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Justification for Class III Permit Modification February 2004 SWMU 94H Operable Unit 1333 JP-8 Fuel Site

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Sandia National Laboratories

Justification for Class III Permit Modification

February 2004

**SWMU 94H
Operable Unit 1333
JP-8 Fuel Site**

NFA Originally Submitted September 2002

Supplemental Risk Document Submitted Oct. 2003

**Environmental
Restoration
Project**



**United States Department of Energy
Albuquerque Operations Office**

NFA

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- 3-C Gamma Spectroscopy Results
- 3-D Diesel and Gasoline Range Organics Results
- 3-E Risk Screening Assessment

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CHAPTER 3.0 ACRONYMS AND ABBREVIATIONS

AOC	area of concern
bgs	below ground surface
CEARP	Comprehensive Environmental Assessment and Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	constituent(s) of concern
DOE	Department of Energy
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ERFO	Environmental Restoration Field Office
FY	fiscal year
g	gram(s)
GRO	gasoline range organics
GWQB	Ground Water Quality Bureau
HE	high explosive(s)
HEAL	Hall Environmental Analytical Laboratory
HI	hazard index
HQ	hazard quotient
HRS	Hazard Ranking System
HSWA	Hazardous and Solid Waste Amendments
HWB	Hazardous Waste Bureau
HWMF	Hazardous Waste Management Facility
JP-4	jet propulsion fuel grade 4
JP-8	jet propulsion fuel grade 8
KAFB	Kirtland Air Force Base
kg	kilogram(s)
L	liter(s)
LAARC	Light Airtransport Accident Resistant Container
LCBS	Lurance Canyon Burn Site
LOBP	Large Open Burn Pool
MCL	maximum contaminant level
MDL	method detection limit
µg	microgram(s)
mg	milligram(s)
ND	not detected
NFA	no further action
NMED	New Mexico Environment Department
OU	Operable Unit
OVM	organic vapor monitor
pCi	picocuries
ppm	part(s) per million
PQL	practical quantitation limit
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation

CHAPTER 3.0 ACRONYMS AND ABBREVIATIONS (Concluded)

RMMA	Radioactive Materials Management Area
RPSD	Radiation Protection Sample Diagnostics
SNL/NM	Sandia National Laboratories/New Mexico
SOBP	Small Open Burn Pool
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
STL	Severn Trent Laboratory
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbons
USAF	U.S. Air Force
USFS	U.S. Forest Service
UXO	unexploded ordnance
VCA	Voluntary Corrective Action
VOC	volatile organic compound

3.0 SOLID WASTE MANAGEMENT UNIT 94H, JP-8 FUEL SITE, LURANCE CANYON BURN SITE

3.1 Summary

Sandia National Laboratories/New Mexico (SNL/NM) is proposing a risk-based, no further action (NFA) decision for Environmental Restoration (ER) Solid Waste Management Unit (SWMU) 94H, Jet Propulsion Fuel Grade 8 (JP-8) Site, Lurance Canyon Burn Site (LCBS), Operable Unit (OU) 1333 on Kirtland Air Force Base (KAFB). SWMU 94H is a newly identified area of concern (AOC) within the boundary of OU 1333, the Canyons Test Area (DOE September 2000), located on U.S. Air Force (USAF) land withdrawn from the U.S. Forest Service (USFS) and permitted to the Department of Energy (DOE). Environmental concern for SWMU 94H is primarily based upon the release of fuel-related compounds to subsurface soil. SWMU 94H is one of eight SWMU 94 subunits associated with past burn testing. This SWMU is identified on Table A.2 of the New Mexico Environment Department (NMED) Hazardous and Solid Waste Amendments (HSWA) Permit as "Fuel Spill at Open Pod Test Area, Lurance Canyon Burn Site."

The JP-8 Site consists of a graded area located near the northwest corner of the Large Open Burn Pool (LOBP). The fuel release was discovered directly north of the former Small Open Burn Pool (SOBP) location; the contamination appeared to follow the west-trending outer conduit of the underground piping in that area. The Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) conducted at SWMU 94H showed that the contamination was limited to the subsurface soil and did not migrate into the underlying bedrock.

A Voluntary Corrective Action (VCA) was conducted at SWMU 94H in July and August 2001. Approximately 880 cubic yards of fuel-contaminated soil were excavated, segregated, and disposed of at KEERS Landfarm in Mountainair, New Mexico, an approved off-site disposal facility. Confirmation and verification soil sample data showed that all soil with greater than 100 parts per million (ppm) total petroleum hydrocarbons (TPH) or diesel range organics (DRO) was removed. Personnel from the NMED inspected the completed excavation and concurred that the clean-up objectives had been met, after which the excavation was backfilled with clean soil and restored to grade.

Review and analysis of all relevant data for SWMU 94H indicate that concentrations of constituents of concern (COCs) are less than applicable risk-assessment action levels. Thus, SWMU 94H is being proposed for an NFA decision based upon confirmation and verification sampling data that demonstrates that COCs released from SWMU 94H into the environment do not pose a risk above an acceptable level under current and projected future land use, as set forth by NFA Criterion 5 (NMED March 1998).

3.2 Description and Operational History

SWMU 94, identified as the LCBS in the HSWA Module of the SNL/NM RCRA Part B Operating Permit, is located on USFS land permitted to the DOE (SNL/NM July 1994). In order to facilitate site characterization of the general area, SWMU 94 was originally subdivided into seven subunits where hazardous constituents may have been released. In September 2000, the DOE Kirtland Area Office notified the NMED of the newly identified SWMU, 94H, as required under Section H of the HSWA module of the RCRA Part B Permit for SNL/NM (DOE September

2000). The eight current SWMU 94 subunits are: SWMU 94A (Aboveground Tanks), SWMU 94B (Debris/Soil Mound Area), SWMU 94C (Bomb Burner Area and Discharge Line), SWMU 94D (Bomb Burner Discharge Pit), SWMU 94E (Small Surface Impoundment), SWMU 94F (Light Airtransport Accident Resistant Container [LAARC] Discharge Pit), SWMU 94G (Scrap Yard), and SWMU 94H (JP-8 Site). All of these subunits are inactive except SWMUs 94A and 94G. Each SWMU 94 subunit has been addressed in a separate NFA proposal. This chapter addresses the historical fuel release from SWMU 94H.

3.2.1 Site Description

SWMU 94H, identified as the JP-8 Site, is a subunit of SWMU 94, designated as the LCBS (SNL/NM September 1995). The JP-8 Site is a SWMU within OU 1333 known as the Canyons Test Area (Figure 3.2.1-1). OU 1333 is located within several remote canyons located on the east side of KAFB.

The location of SWMU 94 lies within SWMUs 65D and 65E (the Lurance Canyon Explosive Test Site Near Field Dispersion Area and the Far Field Dispersion Area, respectively), which are inactive sites that were used for high explosives (HE) tests, liquid and solid propellant burn tests, and open pit burn tests. SWMU 94H is one of eight SWMU 94 subunits associated with past burn testing (Figure 3.2.1-2). The site is located on the canyon-floor alluvium in the closed upper reaches of the Lurance Canyon drainage (Figure 3.2.1-2). The Lurance Canyon drainage is surrounded by moderately steep sloping canyon walls. The site is constructed on a large graded area, and the immediate topographic relief around the site is more than 500 feet (Figure 3.2.1-3). A 25- to 50-foot-wide road is cut on the hillslopes as a firebreak and encircles the site. The canyon floor at the site is isolated by the canyon walls except for the western drainage into Arroyo del Coyote. Coyote Springs Road, the main access road into Lurance Canyon, follows this drainage (Figure 3.2.1-2).

The hydrogeology of Sol se Mete and Lurance Canyons is summarized in the "RFI Work Plan for OU 1333, Canyons Test Area" (SNL/NM September 1995). The stratigraphy of OU 1333 consists of Precambrian metamorphic and intrusive rocks that are overlain by Paleozoic clastic and sedimentary carbonate rocks (Figure 3.2.1-4). Along the canyon bottoms, alluvial sediments overlie these rocks. The original hydrologic model was developed using existing geologic/hydrogeologic reports and data from six wells and four springs present in the area. In general, the initial conceptual model is that groundwater flows through a series of fractures of unknown extent and complexity. Based upon observations during the drilling of the Burn Site Production Well in 1986, groundwater occurs within the fractures of the Precambrian bedrock (Coyote Metasedimentary sequence) under confined conditions. The groundwater flow direction is assumed to be topographically controlled and flow is to the west along the Lurance Canyon drainage.

The Burn Site Production Well (located approximately 280 feet east of SWMU 94H) was drilled in February 1986 to a total depth of 350 feet below ground surface (bgs) (Figure 3.2.1-2). This provided a nonpotable water source for fire suppression during burn tests. The driller's log describes encountering 74 feet of clay, silt, and shale units overlying fractured schist and granite. The water-bearing zone was encountered at a depth of 222 feet bgs. Following well completion, the water level reportedly rose to 68 feet bgs, indicating confined conditions at this location.

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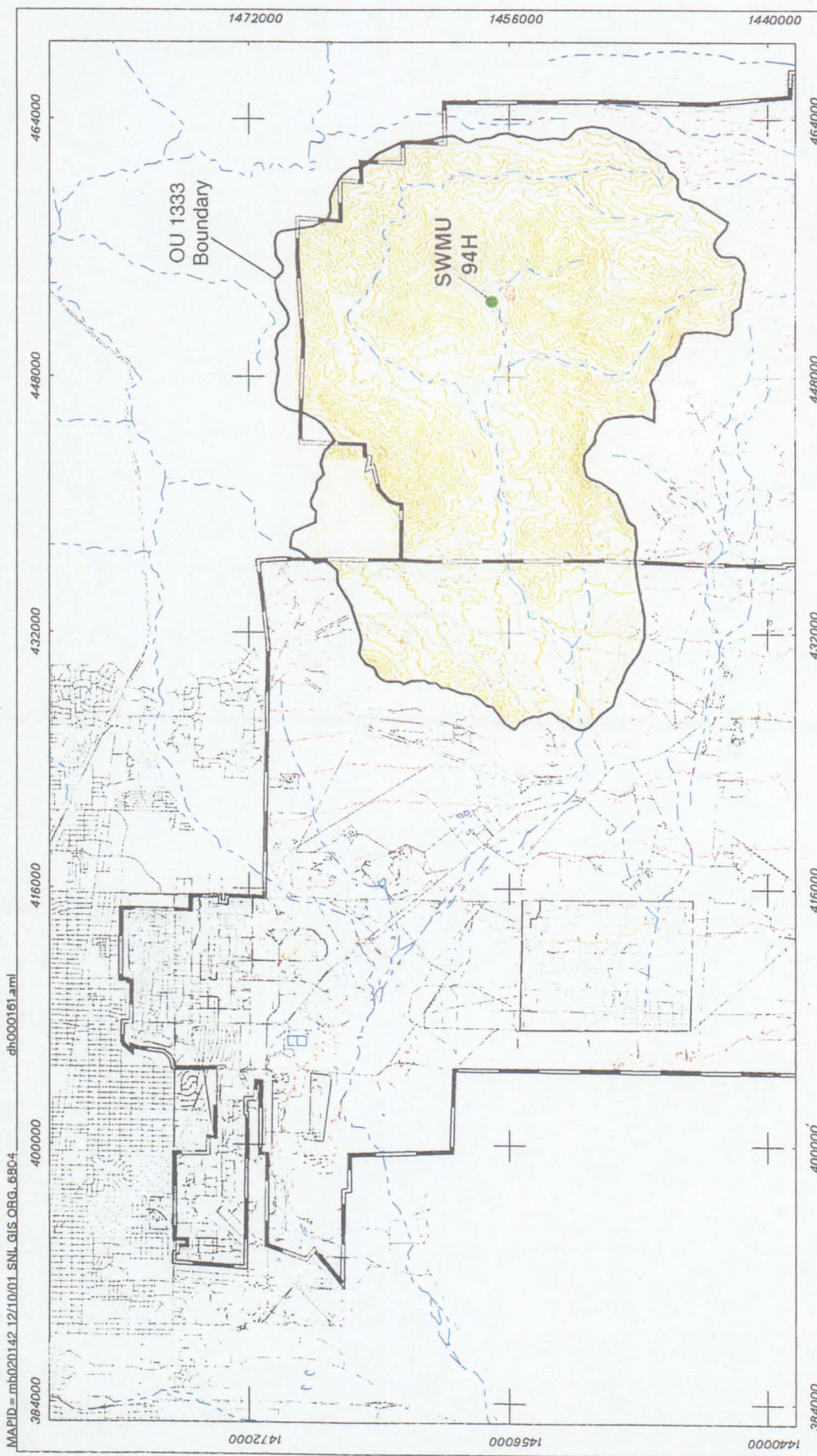
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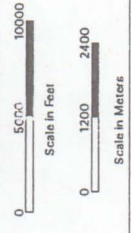
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



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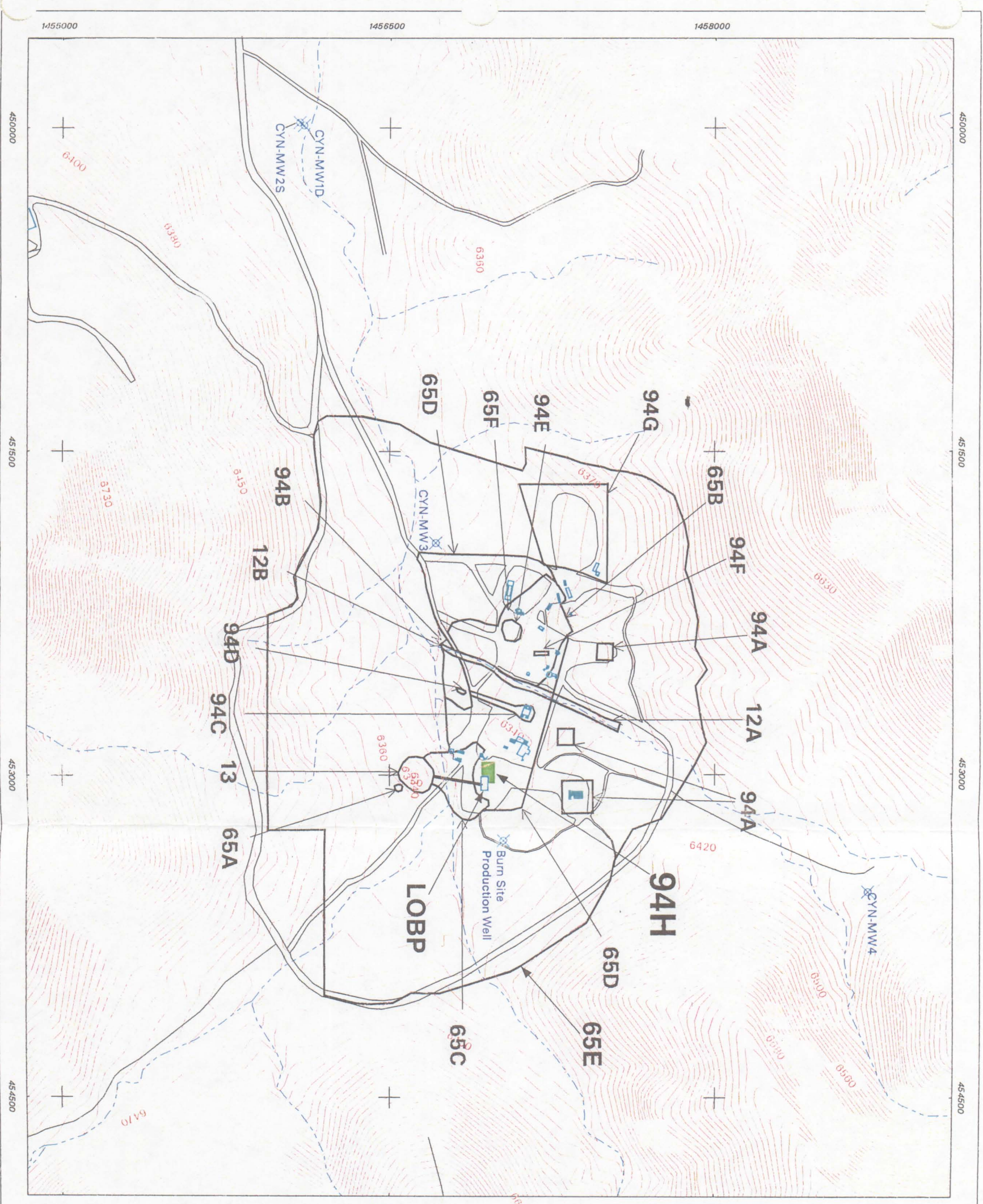
Sandia National Laboratories, New Mexico
 Environmental Geographic Information System

Figure 3.2.1-1
General Location Map of
SWMU 94H










Legend

-  SWMU 94H
-  Roadway
-  200 Foot Contour
-  Drainage
-  Operable Unit 1333
-  KAFB Boundary
-  Technical Area

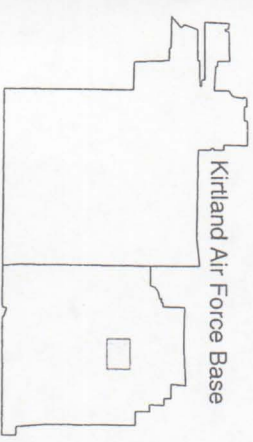


Legend

-  Monitoring Well
-  Road
-  10-Foot Contour Line
-  Surface Drainage
-  Other SWMU Boundary
-  Building / Structure
-  SWMU 94H



Scale in Meters



Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 3.2.1-2
Site Map of SWMU 94H
and Vicinity

*Traverse: UTM Projection, New Mexico State Plane, Coordinate System,
Central Zone, 1927 North American Horizontal Datum,
1983 North American Vertical Datum*



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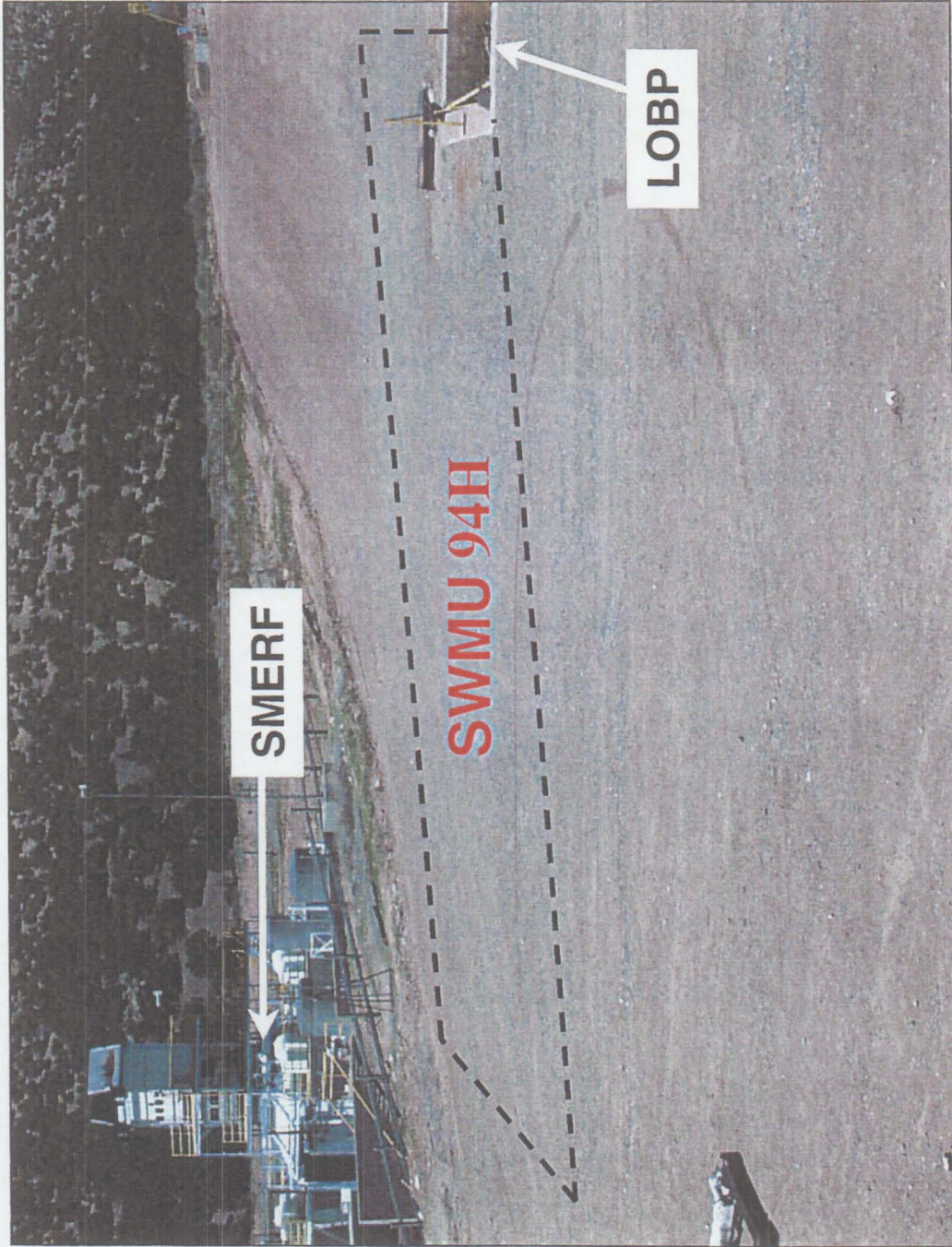


Figure 3.2.1-3
Photograph Showing Locations of
Smoke Emissions Reduction Facility (SMERF), Large Open Burn Pool (LOBP)
and Approximate Boundaries of SWMU 94H (view to the north)

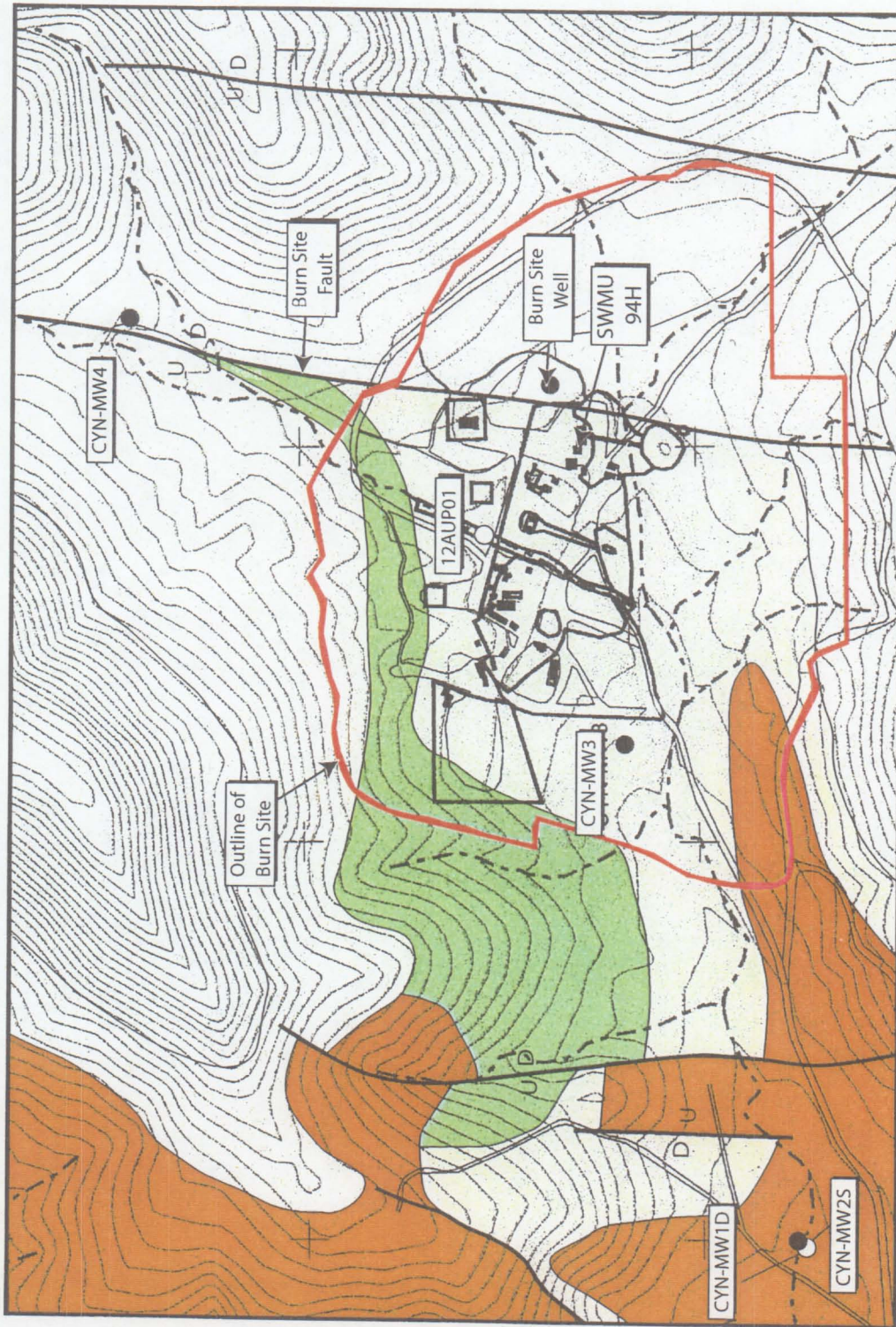


Figure 3.2.1-4
 Bedrock Geology of the Burn Site
 (modified from Karlstrom et al., 1994)

The Burn Site Spring is an ephemeral spring or seep located approximately 2,500 feet east-northeast of SWMU 94H. The seep discharges small quantities of water from fractures and/or bedding plane permeability within the carbonate rocks. Based upon the geochemistry, it does not appear that the spring's source is from deep groundwater, but is more likely from infiltration of precipitation through fractures in the surrounding mountain terrain (IT April 1993).

As part of other Burn Site investigations (SWMUs 12A and 12B), a shallow piezometer (12AUP01) was installed in November 1996 in the SWMU 12A arroyo approximately 450 feet northwest of SWMU 94H (Figure 3.2.1-4). The piezometer, installed in conformance with a document of understanding between SNL/NM and the NMED/DOE Oversight Bureau (Dawson August 1996), monitors the alluvium/bedrock interface to determine if water is present at any time of the year; if so, the piezometer could be used to monitor the water quality. At 12AUP01, about 55 feet of alluvium (poorly sorted sand and gravel in a matrix of silt and clay) overlies Coyote Metasediments. The piezometer was completed to a depth of approximately 58 feet bgs. Moist soil was encountered in the first 2 feet of alluvium. The remaining 53 feet to bedrock were dry. No groundwater was encountered during drilling, nor has any water been detected in the piezometer during monitoring.

In 1996, groundwater samples collected from the Burn Site Production Well by NMED showed nitrate at concentrations above the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) of 10 milligrams (mg) per liter (L). NMED and the SNL/NM ER Project entered into discussions regarding the source of the elevated nitrate and initiated a study (SNL/NM July 1997, SNL/NM September 1997a). The Burn Site Production Well was re-sampled in October 1997 by SNL/NM ER and a report of the results was provided to NMED (SNL/NM December 1997). In 1997, both groundwater monitoring well (CYN-MW1D) and a shallow underflow piezometer (CYN-MW2S) were installed west of the Burn Site in the arroyo where the canyon narrows before opening up again (Figure 3.2.1-4). Thus, the wells were referred to as the "Narrows" wells by NMED and SNL/NM ER. The geology at CYN-MW1D/MW2S was found to be significantly different from the Burn Site Production Well, with about 25 feet of alluvial sediments overlying unfractured to moderately fractured Precambrian Granite. Water has not been detected in Piezometers IZAUP01 and CYN-MW2S; however, both are monitored monthly for the presence of water.

Groundwater was first encountered in CYN-MW1D at a depth of 372 feet bgs and rose to 320 feet bgs. Groundwater samples from CYN-MW1D showed nitrate concentrations slightly above the MCL as well as trace levels of fuel-related volatile organic compounds (VOCs) (SNL/NM October 1998). The highest analyte concentrations were toluene at 77 micrograms (μg)/L and TPH (as diesel) at 0.5 mg/L. Subsequent sampling results show the VOC and TPH concentrations to be gradually decreasing with time. Nitrate levels have remained about the same over time. No water was encountered during drilling, and no water has been recorded in CYN-MW2S since its installation.

As a continuation of the groundwater study, two additional monitoring wells, CYN-MW3 and CYN-MW4, were installed in June 1999. CYN-MW3 was installed in the assumed downgradient direction from SWMU 94F, the suspected source of petroleum hydrocarbon groundwater contamination. As discussed previously, this site contained an unlined discharge pit that received wastewater containing residual Jet Propulsion Fuel Grade 4 (JP-4). The monitoring well is located approximately 1,100 feet southwest of SWMU 94H near the arroyo draining Lurance Canyon. At CYN-MW3, about 35 feet of alluvial fill overlie fractured phyllite interbedded with quartzite units (Coyote Metasediments). The total depth of the well is 148 feet bgs. Groundwater at CYN-MW3 was encountered at a depth of 124 feet bgs, rising to

a static level of 104 feet bgs. Extensive fracturing was evident in the bedrock units at this location. The alluvium appeared to be dry, so a piezometer was not installed at this location. Only nitrates have been detected consistently in CYN-MW3. Groundwater samples from this well indicate nitrate concentrations (highest concentration or range) above the MCL but show very low to nondetectable concentrations of petroleum hydrocarbons. This may be due to the highly transmissive zone that is being monitored.

CYN-MW4 was installed as a background/upgradient monitoring well. It is located approximately 1,800 feet north-northeast of SWMU 94H (Figure 3.2.1-4), within the drainage containing SWMUs 12A and 12B (SNL/NM September 1995). At the well, the alluvium is 21 feet thick. Paleozoic limestone is present beneath the alluvium to about 85 feet bgs. Precambrian schist and quartzite units occur from 85 feet bgs to the total depth of the borehole. These units are fractured but do not exhibit the same degree of fracturing that is present at CYN-MW3. CYN-MW4 was drilled to a total depth of 318 feet bgs without evidence of saturated conditions. However, following an overnight standdown, the water level was measured at 218 feet bgs. The well was completed with a screened interval of 255 to 275 feet bgs. Samples from this well show nitrate concentrations of less than 1 mg/L, but trace levels of petroleum hydrocarbons were detected during the Fiscal Year (FY) 2001 and FY 2002 sampling events. Currently, it is unknown whether these constituents are a result of sampling contamination or are representative of the groundwater quality at this location. Sampling efforts are ongoing. No SNL/NM operations are known to be present upgradient of this well, and the area is undeveloped. The groundwater gradient direction is generally towards the west.

Since 1992, groundwater data for both the Burn Site and Lurance Canyon areas have been collected and reported to the regulatory community by SNL/NM, primarily through the annual groundwater reports prepared by the Groundwater Protection Program, in cooperation with the SNL/NM ER Project (SNL/NM November 2001). The Burn Site Spring has also been sampled as part of the groundwater surveillance program; results for these analyses can be found in the annual reports. With the addition of the three monitoring wells at the Burn Site, and the subsequent detection of petroleum hydrocarbons and elevated nitrate in groundwater, the SNL/NM ER Project prepared a summary report of the analytical results for the Burn Site (SNL/NM November 2001). Results of groundwater sampling of CYN-MW1D for FY 1998 were presented to NMED with notification of the identification of petroleum hydrocarbons in groundwater (SNL/NM October 1998). With the exception of nitrate, no COCs are present in groundwater at or above relevant MCLs. Based upon both the conceptual hydrologic model of the site and the mitigation of the presumed source area for petroleum hydrocarbons (SWMU 94F), the SNL/NM ER Project is proposing a monitored natural attenuation approach for the groundwater.

The presence of nitrate and petroleum hydrocarbons in groundwater (COCs at the Burn Site SWMUs) suggests that there is a mechanism for transporting these contaminants to the uppermost aquifer. Although the groundwater appears to be confined beneath the site, there must be recharge occurring at the Burn Site through localized fractures in the bedrock. At SWMU 94F, the bedrock underlying the thin alluvium is highly fractured. The bottom of the discharge pit receiving wastewater was close to the top of the bedrock, allowing artificial recharge to the fractured bedrock aquifer. The Canyons Groundwater Investigation Report (SNL/NM November 2001) summarizes how contaminants are transported through the fractured bedrock system, possibly even across fault zones.

3.2.2 Operational History

SWMU 94H is located in the immediate vicinity of the LOBP and the former site of the SOBP. There is no operational history for SWMU 94H because it was identified as an AOC when a leak from an existing Burn Site fuel pipeline was discovered in August 2000. The following is a brief operational history of the Burn Site. The LOBP is an active burn unit located approximately 200 feet southeast of the Smoke Emissions Reduction Facility. The LOBP consists of a rectangular concrete basin that measures 30 by 60 feet, is 3 feet deep, and is lined with concrete/fiber-ceramic. The SOBP was located approximately 8 feet west of the LOBP. Built in 1992, the SOBP was an active burn facility until it was decommissioned in November 2000. Additional information regarding the LOBP and SOBP is presented in Annex 3-A of this chapter.

On August 3, 2000, Burn Site personnel were installing a new conduit in a shallow trench on the north side of the SOBP. During excavation of the trench, the workers smelled fuel from a 3-inch-diameter fuel line connecting the SOBP to the aboveground fuel and water supply tanks to the north of the site. Work was stopped immediately and the Burn Site Manager notified, as well as the SNL Environment, Safety, and Health Coordinator, and the ER Burn Site Project Leader.

3.3 Land Use

This section discusses the current and future land uses of SWMU 94H.

3.3.1 Current Land Use

SWMU 94H is located on withdrawn lands within the boundaries of KAFB (see Figure 3.3.1-1) within the active LCBS, currently used for testing fire survivability of transportation containers, weapons components, simulated weapons, and satellite components (Martz November 1985, SNL/NM May 1986). The current land use of the LCBS is industrial and not likely to change, given the extensive upgrades that have been made.

3.3.2 Future/Proposed Land Use

The projected future land use for SWMU 94H is recreational (DOE et al. October 1995), and the risk assessment for this site is based upon a potential recreational land use scenario.

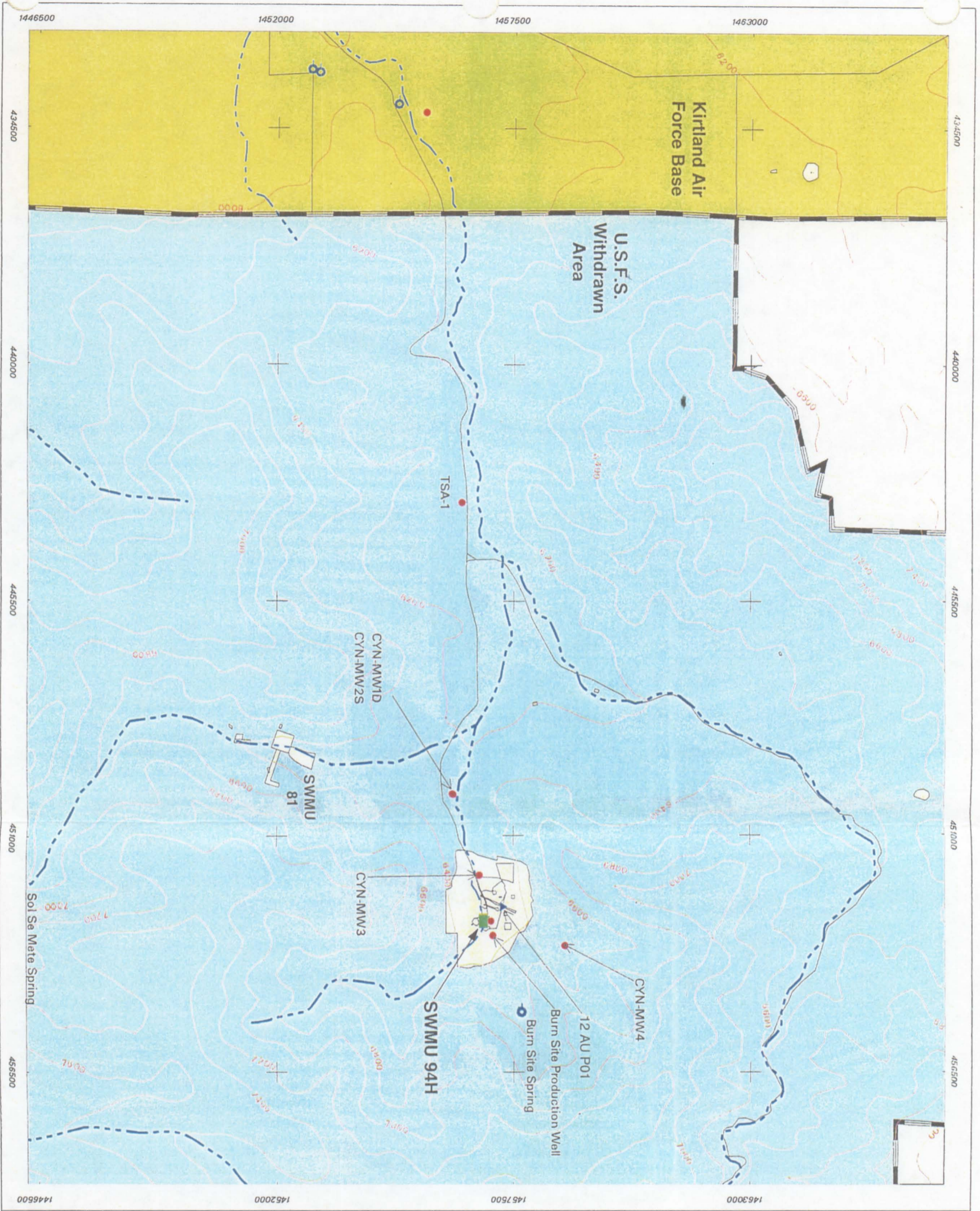
3.4 Investigatory Activities

SWMU 94H has been characterized and remediated during a series of four investigations, as well as a VCA, summarized in the following subsections.

3.4.1 Summary

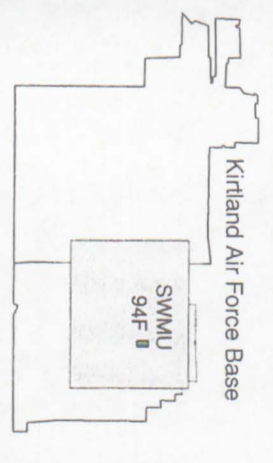
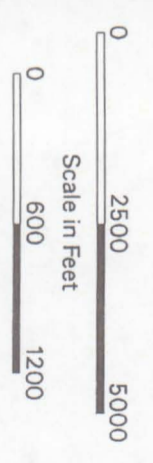
SWMU 94 was investigated initially under the DOE Comprehensive Environmental Assessment and Response Program (CEARP) in the mid-1980s in conformance with the Comprehensive

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Legend

- Spring
- Well
- Piezometer Location
- KAFB / USFS Withdrawn Area Boundary
- Surface-Water Features
- 200-Foot Contour
- Major Unpaved Road
- SWMU 94F
- OU1333 SWMU
- Future Recreational Land Use
- Industrial Land Use



Sandia National Laboratories, New Mexico
 Environmental Geographic Information System

Figure 3.3-1-1
 SWMU 94H, OU 1333 SWMUs and
 Associated Future Land Uses
 Within KAFB Boundary

*Transverse Mercator Projection, New Mexico State Plane Coordinate System,
 Central Zone, for North American Horizontal Datum,
 1983 datum, Anderson Vertical Datum*



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Unclassified	SNL GIS ORG. 6804
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Environmental Response, Compensation, and Liability Act (CERCLA). This investigation included collecting nonsampling data and inspecting the site (Investigation #1). In 1993, preliminary investigations began that included unexploded ordnance (UXO)/HE, radiological, cultural resources, and sensitive-species surveys, as well as scoping sampling (Investigation #2). In August 2000, evidence for the fuel leak at SWMU 94H was first detected. Soil samples were collected as part of a preliminary assessment (Investigation #3). This investigation confirmed the presence of fuel-related contamination in subsurface soil near the SOBP. An RFI that included geoprobe work, waste characterization, and an investigation of the nature and extent of contamination was conducted in July 2001 (Investigation #4). This investigation delineated the extent of contamination and characterized the soil for disposal. A VCA (Investigation #5) was conducted in July and August 2001, which included excavation and disposal of approximately 880 cubic yards of fuel-contaminated soil, confirmation and verification sampling, and site restoration.

3.4.2 Investigation #1—CEARP

3.4.2.1 *Nonsampling Data Collection*

SWMU 94 was evaluated during investigations conducted under the CEARP (DOE September 1987, SNL/NM May 1986) and the RCRA Facility Assessment (RFA) (EPA April 1987). The CEARP Phase I report noted that SWMU 94 was constructed in the late 1970s and was used to study the effects of fire on a variety of test units (e.g., weapons components, transportation containers). JP-4 and JP-8 are the current standard burned fuels, but some other materials used included propellants and nitromethane. Testing activities may have released metallic particulates and other materials into the environment. The RFA report (EPA April 1987) did not present any information on SWMU 94H.

3.4.2.2 *Sampling Data Collection*

No sampling activities were conducted at SWMU 94H as part of the CEARP or RFA.

3.4.2.3 *Results and Conclusions*

The CERCLA finding was uncertain for RCRA-regulated hazardous waste.

3.4.2.4 *Data Gaps*

Sufficient information was not available to calculate Hazard Ranking System (HRS) and Modified HRS migration mode scores.

3.4.3 Investigation #2—SNL/NM ER Preliminary Investigations

3.4.3.1 SNL/NM ER Nonsampling Data Collection

This section describes the nonsampling data collected at SWMU 94. Details of the nonsampling surveys are summarized in the RFI Work Plan (SNL/NM September 1995).

3.4.3.1.1 Background Review

A background review was conducted in order to collect available and relevant information regarding SWMU 94. Background information sources included interviews with SNL/NM staff and contractors familiar with the site's operational history and reviews of existing historical site records and reports. The study was completely documented and provided traceable references that sustain the integrity of this NFA proposal. Table 3.4.3-1 lists the information sources used to assist in evaluating SWMU 94 that are also relevant to SWMU 94H.

3.4.3.1.2 UXO/HE Survey

In October 1993, KAFB Explosive Ordnance Disposal personnel conducted a visual survey for the presence of UXO/HE on the ground surface at SWMU 94 in conjunction with SWMUs 65, 12, and 13. The survey identified one trip flare as live ordnance, and one slap flare and one rifle-propelled illuminator round as ordnance debris. The survey report also documented that metal fragments were found in the hills surrounding these sites (Young September 1994).

3.4.3.1.3 Radiological Survey(s)

SWMU 94 is not, and has never been, classified as a Radioactive Materials Management Area (RMMA).

On April 30 and May 4, 1993, SNL/NM Radiation Protection Office personnel conducted contamination surveys of several sections of road in the Coyote Canyon area. Adhesive swipes that had been placed on the underside of the vehicle collected samples of dust from the air behind the vehicle as it was moving. Analysis yielded no evidence of contamination, nor was airborne radioactivity detected in the dust kicked up by the vehicle (Oldewage May 1993).

During November and December 1993 and January 1994, RUST Geotech Inc. conducted a surface gamma radiation survey of SWMU 94 in conjunction with SWMUs 65, 12, and 13 (RUST Geotech Inc. December 1994). The gamma scan survey was performed at 6-foot centers (100 percent coverage) over the surface of the graded portion of the site (SWMU 65D), which included the area of SWMU 94H. No gamma radiation anomalies were detected within the present boundaries of SWMU 94H (SNL/NM September 1997b).

**Table 3.4.3-1
Summary of Background Information Review for SWMU 94**

Information Source	Reference	
Technical test reports and project log books	Hill [Date unk.] Kervin April 1981 Moore September 1981 Moore June 1982 Gill November 1982 Moore and Luna February 1983 Luna March 1983	Hooper May 1983 Luna and Moore June 1983 Mata December 1983 Cocke May 1984 Stevenson December 1985 SNL/NM November 1994
Engineering drawings "Burn Site" (Drawing Number T95597)	SNL/NM 1983	
Site inspections (field notes, aerial photograph review, site photographs, radiological, UXO/HE, biological, and cultural resource surveys)	Gaither [Date unk.] Luna October 1985 Gaither October 1992 Oldewage May 1993 Karas June 1983	Oldewage December 1993a Oldewage December 1993b Oldewage February 1994 SNL/NM August 1994 Young September 1994
Employee interviews, 24 interviews with 11 facility personnel (current and retired)	Martz September 1985 Martz November 1985 Brouillard June 1994 Larson and Palmieri August 1994 Palmieri September 1994a Palmieri September 1994b Palmieri and Larson October 1994 Jercinovic et al. November 1994 Palmieri November 1994a Palmieri November 1994b	Hickox and Abitz December 1994 Palmieri December 1994a Palmieri December 1994b Palmieri December 1994c Palmieri January 1995 Palmieri March 1995 Jercinovic April 1995 Palmieri April 1995a Palmieri April 1995b Palmieri August 1995

- HE = High explosive(s).
- SNL/NM = Sandia National Laboratories/New Mexico.
- SWMU = Solid Waste Management Unit.
- unk. = Unknown.
- UXO = Unexploded ordnance.

3.4.3.1.4 Cultural Resources Survey

A cultural resources survey of SWMU 94 was conducted as part of the LCBS assessment. Seven cultural resource sites were identified within the boundary of SWMU 65 at the LCBS (Hoagland and Dello-Russo February 1995). However, none of the cultural resource sites are within 100 feet of the SWMU 94H boundaries, and SWMU 94H sampling and remedial activities have not affected the cultural resources.

3.4.3.1.5 Sensitive-Species Survey

A sensitive-species survey was conducted as part of a biological assessment of the LCBS (Biggs May 1991). No sensitive species were found during this survey (IT February 1995). The site is active and no undisturbed habitat remains in the graded portion of the LCBS.

3.4.3.2 *Sampling Data Collection*

In July 1995, SWMU 94 was investigated as part of a site-wide scoping sampling program. This effort obtained preliminary analytical data to support the ER Project site ranking and prioritization. No sampling activities were conducted at SWMU 94H as part of this sampling program.

3.4.3.3 *Data Gaps*

Information gathered from process knowledge, reviewing historical site files, and personal interviews aided in identifying the most likely COCs at SWMU 94 and in selecting the types of analyses to be performed on soil samples. However, the preliminary scoping sampling data are not adequate to support a risk screening assessment.

3.4.4 Investigation #3—SNL/NM ER Preliminary Assessment

3.4.4.1 *Nonsampling Data Collection*

No additional nonsampling data were collected as part of Investigation #3.

