	SAMPLE PRESERVATION	FIELD OBS. AND MEAS.	SAMPLER	ANALYSES	COCs AND RFAs: COC RECORD COMPLETE	RFA RECORD COMPLETE	SAMPLE ID	LAB REPORT: LAB SAMPLE ID	ANALYSES REQUESTED	DATA REVIEWED	DATE SAMPLE RECEIVED	DATE SAMPLE PREPARED	DATE SAMPLE ANALYZED	HOLDING TIME MET	SAMPLE ID	LAB SAMPLE ID	ANALYST	METHOD REF. NUMBER	REPORTING LIMIT	ANALYSES REQUESTED	CONSISTENCY OF UNITS	DATA QUALITY: ACCURACY DATA REPORTED AND MET	PRECISION DATA REPORTED AND MET	MATRIX SPIKE DATA REPORTED AND MET	BLANK DATA REPORTED AND MET	SURROGATE DATA REPORTED AND MET	COMPARABILITY OF UNITS	REASONABLENESS OF DATA	VALIDATION RANKING
SW/SM 016881-1	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
↓ -2	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
Dup of 884 883-1	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
↓ -2	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
884-1	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
↓ -2	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
MS/MSD 889-1	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
MS/MSD ↓ -2	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
TRIP BLNK SWSM 016892-1	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
QUALITY CONTROL SAMPLES																																				
RINSATE BLNK SWSM 016890-1	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
-2	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	NA	Y	Y	Y	Y	C
-3	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	NA	Y	Y	A
↓ -4	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	NA	Y	Y	A

ADDITIONAL COMMENTS: ① Due to instrument failure QC samples could not be completed. Surrogate were acceptable ② QC for 8330 1,3,5-Trinitrobenzene + 4-Amino-2,6-dinitrotoluene were outside lab QC limits

VALIDATION RANKING: U - UNUSABLE DATA A - ACCEPTABLE C - CONDITIONALLY ACCEPTABLE

REV. 1/91

ENVIRONMENTAL PROGRAMS DEPARTMENT

SANDIA NATIONAL LABORATORIES

SAMPLE DATA REVIEW CHECKLIST

DATE 8-4-94
CASE NO. 3617.300
PROJECT NAME TA 3/5 Site III
LABORATORY Enseco
CHECKED BY MB Garcia
APPROVAL/DATE

	SAMPLE COLLECTION LOG												COCs AND RFAs				LAB REPORT										DATA QUALITY							
SAMPLE IDENTIFICATION	SAMPLE ID	SAMPLING PURPOSE	SAMPLE LOCATION	COLLECTION DATE AND TIME	SAMPLE MATRIX	COLLECTION TECHNIQUE	SAMPLE CONTAINERS	SAMPLE PRESERVATION	FIELD OBS. AND MEAS.	SAMPLER	ANALYSES	COC RECORD COMPLETE	RFA RECORD COMPLETE	SAMPLE ID	LAB SAMPLE ID	ANALYSES REQUESTED	DATA REVIEWED	DATE SAMPLE RECEIVED	DATE SAMPLE PREPARED	DATE SAMPLE ANALYZED	HOLDING TIME MET	SAMPLE ID	LAB SAMPLE ID	ANALYST	METHOD REF. NUMBER	REPORTING LIMIT	ANALYSES REQUESTED	CONSISTENCY OF UNITS	ACCURACY DATA REPORTED AND MET	PRECISION DATA REPORTED AND MET	MATRIX SPIKE DATA REPORTED AND MET	BLANK DATA REPORTED AND MET	SURROGATE DATA REPORTED AND MET	COMPARABILITY OF UNITS	REASONABLENESS OF DATA	VALIDATION RANKING
QUALITY CONTROL SAMPLES																																		
Field Blank 016891-1	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
-2	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	A
-3	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	NA	Y	Y	A
-4	Y	Y	Y	Y	Y	Y	NA	NA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	NA	Y	Y	A

ADDITIONAL COMMENTS: _____

VALIDATION RANKING: U - UNUSABLE DATA A - ACCEPTABLE C - CONDITIONALLY ACCEPTABLE

REV. 1/91

Sandia National Laboratories

RADIATION PROTECTION SURVEY REQUEST

Request Number	Case Number
TA-1 94-0326	
Requested By	**Phone**
Mike Gonzales	~~TESTING~~ 848-0404

(Number of Items 3)

Type of Survey(s) Requested:

3 cases of water + soil samples for unrestricted release, swipe survey and probe counts.

Building/Room	Org.
870B	7576
Contact (if other than requester)	**Phone**

Request Taken By	Date	Time
Stan Fitch	6/20/94	8:00 am

IMPACT: Are there any of the following conditions a consideration?
Imminent health or safety hazards, projects that are/will be delayed, off-site activities are/will be affected, process or operation suspended?

Assigned To:

Fitch

Priority (designate 1, 2, 3)

Resolution

All survey results less than limits in DOE 5400.5 Table 4-1, given unrestricted release.

Completed By	Date	Time
[signature]	6-20-94	1440

RADIOLOGICAL SURVEY FORM

Page 1 of 1

Location	ER Side III, Bldg. 6715	Requestor/Dept.	P. Slavin/5582	Date	6/17/94	Time	1300
Purpose	Release Samples for Shipping	Request #	N/A	RWP #	N/A		

Instrument and Probe Type and Serial Number	Surveyor(s) Printed Name	Surveyor(s) Signature
ASP-1 #1/HP210 #2649	Hans Olebarger	

#	Item Description	BETA-GAMMA CONTAMINATION Counting Data Attached ☐Yes ☒No % Eff. 30 /Isotope D.U. cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R	ALPHA CONTAMINATION Counting Data Attached ☐Yes ☒No % Eff. N/A /Isotope N/A cpm	Bkg. cpm	dpm / 100 cm² (1)	(2) T/R	RADIATION SURVEY Bkg. N/A mrem/hr (3)	Distance
1	Soil Samples Chain of Custody #00346	60	60	< 3305	T	N/A	N/A	N/A	N/A	N/A	N/A
2	Soil Samples CofC #00347	60	60	< 3305	T						
3	Soil Samples CofC #00345	60	60	< 3305	T						
4	Swipe of CofC #00346 Samples	60	60	< 120	R						
5	Swipe of CofC #00347 Samples	60	60	< 120	R						
6	Swipe of CofC #00345 Samples	60	60	< 120	R	N/A	N/A	N/A	N/A	N/A	N/A

Note (1): If area other than 100 cm², record as dpm/probe, or dpm/LAW. Note (2): Total/Removable. Note (3): Indicate type, if other than gamma (i.e. n or β).

Remarks: Lc for swipes = $\left(2.32\sqrt{60\text{cpm}/.25\text{min}}\right) \div 0.3$

Reviewed by:

SHIPPER

SF 6951-AE(1-93)

Sandia National Laboratories

1 [X] New Mexico [ ] California [ ] Other

SHIP TO: *Typed or neatly printed*
2
Enseco Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
Attn: Ms. Ellen La Riviere
Contract No. 67-9736B

AR/COC # 508243/00346

Gate Exit Time & Date 3	Highest Material Security Class. 4	Page
	U	1 of 1

Date to be Returned 5	Document No.	Shipping Code 6	Shipment Register No. 7
[X] No Return	A 44334	C	50070

Due at Destination 8: 6/21/94 (Date) — [XX] Firm (Premium transportation authorized) [ ] Flex (Most economical transportation)

Originator of Form 9	Org.	Phone	Date Prepared 10
D.L. McLaughlin	7576	4-0941	6/20/94

FROM: 11 Site	Bldg.	Room	Org.	Requester's E No. 12	Requester's Name (Write "Same" if also originator)	Org.	Phone	Case No. 13
TAI	870B	1	7576	03319	Same			6987.200 ~~4298.3000~~

Material Billing 14	Freight Billing 15	Reason for Shipment 16	Authority for Shipment 17
[ ] Charge [X] No Charge	[XX] Prepaid [ ] Collect *If collect, carrier & acct no. (if known)*	Lab Analysis of Environmental Samples	n/a

Item No. 18	Sec. Class. 19	Quantity 20	Unit 21	Haz. Mat'l. 22	Property Tag No. And/Or MID No. 23	Description 24	Unit Value 25	$ Total 26
1	U	1	EA	N/A	N/A	ENVIRONMENTAL SOIL SAMPLES	N/A	N/A

LAST ITEM

VOIDED

IMPORTANT: SANDIA TRAFFIC ANALYST, PLEASE FAX COPY OF COMPLETED SHIPPER AND WAYBILL TO SMO FACILITY, FAX # 844-4976, IMMEDIATELY UPON SHIPMENT.

6/20/94 3:55

Grand Total 27 $

DOE Transportation Safeguards Div. Courier Required? 28 [ ] YES [XX] NO

Service Clerk 29: [signature]
Property Mgmt. Rep. 30: N/A

Date Shipped or Handcarried 31	Routing 32	B/L No. 33	No. of Boxes 34	Weight 35	Total Cubic Feet/Dimensions 36
6/20/94	FDEF	1305083894	2	68 lbs	4.4 / 30"x16"x

Authorizing Signature 37: [signature]
Jim D. Fish, 7576
(Signature of manager above typed or printed name and Org.
I certify that the material being offered for shipment is nonhazardous unless noted as hazardous in block 22 and required information is being provided.

Special Approval 38 — Name / Org.

Special Approval — Name / Org.

39 Bearer's Signature

40 Receipt Acknowledged — Recipient's Signature/Company / Date

Contract or PEL/MEL Rep. 41 — Name / Org. [ ] External Loan

Ply 1:
Corporate File - Retained by the Traffic Organization after shipper is complete and items are ready for shipment.

The listed material and accompanying information has been examined and the hazardous material designations and all preparations for shipment are certified correct.
42 Hazardous Material Consultant

43 Packed by [signature]

Attachment 111-2

Attachment 111-2

Figure 19-1: Site 111, Building 6715 Sump and Drain Pit (TA-III), Showing Proposed Soil Boring Locations for the Phase I Sampling