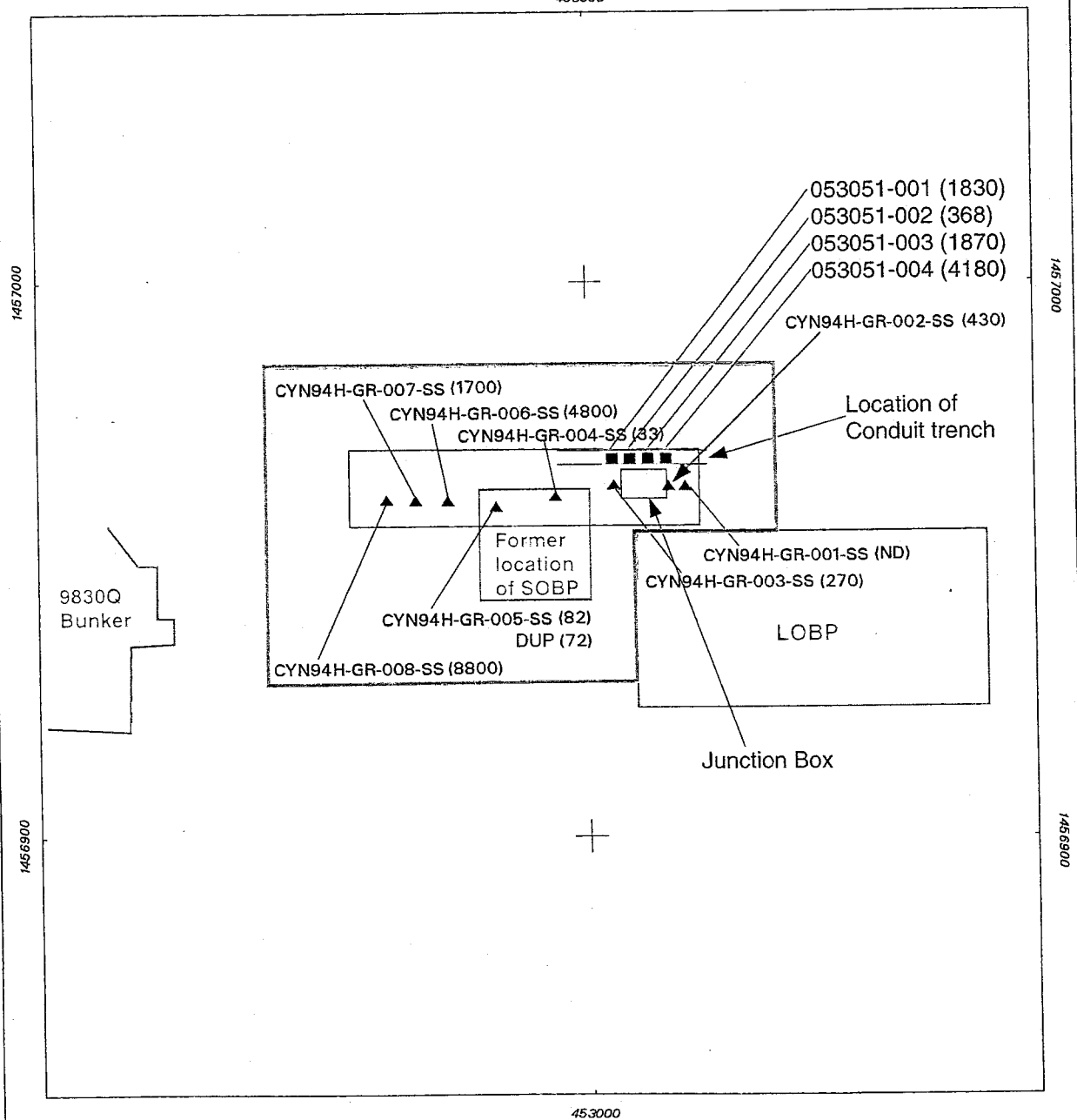
3.4.4.2 *Sampling Data Collection*

On the afternoon of August 3, 2000, a shallow trench was re-excavated by Burn Site personnel on the north side of the former 20- by 20-foot aboveground SOBP. The SOBP was used to contain JP-8 fuel for burn tests and was active until it was removed in October 2000, and subsequently decommissioned in November 2000. It was located approximately 8 feet west of the LOBP. The purpose of the excavation was to install additional conduit piping from the fuel tank to the SOBP. During the excavation, the Burn Site workers smelled fuel. No free product or staining of the soil were observed at the site to indicate a release had occurred, but because the workers smelled fuel, presumably from a 3-inch-diameter JP-4 or JP-8 line, the ER Project and the SNL/NM Oil Spill Prevention Control and Countermeasures Project were contacted to evaluate the situation.

On August 7, 2000, four soil samples were collected from the bottom of the open trench for a preliminary assessment of the extent of contamination. Soil sampling locations are shown in Figure 3.4.4-1. The samples were sent to General Engineering Laboratories, Inc., in Charleston, South Carolina, for TPH analysis (EPA Method 418.1). Analysis of the soil samples collected from the open trench indicated that a release of JP-8 fuel had occurred. Under the requirements of the HSWA Module of the RCRA Permit, NMED was notified of the newly discovered release (DOE September 2000). It was determined that the site would be investigated as part of the SWMU 94 investigation under OU 1333.

Future burn testing scheduled for the LOBP necessitated the removal of the SOBP. In October 2000, workers from the Burn Site removed the SOBP and associated piping. A small area of soil under the pool was removed and the fuel-contaminated soil was placed on plastic to the southwest of the site. On November 17, 2000, SNL/ER personnel collected eight soil samples from the bottom of the excavation as part of the continuing assessment. The soil sampling locations are shown in Figure 3.4.4-1. The samples were sent to Hall Environmental

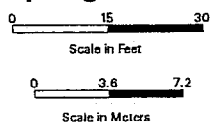
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Legend

- Preliminary Assessment Trench Sample (1870 = concentration of TPH mg/kg)
- ▲ Excavation Sample (270 = concentration of DRO mg/kg)
- Structure
- Outline of Former Excavation
- Approximate SWMU 94H Boundary
- SOBP Small Open Burn Pool
- LOBP Large Open Burn Pool (ND TPH mg/kg Dup DRO)

**Figure 3.4.4-1
SWMU 94H
Former Excavation and
Sampling Locations**



Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Analytical Laboratory (HEAL) in Albuquerque, New Mexico, to be analyzed for DRO by EPA Method 8015 (modified). The bottom of the excavation was lined with plastic and backfilled with clean soil until further investigations could be completed.

On December 11, 2000, SNL/ER personnel collected eight soil samples from the contaminated soil stockpile for waste characterization and disposal. Five of the eight samples were sent to HEAL to be analyzed for TPH by EPA Method 418.1 (Table 3.4.4-1). The remaining three samples were sent to Severn Trent Laboratory (STL) in St. Louis, Missouri, for Toxicity Characteristic Leaching Procedure (TCLP) analyses of VOCs, semi-volatile organic compounds (SVOCs), and metals (Tables 3.4.4-2, 3.4.4-3, and 3.4.4-4).

3.4.4.3 *Preliminary Assessment Sampling Results and Conclusions*

Soil Sampling

The results of the preliminary assessment and soil sampling indicated that fuel-related compounds were present in the subsurface soils underlying the JP-8 Site. The analytical results are described below. For tables in this and subsequent sections, only detected compounds are listed for VOCs and SVOCs.

TPH and DRO Results

The off-site TPH and DRO analytical results are presented in Table 3.4.4-1. TPH was detected in all four samples collected from the trench at concentrations ranging from 368 mg/kilogram (kg) to 4,180 mg/kg. The maximum DRO concentration for the nine excavation samples was 8,800 mg/kg. TPH was detected in all five soil pile grab samples at concentrations ranging from 160 mg/kg to 890 mg/kg. Samples were selected from the excavation based upon either visual signs of contamination or odors. Therefore, these samples tended to have higher DRO concentrations than the samples randomly selected from the soil pile.

TCLP Analyses

Three samples were collected from the soil pile for waste characterization and sent to an off-site laboratory for TCLP VOC, SVOC, and metals analyses. TCLP metals results are presented in Table 3.4.4-2. Arsenic, barium, cadmium, chromium, lead, and mercury were detected in the leachate extract at concentrations less than the maximum concentration of contaminants for the toxicity characteristic. There were no positive detections of VOCs or SVOCs in the TCLP extract (Tables 3.4.4-3 and 3.4.4-4). The TCLP analyses confirmed that the soil did not exhibit RCRA hazardous characteristics and could be disposed of as a special waste (petroleum-contaminated soil) under the New Mexico solid waste regulations.

Table 3.4.4-1
 Summary of SWMU 94H Preliminary Assessment Soil Samples
 TPH and DRO Analytical Results
 August and November 2000
 (Off-Site Laboratory)

Sample Attributes				TPH (EPA Method 418.1 ^a) (mg/kg)	DRO (EPA Method 8015— modified ^a) (mg/kg)
Record Number ^b	ER Sample ID	Date Collected	Location Description		
6036 43	53051-001	08-07-00	In trench, 4 feet west of fuel lines	1,830	NA
603643	53051-002	08-07-00	In trench, below western-most fuel line	368	NA
603643	53051-003	08-07-00	In trench, below eastern-most fuel line	1,870	NA
603643	53051-004	08-07-00	In trench, 4 feet east of fuel lines	4,180	NA
603886	CYN94H-GR-001-SS	11-17-00	Bottom of excavation, approx. 3 feet east of the Junction Box	NA	ND (5.0)
603886	CYN94H-GR-002-SS	11-17-00	Bottom of excavation, approx. 1 foot east of the Junction Box	NA	430
603886	CYN94H-GR-003-SS	11-17-00	Bottom of excavation, approx. 1 foot west of the Junction Box	NA	270
603886	CYN94H-GR-004-SS	11-17-00	Bottom of excavation, approx. 12 feet west of the Junction Box	NA	33
603886	CYN94H-GR-005-SS	11-17-00	Bottom of excavation, approx. 23 feet west of the Junction Box	NA	82
603886	CYN94H-GR-005-DU	11-17-00	Duplicate sample of CYN94H-GR- 005-SS	NA	72
603886	CYN94H-GR-006-SS	11-17-00	Bottom of excavation, approx. 32 feet west of the Junction Box	NA	4,800
603886	CYN94H-GR-007-SS	11-17-00	Bottom of excavation, approx. 38 feet west of the Junction Box	NA	1,700
603886	CYN94H-GR-008-SS	11-17-00	Bottom of excavation, approx. 43 feet west of the Junction Box	NA	8,800
603918	CYN94H-GR-001-SP	12-11-00	Soil Pile	700	NA
603918	CYN94H-GR-002-SP	12-11-00	Soil Pile	570	NA
603918	CYN94H-GR-003-SP	12-11-00	Soil Pile	160	NA
603918	CYN94H-GR-004-SP	12-11-00	Soil Pile	890	NA
603918	CYN94H-GR-005-SP	12-11-00	Soil Pile	350	NA

Note: Values in bold represent detected analytes.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

CYN	= Canyon.	ND ()	= Not detected above the method detection limit, shown in parentheses.
DRO	= Diesel range organics.	SP	= Soil pile.
DU	= Duplicate soil sample.	SS	= Surface soil sample.
ER	= Environmental Restoration.	SWMU	= Solid Waste Management Unit.
EPA	= Environmental Protection Agency.	TPH	= Total petroleum hydrocarbons.
GR	= Grab sample.		
ID	= Identification.		
mg/kg	= Milligram(s) per kilogram.		
NA	= Not analyzed.		

Table 3.4.4-2
 Summary of SWMU 94H Preliminary Assessment Soil Pile Samples
 TCLP Metals Analytical Results
 December 2000
 (Off-Site Laboratory)

Sample Attributes		Metals (EPA Method 6010B/7470A ^a) (mg/L)									
Record Number ^b	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	
603917	CYN94H-GR-001-SP	NA	0.0022 J (0.75)	1.5	0.0022 J (0.12)	ND (0.0008)	0.011 J (0.25)	ND (0.00018)	ND (0.0022)	ND (0.0013)	
603917	CYN94H-GR-002-SP	NA	ND (0.0015)	1.5	0.0019 J (0.12)	ND (0.0008)	0.017 J (0.25)	ND (0.00018)	ND (0.0022)	ND (0.0013)	
603917	CYN94H-GR-003-SP	NA	0.0053 J (0.75)	1.4	0.0018 J (0.12)	0.0072 J (0.25)	0.037 J (0.25)	0.00024 J (0.00018)	ND (0.0022)	ND (0.0013)	
Maximum Concentration of Contaminants for the Toxicity Characteristic ^c			5.0	100.0	1.0	5.0	5.0	0.2	1.0	5.0	

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cTitle 40, Code of Federal Regulations, Part 261.24.

CYN = Canyon.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet).

GR = Grab sample.

ID = Identification.

J () = The reported value is greater than or equal to the method detection limit but is less than the practical quantitation limit, shown in parentheses.

mg/L = Milligram(s) per liter.

NA = Not applicable.

ND () = Not detected above the method detection limit, shown in parentheses.

SP = Soil pile sample.

SWMU = Solid Waste Management Unit.

TCLP = Toxicity Characteristic Leaching Procedure.

Table 3.4.4-3
 TCLP VOC Analytical Method Detection Limits
 Used for SWMU 94H Preliminary Assessment Soil Pile Samples
 December 2000
 (Off-Site Laboratory)

Analyte	Method Detection Limit ($\mu\text{g/L}$)
1,1-Dichloroethene	12
1,2-Dichloroethane	9.8
2-Butanone	25
Benzene	13
Carbon tetrachloride	12
Chlorobenzene	17
Chloroform	8.2
Tetrachloroethene	15
Trichloroethene	12
Vinyl chloride	14

$\mu\text{g/L}$ = Microgram(s) per liter.
 SWMU = Solid Waste Management Unit.
 TCLP = Toxicity Characteristic Leaching Procedure.
 VOC = Volatile organic compound.

Table 3.4.4-4
 TCLP SVOC Analytical Method Detection Limits
 Used for SWMU 94H Preliminary Assessment Soil Pile Samples
 December 2000
 (Off-Site Laboratory)

Analyte	Method Detection Limit ($\mu\text{g/L}$)
1,4-Dichlorobenzene	4.6
2,4,5-Trichlorophenol	3.9
2,4,6-Trichlorophenol	3.3
2,4-Dinitrotoluene	3.4
4-Methylphenol	3.8
Hexachlorobenzene	2.9
Hexachlorobutadiene	4.5
Hexachloroethane	4.3
Nitro-benzene	5.1
Pentachlorophenol	4.3
Pyridine	16
o-Cresol	5

$\mu\text{g/L}$ = Microgram(s) per liter.
 SVOC = Semivolatile organic compound.
 SWMU = Solid Waste Management Unit.
 TCLP = Toxicity Characteristic Leaching Procedure.

3.4.4.4 Data Quality

Quality Assurance (QA)/Quality Control (QC) Results

To assess the precision of soil sampling procedures, one soil sample was collected and analyzed in duplicate at an off-site laboratory. The DRO concentrations for samples CYN-94H-GR-005-SS and CYN-94H-GR-005-DU were 82 mg/kg and 72 mg/kg, respectively.

Data Validation

All off-site laboratory results were reviewed and verified according to "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project Analytical Operating Procedure (AOP 00-03), Rev. 0 (SNL/NM December 1999). Annex 3-B contains the off-site data validation reports. No off-site data were qualified as a result of data validation. The verification/validation process confirmed that the data are acceptable for use in this NFA proposal for SWMU 94H.

3.4.4.5 Data Gaps

Analytical data from the preliminary assessment were sufficient to determine the presence of contamination in soil underlying the JP-8 Site. Additional sampling was required to determine the extent of contamination.

3.4.5 Investigation #4—SNL/NM ER RFI

3.4.5.1 Nonsampling Data Collection

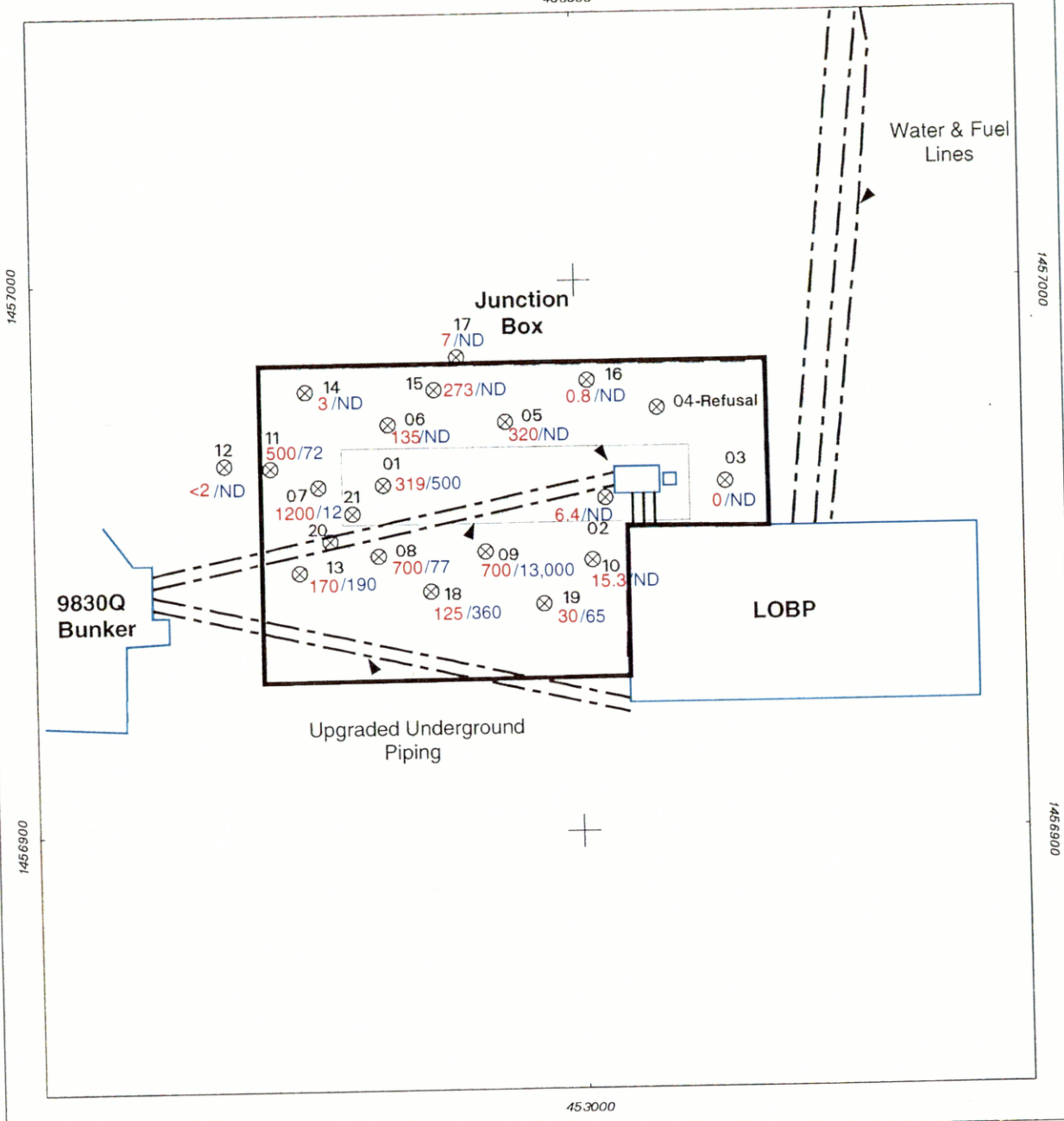
No additional nonsampling data were collected as part of Investigation #4.

3.4.5.2 Sampling Data Collection

SNL/NM ER conducted an RFI at SWMU 94H in June and July 2001. The primary objective of this RFI was to collect data that would support planning of a VCA. Specifically, the RFI strategy was designed to utilize the field screening capabilities and the local off-site laboratory (HEAL) to evaluate soil samples for gross contamination and to send a limited number of samples off site for more specialized waste characterization analyses. A geoprobe was used to collect subsurface soil samples from petroleum-contaminated soils identified during the preliminary assessment. The soil samples were collected sequentially, moving from less contaminated areas to more contaminated areas. These samples were collected to assess the vertical and horizontal extent of soil contamination and to collect soil waste characterization data for disposal purposes.

Nineteen geoprobe boreholes (CY94H-BH01 through CY94H-BH19) were advanced to depths up to 16 feet bgs (Figure 3.4.5-1). One borehole, CY94H-BH04, encountered refusal at a depth

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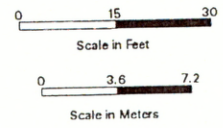
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Legend

- ⊗ Geoprobe Borehole Location 13, 170/190 = OVM (ppm)/ DRO (mg/kg)
- Outline of Former Excavation
- Structure
- Approximate SWMU 94H Boundary
- - - - Underground Pipe
- LOBP** Large Open Burn Pool (ND OVM PPM mg/kg)

**Figure 3.4.5-1
SWMU 94H
Geoprobe Borehole Locations
and OVM/DRO Sample Results**



Sandia National Laboratories, New Mexico
Environmental Geographic Information System

of about 4 feet bgs and could not be sampled. At each location, continuous core samples were collected for lithologic description and field screening using an organic vapor monitor (OVM). One subsurface soil sample was collected from the most contaminated sample interval in each borehole based upon the OVM field screening. A second and, in some cases, a third soil sample were collected at either the alluvium/bedrock interface or from any uncontaminated soil (based upon field screening) encountered below the contaminated interval (SNL/NM June 2001a, SNL/NM June 2001b). A total of 43 subsurface soil samples were collected from the 19 boreholes.

HEAL analyzed 34 of the soil samples for DRO using EPA Method 8015. Three soil samples were collected, one from each of three boreholes, and analyzed at the Radiation Protection Sample Diagnostics (RPSD) Laboratory utilizing gamma spectroscopy (EPA Method 901.1) to screen for radioactivity. Two soil samples were collected from Borehole CY94H-BH01 and analyzed by STL for both VOCs by EPA Method 8260B and RCRA metals plus beryllium by EPA Methods 6010B/7470A/7471A. After the DRO results were obtained from the first 19 boreholes, 2 additional boreholes (CY94H-BH20 and CY94H-BH21) were advanced in the area of highest OVM measurements. Four soil samples were collected from these two boreholes for waste characterization purposes and analyzed by STL for TCLP VOCs, SVOCs, and TCLP metals plus beryllium.

3.4.5.3 *RFI Sampling Results and Conclusions*

DRO Results

The off-site DRO analytical results are presented in Table 3.4.5-1. DRO was detected in nine of the borehole samples at concentrations ranging from 7.2 to 13,000 mg/kg. The highest concentration was found in Borehole 9 at a relatively shallow depth.

Metals Analyses

Inorganic analytical results are summarized in Table 3.4.5-2. Beryllium was detected slightly above the background concentration limit of 0.75 mg/kg in one sample collected from borehole location CY94H-BH1-2.5, but was not above the background concentration in the duplicate sample from this location. The beryllium concentration was 0.84 mg/kg.

VOC Results

Off-site VOC analytical results are presented in Table 3.4.5-3. Acetone was detected in two samples at estimated concentrations of 12 J and 4.3 J $\mu\text{g}/\text{kg}$. Methylene chloride was detected in three samples, including the duplicate sample, at estimated concentrations ranging from 1.4 J to 4 J $\mu\text{g}/\text{kg}$. The compounds acetone and methylene chloride were eliminated as potential COCs in the data validation process because 1) they were detected in the trip blank along with 1,2-dichloropropane and carbon disulfide; and 2) they are common laboratory contaminants. The VOC method detection limits (MDLs) are summarized in Table 3.4.5-4.

Table 3.4.5-1
Summary of SWMU 94H RFI Borehole Soil Samples DRO Analytical Results
June 2001
(Off-Site Laboratory)

Sample Attributes				DRO (EPA Method 8015—modified ^a) (mg/kg)
Record Number ^b	ER Sample ID	Date Collected	Location Description	
604616	CY94H-BH8-5.5	06-18-01	Borehole no. 8, depth 5.5 feet	ND (5.0)
604616	CY94H-BH8-15	06-18-01	Borehole no. 8, depth 15 feet	77
604616	CY94H-BH9-5	06-18-01	Borehole no. 9, depth 5 feet	13,000
604616	CY94H-BH9-16	06-18-01	Borehole no. 9, depth 16 feet	ND (5.0)
604616	CY94H-BH10-10	06-18-01	Borehole no. 10, depth 10 feet	ND (5.0)
604616	CY94H-BH10-14	06-18-01	Borehole no. 10, depth 14 feet	ND (5.0)
604617	CY94H-BH3-6	06-19-01	Borehole no. 3, depth 6 feet	ND (5.0)
604617	CY94H-BH5-3	06-19-01	Borehole no. 5, depth 3 feet	ND (5.0)
604617	CY94H-BH5-3 DU	06-19-01	Duplicate sample of CY94H-BH5-3	ND (5.0)
604617	CY94H-BH5-9.5	06-19-01	Borehole no. 5, depth 9.5 feet	ND (5.0)
604617	CY94H-BH6-3	06-19-01	Borehole no. 6, depth 3 feet	ND (5.0)
604617	CY94H-BH6-10	06-19-01	Borehole no. 6, depth 10 feet	ND (5.0)
604617	CY94H-BH7-3.5	06-19-01	Borehole no. 7, depth 3.5 feet	12
604617	CY94H-BH7-14	06-19-01	Borehole no. 7, depth 14 feet	ND (5.0)
604617	CY94H-BH11-3	06-19-01	Borehole no. 11, depth 3 feet	7.2
604617	CY94H-BH11-7	06-19-01	Borehole no. 11, depth 7 feet	ND (5.0)
604617	CY94H-BH11-14	06-19-01	Borehole no. 11, depth 14 feet	ND (5.0)
604617	CY94H-BH12-3	06-19-01	Borehole no. 12, depth 3 feet	ND (5.0)
604614	CY94H-BH1-2.5	06-20-01	Borehole no. 1, depth 2.5 feet	500
604614	CY94H-BH1-6.7	06-20-01	Borehole no. 1, depth 6.7 feet	ND (5.0)
604614	CY94H-BH1-12.5	06-20-01	Borehole no. 1, depth 12.5 feet	ND (5.0)
604614	CY94H-BH2-8	06-20-01	Borehole no. 2, depth 8 feet	ND (5.0)
604614	CY94H-BH2-11	06-20-01	Borehole no. 2, depth 11 feet	ND (5.0)
604620	CY94H-BH13-3	06-20-01	Borehole no. 13, depth 3 feet	190
604620	CY94H-BH13-3 DU	06-20-01	Duplicate sample of CY94H-BH13-3	100
604620	CY94H-BH13-7	06-20-01	Borehole no. 13, depth 7 feet	ND (5.0)
604620	CY94H-BH14-9	06-20-01	Borehole no. 14, depth 9 feet	ND (5.0)
604620	CY94H-BH15-4	06-20-01	Borehole no. 15, depth 4 feet	ND (5.0)
604620	CY94H-BH15-9	06-20-01	Borehole no. 15, depth 9 feet	ND (5.0)
604620	CY94H-BH16-4	06-20-01	Borehole no. 16, depth 4 feet	ND (5.0)
604641	CY94H-BH17-7	06-21-01	Borehole no. 17, depth 7 feet	ND (5.0)
604641	CY94H-BH18-2	06-21-01	Borehole no. 18, depth 2 feet	360
604641	CY94H-BH19-3	06-21-01	Borehole no. 19, depth 3 feet	65
604641	CY94H-BH19-7	06-21-01	Borehole no. 19, depth 7 feet	ND (5.0)

Note: Values in bold represent detected analytes.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

BH = Borehole

CY = Canyon.

DRO = Diesel range organics.

DU = Duplicate soil sample.

ER = Environmental Restoration.

EPA = Environmental Protection Agency.

ID = Identification.

mg/kg = Milligram(s) per kilogram.

ND () = Not detected above the method detection limit, shown in parentheses.

RCRA = Resource Conservation and Recovery Act.

RFI = RCRA Facility Investigation.

SWMU = Solid Waste Management Unit.

Table 3.4.5-2
 Summary of SWMU 94H RFI Borehole Soil Samples
 Metals Analytical Results
 June and July 2001
 (Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 6010B/7470A/7471A ^e) (mg/kg)									
Record Number ^b	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	
604613	CY94H-BH1-2.5	2.0-5.0	2.6	169	0.84	0.25	13.4	11.5	ND (0.017)	0.47 J (0.5)	0.18 J (0.5)	
604613	CY94H-BH1-2.5-DU	2.0-5.0	2.2	142	0.71	0.27	13.1	13.6	ND (0.017)	ND (0.12)	ND (0.13)	
604613	CY94H-BH1-6.7	6.0-7.0	1.3	214	0.75	0.2	13.3	7.8	ND (0.017)	ND (0.12)	ND (0.13)	
Background Soil Concentrations-Canyons ^c			9.8	246	0.75	0.64	18.8	18.9	0.055	2.7	<0.50	

Note: Values in bold exceed background soil concentrations.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cFrom Garcia November 1998.

CY

= Canyon.

BH

= Borehole.

DU

= Duplicate soil sample.

EPA

= U.S. Environmental Protection Agency.

ER

= Environmental Restoration.

ft

= Foot (feet).

ID

= Identification.

J ()

= The reported value is greater than or equal to the method detection limit but is less than the practical quantitation limit, shown in parentheses.

mg/kg

= Milligram(s) per kilogram.

ND ()

= Not detected above the method detection limit, shown in parentheses.

RCRA

= Resource Conservation and Recovery Act.

RFI

= RCRA Facility Investigation.

SWMU

= Solid Waste Management Unit.

Table 3.4.5-3
 Summary of SWMU 94H RFI Borehole Soil Samples
 VOC Analytical Results
 June 2001
 (Off-Site Laboratory)

Sample Attributes		VOCs (EPA Method 8260B ^a) (µg/kg)				
Record Number ^b	ER Sample ID	Sample Depth (ft)	1,2-Dichloropropane	Acetone	Carbon disulfide	Methylene chloride
604613	CY94H-BH1-2.5	2.0-5.0	ND (0.21)	12 J (20)	ND (0.46)	1.4 J (5)
604613	CY94H-BH1-2.5-DU	2.0-5.0	ND (0.21)	ND (2.6)	ND (0.46)	1.5 J (5)
604613	CY94H-BH1-6.7	6.0-7.0	ND (0.21)	4.3 J (20)	ND (0.46)	4 J (5)
Quality Assurance/Quality Control Sample (µg/L)						
604613	CY94H-BH-TB	NA	6.1	7.8 J (10)	0.5 J (1)	0.98 J (1)

Note: Values in bold represent detected analytes.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

BH = Borehole.

CY = Canyon.

DU = Duplicate soil sample.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet)

ID = Identification.

J () = The reported value is greater than or equal to the method detection limit but is less than the practical quantitation limit, shown in parentheses.

NA = Not applicable.

ND () = Not detected above the method detection limit, shown in parentheses.

RCRA = Resource Conservation and Recovery Act.

RFI = RCRA Facility Investigation.

SWMU = Solid Waste Management Unit.

TB = Trip blank.

µg/kg = Microgram(s) per kilogram.

µg/L = Microgram(s) per liter.

VOC = Volatile organic compound.

Table 3.4.5-4
 VOC Analytical Method Detection Limits
 Used for SWMU 94H RFI Soil Sampling
 June 2001
 (Off-Site Laboratory)

Analyte	Method Detection Limit ($\mu\text{g}/\text{kg}$)
1,1,1-Trichloroethane	0.44
1,1,2,2-Tetrachloroethane	0.44
1,1,2-Trichloroethane	0.43
1,1-Dichloroethane	0.38
1,1-Dichloroethene	1.3
1,2-Dichloroethane	0.43
1,2-Dichloropropane	0.21
1,4-Dichlorobenzene	0.3
2-Butanone	6.6
2-Chloroethyl vinyl ether	0.91
2-Hexanone	1.7
4-methyl-, 2-Pentanone	1.3
Acetone	2.6
Benzene	0.37
Bromodichloromethane	0.45
Bromoform	0.62
Bromomethane	0.6
Carbon disulfide	0.46
Carbon tetrachloride	0.65
Chlorobenzene	0.34
Chloroethane	2.2
Chloroform	0.24
Chloromethane	0.77
Dibromochloromethane	0.38
Ethyl benzene	0.89
Methylene chloride	0.53
Styrene	0.37
Tetrachloroethene	0.36
Toluene	0.54
Trichloroethene	0.31
Vinyl chloride	0.79
Xylene	1.1
cis-1,2-Dichloroethene	0.5
cis-1,3-Dichloropropene	0.52
trans-1,2-Dichloroethene	0.44
trans-1,3-Dichloropropene	0.31

$\mu\text{g}/\text{kg}$ = Microgram(s) per kilogram.
 RCRA = Resource Conservation and Recovery Act.
 RFI = RCRA Facility Investigation.
 SWMU = Solid Waste Management Unit.
 VOC = Volatile organic compound.

Radionuclides

At three borehole locations, a sample was collected for gamma spectroscopy analyses. None of these samples had activities greater than background activity limits. Gamma spectroscopy results are summarized in Table 3.4.5-5. Annex 3-C contains the full gamma spectroscopy results.

TCLP Analyses

Two additional boreholes (Boreholes 20 and 21) were advanced in the area of highest OVM measurements, based upon previous sampling results. Two soil samples were sent to an off-site laboratory for TCLP VOC, SVOC, and metals analyses. No VOCs were detected other than acetone and methylene chloride in the trip blank (Table 3.4.5-6). Acetone and methylene chloride are common laboratory contaminants and are not indicative of site conditions. The TCLP VOC MDLs are summarized in Table 3.4.5-7. The SVOC MDLs are summarized in Table 3.4.5-8. No TCLP VOCs or SVOCs were detected in the soil samples. TCLP metals results are summarized in Table 3.4.5-9. Arsenic, barium, cadmium, lead, and selenium were detected in the leachate extract from the soil samples but at concentrations less than the maximum concentration of contaminants for the toxicity characteristic. The TCLP analyses showed that the soil did not have RCRA hazardous characteristics and could be disposed of as a special waste (petroleum-contaminated soil) under the New Mexico solid waste regulations.

3.4.5.4 *Data Quality*

QA/QC Results

To assess the precision of the borehole sampling procedures, two soil samples were collected and analyzed in duplicate at the off-site laboratory. The DRO concentrations for both sample numbers CY-94H-BH5-3 and CY-94H-BH5-3-DU were not detected (ND). The DRO concentrations for sample numbers CY-94H-BH13-3 and CY-94H-BH13-3-DU were 190 and 100 mg/kg, respectively. Variations in sample concentrations are likely due to sample inhomogeneity.

Data Validation

The on-site and off-site (except HEAL) laboratory results were reviewed and verified according to "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project Analytical Operating Procedure 00-03, Rev. 0 (SNL/NM December 1999). In addition, SNL/NM Department 7713 (RPSD Laboratory) reviewed all gamma spectroscopy results according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 02 (SNL/NM July 1996). Annex 3-B contains the off-site data validation reports. No off-site data were qualified as a result of data validation. The verification/validation process confirmed that the data are acceptable for use in this NFA proposal for SWMU 94H.

Table 3.4.5-5
 Summary of SWMU 94H RFI Soil Samples
 Gamma Spectroscopy Analytical Results
 June 2001
 (On-Site Laboratory)

Sample Attributes			Activity (EPA Method 901.1 ^a) (pCi/g)							
Record Number ^b	ER Sample ID	Sample Depth (ft)	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
			Result	Error ^c	Result	Error ^c	Result	Error ^c	Result	Error ^c
604615	CY94-BH1-7.8	7.0-8.0	ND (0.0115)	-	0.386	0.178	0.0654	0.04	1.09	0.206
604618	CY94-BH7-4	4.0-5.0	0.036	0.0167	0.83	0.375	0.0466	0.0568	0.524	0.183
604619	CY94-BH13-4	4.0-5.0	0.288	0.0388	0.626	0.285	0.103	0.0848	0.781	0.197
Background Soil Activities—Upper Canyons ^d			0.515	NA	1.03	NA	0.16	NA	2.31	NA

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cTwo standard deviations about the mean detected activity.

^dFrom Dinwiddie September 1997.

BH = Borehole.

CY = Canyon.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet).

ID = Identification.

NA = Not applicable.

ND () = Not detected above the minimum detectable activity, shown in parentheses.

pCi/g = Picocurie(s) per gram.

RCRA = Resource Conservation and Recovery Act.

RFI = RCRA Facility Investigation.

SWMU = Solid Waste Management Unit.

- = Error not calculated for nondetectable results.

Table 3.4.5-6
 Summary of SWMU 94H RFI Borehole Soil Samples
 TCLP VOC Analytical Results—Detections Only
 July 2001
 (Off-Site Laboratory)

Sample Attributes		VOCs (EPA Method 8260B ^a) (µg/L)	
Record Number ^b	ER Sample ID	Acetone	Methylene chloride
Quality Assurance/Quality Control Sample (µg/L)			
604647	CY94H-BH20-TB	3.9 J (20)	0.67 J (5)
Maximum Concentration of Contaminants for the Toxicity Characteristic ^c		NRL	NRL

Note: Values in **bold** represent detected compounds.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cTitle 40, Code of Federal Regulations, Part 261.24.

BH = Borehole.

CY = Canyon.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ID = Identification.

J () = The reported value is greater than or equal to the method detection limit but is less than the practical quantitation limit, shown in parentheses.

µg/L = Microgram(s) per liter.

NRL = No regulatory limit.

RCRA = Resource Conservation and Recovery Act.

RFI = RCRA Facility Investigation.

SWMU = Solid Waste Management Unit.

TCLP = Toxicity Characteristic Leaching Procedure.

TB = Trip blank.

VOC = Volatile organic compound.

Table 3.4.5-7
 TCLP VOC Analytical Method Detection Limits
 Used for SWMU 94H RFI Soil Samples
 July 2001
 (Off-Site Laboratory)

Analyte	Method Detection Limit ($\mu\text{g/L}$)
1,1-Dichloroethene	13
1,2-Dichloroethane	4.3
2-Butanone	66
Benzene	3.7
Carbon tetrachloride	6.5
Chlorobenzene	3.4
Chloroform	2.4
Tetrachloroethene	3.6
Trichloroethene	3.1
Vinyl chloride	7.9

$\mu\text{g/L}$ = Microgram(s) per liter.
 RCRA = Resource Conservation and Recovery Act.
 RFI = RCRA Facility Investigation.
 SWMU = Solid Waste Management Unit.
 TCLP = Toxicity Characteristic Leaching Procedure.
 VOC = Volatile organic compound.

Table 3.4.5-8
 TCLP SVOC Analytical Method Detection Limits
 Used for SWMU 94H RFI Soil Samples
 July 2001
 (Off-Site Laboratory)

Analyte	Method Detection Limit ($\mu\text{g/L}$)
1,4-Dichlorobenzene	4.6
2,4,5-Trichlorophenol	3.9
2,4,6-Trichlorophenol	3.3
2,4-Dinitrotoluene	3.4
4-Methylphenol	3.8
Hexachlorobenzene	2.9
Hexachlorobutadiene	4.5
Hexachloroethane	4.3
Nitro-benzene	5.1
Pentachlorophenol	4.3
Pyridine	16
o-Cresol	5

$\mu\text{g/L}$ = Microgram(s) per liter.
 RCRA = Resource Conservation and Recovery Act.
 RFI = RCRA Facility Investigation.
 SVOC = Semivolatile organic compound.
 SWMU = Solid Waste Management Unit.
 TCLP = Toxicity Characteristic Leaching Procedure.

Table 3.4.5-9
 Summary of SWMU 94H RFI Borehole Soil Samples
 TCLP Metals Analytical Results
 July 2001
 (Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 6010B/7470A ^a) (mg/L)		
Record Number ^b	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium
604647	CY94H-BH20-4	4.0-5.0	ND (0.0015)	1.6	ND (0.0002)
604647	CY94H-BH21-4	4.0-5.0	0.0058	2.1	ND (0.0002)
Maximum Concentration of Contaminants for the Toxicity Characteristic ^c			5.0	100.0	0.75

Record Number ^b	ER Sample ID	Sample Depth (ft)	Cadmium	Chromium	Lead
604647	CY94H-BH20-4	4.0-5.0	0.0016	ND (0.002)	0.0062
604647	CY94H-BH21-4	4.0-5.0	0.00098	ND (0.002)	0.0076
Maximum Concentration of Contaminants for the Toxicity Characteristic ^c			1.0	5.0	5.0

Record Number ^b	ER Sample ID	Sample Depth (ft)	Mercury	Selenium	Silver
604647	CY94H-BH20-4	4.0-5.0	ND (0.00018)	0.0058	ND (0.001)
604647	CY94H-BH21-4	4.0-5.0	ND (0.00018)	ND (0.0028)	ND (0.001)
Maximum Concentration of Contaminants for the Toxicity Characteristic ^c			0.2	1.0	5.0

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cTitle 40, Code of Federal Regulations, Part 261.24.

BH = Borehole.

CY = Canyon.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet).

ID = Identification.

mg/L = Milligram(s) per liter.

ND () = Not detected above the method detection limit, shown in parentheses.

RCRA = Resource Conservation and Recovery Act.

RFI = RCRA Facility Investigation.

SWMU = Solid Waste Management Unit.

TCLP = Toxicity Characteristic Leaching Procedure.

3.4.5.5 *Data Gaps*

Analytical data from the RFI were sufficient to allow planning of the VCA to remove contaminated subsurface soil from beneath the JP-8 Site. The VCA was designed to remediate the horizontal and vertical extent of contamination.

3.4.6 Investigation #5—SNL/NM ER VCA Confirmation and Verification Sampling

3.4.6.1 *Nonsampling Data Collection*

No additional nonsampling data was completed as part of Investigation #5.

3.4.6.2 *VCA Activities*

Strategy

The primary objective of the VCA was to remove and properly dispose of all fuel-contaminated soil at SWMU 94H. A conceptual model of the site was developed to scope the VCA. A review of the SWMU 94 RFI data associated with SNL/NM ER investigations at the Burn Site indicated that the fuel-contaminated soil removed from the nearby SWMU 94F, the LAARC Discharge Pit, was the most likely source for low-level organic groundwater contamination observed in the downgradient monitoring wells. The conceptual model developed for SWMU 94H indicated that organic contamination associated with the JP-8 Site could be a source of groundwater contamination. The rationale for conducting a source removal to excavate and dispose of the fuel-contaminated soil beneath SWMU 94H was to protect groundwater quality in the area. The source removal would reduce potential future impacts to groundwater.

SNL/NM ER personnel consulted with NMED personnel to develop clean-up criteria for the VCA. Existing data were reviewed, and it was determined that contamination associated with SWMU 94H was limited to the residual JP-8 fuel that was released near the SOBP. It was agreed that further assessment of contamination would be achieved by analyzing soil samples for DRO/GRO (gasoline range organics). The NMED Ground Water Quality Bureau (GWQB) was consulted regarding a soil clean-up goal that would be protective of groundwater. The GWQB determined that 100 mg/kg would be an appropriate goal. All soil with DRO concentrations greater than 100 mg/kg would be excavated and disposed of at an appropriate facility.

Prior to initiating the fieldwork phase of the VCA, the RFI analytical data were submitted to an off-site disposal facility for review compared with its acceptance criteria. These data indicated that the soil was nonhazardous and could be disposed of under the regulations for fuel-contaminated soil. KEERS Landfarm in Mountainair, New Mexico, an off-site facility, stated that they would accept the excavated fuel-contaminated soil based upon the RFI data. Soil with DRO concentrations greater than 100 mg/kg would be shipped to the off-site facility. SNL/NM ER contracted with a state-approved local laboratory (HEAL) to perform DRO and GRO analyses on a 24-hour turnaround basis so that the soil could be properly segregated for disposal during the VCA. Field screening using an OVM was used to segregate soil until the analytical results from HEAL were obtained.

Chronology of Events

SNL/NM ER and Environmental Restoration Field Office (ERFO) personnel mobilized to the Burn Site on July 24, 2001. The first day was spent dismantling and removing the shallow underground conduit piping system running from the 9830Q Bunker to the Junction Box just north of the LOBP (Figures 3.4.6-1 and 3.4.6-2). The VCA soil excavation began on July 25, 2001 and was completed on August 8, 2001. Approximately 650 cubic yards of noncontaminated "clean" soil (Soil Pile 1) were stockpiled south of the site during the excavation operations. This soil was excavated to gain access to the underlying fuel-contaminated soil.

A total of 880 cubic yards of fuel-contaminated soil with DRO/GRO concentrations greater than 100 mg/kg was excavated and placed on plastic sheeting in the fuel-contaminated stockpile (Soil Pile 2) for later disposal at an off-site facility.

Samples of the clean soil were collected and sent to HEAL for DRO and GRO analyses. Results were provided within 24 hours to allow rapid confirmation that the excavated soil was being properly segregated as well as verify that the clean-up goal of less than 100 mg/kg DRO/GRO had been reached in the sidewalls and bottom tiers of the excavation. Eight additional confirmation samples were collected from the sidewalls and bottom tiers of the excavation and analyzed for VOCs, SVOCs, RCRA metals plus beryllium, and gross alpha/gross beta to provide data to support a risk screening assessment for the site.

On August 13, 2001, representatives from the NMED Hazardous Waste Bureau (HWB) inspected the excavation. The objective of this inspection was to gain concurrence that clean-up objectives had been met. Analytical results, which showed that the sidewalls and bottom tiers of the excavation had DRO/GRO concentrations of less than 100 mg/kg, were reviewed with the HWB representatives. The HWB representatives concurred that the objectives of the VCA had been met and that it was appropriate to backfill the excavation.

On August 15, 2001, SNL/NM ER and ERFO personnel prepared the fuel-contaminated soil for disposal. The contaminated soil pile (Soil Pile 2) was to be transported to a permitted off-site facility for land-farming. The soil pile contained an appreciable amount of cobbles and boulders, which were not acceptable to the disposal facility because large rocks could damage their equipment. Soil Pile 2 was processed using a CV-150-D Basic Screen-All to remove rocks greater than 4 inches in diameter. Approximately 100 cubic yards of rock were segregated from the excavated soil and staged in a bermed area south and west of SWMU 94H. This task was completed on August 18, 2001.

On August 20, 2001, SNL/NM ERFO personnel began backfilling the SWMU 94H excavation. Cobbles and boulders remaining from the SWMU 94F VCA were placed in the bottom of the excavation. Stockpiled clean soil (Soil Pile 1) generated during the excavation and noncontaminated soil piles associated with the SWMU 12A VCA were then used as fill material (SNL/NM May 1997). Backfilling was completed on August 27, 2001, and SNL/NM ERFO personnel were demobilized.

SNL/NM ER began loading trucks to transport the fuel-contaminated soil to the off-site disposal facility on August 20, 2001. This activity was coordinated through the Hazardous Waste Management Facility (HWMF). Trucks were weighed on the certified scales at the Solid Waste Transfer Facility to obtain an empty weight, and weighed again after being loaded to measure the weight of soil associated with each load. The last soil was moved off site on September 5, 2001. A total of 880 cubic yards of soil was transported to the off-site disposal facility.



Figure 3.4.6-1
Removing Clean Soil Overlaying the Conduit Piping System (view to the southeast)



Figure 3.4.6-2
Conduit Piping System Exposed (view to the east)

On September 5, 2001, approximately 350 tons of base course aggregate were delivered to the site. This material consisted of minus-one-inch-diameter gravel mixed with sand and clay for optimal compaction. The entire area around SWMU 94H was covered with this material to restore and help level the site. SNL/NM ER and ERFO personnel demobilized from SWMU 94H on September 18, 2001.

Site Preparation

SNL/NM ER and ERFO personnel mobilized to the site on July 24, 2001. The two ends of the conduit piping system were exposed with a Cat 322B trackhoe excavator and the restraining bolts removed (Figure 3.4.6-2). The trackhoe was then used to remove overlying clean soil and expose the remaining conduit. The entire piping system was lifted out of the ground and stored safely out of the way (Figure 3.4.6-3).

Soil Excavation

The RFI geoprobe and soil sampling data indicated that fuel-contaminated subsurface soil was present approximately 5 feet bgs. The first step of the soil excavation was to carefully remove a 4-foot lift of the overlying clean soils (Figure 3.4.6-4). This initial lift measured approximately 65 by 85 feet in areal extent. The trackhoe and a Cat 966G front-end loader removed and staged this clean soil to an area directly south of SWMU 94H (Soil Pile 1). Two Volvo front-end loaders also were used for soil excavation. Each loader bucket of soil was visually inspected and then screened for fuel contamination using an OVM (Figure 3.4.6-5). No contamination was detected during removal of this lift of soil.

After this first lift of clean soil was removed, a second 4-foot lift of soil, measuring approximately 50 by 75 feet in areal extent, was excavated and removed. The dimensions of each excavated lift were based upon sidewall sample results of the previous lift. The material in the second lift consisted mainly of clayey silts overlying limestone cobbles and rubble. Some fuel-contaminated soil was detected during removal of this lift. Again, each front-end loader bucket of soil was screened using the OVM. A bermed area was constructed south and west of the excavation to stage the fuel-contaminated soil (Soil Pile 2). A disposal decision was made on the spot, and the soil was then hauled to either the "clean" soil pile, if the measurement was less than the 100 ppm clean-up goal, or to the contaminated soil pile (Soil Pile 2), if the OVM measurement was greater than 100 ppm.

During removal of the third 4-foot-thick lift of soil, a small bunker with steel-reinforced concrete walls was uncovered approximately 8 feet bgs. The top of this bunker was the cause of the refusal during the advancement of geoprobe Borehole No. 4. The trackhoe demolished the top parts of the bunker to allow for removal of the contaminated soil. The bottom of the bunker was left in place and eventually buried during backfill operations. The third lift measured approximately 35 by 40 feet in areal extent (Figure 3.4.6-6). The fourth and last lift was 4 to 5 feet in thickness and measured 20 by 25 feet (Figure 3.4.6-7). The excavation was terminated at the bottom of the fourth lift when fuel-contaminated soil was no longer detected.

As the excavation progressed, representative soil samples were collected to characterize the concentrations of fuel contamination. HEAL was used to provide DRO/GRO results on a 24-hour turnaround basis. Some of the excavated contaminated soil was visibly discolored, had OVM readings of 200 to 500 ppm, and had a strong hydrocarbon odor. Laboratory DRO concentrations ranged up to 4,600 mg/kg and GRO concentrations up to 500 mg/kg.



Figure 3.4.6-3
Conduit Piping System Being Set Aside (view to the north)



Figure 3.4.6-4
Excavator Removing First Lift of Clean Soil (view to the northeast)

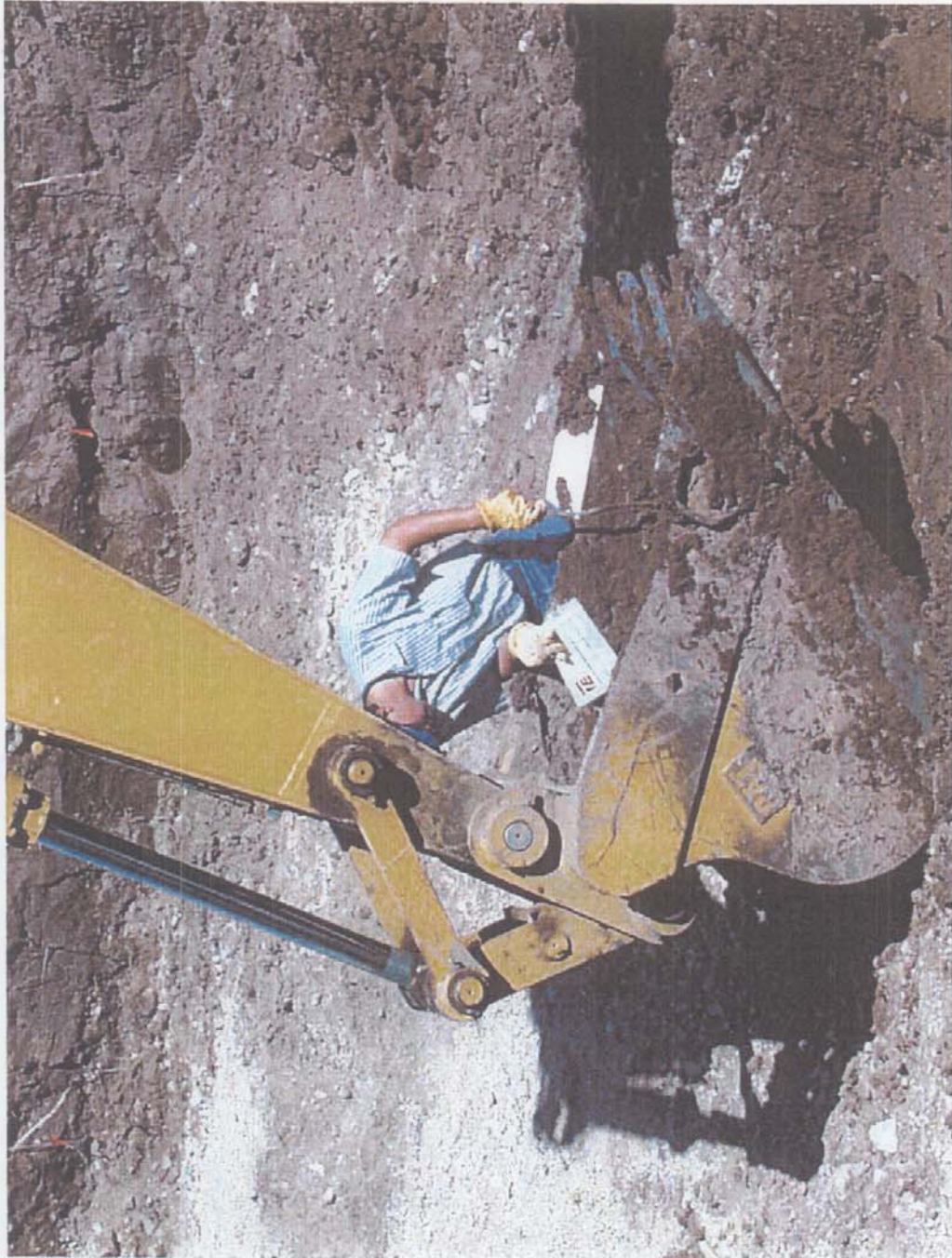


Figure 3.4.6-5
Using an OVM to Screen for Fuel-Contaminated Soil During Excavation



Figure 3.4.6-6
Excavating the Third Lift



Figure 3.4.6-7
Excavating the Fourth Lift (view to the west)

The final dimensions of the excavation were approximately 85 feet in the east and west direction and 65 feet north and south, reaching a maximum depth of approximately 18 feet bgs. The bottom of the fourth lift exposed some of the top of the phyllite schist bedrock (Figure 3.4.6-8). The schist was highly fractured, fissile, and relatively unweathered. After the excavation was completed, it was apparent that the contaminated soil had been confined to a narrowing zone directly under the conduit piping system. The top of the bedrock showed no staining or other indications of fuel contamination, and no odors were detected. Figure 3.4.6-9 shows the completed excavation.

Soil Pile Management

Excavated soil was staged within the graded portion of the Burn Site to the south and west of SWMU 94H. Two soil piles were generated. Soil Pile 1 was the designated location for "clean" excavated soil with OVM readings less than 100 ppm. Soil Pile 2 was the designated location for soil with OVM readings greater than 100 ppm, or noticeable fuel contamination.

Figures 3.4.6-10 and 3.4.6-11 show photographs of the soil piles. The contaminated soil pile was placed on plastic sheeting and bermed with a 2-foot-high lift of clean soil. The berm completely surrounded the contaminated soil. During daily operations, the berm was breached so that the front-end loader could bring in additional fuel-contaminated soil. At the end of each day the berm was reestablished. A berm was also placed around the upgradient end of the excavation to prevent surface-water run-on. The soil pile locations are shown in Figure 3.4.6-12.

Transportation and Disposal

The SNL/NM HWMF contracted for off-site transportation and disposal of the fuel-contaminated soil. An independent trucking contractor was used to haul soil with greater than 100 mg/kg DRO/GRO to KEERS Landfarm in Mountainair, New Mexico (Figures 3.4.6-13 and 3.4.6-14). A total of 880 cubic yards of soil was transported to the Landfarm over a two-and-one-half-week period between August 20 and September 5, 2001. The actual yardage was recorded for each truck. Each truck was capable of hauling approximately 15 to 20 cubic yards of soil. The trucks were weighed at the Solid Waste Transfer Facility at the beginning of each day, and again after being loaded, prior to being transported to the disposal facility.

3.4.6.3 *Waste Management*

Records regarding the shipment of soil to KEERS Landfarm are maintained by the HWMF. Table 3.4.6-1 summarizes the DRO/GRO sampling results of the contaminated and "clean" soil piles. The complete DRO/GRO results from HEAL are included in Annex 3-D.

The site experienced significant rainfall during the night of July 29, 2001, resulting in localized flooding. A run-on prevention berm had been constructed along the upstream side of the excavation, but it was breached by the storm-water flow that partially filled the excavation with water. At the time, the excavation was about 4 feet deep. One sample of the ponded storm water was collected using the trackhoe bucket (Figure 3.4.6-15) and analyzed for DRO/GRO to plan for the disposition of the water. While waiting for the sample to be analyzed, a sump pump was used to transfer the ponded storm water into a 1,750-gallon storage tank. The sample was analyzed overnight and the results (Table 3.4.6-1) showed a very low concentration of GRO (0.091 mg/L). The water in the storage tank was pumped out onto the ground surface and

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Figure 3.4.6-8
Finished Excavation Showing Top (in purple) of the Phyllite-Schist Bedrock

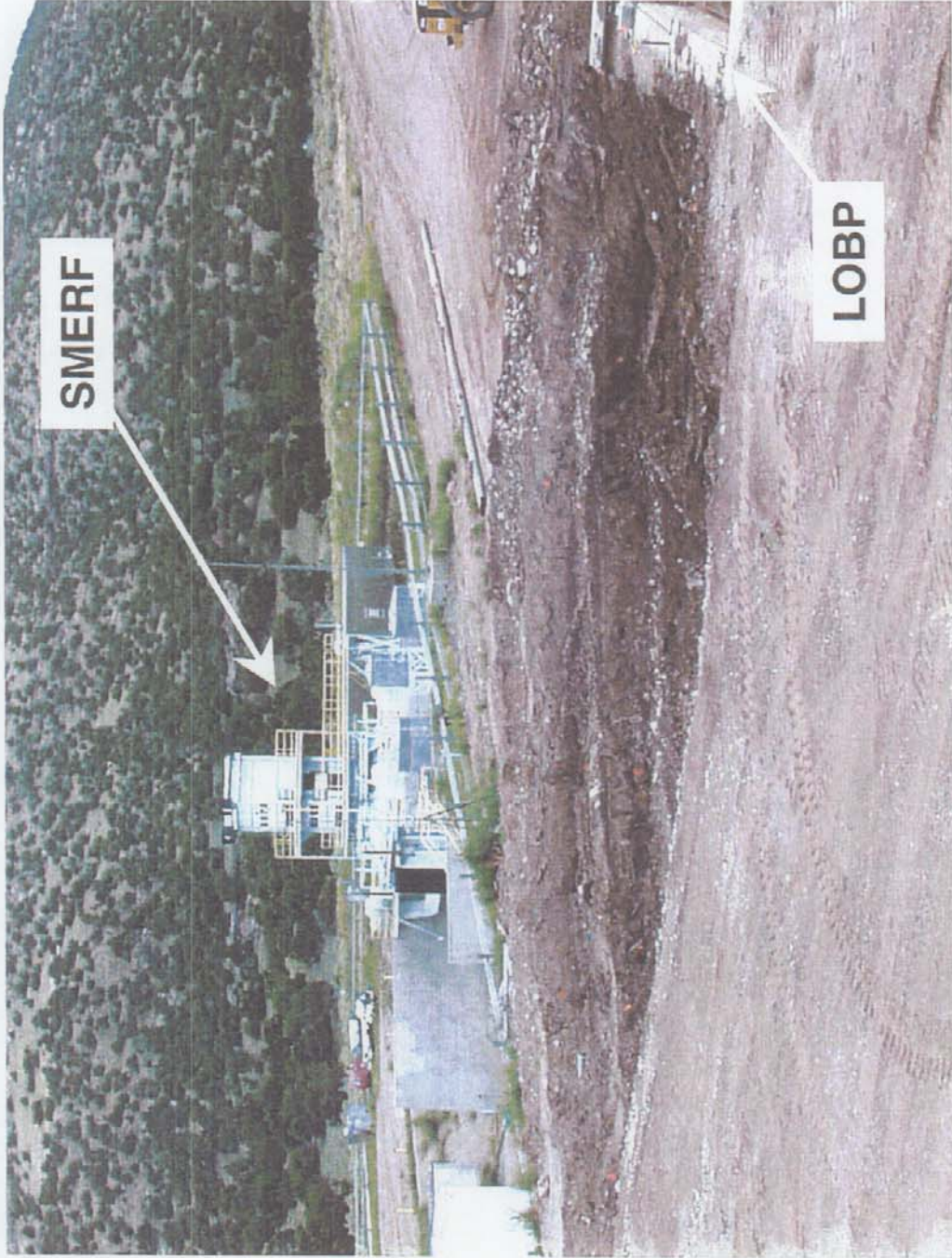


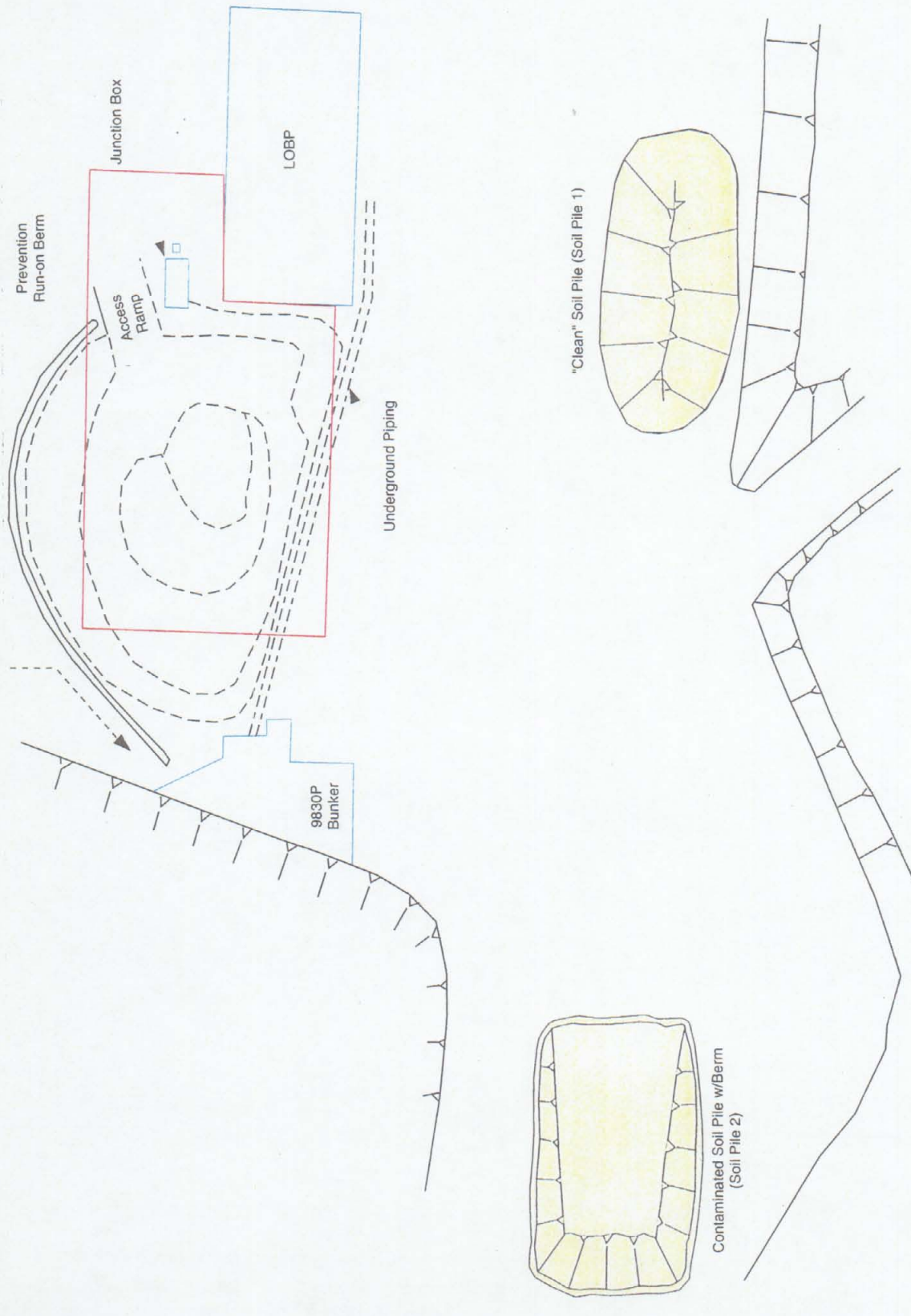
Figure 3.4.6-9
Overview of Completed Excavation (view to the northwest)



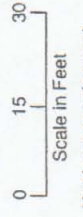
Figure 3.4.6-10
View of Clean (foreground) and Fuel-Contaminated Soil Piles (view to the west)



Figure 3.4.6-11
View of the Fuel-Contaminated Soil Pile (Soil Pile 2) Showing Plastic Sheetting
and Soil Berm (view to the west)



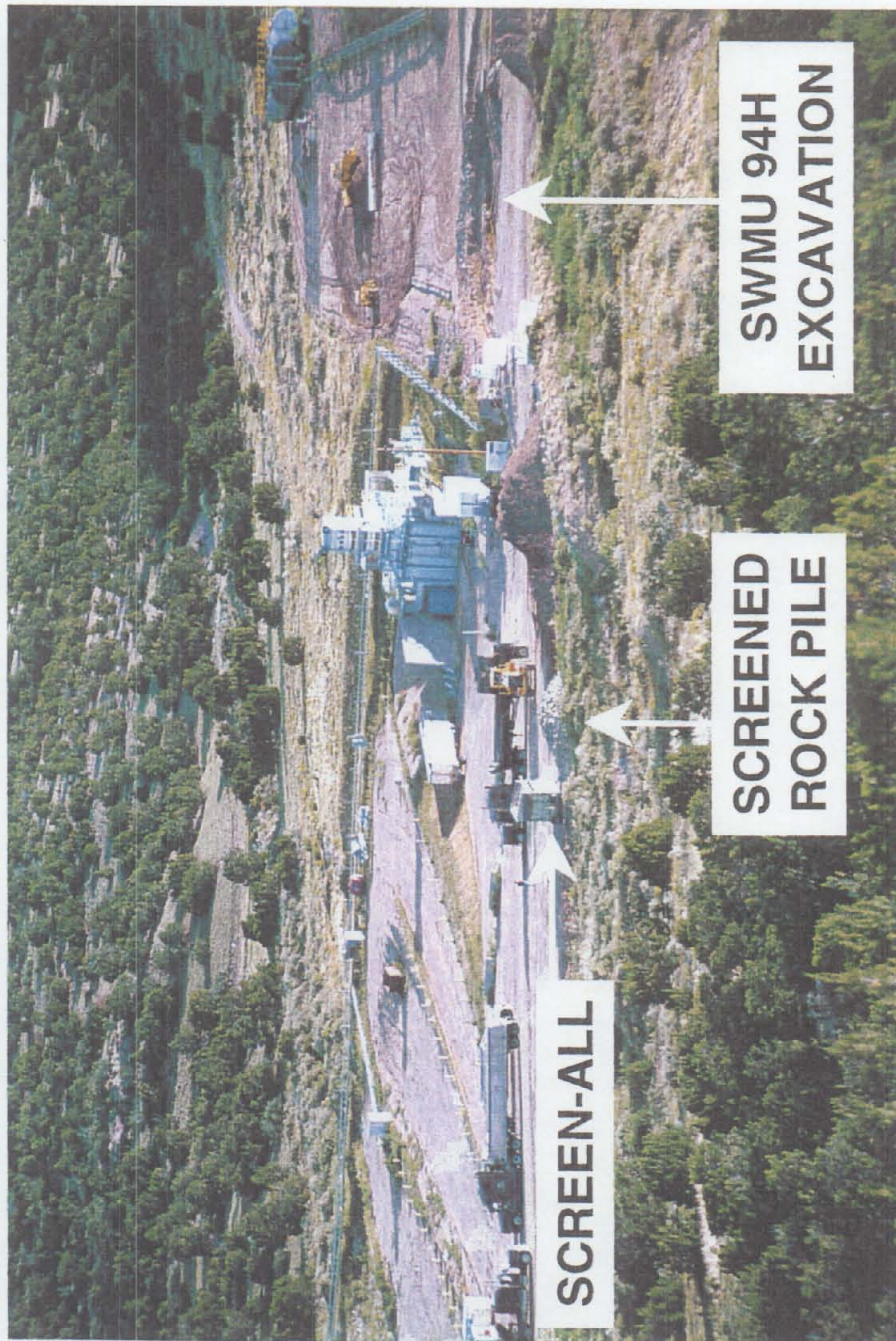
Sandia National Laboratories, New Mexico
Environmental Geographic Information System



Map is not georeferenced
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Figure 3.4.6-12
SWMU 94H Voluntary Corrective Action (VCA)
Completed Excavation and
Soil Pile Locations

- Legend**
- Excavation Lift Boundary
 - Approximate SWMU 94H Boundary
 - ▭ Structure
 - ▧ Slope
 - ▭ Soil Pile
 - ▬ Surface Flow Direction



SCREEN-ALL

**SCREENED
ROCK PILE**

**SWMU 94H
EXCAVATION**

Figure 3.4.6-13
Loading Fuel-Contaminated Soil into Trucks
For Transport to Disposal Facility (view to the north)



Figure 3.4.6-14
SWMU 94H Fuel-Contaminated Soil in Treatment Cell
At KEERS Landfarm (view to the east)

Table 3.4.6-1
 Summary of SWMU 94H VCA Water and Soil Pile Samples
 DRO and GRO Analytical Results
 July and August 2001
 (Off-Site Laboratory)

Sample Attributes				DRO (EPA Method 8015— modified ^a) (mg/kg)	GRO (EPA Method 8015— modified ^a) (mg/kg)
Record Number ^b	ER Sample ID	Date Collected	Location Description		
Surface Water					
604705	CY94H-SW	07-30-01	Ponded storm water runoff	ND (0.50) ^c	0.091^c
Contaminated Soil Pile					
604661	CY94H-CSP-001-S	08-03-01	Contaminated Soil Pile 2	620	31
604661	CY94H-CSP-002-S	08-03-01	Contaminated Soil Pile 2	2,800	120
604661	CY94H-CSP-003-S	08-03-01	Contaminated Soil Pile 2	4,600	290
604661	CY94H-CSP-004-S	08-03-01	Contaminated Soil Pile 2	2,100	140
604661	CY94H-CSP-005-S	08-03-01	Contaminated Soil Pile 2	1,700	500
Uncontaminated Soil Pile					
604668	CY94H-USP-001-S	08-08-01	"Clean" Soil Pile 1	ND (5.0)	ND (5.0)
604668	CY94H-USP-002-S	08-08-01	"Clean" Soil Pile 1	ND (5.0)	ND (5.0)
604668	CY94H-USP-003-S	08-08-01	"Clean" Soil Pile 1	ND (5.0)	ND (5.0)
604668	CY94H-USP-004-S	08-08-01	"Clean" Soil Pile 1	ND (5.0)	ND (5.0)

Note: Values in **bold** represent detected analytes.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cWater sample analyses are reported in milligram(s) per liter.

CSP = Contaminated soil pile.

CY = Canyon.

DRO = Diesel range organics.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

GRO = Gasoline range organics.

ID = Identification.

mg/kg = Milligram(s) per kilogram.

ND () = Not detected above the method detection limit, shown in parentheses.

S = Soil sample.

SW = Surface water sample.

SWMU = Solid Waste Management Unit.

USP = Uncontaminated soil pile.

VCA = Voluntary Corrective Action.

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 Department of Environmental and Soil Physics
 University of Applied Sciences
 2017-2018

Sample No.	Sample Name	Location	Depth (cm)	Moisture (%)	Temperature (°C)	EC (µmhos/cm)	pH	Ca (mg/kg)	Mg (mg/kg)	K (mg/kg)	N (mg/kg)	P (mg/kg)	S (mg/kg)	C (mg/kg)
1
2
3
4
5
6
7
8
9
10

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Figure 3.4.6-15
Using Excavator Bucket to Collect Sample of Pondered Storm Water

allowed to evaporate because the GRO concentration was much lower than the Oil Conservation District recommended remediation action level of 100 ppm for TPH.

The rock that was segregated with the Screen-All from the contaminated soil pile was thinly spaced for a minimum of two days and then inspected for contamination. There were no indications of petroleum staining, no fuel odors, and no readings above background with the OVM. The rock excavated from SWMU 94H was a hard, dense limestone with few fractures, very low porosity and almost no permeability. After consulting with HWB representatives, the SWMU 94H rock was approved for backfill and placed in the bottom of the excavation. The rock previously excavated and stockpiled from SWMU 94F was sampled and approved for backfill by the HWB (SNL/NM June 2001c) and then also placed in the bottom of the SWMU 94H excavation.

3.4.6.4 VCA Confirmation and Verification Work

To verify that SWMU 94H was adequately remediated during the VCA, confirmation work, consisting of sampling the sidewalls and the bottom tiers of the excavation, was conducted to verify that concentrations of DRO/GRO were less than the 100 mg/kg clean-up goal. To support a post-VCA risk screening assessment, eight confirmation sample locations from the sidewalls and bottom tiers of the excavation were re-sampled. These verification samples were analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, HE by EPA Method 8330, RCRA metals plus beryllium by EPA Methods 6010B/7470A/7471A, and gross alpha/beta by DOE RP-710 MOD (modified). Once the confirmation and verification sample results were reviewed and found to be acceptable, the excavation was backfilled and the area was restored to original grade. Base course aggregate was obtained and used to restore the roads and work areas to their original condition.

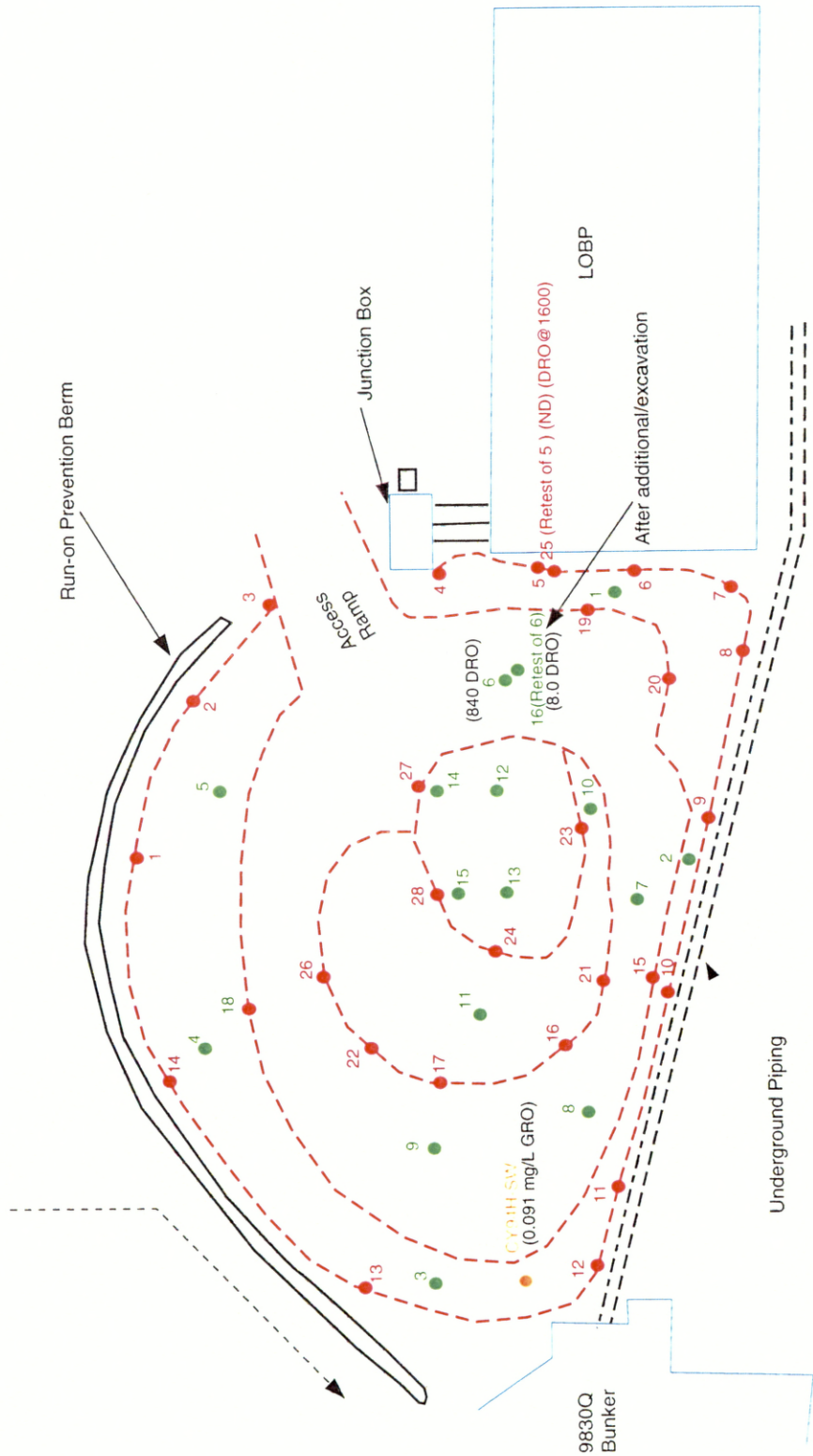
Confirmation and Verification Soil Sampling

Based upon review of the RFI data, it was determined that COCs at the site were limited to residual organic compounds associated with JP-8. As proposed in the VCA plan, DRO/GRO analyses utilizing EPA Method 8015 (modified) were used as the primary laboratory analysis to confirm that the clean-up goal of 100 ppm DRO/GRO was achieved. HEAL, a state-certified laboratory located in Albuquerque, New Mexico, performed the DRO/GRO analyses. Soil grab samples were collected from 28 locations along the sidewalls of the excavation to confirm that there was no remaining soil with concentrations of DRO/GRO greater than 100 mg/kg (Figure 3.4.6-16). A total of 16 samples were collected from the bottom tiers of the excavation for DRO/GRO analyses.

At eight of the confirmation sample locations from the bottom tiers of the excavation, an additional verification sample was collected and sent to an off-site laboratory to be analyzed for RCRA metals plus beryllium, VOCs, SVOCs, HE, and gross alpha/beta. Verification sample locations from the excavation are shown in Figure 3.4.6-17.

Four soil samples were collected from the clean soil pile (Soil Pile 1) for DRO/GRO analyses (Figure 3.4.6-18). After a review of the analytical results, the clean soil pile material was used as backfill in the excavation. Five soil samples were collected from the contaminated soil pile (Soil Pile 2) for DRO analyses. After a review of the analytical results, the contaminated soil was found to exceed the 100 mg/kg clean-up goal and the material was disposed of off site.

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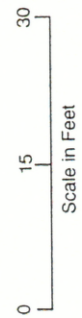


Legend

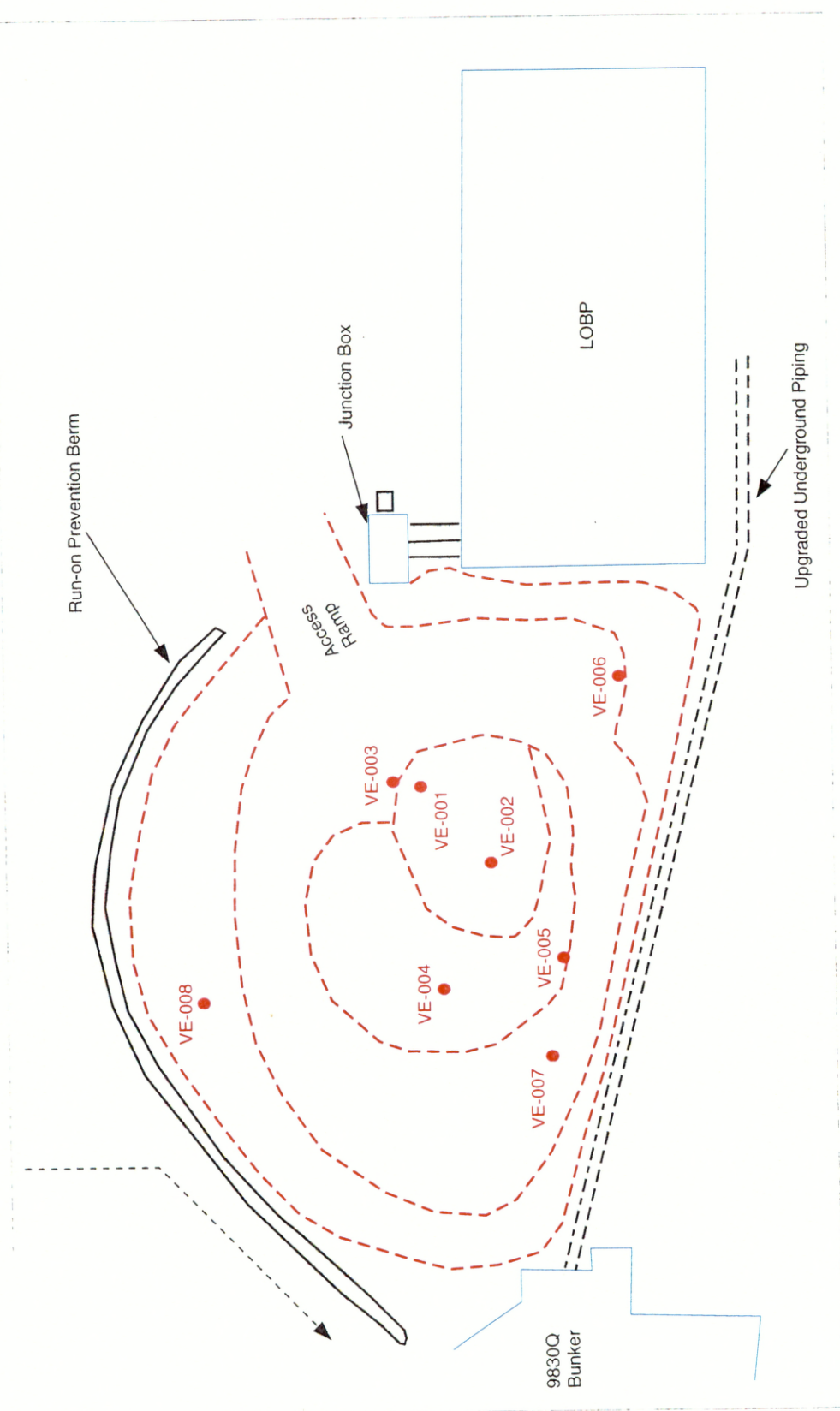
- - - Excavation Lift Boundary
- Structure
- Surface Flow Direction
- 5 (1600 DRO)
- 6 (840 DRO)
- Sidewall Confirmation Sample (CY94H-SW-005-S) Location*. DRO/GRO Concentrations** were ND (not detected) unless otherwise noted.
- Bottom Confirmation Sample (CY94H-B-006-S) Location*. DRO/GRO Concentrations** were ND unless otherwise noted.
- Pondered Stormwater Sample Location and GRO Concentration
- *Sample locations are approximate.
- ** Highest reported DRO or GRO concentration (mg/kg)

Figure 3.4.6-16
SWMU 94H VCA
Confirmation DRO/GRO
Sample Locations

Sandia National Laboratories, New Mexico
 Environmental Geographic Information System



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Legend

- - - Excavation Lift Boundary
- ▭ Structure
- VE-002 Verification Sample Location and Designation
- ▾ Surface Flow Direction

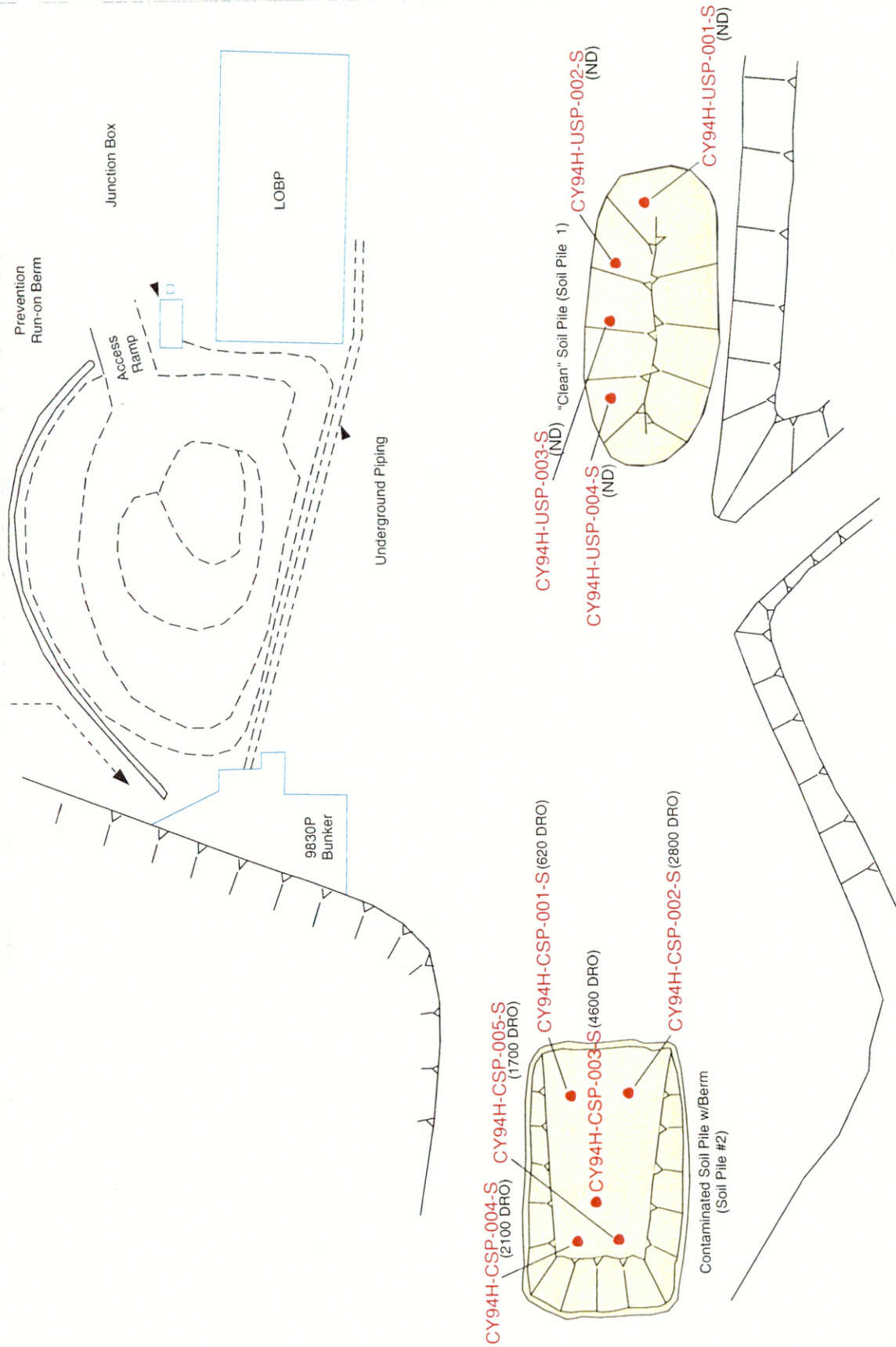
Figure 3.4.6-17
SWMU 94H VCA
Verification Sample Locations

Sandia National Laboratories, New Mexico
 Environmental Geographic Information System



Scale in Feet
 0 15 30

Map is not georeferenced
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Sandia National Laboratories, New Mexico
 Environmental Geographic Information System

Scale in Feet
 0 15 30

Map is not georeferenced
 Contact Bruce Wedgworth for questions concerning map data

Figure 3.4.6-18
SWMU 94H VCA
Soil Pile Sample Locations

- Legend**
- - - Excavation Lift Boundary
 - ▬ Structure
 - ▬ Slope
 - ◀ - - - Surface Flow Direction
 - Sample Location and Highest DRO/GRO Concentration (mg/kg)
 - Soil Pile

3.4.6.5 Results and Conclusions

DRO/GRO Results

DRO/GRO analysis was the primary analytical methodology used for confirmation. A preliminary clean-up goal of 100 mg/kg was established with NMED. DRO/GRO confirmation sampling locations included the sidewalls and bottom tiers of the excavation. Tables 3.4.6-2 and 3.4.6-3 summarize the confirmation DRO/GRO results.

DRO was detected above the MDL of 5.0 mg/kg in only two of the 27 sidewall samples (CY94H-SW-003-S and CY94H-SW-005-S) at concentrations of 16 and 1,600 mg/kg, respectively. The area where sample CY94H-SW-005-S was collected was excavated 1 foot further and re-sampled (CY94H-SW-025-S). The analytical result was ND. One sidewall sample (CY94H-SW-005-S) had a GRO concentration of 380 mg/kg.

DRO was detected above the MDL of 5.0 mg/kg in 1 of the 15 bottom samples (CY94H-B-006-S) at a concentration of 840 mg/kg. The area where sample number CY94H-B-006-S was collected was excavated 1 foot further and re-sampled (CY94H-B-016-S). The re-sampled DRO concentration was 8.0 mg/kg. The re-sampled GRO concentration was 4.1 mg/kg.

Eight verification soil samples were collected from some of the same locations as the sidewall and bottom tier confirmation samples. These sampling results are described below.

RCRA Metals Results

On August 13, 2001, eight verification soil samples (CY94H-VE-001-S through CY94H-VE-008-S) were collected from the sidewalls and bottom tiers of the excavation and analyzed for metals at an off-site laboratory. The sample results are summarized in Table 3.4.6-4. Beryllium was detected slightly above the background concentration limit of 0.75 mg/kg in five of the eight samples, at concentrations ranging from 0.78 J to 0.99 J mg/kg. Silver was also detected above the background concentration limit of less than 0.50 mg/kg in four samples, at concentrations ranging from 0.66 J to 3.9 mg/kg.

VOC Results

The eight verification soil samples were collected from the sidewalls and bottom tiers of the excavation and analyzed for VOCs at an off-site laboratory. Sample results are summarized in Table 3.4.6-5. Methylene chloride was the only VOC detected but was detected in all of the associated equipment and trip blanks. Therefore, the results are not considered valid detections. All methylene chloride sample concentrations were detected at concentrations less than the practical quantitation limit (PQL) and were estimated. The VOC MDLs are summarized in Table 3.4.6-6.

SVOC Results

The eight verification soil samples were collected from the sidewalls and bottom tiers of the excavation for SVOC analyses at an off-site laboratory. No SVOCs were detected in any of the

Table 3.4.6-2
 Summary of SWMU 94H VCA Confirmatory Soil Samples
 DRO and GRO Analytical Results, Side Walls of Excavation
 July and August 2001
 (Off-Site Laboratory)

Sample Attributes				DRO (EPA Method 8015— modified ^a) (mg/kg)	GRO (EPA Method 8015— modified ^a) (mg/kg)
Record Number ^b	ER Sample ID	Date Collected	Location Description		
604658	CY94H-SW-001-S	07-31-01	Northern side wall, 1 st tier	ND (5.0)	ND (5.0)
604658	CY94H-SW-002-S	07-31-01	Northern side wall, 1 st tier	ND (5.0)	ND (5.0)
604658	CY94H-SW-003-S	07-31-01	Northeastern side wall, 1 st tier	16	ND (5.0)
604658	CY94H-SW-004-S	07-31-01	Eastern side wall, 1 st tier	ND (5.0)	ND (5.0)
604658	CY94H-SW-005-S	08-02-01	Eastern side wall, 1 st tier	1,600	380
604658	CY94H-SW-006-S	08-02-01	Eastern side wall, 1 st tier	ND (5.0)	ND (5.0)
604658	CY94H-SW-007-S	08-02-01	Southeastern corner, 1 st tier	ND (5.0)	ND (5.0)
604658	CY94H-SW-008-S	08-02-01	Southeastern corner, 1 st tier	ND (5.0)	ND (5.0)
604658	CY94H-SW-009-S	08-02-01	Southern side wall, 1 st tier	ND (5.0)	ND (5.0)
604658	CY94H-SW-010-S	08-02-01	Southern side wall, 1 st tier	ND (5.0)	ND (5.0)
604660	CY94H-SW-011-S	08-03-01	Southern side wall, 1 st tier	ND (5.0)	ND (5.0)
604660	CY94H-SW-012-S	08-03-01	Southwestern corner, 1 st tier	ND (5.0)	13
604660	CY94H-SW-013-S	08-03-01	Western side wall, 1 st tier	ND (5.0)	ND (5.0)
604660	CY94H-SW-014-S	08-03-01	Northwestern side wall, 1 st tier	ND (5.0)	ND (5.0)
604660	CY94H-SW-015-S	08-03-01	Southern side wall, 2 nd tier	ND (5.0)	ND (5.0)
604660	CY94H-SW-016-S	08-03-01	Southern side wall, 3 rd tier	ND (5.0)	ND (5.0)
604660	CY94H-SW-017-S	08-03-01	Western side wall, 3 rd tier	ND (5.0)	ND (5.0)
604660	CY94H-SW-018-S	08-03-01	Northern side wall, 2 nd tier	ND (5.0)	ND (5.0)
604662	CY94H-SW-019-S	08-06-01	Eastern side wall, 2 nd tier	ND (5.0)	ND (5.0)
604662	CY94H-SW-020-S	08-06-01	Southeastern corner, 2 nd tier	ND (5.0)	ND (5.0)
604664	CY94H-SW-021-S	08-07-01	Southern side wall, 3 rd tier	ND (5.0)	ND (5.0)
604664	CY94H-SW-022-S	08-07-01	Western side wall, 3 rd tier	ND (5.0)	ND (5.0)
604664	CY94H-SW-023-S	08-07-01	Southern side wall, 4 th tier	ND (5.0)	ND (5.0)
604664	CY94H-SW-024-S	08-07-01	Western side wall, 4 th tier	ND (5.0)	ND (5.0)
604664	CY94H-SW-025-S	08-07-01	Re-sample of CY94H-SW-005-S	ND (5.0)	ND (5.0)
604667	CY94H-SW-026-S	08-08-01	Northern side wall, 3 rd tier	ND (5.0)	ND (5.0)
604667	CY94H-SW-027-S	08-08-01	Northern side wall, 4 th tier	ND (5.0)	ND (5.0)
604667	CY94H-SW-028-S	08-08-01	Northern side wall, 4 th tier	ND (5.0)	ND (5.0)

Note: Values in bold represent detected analytes.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

CY = Canyon.

DRO = Diesel range organics.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

GRO = Gasoline range organics.

ID = Identification.

mg/kg = Milligram(s) per kilogram.

ND () = Not detected above the method detection limit, shown in parentheses.

S = Soil sample.

SW = Side wall.

SWMU = Solid Waste Management Unit.

VCA = Voluntary Corrective Action.

Table 3.4.6-3
 Summary of SWMU 94H VCA Confirmatory Soil Samples
 DRO and GRO Analytical Results, Bottom Tiers of Excavation
 July and August 2001
 (Off-Site Laboratory)

Sample Attributes				DRO (EPA Method 8015—modified ^a) (mg/kg)	GRO (EPA Method 8015—modified ^a) (mg/kg)
Record Number ^b	ER Sample ID	Date Collected	Location Description		
604663	CY94H-B-001-S	08-06-01	Bottom of excavation (east)	ND (5.0)	ND (5.0)
604663	CY94H-B-002-S	08-06-01	Bottom of excavation (south)	ND (5.0)	ND (5.0)
604663	CY94H-B-003-S	08-06-01	Bottom of excavation (west)	ND (5.0)	ND (5.0)
604663	CY94H-B-004-S	08-06-01	Bottom of excavation (northwest)	ND (5.0)	ND (5.0)
604663	CY94H-B-005-S	08-06-01	Bottom of excavation (north)	ND (5.0)	ND (5.0)
604663	CY94H-B-006-S	08-06-01	Bottom of excavation (east)	840	ND (100)
604663	CY94H-B-007-S	08-06-01	Bottom of excavation (south)	ND (5.0)	ND (5.0)
604665	CY94H-B-008-S	08-07-01	Bottom of excavation (south)	ND (5.0)	ND (5.0)
604665	CY94H-B-009-S	08-07-01	Bottom of excavation (west)	ND (5.0)	ND (5.0)
604665	CY94H-B-010-S	08-07-01	Bottom of excavation (south)	ND (5.0)	ND (5.0)
604665	CY94H-B-011-S	08-07-01	Bottom of excavation (west)	ND (5.0)	ND (5.0)
604665	CY94H-B-012-S	08-07-01	Bottom of excavation (center)	ND (5.0)	ND (5.0)
604665	CY94H-B-013-S	08-07-01	Bottom of excavation (center)	ND (5.0)	ND (5.0)
604665	CY94H-B-014-S	08-07-01	Bottom of excavation (center)	ND (5.0)	ND (5.0)
604665	CY94H-B-015-S	08-07-01	Bottom of excavation (center)	ND (5.0)	ND (5.0)
604666	CY94H-B-016-S	08-08-01	Re-sample of CY94H-B-006-S	8.0	4 J

Note: Values in **bold** represent detected analytes.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

B = Bottom soil sample.