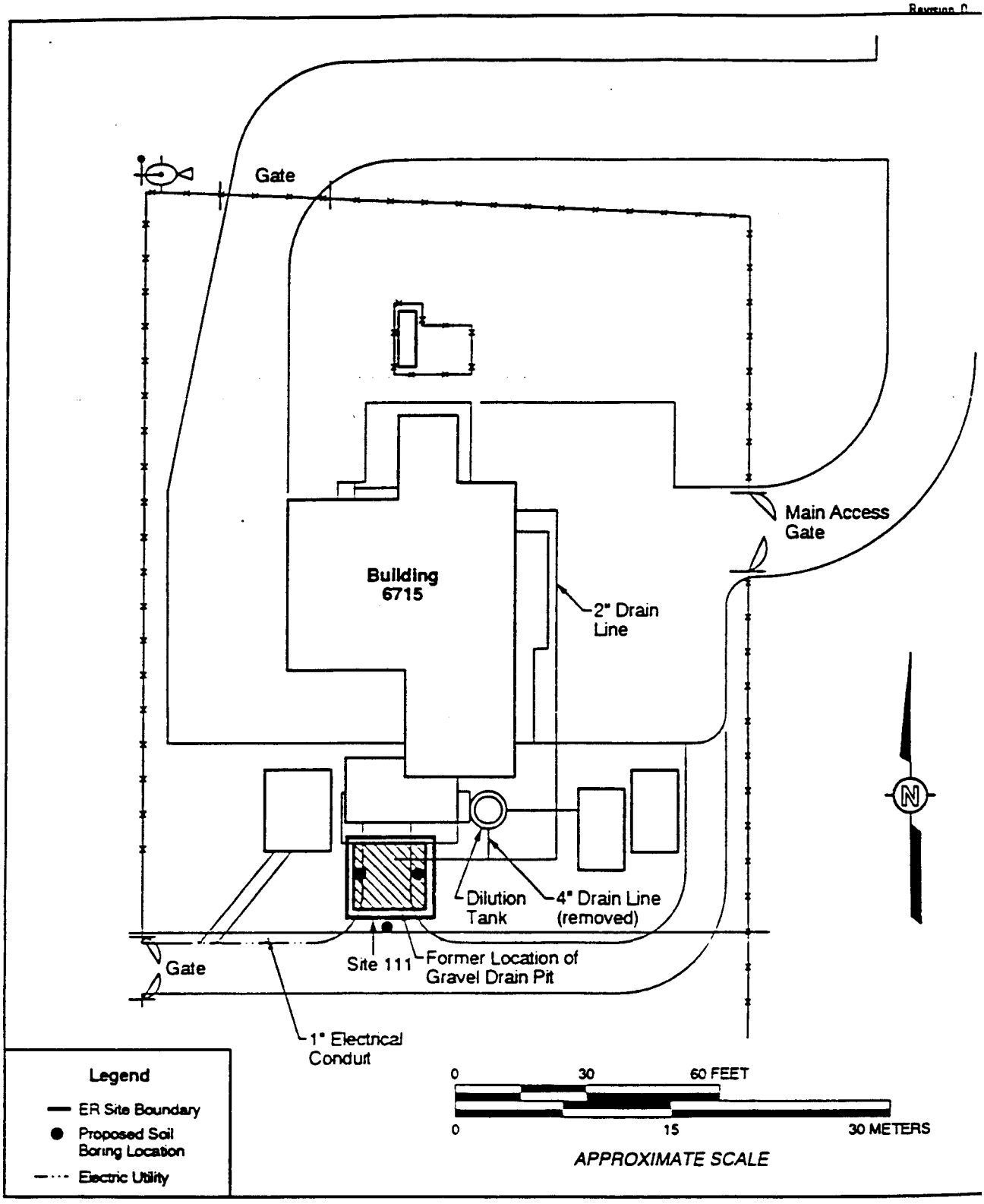
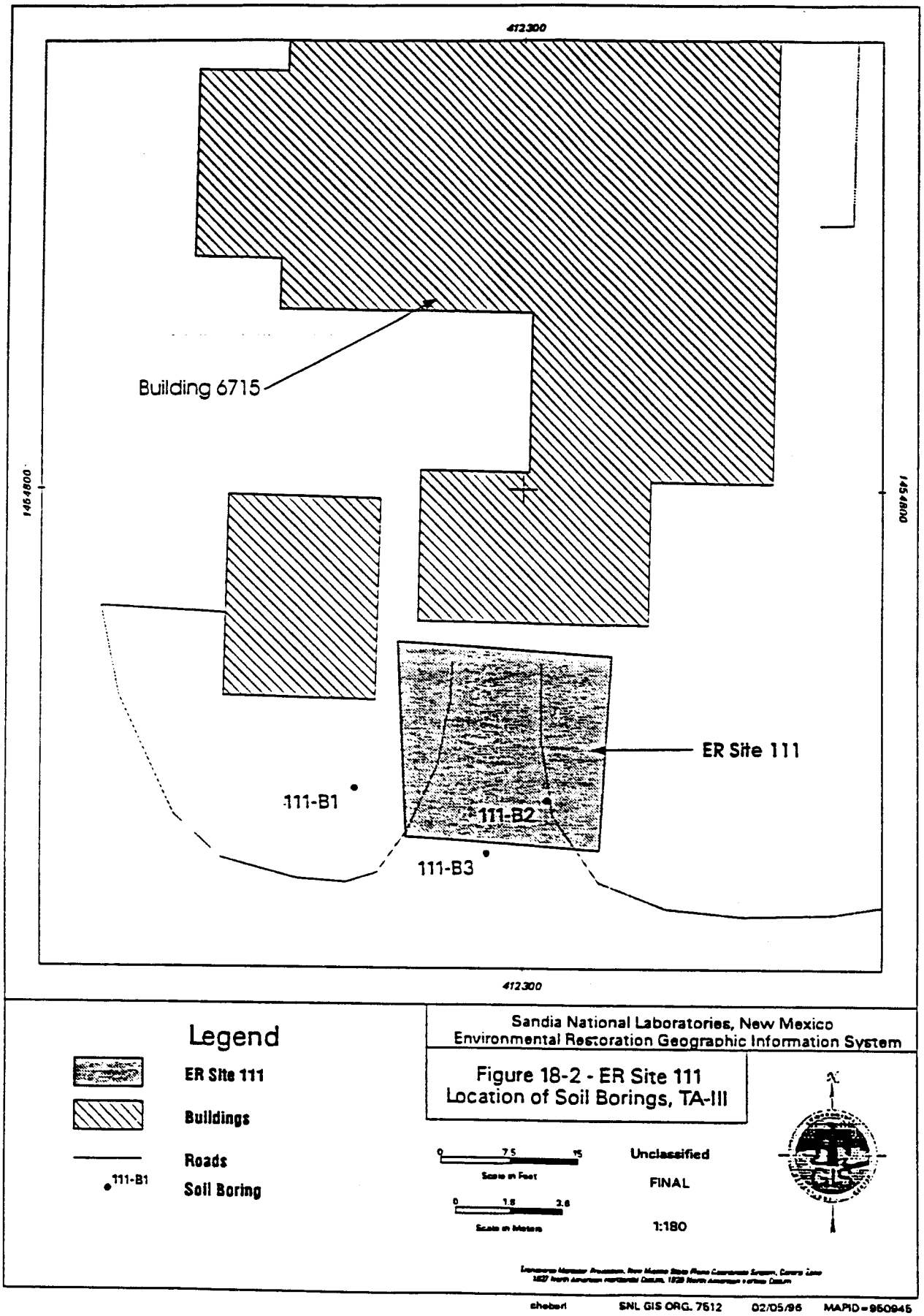


Figure 19-1

Site 111, Building 6715 Sump and Drain Pit (TA-3), Showing Proposed Soil Boring Locations for the Phase 1 Sampling


412300
Building 6715
1464800
1454800
ER Site 111
111-B1
111-B2
111-B3
412300
Legend
ER Site 111
Buildings
Roads
111-B1
Soil Boring
Sandia National Laboratories, New Mexico
Environmental Restoration Geographic Information System
Figure 18-2 - ER Site 111
Location of Soil Borings, TA-III
0 7.5 15
Scale in Feet
0 1.5 3.0
Scale in Meters
Unclassified
FINAL
1:180
N
chebert
SNL GIS ORG. 7612
02/05/96
MAPID=950945

Justification for Class III Permit Modification

April 2001

Solid Waste Management Unit 111 Operable Unit 1306

NOD Originally Submitted November 2000

Sandia National Laboratories
Albuquerque, New Mexico
January 2001

Environmental Restoration Project
Supplemental Responses to NMED 2nd Notice of Deficiency
Technical Areas III and V RCRA Facility Investigation
SWMU 111

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ACRONYMS AND ABBREVIATIONS

AOC	area of concern
bgs	below ground surface
COC	constituent of concern
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ft	foot (feet)
HE	high explosive(s)
HI	hazard index
kg	kilogram(s)
mg	milligram(s)
NFA	No Further Action
NMED	New Mexico Environment Department
NOD	Notice of Deficiency
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RL	reporting limit
SNL/NM	Sandia National Laboratories/New Mexico
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TA	Technical Area
VOC	volatile organic compound

1.0 INTRODUCTION

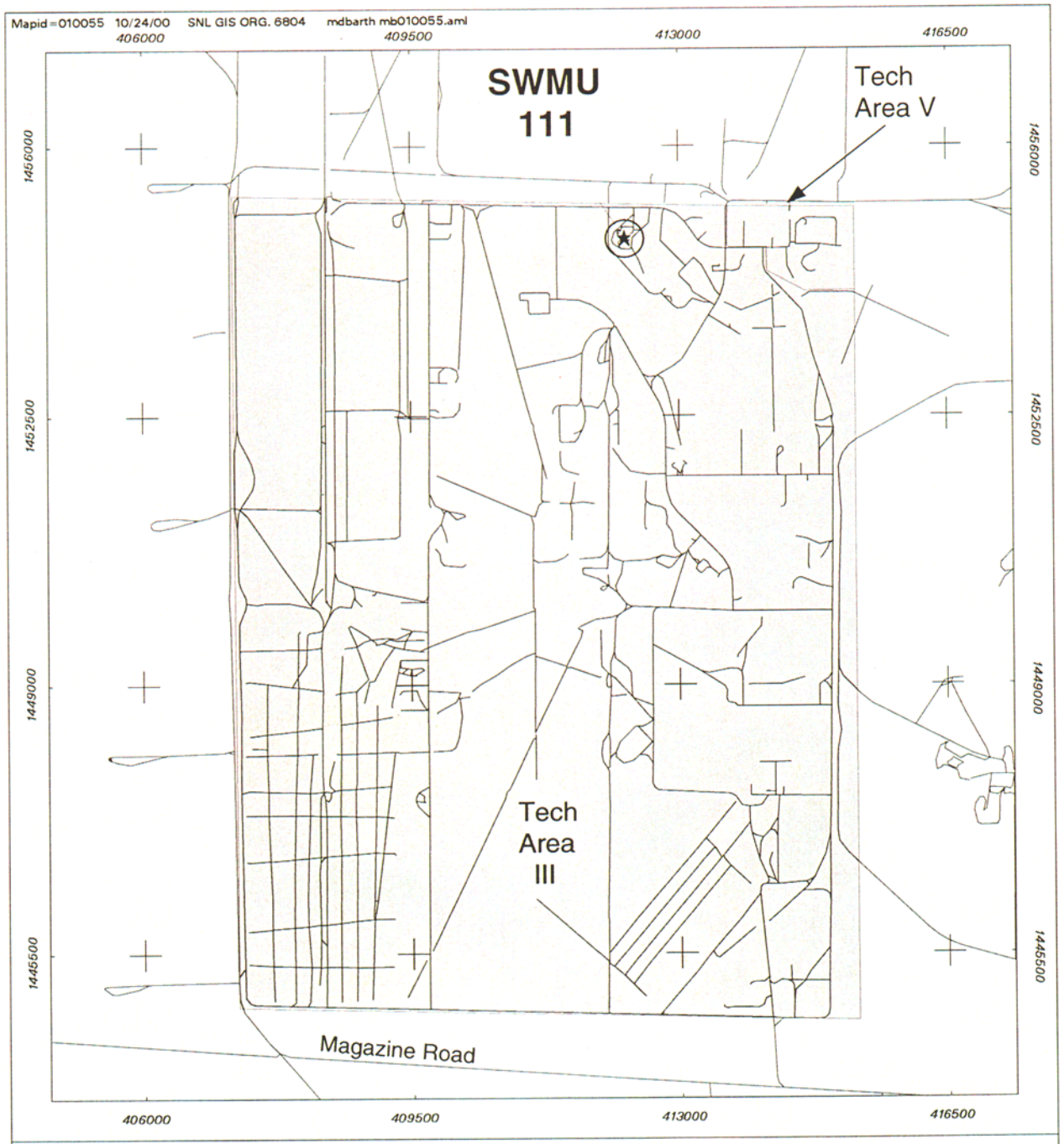
This supplemental response document is submitted to address additional concerns expressed by the New Mexico Environment Department (NMED) Hazardous Waste Bureau regarding the No Further Action (NFA) proposal submitted for Solid Waste Management Unit (SWMU) 111, the Building 6715 Sump/Drain, by Sandia National Laboratories/New Mexico (SNL/NM). A report on the activities conducted for the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) of Technical Areas (TAs)-III/V was submitted to the NMED in June 1996. NMED issued two Notices of Deficiency (NODs) on the TA-III/V RFI Report (Garcia 1997, Garcia 1998). SNL/NM made responses to both NODs (SNL/NM 1997, SNL/NM 1998). Following the submittal of SNL/NM's responses to NMED's 2nd NOD in July 1998, several meetings were held between SNL/NM and NMED personnel to reach agreement on what further characterization was required to complete the NFA proposals for sites included in the TA-III/V RFI Report.