CY = Canyon.

DRO = Diesel range organics.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

GRO = Gasoline range organics.

ID = Identification.

J = Value is estimated.

mg/kg = Milligram(s) per kilogram.

ND () = Not detected above the method detection limit, shown in parentheses.

S = Soil sample.

SWMU = Solid Waste Management Unit.

VCA = Voluntary Corrective Action.

Table 3.4.6-4
Summary of SWMU 94H Verification Soil Samples Metals Analytical Results
August 2001
(Off-Site Laboratory)

Sample Attributes			Metals (EPA Method 6010B/7470A/7471A ^a) (mg/kg)		
Record Number ^b	ER Sample ID	Sample Depth (ft)	Arsenic	Barium	Beryllium
604669	CY94H-VE-001-S	0.0-1.0	2.8	159	0.99 J (2.5)
604669	CY94H-VE-002-S	0.0-1.0	1.7	148	0.74 J (2.5)
604669	CY94H-VE-003-S	0.0-1.0	2.4	135	0.6
604669	CY94H-VE-004-S	0.0-1.0	2.8	111	0.78 J (2.5)
604669	CY94H-VE-005-S	0.0-1.0	1.3	102	0.91 J (2.5)
604669	CY94H-VE-006-S	0.0-1.0	2.8	113	0.64
604669	CY94H-VE-007-S	0.0-1.0	2.4	108	0.79 J (2.5)
604669	CY94H-VE-008-S	0.0-1.0	3.3	138	0.79 J (2.5)
Background Soil Concentrations-Canyons ^c			9.8	246	0.75
Quality Assurance/Quality Control Sample (mg/L)					
604669	CY94H-EB-001-S	NA	ND (0.0014)	ND (0.0036)	0.0007 J (0.005)

Record Number ^b	ER Sample ID	Sample Depth (ft)	Cadmium	Chromium	Lead
604669	CY94H-VE-001-S	0.0-1.0	0.18 J (0.2)	12	5.7
604669	CY94H-VE-002-S	0.0-1.0	0.25	9.5	4.5
604669	CY94H-VE-003-S	0.0-1.0	0.22	10.1	6.1
604669	CY94H-VE-004-S	0.0-1.0	0.28	9	9
604669	CY94H-VE-005-S	0.0-1.0	0.27	10.6	5.7
604669	CY94H-VE-006-S	0.0-1.0	0.21	9.2	7.3
604669	CY94H-VE-007-S	0.0-1.0	0.45	7.8	7
604669	CY94H-VE-008-S	0.0-1.0	0.18 J (0.2)	10.9	13.3
Background Soil Concentrations-Canyons ^c			0.64	18.8	18.9
Quality Assurance/Quality Control Sample (mg/L)					
604669	CY94H-EB-001-S	NA	ND (0.00015)	0.0029 J (0.005)	ND (0.00076)

Record Number ^b	ER Sample ID	Sample Depth (ft)	Mercury	Selenium	Silver
604669	CY94H-VE-001-S	0.0-1.0	ND (0.017)	ND (0.12)	0.66 J (2.5)
604669	CY94H-VE-002-S	0.0-1.0	ND (0.017)	ND (0.12)	ND (0.6)
604669	CY94H-VE-003-S	0.0-1.0	ND (0.017)	ND (0.12)	0.22 J (0.5)
604669	CY94H-VE-004-S	0.0-1.0	ND (0.017)	ND (0.12)	1.9 J (2.5)
604669	CY94H-VE-005-S	0.0-1.0	ND (0.017)	ND (0.12)	3.9
604669	CY94H-VE-006-S	0.0-1.0	ND (0.017)	0.89	ND (0.12)
604669	CY94H-VE-007-S	0.0-1.0	ND (0.017)	ND (0.12)	2.7
604669	CY94H-VE-008-S	0.0-1.0	ND (0.017)	ND (0.12)	ND (0.12)
Background Soil Concentrations-Canyons ^c			0.055	2.7	<0.50
Quality Assurance/Quality Control Sample (mg/L)					
604669	CY94H-EB-001-S	NA	ND (0.0001)	ND (0.0012)	0.0072 J (0.01)

Note: Values in bold indicate concentrations greater than background.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

^cFrom Garcia November 1998.

CY = Canyon.
 EB = Equipment blank.
 EPA = U.S. Environmental Protection Agency.
 ER = Environmental Restoration.
 ft = Foot (feet).
 ID = Identification.
 J () = The reported value is greater than or equal to the method detection limit but is less

than the practical quantitation limit, shown in parentheses.
 mg/kg = Milligram(s) per kilogram.
 mg/L = Milligram(s) per liter.
 NA = Not applicable.
 ND () = Not detected above the method detection limit, shown in parentheses.
 S = Surface soil sample.
 SWMU = Solid Waste Management Unit.
 VE = Verification sample.

Table 3.4.6-5
 Summary of SWMU 94H Verification Soil Samples
 VOC Analytical Results—Detections Only
 August 2001
 (Off-Site Laboratory)

Sample Attributes			VOCs (EPA Method 8260B ^a) (µg/kg)
Record Number ^b	ER Sample ID	Sample Depth (ft)	Methylene chloride
604669	CY94H-VE-001-S	0.0-1.0	3.4 BJ (5)
604669	CY94H-VE-002-S	0.0-1.0	2.8 BJ (5)
604669	CY94H-VE-003-S	0.0-1.0	3 BJ (5)
604669	CY94H-VE-004-S	0.0-1.0	3 BJ (5)
604669	CY94H-VE-005-S	0.0-1.0	3 BJ (5)
604669	CY94H-VE-006-S	0.0-1.0	2.9 BJ (5)
604669	CY94H-VE-007-S	0.0-1.0	3.7 BJ (5)
604669	CY94H-VE-008-S	0.0-1.0	3 BJ (5)
Quality Assurance/Quality Control Samples (all in µg/L)			
604669	CY94H-EB-001-S	NA	5.6 B
604669	CY94H-TB-001-S	NA	8 B

Note: Values in **bold** represent detected compounds.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

B = Analyte detected in associated blank.

CY = Canyon.

EB = Equipment blank.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet)

ID = Identification.

J () = The reported value is greater than or equal to the method detection limit but is less than the practical quantitation limit, shown in parentheses.

µg/kg = Microgram(s) per kilogram.

µg/L = Microgram(s) per liter.

NA = Not applicable.

S = Surface soil sample.

SWMU = Solid Waste Management Unit.

TB = Trip blank.

VE = Verification sample.

VOC = Volatile organic compound.

Table 3.4.6-6
 VOC Analytical Method Detection Limits
 Used for SWMU 94H Verification Soil Samples
 August 2001
 (Off-Site Laboratory)

Analyte	Method Detection Limit (µg/kg)
1,1,1-Trichloroethane	0.44
1,1,2,2-Tetrachloroethane	0.44
1,1,2-Trichloroethane	0.43
1,1-Dichloroethane	0.38
1,1-Dichloroethene	1.3
1,2-Dichloroethane	0.43
1,2-Dichloroethene	0.83
1,2-Dichloropropane	0.21
1,4-Dichlorobenzene	0.3
2-Butanone	6.6
2-Hexanone	1.7
4-methyl-, 2-Pentanone	1.3
Acetone	2.6
Benzene	0.37
Bromodichloromethane	0.45
Bromoform	0.62
Bromomethane	0.6
Carbon disulfide	0.46
Carbon tetrachloride	0.65
Chlorobenzene	0.34
Chloroethane	2.2
Chloroform	0.24
Chloromethane	0.77
Dibromochloromethane	0.38
Ethyl benzene	0.89
Methylene chloride	0.53
Styrene	0.37
Tetrachloroethene	0.36
Toluene	0.54
Trichloroethene	0.31
Vinyl chloride	0.79
Xylene	1.1
cis-1,3-Dichloropropene	0.52
trans-1,3-Dichloropropene	0.31

µg/kg = Microgram(s) per kilogram.
 SWMU = Solid Waste Management Unit.
 VOC = Volatile organic compound.

verification samples collected from the excavation sidewalls and bottom tiers. The SVOC MDLs are summarized in Table 3.4.6-7.

A discussion of the significance of these results is presented in the Data Validation section below.

HE Results

The eight verification soil samples were collected from the sidewalls and bottom tiers of the excavation and analyzed for HE at the STL off-site laboratory. No HE compounds were detected in any of the verification samples. The HE MDLs are summarized in Table 3.4.6-8.

Radionuclides

On August 13, 2001, the eight verification soil samples were collected from the sidewalls and bottom tiers of the excavation and analyzed for gross alpha/beta at the STL off-site laboratory. The gross alpha/beta results, summarized in Table 3.4.6-9, show activities less than the background soil activity limits of 18.3 and 52.7 picocuries (pCi)/gram (g), respectively.

QA/QC Results

Table 3.4.6-5 presents the results of the VOC analyses and QA/QC samples. An equipment blank and trip blank were collected with the verification VOC samples from the sidewalls and bottom tiers of the excavation. Methylene chloride was detected in both the trip blank and the equipment blank at concentrations of 8 B and 5.6 B $\mu\text{g}/\text{kg}$, respectively. The detections of methylene chloride in the verification samples were determined to be nondetects during data validation due to blank contamination.

Data Validation

No data validation was performed on the samples sent to HEAL for DRO/GRO analyses. The off-site VOC, SVOC, HE, metals, and gross alpha/beta laboratory results were reviewed and verified according to "Data Validation Procedure for Chemical and Radiochemical Data," SNL/NM ER Project Analytical Operating Procedure 00-03, Rev. 0 (SNL/NM December 1999). In addition, SNL/NM Department 7713 (RPSD Laboratory) reviewed all gamma spectroscopy results according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 02 (SNL/NM July 1996). Annex 3-B contains the off-site data validation reports. The verification/validation process confirmed that the data are acceptable for use in this NFA proposal for SWMU 94H.

Table 3.4.6-7
SVOC Analytical Method Detection Limits
Used for SWMU 94H Verification Soil Samples
August 2001
(Off-Site Laboratory)

Analyte	Method Detection Limit (µg/kg)
1,2,4-Trichlorobenzene	23
1,2-Dichlorobenzene	35
1,3-Dichlorobenzene	33
1,4-Dichlorobenzene	30
2,4,5-Trichlorophenol	86
2,4,6-Trichlorophenol	55
2,4-Dichlorophenol	60
2,4-Dimethylphenol	39
2,4-Dinitrophenol	54
2,4-Dinitrotoluene	74
2,6-Dinitrotoluene	59
2-Chloronaphthalene	19
2-Chlorophenol	39
2-Methylnaphthalene	30
2-Nitroaniline	56
2-Nitrophenol	39
3,3'-Dichlorobenzidine	28
3-Nitroaniline	37
4-Bromophenyl phenyl ether	24
4-Chloro-3-methylphenol	75
4-Chlorobenzenamine	54
4-Chlorophenyl phenyl ether	32
4-Methylphenol	51
4-Nitroaniline	52
4-Nitrophenol	79
Acenaphthene	22
Acenaphthylene	26
Anthracene	21
Benzo(a)anthracene	13
Benzo(a)pyrene	15
Benzo(b)fluoranthene	17
Benzo(ghi)perylene	140
Benzo(k)fluoranthene	33
Butylbenzyl phthalate	16
Carbazole	93
Chrysene	15
Di-n-butyl phthalate	25
Di-n-octyl phthalate	27
Dibenz[a,h]anthracene	28
Dibenzofuran	28
Diethylphthalate	55
Dimethylphthalate	42
Dinitro-o-cresol	120
Fluoranthene	25

Refer to footnotes at end of table.

Table 3.4.6-7 (Concluded)
 SVOC Analytical Method Detection Limits
 Used for SWMU 94H Verification Soil Samples
 August 2001
 (Off-Site Laboratory)

Analyte	Method Detection Limit (µg/kg)
Fluorene	32
Hexachlorobenzene	24
Hexachlorobutadiene	23
Hexachlorocyclopentadiene	25
Hexachloroethane	29
Indeno(1,2,3-c,d)pyrene	82
Isophorone	27
Naphthalene	22
Nitro-benzene	30
Pentachlorophenol	65
Phenanthrene	15
Phenol	45
Pyrene	160
bis(2-Chloroethoxy)methane	24
bis(2-Chloroethyl)ether	29
bis(2-Ethylhexyl)phthalate	36
bis-Chloroisopropyl ether	34
n-Nitrosodiphenylamine	30
n-Nitrosodipropylamine	37
o-Cresol	40

µg/kg = Microgram(s) per kilogram.
 SVOC = Semivolatile organic compound.
 SWMU = Solid Waste Management Unit.

Table 3.4.6-8
 HE Analytical Method Detection Limits
 Used for SWMU 94H Verification Soil Samples
 August 2001
 (Off-Site Laboratory)

Analyte	Method Detection Limit (µg/kg)
1,3,5-Trinitrobenzene	31
1,3-Dinitrobenzene	36
2,4,6-Trinitrotoluene	20
2,4-Dinitrotoluene	35
2,6-Dinitrotoluene	110
2-Amino-4,6-dinitrotoluene	36
2-Nitrotoluene	52
3-Nitrotoluene	36
4-Amino-2,6-dinitrotoluene	39
4-Nitrotoluene	73
HMX	81
Nitro-benzene	38
RDX	38
Tetryl	21

- HE = High Explosive(s).
 HMX = 1,3,5,7-Tetranitro-1,3,5,7-tetrazacyclooctane.
 µg/kg = Microgram(s) per kilogram.
 RDX = 1,3,5-Trinitro-1,3,5-triazacyclohexane.
 SWMU = Solid Waste Management Unit.
 Tetryl = 2,4,6-Trinitrophenylmethylnitramine.

Table 3.4.6-9
 Summary of SWMU 94H Verification Soil Samples
 Gross Alpha and Beta Analytical Results
 August 2001
 (Off-Site Laboratory)

Sample Attributes			Activity ^a (pCi/g)			
Record Number ^b	ER Sample ID	Sample Depth (ft)	Gross Alpha		Gross Beta	
			Result	Error ^c	Result	Error ^c
604669	CY94H-VE-001-S	0.0-1.0	6.3	3.7	18.1	3.7
604669	CY94H-VE-002-S	0.0-1.0	13.4	4.6	13.6	3.4
604669	CY94H-VE-003-S	0.0-1.0	9.8	3.4	16.3	3.1
604669	CY94H-VE-004-S	0.0-1.0	5.9	3.6	12.5	3.3
604669	CY94H-VE-005-S	0.0-1.0	6.1	3.7	11.3	3.8
604669	CY94H-VE-006-S	0.0-1.0	8.2	3.3	21.9	3.6
604669	CY94H-VE-007-S	0.0-1.0	12.1	4.1	15.9	3.2
604669	CY94H-VE-008-S	0.0-1.0	13.7	3.4	25.5	3.6
Background Soil Activities ^d			18.3	NA	52.7	NA

^aDOE RP-710 MOD.

^bAnalysis request/chain-of-custody record.

^cTwo standard deviations about the mean detected activity.

^dFrom Tharp July 1998.

CY = Canyon.

DOE = Department of Energy.

EPA = U.S. Environmental Protection Agency.

ER = Environmental Restoration.

ft = Foot (feet).

ID = Identification.

MOD = Modified.

NA = Not applicable.

pCi/g = Picocurie(s) per gram.

S = Surface soil sample.

SWMU = Solid Waste Management Unit.

VE = Verification sample.

3.5 Site Conceptual Model

The site conceptual model for SWMU 94H is based upon historic disposal operations, the geologic and hydrologic setting, and the residual COCs identified in the soil samples collected from the site. This section summarizes the nature and extent of contamination and the environmental fate of COCs.

3.5.1 Nature and Extent of Contamination

A fuel line on the north side of the SOBP discharged JP-8 fuel that infiltrated into the subsurface soil at SWMU 94H. Because the amount of spilled fuel was unknown and represented a potential threat to groundwater, a VCA was conducted to remediate the site. The rationale for the VCA was to remove a source of fuel contaminants potentially impacting groundwater quality.

During planning of the SWMU 94H VCA, it was determined that soil contamination and soil clean-up goals could be best established using DRO/GRO as the primary laboratory analyses. The VCA removed approximately 880 cubic yards of fuel-contaminated soil with DRO/GRO concentrations greater than 100 mg/kg. All of the soil with concentrations of DRO/GRO greater than 100 mg/kg was successfully removed during the VCA, eliminating a potential source of groundwater contamination. The VCA verified that contamination had not infiltrated the bedrock underlying the site.

To conduct a post-VCA risk screening assessment, verification VOC, SVOC, HE, metals, and gross alpha/beta samples were collected from the sidewalls and bottom tiers of the excavation. These data confirmed the DRO/GRO sample results. Any VOC or SVOC detected was considered a potential COC and evaluated during the risk screening assessment. For the risk screening assessment, it was conservatively assumed that the metals concentrations found in the excavated soil during the RFI sampling were representative of post-VCA conditions. Any metal found to exceed background was considered a potential COC. Radionuclides detected above background activity levels were also considered potential COCs. Table 3.5.1-1 lists the COCs and the sample locations where they were observed. A preliminary risk screening assessment was performed on the RFI data, and it was determined that the excavated soil did not pose an unacceptable human health or ecological risk.

3.5.2 Environmental Fate

The primary source of COCs at SWMU 94H was the spilled JP-8 fuel used in the burn tests at the LOBP and SOBP. A fuel line leaked an unknown amount of fuel that infiltrated into the subsurface soil. The VCA removed and disposed of the contaminated soil. Possible secondary release mechanisms include the release of residual COCs to the vadose zone, dust emissions, direct contact, and uptake of residual COCs by biota. Figure 3.5.2-1 presents the conceptual model flow diagram for SWMU 94H. None of the secondary release mechanisms are considered probable potential pathways to receptors, but are retained in the conceptual model.

Table 3.5.1-1
Summary of COCs for SWMU 94H

COC Type	Number of Samples	COCs Greater Than Background	Background Soil Concentrations/ Canyon Area ^a (mg/kg)	Maximum Concentration (mg/kg)	Average Concentration ^b (mg/kg)	Sampling Locations Where Background Concentration was Exceeded ^c
Metals— RFI VCA Verification	11 environmental 1 equipment blank	Beryllium	0.75	0.99 J	0.78	CY94H-BH1-2.5 (2.0-5.0) CY94H-VE-001-S (0.0-1.0) CY94H-VE-004-S (0.0-1.0) CY94H-VE-005-S (0.0-1.0) CY94H-VE-007-S (0.0-1.0) CY94H-VE-008-S (0.0-1.0)
		Silver	<0.50	3.9	0.92	CY94H-VE-001-S (0.0-1.0) CY94H-VE-004-S (0.0-1.0) CY94H-VE-005-S (0.0-1.0) CY94H-VE-007-S (0.0-1.0)

^aFrom Dinwiddie September 1997 (radionuclides) and Garcia November 1998 (metals).

^bAverage concentration includes all samples. For nondetectable results, the detection limit is used to calculate the average.

^cSample depth shown in parentheses.

BH = Borehole.

COC = Constituent of concern.

CY = Canyon.

J = The reported value is greater than or equal to the method detection limit but is less than the practical quantitation limit.

mg/kg = Milligram(s) per kilogram.

RCRA = Resource Conservation and Recovery Act.

RFI = RCRA Facility Investigation.

S = Surface soil sample.

SWMU = Solid Waste Management Unit.

VCA = Voluntary Corrective Action.

VE = Verification soil sample.

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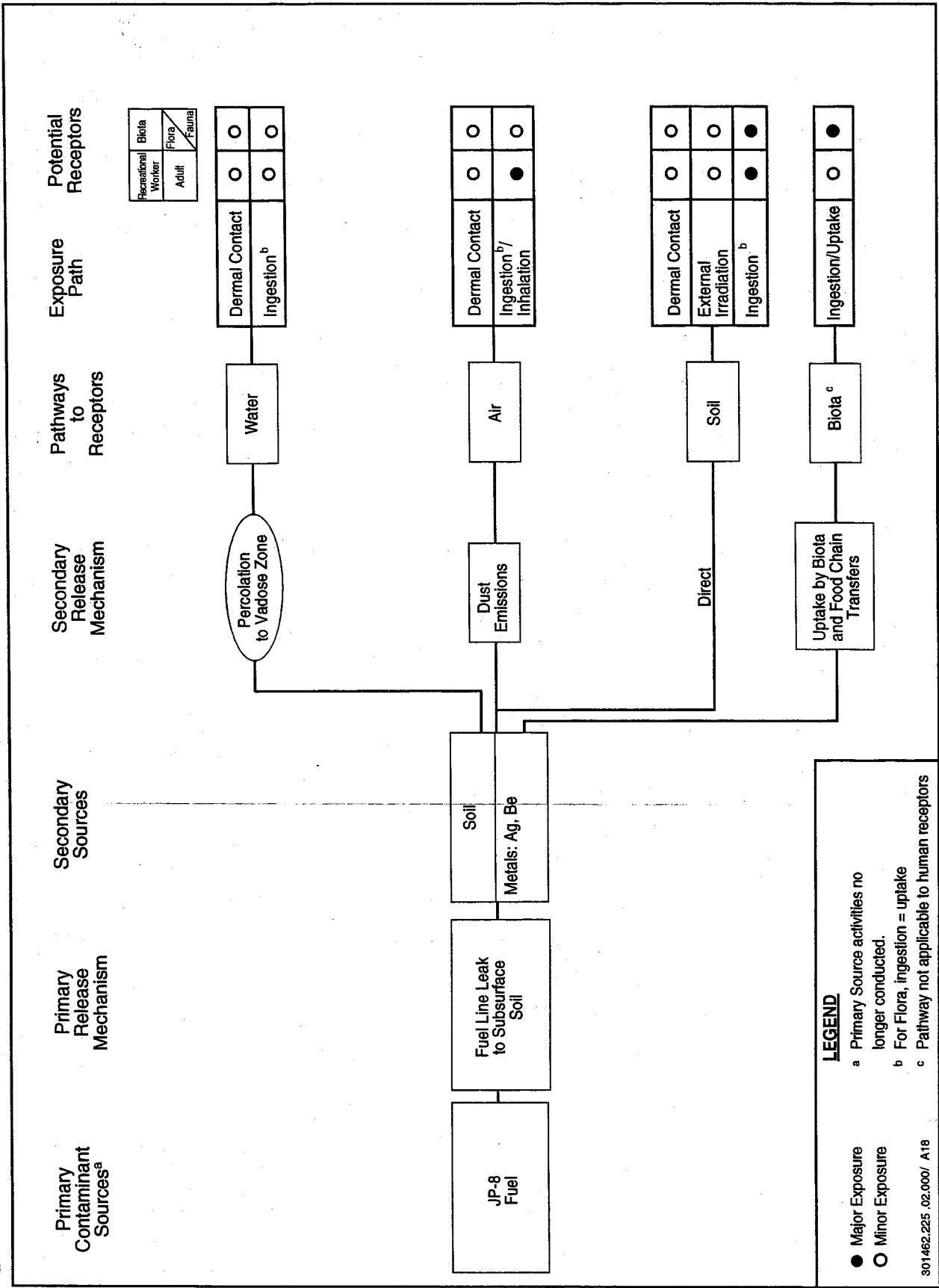


Figure 3.5.2-1
Conceptual Model Flow Diagram for SWMU 94H, JP-8 Site



The current land use for SWMU 94H is industrial. However, because the future land use for SWMU 94H is recreational (DOE et al. October 1995), the potential human receptor is considered a recreational user of the site. For all applicable pathways, the exposure routes considered for the recreational user are dermal contact and ingestion/inhalation. Only ingestion of soil is considered a major exposure route for the recreational user. Potential biota receptors include flora and fauna at the site. Similar to the recreational user, direct ingestion of soil is considered the major exposure route for biota, in addition to ingestion through food chain transfers or direct uptake. Annex 3-E, Section V, provides additional discussion of the exposure routes and receptors at SWMU 94H.

3.6 Site Assessments

Site assessments at SWMU 94H include risk screening assessments followed by risk baseline assessments (as required) for both human health and ecological risk. The following sections summarize the site assessment results, and Annex 3-E discusses the risk screening assessment in more detail.

3.6.1 Summary

The site assessment concludes that SWMU 94H presents no significant potential to affect human health under a recreational land use scenario. After considering the uncertainties associated with the available data and modeling assumptions, ecological risks associated with SWMU 94H were found to be very low.

3.6.2 Screening Assessments

Risk screening assessments were performed for both human health and ecological risk for SWMU 94H. This section briefly summarizes the risk screening assessments.

3.6.2.1 Human Health

SWMU 94H has been recommended for recreational land use (DOE et al. October 1995). Annex 3-E provides a complete discussion of the risk assessment process, results, and uncertainties. Because specific COCs are present in concentrations greater than background levels, it was necessary to perform a health risk assessment analysis for the site. After the soil removal action was completed, verification samples were collected from the bottom tiers and sidewalls of the excavation for VOC, SVOC, HE, metals, and gross alpha/beta analyses. Metals occur naturally in soil, and there were two metal detections (beryllium and silver) greater than background. All soil sampled as part of the VCA that was found to contain more than 100 mg/kg DRO was subsequently excavated and disposed of at an approved facility. The risk assessment process provides a quantitative evaluation of the potential adverse human health effects caused by constituents in the site's soil by calculating the hazard index (HI) and excess cancer risk for a recreational land use setting.

In summary, the HI for a recreational land use setting calculated for nonradiological COCs at SWMU 94H is 0.00, which is less than the numerical standard of 1.0 suggested by risk

assessment guidance (EPA 1989). Incremental HI risk, determined by subtracting risk associated with background from potential nonradiological COC risk, is 0.00. The excess cancer risk for SWMU 94H nonradiological COCs is 3E-11 for a recreational land use setting. Guidance from the NMED indicates that excess lifetime risk of developing cancer by an individual must be less than 1E-05 (Bearzi January 2001). Thus, the excess cancer risk for this site is below the suggested acceptable risk value. The incremental excess cancer risk is 1.00E-11.

The residential land use scenarios for this site are provided only for comparison in the Risk Screening Assessment (Annex 3-E). The report concludes that SWMU 94H does not have potential to affect human health under a recreational land use scenario.

3.6.2.2 *Ecological*

RFI gamma spectroscopy analyses and verification metals data were used to calculate the ecological risk. An ecological screening assessment that corresponds with the screening procedures in the EPA's Ecological Risk Assessment Guidance for Superfund (EPA 1997) was performed as set forth by the NMED Risk-Based Decision Tree (NMED March 1998). An early step in the evaluation compared COC concentrations and identified potentially bioaccumulative constituents (see Annex 3-E, Sections III, IV, VII.2, and VII.3). This methodology also required developing a site conceptual model and a food web model, as well as selecting ecological receptors. Each of these items was presented in the "Predictive Ecological Risk Assessment Methodology for SNL/NM ER Program, Sandia National Laboratories/New Mexico" (IT July 1998) and will not be duplicated here. The screening also included the estimation of exposure and ecological risk.

Tables 14 and 15 of Annex 3-E present the results of the ecological risk assessment screening. Site-specific information was incorporated into the screening assessment when such data were available. Hazard quotients (HQs) greater than 1 were originally predicted; however, closer examination of the exposure assumptions revealed an overestimation of risk primarily attributed to exposure concentration (use of maximum COC concentrations in estimating risk and wildlife toxicity benchmarks based upon the no-observed-adverse-effect-level values) and background risk. Based upon an evaluation of these uncertainties, ecological risks associated with this site are expected to be very low.

3.6.3 Baseline Risk Assessments

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

3.6.3.1 *Human Health*

Because results of the human health risk screening assessment summarized in Section 3.6.2.1 indicate that SWMU 94H does not have potential to affect human health under a recreational land use setting, a baseline human health risk assessment is not required for this site.

3.6.3.2 *Ecological*

Because ecological results of the screening assessment summarized in Section 3.6.2.2 indicate that SWMU 94H presents very low ecological risk, a baseline ecological risk assessment is not required for SWMU 94H.

3.6.4 Other Applicable Assessments

Surface-Water Assessment

A surface-water site assessment was conducted at SWMU 94H in October 2001 in accordance with guidelines developed jointly by Los Alamos National Laboratory and the NMED Surface-Water Quality Bureau. The assessment evaluated the potential for erosion to occur at SWMU 94H. The site received a score of 69.3. The limited COCs detected at the site (beryllium and silver) are buried within the former excavation (Table-3.5.1-1) and not readily subject to erosion. In addition, as discussed under the Results and Conclusions (Section 3.4.6.5) and Screening Assessments (Section 3.6.2) sections, detected COCs were at levels that pose no threat to human health or the environment, nor that could adversely affect surface-water quality.

3.7 No Further Action Proposal

3.7.1 Rationale

Based upon field investigation data and the human health risk assessment analysis, an NFA decision is recommended for SWMU 94H because no COCs were present in concentrations considered hazardous to human health for a recreational land use scenario.

3.7.2 Criterion

Based upon the evidence provided above, SWMU 94H is proposed for an NFA decision in conformance with Criterion 5 (NMED March 1998), which states, "The SWMU/AOC 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."

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ANNEX 3-A
Summary of Testing Activities at SWMU 94 Lurance Canyon Burn Site



3A.0 INTRODUCTION

The Lurance Canyon Burn Site (LCBS) was used for testing fire survivability of transportation containers, weapons components, simulated weapons, and satellite components. Testing programs at the LCBS can be grouped into the following six categories related to burn structures:

- Portable pan burn tests
- Small surface impoundment (Solid Waste Management Unit [SWMU] 94E)
- Large Open Burn Pool (LOBP)
- Small Open Burn Pool (SOBP)
- Light Airtransport Accident Resistant Container (LAARC) Unit (Discharge Pit, SWMU 94F)
- Bomb Burner Unit (Lines at Discharge Pit, SWMUs 94C and 94D)
- Small Wind-Shielded (SWISH) Unit
- Smoke Emissions Reduction Facility (SMERF)
- Bunker 9830 and Support Buildings
- Aboveground tanks (SWMU 94A)
- Debris/soil mounds (SWMU 94B)
- Scrap Yard (SWMU 94G).

Table 3A-1 summarizes the burn testing structures and associated features at SWMU 94. This annex describes the historical operations at each of these structures and locations are shown on Figures 3A-1 and 3A-2.

3A.1 PORTABLE PAN BURN TESTS

The test log for SWMU 94 records 65 burn tests involving seven testing programs that took place in portable pans (Table 3A-1) (SNL/NM November 1994), but additional tests may have taken place prior to the first 1979 entry. Portable pan burn tests were conducted from approximately 1975 to 1991 (Palmieri April 1995a). Burn tests requiring a similar testing environment are now conducted in the SOBP. Round portable pans, 6 to 10 feet in diameter and 2 to 3 feet deep (Figure 3A-3), were set up with or without temporary chimneys in at least five locations within SWMU 94 (Gill November 1982, Hickox and Abitz December 1994, Palmieri April 1995a). These sites are just north and just south of the Small Surface Impoundment (SWMU 93E), south of the SWISH Unit in the Bomb Burner Unit trench and at the current-day

Table 3A-1
 Summary of Burn Testing and Associated Operations at
 SWMU 94, Lurance Canyon Burn Site

Test Unit/Structure	Test Type/Operation	Test Date	Number of Recorded Tests (SNL/NM November 1994)	Test/Operational Release Location	Test Materials/Operational Release	Reference
Portable Pans	Open Burning	1975 to March 1991 1985 to 1987 (none conducted)	65 (minimum)	Primary Detonation Area (SWMU 65B) and Near Field Dispersion Area (SWMU 65D)	Detonations (HE, gun propellant, radionuclides)	SNL/NM November 1994 Moore September 1981 Larson and Palmieri October 1994 Caregeorges January 1994 Hickox and Abitz December 1994 Palmieri March 1995 Palmieri April 1995a
Small Surface Impoundment	Open Burning	pre-1979 to 1980	4	None (most evaporated) Small Surface Impoundment Subsurface infiltration	Wastewater (JP-4 fuel and water mixture) Wastewater (JP-4 fuel and water mixture)	SNL/NM November 1994
LOBP (30 x 60 feet)	Open Burning	1977 to present	53 (includes Railcar Burn Test)	1977 test (evaporated) 1977 to 1983 (inactive) 1983 to 1987 (SWMU 13) 1988 to present (COA POTW via trucking)	Wastewater (JP-4 fuel and water mixture, radionuclides)	Palmieri October 1994
SOBP (20 x 20 feet)	Open Burning	1992 to present	23	1992 to present (COA POTW via trucking, connected to the LOBP)	Wastewater (JP-4 fuel and water mixture)	SNL/NM November 1994 Palmieri October 1994
LAARC Unit	Enclosed Burning	June 1980 to August 1987	63	Unlined discharge pit	Wastewater (JP-4 fuel and water mixture)	SNL/NM November 1994
Bomb Burner Unit	Enclosed Burning	September 1982 to January 1988	23	Within Bomb Burner Unit Unlined discharge pit	Detonations (HE radionuclides, metals) Wastewater (JP-4 fuel and water mixture)	SNL/NM November 1994
			1 TABS Test	Bomb Burner Unit trench	Detonation (HE, radionuclides, metals)	

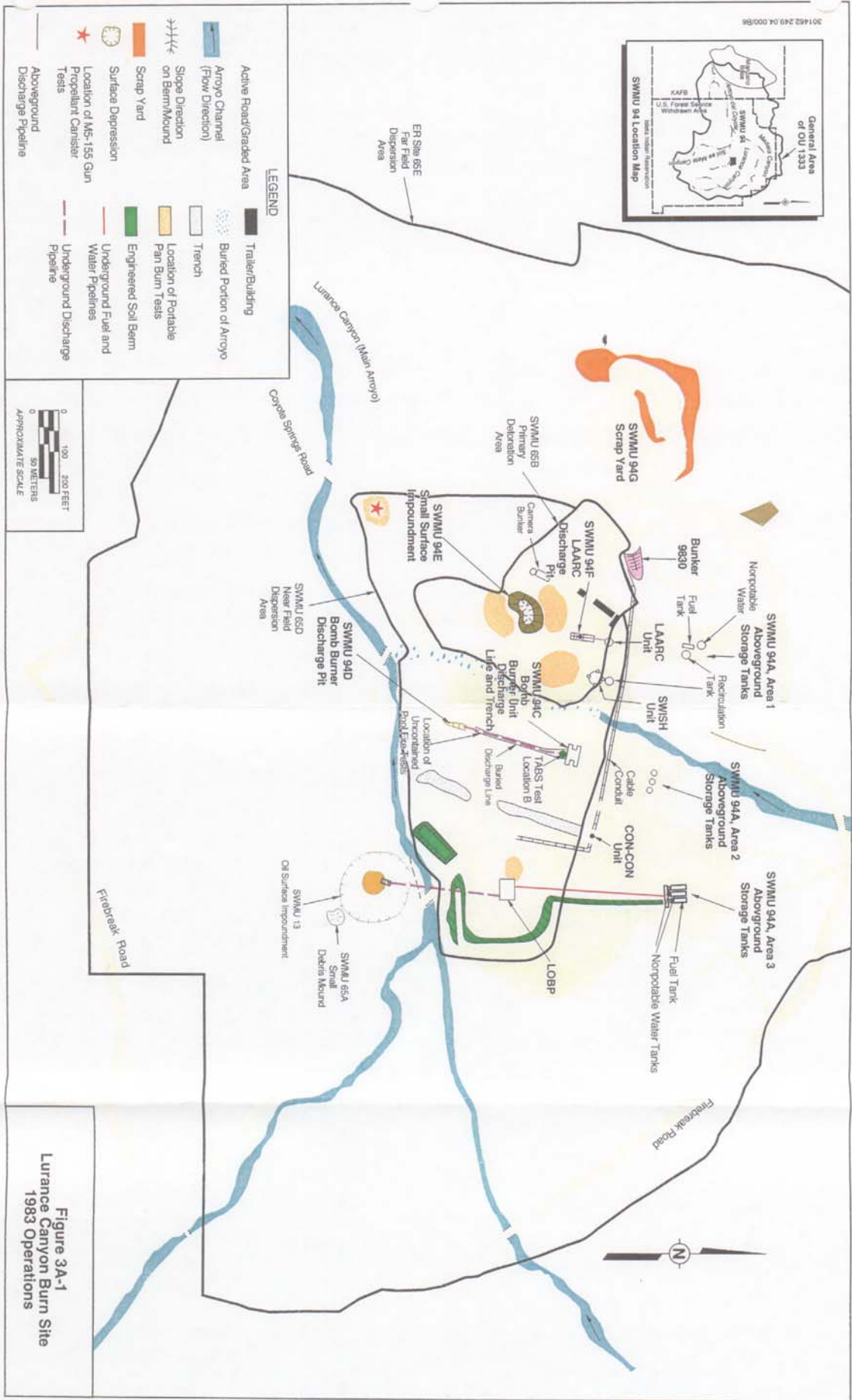
Refer to footnotes at end of table.

Table 3A-1 (Concluded)
 Summary of Burn Testing and Associated Operations at
 SWMU 94, Lurance Canyon Burn Site

Test Unit/Structure	Test Type/Operation	Test Date	Number of Recorded Tests (SNL/NIM November 1994)	Test/Operational Release Location	Test Materials/Operational Release	Reference
SWISH Unit	Enclosed Burning	January 1983 to April 1990	61	None (never disposed of wastewater)	None (wastewater recirculated, never disposed)	SNL/NIM November 1994 Author [unk] Date [unk] Palmeri October 1994 Palmeri December 1994a
SMERF	Enclosed Burning	August 1992 to present	27	1992 to present (COA POTW via trucking)	None (wastewater recirculated)	
Bunker 9830	Enclosed Burning	1967 to present (Control Bunker/Storage) 1975 to 1988 (Burn Testing)	Cable testing 10 (fire suppressant)	None (contained within the bunker)	None	Larson and Palmeri August 1994 Palmeri November 1994a
Aboveground Tanks	Supply Water, JP-4 Fuel, and Coolant for Burn Testing	1980 to present	NA	Subsurface infiltration	Accidental spills of JP-4 fuel on soil	Hickox November 1994 Larson and Palmeri October 1994
Debris/Soil Mounds	Grading	pre-1992 to present	NA	Subsurface infiltration or surface runoff	Metals or radionuclides leachate	Palmeri April 1995a
Scrap Yard	Storage of surplus test materials	1980 to present	NA	Subsurface infiltration	Accidental spills of hydraulic oils on soil	Hickox November 1994 Larson and Palmeri October 1994 Palmeri November 1994b

COA = City of Albuquerque.
 HE = High explosive(s).
 JP-4 = Jet fuel composition 4.
 LAARC = Light Airtransport Accident Resistant Container.
 LOBP = Large Open Burn Pool.
 NA = Not applicable.
 POTW = Publicly Owned Treatment Works.
 SMERF = Smoke Emission Reduction Facility.
 SNL/NIM = Sandia National Laboratories/New Mexico.
 SOBP = Small Open Burn Pool.
 SWISH = Small Wind-Shielded (Unit).
 SWMU = Solid Waste Management Unit.
 TABS = Torch Activated Burn System.

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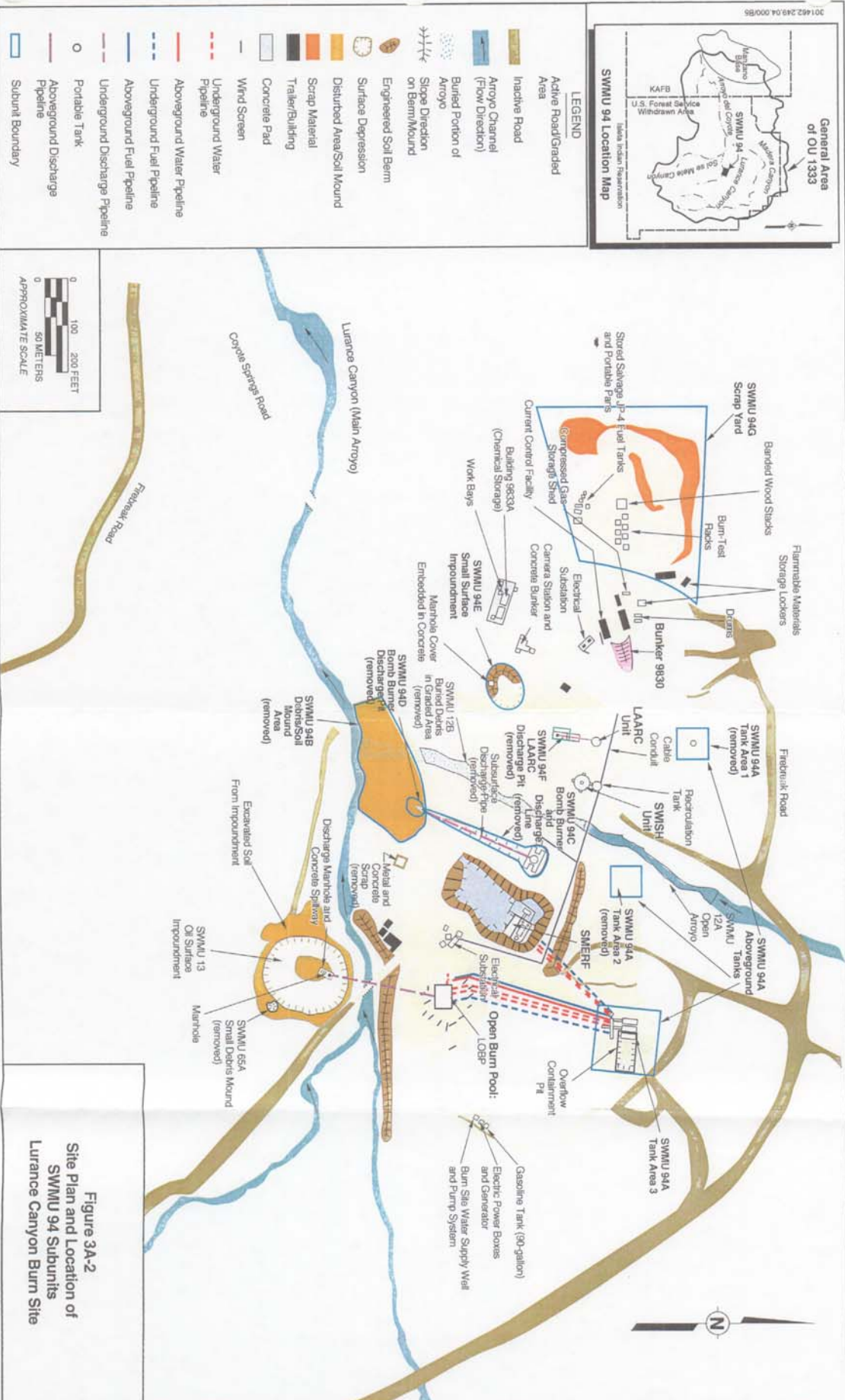


LEGEND

- Active Road/Graded Area
- Arroyo Channel (Flow Direction)
- Slope Direction on Berm/Mound
- Scrap Yard
- Surface Depression
- Location of M5-155 Gun Propellant Canister Tests
- Aboveground Discharge Pipeline
- Trailer/Building
- Buried Portion of Arroyo
- Trench
- Location of Portable Pan Burn Tests
- Engineered Soil Berm
- Underground Fuel and Water Pipelines
- Underground Discharge Pipeline



Figure 3A-1
Lurance Canyon Burn Site
1983 Operations





Photograph of portable pans in the southern portion of the scrap yard in April 1995. The pans held JP-4 fuel and water used in small-scale burn tests at SWMU 94.

Figure 3A-3
Photograph of Portable Pan

location of the SOBPs (Palmieri April 1995a). Following a test, water remaining in the portable pans was typically left to evaporate (Jercinovic et al. November 1994). However, some wastewater from the portable pans may have been discharged into the Small Surface Impoundment fuel fire at a minimum temperature of 1,850 degrees Fahrenheit (°F) (Caregeorges January 1994). After completing the test, the test unit was swipec tested to determine whether uranium dioxide was released (Larson and Palmieri October 1994). No radioactivity was found on the swipec samples.

Uncontained Pool-Fire Tests

In September 1981, five tests of uncontained pool fires were conducted in the area of the Bomb Burner Unit trench (SWMU 94C) to investigate the size of a fire produced from fuel leaking from an aircraft wing. Jet fuel composition 4 (JP-4) fuel was pumped from a 55-gallon tank onto a steel plate that rested on a pan, which was then covered with a concrete pad. A portable chimney was placed over the pan. The JP-4 fuel was pumped onto the steel plate at varying rates to control the size of the burn pool. No other materials were burned (Moore September 1981, Hickox and Abitz December 1994). These tests occurred prior to the first portable pan entry in the log book.

Gun-Propellant Canister Tests

In October 1982, five burn tests involving exposure of M5-155 gun-propellant canisters to JP-4 fuel fires were performed at SWMU 94 (Gill November 1982, Palmieri March 1995, SNL/NM November 1994) in a portable pan located near the entrance to the site (Figure 3A-1). Gun and rocket propellants are composed primarily of nitrocellulose, but they differ in that gun propellant does not contain aluminum or potassium perchlorate (Hickox and Abitz December 1994). The purpose of the 11-minute burn tests was to observe and record the behavior of gun-propellant canisters in a fully engulfing fire representative of an accidental fire situation. A portable pan (6 feet in diameter and 2 feet deep) with an air curtain system was used for the tests. The air curtain, produced by a fan rated at 14,000 cubic feet per minute to blow air through an annular area around the lip of the burn pan, protected the fire from wind effects. In three of the tests, the M5-155 gun-propellant canister was breached in approximately 100 seconds, as evidenced by a brilliant flash associated with the ignition of the gun propellant. An accelerated burning of the fire ensued for about 15 to 20 seconds, presumably corresponding to the consumption of the gun propellant. In two of the tests, the accelerated burning stage was followed by an igniter explosion, which is not considered a large explosion (Hickox and Abitz December 1994). The igniter consisted of a mild detonating fuse surrounded by barium nitrate. No detailed information is available for two of the five tests.

Slow-Heat Tests

The vented slow-heat tests conducted in 1983 (Mata December 1983) were designed to investigate whether the combustion products of burning PBX-9502 (TATB-95 percent, Kel-F 800-5 percent) (Dobratz and Crawford January 1995) explosive would vent from the test unit without reaching critical internal pressure that would cause an explosion. A corrugated culvert chimney was placed over a portable burn pan in the Bomb Burner Unit trench, and a hole was cut in the side for a large water-cooled lever arm. The lever arm portion inside the corrugated culvert chimney extended over the portable pan. A mock weapon containing high

explosives (HE) was placed on the end of the lever arm that extended over the burn pool, and the other end of the lever arm was attached to a piston-like instrument that determined the change in mass of the HE inside the weapon as a function of burn time (Hickox and Abitz December 1994). Two burn tests were conducted to demonstrate the successful operation of the water-cooling system. On October 4, 1983, a third test with a vented stainless steel casing containing insensitive (i.e., nonshockwave initiated) HE was conducted in a JP-4 fuel fire at a nominal temperature of 2,000°F for approximately 60 minutes (Mata December 1983, Hickox and Abitz December 1994). The HE inside the weapon was completely burned without an explosion.

Nitromethane Calibration Tests

Thirty-eight nitromethane calibration tests were conducted at SWMU 94 between September and October 1984 (SNL/NM November 1994). The tests involved filling test units with nitromethane and exposing them to a JP-4 fuel fire. The purpose of these tests was to calibrate detonation velocity using liquid nitromethane and Composition-1 (C-1) and Composition-7 explosives (Palmieri March 1995). The tests were conducted in the Bomb Burner Unit trench. A trial test was conducted in August 1984 using gasoline rather than nitromethane. Neither the trial test using gasoline nor the first two nitromethane tests completely detonated the C-1 explosives. The remaining 36 tests were high-order detonations (see SNL/NM November 1994 for additional information on these tests).