This document contains the supplemental information for SWMU 111 requested by NMED and is submitted in the form of supplemental information to the 2nd NOD. For SWMU 111, no additional site characterization was required. This document follows the general NFA guidelines but references the 1996 RFI report (SNL/NM 1996) to reduce redundancy. This document includes engineering drawings of the facility, analytical summary tables in the NFA format, and a risk assessment. SWMU 111 is proposed for NFA.

1.1 Site Description and Operational History

SWMU 111 is located in the northern portion of TA-III, south of Building 6715 (Figure 1-1), and is approximately 400 square feet in size (Figure 1-2). Building 6715 was constructed in 1971 and was used for conducting structural-response experiments with high explosives (HEs). The only HE ever used at this site is silver acetylyde-silver nitrate, which is effectively identified by the presence of silver. Until 1988, wastewater from rinsing of equipment and work areas containing silver and HE residue was discharged to a 4-foot (ft) diameter by 8-ft deep stainless-steel tank. Overflow from this tank was discharged through a polyvinyl chloride (PVC) pipe to a gravel and sand-filled pit, which was constructed to a depth of 4 ft below ground surface (bgs). Although volatile organic compounds (VOCs) were reported to have been added to the wastewater at one time, sampling of the wastewater revealed no organic compounds (SNL/NM 1993).

In 1988, the tank, PVC pipe, and pit were excavated to a depth of 6 ft and removed by the SNL/NM line organization (Figure 1-3). Soil samples were collected before and after the excavation to confirm the removal of contamination. The samples were analyzed for silver, which was chosen as the likely indicator for the presence of residual contamination. The results ranged from the detection limit (0.12 milligrams [mg] per kilogram [kg] to 6.5 mg/kg of silver at the bottom of the pit and are reported in the RFI Work Plan (SNL/NM 1993).



Legend

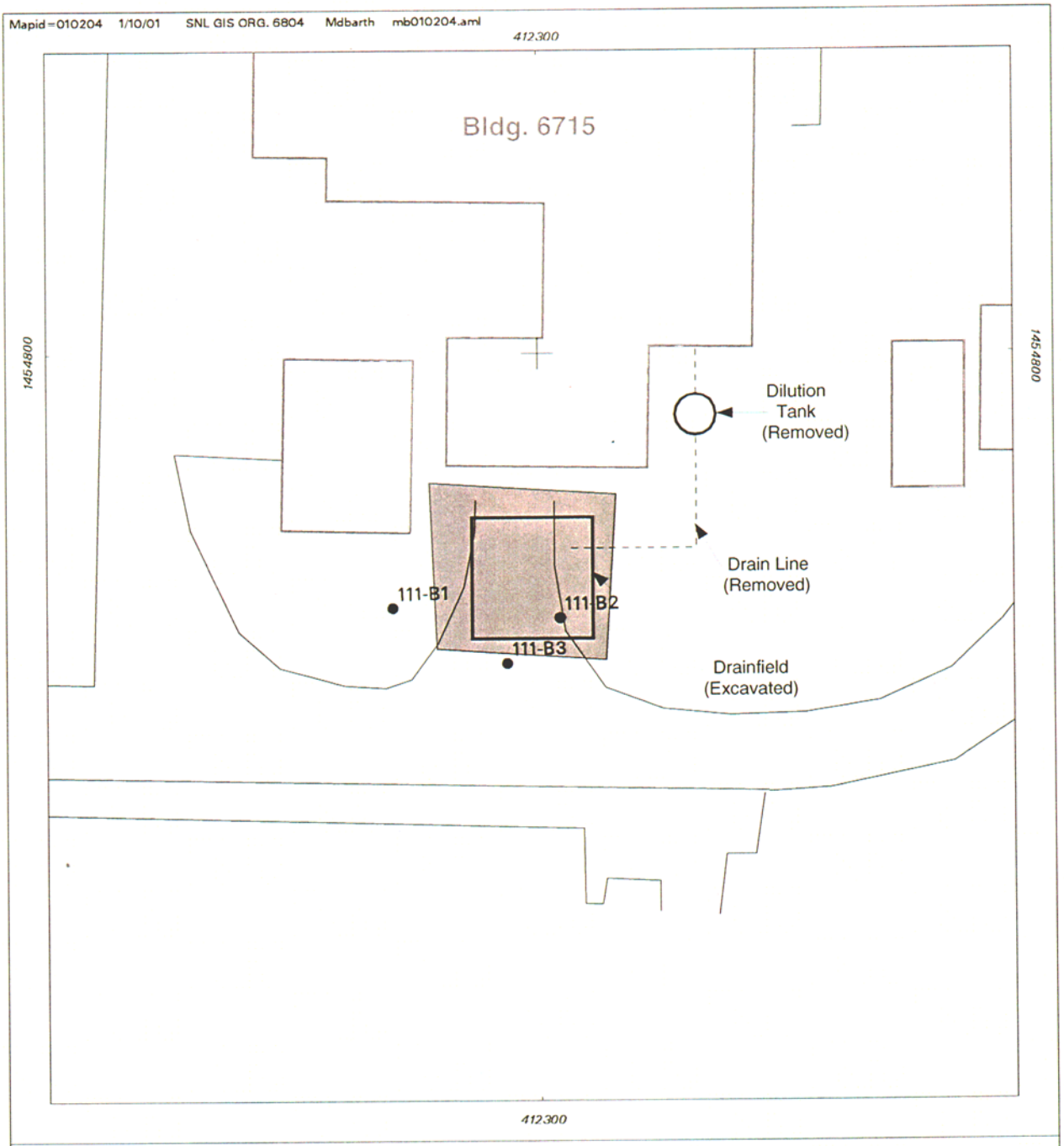
- SWMU 111
- Major Road
- Technical Area

Figure 1-1
Location of TA-III and SWMU 111

0 1050 2100
Scale in Feet

0 252 504
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System



Legend

- Borehole Location
- Road
- Building/Structures
- Drainline
- Drain Field / Dilution Tank
- SWMU 111

Figure 1-2
SWMU 111 Drainfield and Locations of 1994 RFI Boreholes

0 10 20
Scale in Feet

0 2.4 4.8
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 1-3
Photograph of Excavation of SWMU 111 Gravel Pit, 1988

1.2 Previous Investigations

Previous investigations and results are summarized in the RFI report (SNL/NM 1996). A brief summary of the work conducted for the RFI is provided here. In June 1994, three boreholes (B1 through B3 on Figure 1-2) were advanced in the vicinity of the former drain pit using a vehicle-mounted, small-diameter hydraulic probe. Soil samples were collected at depths of 8, 12, and 15 ft bgs. Screening for HEs and silver was conducted on all samples. Off-site laboratory analysis for VOCs, semivolatile organic compounds (SVOCs), HEs, and silver was conducted in accordance with the RFI Work Plan (SNL/NM 1993).

1.3 Additional Investigations

Additional investigation was requested by the NMED in discussions with SNL/NM ER Project personnel following the submittal of responses to the 2nd NOD on the TA-III/V RFI (SNL/NM 1998). It was agreed that verifying the location of the gravel pit to ensure that the RFI boreholes had been correctly placed within the boundaries of the pit and performing a risk assessment on the detected constituents of concern (COCs) were adequate to resolve the NOD. Additionally, a more complete summary of the analytical results in NFA format was requested.

The data tables in this report present analytes that revealed a concentration above the respective method detection limit (MDL), when available, or the reporting limit (RL). Therefore, an abbreviated suite of parameters may be present on the results table. A complete list of the analytes tested for in each suite will be given in the MDL/RL table.

Engineering drawings (as-builts) indicate the presence of the pit directly south of the building. A cross-section of the pit, taken from the SNL/NM engineering drawing, is included as Figure 1-4. A summary of the soil sample analytical results is provided in Section 2.0. A risk assessment was performed and is detailed in Section 4.0.

1.3.1 Results of Additional Investigations

The location of the former gravel pit, as shown on the SNL/NM engineering drawings, was digitized into the Geographic Information System map (Figure 1-2) to confirm that one of the three RFI boreholes was placed within the location of the pit. The other two were adjacent to the former gravel pit. As indicated in the original RFI, the boreholes were originally placed as close as practical based on the presence of underground utilities. The cross-section of the gravel pit, presented in Figure 1-4, indicates that the total depth of the original pit was approximately 4 ft bgs. Thus, the excavation to 6 ft, conducted by the SNL/NM line organization in 1998, was an over-excavation of the materials in the pit. Confirmation soil samples were collected by the line organization at the time of the excavation. One soil sample was collected south of the pit to assess a background concentration for silver. The background sample contained 1.4 mg/kg of silver. Six other samples were collected at the bottom and sides of the excavation, and the results showed silver levels below the background value with only two samples above the background (maximum concentration was 6.5 mg/kg) (SNL/NM 1993). Soil samples from the RFI also confirmed the removal of materials to background levels.

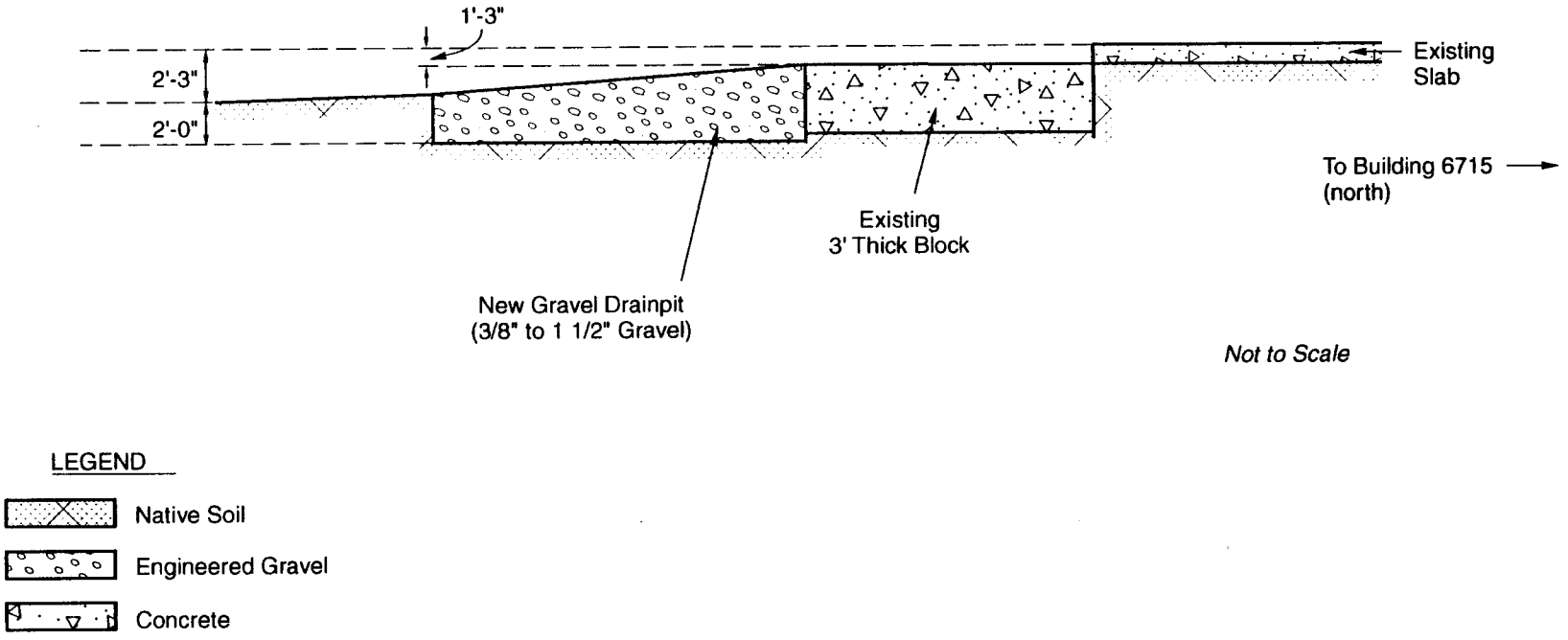


Figure 1-4
SNL/NM As-Built Engineering Drawing (dated 1977)
Showing Construction Details of SWMU 111 Gravel Drain Pit (adapted)

The risk assessment, provided in Section 4.0, indicates that the maximum concentration of silver at the site is below the level that would be detrimental to human health or the environment.