3A.2 SMALL SURFACE IMPOUNDMENT

SWMU 94E, Small Surface Impoundment is approximately 60 feet long, 25 feet wide, and less than 2 feet deep (Figure 3A-1) (Palmieri December 1994b, SNL/NM August 1994). The inactive impoundment is surrounded by low soil berms on the south and west sides (Larson and Palmieri October 1994) (Figures 3A-4a and 3A-4b). A crude concrete trough approximately 3 feet long is located at the northeastern edge of the impoundment, and a manhole is on the southern edge of the impoundment (Hickox November 1994, Palmieri December 1994b) (Figure 3A-4a). The exact use of the manhole is not known (Hickox November 1994, Palmieri December 1994b). It is believed that the small surface impoundment was used once to burn JP-4 fuel as a test demonstration (Jercinovic et al. November 1994). The first three log book entries (from October 1979 through February 1980) reference the "old facility" and the "culvert facility," which refer to portable chimney setups in the small surface impoundment (Palmieri April 1995a, SNL/NM November 1994). These tests consisted only of JP-4 fuel fires and investigated the effectiveness of controlling the flames with portable chimneys. The impoundment currently receives storm runoff from the northwestern portion of the site and may have received liquids from the portable pans (Jercinovic et al. November 1994).

3A.3 THE LARGE OPEN BURN POOL

The LOBP is an active burn unit located approximately 200 feet southeast of the SMERF (SNL/NM August 1994) (Figure 3A-2). The pool is formed by a rectangular concrete basin 30 by 60 feet and 3 feet deep (Figure 3A-5a) and is concrete/fiber-ceramic-lined (Palmieri October 1994, Larson and Palmieri October 1994). Fire tests at the LOBP were primarily performed on a variety of shipping containers, most of which burned in the LOBP and contained

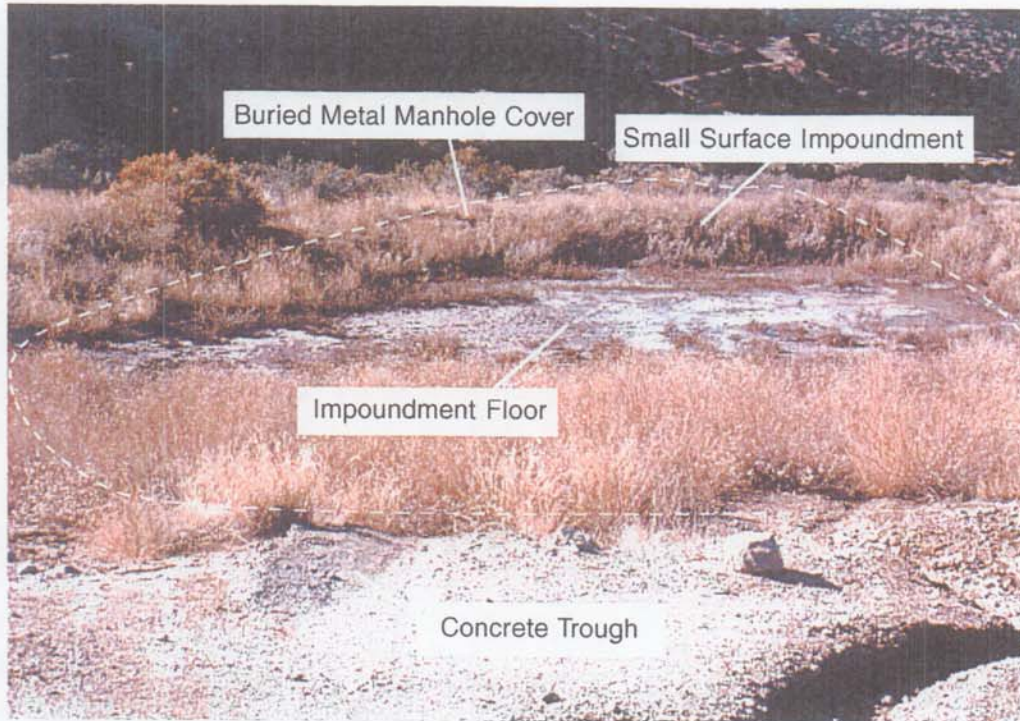


Figure 3A-4a Photograph of the small surface impoundment (SWMU 94E) in December 1994. The impoundment is located east of the camera bunker. View is to the southwest.

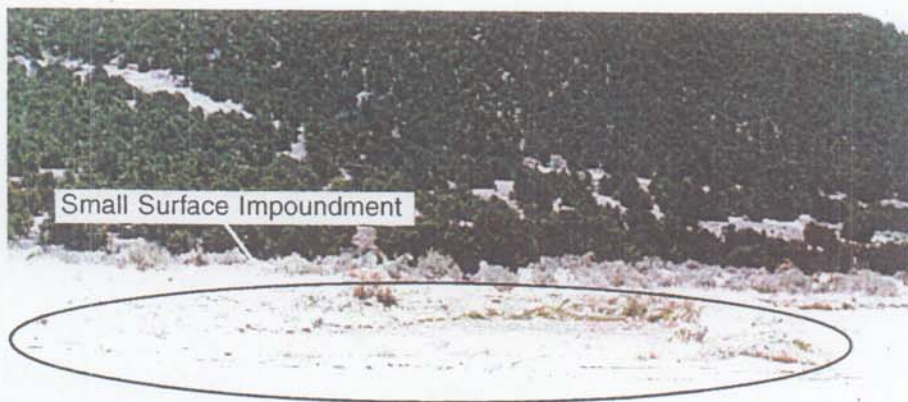


Figure 3A-4b Photograph of the small surface impoundment (SWMU 94E) in April 1995. Photograph was taken from the direction of surface runoff. View is to the southwest.

Figure 3A-4
Photographs of SWMU 94E, Small Surface Impoundment

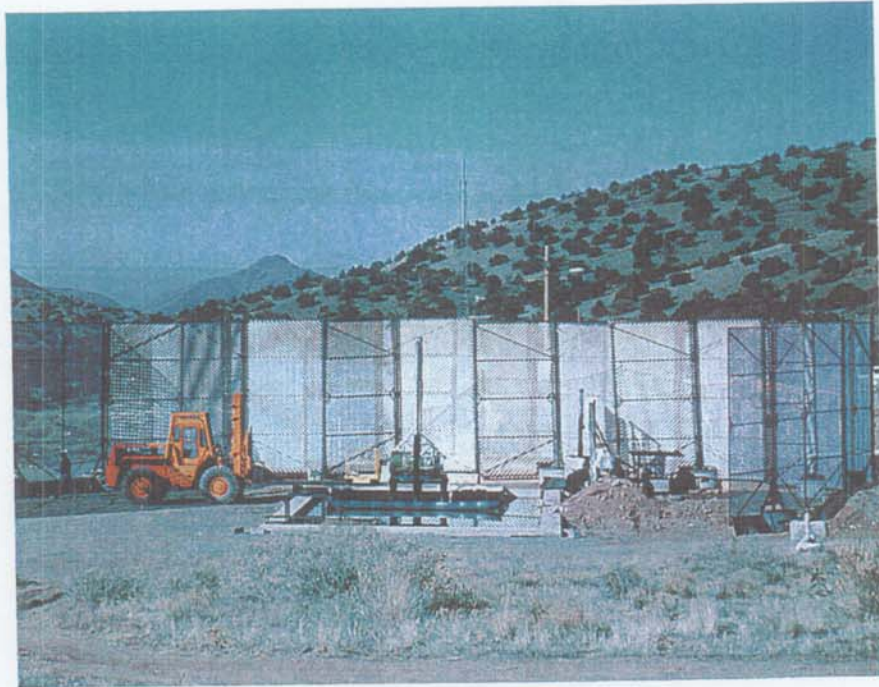


Figure 3A-5a Photograph of the LOBP under construction at SWMU 94 in 1977. View is to the northwest.

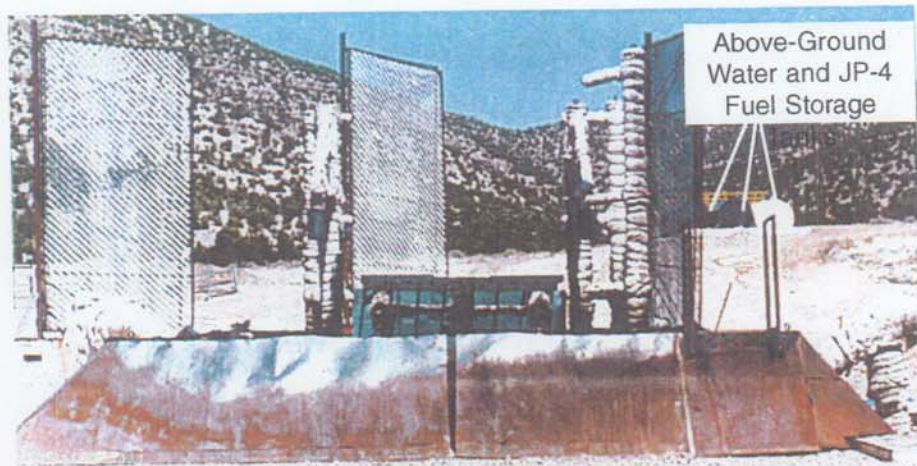


Figure 3A-5b Photograph of the SOBPs at SWMU 94 in April 1995. View is to the north.

Figure 3A-5
Photographs of Large Open Burn Pool and Small Open Burn Pool

Environmental Response, Compensation, and Liability Act (CERCLA). This investigation included collecting nonsampling data and inspecting the site (Investigation #1). In 1993, preliminary investigations began that included unexploded ordnance (UXO)/HE, radiological, cultural resources, and sensitive-species surveys, as well as scoping sampling (Investigation #2). In August 2000, evidence for the fuel leak at SWMU 94H was first detected. Soil samples were collected as part of a preliminary assessment (Investigation #3). This investigation confirmed the presence of fuel-related contamination in subsurface soil near the SOBP. An RFI that included geoprobe work, waste characterization, and an investigation of the nature and extent of contamination was conducted in July 2001 (Investigation #4). This investigation delineated the extent of contamination and characterized the soil for disposal. A VCA (Investigation #5) was conducted in July and August 2001, which included excavation and disposal of approximately 880 cubic yards of fuel-contaminated soil, confirmation and verification sampling, and site restoration.

3.4.2 Investigation #1–CEARP

3.4.2.1 *Nonsampling Data Collection*

SWMU 94 was evaluated during investigations conducted under the CEARP (DOE September 1987, SNL/NM May 1986) and the RCRA Facility Assessment (RFA) (EPA April 1987). The CEARP Phase I report noted that SWMU 94 was constructed in the late 1970s and was used to study the effects of fire on a variety of test units (e.g., weapons components, transportation containers). JP-4 and JP-8 are the current standard burned fuels, but some other materials used included propellants and nitromethane. Testing activities may have released metallic particulates and other materials into the environment. The RFA report (EPA April 1987) did not present any information on SWMU 94H.

3.4.2.2 *Sampling Data Collection*

No sampling activities were conducted at SWMU 94H as part of the CEARP or RFA.

3.4.2.3 *Results and Conclusions*

The CERCLA finding was uncertain for RCRA-regulated hazardous waste.

3.4.2.4 *Data Gaps*

Sufficient information was not available to calculate Hazard Ranking System (HRS) and Modified HRS migration mode scores.

3.4.3 Investigation #2—SNL/NM ER Preliminary Investigations

3.4.3.1 SNL/NM ER Nonsampling Data Collection

This section describes the nonsampling data collected at SWMU 94. Details of the nonsampling surveys are summarized in the RFI Work Plan (SNL/NM September 1995).

3.4.3.1.1 Background Review

A background review was conducted in order to collect available and relevant information regarding SWMU 94. Background information sources included interviews with SNL/NM staff and contractors familiar with the site's operational history and reviews of existing historical site records and reports. The study was completely documented and provided traceable references that sustain the integrity of this NFA proposal. Table 3.4.3-1 lists the information sources used to assist in evaluating SWMU 94 that are also relevant to SWMU 94H.

3.4.3.1.2 UXO/HE Survey

In October 1993, KAFB Explosive Ordnance Disposal personnel conducted a visual survey for the presence of UXO/HE on the ground surface at SWMU 94 in conjunction with SWMUs 65, 12, and 13. The survey identified one trip flare as live ordnance, and one slap flare and one rifle-propelled illuminator round as ordnance debris. The survey report also documented that metal fragments were found in the hills surrounding these sites (Young September 1994).

3.4.3.1.3 Radiological Survey(s)

SWMU 94 is not, and has never been, classified as a Radioactive Materials Management Area (RMMA).

On April 30 and May 4, 1993, SNL/NM Radiation Protection Office personnel conducted contamination surveys of several sections of road in the Coyote Canyon area. Adhesive swipes that had been placed on the underside of the vehicle collected samples of dust from the air behind the vehicle as it was moving. Analysis yielded no evidence of contamination, nor was airborne radioactivity detected in the dust kicked up by the vehicle (Oldewage May 1993).

During November and December 1993 and January 1994, RUST Geotech Inc. conducted a surface gamma radiation survey of SWMU 94 in conjunction with SWMUs 65, 12, and 13 (RUST Geotech Inc. December 1994). The gamma scan survey was performed at 6-foot centers (100 percent coverage) over the surface of the graded portion of the site (SWMU 65D), which included the area of SWMU 94H. No gamma radiation anomalies were detected within the present boundaries of SWMU 94H (SNL/NM September 1997b).

Table 3.4.3-1
Summary of Background Information Review for SWMU 94

Information Source	Reference	
Technical test reports and project log books	Hill [Date unk.] Kervin April 1981 Moore September 1981 Moore June 1982 Gill November 1982 Moore and Luna February 1983 Luna March 1983	Hooper May 1983 Luna and Moore June 1983 Mata December 1983 Cocke May 1984 Stevenson December 1985 SNL/NM November 1994
Engineering drawings "Burn Site" (Drawing Number T95597)	SNL/NM 1983	
Site inspections (field notes, aerial photograph review, site photographs, radiological, UXO/HE, biological, and cultural resource surveys)	Gaither [Date unk.] Luna October 1985 Gaither October 1992 Oldewage May 1993 Karas June 1983	Oldewage December 1993a Oldewage December 1993b Oldewage February 1994 SNL/NM August 1994 Young September 1994
Employee interviews, 24 interviews with 11 facility personnel (current and retired)	Martz September 1985 Martz November 1985 Brouillard June 1994 Larson and Palmieri August 1994 Palmieri September 1994a Palmieri September 1994b Palmieri and Larson October 1994 Jercinovic et al. November 1994 Palmieri November 1994a Palmieri November 1994b	Hickox and Abitz December 1994 Palmieri December 1994a Palmieri December 1994b Palmieri December 1994c Palmieri January 1995 Palmieri March 1995 Jercinovic April 1995 Palmieri April 1995a Palmieri April 1995b Palmieri August 1995

HE = High explosive(s).
 SNL/NM = Sandia National Laboratories/New Mexico.
 SWMU = Solid Waste Management Unit.
 unk. = Unknown.
 UXO = Unexploded ordnance.

3.4.3.1.4 Cultural Resources Survey

A cultural resources survey of SWMU 94 was conducted as part of the LCBS assessment. Seven cultural resource sites were identified within the boundary of SWMU 65 at the LCBS (Hoagland and Dello-Russo February 1995). However, none of the cultural resource sites are within 100 feet of the SWMU 94H boundaries, and SWMU 94H sampling and remedial activities have not affected the cultural resources.

3.4.3.1.5 Sensitive-Species Survey

A sensitive-species survey was conducted as part of a biological assessment of the LCBS (Biggs May 1991). No sensitive species were found during this survey (IT February 1995). The site is active and no undisturbed habitat remains in the graded portion of the LCBS.

3.4.3.2 *Sampling Data Collection*

In July 1995, SWMU 94 was investigated as part of a site-wide scoping sampling program. This effort obtained preliminary analytical data to support the ER Project site ranking and prioritization. No sampling activities were conducted at SWMU 94H as part of this sampling program.

3.4.3.3 *Data Gaps*

Information gathered from process knowledge, reviewing historical site files, and personal interviews aided in identifying the most likely COCs at SWMU 94 and in selecting the types of analyses to be performed on soil samples. However, the preliminary scoping sampling data are not adequate to support a risk screening assessment.

3.4.4 Investigation #3—SNL/NM ER Preliminary Assessment

3.4.4.1 *Nonsampling Data Collection*

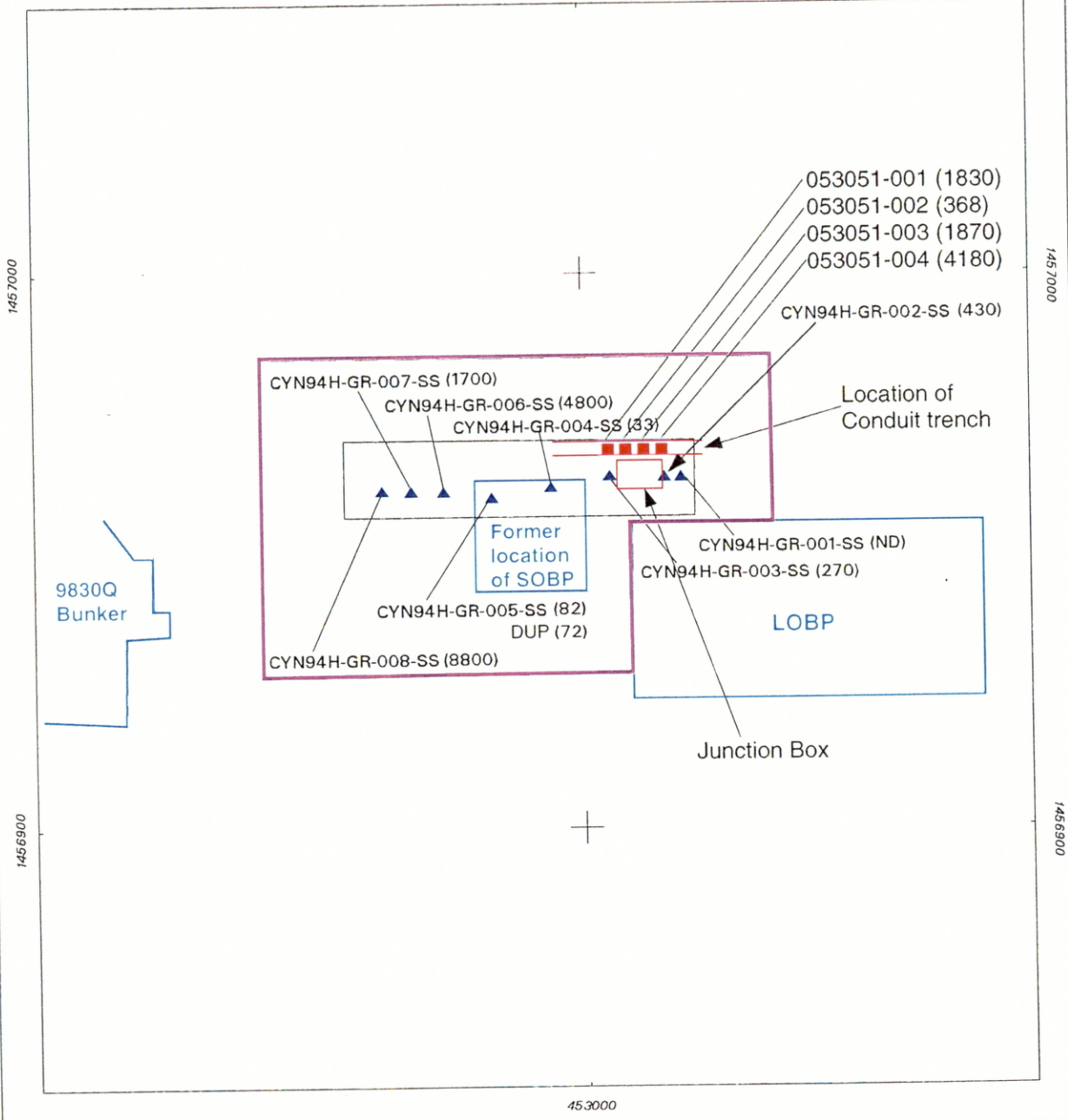
No additional nonsampling data were collected as part of Investigation #3.

3.4.4.2 *Sampling Data Collection*

On the afternoon of August 3, 2000, a shallow trench was re-excavated by Burn Site personnel on the north side of the former 20- by 20-foot aboveground SOBP. The SOBP was used to contain JP-8 fuel for burn tests and was active until it was removed in October 2000, and subsequently decommissioned in November 2000. It was located approximately 8 feet west of the LOBP. The purpose of the excavation was to install additional conduit piping from the fuel tank to the SOBP. During the excavation, the Burn Site workers smelled fuel. No free product or staining of the soil were observed at the site to indicate a release had occurred, but because the workers smelled fuel, presumably from a 3-inch-diameter JP-4 or JP-8 line, the ER Project and the SNL/NM Oil Spill Prevention Control and Countermeasures Project were contacted to evaluate the situation.

On August 7, 2000, four soil samples were collected from the bottom of the open trench for a preliminary assessment of the extent of contamination. Soil sampling locations are shown in Figure 3.4.4-1. The samples were sent to General Engineering Laboratories, Inc., in Charleston, South Carolina, for TPH analysis (EPA Method 418.1). Analysis of the soil samples collected from the open trench indicated that a release of JP-8 fuel had occurred. Under the requirements of the HSWA Module of the RCRA Permit, NMED was notified of the newly discovered release (DOE September 2000). It was determined that the site would be investigated as part of the SWMU 94 investigation under OU 1333.

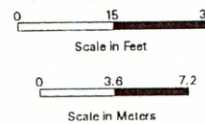
Future burn testing scheduled for the LOBP necessitated the removal of the SOBP. In October 2000, workers from the Burn Site removed the SOBP and associated piping. A small area of soil under the pool was removed and the fuel-contaminated soil was placed on plastic to the southwest of the site. On November 17, 2000, SNL/ER personnel collected eight soil samples from the bottom of the excavation as part of the continuing assessment. The soil sampling locations are shown in Figure 3.4.4-1. The samples were sent to Hall Environmental



Legend

- Preliminary Assessment Trench Sample (1870 = concentration of TPH mg/kg)
- ▲ Excavation Sample (270 = concentration of DRO mg/kg)
- Structure
- Outline of Former Excavation
- Approximate SWMU 94H Boundary
- SOBP Small Open Burn Pool
- LOBP Large Open Burn Pool (ND TPH mg/kg Dup DRO)

**Figure 3.4.4-1
SWMU 94H
Former Excavation and
Sampling Locations**



Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Analytical Laboratory (HEAL) in Albuquerque, New Mexico, to be analyzed for DRO by EPA Method 8015 (modified). The bottom of the excavation was lined with plastic and backfilled with clean soil until further investigations could be completed.

On December 11, 2000, SNL/ER personnel collected eight soil samples from the contaminated soil stockpile for waste characterization and disposal. Five of the eight samples were sent to HEAL to be analyzed for TPH by EPA Method 418.1 (Table 3.4.4-1). The remaining three samples were sent to Severn Trent Laboratory (STL) in St. Louis, Missouri, for Toxicity Characteristic Leaching Procedure (TCLP) analyses of VOCs, semi-volatile organic compounds (SVOCs), and metals (Tables 3.4.4-2, 3.4.4-3, and 3.4.4-4).

3.4.4.3 *Preliminary Assessment Sampling Results and Conclusions*

Soil Sampling

The results of the preliminary assessment and soil sampling indicated that fuel-related compounds were present in the subsurface soils underlying the JP-8 Site. The analytical results are described below. For tables in this and subsequent sections, only detected compounds are listed for VOCs and SVOCs.

TPH and DRO Results

The off-site TPH and DRO analytical results are presented in Table 3.4.4-1. TPH was detected in all four samples collected from the trench at concentrations ranging from 368 mg/kilogram (kg) to 4,180 mg/kg. The maximum DRO concentration for the nine excavation samples was 8,800 mg/kg. TPH was detected in all five soil pile grab samples at concentrations ranging from 160 mg/kg to 890 mg/kg. Samples were selected from the excavation based upon either visual signs of contamination or odors. Therefore, these samples tended to have higher DRO concentrations than the samples randomly selected from the soil pile.

TCLP Analyses

Three samples were collected from the soil pile for waste characterization and sent to an off-site laboratory for TCLP VOC, SVOC, and metals analyses. TCLP metals results are presented in Table 3.4.4-2. Arsenic, barium, cadmium, chromium, lead, and mercury were detected in the leachate extract at concentrations less than the maximum concentration of contaminants for the toxicity characteristic. There were no positive detections of VOCs or SVOCs in the TCLP extract (Tables 3.4.4-3 and 3.4.4-4). The TCLP analyses confirmed that the soil did not exhibit RCRA hazardous characteristics and could be disposed of as a special waste (petroleum-contaminated soil) under the New Mexico solid waste regulations.

Table 3.4.4-1
 Summary of SWMU 94H Preliminary Assessment Soil Samples
 TPH and DRO Analytical Results
 August and November 2000
 (Off-Site Laboratory)

Sample Attributes				TPH (EPA Method 418.1 ^a) (mg/kg)	DRO (EPA Method 8015— modified ^a) (mg/kg)
Record Number ^b	ER Sample ID	Date Collected	Location Description		
6036 43	53051-001	08-07-00	In trench, 4 feet west of fuel lines	1,830	NA
603643	53051-002	08-07-00	In trench, below western-most fuel line	368	NA
603643	53051-003	08-07-00	In trench, below eastern-most fuel line	1,870	NA
603643	53051-004	08-07-00	In trench, 4 feet east of fuel lines	4,180	NA
603886	CYN94H-GR-001-SS	11-17-00	Bottom of excavation, approx. 3 feet east of the Junction Box	NA	ND (5.0)
603886	CYN94H-GR-002-SS	11-17-00	Bottom of excavation, approx. 1 foot east of the Junction Box	NA	430
603886	CYN94H-GR-003-SS	11-17-00	Bottom of excavation, approx. 1 foot west of the Junction Box	NA	270
603886	CYN94H-GR-004-SS	11-17-00	Bottom of excavation, approx. 12 feet west of the Junction Box	NA	33
603886	CYN94H-GR-005-SS	11-17-00	Bottom of excavation, approx. 23 feet west of the Junction Box	NA	82
603886	CYN94H-GR-005-DU	11-17-00	Duplicate sample of CYN94H-GR- 005-SS	NA	72
603886	CYN94H-GR-006-SS	11-17-00	Bottom of excavation, approx. 32 feet west of the Junction Box	NA	4,800
603886	CYN94H-GR-007-SS	11-17-00	Bottom of excavation, approx. 38 feet west of the Junction Box	NA	1,700
603886	CYN94H-GR-008-SS	11-17-00	Bottom of excavation, approx. 43 feet west of the Junction Box	NA	8,800
603918	CYN94H-GR-001-SP	12-11-00	Soil Pile	700	NA
603918	CYN94H-GR-002-SP	12-11-00	Soil Pile	570	NA
603918	CYN94H-GR-003-SP	12-11-00	Soil Pile	160	NA
603918	CYN94H-GR-004-SP	12-11-00	Soil Pile	890	NA
603918	CYN94H-GR-005-SP	12-11-00	Soil Pile	350	NA

Note: Values in **bold** represent detected analytes.

^aEPA November 1986.

^bAnalysis request/chain-of-custody record.

CYN = Canyon.

DRO = Diesel range organics.

DU = Duplicate soil sample.

ER = Environmental Restoration.

EPA = Environmental Protection Agency.

GR = Grab sample.

ID = Identification.

mg/kg = Milligram(s) per kilogram.

NA = Not analyzed.

ND () = Not detected above the method
detection limit, shown in
parentheses.

SP = Soil pile.

SS = Surface soil sample.

SWMU = Solid Waste Management Unit.

TPH = Total petroleum hydrocarbons.

The Bomb Burner Unit was constructed below ground level to contain potential explosions that might have occurred during burn tests. A shallow, open trench extending southward from the Bomb Burner Unit was constructed to provide vehicle and equipment access to the unit (Figure 3A-8a). Engineering drawings and maps suggest that fuel and water were supplied to the burn unit from three aboveground tanks formerly located approximately 200 feet north of the unit (Figure 3A-1) (SNL/NM 1983). These aboveground tanks have since been removed from the site. The burn pan used in the Bomb Burner Unit is 10 feet in diameter (Hooper May 1983, Mata December 1983). A 12-inch-diameter corrugated pipe connects the burn pan to the Bomb Burner Discharge Pit (SWMU 94D) located approximately 250 feet south of the Bomb Burner Unit (Figure 3A-1) (Palmieri October 1994, Jercinovic et al. November 1994). The discharge pit is approximately 25 feet long, 10 feet wide and 8 feet deep (Figure 3A-8b) (Palmieri December 1994d). Following tests that involved radionuclides, wastewater from the Bomb Burner Unit was screened for radiological activity before being released into the discharge pit (Palmieri October 1994). As many as 1,500 gallons of wastewater per test may have been discharged into the pit.

Test reports document a number of the tests at the Bomb Burner Unit (Hooper May 1983, Stevenson December 1985, Hill Date [unk], Mata December 1983) and describe the test set up and materials involved. The Bomb Burner Area and Discharge Line are designated as SWMU 94C. The remainder of this section describes two reported tests that are representative of the testing conducted in the Bomb Burner Unit.

In September 1982, a burn test was conducted on a W-69 warhead used in the SRAM missile (Hooper May 1983). Aluminum, steel, HE, and insulation materials were exposed to a JP-4 fuel fire in order to determine the response of the W-69 to an accidental fuel fire. The fuel fire was performed at a temperature of approximately 1,800°F for a total burn time of 95 minutes. The warhead remained in place on the test stand and, as expected, all aluminum and organic components melted (Hooper May 1983). The PBX-9404 HE did not detonate and was consumed in a nonviolent manner, and no warhead materials were expelled from the unit.

On March 9, 1983, a W-80 warhead was subjected to a high-intensity JP-4 fuel fire at a nominal temperature of 2,000°F for approximately 30 minutes (Hill Date [unk], Luna March 1983, SNL/NM November 1994). The purpose of the test was to determine the behavior of internal HE components and the inherent safety of the weapon when exposed to an accidental fuel fire. The test unit configuration consisted of the warhead external aluminum case, binary parts, live insensitive HE material, and a mass simulated canned subassembly placed 3.5 feet above the surface of the fuel. Test unit thermocouples were wrapped with cera-blanket insulation, shielded in a steel pipe, and then wrapped with additional insulation. The HE burned successfully without any explosive incident. Real-time radiography and video coverage of the warhead burn test was observed at Bunker 9830 (Hill Date [unk]).

Several burn tests have been conducted in the Bomb Burner Unit trench since 1982, including portable pan burn tests such as the vented slow-heat tests and uncontained pool fires. Fuel-fire burn testing conducted in the trench includes the Torch Activated Burn System (TABS) test Location B (Figure 3A-1) and one series of rocket propellant tests. The TABS test Location B resulted in detonation within the trench.



Photograph of the SWISH Unit at SWMU 94 in December 1994.
View is to the north.

Figure 3A-9
Photograph of SWISH Unit

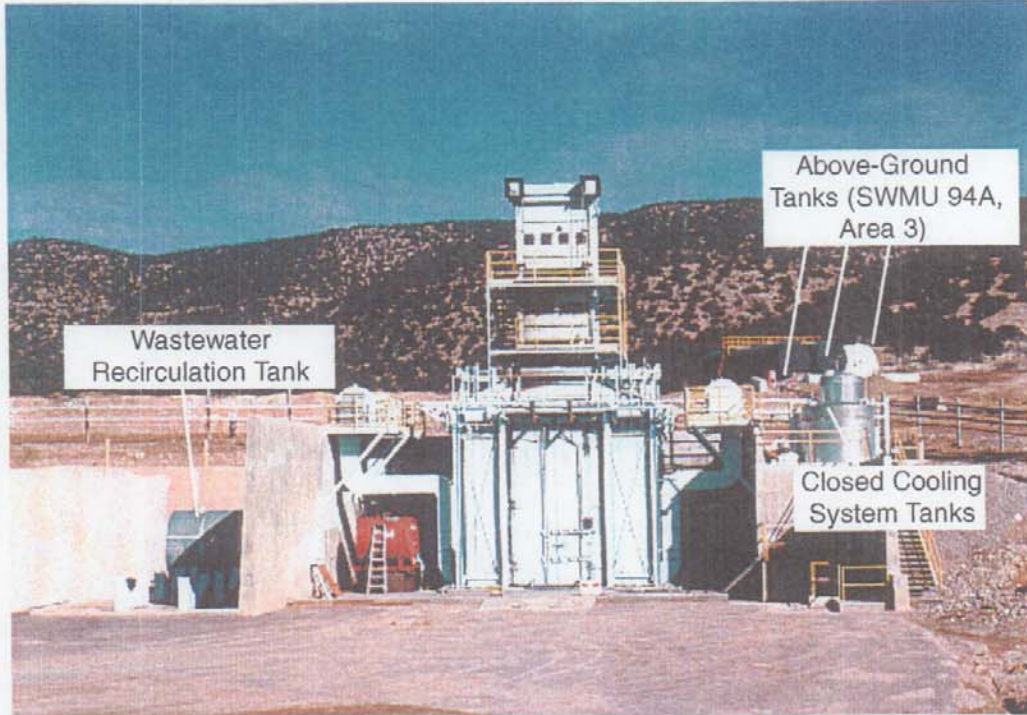


Figure 3A-10a Photograph of the SMERF at SWMU 94 in December 1994. View is to the north.



Figure 3A-10b Photograph of the SMERF conducting performance tests at SWMU 94 in December 1994. View is to the northeast.

**Figure 3A-10
Photographs of SMERF**

The SMERF is accessed by a shallow, open trench that rises southward to the entry road (SNL/NM August 1994). The unit consists of a cubical test chamber approximately 20 by 20 feet. The chamber contains a 10- by 10-foot-square burn pan (Author [unk] Date [unk]c) that can be reduced to an 8- or 7-foot-square configuration (SNL/NM November 1994).

A 20-foot-tall stack houses a passive afterburner to reduce smoke emissions (Author [unk] Date [unk]c, Kent July 1994). Underground pipelines connect the unit to two of the three aboveground tanks located north of the LOBP (SWMU 94A, Area 3). Two of the lines recirculate a glycol/water cooling mixture between the vertical walls, roof panels, and the storage tank. A third line supplies fuel from the JP-4 fuel tank. The underground pipes join the SMERF at a valve box on the northern side of the unit. The valves are marked "fuel," "water," and "water return." Three additional aboveground tanks are located inside a concrete berm enclosure on the eastern side of the SMERF. These tanks are connected to the incoming pipelines by 8- and 3-inch lines. The tanks are part of the water recirculation system. Two of these aboveground tanks are labeled "nonpotable water," and the third is labeled "water/glycol." These tanks are part of a closed recirculation system. Propylene glycol is used for active cooling of the walls and roof panels in the SMERF (Larson and Palmieri October 1994).

3A.9 BUNKER 9830 AND SUPPORT BUILDINGS

Bunker 9830, located approximately 200 feet northwest of the LAARC Unit (Figure 3A-1), was constructed in 1967 to house instrumentation for SWMU 65 activities. The eastern half of Bunker 9830 was used from 1975 through 1980 for fire tests on nuclear reactor control cables (Larson and Palmieri August 1994, Palmieri November 1994a). These tests were conducted as part of the reactor safety program in response to the Browns Ferry Reactor fire. In the initial test, a mockup of a nuclear reactor cable assembly was constructed in Bunker 9830 and was ignited to simulate the incident (Brouillard June 1994). The tests used heptane as a fuel source. The number of tests conducted is unknown. Fire suppression tests were conducted in Bunker 9830 from 1975 to 1980. A series of ten fire tests on cable insulation were conducted using propane gas (Palmieri April 1995e). The bunker is not involved in current SWMU 94 burn operations (Palmieri December 1994e) and is used to store equipment. All testing in Bunker 9830 was completely contained, and there have been no documented historical releases of hazardous constituents to the environment.

Several small trailers northwest of Bunker 9830 store equipment, tools, parts, insulation, cable, television monitors, instrumentation, and data systems (Larson and Palmieri October 1994). Several trailers are marked by placards indicating the storage of hazardous chemicals. According to interviewees, these designations are inaccurate for all but one identified trailer, because there actually is no chemical storage in these trailers (Larson and Palmieri October 1994, Palmieri December 1994b). Currently, all chemicals are stored in Building 9833A, which is located about 200 feet southwest of Bunker 9830 (Figure 3A-2) (Larson and Palmieri October 1994).

The control and instrumentation point for the Lurance Canyon Explosives Test Site during explosives testing was Building 9831 at SWMU 81 (New Aerial Cable Site). By 1979, the control facility was moved to what is now the lunch trailer (Palmieri April 1995a) located 30 feet from Bunker 9830. Currently, the control facility is set up in a trailer located off the southwest corner of Bunker 9830 (Figure 3A-1) (Larson and Palmieri August 1994). Cables radiate from each of the previous control facilities to the various burn site units (Larson and Palmieri October 1994).

3A.10 ABOVEGROUND TANKS

Aboveground tanks (SWMU 94A) have been used to supply water, JP-4 fuel, and coolant for burn testing at all of the engineered structures. There are three storage tank locations at SWMU 94 that served the LAARC Unit, the Bomb Burner Unit, the SMERF, the SOBP, and the LOBP. The aboveground tank locations include an area north of the LAARC Unit, north of the Bomb Burner Unit, and the current tank location north of the LOBP (Figure 3A-1). These three aboveground tank locations are discussed below.

North of the LAARC Unit (Area 1)

An aboveground tank labeled "nonpotable water" is currently located north of the LAARC Unit and was used to supply water to the unit (Figures 3A-1 and 3A-11a) (Hickox November 1994). Two aboveground tanks were also formerly used for fuel storage at this location (Kervin April 1981). These two tanks have since been removed.

North of the Bomb Burner Unit (Area 2)

The 1983 historical aerial photograph shows that three aboveground tanks were formerly located north of the Bomb Burner Unit (Figures 3A-1 and 3A-11b) (SNL/NM 1983). These aboveground tanks were used to supply JP-4 fuel and water for testing at the Bomb Burner Unit. The tanks are no longer present at the site, and no documentation exists that describes the installation and removal of the tanks. No physical evidence exists at the site to identify their former locations.

North of the LOBP (Area 3)

Three aboveground tanks are now located approximately 400 feet north of the LOBP: One contains JP-4 fuel, another contains nonpotable water, and the third contains glycol/water (Figures 3A-2 and 3A-11c). Prior to 1992, when the nonpotable water and glycol/water tanks were installed, there were two nonpotable water tanks in addition to a JP-4 fuel tank at the same location (Figure 3A-2) (Hickox November 1994). The current nonpotable water and JP-4 fuel tanks provide water and fuel for burn tests conducted at the LOBP, the SOBP, and the SMERF. The glycol/water is used as a coolant for the SMERF. A plastic-lined, earthen, secondary overflow containment pit is installed around the aboveground tank containing JP-4 fuel (Figure 3A-11d) (Larson and Palmieri October 1994).

Two underground pipelines connect the LOBP to the JP-4 fuel tank and to the nonpotable water tank. Two aboveground 3.5-inch-diameter galvanized metal pipelines connect the SOBP to the JP-4 fuel tank and to the nonpotable water tank. Three underground pipelines run from the tanks to the SMERF: One connects to the JP-4 fuel tank, and the other two provide glycol/water



Figure 3A-11a Photograph of the above ground tank (SWMU 94A, Area 1) north of the LAARC Unit in April 1995. Additional above ground tanks storing fuel were located here when the LAARC was active. View is to the northeast.

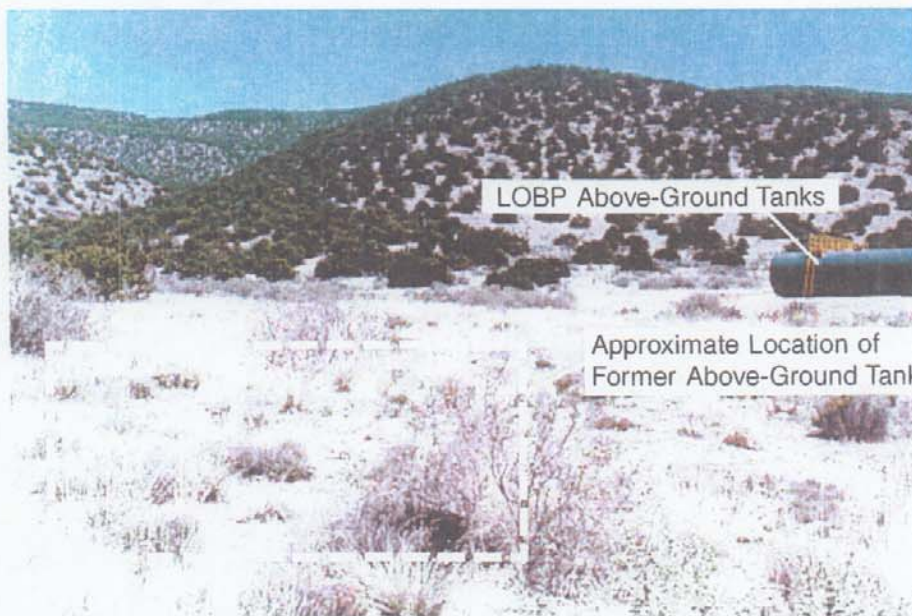


Figure 3A-11b Photograph of the former above ground tank location (SWMU 94A, Area 2) north of the Bomb Burner Unit in April 1995. The above ground tanks north of the LOBP are visible in the background. View is to the northeast.

Figure 3A-11

Photographs of SWMU 94A, Aboveground Tank North of LAARC Unit and Location of Former Aboveground Tank North of Bomb Burner Unit



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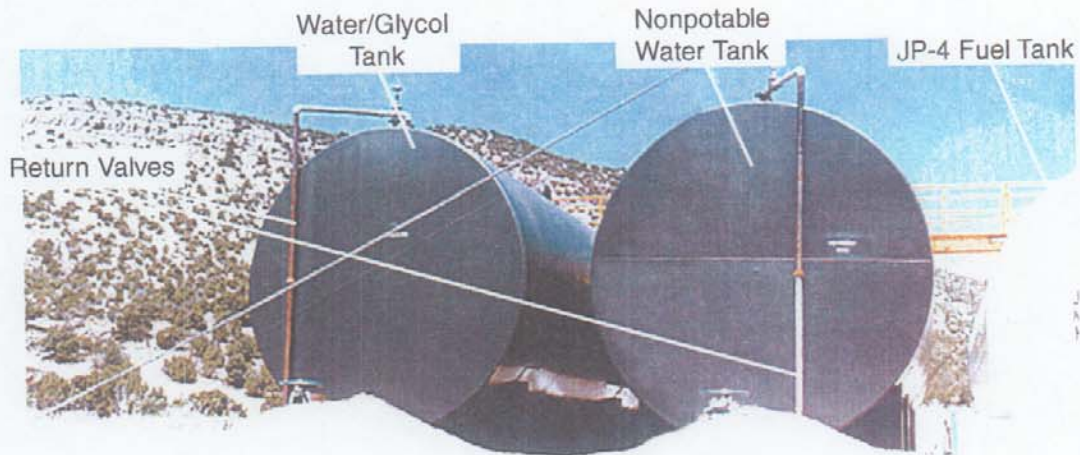


Figure 3A-11c Photograph of the aboveground tanks north of the LOBP (SWMU 94A, Area 3) in April 1995. The aboveground tanks provide the recirculation system for the LOBP, SOBP, and for the SMERF. Nonpotable water is recirculated back to the labeled tank following testing. View is to the north.

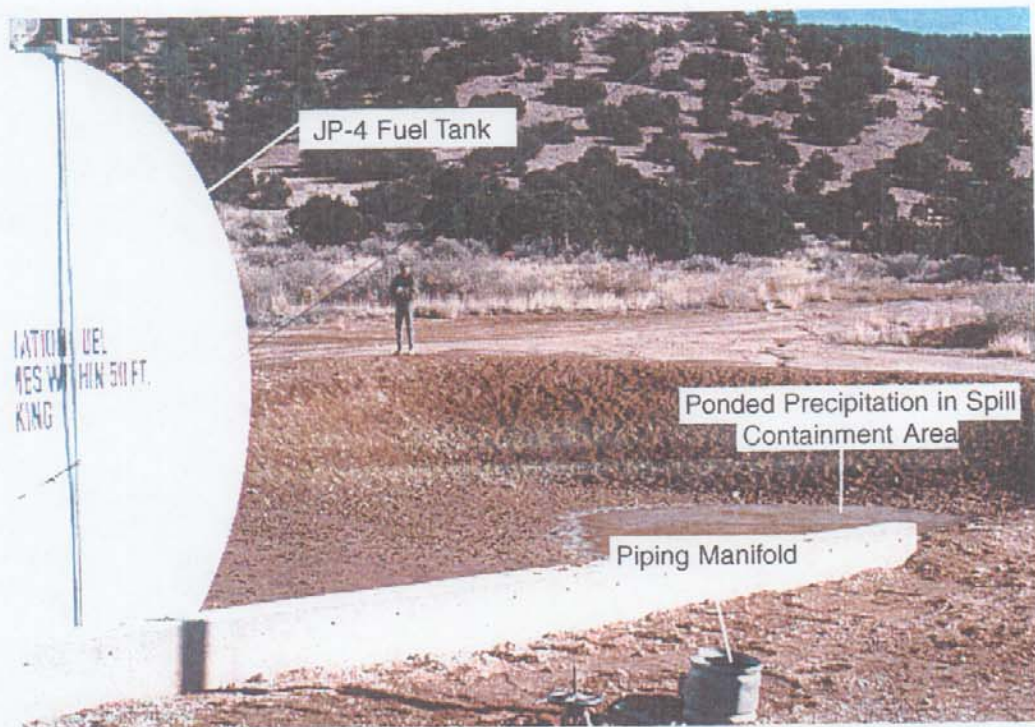


Figure 3A-11d Photograph of the spill containment area surrounding the JP-4 fuel aboveground tank (SWMU 94A, Area 3) north of the LOBP in December 1994. The spill containment area is constructed of soil overlying a plastic liner. View is to the northeast.

Figure 3A-11
Photographs of SWMU 94A, Aboveground Tanks North of LOBP



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coolant for circulation between the vertical walls and roof panels of the SMERF. A recirculation system currently routes wastewater back to the water and water/glycol tanks for storage and reuse (Hickox November 1994, Larson and Palmieri October 1994).

4A.11 DEBRIS/SOIL MOUNDS

A Debris/Soil Mound Area (SWMU 94B) is located on the southern portion of SWMU 94, north of the main arroyo in the Lurance Canyon (Figures 3A-2 and 3A-12). There is little documentation for the origination of the debris/soil mound area, but this site appears to be the product of grading and soil redistribution during the evolution of SWMU 94 since 1983. The mounds, which range in height from about 3 to 6 feet, are not clearly defined but merge together. The only apparent debris in the soil mound area is concrete fragments, electrical cables, and wood (Figure 3A-12). Several radiological anomalies have been identified in the debris/soil mound area. The radiological anomalies may be associated with past activities at SWMU 65.

3A.12 SCRAP YARD

The Lurance Canyon Burn Site Scrap Yard (SWMU 94G) was started in 1980 in the northwestern portion of the site (Figures 3A-2 and 3A-13a) (Palmieri November 1994b). The scrap yard contains unused test equipment, portable generators, fiber/ceramic insulation, pipes, pump motors, cinder blocks, test stands, cables, wood, portable pans, empty tanks labeled JP-4, empty drums, and scrap metal (Figure 3A-13a and 3A-13b) (Hickox November 1994, Larson and Palmieri October 1994). In approximately 1990, hydraulic oil leaked onto the soil in the equipment/scrap yard (Larson and Palmieri October 1994). This is the only documented release of liquid at the scrap yard. The affected soil was placed in 55-gallon drums and removed (Larson and Palmieri October 1994). No other containerized fluids have ever been (nor are expected to be) stored in the scrap yard.

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Author [unk], Date [unk]b. Notes collected for SWMU 94, Sandia National Laboratories, Notes (unpublished), Albuquerque, New Mexico.

Author [unk], Date [unk]c. Notes collected for SWMU 94, Sandia National Laboratories, Notes (unpublished), Albuquerque, New Mexico.