2.0 RFI DATA SUMMARY

Summaries of the RFI data are provided in Tables 2-1 through 2-7. A total of 10 soil samples (including one duplicate) were collected from the three boreholes and were submitted to the on-site ER Chemistry Laboratory for screening for silver by directly-coupled plasma analysis and for HE by immunoassay techniques. These results are summarized in Table 2-1. Four soil samples (one sample from each borehole, plus a duplicate from B2) were submitted to an off-site laboratory (Enseco) for analysis of silver (by U.S. Environmental Protection Agency [EPA] Method 6010), VOCs (by EPA Method 8240), SVOCs (by EPA Method 8270), and HE (by High-Performance Liquid Chromatography and EPA Method 8270). As is summarized in the analytical tables (Tables 2-2 through 2-7), only silver and bis (2-ethylhexyl)phthalate were detected above their respective laboratory RLs. VOCs were detected at trace levels ("J" values), and no HE compounds were detected above the laboratory RLs. The laboratory RLs are provided in Tables 2-2 through 2-7 because method detection limits were not available for the 1994 analyses. Annex A contains the results of the Data Validation performed for the RFI sampling analyses.

3.0 SITE CONCEPTUAL MODEL

The site conceptual model for SWMU 111 is based upon the COCs identified from operational history information. This section summarizes the nature and extent of contamination and the environmental fate of COCs.

3.1 Nature and Extent of Contamination

The potential COCs at SWMU 111 are silver, VOCs, SVOCs, and HE, resulting from the disposal of waste water into the gravel pit. As indicated in the RFI Report (SNL/NM 1996) and in the succeeding tables, the maximum concentrations of silver were restricted to Borehole B2, which was located within the gravel pit. The vertical extent of silver contamination, indicated by this borehole, was 8 ft bgs. Silver is the only analyte considered a real COC – the other detected COCs, because of their use as laboratory chemicals and/or their presence in the laboratory method blanks (Table 2-3 and Table 2-5), are believed to represent laboratory contamination. Nevertheless, all the detected COCs are included in the risk assessment (Section 4.1).

Table 2-1
Summary of SWMU 111 Soil Sampling Screening Results
June 1994
(On-Site Laboratory)

Sample Attributes				Analytical Results	
Record Number[a]	ER Sample ID	Date Sampled	Sample Depth (ft)	Silver[b] (µg/g)	HE[c] (ppm)
00345	TA3/5-111-B1-8	6-17-94	8	ND (0.0124)	ND (1)
00345	TA3/5-111-B1-12	6-17-94	12	ND (0.0112)	ND (1)
00345	TA3/5-111-B1-15	6-17-94	15	ND (0.0074)	ND (1)
00345	TA3/5-111-B2-8	6-17-94	8	ND (0.0111)	ND (1)
00345	TA3/5-111-B2-8D (duplicate sample)	6-17-94	8	ND (0.0092)	ND (1)
00345	TA3/5-111-B2-12	6-17-94	12	ND (0.0075)	ND (1)
00345	TA3/5-111-B2-15	6-17-94	15	0.1423	ND (1)
00345	TA3/5-111-B3-8	6-17-94	8	ND (0.009)	ND (1)
00345	TA3/5-111-B3-12	6-17-94	12	0.0115	ND (1)
00345	TA3/5-111-B3-15	6-17-94	15	0.0047	ND (1)

[a]Analysis request/chain of custody number.
[b]Silver analyzed by directly-coupled plasma.
[c]HE analyzed by immunoassay.
B# = Borehole number in ER Sample ID.
ER = Environmental Restoration.
ft = Foot (feet).
HE = High explosive(s).
ID = Identification.
µg/g = Microgram(s) per gram.
ND = Not detected above the method detection limit, shown in parentheses.
ppm = Parts per million.
SWMU = Solid Waste Management Unit.
TA = Technical Area.

Table 2-2
Summary of SWMU 111 Soil Sampling Silver Analytical Results
June 1994
(Off-Site Laboratory)

Sample Attributes				Silver (EPA Method 6010[b]) (mg/kg)
Record Number[a]	ER Sample ID	Date Sampled	Sample Depth (ft)	
00346	TA3/5-111-B1-12	6-17-94	12	ND (1)
00346	TA3/5-111-B2-8	6-17-94	8	**2.1**
00346	TA3/5-111-B2-8D (duplicate sample)	6-17-94	8	**1.9**
00346	TA3/5-111-B3-15	6-17-94	15	0.54 J (1)
Background soil concentration—Southwest Supergroup[c]				<1

Note: Values in **bold** exceed background soil concentration.
[a]Analysis request/chain-of-custody record.
[b]EPA November 1986.
[c]Dinwiddie 1997.
B# = Borehole number in ER Sample ID.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The associated value is an estimated quantity. The reported value is greater than or equal to the method detection limit but is less than the reporting limit, shown in parentheses.
mg/kg = Milligram(s) per kilogram.
ND ( ) = Not detected above the reporting limit, shown in parentheses (method detection limit not available).
SWMU = Solid Waste Management Unit.
TA = Technical Area.

Table 2-3
Summary of SWMU 111 Soil Sampling VOC Analytical Results
June 1994
(Off-Site Laboratory)

Sample Attributes				VOCs (EPA Method 8240[a]) (µg/kg)		
Record Number[b]	ER Sample ID	Date Sampled	Sample Depth (ft)	Acetone	Methylene Chloride	Toluene
00346	TA3/5-111-B1-12	6-17-94	12	ND (10)	**3.4 B,J (5)**	ND (5)
00346	TA3/5-111-B2-8	6-17-94	8	**3.7 J (10)**	**3 B,J (5)**	ND (5)
00346	TA3/5-111-B2-8D (duplicate sample)	6-17-94	8	**5.5 J (10)**	**3.5 B,J (5)**	**1.5 J (5)**
00346	TA3/5-111-B3-15	6-17-94	15	**5.7 J (10)**	**3.6 B,J (5)**	**1.8 J (5)**

Note: **Bold** values represent detected VOCs.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
B = Analyte detected in laboratory method blank.
B# = Borehole number in ER Sample ID.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The associated value is an estimated quantity. The reported value is greater than or equal to the method detection but is less than the reporting limit, shown in parentheses.
µg/kg = Microgram(s) per kilogram.
ND ( ) = Not detected, with the reporting limit shown in parentheses (method detection limits not available).
SWMU = Solid Waste Management Unit.
TA = Technical Area.
VOC = Volatile organic compound.

Table 2-4
VOC Analytical Reporting Limits
for SWMU 111 Soil Sampling
June 1994
(Off-Site Laboratory)

Analyte	Soil Sample RL (EPA Method 8240[a]) (µg/kg)
Acetone	10
Benzene	5.0
Bromodichloromethane	5.0
Bromoform	5.0
Bromomethane	10
2-butanone	10
Carbon disulfide	5.0
Carbon tetrachloride	5.0
Chlorobenzene	5.0
Chloroethane	10
Chloroform	5.0
Chloromethane	10
Dibromochloromethane	5.0
1,1-Dichloroethane	5.0
1,2-Dichloroethane	5.0
1,1-Dichloroethene	5.0
1,2-Dichloroethene	5.0
1,2-Dichloropropane	5.0
cis-1,3-Dichloropropene	5.0
trans-1,3-Dichloropropene	5.0
Ethyl benzene	5.0
2-Hexanone	10
Methylene chloride	5.0
4-methyl-2-Pentanone	5.0
Styrene	10
1,1,2,2-Tetrachloroethane	5.0
Tetrachloroethene	5.0
Toluene	5.0
1,1,1-Trichloroethane	5.0
1,1,2-Trichloroethane	5.0
Trichloroethene	5.0
Vinyl acetate	10
Vinyl chloride	10
Xylenes	5.0

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
µg/kg = Microgram(s) per kilogram.
RL = Reporting limit.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 2-5
Summary of SWMU 111 Soil Sampling SVOC Analytical Results
June 1994
(Off-Site Laboratory)

Sample Attributes				SVOCs (EPA Method 8270[a]) (µg/kg)
Record Number[b]	ER Sample ID	Date Sampled	Sample Depth (ft)	bis (2-Ethylhexyl)phthalate
00346	TA3/5-111-B1-12	6-17-94	12	**70 J (330)**
00346	TA3/5-111-B2-8	6-17-94	8	**87 J (330)**
00346	TA3/5-111-B2-8D (duplicate sample)	6-17-94	8	**51 J (330)**
00346	TA3/5-111-B3-15	6-17-94	15	**350**

Note: **Bold** values represent detected SVOCs.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
B# = Borehole number in ER Sample ID.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The associated value is an estimated quantity. The reported value is greater than or equal to the method detection limit but is less than the reporting limit, shown in parentheses.
µg/kg = Microgram(s) per kilogram.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
TA = Technical Area.

Table 2-6
SVOC Analytical Reporting Limits for SWMU 111 Soil Sampling June 1994 (Off-Site Laboratory)

Analyte	Soil Sample RL (EPA Method 8270*) (µg/kg)
Acenaphthene	330
Acenaphthylene	330
Anthracene	330
Benzo(a)anthracene	330
Benzo(a)pyrene	330
Benzo(b)fluoranthene	330
Benzo(ghi)perylene	330
Benzo(k)fluoranthene	330
Benzoic acid	1600
Benzyl alcohol	330
4-Bromophenyl phenyl ether	330
Butylbenzyl phthalate	330
Carbazole	330
4-Chloroaniline	330
4-Chloro-3-methylphenol	330
bis(2-Chloroethoxy)methane	330
bis(2-Chloroethyl)ether	330
bis(2-Chloroisopropyl) ether	330
2-Chloronaphthalene	330
2-Chlorophenol	330
4-Chlorophenyl phenyl ether	330
Chrysene	330
Di-n-butyl phthalate	330
Di-n-octyl phthalate	330
Dibenz[a,h]anthracene	330
Dibenzofuran	330
1,2-Dichlorobenzene	330
1,3-Dichlorobenzene	330
1,4-Dichlorobenzene	330
3,3'-Dichlorobenzidine	660
2,4-Dichlorophenol	330
Diethylphthalate	330
2,4-Dimethylphenol	330
Dimethylphthalate	330
4,6-Dinitro-2-methylphenol	1600
2,4-Dinitrophenol	1600

Refer to footnotes at end of table.