Author [unk], Date [unk]d. Notes collected for SWMU 94, Sandia National Laboratories, Notes (unpublished), Albuquerque, New Mexico.

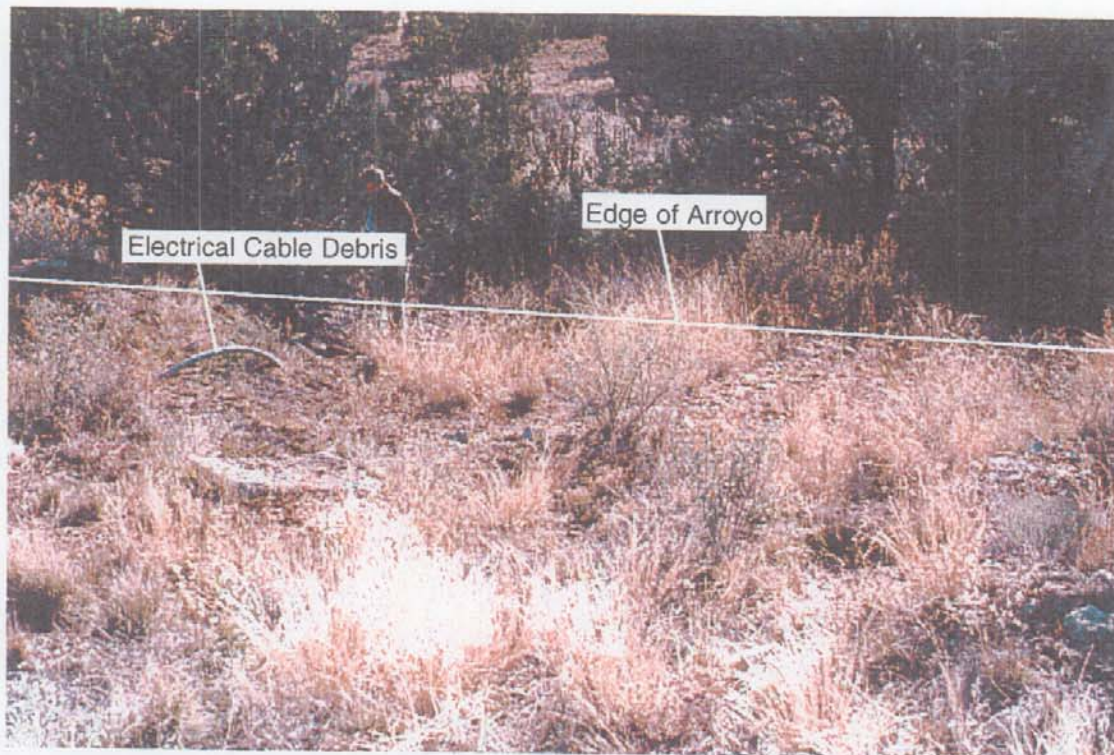
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Photograph of part of the debris/soil mound area (SWMU 94B) in December 1994. Visible debris is identified. View is to the south.

Figure 3A-12
Photograph of SWMU 94B, Debris/Soil Mound Area

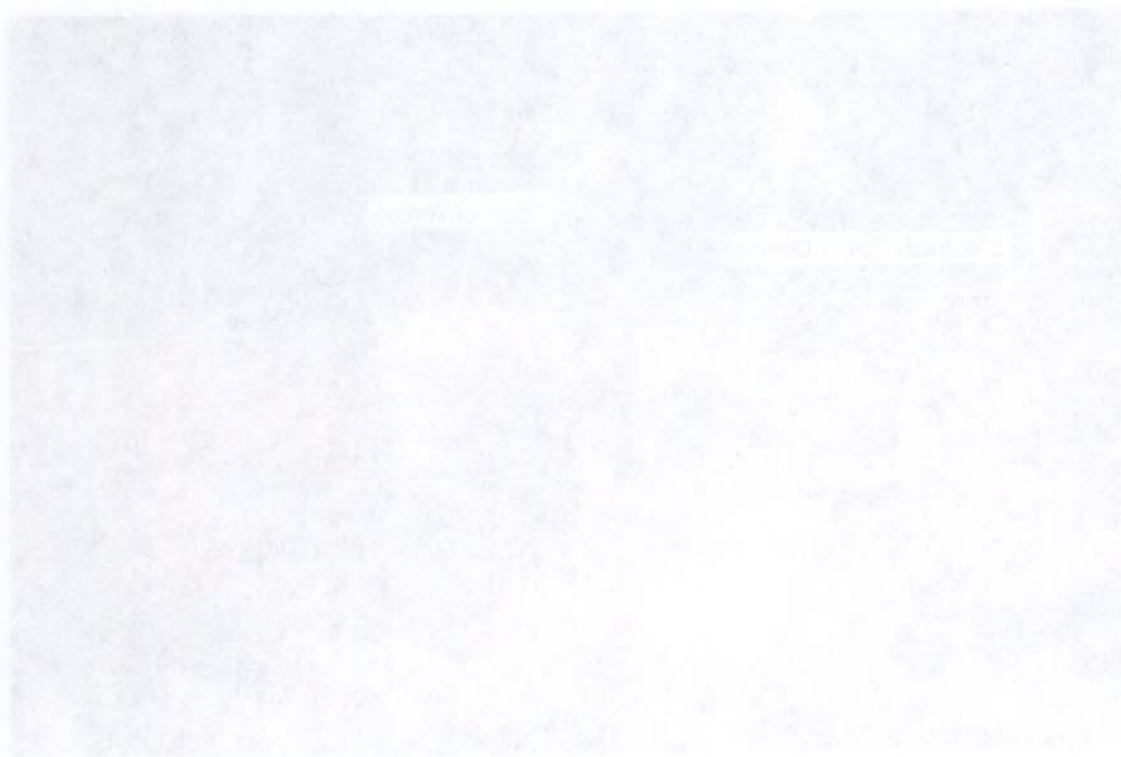


Figure 1. A very faint, low-contrast image, possibly a scan of a document page, showing indistinct shapes and colors. The image is mostly grey and white with some darker patches, but no text or clear figures are discernible.

Figure 2. A very faint, low-contrast image, possibly a scan of a document page, showing indistinct shapes and colors. The image is mostly grey and white with some darker patches, but no text or clear figures are discernible.

Figure 3. A very faint, low-contrast image, possibly a scan of a document page, showing indistinct shapes and colors. The image is mostly grey and white with some darker patches, but no text or clear figures are discernible.

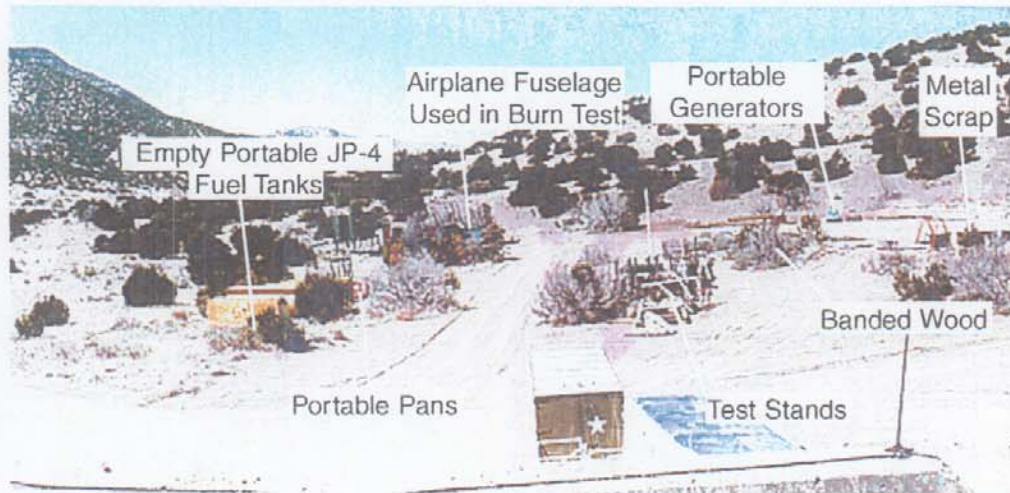


Figure 3A-13a Photograph of the scrap yard (SWMU 94G) in April 1995. Stored inventory is indicated. View is to the west.

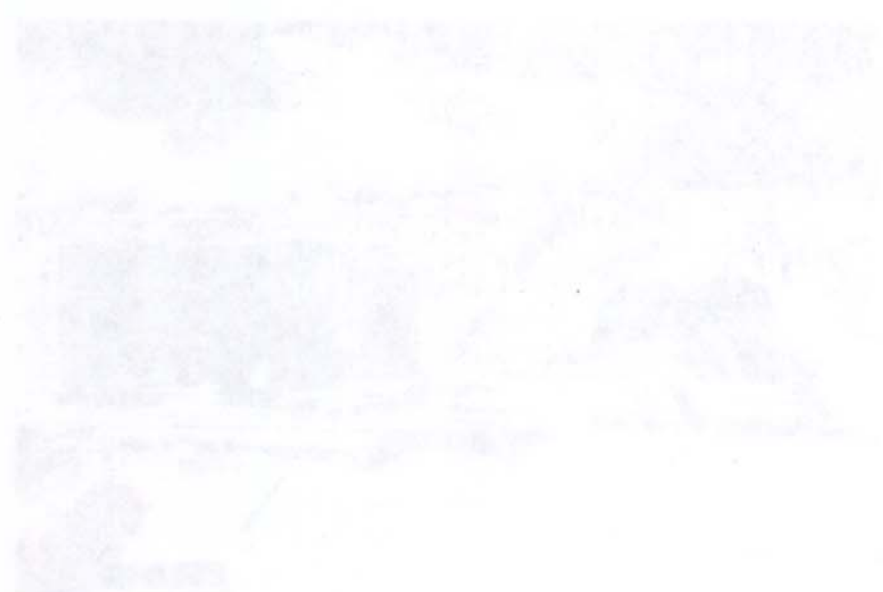


Figure 3A-13b Photograph of empty drums in the northern portion of the scrap yard (SWMU 94G) in April 1995. View is to the north.

Figure 3A-13
Photographs of SWMU 94G, Scrap Yard



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Page 10 of 10

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ANNEX 3-B
Data Validation Reports

Sample Findings Summary

Site: Site 94H

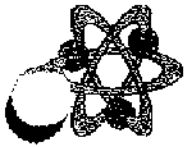
AR/COC: 604669

Data Type: Inorganic, Organic, and Rad

Sample ID	7440-31-2 (arsenic)	7440-41-7 (beryllium)	7440-47-3 (chromium)	7440-22-4 (silver)	7439-92-1 (lead)	2691-41-0 (HMW)	121-62-4 (RDX)	99-35-49 (1,3,5-trinitrobenzene)	99-65-0 (1,3-dinitrobenzene)	98-95-3 (nitrobenzene)	473-45-8 (ethyl dinitrobenzene)	194-6-51-0 (4-ortho-2,6-dinitrotoluene)	99-99-0 (4-nitrotoluene)	621-64-7 (m-nitroso-di-n-propylamine)	191-24-2 (benzofluoropyrene)	51-28-5 (2,4-dinitrophenol)	534-52-1 (4,6-dinitro-2-methylphenol)	
056700-003 / CY94H-VE-001-S	J, A2, J, B3	J, B3, A2, P1	J, B3, A2, P1	J, B, B3	J, A2, P1											UJ	UJ	
056701-003 / CY94H-VE-002-S	J, A2, J, B3	J, B3, A2, P1	J, B3, A2, P1	J, B, B3	J, A2, P1											UJ	UJ	
056702-003 / CY94H-VE-003-S	J, A2, J, B3	J, B3, A2, P1	J, B3, A2, P1	J, B, B3	J, A2, P1											UJ	UJ	
056703-003 / CY94H-VE-004-S	J, A2, J, B3	J, B3, A2, P1	J, B3, A2, P1	J, B, B3	J, A2, P1											UJ	UJ	
056704-003 / CY94H-VE-005-S	J, A2, J, B3	J, B3, A2, P1	J, B3, A2, P1	J, B, B3	J, A2, P1											UJ	UJ	
056705-003 / CY94H-VE-006-S	J, A2, J, B3	J, B3, A2, P1	J, B3, A2, P1	J, B, B3	J, A2, P1											UJ	UJ	
056706-003 / CY94H-VE-007-S	J, A2, J, B3	J, B3, A2, P1	J, B3, A2, P1	J, B, B3	J, A2, P1											UJ	UJ	
056707-003 / CY94H-VE-008-S	J, A2, J, B3	J, B3, A2, P1	J, B3, A2, P1	J, B, B3	J, A2, P1											UJ	UJ	
056711-008 / CY94H-EB-001	J, B3	J, B3	J, B3	J, B														
056711-006 / CY94H-EB-001																		
056711-004 / CY94H-EB-001																		
056703-003 / CY94H-VE-004-S	EPA8270: All compounds associated with IS 1, IS 2, IS 3, IS 4, and IS 5 are qualified "UJ." See left hand column of SVOC worksheet for IS numbers. Note 2,4-dinitrophenol (61-26-6) and 4,6-dinitro-2-methylphenol (634-62-1) are already qualified due to poor calibration; no further qualification is necessary.																	
056705-003 / CY94H-VE-006-S	EPA8270: All compounds associated with IS 1, IS 2, IS 3, and IS 4 are qualified "UJ." See left hand column of SVOC worksheet for IS numbers. Note 2,4-dinitrophenol (61-26-6) and 4,6-dinitro-2-methylphenol (634-62-1) are already qualified due to poor calibration; no further qualification is necessary.																	

Validated By: *Kate A. [Signature]* Date: 11/06/01

Analytical Quality Associates, Inc.



616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

MEMORANDUM

DATE: November 6, 2001
TO: File
FROM: Kevin Lambert
SUBJECT: Radiochemical Data Review and Validation – SNL
Site 94 H, AR/COC No. 604669, SDG No. F1H150189 (STSL), and
Project/Task No. 7214.02.02.21

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

Summary

The samples were prepared and analyzed with accepted procedures and specified method (Gross Alpha/Beta – DOE RP-710 MOD).

All analytes were successfully analyzed. No problems were identified with the data package that result in the qualification of data.

Data is acceptable except as noted above. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

Gross Alpha/Beta: The samples were analyzed within the prescribed holding times.

Calibration

Gross Alpha/Beta: All initial and continuing calibration requirements were met.

Blanks

Gross Alpha/Beta: No target analytes were detected in the method blank (MB).

Laboratory Control Sample (LCS) Analyses

Gross Alpha/Beta: The LCS met QC acceptance criteria.

Matrix Spike (MS) Analyses

Gross Alpha/Beta: The MS met QC acceptance criteria.

Replicate Analyses

Gross Alpha/Beta: The replicate analysis met QC acceptance criteria.

Negative Bias

Gross Alpha/Beta: The negative bias met QC acceptance criteria.

Other QC

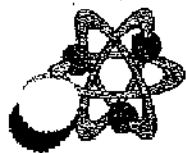
Gross Alpha/Beta:

No equipment blank (EB), field blank (FB) or field duplicate pair was submitted on the ARCOC.

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.

Analytical Quality Associates, Inc.



616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

MEMORANDUM

DATE: November 1, 2001
TO: File
FROM: Kevin Lambert
SUBJECT: Inorganic Data Review and Validation – SNL
Site 94H, AR/COC No. 604669, SDG No. F1H150189 (STSL), and
Project/Task No. 7214.02.02.21

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

Summary

The samples were prepared and analyzed with accepted procedures and specified methods (ICP – EPA6010B and CVAA – EPA7470A/7471A). All parameters were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. **ICP – Equipment Blank (EB):** The initial calibration blank (ICB) value for beryllium and chromium were greater than (>) the detection limit (DL). Sample results were less than (<) 5x the ICB value and are qualified "J, B3."
2. **ICP – EB:** The method blank (MB) value for silver was greater than (>) the detection limit (DL). Sample result was < 5x the MB value and is qualified "J, B."
3. **ICP - Soil:** The ICB and continuing calibration blank (CCB) values for beryllium were > the DL. Sample results were < 5x the ICB and CCB values and are qualified "J, B3."
4. **ICP - Soil:** The ICB and CCB values for chromium were > the DL. Samples F1H150189-002, -005, -011, -014, and -020 were < 5x the ICB and CCB values and are qualified "J, B3." Samples F1H150189-008, -017, and -023 were non-detect (ND) or > 5x the ICB and CCB values; no data are qualified as a result.
5. **ICP - Soil:** The ICB value for silver was > the DL. Samples F1H150189-002, -008, -011, -014, and -020 were < 5x the ICB and/or CCB value and are qualified "J, B3." Samples F1H150189-005, -017, and -023 were ND or > 5x the ICB value; no data are qualified as a result.

6. ICP - Soil: The MB value for silver was > the DL. Samples F1H150189-002 and -008 were < 5x the MB value and are qualified "J, B." Samples F1H150189-005, -011, -014, -017, -020, and -023 were ND or > 5x the ICB value; no data are qualified as a result.
7. ICP- Soil: The matrix spike (MS) percent recovery (%R) for chromium (70%) was < the lower QC limit (75%) and the difference between the original and the replicate is > the RL. Matrix interference is suspected to result in the poor accuracy and precision. Sample results are qualified "J, A2, P1."
8. ICP- Soil: The MS %R for lead (30%) was < the lower QC limit (75%) and the replicate relative percent difference (RPD) (51%) did not meet QC acceptance criteria (20%). Matrix interference is suspected to result in the poor accuracy and precision. Sample results are qualified "J, A2, P1."
9. ICP- Soil: The MS %R for arsenic (65%) was < the lower QC limit (75%). Matrix interference is suspected to result in the poor accuracy. Sample results are qualified "J, A2."

Data is acceptable and QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

ICP and CVAA – EB and Soil: The samples were analyzed within the prescribed holding times.

Calibration

ICP and CVAA – EB and Soil: Initial and continuing calibration verification data met QC acceptance criteria.

Blanks

ICP - EB:

No target analytes were detected in the ICB except for barium, beryllium, and chromium. Beryllium and chromium are qualified as noted above in the summary section. The ICB value for barium was > the DL. Sample result was ND; no data is qualified as a result.

No target analytes were detected in the CCB except for beryllium and silver. Beryllium is qualified as noted above in the summary section. The absolute CCB value for silver was > the DL but < the reporting limit (RL). Sample result was > 5x the DL; no data is qualified as a result.

No target analytes were detected in the method blank (MB) except for beryllium and silver. Silver is qualified as noted above in the summary section. Beryllium was > 5x the MB value; no data is qualified as a result.

CVAA – EB:

Mercury was not detected in the ICB, CCB, and MB.

ICP - Soil:

No target analytes were detected in the ICB except for beryllium, chromium, and silver. Beryllium, chromium, and silver are qualified as noted above in the summary section.

No target analytes were detected in the CCB except for beryllium and chromium. Beryllium and chromium are qualified as noted above in the summary section.

No target analytes were detected in the MB except for beryllium, chromium, and silver. Silver is qualified as noted above in the summary section. Beryllium and chromium were > 5x the MB values; no data are qualified as a result.

CVAA - Soil:

Mercury was not detected in the ICB, CCB, and MB.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analyses

ICP and CVAA - EB and Soil: The LCS/LCSD met QC acceptance criteria.

Matrix Spike (MS) Analyses

ICP and CVAA - EB: The MS met QC acceptance criteria.

ICP and CVAA - Soil: The MS met QC acceptance criteria except for chromium, silver, lead, and arsenic. Chromium, lead, and arsenic are qualified as noted above in the summary section. The MS %R for silver (73%) was slightly < lower QC limit (75%). The LCS/LCSD was used to assess the accuracy and met QC acceptance criteria; no data is qualified as a result.

Replicate Analyses

ICP and CVAA - EB: Replicate analyses met QC acceptance criteria.

ICP and CVAA - EB: Replicate analyses met QC acceptance criteria except for chromium and lead. Chromium and lead are qualified as noted above in the summary section.

ICP Interference Check Sample (ICS) Analysis

ICP - EB and Soil: The ICS data met QC acceptance criteria.

ICP Serial Dilution

ICP - EB and Soil: Serial dilution met QC acceptance criteria.

Other QC

ICP and CVAA - Soil:

No target analytes were detected in the EB except for beryllium, chromium, and silver. Sample results were ND or > 5x the EB values; no data are qualified as a result.

No field blank (FB) or field duplicate pair was submitted on the ARCOC.

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.

Analytical Quality Associates, Inc.



616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

MEMORANDUM

DATE: November 2, 2001
TO: File
FROM: Kevin Lambert
SUBJECT: Organic Data Review and Validation – SNL
Site 94H, AR/COC No. 604669, SDG No. F1H150169 (STSL), and
Project/Task No. 7214.02.02.21

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

Summary

The samples were prepared and analyzed with accepted procedures and specified methods (HE – EPA8330, SVOC - EPA8270, and VOC – EPA8260). All compounds were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. HE – Equipment Blank (EB): The LCS/LCSD relative percent difference (RPD) for HMX (43%), RDX (45%), 1,3,5-trinitrobenzene (41%), 1,3-dinitrobenzene (44%), nitrobenzene (46%), 479-45-8 (tetryl), 4-amino-2,6-dinitrotoluene (41%), and 4-nitrotoluene (42%) were outside the QC acceptance criteria (40%). Sample results were non-detect (ND) and are qualified "UJ, P."
2. SVOC – EB: The calibration response factor (RF) for n-nitroso-di-n-propylamine (0.251) was less than (<) the specified minimum RF (0.50) but greater than (>) 0.01. Sample results were ND and are qualified "UJ."
3. SVOC – EB: The calibration relative standard deviation (RSD) and continuing calibration verification percent difference (CCV %D) for 2,4-dinitrophenol (37% and -23% respectively) were > 20% but < 40%. Sample results were ND and are qualified "UJ."
4. SVOC – EB: The CCV %D for benzo(g,h,i)perylene (43%) was > 40% but < 60%. The bias is considered low. Sample results were ND and are qualified "UJ."
5. SVOC – Soil: The calibration RSD for 2,4-dinitrophenol (45%) was > 40% but < 60% and the CCV %D (22%) was > 20% but < 40%. Sample results were ND and are qualified "UJ."

6. SVOC – Soil: The calibration RSD and the CCV %D for 4,6-dinitro-2-methylphenol (28% and 24% respectively) was > 20% but < 40%. Sample results were ND and are qualified "UJ."
7. SVOC – Soil: For sample F1H150189-011, internal standards (IS) 1, 2, 3, 4, and 5 were > 200% of the average calibration standard. Associated sample results were ND and are qualified "UJ."
8. SVOC – Soil: For sample F1H150189-017, internal standards (IS) 1, 2, 3, and 4 were > 200% of the average calibration standard. Associated sample results were ND and are qualified "UJ."
9. VOC – Trip Blank (TB) and EB: Methylene chloride was detected in the method blank (MB). The TB and EB results were < 10x the MB value but > the reporting limits (RL). The TB and EB results are qualified ND at the reported values (8.0 U, B and 5.6 U, B respectively).
10. VOC – Soil: Methylene chloride was detected in the MB. Sample results were < 10x the MB value and < the RL. Sample results are qualified ND at the RL (5.0 U, B).
11. VOC – Soil: For sample F1H150189-019, internal standards (IS) 1, 2, and 3 were < 50% of the average calibration standard. Associated sample results were ND and are qualified "UJ." Methylene chloride is qualified "5.0 UJ, B."

Data is acceptable and QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

HE – EB and Soil: The samples were extracted and/or analyzed within the prescribed holding times.

SVOC – EB and Soil: The samples were extracted and/or analyzed within the prescribed holding times.

VOC – TB, EB, and Soil: The samples were extracted and/or analyzed within the prescribed holding times.

Calibration

HE – EB and Soil: The initial calibration and continuing calibration data met QC acceptance criteria.

SVOC – EB:

The initial calibration data met QC acceptance criteria except as noted above in the summary section. The calibration RSD for pentachlorophenol (21%) was > 20% but < 40%. Sample results were ND and as a result based on professional judgment no data are qualified.

The continuing calibration data met QC acceptance criteria except as noted above in the summary section. The CCV %D for 2,4-dinitrotoluene (-24%), indeno(1,2,3-cd)pyrene (35%) and dibenzo(a,h)anthracene (33%) were > 20% but < 40%. Sample results were ND and as a result based on professional judgment no data are qualified. The CCV %D for 4,6-dinitro-2-methylphenol (-49%) was > 40% but < 60%. The bias is considered high. Sample results were ND and as a result based on professional judgment no data are qualified.

SVOC – Soil:

The initial calibration data met QC acceptance criteria except as noted above in the summary section. The calibration RSD for hexachlorocyclopentadiene (21%) and pentachlorophenol (26%) were > 20% but < 40%. Sample results were ND and as a result based on professional judgment no data are qualified.

The continuing calibration data met QC acceptance criteria except as noted above in the summary section.

VOC – TB, EB, and Soil:

The initial calibration data met QC acceptance criteria. The calibration RSD for acetone (22%) and bromoform (22%) were > 20% but < 40%. Sample results were ND and as a result based on professional judgment no data are qualified.

The continuing calibration data met QC acceptance criteria. The CCV %D for bromomethane (-26%) were > 20% but < 40%. Sample results were ND and as a result based on professional judgment no data are qualified.

Blanks

HE – EB and Soil: No target analytes were detected in the MB.

SVOC – EB and Soil: No target analytes were detected in the MB.

VOC – TB, EB, and Soil: No target analytes were detected in the MB except for methylene chloride. Methylene chloride is qualified as noted above in the summary section.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analyses

HE – EB: The LCS/LCSD met QC acceptance criteria except as noted above in the summary section.

HE – Soil: The LCS met QC acceptance criteria. No LCSD was provided with the sample delivery group (SDG). Laboratory precision was assessed using the MS/MSD, which met QC acceptance criteria.

SVOC – EB and Soil: The LCS/LCSD met QC acceptance criteria.

VOC – TB, EB, and Soil: The LCS/LCSD met QC acceptance criteria.

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

HE - EB: No MS/MSD was run on the SDG. An MS/MSD was run on a similar SDG in the batch and did not meet QC acceptance criteria. No qualifications are applied as a result.

HE - Soil: The MS/MSD met QC acceptance criteria.

SVOC - EB: The MS/MSD met QC acceptance criteria. The MS/MSD RPD for 4-chloro-3-methylphenol (25%) was outside QC acceptance criteria (21%). Precision was assessed using LCS/LCSD, which met QC acceptance criteria. As a result based on professional judgment no data is qualified.

SVOC - Soil: The MS/MSD met QC acceptance criteria.

VOC - TB, EB, and Soil: The MS/MSD met QC acceptance criteria.

Surrogates

HE - EB and Soil: The surrogate recoveries met QC acceptance criteria.

SVOC - EB: The surrogate recoveries met QC acceptance criteria except for nitrobenzene-d5. A comparison against "real time" limits based on sample surrogate/spike recoveries indicates the surrogate recovery for nitrobenzene-d5 met control limits. No data are qualified as a result.

SVOC - Soil: The surrogate recoveries met QC acceptance criteria except in samples F1H150189-005, -008, -011, -014, -017, -020, and -023. A comparison against "real time" limits based on sample surrogate/spike recoveries indicates the surrogate recoveries met control limits. No data are qualified as a result.

VOC - TB, EB, and Soil: The surrogate recoveries met QC acceptance criteria.

Internal Standards

SVOC - EB: The internal standards met QC acceptance criteria.

SVOC - Soil: The internal standards met QC acceptance criteria except as noted above in the summary section.

VOC - TB and EB: The internal standards met QC acceptance criteria.

VOC - Soil: The internal standards met QC acceptance criteria except as noted above in the summary section.

Confirmation

HE - EB and Soil: Not required; sample results are ND.

Other QC

HE: No target analytes were detected in the EB. No field blank (FB) or field duplicate pair was submitted on the ARCOC.

SVOC: No target analytes were detected in the EB. No field blank (FB) or field duplicate pair was submitted on the ARCOC.

VOC: No target analytes were detected in the TB and EB except for methylene chloride. The TB and EB methylene chloride results were qualified ND due to MB contamination; no further qualification is necessary. No field blank (FB) or field duplicate pair was submitted on the ARCOC.

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: Site 94H Project/Task #: F21402.03.21 # of Samples: 29 Matrix: 24 soil, 5 Aqueous
 AR/COC #: 604669 Laboratory Sample IDs: _____
 Laboratory: STSL FIH/50189-001 to -024 (Soil)
 Laboratory Report #: FIH/50189 - 025 to -029 (Field QC)

QC Element	Analysis										RAD	Other
	Organics					Inorganics						
	VOC	SVOC	PAHs	PCBs	PFAS	TPH	NO3	NO2	Ammonia	As		
1. Holding Times/Preservation	✓	✓	NA	✓	✓	✓	NA	✓	✓	NA	✓	NA
2. Calibrations	✓	UJ		✓				✓			✓	
3. Method Blanks	✓	✓		✓				✓			✓	
4. MS/MSD	✓	✓		✓				✓			✓	
5. Laboratory Control Samples	✓	✓		✓				✓			✓	
6. Replicates	✓	✓		✓				✓			✓	
7. Surrogates	✓	✓		✓				✓			✓	
8. Internal Standards	UJ	UJ										
9. TCL Compound Identification	✓	✓										
10. ICP Interference Check Sample								✓				
11. ICP Serial Dilution								✓				
12. Carrier/Chemical Tracer Recoveries	✓	✓										NA
13. Other QC	✓	UJ	✓	UJ	✓	UJ	✓	UJ	✓	✓	✓	NA

J = Estimated Check (✓) = Acceptable
 U = Not Detected Shaded Cells = Not Applicable (also "NA")
 UJ = Not Detected, Estimated NP = Not Provided
 R = Unusable Other: _____
 Reviewed By: Kevin A. Tomblin Date: 11/06/21

Volatile Organics

Site/Project: Site 94H AR/COC #: 604669 Batch #: 1235154
 Laboratory: STSL Laboratory Report #: FIN150189 # of Samples: 2 Matrix: AGREGATES

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

Met

Criteria

Met

Criteria

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: (1) Acetone & Bromoform ⇒ RSD (22, 23) were > 20% but < 40%; Sample results were ND and as a result based on professional judgment no data are qualified
 (2) Bromomethane ⇒ CCV % D(-26) was > 20% but < 40%; Sample results were ND and as a result based on professional judgment no data are qualified
 (3) Methylene chloride ⇒ Detected in MB; TB result < 10x MB value but > RL, TB result qualified ND at the reported value (8.0 U, B); EB result < 10x MB value but > RL, EB result qualified ND at the reported value (5.6 U, B)

Volatile Organics

Site/Project: Site 94 H AR/COC #: 604669 Batch #: 1234198
 Laboratory: STSL Laboratory Report #: FIH150189 # of Samples: 8 Matrix: SOIL

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
FIH150189-019				168878 (193901)	✓	59958 (98216)	✓	129300 (159196)	✓
		Met							
		Criteria							

SMC 1: 4-Bromofluorobenzene
 SMC 2: 1,2-Dichloroethane-d4
 SMC 3: Toluene-d8
 IS 1: Bromochloromethane Fluorobenzene
 IS 2: 1,4-Difluorobenzene, 1,4-Dichlorobenzene-d4
 IS 3: Chlorobenzene-d5

- Comments: ① Acetone & Bromoform ⇒ PSD (28,22) were > 20 but < 40; Sample results very NO and as a result based on professional judgment No data are reported.
- ② Bromomethane ⇒ GC V% D(-26) was > 20 but < 40; Sample results were ND and as a result based on professional judgment No data are reported.
- ③ Methylene Chloride ⇒ Detected in MB; Sample results < 10x MB value and < RL; Sample results qualified ND at the RL (5.0 U, B)
- ④ TB & EB results qualified ND due to MB contamination; no further qualification is necessary
- ⑤ Internal Std results < 50% of the average result from the calibration Std; Sample results were ND and are qualified "U"; Methylene Chloride is qualified "5.0 U, B"

Inst ID: M5J

Semivolatile Organics (SW 846 Method 8270)

Laboratory Sample ID:

AR/OC #: 604669

Laboratory Report #: FIH150189

FIH150189-027 (EB)

Site: Sitz 94H

Method: EPA8270C

Matrix: Aqueous

Batch #: 1228294

of Samples: 1

S/N	CAS #	NAME	Mn. C. Rf	Mn. Int. Rf	Calib. R ²	Calib. RSD %	Calib. RSD %	Method		MS APP	Field DUB RSD	Field Blanks
								LCS	LOSD			
			>0.5	<20%/ 0.99	20%	LCS	LOSD	MS APP	Field DUB RSD	Field Blanks	Field Blanks	
1	A	108-95-2	Phenol	✓	0.80	✓	✓	✓	✓	✓	NA	NA
1	BN	111-41-4	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	95-50-1	1,2-Dichlorobenzene	✓	0.40	✓	✓	✓	✓	✓	✓	✓
1	A	95-48-7	2-Methylphenol	✓	0.70	✓	✓	✓	✓	✓	✓	✓
1	BN	108-60-1	bis(2-chloropropyl)ether	✓	0.01	✓	✓	✓	✓	✓	✓	✓
1	A	106-44-5	4-Methylphenol	✓	0.60	✓	✓	✓	✓	✓	✓	✓
1	BN	621-64-7	N-Nitroso-di-n-propylamine	✓	0.50	✓	✓	✓	✓	✓	✓	✓
2	BN	77-82-4	Hexachlorocyclopentadiene	✓	0.45	✓	✓	✓	✓	✓	✓	✓
2	BN	85-01-3	Sublimates	✓	0.20	✓	✓	✓	✓	✓	✓	✓
2	BN	78-59-1	Isophorone	✓	0.40	✓	✓	✓	✓	✓	✓	✓
2	A	88-75-3	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	105-47-8	4-Chloroaniline	✓	0.01	✓	✓	✓	✓	✓	✓	✓
2	BN	87-68-3	Hexachlorocyclopentadiene	✓	0.01	✓	✓	✓	✓	✓	✓	✓
2	A	59-50-7	4-Chloro-3-methylphenol	✓	0.20	✓	✓	✓	✓	✓	✓	✓
2	BN	91-57-6	1-Methylnaphthalene	✓	0.40	✓	✓	✓	✓	✓	✓	✓
3	BN	77-47-4	Hexachlorocyclopentadiene	✓	0.01	✓	✓	✓	✓	✓	✓	✓
3	A	88-06-2	2,4,6-Trichlorophenol	✓	0.20	✓	✓	✓	✓	✓	✓	✓
3	A	95-93-4	2,4,5-Trichlorophenol	✓	0.20	✓	✓	✓	✓	✓	✓	✓

Notes: Shaded rows are BORA assignments.

Comments:

Reviewed By: Kerwin A Lambert Date: 11/06/01

Inst ID: M5J

Semivolatile Organics

Site Project: Site 94H AR/COC #: 604669 Batch #: 1828294 Matrix: Aqueous
 Laboratory: STSL Laboratory Report #: FIH150189 # of Samples: 1

USEPA CAS #	NAME	M	R	C	S	GC/MS		GC/MS		GC/MS		GC/MS		GC/MS		GC/MS		GC/MS	
						>0.05	<0.05/ 0.99	20%	20%	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS
3	BN 91-58-7	1-Chloronaphthalene	✓	0.80	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA	NA	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 606-24-2	2,6-Dinitrobenzene	✓	0.20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 99-09-2	3-Nitroaniline	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 83-32-9	Acenaphthene	✓	0.90	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	A 31-28-3	2,4-Dinitrophenol	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	A 100-02-7	4-Nitrophenol	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 132-64-9	Dibenzofuran	✓	0.80	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 84-66-2	Diethylphthalate	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 7005-72-3	4-Chlorophenylphenylether	✓	0.40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 86-73-7	Fluorene	✓	0.90	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 100-01-6	4-Nitroaniline	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	A 334-52-1	4,6-Dinitro-2-methylphenol	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	BN 86-30-6	N-Nitrosodiphenylamine (1)	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	BN 101-55-3	4-Bromophenylphenylether	✓	0.16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	BN 85-01-8	Phenanthrene	✓	0.70	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	BN 120-12-7	Acridene	✓	0.70	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	BN 86-74-8	Quinoline	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	BN 84-74-2	Dio-n-butylphthalate	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	BN 206-44-0	Fluorene	✓	0.60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 129-00-0	Pyrene	✓	0.60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 85-68-7	Butylbenzylphthalate	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 91-94-1	2,3-Dichlorobenzamide	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	BN 36-83-3	Benzo(b)anthracene	✓	0.80	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Comments:

Inst ID: MSJ

Semivolatile Organics

Site/Project: Sits 94H AR/COC #: 604669

Batch #: 1228294

Laboratory: STSL

Laboratory Report #: F1H150189

of Samples: 1

Matrix: AQUEOUS

SVA CAS#	NAME	Meth. ID	Meth. Name	Meth. Type	Meth. Ref	GC/MS		GC/MS		GC/MS		GC/MS		Field Equip. Status	Field Blank
						>0.5	<20% / 0.99	20%	GC/MS	GC/MS	GC/MS	GC/MS			
5	BN 218-01-9	Chrysene	✓	0.70	✓	✓	✓	✓	NA	NA	NA	NA	NA	NA	
5	BN 117-81-7	bis(2-Ethylhexyl)phthalate	✓	0.01	✓	✓	✓	✓							
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	✓	✓	✓	✓							
6	BN 193-39-5	Indeno(1,2,3-cd)pyrene	✓	0.50	✓	✓	✓	✓	3.5						
6	BN 53-70-3	Dibenz(a,h)anthracene	✓	0.40	✓	✓	✓	✓	3.3						
6	BN 191-94-2	Benzo(ghi)perylene	✓	0.50	✓	✓	✓	✓	4.3	✓					

NA - Not Applicable

Comments: N-nitroso-di-n-propylamine (Calib RF (0.251)) was < specified minimum (0.50) but ≥ 0.01; Sample results was ND and is qualified "UJ".

2,4-dinitrotoluene, 4-dinitrotoluene, indeno(1,2,3-cd)pyrene, & dibenzo(a,h)anthracene ⇒ CCV %D were > 20% but < 40%. Sample results were ND and as a result based on professional judgment no data are qualified.

3 4,6-dinitro-2-methylphenol & benzo(g,h,i)perylene ⇒ CCV %D were > 40% but < 60%. The data is considered high for 4,6-dinitro-2-methylphenol and sample result was ND; as a result based on professional judgment no data is qualified. Benzo(g,h,i)perylene is listed low. Sample result was ND and is qualified "UJ".

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
F1H150189-037 30/3A	✓	✓	✓	✓	✓	✓	✓	✓

Internal Standard Outliers

Sample	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6
	✓	✓	✓	✓	✓	✓

Not Criteria

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-Trichlorophenol (A)
 SMC 7: 1,2-Dichlorobenzene-d4 (BN)
 SMC 8: 1,2-Dichlorobenzene-d4 (BN)

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

Inst ID: MSK

Semivolatile Organics (SW 846 Method 8270)

Laboratory Sample ID: FIH150189

AR/COC #: 604669

Site/Project: SLS 94H

Laboratory Report #: FIH150189

Methods: EPA 8270C

of Samples: 8 Matrix: soil

Batch #: 1229536

Lab	Sample	CAS#	Name	Conc	Unit	GC/MS		MSD	MSD	MSD	MSD	MSD	MSD	MSD	MSD	MSD	MSD	MSD	MSD						
						>0.5	<30% / 0.90																		
1	A	108-95-2	Phenol	✓	0.80	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	✓	NA		
1	BN	111-44-4	bis(2-Chloroethoxy)ether	✓	0.70	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1	A	95-57-8	2-Chlorophenol	✓	0.80	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1	BN	541-73-1	1,3-Dichlorobenzene	✓	0.60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
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-chloroisopropoxy)ether	✓	0.01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1	A	105-44-5	4-Methylphenol	✓	0.60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1	BN	621-64-7	N-Nitroso-di-n-propylamine	✓	0.50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2	BN	78-49-1	1-naphthol	✓	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	✓	0.38	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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	2,4,6-Trichlorophenol	✓	0.20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Shaded rows are RCRA unapproved.

Comments:

Reviewed By: Kevin A. Lambert Date: 11/06/01

Semivolatle Organics

Inst ID: MSK

Page 2 of 3

Site/Project: Site 94H AR/COC #: 604669 Batch #: 1229536

Laboratory: STSL Laboratory Report #: F1H150189 # of Samples: 8 Matrix: soil

IS	SVA	CAS#	NAME	T C	M R	Min RF	Cath RF	Calc RF	Cath RF	Calib RF		GC/MS Metho	LCS			MSS			Field		
										>0.05	<20%/ 0.99		RF	RF	RF	RF	RF	RF	RF	RF	RF
3	BN	91-38-7	2-Chloranaphthalene	✓		0.80	✓	✓	✓									NA	✓		NA
3	BN	88-74-1	2-Nitroaniline	✓		0.01	✓	✓	✓												
3	BN	131-11-3	Dimethylhydantoin	✓		0.01	✓	✓	✓												
3	BN	208-96-8	Azobenzene	✓		0.90	✓	✓	✓												
3	BN	606-20-2	2,6-Dinitrobenzene	✓		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	✓	45	22												
3	A	100-02-7	4-Nitrophenol	✓		0.01	✓	✓	✓												
3	BN	132-64-9	Dibenzofuran	✓		0.80	✓	✓	✓												
3	BN	54-66-2	Diethylphthalate	✓		0.01	✓	✓	✓												
3	BN	7003-77-3	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	✓	23	24												
4	BN	86-30-6	N-Nitrosodiphenylamine (I)	✓		0.01	✓	✓	✓												
4	BN	101-55-3	4-Bromophenyl-phenylether	✓		0.10	✓	✓	✓												
4	BN	85-01-8	Phenanthrene	✓		0.70	✓	✓	✓												
4	BN	20-12-7	Anthracene	✓		0.70	✓	✓	✓												
4	BN	86-74-8	Carbazole	✓		0.01	✓	✓	✓												
4	BN	84-70-2	Di-n-butylphthalate	✓		0.01	✓	✓	✓												
4	BN	806-44-0	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'-Dithiobenzidine	✓		0.01	✓	✓	✓												
5	BN	56-55-3	Benzo(e)anthracene	✓		0.80	✓	✓	✓												

Comments:



INST ID: MSK

Semivolatile Organics

Site/Project: Sata 94H AR/COC #: 604669 Batch #: 1229536
Laboratory: STSL Laboratory Report #: FIH150189 # of Samples: 8 Matrix: Soil

Main data table with columns for compound name, concentration, and various analytical parameters.

NA - Not Applicable

Surrogate Recovery Outliers

Table listing surrogate recovery outliers with sample IDs and values.

Internal Standard Outliers

Table listing internal standard outliers with sample IDs and values.

Table with columns for SMC 1-6 and associated values.

Comments: FIH150189-017... No data are provided... based on professional judgment... 1) Hydrochlorocyclopentadiene & Pentachlorobenzene... 2) methylphenol... 3) 2,4-Dinitrophenol & 4,6-dinitro-2-methylphenol... 4) 2,4-Dinitrophenol & 4,6-dinitro-2-methylphenol... 5) 2,4-Dinitrophenol & 4,6-dinitro-2-methylphenol... 6) 2,4-Dinitrophenol & 4,6-dinitro-2-methylphenol...

IS 1: 1,4-Dichlorobenzene-d4 (BN) (1190878)
IS 2: Naphthalene-d8 (BN)
IS 3: Chrysene-d12 (BN) (474262)
IS 4: Phenanthrene-d10 (BN)
IS 5: Acenaphthene-d10 (BN) (865216)
IS 6: Pyrene-d12 (BN) (1706326)

EQ BIK D F1H150189-027

- ④ ~~Only~~ surrogate %R for nitrobenzene-d5 (30) was slightly \angle the lower QC limit (32); DV procedure requires at least 2 surrogates for SVC. \angle the out of specification low; No data are qualified as a result. A comparison of meeting limits based on sample surrogate/spike recoveries and recoveries were in control.
- ⑤ 4-Clsms-3-methylphenol \Rightarrow MS/MSD RPD (25) was outside QC acceptance criteria; Decision was assessed using LC-5/LCSD which met QC acceptance criteria; As a result based on professional judgment no data is qualified

WAL 11/20/11

Soil \Rightarrow F1H150189-002, 005, 008, 011, 014, 017, 020, ~~023~~

- ② 2,4-dinitrophenol \Rightarrow ~~GC/MS/F(37)~~ ^{RSD W/MSD} and CCV W/D(-33) were $> 20\%$ but $< 40\%$; Sample result was N/D and is qualified "UJ"

Soil \Rightarrow F1H150189-002, 005, 008, 011, 014, 017, 020, ~~023~~

- ③ ~~W/MSD~~ For F1H150189-005, 008, 011, 017, ~~023~~ only surrogate %R for 2,4,6-Trichlorophenol (41, 35, 33, 27, 29) were \angle the lower QC limit (42); A comparison was made against real time limits based on sample surrogate/spike recoveries and recoveries were in control; Also DV procedure requires at least 2 surrogates for SVC be out of specification low; \therefore No data are qualified as a result
- ③ For F1H150189-014 ϕ 0.20 \Rightarrow 3 surrogate %R for nitrobenzene-d5 (36, 38), 2 phenylphenol (44, 41), and 2,4,6-trichlorophenol (31, 29) were \angle the lower QC limits (39, 42, 42); A comparison was made against real time limits based on sample surrogate/spike recoveries and recoveries were in control; \therefore No data are qualified as a result
- ④ For F1H150189-011 \Rightarrow IS-1, IS-2, IS-3, IS-4, & IS-5 results were $> 200\%$ of the average result from the calibration standard; Associated sample results were N/D and are qualified "UJ"
- ④ For F1H150189-017 \Rightarrow IS-1, IS-2, IS-3, IS-4 results were $> 200\%$ of the average result from the calibration standard; Associated sample results were N/D and qualified "UJ"

11/20/11



High Explosives (SW 846 Method 8330)

Site/Project: Site 94H AR/COC #: 604669 Laboratory Sample IDs: FH150189-028 (EB)

Laboratory: STSL Laboratory Report #: FH150189

Methods: EPA8330 Matrix: Aqueous

of Samples: 1 Batch #: 1232492

CAS #	NAME	GC/MS		GC/MS		GC/MS		GC/MS		GC/MS		GC/MS	
		99	20%	99	20%	99	20%	99	20%	99	20%	99	20%
2691-41-0	HMX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
121-82-4	RDX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
99-35-49	1,3,5-Trinitrobenzene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
99-65-0	1,3-dinitrobenzene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
98-95-3	Nitrobenzene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
479-45-8	Tetryl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
118-96-7	2,4,6-trinitrotoluene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
35572-78-2	2-amino-4,6-dinitrotoluene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19406-51-0	4-amino-2,6-dinitrotoluene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
121-14-2	2,4-dinitrotoluene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
606-20-2	2,6-dinitrotoluene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
88-72-2	2-nitrotoluene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
99-99-0	4-nitrotoluene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
99-08-1	3-nitrotoluene	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
78-11-5	PEIN												

SAMPLE	SMC	REP	SMC	REP	SAMPLE	SMC	REP	SAMPLE	SMC	REP
<u>Met Criteria</u>										

Confirmation										
SAMPLE	SMC	REP	SMC	REP	SAMPLE	SMC	REP	SAMPLE	SMC	REP
<u>Not Required</u>										
<u>Sample Results ND</u>										

Solids-to-aqueous conversion:
 mg/kg = $\mu\text{g/g} \times (\mu\text{g/g}) \times (\text{sample mass (g)} / \text{sample vol. (ml)}) \times (1000 \text{ ml} / 1 \text{ liter}) / \text{Dilution Factor} = \mu\text{g/l}$

Comments:
 NA - Not Applicable
 Not meet criteria

① LCS/LCSD RPD for 8 of 14 compounds were > QC acceptance criteria (40); Sample results were ND and are qualified "UJ, P"

Reviewed By: Kevin A Lambert Date: 11/06/06

High Explosives (SW 846 Method 8330)

Site/Project: Site 94H AR/COC #: 604669 Laboratory Sample ID: FIH150189-002, -005, -008, -011, -014,
 Laboratory: STSL Laboratory Report #: FIH150189
 Methods: EPA8330 Batch #: 1235410
 # of Samples: 8 Matrix: soil

QMS #	NAME	Matrix	Flask No.	Vial No.	Method	LOS		LCS		MS	MSD	MS RPD	20%	Pack Dup	MSD	Blank	U
						99	20%	20%	20%								
2691-41-0	HMX	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	NA	✓	U	NA	
121-82-4	RDX	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
99-35-49	1,3,5-Trinitrobenzene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
99-65-0	1,3-dinitrobenzene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
98-95-3	Nitrobenzene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
479-45-8	Tetryl	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
118-96-7	2,4,6-trinitrotoluene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
35572-78-2	2-amino-4,6-dinitrotoluene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
19406-51-0	4-amino-2,6-dinitrotoluene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
121-14-2	2,4-dinitrotoluene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
606-20-2	2,6-dinitrotoluene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
88-72-2	2-nitrotoluene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
99-99-0	4-nitrotoluene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
99-08-1	3-nitrotoluene	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	
78-11-5	PEIN	✓	✓	✓	U	✓	✓	✓	✓	✓	✓	✓	✓	✓	U	✓	

NA- Not Applicable

Comments:

Note: An LCS/D was not run; The MS/MSD was used to assess precision and met Q.C. acceptance criteria; No data qualified as a result.

Sample	MS/MSD	MSD	MS RPD	20%	MSD	Blank	U
Not Qualified							

Sample	MS/MSD	MSD	MS RPD	20%	MSD	Blank	U
Not Qualified							
Sample Repeats MD							

Confirmation

Solids-to-aqueous conversion:
 $\text{mg/kg} = \mu\text{g/g} \times (\text{sample mass (g)} / \text{sample vol. (ml)}) \times (1000 \text{ ml} / 1 \text{ liter}) / \text{Dilution Factor} = \mu\text{g/l}$

Reviewed By: Kevin A Zambert Date: 11/06/04

Inorganic Metals

Site/Project: Site 94H AR/COC #: 604669 Laboratory Sample IDs: FIH50189-029 (EB)

Laboratory: STSL Laboratory Report #: FIH50189

Methods: EPA 6010B, EPA 7470A

of Samples: 1 Matrix: Aqueous Batch #: 1234161 (ICP), 1228156 (CVAA)

CAS#	TAL	ICV	CCV	ICB	CCB	Method Blank	LCS	LCSD	LCSB	CC Element			MSD	MSD RPD	Rep. RPD	ICS AB	Serial Dilution	Field Dup. RPD	Equip. Blank	Field Blank
										MS	MSD	MSD RPD								
7429-08-5 Al	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA	NA
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	NA	NA	NA	NA	NA	NA	NA
7440-70-3 Cs																				
7440-49-4 Cu																				
7440-50-8 Cr																				
7439-89-6 Fe																				
7439-95-4 Mg																				
7439-96-3 Mn																				
7440-02-0 Ni																				
7440-09-7 K																				
7440-23-1 Na																				
7440-67-2 V																				
7440-66-6 Zn																				
7440-36-0 Sb																				
7440-28-0 Tl																				
Cyanide CN																				

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

Comments: NA - Not Applicable

Reviewed By: Karin A Lambert Date: 11/06/01

SEE OTHER PAGE

Inorganic Metals

Laboratory Sample ID#:
FIH150189-002, -005, -008, -011, -014, -017
-020, & -023

Site/Project: S14 94 H AR/COC #: 604669
 Laboratory Report #: FIH150189
 Laboratory: STSL
 Methods: EPA 6010 B, EPA 7471 A

Batch #: 1229122 (ICP), 1228159 (CVAR)

of Samples: 8 Matrix: SOIL

TAL	ICV	CCV	ICB	CCB	Method	LCS	LCSD	LCSD	MSD	MSD	Rep.	ICS	Serial	Field	Field	Field	
			ug/g	ug/g	mg/kg		RPD	RPD	RPD	RPD	RPD	AB	Dilution	Drip	Blanks	Blanks	
7429-89-3 Al	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-41-7 Be	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-70-2 Ca	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-48-4 Co	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-50-8 Cu	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7439-89-5 Fe	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7439-93-4 Mg	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7439-96-5 Mn	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-02-0 Ni	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-02-7 K	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-23-5 Na	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-52-2 V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-66-6 Zn	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-35-0 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 vol. (ml)) / sample vol. (1 liter)] / Dilution Factor = µg/l

Comments: NA - Not Applicable

Reviewed By: Karen A. Lambert Date: 11/26/01

SEE OTHER PAGES

Eq. BIK → FIH/50189-029

1) ICB > DL

Ba ⇒ Sample results were ND; no data qualified as a result
Be ⇒ Sample result < 5x ICB value; data qualified "J,B3"
Ca ⇒ " " " " " " " "

2) CCB > DL

Be ⇒ Same as above for ICB

3) CCB/ > DL but < RL

Ag ⇒ Sample result was > 5x DL; no data qualified as a result
Mg ⇒ Sample result was > 5x MB ^{11/16/01}

3) MB > DL

Be ⇒ Same as above for CCB & CCB; Sample result ~~< 5x MB~~ value; no data qualified as a result
Ag ⇒ Sample result < 5x MB value; data qualified "J,B3"
Field Samples ⇒ FIH/50189-002, -005, -008, -011, -014, -017, -020, 4-023

1) ICB > DL

Be ⇒ Sample -002, -005, -011, -014, -020 were < 5x ICB value and are qualified "J,B3"; Samples -008, -017, 4-023 were ND due to 42 data are qualified as a result
Cr ⇒ Sample -005, -011, -014, -020 were < 5x ICB value and are qualified "J,B3"; Samples -002, -008, -017, 4-023 were ND due to 42 data qualified as a result
Ag ⇒ Sample -002, -005, -011, -014, -020 were < 5x ICB value and are qualified "J,B3"; Samples -005, -017, -023 were ND or > 5x ICB value and no data are qualified as a result

1) Sample -008 CCB > DL

Be ⇒ Sample -008, -017, -023 were < 5x CCB value and are qualified "J,B3"; Samples -002, -005, -011, -014, -020 are qualified due to ICB, no further qualification necessary
Cr ⇒ Sample -002 were < 5x CCB value and are qualified "J,B3"; Samples -005, -011, -014, -020 are qualified due to CCB, no further qualification necessary; Samples -008, -017, -023 were ND or > 5x CCB value and no data qualified as a result

11/06/01 KHL

Site 94H COL # 604649 I nonorganic Metals Lab # F1H150189

Field Sample Cont'd ⇒ F1H150189-002, -005, -011, -014, -017, -020, -023

MB > DL

Be ⇒ Sample results were > 5x MB value; no data qualified as a result " " "

Cr ⇒ " " " " " " "

Ag ⇒ Samples -002, -005 were < 5x MB value and are qualified "J, B"; Samples -011, -014, -017, -020, -023 were ND or > 5x MB value and no data qualified as a result

MSZR & RPD ^(2.5)

Cr ⇒ MSZR(70) < Lower limit(75) and Rep RPD did not meet QC criteria; Samples results are qualified "J, A2, P1"; Matrix interference suspected to result in poor accuracy & precision

Ag ⇒ MSZR(73) slightly < lower limit(75); ACS/LCSD was met criteria and used to assess accuracy. No data qualified as a result

Pb ⇒ MSZR(30) < Lower limit(75) and Rep RPD(51) did not meet QC criteria(20); Samples results are qualified "J, A2, P1"; Matrix interference suspected to result in poor accuracy & precision

As ⇒ MSZR(65) < Lower limit(75); Sample results were qualified "J, A2"

EB > DL

Be ⇒ Sample results were > 5x EB value; no data qualified as a result " " "

Cr ⇒ Sample results " " " " " " "

Ag ⇒ " " were ND or > 5x EB value; no data qualified as a result

11/16/01 KAC

Radiochemistry

Site/Project: Site 94H AR/OC #: 604669 Laboratory Sample ID: FIH150189-003, -006, -009, -012, -015,
 Laboratory: STSL Laboratory Report #: FIH150189
 Methods: DOE RP-710 MOD Matrix: soil Batch #: 1248378
 # of Samples: 8

Analyte	Method Blanks	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Criteria	U	20%	25%	<1.0	U	<1.0	U			50-105			50-105
H3													
U-238													
U-234													
U-235/-236													
Th-232													
Th-228													
Th-230													
Pu-239/-240	✓	✓	✓	✓	NA	NA	NA						
Gross Alpha	✓	✓	✓	✓	NA	NA	NA						
Nonvolatile Beta													
Ra-226													
Ra-228													
Ni-63													
Gamma Spec. Am-241													
Gamma Spec. Cs-137													
Gamma Spec. Co-60													

Comments: NA - Not Applicable

Analyte	Method	LCS	MS	Rep RER	Equip. Blanks	Field Dup. RER	Field Blanks	Sample ID	Isotope	IS/Trace	Sample ID	Isotope	IS/Trace
Iso-U	Alpha spec.	U-232											
Iso-Pu	Alpha spec.	Pu-242											
Iso-Th	Alpha spec.	Th-229											
Am-241	Alpha spec.	Am-242											
Sr-90	Beta	Y ingrowth											
Ni-63	Beta	NA											
Ra-226	Deamination	NA											
Ra-226	Alpha spec.	Ba-133 or Ra-225											
Ra-228	Gamma spec.	Ba-133											

Gamma spec. LCS contains: Am-241, Cs-137, and Co-60

Reviewed By: Kevin A. Lambert Date: 11/06/01

8/15/01

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. **N/A** SARWR No. **604869**

Contract No. **AJ24808** Project/Task No. **7214.D2.02.27**

Project/Task Manager: **Frostout** SMO Authorization: **Raymond Mitchell**

Project Name: **6WIKU 94H** Lab Contact: **Mark Leeb 314-260-8866**

Reason/Order Code: **CU 1338 #3** Lab Destination: **Seaw. Tent. 571 LANE**

Logbook Ref. No.: **CFO 107-01** SMO Contact/Phone: **D Salimi 841**

Service Order No. **NA** Send Report to SMO: **S. J. Jervis 844-8184**

Location: **Room NA**

Reference LOV (available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date Collected	Container Type	Volume	ABQC Method	Preserve Method	Collection Method	Sample Type	Requested Parameter & Method	Lab Sample ID
056700-002	CY94H-VE-001-S	11.5	94H	081301 0906	AG	4oz	G	None	G	SA	VOC	
056700-003	CY94H-VE-001-S	11.5	94H	081301 0806	AG	8oz	G	None	G	SA	SVOC/HE/RCRA metals + Be	
056700-004	CY94H-VE-001-S	11.5	94H	081301 0906	AG	8oz	G	None	G	SA	Gross A/B	
056701-002	CY94H-VE-002-S	18	94H	081301 0913	AG	4oz	G	None	G	SA	VOC	
056701-003	CY94H-VE-002-S	18	94H	081301 0913	AG	8oz	G	None	G	SA	SVOC/HE/RCRA metals + Be	
056701-004	CY94H-VE-002-S	18	94H	081301 0913	AG	8oz	G	None	G	SA	Gross A/B	
056702-002	CY94H-VE-003-S	12	94H	081301 0923	AG	4oz	G	None	G	SA	VOC	
056702-003	CY94H-VE-003-S	12	94H	081301 0923	AG	8oz	G	None	G	SA	SVOC/HE/RCRA metals + Be	
056702-004	CY94H-VE-003-S	12	94H	081301 0923	AG	8oz	G	None	G	SA	Gross A/B	
056703-002	CY94H-VE-004-S	11.5	94H	081301 0933	AG	4oz	G	None	G	SA	VOC	

Special Instructions/OC Requirements: Yes No

Raw Data Package: Yes No

Please send report to: **MThacker-MS 1088 Ph284-2575 Fax284-2817 methack@isandla.gov**

Please list as separate report:

1. Relinquished by	2. Received by	3. Relinquished by	4. Received by	5. Relinquished by	6. Received by	7. Relinquished by	8. Received by

1 2 3 4 5 6 7 8 9 10

*7 & 15 Day Turnaround Time! ERCL requires prior notification.

**CONTRACT LABORATORY
Analysis Request And Chain Of Custody (Continuation)**

Page 2 of 2
604569

AR/COG

Project Name: SHM/SH		Project/Task Message		Project/Task No.: 7244020241		Reference LOY (available at SMD)		Preserve Agent		Collection Method		Sample Type		Parameter & Method Requested		Lab Use Lab Sample ID
Building	NA	Room	NA	ER Sample ID or Sample Location detail	ER Site No.	Beginning Depth (ft)	Date/Time (hr)	Sample Matrix	Container Type	Volume	Method	Sample Type	Requested	Requested	Requested	
056703-003				CY94H-VE-004-S	94H	11.8	081301 0839	S	AG	8oz	G	SA	SVOC/HE/RCRA metals + Be			11
056703-004				CY94H-VE-004-B	94H	11.8	081301 0839	S	AG	8oz	G	SA	GrossA/B			12
056704-002				CY94H-VE-005-S	94H	11.6	081301 0839	S	AG	4oz	G	SA	VOC			13
056704-003				CY94H-VE-005-S	94H	11.6	081301 0839	S	AG	8oz	G	SA	SVOC/HE/RCRA metals + Be			14
056704-004				CY94H-VE-005-S	94H	11.6	081301 0839	S	AG	8oz	G	SA	GrossA/B			15
056705-002				CY94H-VE-006-S	94H	5.0	081301 0846	S	AG	4oz	G	SA	VOC			16
056705-003				CY94H-VE-006-S	94H	5.0	081301 0846	S	AG	8oz	G	SA	SVOC/HE/RCRA metals + Be			17
056705-004				CY94H-VE-006-S	94H	5.0	081301 0846	S	AG	8oz	G	SA	GrossA/B			18
056706-002				CY94H-VE-007-S	94H	8	081301 0850	S	AG	4oz	G	SA	VOC			19
056706-003				CY94H-VE-007-S	94H	8	081301 0850	S	AG	8oz	G	SA	SVOC/HE/RCRA metals + Be			20
056706-004				CY94H-VE-007-S	94H	8	081301 0850	S	AG	8oz	G	SA	GrossA/B			21
056707-002				CY94H-VE-008-S	94H	3.8	081301 1000	S	AG	4oz	G	SA	VOC			22
056707-003				CY94H-VE-008-S	94H	3.8	081301 1000	S	AG	8oz	G	SA	SVOC/HE/RCRA metals + Be			23
056707-004				CY94H-VE-008-S	94H	3.8	081301 1000	S	AG	8oz	G	SA	GrossA/B			24
056708-002				CY94H-TB-001	94H	N/A	081301 0808	DIW	G	3x40ml	G	TB	VOC			25
056711-002				CY94H-EB-001	94H	N/A	081301 1025	DIW	G	3x40ml	G	EB	VOC			26
056711-004				CY94H-EB-001	94H	N/A	081301 1025	DIW	AG	2x1L	G	EB	SVOC			27
056711-005				CY94H-EB-001	94H	N/A	081301 1025	DIW	AG	3x1L	G	EB	HE			28
056711-008				CY94H-EB-001	94H	N/A	081301 1025	DIW	P	500ml	G	EB	RCRA/8B METALS			29

Contract Verification Review (CVR)

Project Leader FRESHOUR Project Name SWRAJ 94H Case No. 7214 02 02 21
 AR/COC No. 804569 Analytical Lab SEVERN TRENT SDG No. F3H190189

in the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date sampling received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IOL, MDA and L _c)	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (± sigma error) and tracer recovery (if applicable) reported	X				
2.10	Matrix provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Confederal qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1	Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QIC samples and sample data.	X		
3.2	Quantitation limit met for all samples	X		
3.3	Accuracy	X		
a)	Laboratory control samples accuracy reported and met for all samples		X	SURROGATES FAILED RECOVERY LIMITS FOR SVOC SAMPLES #056701-003, 056702-003, 056703-003, 056704-003, 056705-003, 056708-003, 056767-003 & 056711-004
b)	Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique		X	HMX & RDX FAILED RECOVERY LIMITS FOR MS/MSD (air) ARSENIC, CHROMIUM, LEAD & SILVER FAILED RECOVERY LIMITS FOR MS (soil)
c)	Matrix spike recovery data reported and met		X	
3.4	Precision	X		
a)	Replicate sample precision reported and met for all inorganic and radiochemistry samples		X	RPD FOR 4-CHLORO-3-METHYLPHENOL OUTSIDE ACCEPTANCE LIMITS
b)	Matrix spike duplicate RPD data reported and met for all organic samples		X	METHYLENE CHLORIDE DETECTED IN VOC METHOD BLANKS BERYLLIUM, CHROMIUM & SILVER DETECTED IN METHOD BLANK
3.5	Blank data		X	METHYLENE CHLORIDE DETECTED IN VOC TRIP & EQUIPMENT BLANKS
a)	Method or reagent blank data reported and met for all samples		X	
b)	Sampling blank (e.g., field, trip, and equipment) data reported and met		X	
3.6	Contractual qualifiers provided: "J" - estimated quantity; "B" - analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U" - analyte undetected (results are below the MDL,IDL, or MDA (radiochemical)); "H" - analysis done beyond the holding time	X		
3.7	Narrative addresses plating for gross alpha/beta	NA		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	X		

Contract Verification Review (Continued)

Item	Yes	No	Comments
4.0 Calibration and Validation Documentation			
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/PLC (8330 and 8010 and 8082)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) Instrument run logs provided	X		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	X		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? Yes No

Based on the review, this data package is complete. Yes No

If no, provide: nonconformance report or correction request number _____ and date correction request was submitted: _____

Reviewed by: W. Palencia Date: 10-01-2001 Closed by: _____ Date: _____

SMO ANALYTICAL DATA ROUTING FORM

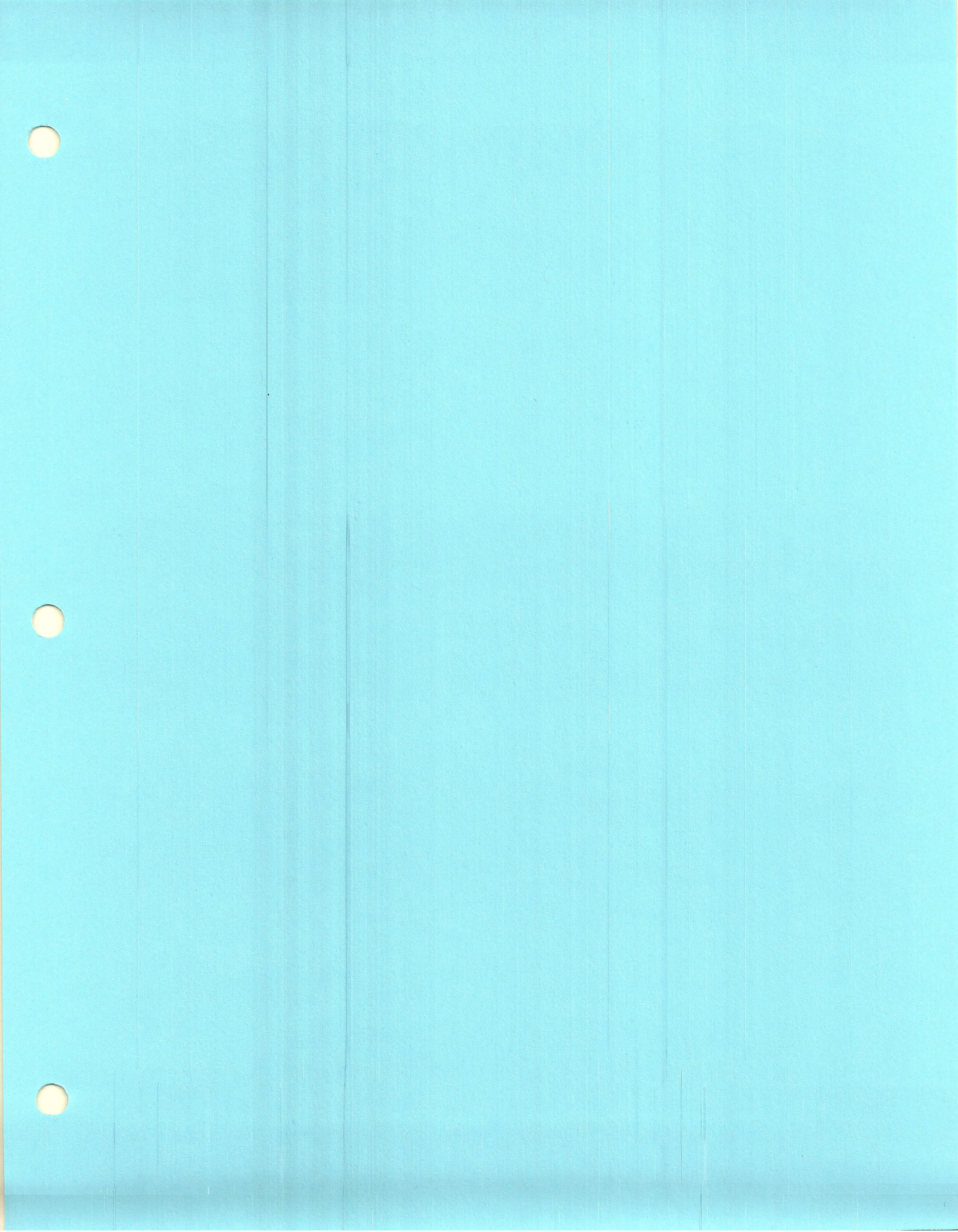
Project Name: SWMU 94H Task No./Service Order: 7214_02.02.21 / CF0 107
 SNL Task Leader: FRESHOUR Org/Mail Stop: 6134 / 1088
 SMO Project Coordinator: SALMI Sample Ship Date: 8/14/01

ARCOG	Lab	Lab ID	Preliminary Received	Final Received	EDD Req'd		EDD Rec'd	
					YES	NO	YES	NO
<u>604669</u>	<u>STSL</u>	<u>F1H150189</u>		<u>9/24/01</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Correction Requested from Lab: _____ Date _____ Correction Request #: _____
 Corrections Received: _____ Requester: _____
 Review Complete: 10-1-01 Signature: W. Palencia
 Priority Data Faxed: _____ Faxed To: _____
 Preliminary Notification: _____ Person Notified: _____
 Final Transmittal: 10-1-01 Transmitted To: Thacker
 Transmitted By: Palencia
 Filed in Records Center/ER: _____ Filed By: _____

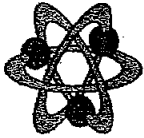
Comments: Electronic data filed on Q:\SMO\STAR\EDD BY COC
To validation 10/3/01

Received (Records Center) By: _____



Analytical Quality Associates, Inc.

616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com



MEMORANDUM

DATE: April 12, 2001
TO: File
FROM: Kevin Lambert
SUBJECT: ~~Organic Data Review and Validation - SNL~~
Site 94H Burnsite, ARCO No. 603917, SDG No. F0L120103, and
Project/Task No. 7214.01.05

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

Summary

The samples were prepared and analyzed with accepted procedures and specified method (VOC - EPA8260B and SVOC - EPA8270C). All compounds were successfully analyzed. No problems were identified with the data package that result in the qualification of data.

Data is acceptable and QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

VOC and SVOC Analysis: The samples were extracted and analyzed within the prescribed holding times.

Calibration

VOC Analysis: The initial calibration data met QC acceptance criteria. The continuing calibration data met QC acceptance criteria except for 2-butanone and tetrachloroethene. The continuing calibration verification percent difference (CCV %D) for 2-butanone (-25%) and tetrachloroethene (-25%) were > 20% but < 40%. All other QC met acceptance criteria and sample results were non-detect. As a result, based on professional judgment, no data are qualified.

SVOC Analysis: The initial and continuing calibration data met QC acceptance criteria.

Blanks

VOC and SVOC Analysis: No target analytes were detected in the method blanks (MB).

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analyses

VOC and SVOC Analysis: The LCS/LCSD met QC acceptance criteria.

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

VOC and SVOC Analysis: The MS/MSD met QC acceptance criteria.

Surrogates

VOC Analysis: The surrogate recoveries met QC acceptance criteria.

SVOC Analysis: The surrogate recoveries met QC acceptance criteria except p-terphenyl-d14 recovery (120%) was greater than (>) the upper acceptance limit (106%) for sample FOL120103-002. All other QC met acceptance criteria and sample results were non-detect. As a result, based on professional judgment, no data are qualified.

Internal Standards

VOC Analysis: Internal standards data met QC acceptance criteria.

SVOC Analysis: Internal standards data met QC acceptance criteria except phenathrene-d10 (48%) was slightly less than (<) the lower acceptance limit (50%) for sample FOL120103-003. All other QC met acceptance criteria and sample results were non-detect. As a result, based on professional judgment, no data are qualified.

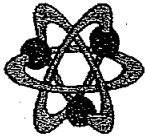
Other QC

VOC and SVOC Analysis: Not Applicable

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.

Analytical Quality Associates, Inc.



616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

MEMORANDUM

DATE: April 12, 2001
TO: File
FROM: Kevin Lambert
SUBJECT: ~~Inorganic Data Review and Validation - SNL~~
Site 94H Burnsite, ARCO No. 603917, SDG No. F0L120103, and
Project/Task No. 7214.01.05

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

Summary

The samples were prepared and analyzed with accepted procedures and specified methods (ICP - EPA6010B and CVAA - EPA7470A). The parameters were successfully analyzed. Problems were identified with the data package that result in the qualification of data.

1. ICP Analysis: The initial calibration blank (ICB) and continuing calibration blank (CCB) values for cadmium was greater than (>) the detection limit (DL). Cadmium results were less than (<) 5x the ICB and CCB values and are qualified "J, B3."
2. ICP Analysis: The ICB and CCB absolute values for chromium were > the DL but < the reporting limit (RL). Chromium for sample F0L120203-003 was >5x the DL: no data is qualified as a result. Chromium results for samples F0L120203-001 and -002 were non-detect and are qualified "UJ, B3."
3. ICP Analysis: The method blank (MB) value for lead was > the DL. Lead results were < 5x the MB value and are qualified "J, B."

Data is acceptable and QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

ICP and CVAA Analysis: The samples were analyzed within the prescribed holding times.

Calibration

ICP and CVAA Analysis: Initial and continuing calibration verification data met QC acceptance criteria.

Blanks

ICP Analysis: No target analytes were detected in the ICB except for cadmium and chromium. Sample results were qualified as noted above in the summary section.

ICP Analysis: No target analytes were detected in the CCB except for cadmium, chromium, and lead. Cadmium and chromium results were qualified as noted above in the summary section. The CCB value for lead was > the DL but the sample results were > 5x the CCB values; no data are qualified as a result.

ICP Analysis: No target analytes were detected in the MB except for lead. Lead results are qualified as noted above in the summary section.

CVAA Analysis: Mercury was not detected in the ICB, CCB and MB.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analyses

ICP and CVAA Analysis: The LCS/LCSD met QC acceptance criteria.

Matrix Spike (MS) Analyses

ICP and CVAA Analysis: The MS met QC acceptance criteria.

Replicate Analyses

ICP and CVAA Analysis: The replicate analyses met QC acceptance criteria. The relative percent difference (RPD) for cadmium, arsenic, and mercury do not apply. Sample results were < 5x the RL and the difference between the original and replicate results were < the RL; no data are qualified as a result.

ICP Interference Check Sample (ICS) Analysis

ICP Analysis: The ICS data met QC acceptance criteria.

ICP Serial Dilution

ICP Analysis: No data was provided.

Other QC

ICP and CVAA Analysis: Not Applicable

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: Site 94H Burns site

Data Type: Inorganic and Organic

AR/COC: 603917

Sample ID		7440-43-9 (cadmium)	7440-47-3 (chromium)	7439-92-1 (lead)	Method/CAS Number (Analysis/Analyte)																			
054516-001 / CYN94H-GR-001-SP	J, B3	J, B3	UJ, B3	J, B																				
054517-001 / CYN94H-GR-002-SP	J, B3	J, B3	UJ, B3	J, B																				
054518-001 / CYN94H-GR-003-SP	J, B3	J, B3		J, B																				
No VOC/SVOC data were qualified.																								
Data is acceptable.																								
QC measures appear to be adequate.																								

Validated By: *Kevin A. Lambert*

Date: 04/12/01

Data Validation Summary

Site/Project: Site 94H Business Project/Task #: 7214-01.0508 # of Samples: 6 Matrix: Soil
 AR/COC #: 603917 Laboratory Sample IDs: 4/12/01
 Laboratory: STSL Laboratory Sample IDs: FOL120103-001 to -006
 Laboratory Report #: FOL120103

QC Element	Analysis											RAD	Other	
	Organics					Inorganics					CN			
	VOC	SVOC	Pesticide/PCB	HPLC (HE)	ICP/AES	GFAA/AA	CVAA (Hg)							
1. Holding Times/Preservation	✓	✓	NA	NA	✓	NA	✓							
2. Calibrations	✓	✓			J, UJ		✓							
3. Method Blanks	✓	✓			J		✓							Not
4. MS/MSD	✓	✓			✓		✓							
5. Laboratory Control Samples	✓	✓			✓		✓							Applicable
6. Replicates														
7. Surrogates	✓	✓												
8. Internal Standards	✓	✓												
9. TCL Compound Identification	✓	✓												
10. ICP Interference Check Sample								✓						
11. ICP Serial Dilution								NP						
12. Carrier/Chemical Tracer Recoveries														
13. Other QC	NA	NA	✓	✓	NA	✓	NA	NA	NA	✓	NA			

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: Kevin A. Lambert Date: 4/12/01

Volatile Organics (SW 846 Method 8260)

Site/Project: Site 94H Burnate AR/COC #: 603917 Matrix: SOIL

Laboratory: STSL Laboratory Report #: F04120103 Laboratory Sample IDs: F04120103-004, -005, 4-006

Methods: EPA 8260B Batch #: 0356205

IS	CAS #	Name	T C L	Min. RF	Intercept	Calib. RF	Calib. RSD/ R ²	CCV %D	Method Bike	LCS LCS-D	LCS RPD	MS MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Trip Blanks
1	74-87-3	Chloromethane		0.10										NA	NA	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												
1	67-64-1	acetone (10xblk)		0.01												
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		✓		-25		✓		✓				
2	71-55-6	1,1,1-trichloroethane		0.10												
2	56-23-6	carbon tetrachloride	✓	0.10		✓				✓		✓				
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												
3	591-78-6	2-hexanone		0.01												
3	127-18-4	Tetrachloroethene	✓	0.20		✓				✓		✓				
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												
3	540-59-0	1,2-dichloroethylene (total)		0.01												
3	110-75-8	2-chloroethyl vinyl ether														

Comments: NA - Not Applicable

Notes: Shaded rows are RCRA compounds.

Reviewed By: Karin A. Lambert Date: 4/12/01

Volatile Organics

Site/Project: Site 94H Burnside AR/COC #: 603917 Batch #: 0356205
 Laboratory: STSL Laboratory Report #: F01120103 # of Samples: 3 Matrix: soil

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

Met
 CRITERIA
 Met
 CRITERIA

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:

① CCV %D
 2-butanone => %D (-25%) was > 20% but < 40%, sample results were ND, based on professional judgment No data were qualified
 4/10/11 KAC
 Tetrachloroethene => %D (-25) was > 20% but < 40%, sample results were ND, based on professional judgment No data are qualified

Semivolatile Organics (SW 846 Method 8270)

Site/Project: Site 94H Burnside AR/COC #: 603917 Laboratory Sample IDs: F0120103-001, -002, -003
 Laboratory: STSC Laboratory Report #: F0120103
 Methods: EPA 8270C

of Samples: 3 Matrix: Soil Batch #: 0349201

IS	SUA	CAS #	NAME	T.C.L.	Min. RF	Intercept	Calib. RF	Calib. RSD/R ²	CCV %D	Method Blanks	LCS	LCSD RPD	LGS	MS RPD	MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks	
																				>05
1	A	108-95-2	Phenol	0.80														NA	NA	NA
1	EN	111-44-4	bis(2-Chloroethyl)ether	0.70																
1	A	95-57-8	2-Chlorophenol	0.80																
1	EN	541-73-1	1,3-Dichlorobenzene	0.60																
1	EN	106-44-5	4-Methylphenol	0.60																
1	EN	95-50-1	1,2-Dichlorobenzene	0.40																
1	A	95-48-7	2-Methylphenol	0.70																
1	EN	108-60-1	bis(2-chloroisopropyl)ether	0.01																
1	A	106-44-5	4-Methylphenol	0.60																
1	EN	621-64-7	N-Nitroso-di-n-propylamine	0.50																
1	EN	67-72-1	Hexachlorobutadiene	0.50																
2	EN	98-95-3	Nitrobenzene	0.20																
2	EN	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	EN	111-91-1	bis(2-Chloroethoxy)methane	0.30																
2	A	120-83-2	2,4-Dichlorophenol	0.20																
2	EN	120-82-1	1,2,4-Trichlorobenzene	0.20																
2	EN	91-20-3	Naphthalene	0.70																
2	EN	106-47-8	4-Chloroaniline	0.01																
2	EN	87-68-3	Hexachlorobutadiene	0.01																
2	A	59-50-7	4-Chloro-3-methylphenol	0.20																
2	EN	91-57-6	2-Methylnaphthalene	0.40																
3	EN	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																

Notes: Shaded rows are RCRA compounds.

Comments: NA. Not Applicable

Reviewed By: Karin A. Lambert Date: 4/12/01

Semivolatile Organics

Site/Project: St. 94H Burnside AR/COC #: 603917 Batch #: 0349201

Laboratory: STSL Laboratory Report #: F0120103 # of Samples: 3 Matrix: Soil

IS BNA	GAS #	NAME	T C L	Min RF	Intercept	Calib. RF	Calib. RSD/ R ²	CGV %D		Method Blanks	LCS RSD	LCS MSD	MS RPD	MSD RPD	Field Dup. RPD	Equip. Blanks	Field Blanks		
								<20%/ 0.99	20%										
3	BN 91-58-7	2-Chloronaphthalene	0.80														NA	NA	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 121-14-3	2,4-Dinitrotoluene	0.20																
3	BN 84-66-2	Diethylphthalate	0.01																
3	BN 700-5-72-3	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 (I)	0.01																
4	BN 101-55-3	4-Bromophenyl-phenylether	0.10																
4	BN 118-74-1	Hexachlorobenzene	0.10																
4	A 87-46-3	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(e)anthracene	0.80																

Comments:

Semivolatile Organics

Site/Project: Sta 94H Burnside AR/COC #: 603917 Batch #: 0349201

Laboratory: STSL Laboratory Report #: FOL120103 # of Samples: 3 Matrix: SOIL

IS BNA	CAS #	NAME	TCL	Min. RF	Intercept	Calib. R ²	Calib. RSD %	CCV %D	Method Blanks	LCS B	LCS RPD	MS MSD	MS RPD	Field Dup. RPD	Equip. Blanks	Field Blanks
5	EN 218-01-9	Chrysene		0.70										NA	NA	NA
5	EN 117-81-7	bis(2-Ethylhexyl)phthalate		0.01												
6	EN 117-84-0	Di-n-octylphthalate		0.01												
6	EN 205-99-2	Benzo(b)fluoranthene		0.70												
6	EN 207-08-9	Benzo(k)fluoranthene		0.70												
6	EN 50-32-8	Benzo(e)pyrene		0.70												
6	EN 193-39-5	Indeno(1,2,3-cd)pyrene		0.50												
6	EN 53-70-3	Dibenz(a,h)anthracene		0.40												
6	EN 191-24-2	Benzo(g,h,i)perylene		0.50												
	10-86-1	Pyridine	✓			✓		✓	✓	✓	✓	✓	✓			

① Surrogate %R: One BN surrogate %R is > the upper limit; Sample results were ND; No data are qualified since only one BN surrogate was out of %R specification

② Internal Stds: One IS area count was slightly < the lower limit (50%); Sample results were ND; based on professional judgment no data are qualified as a result

Surrogate Recovery Outliers

Sample	SMC 1	SMC 2	SMC 3	SMC 4	SMC 5	SMC 6	SMC 7	SMC 8
FOL120103-002	✓	✓	✓	✓	120 (14)	✓	NA	NA

3 -SMC 2: Nitrobenzene-d5 (BN)
 -SMC 4: Phenol-d6 (A)
 -SMC 7: 2,2-Chlorophenol-d4 (A)
 KAL 4/12/01

4 -SMC 2: 2-Fluorobiphenyl (BN)
 5 -SMC 7: p-Terphenyl-d14 (BN)
 SMC 6: 2,4,6-Tribromophenol (A)

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
FOL120103-003	✓	✓	✓	✓	✓	✓	453112	✓	✓	✓	✓	✓

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

↳ 1892018 - 473005

Inorganic Metals

4/12/01

KAL

AR/COG #: ~~7214~~ 603917

Laboratory Sample ID: FOL120103-001, -002, -003

Laboratory Report #: FOL120103

Methods: EPA 6010B, EPA 7470A

of Samples: 3 Matrix: soil

Batch #: 0349286 (ICP), 0349177 (GVAA)

CAS #/ Analyte	QC Element										Field Dup. RPD	Equip. Blanks	Field Blanks			
	TAL	ICV	CCV	ICB	CCR	Method Blank	LCS	LCSD RPD	MS	MSD				MSD RPD	Rep. RPD	ICS AB
7429-90-5 Al	✓	✓	✓	✓	✓	✓	✓	✓	✓	NA	NA	✓	✓	NA	NA	NA
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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-22-3 Pb	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-23-5 Na	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-62-2 V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-66-6 Zn	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7439-92-1 Pb	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7439-95-2 Se	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-38-2 As	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-36-0 Sb	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7440-28-0 Tl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7439-97-6 Hg	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cyanide CN																

Not Provided

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

Comments: NA - Not Applicable

SEE OTHER SIDE

Reviewed By: Kevin A. Lambert

Date: 4/12/01

① ICB & CCB

Cd - The ICB & CCB values were $\geq DL$; Sample results were $< 5x$ the ICB & CCB values and data are qualified "J, B3"
Cr - The ICB & CCB absolute values were $> DL$ but $\leq RL$; Sample results for F0120103-001 & -002 were ND and data are qualified "UJ, B3"; Sample result for F0120103-003 was a detect and was $> 5x$ the DL; No data is qualified as a result.
Pb - The CCB value was $\geq DL$; Sample results were $> 5x$ the CCB value; No data are qualified as a result.

② Method Blank (MB)

Pb - The MB value was $\geq DL$; Sample results were $< 5x$ the MB value; data are qualified "J, B".

③ Rep RPD

Cd, As, & Hg - RPD does not apply; Sample results were $< 5x$ the RL. The difference between the original and the replicate result ~~was~~ ^{was} < 2 the RL; No data are qualified as a result.

Contract Verification Review (CVR)

Project Leader FRESHOUR Project Name SITE 94H BURNSITE Case No. 7214_01.05.00

AR/COC No. 603917 Analytical Lab SEVERN TRENT SDG No. F0L120103

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
1.1	All items on COC complete - data entry clerk initiated and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/mainix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L _c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	XX				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	NA				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1	Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2	Quantitation limit met for all samples	X		
3.3	Accuracy	X		
a)	Laboratory control samples accuracy reported and met for all samples	X		
b)	Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique		X	SURROGATE FOR SVOC SAMPLE #054517-001, SVOC METHOD BLANK & SVOC MSD FAILED RECOVERY LIMITS
c)	Matrix spike recovery data reported and met	X		
3.4	Precision	X		
a)	Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b)	Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5	Blank data	X		
a)	Method or reagent blank data reported and met for all samples	X		
b)	Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
3.6	Contractual qualifiers provided: "J" - estimated quantity; "B" - analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U" - analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H" - analysis done beyond the holding time	X		
3.7	Narrative addresses planchet flaring for gross alpha/beta	NA		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives) and pesticides/PCBs	NA		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330 and 8010)			
a) Initial calibration provided	NA		
b) Continuing calibration provided	NA		
c) Instrument run logs provided	NA		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	NA		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

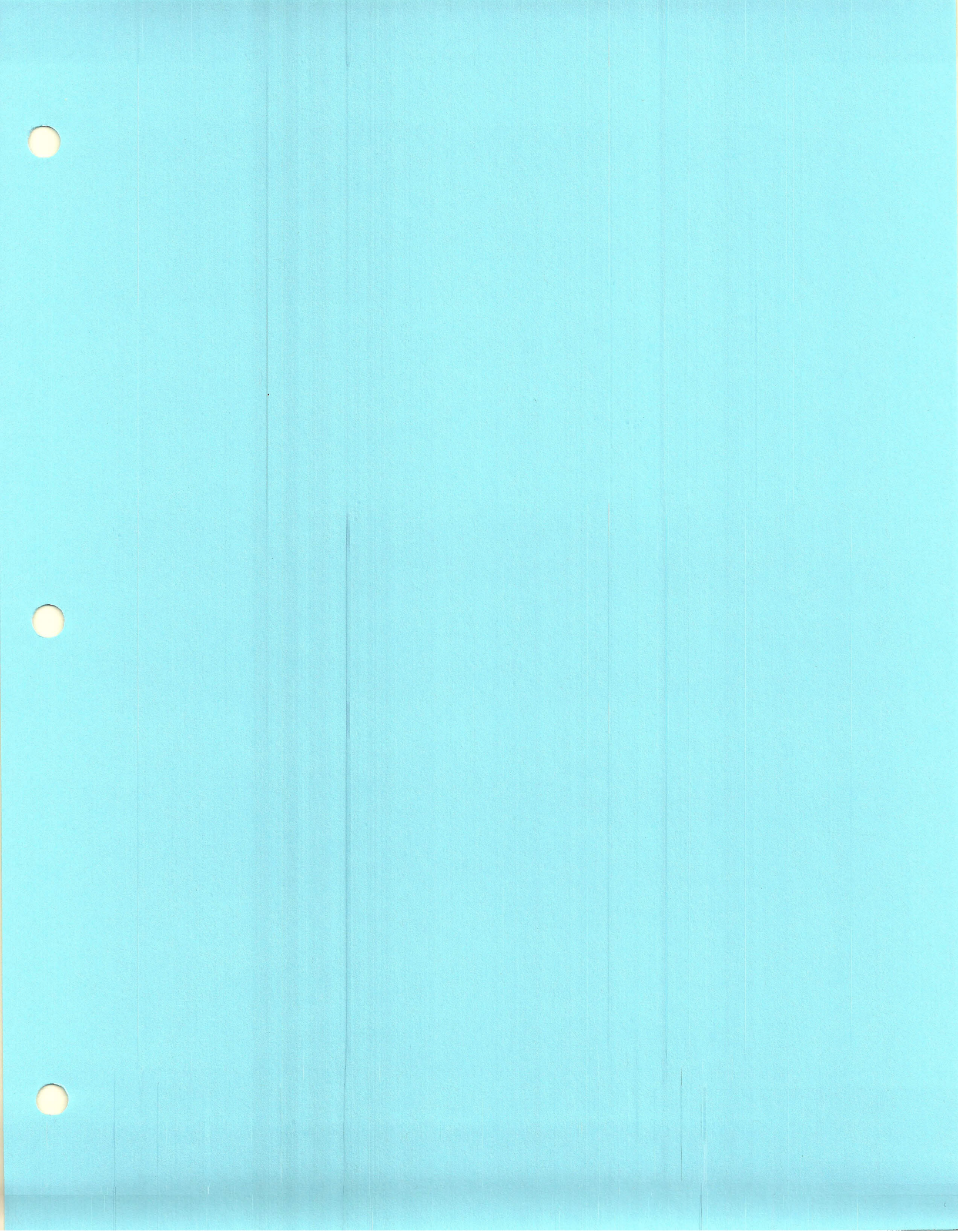
Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
METHOD BLANK	METALS	'J' QUALIFIER USED INCORRECTLY ON CHROMIUM & ARSENIC

Were deficiencies unresolved? Yes No

Based on the review, this data package is complete. Yes No

If no, provide: nonconformance report or correction request number 2466 and date correction request was submitted: 1-23-2001

Reviewed by: W. Palencia Date: 1-23-2001 Closed by: W. Palencia Date: 3-26-01



Contract Verification Review (CVR)

Project Leader FRESHOUR Project Name SWMU 94H Case No. 7214_02.02.21

AR/COC No. 604647 Analytical Lab SEVERN TRENT SDG No. F1G060102

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
1.1	All items on COC complete - data entry clerk initiated and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L _c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	NA				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided		X	'B' QUALIFIER USED INSTEAD OF 'J' ON METALS		
2.14	All requested result and TIC (if requested) data provided	X		SAMPLES #0566516-002 & 0566517-002		

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy	X		
a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	X		
3.4 Precision	X		
a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data	X		
a) Method or reagent blank data reported and met for all samples			ACETONE AND METHYLENE CHLORIDE DETECTED IN VOC TRIP BLANK
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	'B' QUALIFIER USED INCORRECTLY
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time		X	
3.7 Narrative addresses planchet flaming for gross alpha/beta	NA		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	NA		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.) a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	NA		
b) Continuing calibration provided	NA		
c) Instrument run logs provided	NA		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	NA		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
056516-002 & 056517-002	6010	'B' QUALIFIER USED INCORRECTLY

Were deficiencies unresolved? Yes No
 Based on the review, this data package is complete. Yes No

If no, provide: nonconformance report or correction request number 2946 and date correction request was submitted: 8-29-2001

Reviewed by: W. Palencia Date: 8-29-2001 Closed by: _____ Date: _____

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab Batch No. **N/A** SARWR No. **AR/COC 604647**

Date Samples Shipped: **7-5-01** SMO USE Contract No. **AJ-2880B** PO: **21632**
 Project/Task Manager: **P Freshour** Project/Task No.: **7214.02.02.21**
 Project Name: **SWMU 94H** SMO Authorization: *[Signature]*
 Record Center Code: **#3** M Loop: **314-298-8566** Severn Trent
 Logbook Ref. No.: **CFO 107-01** SMO Contact/Phone: **D Salimi 505-844-3110**
 Service Order No.: **NA** Send Report to SMO: **S. Jensen 505-844-3184**

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date Collected	Sample Matrix	Reference LOV (available at SMO)		Sample Type	Lab Sample ID		
						Container Type	Volume				
056516-001	CY94H-BH20-4	4	94H	070201 0929	S	AG	4oz	None	G	SA	TCLP VOC(1311/8260)
056516-002	CY94H-BH20-4	4	94H	070201 0929	S	AG	8oz	None	G	SA	TCLP SVOCs; TCLP metals - Be(1311/8270)
056517-001	CY94H-BH21-4	4	94H	070201 0946	S	AG	4oz	None	G	SA	TCLP VOC(1311/8260)
056517-002	CY94H-BH21-4	4	94H	070201 0946	S	AG	8oz	None	G	SA	TCLP SVOCs; TCLP metals - Be(1311/8270)
056518-001	CY94H-BH20-TB	N/A	94H	070201 0929	DIW	G	3x40ml	HCl	N/A	TB	VOC (8260)

RMMA Yes No Ref. No. _____
 Sample Disposal Return to Client Disposal by lab
 Turnaround Time 7 Day 15 Day 30 Day
 Return Samples By: Negotiated TAT QC Inits. *[Signature]*

Special Instructions/QC Requirements: Yes No No
 EDD Yes No
 Raw Data Package Yes No
 *Please send report to: MThacker MS1088 PH505-284-2575 Fax 505-284-2617
 msthack@sandia.gov

Please list as separate report.		Org.	Date	Time
1. Relinquished by	<i>[Signature]</i>	Org. 6135	Date 070201	Time 1228
1. Received by	<i>[Signature]</i>	Org. 7135	Date 070201	Time 1328
2. Relinquished by	<i>[Signature]</i>	Org. 6132	Date 7-5-01	Time 1100
2. Received by	<i>[Signature]</i>	Org.	Date	Time
3. Relinquished by	<i>[Signature]</i>	Org.	Date	Time
3. Received by	<i>[Signature]</i>	Org.	Date	Time

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

Shipping Code: <u> </u>	Control No. <u> </u>
--------------------------	-----------------------

SHIPPER
 F 6951-AE# (8-98)
 Supersedes (1-98) Issue

Sandia National Laboratories
1515 Eubank SE
Albuquerque, NM 87123

Blocks with RED letters are required.
 Press F1 for instructions for each field.
 NOTE: If text entered wraps, the form could print on second page.