Table 2-6 (Concluded)
SVOC Analytical Reporting Limits
for SWMU 111 Soil Sampling
June 1994
(Off-Site Laboratories)

Analyte	Soil Sample RL (EPA Method 8270[a]) (µg/kg)
2,4-Dinitrotoluene	330
2,6-Dinitrotoluene	330
bis (2-Ethylhexyl)phthalate	330
Fluoranthene	330
Fluorene	330
Hexachlorobenzene	330
Hexachlorobutadiene	330
Hexachlorocyclopentadiene	330
Hexachloroethane	330
Indeno(1,2,3-c,d)pyrene	330
Isophorone	330
2-Methylnaphthalene	330
2-Methylphenol	330
4-Methylphenol	330
Naphthalene	330
Nitro-benzene	330
2-Nitroaniline	1600
3-Nitroaniline	1600
4-Nitroaniline	1600
2-Nitrophenol	330
4-Nitrophenol	1600
n-Nitrosodiphenylamine	330
n-Nitrosodipropylamine	330
Pentachlorophenol	1600
Phenanthrene	330
Phenol	330
Pyrene	330
1,2,4-Trichlorobenzene	330
2,4,5-Trichlorophenol	1600
2,4,6-Trichlorophenol	330

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
µg/kg = Microgram(s) per kilogram.
RL = Reporting limit.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 2-7
HE Analytical Reporting Limits for SWMU 111 Soil Sampling
June 1994
(Off-Site Laboratory)

Analyte	Soil Sample RL (µg/g)
EPA Method 8330[a]	
2-Amino-4,6-dinitrotoluene	0.25
4-Amino-2,6-dinitrotoluene	0.25
1,3-Dinitrobenzene	0.25
2,4-Dinitrotoluene	0.25
2,6-Dinitrotoluene	0.26
HMX	2.2
Nitrobenzene	0.26
2-Nitrotoluene	0.25
3-Nitrotoluene	0.25
4-Nitrotoluene	0.25
RDX	1.0
Tetryl	0.65
1,3,5-Trinitrobenzene	0.25
2,4,6-Trinitrotoluene	0.25

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = 1,3,5,7-Tetranitro-1,3,5,7-tetrazacyclooctane.
µg/g = Microgram(s) per gram.
RDX = 1,3,5-Trinitro-1,3,5-triazacyclohexane.
RL = Reporting limit.
SWMU = Solid Waste Management Unit.
Tetryl = 2,4,6-Trinitrophenylmethylnitramine.

3.2 Environmental Fate

The primary source of suspected COCs at SWMU 111 was via the gravel pit, which was excavated, sampled, and backfilled in 1988. The primary release mechanism of COCs at SWMU 111 was to the gravel pit from the disposal of wastewater. Confirmatory sampling conducted in 1994 during the RFI revealed that the concentrations of COCs at SWMU 111 in the subsurface soils within and adjacent to the gravel pit are low or nondetectable.

A review of the potential for secondary release mechanisms to influence environmental fate was conducted and the results are discussed here. Neither surface run-off nor percolation to the vadose zone is considered a secondary release mechanism because the surface of the site is paved with asphalt. Dust emissions and direct ingestion of soil are removed from consideration for the same reason – there is no exposed soil at the surface. Uptake by biota is not considered a release mechanism because the silver concentrations occur below the 5 ft bgs level required for this mechanism because the soil contamination was removed (to a depth of 6 ft bgs) when the tank and gravel pit was removed. Furthermore, because of low annual rainfall, high evaporation rates, and because the site is paved, no vertical migration of contaminants is expected within the subsurface. Depth to groundwater is approximately 465 ft bgs (SNL/NM 2000), so near surface concentrations of silver are not expected to reach groundwater.

Thus, because the gravel pit was over-excavated and all materials were removed; the site is paved; and because precipitation rates are low, coupled with very high evapotranspiration rates, there are no exposure pathways or secondary release mechanisms to consider for uptake either by humans or biota.

Human health and ecological risk assessments were completed for SWMU 111 and the results are provided in Section 4.0.

4.0 SITE ASSESSMENTS

Site assessments that have been completed at SWMU 111 include a human health screening assessment and a surface water assessment. It was determined that neither an ecological risk screening assessment nor a baseline human health assessment were required. The following sections summarize the site assessment results.

4.1 Background Screening Procedure

4.1.1 Methodology

Maximum COC concentrations are compared to the approved SNL/NM maximum screening levels for this area. For added conservatism, the highest concentration for silver (6.5 mg/kg) from the 1988 sampling was used for silver. The SNL/NM maximum background screening levels are selected to provide the background screening in Table 4-1 and used to calculate risk

Table 4-1
COCs for Human Health Risk Screening Assessment for SWMU 111 with Comparison to the Associated SNL/NM Background Screening Values

COC Name	Maximum Concentration (mg/kg)	SNL/NM Background Screening Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?
Silver	6.5	<1	No
Acetone	0.0057	NA	NA
bis (2-Ethylhexyl)phthalate	0.35	NA	NA
Methylene chloride	0.0036	NA	NA
Toluene	0.0018	NA	NA

[a]Dinwiddie (1997) Southwest Supergroup.
COC = Constituent of concern.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

attributable to background in Table 4-2. Only the COCs that are above their respective SNL/NM maximum background screening levels, or do not have a quantifiable background screening level, are considered in further risk assessment analyses.

4.1.2 Results

A comparison of the SWMU 111 maximum COC concentrations to the SNL/NM maximum background screening levels (Dinwiddie 1997) is presented in Table 4-1. Silver was detected above background. Four organic compounds were also detected. Organic compounds do not have associated background screening values, thus they are carried forward in the risk assessment analysis.

4.1.2.1 Human Health Risk Screening Assessment

The recommended future land-use for SWMU 111 is industrial (DOE et al. 1995). However, for comparison, both industrial and residential land uses are presented.

For the industrial land-use scenario, the calculated hazard index (HI) is 0.00 (less than the numerical guideline of 1 suggested in the Risk Assessment Guidance for Superfund [EPA 1989]) (Table 4-2). The estimated excess cancer risk is 2E-9 (Table 4-2), which is below the suggested acceptable risk value of 1E-5 (NMED 2000).

This assessment also determined risk considering the background concentration of the potential COC for both the industrial and residential land-use scenarios (Table 4-3). The HI and the excess cancer risk could not be calculated because no quantified background screening value exists for silver. Thus, the background contribution from silver is assumed to be zero for both the HI and excess cancer risk. Incremental risk is determined by subtracting risk

Table 4-2
Human Health Risk Assessment Values for SWMU 111 Nonradiological COCs

COC Name	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Silver	6.5	0.00	--	0.27	--
Acetone	0.0057	0.00	--	0.00	--
bis (2-Ethylhexyl)phthalate	0.35	0.00	2E-9	0.00	1E-8
Methylene chloride	0.0036	0.00	2E-10	0.00	3E-8
Toluene	0.0018	0.00	--	0.00	--
Total		**0.00**	**2E-9**	**0.3**	**4E-8**

[a]EPA guidance for calculating the risk associated with the defined land-use scenario. (EPA 1989).
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
-- = Information not available.

Table 4-3
Human Health Risk Screening Assessment Values for SWMU 111 Nonradiological COCs Using NMED Background Constituents

COC Name	Background Concentration[a] (mg/kg)	Industrial Land-Use Scenario[b]		Residential Land-Use Scenario[b]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Silver	<1	--	--	--	--
Total		**--**	**--**	**--**	**--**

[a]Dinwiddie (1997) Southwest Supergroup.
[b]EPA guidance for calculating the risk associated with the defined land-use scenario. (EPA 1989).
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
NMED = New Mexico Environment Department.
SWMU = Solid Waste Management Unit.
-- = Information not available.

associated with background from the potential COC risk. These numbers are not rounded before the difference is determined and, therefore, may appear to be inconsistent with numbers presented in the tables and within the text. The incremental HI is 0.00, and the estimated incremental cancer risk is 2.2E-9 for the industrial land-use scenario. Thus, the incremental HI and estimated excess cancer risk are below NMED guidance (NMED 2000) considering an industrial land-use scenario.

The calculated HI for the residential land-use scenario is 0.3, which is below the numerical guidance (Table 4-2). The estimated excess cancer risk is 4-E8. Thus, the excess cancer risk for this site is below suggested guidelines. Assuming that the background contribution from silver is zero for both the HI and excess cancer risk, the incremental HI is 0.3, and the estimated incremental cancer risk is 4E-8 for the residential land-use scenario. Thus, the incremental HI and estimated excess cancer risk are below NMED guidance considering a residential land-use scenario (NMED 2000).

Uncertainties associated with the calculations are considered small relative to the conservatism of risk assessment analysis. It is therefore concluded that SWMU 111 poses insignificant risk to human health under either an industrial or residential land-use scenario.

4.1.2.2 Ecological Risk Screening Assessment

Ecological risk was not performed because no significant exposure pathways for COCs exist at depths greater than 5 ft bgs. Because all COC detections were reported at a depth greater than 5 ft, the risk to ecological receptors at this site is expected to be very low.

4.2 Baseline Risk Assessments

This section discusses the baseline risk assessments for human health and ecological risk.

4.2.1 Human Health

Based upon the fact that human health results of the screening assessment summarized in Section 4.1.2.1 indicate that SWMU 111 does not have potential to affect human health under a residential land use setting, a baseline human health risk assessment is not required for SWMU 111.

4.2.2 Ecological

Based upon the fact that ecological results of the screening assessment summarized in Section 4.1.2.2 indicate that SWMU 111 has very low ecological risk, a baseline ecological risk assessment is not required for SWMU 111.

4.3 Surface Water Assessment

A surface water site assessment was completed for this site in August 2000. The guidance for this assessment was developed jointly by Los Alamos National Laboratory and the NMED Surface Water Quality Bureau. The procedure was adopted by SNL/NM ER for use at sites at SNL/NM. The assessment evaluated the potential for erosion from the site. The results of the assessment indicated that there is low potential for erosion at the site. Annex B contains the complete details of the surface water assessment.

5.0 NO FURTHER ACTION PROPOSAL

The data collected at SWMU 111 and the risk assessment support the recommendation of NFA for this site:

- The potential COCs at the site (silver, VOCs, SVOCs, and HEs) were not present or were present at very low concentrations in the confirmatory soil samples.
- The risk assessment concluded that SWMU 111 poses insignificant risk to human health under both industrial and residential land-use scenarios, and the site poses insignificant risk to the ecological receptors.

Based upon the evidence provided above, SWMU 111 is proposed for an NFA decision in conformance with Criterion 5 (NMED 1998), which states that "the SWMU/AOC [area of concern] has been characterized or remediated in accordance with current applicable state or federal regulations and that available data indicate that contaminants pose an acceptable level of risk under current and projected future land use."

6.0 REFERENCES

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U.S. Environmental Protection Agency (EPA), November 1986. "Test Methods for Evaluating Solid Waste," 3rd ed., Update III, SW-846, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1989. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual," EPA/540-1089/002, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C.

ANNEX A
Data Validation Report

Sample Findings Summary

Site: TA 3/5 - Site 111 AR/COC: 00346 Data Classification: Organics (EPA 8240 / 8270 / 8330)

ER Sample ID	Analysis	DV Qualifiers	Comments
016890-1 111-B-RBA	67-64-1 (acetone)	10U, B	
91-1 111-B-FBA	↓	↓	
92-1 111-B3-TBA	↓	↓	
81-1 111-B1-12	75-09-2 (methylene chloride)	5U, B, B1, B2	
83-1 111-B2-8D	↓	↓	
84-1 111-B2-8	↓	↓	
89-1 111-B3-15	↓	↓	
81-2 111-B1-12	117-81-7 (bis(2-ethylhexyl) phthalate)	330U, B	
83-2 111-B2-8D	↓	↓	
84-2 111-B2-8	↓	↓	
	Data are acceptable.		
	QC Measures appear to be adequate		

ER Sample ID - This value is located on the **AR/Chain of Custody**.

Analysis - Use valid test methods provided below **or if the result** applies to an individual analyte within a test method, use the CAS number from the analytical data sheet.

DV Qualifiers - The entry will be taken from the **list of valid qualifiers** and associated comments. If other qualifiers not on the list are needed, contact Tina Sanchez to coordinate adding them to the list.

Comments - This is only to be used if a comment **associated with** the qualifier is not appropriate, needs modification because of an unusual circumstance, or additional clarification is warranted.

Test Methods - Anions_CE, EPA6010, EPA6020, **EPA7470/1**, EPA8015B, EPA8081, EPA8260, EPA8260-M3, EPA8270, HACH_ALK, HACH_ NO2, HACH_NO3, MEKC_HE, PCBRISC

Reviewed by: [signature] Date: 11/13/00

MEMORANDUM

DATE: November 13, 2000

TO: File

FROM: Kenneth Salaz KAS

SUBJECT: Organic Data Review and Validation
TA3/5-Stie 111, ARCOC #00346,
SDG #036355, Project/Task No. 7219.01.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation.

Summary

All samples were prepared and analyzed with accepted procedures and specified methods: EPA8240 (VOCs), EPA8270 (SVOCs), and EPA8330 (HEs). Problems were identified with the data package that result in the qualification of data.

1. VOC Analysis: For the equipment/rinsate blank (EB), field blank (FB), and trip blank (TB), acetone was detected in the method blank. All associated sample results were detects, less than (<) 10X the blank concentration, < the reporting limit (RL), and will be qualified "10U,B." For the field samples, methylene chloride was detected in the method blank, EB, FB, and TB. All associated sample results were detects, <10X the blank concentrations, < the RL, and will be qualified "5U,B,B1,B2."

   SVOC Analysis: In the EB, bis(2-ethylhexyl)phthalate was detected. The associated results of samples 036355-002, -004, and -006 were detects, <10X the blank concentration, < the RL and will be qualified "330U,B." The associated result of sample -008 was greater than (>) 10X the blank concentration. Thus, no data were qualified.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. It should be noted that this data package was historical, and the QC data provided by the laboratory were limited. Thus, complete data review and validation was not possible. Therefore, use of this data validation report should be at the sole discretion of the user.

Holding Times/Preservation

All Analyses: All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All Analyses: No calibration data were provided with the data package.

Blanks

VOC Analysis: No target analytes were detected in the method blanks except as noted above in the summary section and the following. In the method blanks for all samples, 4-methyl-2-pentanone and 2-hexanone were detected. However, all associated sample results were non-detect (ND). Thus, no data were qualified.

SVOC/HE Analyses: No target analytes were detected in the method blanks.

Surrogates

VOC/SVOC Analyses: The surrogate %Rs met QC acceptance criteria.

HE Analysis: No surrogate data for this method were provided with the data package.

Internal Standards (ISs)

VOC/SVOC Analyses: No IS data were provided with the data package.

HE Analysis: No ISs were required for this method.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

VOC/SVOC Analyses: The MS/MSD analyses met QC acceptance criteria.

HE Analysis: The MS/MSD analysis met QC acceptance criteria except for the following. The MS/MSD percent recoveries (%Rs) of nitrobenzene and the MS %R of 4-nitrotoluene were > QC limits. However, all associated sample results were ND. Thus, no data were qualified.

Laboratory Control Samples (LCS/LCSD)

VOC/SVOC Analyses: The LCS/LCSDs met QC acceptance criteria.

HE Analysis: The LCS/LCSDs met QC acceptance criteria except for the following. For the EB and FB, the LCS/LCSD %Rs of 1,3,5-trinitrobenzene and 4-amino-2,6-dinitrotoluene were > QC limits. For the field samples, the LCSD %R of nitrobenzene was > QC limits. However, all associated sample results were ND. Thus, no data were qualified.

Other QC

VOC/SVOC Analyses: A field duplicate was submitted. However, there are no "required" review criteria for field duplicate analyses comparability. No target analytes were detected in the EBs, FBs, or TB except as noted above in the summary section.

HE Analysis: A field duplicate was submitted. However, there are no "required" review criteria for field duplicate analyses comparability. No target analytes were detected in the EB or FB.

No other specific issues were identified which affect data quality.

Please contact me if you have any questions or comments regarding the review of this package.

Sample Findings Summary

Site: TA-3/5 - Site 111 AR/COC: 00346 Data Classification: Inorganics (EPA 6010 Ag only)

ER Sample ID	Analysis	DV Qualifiers	Comments
	No data were	qualified.	
	Data are acceptable.		
	QC Measures appear	to be adequate.	

ER Sample ID - This value is located on the AR/Chain of Custody.

Analysis - Use valid test methods provided below or if the result applies to an individual analyte within a test method, use the CAS number from the analytical data sheet.

DV Qualifiers - The entry will be taken from the list of valid qualifiers and associated comments. If other qualifiers not on the list are needed, contact Tina Sanchez to coordinate adding them to the list.

Comments - This is only to be used if a comment associated with the qualifier is not appropriate, needs modification because of an unusual circumstance, or additional clarification is warranted.

Test Methods - Anions_CE, EPA6010, EPA6020, EPA7470/1, EPA8015B, EPA8081, EPA8260, EPA8260-M3, EPA8270, HACH_ALK, HACH_ NO2, HACH_NO3, MEKC_HE, PCBRISC

Reviewed by: [signature] Date: 11/13/00

MEMORANDUM

DATE: November 13, 2000

TO: File

FROM: Kenneth Salazar

SUBJECT: Inorganic Data Review and Validation
TA3/5-Site 111, ARCOC #00346,
SDG #036355, Case No. 7219.01.06

See the attached Data Validation Worksheets for supporting documentation on the data review and validation.

Summary

All samples were prepared and analyzed with accepted procedures and specified methods: EPA6010 (silver). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation. It should be noted that this data package was historical, and the QC data provided by the laboratory were limited. Thus, complete data review and validation was not possible. Therefore, use of this data validation report should be at the sole discretion of the user.

Holding Times

All samples were analyzed within the prescribed holding times.

Calibration

No calibration data were provided with the data package.

Blanks

No target analytes were detected in the method blanks. No initial or continuing calibration blank (ICB/CCB) data were provided with the data package.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

The MS/MSD analysis met QC acceptance criteria.

Laboratory Control Samples (LCS/LCSD)

The LCS/LCSD analyses met QC acceptance criteria.

Replicate Analysis

No replicate analyses were performed. The MS/MSD analysis was used as a measure of precision. All QC acceptance criteria were met.

ICP Interference Check Sample (ICS)

No ICS data were provided with the data package.

ICP Serial Dilution

No serial dilution data were provided with the data package.

Other QC

A field duplicate was submitted. However, there are no "required" review criteria for field duplicate analyses comparability. No target analytes were detected in the equipment/rinsate blank (EB) or field blank (FB).

No other specific issues were identified which affect data quality.

Please contact me if you have any questions or comments regarding the review of this package.

Data Validation Summary

Site/Project: TA 3/5 - Site 111 Project/Task #: ~~3617.300~~ 7219.01.06 (KS 11/13/00) # of Samples: 17 Matrix: 8 soil / 9 aqueous

AR/COC #: 00346 Laboratory Sample IDs: 036355-0001 to -0017

Laboratory: Enseco

Laboratory Report #: 036355

QC Element	Analysis									
	Organics				Inorganics				RAD	Other
	VOC	SVOC	Pesticide/ PCB	HPLC (HE)	ICP/AES	GFAA/ AA	CVAA (Hg)	CN		
1. Holding Times/Preservation	✓	✓	NA	✓	✓	NA	NA	NA	NA	NA
2. Calibrations	NP	NP	↓	NP	NP	↓	↓	↓	↓	↓
3. Method Blanks	U, B	✓		✓	✓					
4. MS/MSD	✓	✓		✓	✓					
5. Laboratory Control Samples	✓	✓		✓	✓					
6. Replicates					NA					
7. Surrogates	✓	✓		NP						
8. Internal Standards	NP	NP								
9. TCL Compound Identification	NP	NP								
10. ICP Interference Check Sample					NP					
11. ICP Serial Dilution					NP					
12. Carrier/Chemical Tracer Recoveries										
13. Other QC	U, B1, B2		↓	✓	✓	↓	↓	↓	↓	↓

J = Estimated
U = Not Detected
UJ = Not Detected, Estimated
R = Unusable

Check (√) = Acceptable
Shaded Cells = Not Applicable (also "NA")
NP = Not Provided
Other: _____

Reviewed By: _____ Date: 11/13/00

Volatile Organics (SW 846 Method 8260)

Site/Project: TA 3/5 - Sik III AR/COC #: 00346 # of Samples: 7 Matrix: 4 soil / 3 aqueous

Laboratory: Enseco Laboratory Report #: 036355 Laboratory Sample IDs: 036355 - 1, -3, -5, -7, -9 (EB), -13 (FB), -17 (TB)

Methods: EPA 8240 Batch #s: 29 JUN94-0 (soil), 23 JUN94-0 (aqueous)

IS	CAS #	Name	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20% / 0.99	CCV %D 20%	Method Blks (soil)	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks	Method Blank (aqueous)	Field Blank
1	74-87-3	Chloromethane	✓	0.10					✓							NA	✓	✓	✓	✓
1	74-83-9	Bromomethane	✓	0.10																
1	75-01-4	**vinyl chloride**	✓	0.10																
1	75-00-3	Chloroethane	✓	0.01																
1	75-09-2	methylene chloride (10xblk)	✓	0.01					2.2								1.5	2.1		1.4
1	67-64-1	**acetone(10xblk)**	✓	0.01					✓								✓	✓	5.4	✓
1	75-15-0	carbon disulfide	✓	0.10															✓	
1	75-35-4	**1,1-dichloroethene**	✓	0.20						✓	✓	✓	✓	✓	✓					
1	75-34-3	**1,1-dichloroethane**	✓	0.10																
1	67-66-3	**Chloroform**	✓	0.20																
1	107-06-2	**1,2-dichloroethane**	✓	0.10																
1	78-93-3	**2-butanone(10xblk)**	✓	0.01																
2	71-55-6	1,1,1-trichloroethane	✓	0.10																
2	56-23-5	**carbon tetrachloride**	✓	0.10			NP													
2	75-27-4	Bromodichloromethane	✓	0.20																
2	78-87-5	**1,2-dichloropropane**	✓	0.01																
2	10061-01-5	cis-1,3-dichloropropene	✓	0.20																
2	79-01-6	**Trichloroethene**	✓	0.30						✓	✓	✓	✓	✓	✓					
2	124-48-1	Dibromochloromethane	✓	0.10																
2	79-00-5	1,1,2-trichloroethane	✓	0.10																
2	71-43-2	**Benzene**	✓	0.50						✓	✓	✓	✓	✓	✓					
2	10061-02-6	trans-1,3-dichloropropene	✓	0.10																
2	75-25-2	Bromoform	✓	0.10																
3	108-10-1	4-methyl-2-pentanone	✓	0.10					1.6										✓	
3	591-78-6	2-hexanone	✓	0.01					3.7										~~6.022~~	RB 11/9/94
3	127-18-4	**Tetrachloroethene**	✓	0.20					✓										6.0	
3	79-34-5	1,1,2,2-tetrachloroethane	✓	0.30															✓	
3	108-88-3	toluene(10xblk)	✓	0.40						✓	✓	✓	✓	✓	✓					
3	108-90-7	**Chlorobenzene**	✓	0.50						✓	✓	✓	✓	✓	✓					
3	100-41-4	Ethylbenzene	✓	0.10																
3	100-42-5	Styrene	✓	0.30																
3	1330-20-7	xylenes(total)	✓	0.30																
	540-59-0	**1,2-dichloroethylene(total)**	✓	0.01																
	~~110-75-8~~	~~2-chloroethyl vinyl ether~~																		
	108-05-4	vinyl acetate	✓													✓	✓	✓	✓	✓

Comments:

Notes: Shaded rows are RCRA compounds.

NA = Not Applicable
NP = Not Provided

Reviewed By: [signature] Date: 11/13/00

Volatile Organics

Site/Project: TA3/5 - Site 111 AR/COC #: 00346 Batch #s: 29JUN94-D(soil), 23JUN94-D(aqueous)

Laboratory: Enseco Laboratory Report #: 036355 # of Samples: 7 Matrix: 4 soil / 3 aqueous

Surrogate Recovery and Internal Standard Outliers (SW 846 Method 8260)

Sample	SMC 1	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
		All							
						N/P			
		Passed							

SMC 1: 4-Bromofluorobenzene
SMC 2: 1,2-Dichloroethane-d4
SMC 3: Toluene-d8

IS 1: Bromochloromethane
IS 2: 1,4-Difluorobenzene
IS 3: Chlorobenzene-d5

Comments: * Summary

⇒ In the method blank for the EB, FB, and TB, acetone was detected. All assoc. sample results were detects, < 10X the blank conc., < the RL, and will be qualified "10U,B."

⇒ In the method blank for the field samples, methylene chloride was detected. All assoc. sample results were detects, < 10X the blank conc., < the RL, and will be qualified "5U,B."

⇒ 4-methyl-2-pentanone and 2-hexanone were also detected. However, all assoc sample results were ND. Thus, no data were qualified.

⇒ In the EB, FB, and TB, methylene chloride was detected. All assoc. sample results were detects, < 10X the blank conc.s, < the RL, and will be qual. "5U,B1,B2."

Semivolatile Organics (SW 846 Method 8270)

Site/Project: TA 3/5 - Site 111 AR/COC #: 00346 Laboratory Sample IDs: 036355-2, -4, -6, -8, -10(EB), -14(FB)

Laboratory: Enseco Laboratory Report #: 036355

Methods: EPA 8270

# of Samples: 6 Matrix: 4 soil / 2 aqueous Batch #s: 23JUN94-N1(soil), 24JUN94-N1(aqueous)

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20%/ 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
1	A	108-95-2	Phenol	✓	0.80					✓	✓	✓	✓	✓	✓	✓	NA	✓	✓		
1	BN	111-44-4	bis(2-Chloroethyl)ether	✓	0.70																
1	A	95-57-8	2-Chlorophenol	✓	0.80						✓	✓	✓	✓	✓	✓					
1	BN	541-73-1	1,3-Dichlorobenzene	✓	0.60																
1	BN	106-46-7	1,4-Dichlorobenzene	✓	0.50						✓	✓	✓	✓	✓	✓					
1	BN	95-50-1	1,2-Dichlorobenzene	✓	0.40																
1	A	95-48-7	2-Methylphenol	✓	0.70																
1	BN	108-60-1	bis(2-chloroisopropyl)ether	✓	0.01																
1	A	106-44-5	4-Methylphenol	✓	0.60																
1	BN	621-64-7	N-Nitroso-di-n-propylamine	✓	0.50						✓	✓	✓	✓	✓	✓					
1	BN	67-72-1	Hexachloroethane	✓	0.30		NP														
2	BN	98-95-3	Nitrobenzene	✓	0.20																
2	BN	78-59-1	Isophorone	✓	0.40																
2	A	88-75-5	2-Nitrophenol	✓	0.10																
2	A	105-67-9	2,4-Dimethylphenol	✓	0.20																
2	BN	111-91-1	bis(2-Chloroethoxy)methane	✓	0.30																
2	A	120-83-2	2,4-Dichlorophenol	✓	0.20																
2	BN	120-82-1	1,2,4-Trichlorobenzene	✓	0.20						✓	✓	✓	✓	✓	✓					
2	BN	91-20-3	Naphthalene	✓	0.70																
2	BN	106-47-8	4-Chloroaniline	✓	0.01																
2	BN	87-68-3	Hexachlorobutadiene	✓	0.01																
2	A	59-50-7	4-Chloro-3-methylphenol	✓	0.20						✓	✓	✓	✓	✓	✓					
2	BN	91-57-6	2-Methylnaphthalene	✓	0.40																
3	BN	77-47-4	Hexachlorocyclopentadiene	✓	0.01																
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.20																
3	A	95-95-4	2,4,5-Trichlorophenol	✓	0.20																

Comments:

Notes: Shaded rows are RCRA compounds

NA = Not Applicable
NP = Not Provided

Reviewed By: _____ Date: 11/13/00

Semivolatile Organics

Site/Project: TA 3/5 - Site III   AR/COC #: 00346   Batch #s: 23JUN94-N1 (soil), 24JUN94-N1 (aqueous)

Laboratory: Enseco   Laboratory Report #: 036355   # of Samples: 6   Matrix: 4 soil / 2 aqueous

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF >.05	Calib. RSD/ R^2 <20% / 0.99	CCV %D 20%	Method Blanks	LCS	LCSD	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
3	BN	91-58-7	2-Chloronaphthalene	✓	0.80					✓							NA	✓	✓		
3	BN	88-74-4	2-Nitroaniline	✓	0.01																
3	BN	131-11-3	Dimethylphthalate	✓	0.01																
3	BN	208-96-8	Acenaphthylene	✓	0.90																
3	BN	606-20-2	2,6-Dinitrotoluene	✓	0.20																
3	BN	99-09-2	3-Nitroaniline	✓	0.01																
3	BN	83-32-9	Acenaphthene	✓	0.90						✓	✓	✓	✓	✓	✓					
3	A	51-28-5	2,4-Dinitrophenol	✓	0.01																
3	A	100-02-7	4-Nitrophenol	✓	0.01						✓	✓	✓	✓	✓	✓					
3	BN	132-64-9	Dibenzofuran	✓	0.80																
3	BN	121-14-2	2,4-Dinitrotoluene	✓	0.20						✓	✓	✓	✓	✓	✓					
3	BN	84-66-2	Diethylphthalate	✓	0.01		NP														
3	BN	7005-72-3	4-Chlorophenyl-phenylether	✓	0.40																
3	BN	86-73-7	Fluorene	✓	0.90																
3	BN	100-01-6	4-Nitroaniline	✓	0.01																
4	A	534-52-1	4,6-Dinitro-2-methylphenol	✓	0.01																
4	BN	86-30-6	N-Nitrosodiphenylamine (1)	✓	0.01																
4	BN	101-55-3	4-Bromophenyl-phenylether	✓	0.10																
4	BN	118-74-1	Hexachlorobenzene	✓	0.10																
4	A	87-86-5	Pentachlorophenol	✓	0.05						✓	✓	✓	✓	✓	✓					
4	BN	85-01-8	Phenanthrene	✓	0.70																
4	BN	120-12-7	Anthracene	✓	0.70																
4	BN	86-74-8	Carbazole	✓	0.01																
4	BN	84-74-2	Di-n-butylphthalate	✓	0.01																
4	BN	206-44-0	Fluoranthene	✓	0.60																
5	BN	129-00-0	Pyrene	✓	0.60						✓	✓	✓	✓	✓	✓					
5	BN	85-68-7	Butylbenzylphthalate	✓	0.01																
5	BN	91-94-1	3,3'-Dichlorobenzidine	✓	0.01																
5	BN	56-55-3	Benzo(a)anthracene	✓	0.80																

Comments:

Semivolatile Organics

Site/Project: TA315 - SWMU 111 AR/COC #: 00346 Batch #s: see page 2 of 3

Laboratory: Enseco Laboratory Report #: 036355 # of Samples: 6 Matrix: 4 soil / 2 aqueous

IS	BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. RF	Calib. RSD/ R^2	CCV %D	Method Blanks	LCS	LCS D	LCS RPD	MS	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
							>.05	<20%/ 0.99	20%												
5	BN	218-01-9	Chrysene	✓	0.70					✓							NA	✓	✓		
5	BN	117-81-7	bis(2-Ethylhexyl)phthalate	✓	0.01													12			
6	BN	117-84-0	Di-n-octylphthalate	✓	0.01													✓			
6	BN	205-99-2	Benzo(b)fluoranthene	✓	0.70																
6	BN	207-08-9	Benzo(k)fluoranthene	✓	0.70																
6	BN	50-32-8	Benzo(a)pyrene	✓	0.70			NP													
6	BN	193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50																
6	BN	53-70-3	Dibenz(a,h)anthracene	✓	0.40																
6	BN	191-24-2	Benzo(g,h,i)perylene	✓	0.50																
			Benzyl Alcohol	✓																	
			Benzoic Acid	✓																	

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
All Passed								

SMC 1: Nitrobenzene-d5 (BN)
SMC 2: 2-Fluorobiphenyl (BN)
SMC 3: p-Terphenyl-d14 (BN)
SMC 4: Phenol-d6 (A)
SMC 5: 2-Fluorophenol (A)
SMC 6: 2,4,6-Tribromophenol (A)
SMC 7: 2-2-Chlorophenol-d4 (A)
SMC 8: 1,2-Dichlorobenzene-d4 (BN)

Internal Standard Outliers

Sample	IS 1-area	IS 1-RT	IS 2-area	IS 2-RT	IS 3-area	IS 3-RT	IS 4-area	IS 4-RT	IS 5-area	IS 5-RT	Is 6-area	IS 6-RT
NP												

IS 1: 1,4-Dichlorobenzene-d4 (BN)
IS 2: Naphthalene-d8 (BN)
IS 3: Acenaphthene-d10 (BN)
IS 4: Phenathrene-d10 (BN)
IS 5: Chrysene-d12 (BN)
IS 6: Perylene-d12 (BN)

Comments: * Summary

=> In the EB, bis(2-ethylhexyl)phthalate was detected. The assoc. results of samples -2, -4, and -6 were detects, <10X the blank conc., < the RL, and will be qualified "330U,B."

High Explosives (SW 846 Method 8330)

Site/Project: TA3/5 - Site 111 AR/COC #: 00346 Laboratory Sample IDs: 036355-2,-4,-6,-8,-11(EB),-15(FB)

Laboratory: Enseco Laboratory Report #: 036355

Methods: EPA 8330

# of Samples: 6 Matrix: 4 soil / 2 aqueous Batch #s: 27JUN94-N1(soil), 23JUN94-N1(aqueous)

CAS #	NAME	TAL	Intercept	Curve R^2 .99	CCV %D 20%	Method Blanks U	① LCS	LCSD	LCS RPD 20%	MS	MSD	MS RPD 20%	Field. Dup. RPD	Equip. Blanks U	Field Blanks U		
2691-41-0	HMX	✓					✓	✓	✓	✓	✓	✓	NA	✓	✓		
121-82-4	RDX						✓	✓									
99-35-49	1,3,5-Trinitrobenzene						✓/100	✓/145									
99-65-0	1,3-dinitrobenzene						✓	✓		↓	↓						
98-95-3	Nitrobenzene						✓	138/✓		144	137						
479-45-8	Tetryl						✓	✓		✓	✓						
118-96-7	2,4,6-trinitrotoluene			NP			↓	↓			↓						
35572-78-2	2-amino-4,6-dinitrotoluene																
19406-51-0	4-amino-2,6-dinitrotoluene						✓/296	✓/264									
121-14-2	2,4-dinitrotoluene						✓	✓									
606-20-2	2,6-dinitrotoluene						↓	↓		↓	↓						
88-72-2	2-nitrotoluene																
99-99-0	4-nitrotoluene									130	✓						
99-08-1	3-nitrotoluene	↓					↓	↓	↓	✓	✓	↓	↓	↓	↓		
78-11-5	PETN																

NA = N.A Applicable
NP = Not Provided

Sample	SMC %REC	SMC RT	Sample	SMC %REC	SMC RT
NP					

Comments:
① 2nd LCS entries apply to aqueous samples only.

Confirmation

Sample	CAS #	RPD > 25%	Sample	CAS #	RPD > 25%
NA (All ND)					

* Summary → See back of this page.

Solids-to-aqueous conversion:
mg / kg = µg / g : [(µg / g) x (sample mass (g) / sample vol. (ml)) x (1000 ml / 1 liter)] / Dilution Factor = µg / l

Reviewed By: _____ Date: 11/13/00

Inorganic Metals

Site/Project: TA 3/5 - Site 111 AR/COC #: 00346 Laboratory Sample IDs: 036355 - 2, -4, -6, -8, -12 (EB), -16 (FB)

Laboratory: Enseco Laboratory Report #: 036355

Methods: EPA 6010

# of Samples: 6 Matrix: 4 soil / 2 aqueous Batch #s: 27JUN94-9D (soil), 01JUL94-9C (aqueous)

CAS #/ Analyte	QC Element																			
	TAL	ICV	CCV	ICB	CCB	Method Blanks	LCS	LCSD	LCSD RPD	MS	MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blanks	Field Blanks		
7429-90-5 Al																				
7440-39-3 Ba																				
7440-41-7 Be																				
7440-43-9 Cd																				
7440-70-2 Ca																				
7440-47-3 Cr																				
7440-48-4 Co																				
7440-50-8 Cu																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-5 Mn																				
7440-02-0 Ni																				
7440-09-7 K																				
7440-22-4 Ag	✓	NP	NP	NP	NP	✓	✓	✓	✓	✓	✓	✓	NA	NP	NP	NA	✓	✓		
7440-23-5 Na																				
7440-62-2 V																				
7440-66-6 Zn																				
7439-92-1 Pb																				
7782-49-2 Se																				
7440-38-2 As																				
7440-36-0 Sb																				
7440-28-0 Tl																				
7439-97-6 Hg																				
Cyanide CN																				

Notes: Shaded rows are RCRA metals. Solids-to-aqueous conversion: mg/kg = µg/g : [(µg/g) x (sample mass (g) / sample vol (ml)) x (1000 ml / 1 liter)] / Dilution Factor = µg/l

NA = Not Applicable
NP = Not Provided

Comments: * Summary

⇒ All QC criteria were met. No data were qualified.

Reviewed By: [signature] Date: 11/13/96

Sandia National Laboratories

SF 2001 COC (12-93)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

AR/COC- 00346

PAGE 1 OF 2

Department No.:	7582	Date Samples Shipped:	A 44334 6/20/94
Project/Task Manager:	CHRIS ABEL / PAULA SLAVIN	Carrier/Waybill No.:	A44334
Project Name:	TA 3/5 - SITE 111	Lab Destination:	ENGECO / RMAL
Sample Team Members	TIM JACKSON	Lab Contact:	ELLEN LA RIVIERE
	JOHN BOYD	SMO Contact/Phone:	(505) 848-0402
		Send Report to SMO:	PAM PUSSANT
SCL or Logbook Ref. No.:	00620	SMO Reference No.:	301455.152.02

Bill to:	Sandia National Laboratories
	Supplier Services Department
	P.O. Box 5800 MS 0154
	Albuquerque, NM 87185-0154
Contract No.:	67-97368
Case No.:	3617.300
SMO Authorization:	D. M. Laug

Sample Number - Fraction	Sample Matrix	Date/Time Collected	Container Type	Sample Volume	Preservative	Required Analytical Testing	Lab Sample Number	Condition on Receipt
SNL/NM 016884-1	SOIL	6-17-94/835	GLASS	4 oz	ICE, 4°C	VOC (8240)	36355 1	GOOD
016884-2		↓		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)	2	
016883-1		1035 + 835 TP		4 oz		VOC (8240)	3	
016883-2		↓		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)	4	
016886-1		0955 - 847 TP		4 oz		VOC (8240)	5	
016886-2		0950 ↓		16 oz		SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010)	6	
016889-1		1120		2x4 oz		VOC (8240) MS/MSD	7	MS/SD
016889-2	↓	↓		2x16 oz	↓	SVOC (8270), EXPLOSIVE RESIDUE (8330), SILVER (6010) MS/MSD	8	MS/SD
016890-1	WATER	1200		3x40 mL	HCL	VOC (8240)	9	
016890-2	↓	↓		2x1 L	ICE, 4°C	SVOC (8270)	10	
016890-3	↓	↓	↓	2x1 L	↓	EXPLOSIVE RESIDUE (8330)	11	↓

Possible Hazard Identification

☑ Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Radiological

*Reference attached radiological screening for specific contact readings.

Turnaround Time

☑ Normal ☐ Rush _____ Required Report Date PER CONTRACT

Sample Disposal

☐ Return to Client ☑ Disposal by Lab Archive Until PER CONTRACT

Special Instructions/QC Requirements
- PLEASE FAX COPY OF RESULTS TO PAULA SLAVIN @ (505) 848-0417
- ENVIRONMENTAL SAMPLES - NO CONTAMINATION SUSPECTED
- MS/MSD = MATRIX SPIKE / MATRIX SPIKE DUPLICATE

1. Relinquished by	Tim Jackson	Org.	ITC	Date	6-20-94	Time	0945
1. Received by		Org.	GMO ITC	Date	6-21-94	Time	0945
3. Relinquished by		Org.	SMO 7526	Date	6/21/94	Time	1001
2. Received by	Bonnie Hager	Org.	RMAL	Date	6/21/94	Time	0845
3. Relinquished by		Org.		Date		Time	
3. Received by		Org.		Date		Time	
4. Relinquished by		Org.		Date		Time	
4. Received by		Org.		Date		Time	
5. Relinquished by		Org.		Date		Time	
5. Received by		Org.		Date		Time	
6. Relinquished by		Org.		Date		Time	
6. Received by		Org.		Date		Time	

WHITE - To Accompany Samples, Laboratory Copy BLUE - To Accompany Samples, Return to SMO YELLOW - SMO Suspense Copy PINK - Field Copy

Sandia National Laboratories

SF 2001 COD (12-93)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD
(continuation)

AR/COC- 00346

Project Name: TA 3/5 - SITE 111   Project/Task Manager: CHRIS AAS / PAULA SLAVIN   Case No.: 3617.300

Sample Number - Fraction	Sample Matrix	Date/Time Collected	Container Type	Sample Volume	Preservative	Required Analytical Testing	Lab Sample Number	Condition on Receipt
016890 - 4	WATER	6-17-94/1200	POLY	500mL	HNO_3	SILVER (6010)	3635512	good
016891 - 1	↓	1207	GLASS	3X40mL	HCL	VOC (8240)	13	↓
016891 - 2		↓	↓	2X1Li	ICE, 4°C	SVOC (8270)	14	
016891 - 3				2X1Li	ICE, 4°C	EXPLOSIVE RESIDUE (8330)	15	
016891 - 4			POLY	500mL	HNO_3	SILVER (6010)	16	
016892 - 1	↓	1210	GLASS	40mL	HCL	VOC (8240) TRIP BLANK	17	↓

TH

Rec'd by lab Bonnie Kruger 6/21/94 0845

180000

WHITE - To Accompany Samples, Laboratory Copy   BLUE- To Accompany Samples, Return to SMO   YELLOW- SMO Suspense Copy   PINK- Field Copy

ANNEX B
Surface Water Assessment

SURFACE WATER SITE ASSESSMENT

Part B (3 pages)

Site Information:

1a) Site # 111 1b) Building # (if applicable) NA 1c) OU # 1306

2. Date/Time (M/D/Y H:M, 24Hr) 08-15-00) 1050

Site Setting:

3a) (✓) On Alluvial Plain.

3b) ( ) Within a bench of an arroyo or drainage basin

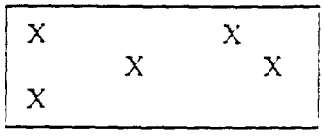
3c) ( ) In canyon floor/drainage basin, but not in an established channel.

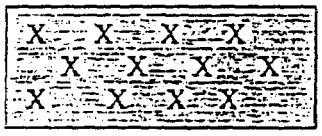
3d) ( ) Within established arroyo channel/drainage basin

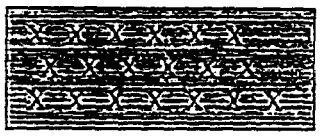
Explanation: Building 6715 Sump/Drains (TA-III)

4. Estimated ground and / or canopy cover at the site: (deciduous leaves, pine needles, vegetation, trees, rocks)

Estimated percent of ground cover:

a) 

b) 

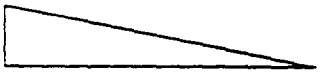
c) 

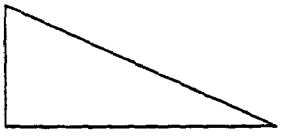
( ) 0-25% cover (✓) 25-75% cover ( ) 75-100% cover

Explanation: Concrete sidewalk and asphault drive area.

5. Steepest slope at the area impacted:

a)

b) 

c) 

(✓) less than 10% ( ) 10 to 30% ( ) 30% or greater

Explanation:

SURFACE WATER SITE ASSESSMENT

Part B (3 pages)
SITE 111

Runoff Factors:

Y / N

( ) (✓) 6) Is there visible evidence of runoff discharging from the site? If yes, answer a) – c) below:

( ) (✓) 6a) Is runoff channelized? If yes, describe. ( ) Man-made channel. ( ) Natural Channel.

6b) Where does evidence of runoff terminate?

Drainage or wetland. (name) NA

Within bench of Canyon setting. (name) NA

Other (retention pond, meadow, mesa top etc) NA

Explanation: NA

( ) (✓) 6c) Has runoff caused visible erosion at the site? If yes, explain. ( ) Sheet ( ) Rill ( ) Gully

Explanation: NA

Run-on Factors:

Rate the potential for storm water to run on to this site: (Check EITHER #7 or #9)
Note: Include comments in appropriate boxes if both natural and man-made run-on exist.

(✓) ( ) 7. Are structures creating run-on to the site? (buildings, roof drains, parking lots, storm drains)

Explanation: Slight elevated slope from building to North and soil berm to south side of site.

( ) (✓) 8. Are current operations adversely impacting run-on to the site? (fire hydrants, NPDES outfalls)

Explanation: NO

( ) (✓) 9. Are natural drainage patterns directing stormwater onto the site?

Explanation: NA

SURFACE WATER SITE ASSESSMENT

Part B (3 pages)
SITE 111

Assessment Finding:

Y / N

○ ○ 10. Based on the above criteria and the assessment of this site, do soil erosion potentials exist? **(REFER TO EROSION POTENTIAL MATRIX)**

Explanation: NA

11. ANGEL B VEGA
Angel B Vega Jr
ER SW Representative

mbm / 6135 / 844-9081
Company / Organization / Phone #

Task Leader or Designee

GRAM / 6133 / 284-2588
Company / Organization / Phone

Initials of Independent Reviewer. ☐ Check here when information is entered into database. ☐

Notes Recommendations & Photos. (Please attach photos)

○ ○ 12a. Is there visible trash / debris on the site?

○ ○ 12b. Is there visible trash / debris in the watercourse?

Description of existing BMP's: NA

○ ○ 13a. Are BMP's being properly maintained? (If no, describe in "Other Internal Notes")

○ ○ 13b. Are BMP's effectively keeping sediment in place and reducing erosion potential?

Recommended BMP's for this site: NA

Other Internal Notes: NA

Surface Water Site Assessment Erosion Matrix Sheet

SWMU / IRP # 111/118

CRITERIA EVALUATED	Value	Erosion / Sediment transport Potential Factor Low 0.1	Medium 0.5	High 1.0	Calculated Score
Site Setting (43 point max)					
On Mesa top or hill top	1	No Multiplying Factor Defined Based on Topgraphic Setting			
Within bench of canyon/drainage basin	4				4
Within canyon floodplain or drainage basin, but not in watercourse	13				
Within canyon bottom or drainage basin and in watercourse	17				
Estimated % ground and canopy cover	13	> 75 %	~25 - 75 %	< 25 %	10.5
Slope at area impacted	13	0 - 10 %	10 - 30 %	> 30 %	10.5
Surface Water Run-off Factors (46 point max)				Section Total	
Visible evidence of runoff discharge? (Y/N)	5	If NO, Score 0 for Run-off Section. If YES, Score 5 and Complete Section.			0
Where does runoff terminate?	19	Other	Bench Setting	Drainage/Wetland	0
Has runoff caused visible erosion? (Y/N)	22	Sheet	Rill	Gully	0
		If NO, Score as 0. If YES, Caculate and Record Value.			
Surface Water Run-on Factors (11 point max)				Section Total	
Do structures adversely affect run-on?* (Y/N)	7	If YES, Score as 7. If NO, Score as 0.			0
Does natural drainage adversely affect site run-on?* (Y/N)	7	If YES, Score as 7. If NO, Score as 0.			0
Do current operations adversely impact site run-on? (Y/N)	4	If YES, Score as 4. If NO, Score as 0.			0
* Select either structures OR natural drainage.					
MAX. POSSIBLE EROSION MATRIX SCORE:	100	Score: < 40 = low erosion potential 40 - 60 = moderate erosion potential > 60 = high erosion potential		**Total Score**	

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