(1) FROM:
 New Mexico
 California
 Other

Before Filling Out Form Call 845-0068 for Document Number **(2) Document No. 745259**

(3) SHIP TO:
 Severn Trent - St. Louis
 Attn: Mark Loeb Tel: 800-333-3305
 13715 Rider Trail North
 Earth City, MO 63045

Contract#: AJ-2480B
 COC #: 604647

(10) RMA # (if applicable) N/A

(4) Date Prepared: <u>7-5-01</u>	(5) Highest Material Security Classification: <u>UNC</u>	(6) Page 1 of 1
(7) Nuclear Explosive-Like Assembly (NELA)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		(8) Date to be returned: <input checked="" type="checkbox"/> No Return
(9) Date Due at Destination: <u>7-6-01</u>	<input checked="" type="checkbox"/> Firm: (CA only-see instructions or press F1 for PTA justification) <input type="checkbox"/> Flex: (Most economical transportation)	

*** FIRST OVERNIGHT**

(11a) Form Filled Out By (Name) Douglas E. Perry, 6132	(11b) Phone: 505-845-0867	(12) Case No: 10204 1.2	(13) Freight Billing: Sandia Pays <input checked="" type="checkbox"/> Consignee Pays <input type="checkbox"/> If Consignee Pays, Carrier & acct. no.					
(14a) Requester Name: Same	(14b) Org: 6132	(14c) MS: 0756	(14d) Phone: 505-845-0867	(14e) SSN: 212-56-6412				
Pickup Location: (15a) Bldg: NA	(15b) Room: NA	New Sandia Location (if applicable) (16a) Site Code: NA	(16b) Bldg: NA	(16c) Room: NA	(16d) Org: NA			
(17) Reason for Shipment: (must select one): Analysis/Testing		(18) Authority Number: NA	(19) DOE Transportation Safeguards Dept. Courier Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
(20) Item No.	(21) Sec. Class.	(22) Qty	(23) Unit	(24) Haz. Mat'l.	(25) Property Tag No. and/or MID No.	(26) Description	(27) Unit Value	Total \$
	UNC	1	EA	N	NA	Environmental Solid/Liquid Samples	\$0.00	\$0.00
						-----Last Item-----		\$0.00
								\$0.00
						COUPLER #1: 3.0 LB @ 30 LBS. COC 604647		\$0.00
								\$0.00
								\$0.00
								\$0.00
								\$0.00
								\$0.00
						SANDIA SHIPPING ONLY: Please FAX a copy of this Shipper to SMO at 844-4976. Thanks!		\$0.00
								\$0.00
Grand Total							\$0.00	\$0.00

(28) Type or print approval name: <u>D.E. Perry, 6132</u> Authorizing Signature: <u>[Signature]</u> Manager or delegated authority I certify that the material being offered for shipment is non hazardous unless noted as hazardous in block 24 and required information is being provided.		(29) Special Approval (International): Signature _____ Org. _____		(30) Special Approval (Service Clerk, DOE): Signature _____ Org. _____	
(31) Recipients's Signature/Co. Signature/Co. _____ Date _____		(32) Contracting or GFP Rep. Signature _____ Date _____		The listed material and accompanying information have been examined and the hazardous material destinations and all preparations for shipment are certified correct.	
Received in Shipping: Date: <u>7/5/01</u> Time: <u>12:40</u>	Shipping Service Clerk: <u>[Signature]</u>	Property Management Rep: <u>[Signature]</u>	Hazardous Material Consultant		
Date Shipped or Handcarried:	Routing:	B/L No.:	No. of Boxes: <u>30</u>	Weight: <u>3.0</u>	Dimension: <u>3.0</u>
			<u>1</u>	<u>LBS.</u>	<u>ft 3</u>
					Packed by: <u>[Signature]</u>



SEVERN TRENT LABORATORIES, INC.
PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: F1G060102 Sandia National Laboratories PAGE 1
 Mixed Waste Treatment Date Reported: 8/08/01
 Project Number: 604647

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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Client Sample ID: 056516-001/CY94H-BH20-4

Sample #: 001 Date Sampled: 07/02/01 09:29 Date Received: 07/06/01 Matrix: SOLID

Volatile Organics by GC/MS TCLP

Reviewed

Vinyl chloride	ND	100	ug/L	SW846 8260B
1,1-Dichloroethene	ND	50	ug/L	SW846 8260B
2-Butanone	ND	200	ug/L	SW846 8260B
Chloroform	ND	50	ug/L	SW846 8260B
Carbon tetrachloride	ND	50	ug/L	SW846 8260B
1,2-Dichloroethane	ND	50	ug/L	SW846 8260B
Benzene	ND	50	ug/L	SW846 8260B
Trichloroethene	ND	50	ug/L	SW846 8260B
Tetrachloroethene	ND	50	ug/L	SW846 8260B
Chlorobenzene	ND	50	ug/L	SW846 8260B

Client Sample ID: 056516-002/CY94H-BH20-4

Sample #: 002 Date Sampled: 07/02/01 09:29 Date Received: 07/06/01 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals TCLP

Reviewed

Silver	TCLP	ND	0.25	mg/L	SW846 6010B
Arsenic	TCLP	ND	0.75	mg/L	SW846 6010B
Barium	TCLP	1.6	0.50	mg/L	SW846 6010B
Beryllium	TCLP	ND	0.12	mg/L	SW846 6010B
Cadmium	TCLP	0.0016 B	0.12	mg/L	SW846 6010B
Chromium	TCLP	ND	0.25	mg/L	SW846 6010B
Lead	TCLP	0.0062 B	0.25	mg/L	SW846 6010B
Selenium	TCLP	0.0058 B	0.12	mg/L	SW846 6010B

Mercury in Liquid Waste (Manual Cold-Vapor) TCLP

Reviewed

Mercury	TCLP	ND	0.010	mg/L	SW846 7470A
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B Estimated result. Result is less than RL.

Semivolatile Organic Compounds by GC/MS TCLP

In Review

Pyridine	ND	100	ug/L	SW846 8270C
1,4-Dichlorobenzene	ND	50	ug/L	SW846 8270C
2-Methylphenol	ND	50	ug/L	SW846 8270C
4-Methylphenol	ND	50	ug/L	SW846 8270C
Hexachloroethane	ND	50	ug/L	SW846 8270C

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: F1G060102 Sandia National Laboratories Date Reported: 8/08/01 PAGE 2
 Mixed Waste Treatment
 Project Number: 604647

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Client Sample ID: 056516-002/CY94H-BH20-4				
Sample #: 002 Date Sampled: 07/02/01 09:29 Date Received: 07/06/01 Matrix: SOLID				
Semivolatile Organic Compounds by GC/MS TCLP In Review				
Nitrobenzene	ND	50	ug/L	SW846 8270C
Hexachlorobutadiene	ND	50	ug/L	SW846 8270C
2,4,6-Trichloro-phenol	ND	50	ug/L	SW846 8270C
2,4,5-Trichloro-phenol	ND	50	ug/L	SW846 8270C
2,4-Dinitrotoluene	ND	50	ug/L	SW846 8270C
Hexachlorobenzene	ND	50	ug/L	SW846 8270C
Pentachlorophenol	ND	250	ug/L	SW846 8270C

Inorganic Analysis Reviewed
 Percent Moisture 15.3 0.10 % MCAWW 160.3 MOD

Client Sample ID: 056517-001/CY94H-BH21-4
 Sample #: 003 Date Sampled: 07/02/01 09:46 Date Received: 07/06/01 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Volatile Organics by GC/MS TCLP Reviewed				
Vinyl chloride	ND	100	ug/L	SW846 8260B
1,1-Dichloroethene	ND	50	ug/L	SW846 8260B
2-Butanone	ND	200	ug/L	SW846 8260B
Chloroform	ND	50	ug/L	SW846 8260B
Carbon tetrachloride	ND	50	ug/L	SW846 8260B
1,2-Dichloroethane	ND	50	ug/L	SW846 8260B
Benzene	ND	50	ug/L	SW846 8260B
Trichloroethene	ND	50	ug/L	SW846 8260B
Tetrachloroethene	ND	50	ug/L	SW846 8260B
Chlorobenzene	ND	50	ug/L	SW846 8260B

Client Sample ID: 056517-002/CY94H-BH21-4
 Sample #: 004 Date Sampled: 07/02/01 09:46 Date Received: 07/06/01 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals TCLP Reviewed
 Silver TCLP ND 0.25 mg/L SW846 6010B

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

PAGE 3

Lot #: F1G060102 Sandia National Laboratories Date Reported: 8/08/01
 Mixed Waste Treatment
 Project Number: 604647

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Client Sample ID: 056517-002/CY94H-BH21-4				
Sample #: 004 Date Sampled: 07/02/01 09:46 Date Received: 07/06/01 Matrix: SOLID				
Arsenic	TCLP	0.0058 B	0.75	mg/L SW846 6010B
Barium	TCLP	2.1	0.50	mg/L SW846 6010B
Beryllium	TCLP	ND	0.12	mg/L SW846 6010B
Cadmium	TCLP	0.00098 B	0.12	mg/L SW846 6010B
Chromium	TCLP	ND	0.25	mg/L SW846 6010B
Lead	TCLP	0.0076 B	0.25	mg/L SW846 6010B
Selenium	TCLP	ND	0.12	mg/L SW846 6010B
Mercury in Liquid Waste (Manual Cold-Vapor) TCLP				
Mercury	TCLP	ND	0.010	mg/L SW846 7470A Reviewed

B Estimated result. Result is less than RL.

Semivolatile Organic Compounds by GC/MS TCLP				In Review
Pyridine	ND	100	ug/L	SW846 8270C
1,4-Dichlorobenzene	ND	50	ug/L	SW846 8270C
2-Methylphenol	ND	50	ug/L	SW846 8270C
4-Methylphenol	ND	50	ug/L	SW846 8270C
Hexachloroethane	ND	50	ug/L	SW846 8270C
Nitrobenzene	ND	50	ug/L	SW846 8270C
Hexachlorobutadiene	ND	50	ug/L	SW846 8270C
2,4,6-Trichloro-phenol	ND	50	ug/L	SW846 8270C
2,4,5-Trichloro-phenol	ND	50	ug/L	SW846 8270C
2,4-Dinitrotoluene	ND	50	ug/L	SW846 8270C
Hexachlorobenzene	ND	50	ug/L	SW846 8270C
Pentachlorophenol	ND	250	ug/L	SW846 8270C

Inorganic Analysis				Reviewed
Percent Moisture	15.2	0.10	%	MCAW 160.3 MOD

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: F1G060102 Sandia National Laboratories Date Reported: 8/08/01 PAGE 4
 Mixed Waste Treatment
 Project Number: 604647

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Client Sample ID: 056518-001/CY94H-BH20-TB				
Sample #: 005	Date Sampled: 07/02/01 09:46	Date Received: 07/06/01	Matrix: WATER	Reviewed
Volatile Organics by GC/MS				
Chloromethane	ND	10	ug/L	SW846 8260B
Vinyl chloride	ND	5.0	ug/L	SW846 8260B
Bromomethane	ND	10	ug/L	SW846 8260B
Chloroethane	ND	10	ug/L	SW846 8260B
Acetone	3.9 J,B	20	ug/L	SW846 8260B
1,1-Dichloroethene	ND	5.0	ug/L	SW846 8260B
Methylene chloride	0.67 J,B	5.0	ug/L	SW846 8260B
Carbon disulfide	ND	5.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/L	SW846 8260B
2-Butanone	ND	20	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	5.0	ug/L	SW846 8260B
Chloroform	ND	5.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	5.0	ug/L	SW846 8260B
Benzene	ND	5.0	ug/L	SW846 8260B
Trichloroethene	ND	5.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	5.0	ug/L	SW846 8260B
Bromodichloromethane	ND	5.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B
Toluene	ND	5.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/L	SW846 8260B
2-Hexanone	ND	20	ug/L	SW846 8260B
Tetrachloroethene	ND	5.0	ug/L	SW846 8260B
Dibromochloromethane	ND	5.0	ug/L	SW846 8260B
Chlorobenzene	ND	5.0	ug/L	SW846 8260B
Ethylbenzene	ND	5.0	ug/L	SW846 8260B
Xylenes (total)	ND	5.0	ug/L	SW846 8260B
Styrene	ND	5.0	ug/L	SW846 8260B
Bromoform	ND	5.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L	SW846 8260B

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

FIG060102

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab	SARWR No.		Contract No.		Waste Characterization	
Batch No.	NA		AR/COC		604647	
Dept. No./Mail Stop:	6132/1088		Project/Task No.:		7214.02.02.21	
Project/Task Manager:	P Freshour		SMO Authorization:		[Signature]	
Project Name:	SWMU 94H		Lab Contact:		M Loeb 314-298-8566	
Record Center Code:	#3		SMO Contact/Phone:		D Salimi 505-844-3110	
Logbook Ref. No.:	CFO 107-01		Send Report to SMO:		S Jensen 505-844-3184	
Service Order No.	NA		Lab Destination:		Savern Trent	
Location	Tech Area		ER Site No.		Date/Time Collected	
Building	Room		ER Sample ID or Sample Location Detail		Sample Matrix	
Sample No.-Fraction	NA		Beginning Depth (ft)		Date/Time Collected	
056516-001	CY94H-BH20-4		4		94H 070201 0929	
056516-002	CY94H-BH20-4		4		94H 070201 0929	
056517-001	CY94H-BH21-4		4		94H 070201 0946	
056517-002	CY94H-BH21-4		4		94H 070201 0946	
056518-001	CY94H-BH20-TB		N/A		94H 070201 0929	
Reference LOV (available at SMO)						
Sample No.	Volume	Container Type	Preserve All@4C	Collection Method	Sample Type	Lab Sample ID
056516-001	4oz	AG	None	G	SA	TCLP VOC(1311/8260)
056516-002	8oz	AG	None	G	SA	TCLP SVOCs; TCLP metals + Be(1311/8270)
056517-001	4oz	AG	None	G	SA	TCLP VOC(1311/8260)
056517-002	8oz	AG	None	G	SA	TCLP SVOCs; TCLP metals + Be(1311/8270)
056518-001	3x40ml	G	HCl	N/A	TB	VOC(8260)
RMMA	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Ref. No.		Abnormal Conditions	
Sample Disposal	Return to Client <input type="checkbox"/>		Disposal by lab <input checked="" type="checkbox"/>		Receipt <input type="checkbox"/>	
Turnaround Time	7 Day <input type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day <input checked="" type="checkbox"/>		Negotiated TAT <input type="checkbox"/>		Raw Data Package <input checked="" type="checkbox"/>	
Return Samples By:			Special Instructions/QC Requirements:			Please send report to:
Name	Signature	Init	Company/Organization/Phone/Cellular	EDD	Yes <input type="checkbox"/> No <input type="checkbox"/>	MTTracker MS 1088 Ph 505-284-2575 Fax 505-284-2617
M Sanchez	[Signature]	MS	Weston/6135/845-3267	Raw Data Package	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	msthack@sandia.gov
G Quintana	[Signature]	GQ	IT/6135/284-3309	Please list as separate report.		
W Gibson	[Signature]	WG	MDM/6135/845-3267	Date		
Sample Team Members			Date			Time
1. Relinquished by [Signature]			Date 07-20-01			Time 13:28
1. Received by [Signature]			Date 07-02-01			Time 13:28
2. Relinquished by [Signature]			Date 7-5-01			Time 11:00
2. Received by [Signature]			Date 07-02-01			Time 07:15
3. Relinquished by [Signature]			Date			Time
3. Received by [Signature]			Date			Time

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

Shipping Code: NA Consignee: NA

SHIPPER
SF 6951-AE# (8-88)
Supersedes (1-88) Issue

Sandia National Laboratories
1515 Eubank SE
Albuquerque, NM 87123

Blocks with RED letters are required.
Press F1 for instructions for each field.
NOTE: If text entered wraps, the form could print on second page.

(1) FROM:
 New Mexico
 California
 Other

Before Filling Out Form Call 845-0068 for Document Number (2) Document No. 745259

(3) SHIP TO:
Severn Trent - St. Louis
Attn: Mark Loeb Tel: 800-333-3305
13715 Rider Trail North
Earth City, MO 63045
Contract#: AJ-2480B
COC #: 604647
(10) RMA # (if applicable) N/A

(4) Date Prepared: 7-5-01 (5) Highest Material Security Classification: UNC (6) Page 1 of 1
(7) Nuclear Explosive-Like Assembly (NELA)?
 Yes No (8) Date to be returned:
 No Return
(9) Date Due at Destination: 7-6-01 Firm: (CA only-see instructions or press F1 for PTA justification)
 Flex: (Most economical transportation)

*** FIRST OVERNIGHT**

(11a) Form Filled Out By (Name): Douglas E. Perry, 6132 (11b) Phone: 505-845-0867 (12) Case No: 10204 1.2 (13) Freight Billing: Sandia Pays Consignee Pays
(14a) Requester Name: Same (14b) Org: 6132 (14c) ISS: 0756 (14d) Phone: 505-845-0867 (14e) SSN: 212-56-6412
Pickup Location: (15a) Bldg: NA (15b) Room: NA New Sandia Location (if applicable) (15c) Site Code: NA (16b) Bldg: NA (16c) Room: NA (16d) Org: NA
(17) Reason for Shipment: (must select one): Analysis/Testing (18) Authority Number: NA (19) DOE Transportation Safeguards Dept. Courier Required? Yes No
Analysis/Testing
(20) Item No. (21) Sec. Class. (22) Qty (23) Unit (24) Haz. Mat'l. (25) Property Tag No. and/or MID No. (26) Description (27) Unit Value Total \$
1 UNC 1 EA N NA Environmental Solid/Liquid Samples \$0.00 \$0.00
-----Last Item----- \$0.00
quantity: 3.0 lbs 30 lbs COC 604647 \$0.00
\$0.00
\$0.00
\$0.00
\$0.00
\$0.00
\$0.00
SANDIA SHIPPING ONLY: Please \$0.00
FAX a copy of this Shipper to SMO \$0.00
at 844-4976. Thanks! \$0.00
Grand Total \$0.00

(28) Type or print approval name: D.E. Perry, 6132 (29) Special Approval (International): (30) Special Approval (Service Clerk, DOE):
Authorizing Signature: [Signature] Signature _____ Org. _____
Signature _____ Org. _____
Signature _____ Org. _____
Signature _____ Date _____
Signature _____ Date _____
I certify that the material being offered for shipment is non hazardous unless noted as hazardous in block 24 and required information is being provided.
The listed material and accompanying information have been examined and the hazardous material destinations and all preparations for shipment are certified correct.
Received in Shipping Date: 7/5/01 Time: 10:40 Shipping Service Clerk: [Signature] Property Management Rep: [Signature]
Date Shipped or Handcarried: _____ Routing: _____ B/L No. _____ No. of Boxes: 1 Weight: 30 lbs Dimension: 3-0 Packed by: [Signature]



Lot No.: FIG060102

**Condition Upon Receipt Form
St. Louis Laboratory**

Client: Sandia Date: 070601 Time: 0715
 Quote No: 34436 34180 Initiated by: [Signature]
 Shipper/No: 4708 8601 5442 Fed Ex COC/RFA Numbers: 101467

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

- | | | | |
|---|--|---|---|
| 1. <input checked="" type="radio"/> Y <input type="radio"/> N | Sample received in undamaged condition. | 5. <input checked="" type="radio"/> Y <input type="radio"/> N | Sample volume sufficient for analysis. |
| 2. <input checked="" type="radio"/> Y <input type="radio"/> N | Sample received within $4^{\circ}\text{C} \pm 2^{\circ}\text{C}^*$
Record temperature: <u>3</u> | 6. <input checked="" type="radio"/> Y <input type="radio"/> N | Sample received with Chain of Custody. |
| 3. <input type="radio"/> Y <input checked="" type="radio"/> N <input checked="" type="radio"/> NA | Sample received with proper pH**. | 7. <input checked="" type="radio"/> Y <input type="radio"/> N | Chain of Custody matches sample IDs on containers. |
| 4. <input checked="" type="radio"/> Y <input type="radio"/> N | Sample received in proper containers. | 8. <input checked="" type="radio"/> Y <input type="radio"/> N | Custody seal received intact and tamper evident on cooler. |
| | | 9. <input checked="" type="radio"/> Y <input type="radio"/> N | Custody seal received intact and tamper evident on bottles. |

* Temperature Variance Does Not Affect the Following Analyses: _____

** For DOE-AL (Pantex, LANL, Sandia, Timet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes: Blue ice frozen

Corrective Action:

- Client's Name: _____ Informed verbally on: _____ By: _____
- Client's Name: _____ Informed in writing on: _____ By: _____
- Sample(s) processed "as is". _____
- Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: [Signature] Date: 070601
 Project Management Review: [Signature] Date: 7-6-01

**SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
 THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
 IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR
 INITIALS AND THE DATE NEXT TO THAT ITEM**

SL20300
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SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 120G
STORAGE LOC: V9
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056516-001/CY94H-BH20-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G060102-001
WORK ORDER: EF1PH
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:29
RECEIVING TIME: 7:15
SDG# : F1G060102

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	<u>WRK</u>	<u>REQUEST</u>	<u>EXTRACTION</u>	<u>ANALYSIS</u>
	<u>LOC</u>	<u>DATE</u>	<u>EXP DATE</u>	<u>EXP DATE</u>
Volatile Organics, GC/MS (8260B)	06	7/06/01	7/16/01	7/30/01
TCLP(1311-ZHE/filter) -> PURGE-AND-TRAP (Low Level)				
STL: SW-846 8260-TCLP				
(A-58-QK-01) EF1PH-1-AA Protocol: C				
QC Program: STANDARD TEST SET				

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 120G
STORAGE LOC: V9
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056516-001/CY94H-BH20-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G060102-001-D
WORK ORDER: EF1PH MSD
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:29
RECEIVING TIME: 7:15
SDG# : F1G060102

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	<u>WRK</u>	<u>REQUEST</u>	<u>EXTRACTION</u>	<u>ANALYSIS</u>
	<u>LOC</u>	<u>DATE</u>	<u>EXP DATE</u>	<u>EXP DATE</u>
Volatile Organics, GC/MS (8260B)	06	7/06/01	7/16/01	7/30/01
TCLP(1311-ZHE/filter) -> PURGE-AND-TRAP (Low Level)				
STL: SW-846 8260-TCLP				
(A-58-QK-01) EF1PH-1-AE Protocol: C QC Program: STANDARD TEST SET				

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SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 120G
STORAGE LOC: V9
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056516-001/CY94H-BH20-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G060102-001-S
WORK ORDER: EF1PH MS
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:29
RECEIVING TIME: 7:15
SDG# : F1G060102

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	<u>WRK</u>	<u>REQUEST</u>	<u>EXTRACTION</u>	<u>ANALYSIS</u>
	<u>LOC</u>	<u>DATE</u>	<u>EXP DATE</u>	<u>EXP DATE</u>
Volatile Organics, GC/MS (8260B)	06	7/06/01	7/16/01	7/30/01
TCLP(1311-ZHE/filter) -> PURGE-AND-TRAP (Low Level)				
STL: SW-846 8260-TCLP				
(A-58-QK-01) EF1PH-1-AD Protocol: C				
QC Program: STANDARD TEST SET				

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:30:38
User Id.: CLARKEJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 250G
STORAGE LOC: T162
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056516-002/CY94H-BH20-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:
METALS REQUIRE DUPLICATE!!
Beginning Depth: .00 Ending Depth: .00

QUOTE/SAR #: 34180
LAB ID: F-1G060102-002
WORK ORDER: EF1PJ
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:29
RECEIVING TIME: 7:15
SDG# : F1G060102

***** ANALYSIS *****

WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
06	7/06/01	0/00/00	10/09/01
Archive NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-ZZ-01) EF1PJ-1-AA Protocol: A QC Program: STANDARD TEST SET			
06	7/06/01	7/17/01	8/26/01
Base/Neutrals and Acids (8270C) TCLP(1311) -> LIQ/LIQ, SEP FUNNEL - Acid->Base STL: SW-846 8270C-TCLP (A-62-QL-01) EF1PJ-1-AC Protocol: C QC Program: STANDARD TEST SET			
06	7/06/01	7/30/01	8/27/01
Mercury (7470A, Cold Vapor) - Liquid TCLP(1311) -> METALS, TOTAL (Method exclusive) M7470TP HG (A-0M-08-01) EF1PJ Protocol: C QC Program: STANDARD TEST SET			
06	7/06/01	12/29/01	1/07/02
Inductively Coupled Plasma (6010B Trace) TCLP(1311) -> METALS, TOTAL MT6010TP AG,AS,BA,BE,CD,CR,PB,SE (A-34-QM-01) EF1PJ Protocol: C QC Program: STANDARD TEST SET			
06	7/06/01	0/00/00	10/09/01
Moisture, Percent (160.3) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-WM-01) EF1PJ-1-A5 Protocol: A QC Program: STANDARD TEST SET			

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL, St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 250G
STORAGE LOC: T162
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056516-002/CY94H-BH20-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:
METALS REQUIRE DUPLICATE!!
Beginning Depth: .00 Ending Depth: .00

QUOTE/SAR #: 34180
LAB ID: F-1G060102-002-D
WORK ORDER: EF1PJ MSD
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:29
RECEIVING TIME: 7:15
SDG# : F1G060102

***** ANALYSIS *****

	WRK	REQUEST	EXTRACTION	ANALYSIS
	LOC	DATE	EXP DATE	EXP DATE
Base/Neutrals and Acids (8270C)	06	7/06/01	7/17/01	8/26/01
TCLP(1311) -> LIQ/LIQ, SEP FUNNEL - Acid->Base				
STL: SW-846 8270C-TCLP				
(A-62-QL-01) EF1PJ-1-AT Protocol: C QC Program: STANDARD TEST SET				

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 250G
STORAGE LOC: T162
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056516-002/CY94H-BH20-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:
METALS REQUIRE DUPLICATE!!
Beginning Depth: .00 Ending Depth: .00

QUOTE/SAR #: 34180
LAB ID: F-1G060102-002-S
WORK ORDER: EF1PJ MS
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:29
RECEIVING TIME: 7:15
SDG# : F1G060102

***** ANALYSIS *****

	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Base/Neutrals and Acids (8270C) TCLP(1311) -> LIQ/LIQ, SEP FUNNEL - Acid->Base STL: SW-846 8270C-TCLP (A-62-QL-01) EF1PJ-1-AR Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	7/17/01	8/26/01
Mercury (7470A, Cold Vapor) - Liquid TCLP(1311) -> METALS, TOTAL (Method exclusive) M7470TP HG (A-0M-08-01) EF1PJ Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	7/30/01	8/27/01
Inductively Coupled Plasma (6010B Trace) TCLP(1311) -> METALS, TOTAL MT6010TP AG,AS,BA,BE,CD,CR,PE,SE (A-34-QM-01) EF1PJ Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	12/29/01	1/07/02

PSL20300
Page 1

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122557 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 120G
STORAGE LOC: V9
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056517-001/CY94H-BH21-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G050102-003
WORK ORDER: EF1PK
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:46
RECEIVING TIME: 7:15
SDG# : F1G060102

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Volatile Organics, GC/MS (8260B)	06	7/06/01	7/16/01	7/30/01
TCLP(1311-ZHE/filter) -> PURGE-AND-TRAP (Low Level)				
STL: SW-846 8260-TCLP				
(A-58-QK-01) EF1PK-1-AA Protocol: C				
QC Program: STANDARD TEST SET				

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:30:38
User Id.: CLARKEJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 250G
STORAGE LOC: T162
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056517-002/CY94H-BH21-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G060102-004
WORK ORDER: EF1PL
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:46
RECEIVING TIME: 7:15
SDG# : F1G060102

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****				
	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Archive NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-22-01) EF1PL-1-AA Protocol: A QC Program: STANDARD TEST SET	06	7/06/01	0/00/00	10/09/01
Base/Neutrals and Acids (8270C) TCLP(1311) -> LIQ/LIQ, SEP FUNNEL - Acid->Base STL: SW-846 8270C-TCLP (A-62-QL-01) EF1PL-1-AC Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	7/17/01	8/26/01
Mercury (7470A, Cold Vapor) - Liquid TCLP(1311) -> METALS, TOTAL (Method exclusive) M7470TP HG (A-0M-08-01) EF1PL Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	7/30/01	8/27/01
Inductively Coupled Plasma (6010B Trace) TCLP(1311) -> METALS, TOTAL MT6010TE AG,AS,BA,BE,CD,CR,PB,SE (A-34-QM-01) EF1PL Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	12/29/01	1/07/02
Moisture, Percent (160.3) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-WM-01) EF1PL-1-AN Protocol: A QC Program: STANDARD TEST SET	06	7/06/01	0/00/00	10/09/01

PSL20300
Page 1

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: CLARKEJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 3XVIAL40
STORAGE LOC: V2J
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: WATER
SAMPLE ID: 056518-001/CY94R-BH20-TB
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G060102-005
WORK ORDER: EFLPM
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:46
RECEIVING TIME: 7:15
SDG# : F1G060102

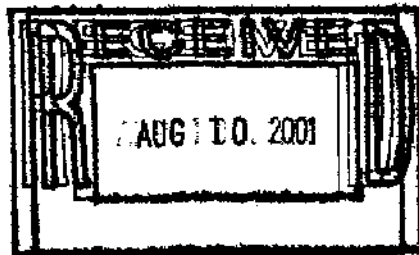
Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Volatile Organics, GC/MS (8260B) PURGE AND TRAP - 5 mL purge STL: SW-846 8260B (I-15-QK-01) EFLPM-1-AA Protocol: A	06	7/06/01	0/00/00	7/16/01

QC Program: STANDARD TEST SET

CUSTOMER
COPY



ANALYTICAL REPORT



STL St. Louis
19715 River Trail North
Earth City, MO 63045

Tel 314 298 8566
Fax 314 298 8957
www.stl-inc.com

PROJECT NO. 604647

Mixed Waste Treatment

Lot #: F1G060102

Suzi Jensen

Sandia National Laboratories
Sample Management Office
BLDG 823 Room 4279
Mail Stop 0756
1515 Eubank BLVD. SE
Albuquerque, NM 87123

SEVERN TRENT LABORATORIES, INC.

A handwritten signature in black ink, appearing to read "Mark J. Loeb".

Mark J. Loeb
Project Manager

August 9, 2001

CASE NARRATIVE

Sandia National Laboratories
Sample Management Office
Organization 6133/Mail Stop 1042
1515 Eubank Blvd SE
Albuquerque, NM 87123

August 9, 2001

ATTN: Suzi Jensen

Page 1 of 2

Sandia Case Number : 7214.02.02.21
Sandia Contract Number : AJ-2480B
Sandia Project Name : SWMU 94H
AR/COC Number : 604647
Quanterra Login Number : FIG060102
Date Received : July 07, 2001
Number of Samples : Five (5)
Sample Type : Solid and Water
Service Order Number : CF0107-01

I. INTRODUCTION

On July 06, 2001, four (4) solid samples and one (1) water sample were received at STL St. Louis, from Sandia National Laboratories. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

All analytical results and quality control data for this data package were obtained in accordance with the contractual requirements and meet STL's Quality Assurance Program, which has been approved by Sandia National Laboratory.

Upon receipt the sample was given laboratory ID numbers to correspond with the specific client ID's. The cross-reference table can be found on a separate page as part of the narrative.

II. RESULTS/METHODOLOGY

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification, analytical results and the appropriate detection limits.

The samples were prepared and analyzed using the methods indicated within the report.

Page 2 of 2

Date : August 9, 2001

STL Login Number : FIG060102

III. QUALITY CONTROL

QA/QC information was performed on the enclosed analytical data. The purpose of QA/QC information is to ensure the user that the data enclosed are scientifically valid and are used to assess the laboratory's performance.

Please note that although the certificate of analysis lists Detection Limit, this is actually the laboratory reporting limit. This is not a method detection limit (MDL).

IV. NONCONFORMANCES/COMMENTS

Condition Upon Receipt:

The temperature upon receipt was 3.0 °C. No problems were noted at the time of sample receipt.

Nonconformance 06-05089

Affected Samples:

FIG060102 (2): 056516-002/CY94H-BH20-4

FIG060102 (4): 056517-002/CY94H-BH21-4

Affected Methods:

7470A

Case Narrative:

The MS and MSD were spiked with an expired TCLP spiking solution. The spike standard expiration date was established internally by STL and was not method based. MS and MSD results were well within control limits indicating the standard was still good.

Corrective Action:

Analysts will be reminded to look for expiration dates as well as discard of expired standards and spiking solutions immediately.

Nonconformance 06-05125

Affected Samples:

FIG060102 (2): 056516-002/CY94H-BH20-4

FIG060102 (4): 056517-002/CY94H-BH21-4

Affected Methods:

7470A

Case Narrative:

Client requested a matrix spike and duplicate for the metals analysis. A matrix spike and matrix spike duplicate were prepped and analyzed instead of the matrix spike and duplicate for the mercury analysis.

METHODS SUMMARY

FIG060102

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
Mercury in Liquid Waste (Manual Cold-Vapor)	SW846 7470A	SW846 1311/7470
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Semivolatile Organic Compounds by GC/MS	SW846 8270C	SW846 1311/3510
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 1311/3010
Volatile Organics by GC/MS	SW846 8260B	SW846 1311/5030
Volatile Organics by GC/MS	SW846 8260B	SW846 5030

References:

- MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.
- SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical
Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

FIG060102

NO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
EF1PH	001	056516-001/CY94H-BH20-4	07/02/01	09:29
EF1PJ	002	056516-002/CY94H-BH20-4	07/02/01	09:29
EF1PK	003	056517-001/CY94H-BH21-4	07/02/01	09:46
EF1PL	004	056517-002/CY94H-BH21-4	07/02/01	09:46
EF1PM	005	056518-001/CY94H-BH20-TB	07/02/01	09:46

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, palat filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

SANDIA NATIONAL LABORATORIES

Client Sample ID: 056516-001/CY94H-BH20-4

TCLP GC/MS Volatiles

Lot-Sample #....: F1G050102-001 Work Order #....: EF1PH1AA Matrix.....: SOLID
 Date Sampled....: 07/02/01 09:29 Date Received...: 07/06/01
 Leach Date.....: 07/19/01 Prep Date.....: 07/12/01 Analysis Date...: 07/12/01
 Leach Batch #...: F119107 Prep Batch #....: 1194138 Analysis Time...: 14:16
 Dilution Factor: 1 Initial Wgt/Vol: 0.5 mL Final Wgt/Vol...: 5 mL
 % Moisture.....: Analyst ID.....: 400452 Instrument ID...: MSE
 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Vinyl chloride	ND	100	ug/L	7.9
1,1-Dichloroethene	ND	50	ug/L	13
2-Butanone	ND	200	ug/L	66
Chloroform	ND	50	ug/L	2.4
Carbon tetrachloride	ND	50	ug/L	6.5
1,2-Dichloroethane	ND	50	ug/L	4.3
Benzene	ND	50	ug/L	3.7
Trichloroethene	ND	50	ug/L	3.1
Tetrachloroethene	ND	50	ug/L	3.6
Chlorobenzene	ND	50	ug/L	3.4

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	109	(75 - 127)
Toluene-d8	96	(79 - 117)
4-Bromofluorobenzene	86	(60 - 119)
1,2-Dichloroethane-d4	104	(71 - 133)

NOTE (S) :

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311.

SANDIA NATIONAL LABORATORIES

Client Sample ID: 056516-002/CY94H-BH20-4

TCLP GC/MS Semivolatiles

Lot-Sample #....: F1G060102-002	Work Order #....: EF1PJIAC	Matrix.....: SOLID
Date Sampled....: 07/02/01 09:29	Date Received...: 07/06/01	
Leach Date.....: 07/10/01	Prep Date.....: 07/14/01	Analysis Date...: 08/08/01
Leach Batch #...: P119106	Prep Batch #....: 1197141	Analysis Time...: 00:51
Dilution Factor: 1	Initial Wgt/Vol: 200 mL	Final Wgt/Vol...: 1 mL
% Moisture.....: 15	Analyst ID.....: 400697	Instrument ID...: MSJ
	Method.....: SW846 8270C	

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Pyridine	ND	100	ug/L	16
1,4-Dichlorobenzene	ND	50	ug/L	4.6
2-Methylphenol	ND	50	ug/L	5.0
4-Methylphenol	ND	50	ug/L	3.8
Hexachloroethane	ND	50	ug/L	4.3
Nitrobenzene	ND	50	ug/L	5.1
Hexachlorobutadiene	ND	50	ug/L	4.5
2,4,6-Trichloro-phenol	ND	50	ug/L	3.3
2,4,5-Trichloro-phenol	ND	50	ug/L	3.9
2,4-Dinitrotoluene	ND	50	ug/L	3.4
Hexachlorobenzene	ND	50	ug/L	2.9
Pentachlorophenol	ND	250	ug/L	4.3

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
2-Fluorophenol	37	(10 - 90)
Phenol-d5	22	(10 - 91)
Nitrobenzene-d5	49	(32 - 113)
2-Fluorobiphenyl	45	(32 - 110)
Terphenyl-d14	58	(22 - 106)
2,4,6-Tribromophenol	51	(22 - 133)

NOTE(S) :

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

SANDIA NATIONAL LABORATORIES

Client Sample ID: 056517-001/CY94H-BH21-4

TCLP GC/MS Volatiles

Lot-Sample #....: F1G060102-003 Work Order #....: EF1PK1AA Matrix.....: SOLID
 Date Sampled....: 07/02/01 09:45 Date Received...: 07/06/01
 Leach Date.....: 07/10/01 Prep Date.....: 07/12/01 Analysis Date...: 07/12/01
 Leach Batch #...: P119107 Prep Batch #...: 1194138 Analysis Time...: 14:51
 Dilution Factor: 1 Initial Wgt/Vol: 0.5 mL Final Wgt/Vol...: 5 mL
 % Moisture.....: Analyst ID.....: 400452 Instrument ID...: MSE
 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	MDL
Vinyl chloride	ND	100	ug/L	7.9
1,1-Dichloroethene	ND	50	ug/L	13
2-Butanone	ND	200	ug/L	66
Chloroform	ND	50	ug/L	2.4
Carbon tetrachloride	ND	50	ug/L	6.5
1,2-Dichloroethane	ND	50	ug/L	4.3
Benzene	ND	50	ug/L	3.7
Trichloroethene	ND	50	ug/L	3.1
Tetrachloroethene	ND	50	ug/L	3.6
Chlorobenzene	ND	50	ug/L	3.4

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	111	(75 - 127)
Toluene-d8	97	(79 - 117)
4-Bromofluorobenzene	91	(60 - 119)
1,2-Dichloroethane-d4	108	(71 - 133)

NOTE (S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

SANDIA NATIONAL LABORATORIES

Client Sample ID: 056518-001/CY94H-BH20-TB

GC/MS Volatiles

lot-Sample #....: F1G060102-005 Work Order #....: EF1PM1AA Matrix.....: WATER
 Date Sampled...: 07/02/01 09:46 Date Received...: 07/06/01
 Prep Date.....: 07/12/01 Analysis Date...: 07/12/01
 Prep Batch #....: 1194136 Analysis Time...: 11:56
 Dilution Factor: 1 Initial Wgt/Vol: 5 mL Final Wgt/Vol...: 5 mL
 Analyst ID.....: 400452 Instrument ID...: MSE
 Method.....: SW846 B260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Chloromethane	ND	10	ug/L	0.77
Vinyl chloride	ND	5.0	ug/L	0.79
Bromomethane	ND	10	ug/L	0.60
Chloroethane	ND	10	ug/L	2.2
Acetone	3.9 J,B	20	ug/L	2.6
1,1-Dichloroethene	ND	5.0	ug/L	1.3
Methylene chloride	0.67 J,B	5.0	ug/L	0.53
Carbon disulfide	ND	5.0	ug/L	0.46
1,1-Dichloroethane	ND	5.0	ug/L	0.38
2-Butanone	ND	20	ug/L	6.6
1,2-Dichloroethene (total)	ND	5.0	ug/L	0.83
Chloroform	ND	5.0	ug/L	0.24
1,1,1-Trichloroethane	ND	5.0	ug/L	0.44
Carbon tetrachloride	ND	5.0	ug/L	0.65
1,2-Dichloroethane	ND	5.0	ug/L	0.43
Benzene	ND	5.0	ug/L	0.37
Trichloroethene	ND	5.0	ug/L	0.31
1,2-Dichloropropane	ND	5.0	ug/L	0.21
Bromodichloromethane	ND	5.0	ug/L	0.45
4-Methyl-2-pentanone	ND	20	ug/L	1.3
cis-1,3-Dichloropropene	ND	5.0	ug/L	0.52
Toluene	ND	5.0	ug/L	0.54
trans-1,3-Dichloropropene	ND	5.0	ug/L	0.31
1,1,2-Trichloroethane	ND	5.0	ug/L	0.43
2-Hexanone	ND	20	ug/L	1.7
Tetrachloroethene	ND	5.0	ug/L	0.36
Dibromochloromethane	ND	5.0	ug/L	0.38
Chlorobenzene	ND	5.0	ug/L	0.34
Ethylbenzene	ND	5.0	ug/L	0.89
Xylenes (total)	ND	5.0	ug/L	1.1
Styrene	ND	5.0	ug/L	0.37
Bromoform	ND	5.0	ug/L	0.62
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L	0.44

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SANDIA NATIONAL LABORATORIES

Client Sample ID: 056518-001/CY94H-BH20-TB

GC/MS Volatiles

Lot-Sample #....: F1G060102-005 Work Order #....: EF1PM1AA Matrix.....: WATER

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
4-Bromofluorobenzene	88	(60 - 119)
Toluene-d8	103	(79 - 117)
Dibromofluoromethane	107	(75 - 127)
1,2-Dichloroethane-d4	104	(71 - 133)

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

SANDIA NATIONAL LABORATORIES

Client Sample ID: 056516-002/CY94H-BH20-4

General Chemistry

Lot-Sample #...: F1G060102-002 Work Order #...: EF1PJ Matrix.....: SOLID
Date Sampled...: 07/02/01 09:29 Date Received...: 07/06/01
% Moisture.....: 15

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Moisture	15.3	0.10	%	MCAWN 160.3 MOD	07/20/01	1204279
		Dilution Factor: 1		Initial Wgt/Vol: 10 g	Final Wgt/Vol...: 10 g	
		Analysis Time...: 09:40		Analyst ID.....: 480566	Instrument ID...: WET CHEM	
		MDL.....:				

SANDIA NATIONAL LABORATORIES

Client Sample ID: 056517-002/CY94H-BH21-4

General Chemistry

Lot-Sample #....: FIG060102-004 Work Order #....: EF1PL Matrix.....: SOLID
 Date Sampled....: 07/02/01 09:46 Date Received...: 07/06/01
 ‡ Moisture.....: 15

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Moisture	15.2	0.10	‡	MCAWW 160.3 MOD	07/20/01	1204280
				Dilution Factor: 1	Initial Wgt/Vol: 10 g	Final Wgt/Vol...: 10 g
				Analysis Time...: 09:40	Analyst ID.....: 400666	Instrument ID...: WET CHEM
				MDL.....:		

QC DATA ASSOCIATION SUMMARY

FIG060102

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	SOLID	SW846 8260B	P119107	1194138	1194028
002	SOLID	SW846 7470A	P119106	1193375	1193200
	SOLID	SW846 8270C	P119106	1197141	
	SOLID	SW846 6010B	P119106	1192366	1192182
	SOLID	MCAWW 160.3 MOD		1204279	1204121
003	SOLID	SW846 8260B	P119107	1194138	1194028
004	SOLID	SW846 7470A	P119106	1193375	1193200
	SOLID	SW846 8270C	P119106	1197141	
	SOLID	SW846 6010B	P119106	1192366	1192182
	SOLID	MCAWW 160.3 MOD		1204280	1204121
005	WATER	SW846 8260B		1194136	

SANDIA NATIONAL LABORATORIES

Client Sample ID: 056516-002/CY94H-BH20-4

TCLP Metals

Lot-Sample #....: F1G060102-002
 Date Sampled....: 07/02/01 09:29 Date Received...: 07/06/01
 Leach Date.....: 07/10/01 Leach Batch #...: P119106

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 1192366						
Silver	ND	0.25	mg/L	SW846 6010B	07/11-07/17/01	EF1PJ1AK
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38		Analyst ID.....: 063161	Instrument ID...: 61E	
		MDL.....: 0.0010				
Arsenic	ND	0.75	mg/L	SW846 6010B	07/11-07/17/01	EF1PJ1AE
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38		Analyst ID.....: 063161	Instrument ID...: 61E	
		MDL.....: 0.0015				
Barium	1.6	0.50	mg/L	SW846 6010B	07/11-07/17/01	EF1PJ1AF
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38		Analyst ID.....: 063161	Instrument ID...: 61E	
		MDL.....: 0.00090				
Beryllium	ND	0.12	mg/L	SW846 6010B	07/11-07/17/01	EF1PJ1AM
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38		Analyst ID.....: 063161	Instrument ID...: 61E	
		MDL.....: 0.00020				
Cadmium	0.0016 B	0.12	mg/L	SW846 6010B	07/11-07/17/01	EF1PJ1AG
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38		Analyst ID.....: 063161	Instrument ID...: 61E	
		MDL.....: 0.00020				
Chromium	ND	0.25	mg/L	SW846 6010B	07/11-07/17/01	EF1PJ1AH
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38		Analyst ID.....: 063161	Instrument ID...: 61E	
		MDL.....: 0.0020				
Lead	0.0062 B	0.25	mg/L	SW846 6010B	07/11-07/17/01	EF1PJ1AJ
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38		Analyst ID.....: 063161	Instrument ID...: 61E	
		MDL.....: 0.00090				
Selenium	0.0058 B	0.12	mg/L	SW846 6010B	07/11-07/17/01	EF1PJ1AL
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38		Analyst ID.....: 063161	Instrument ID...: 61E	
		MDL.....: 0.0028				

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SANDIA NATIONAL LABORATORIES

Client Sample ID: 056516-002/CY94H-BH20-4

TCLP Metals

Lot-Sample #: F1G060102-002

Matrix: SOLID

PARAMETER	RESULT	REPORTING			METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
		LIMIT	UNITS				
Prep Batch #...	1193375						
Mercury	ND	0.010	mg/L		SWE46 7470A	07/12-07/13/01	EF1PJ1AD
		Dilution Factor: 5			Initial Wgt/Vol: 6 mL	Final Wgt/Vol: 30 mL	
		Analysis Time: 15:00			Analyst ID: 400646	Instrument ID: PS2	
		MDL: 0.00018					

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

B Estimated result. Result is less than RL.

SANDIA NATIONAL LABORATORIES

Client Sample ID: 056517-002/CY94H-BH21-4

TCLP Metals

Lot-Sample #...: F1G060102-004 Matrix.....: SOLID
 Date Sampled...: 07/02/01 09:46 Date Received...: 07/06/01
 Leach Date.....: 07/10/01 Leach Batch #...: P119106

PARAMETER	RESULT	REPORTING			METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
		LIMIT	UNITS				
Prep Batch #...: 1192366							
Silver	ND	0.25	mg/L	SW846 6010B	07/11-07/17/01	EF1PL1AK	
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL		
		Analysis Time...: 10:45		Analyst ID.....: 063161	Instrument ID...: 61E		
		MDL.....: 0.0010					
Arsenic	0.0058 B	0.75	mg/L	SW846 6010B	07/11-07/17/01	EF1PL1AK	
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL		
		Analysis Time...: 10:45		Analyst ID.....: 063161	Instrument ID...: 61E		
		MDL.....: 0.0015					
Barium	2.1	0.50	mg/L	SW846 6010B	07/11-07/17/01	EF1PL1AF	
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL		
		Analysis Time...: 10:45		Analyst ID.....: 063161	Instrument ID...: 61E		
		MDL.....: 0.00090					
Beryllium	ND	0.12	mg/L	SW846 6010B	07/11-07/17/01	EF1PL1AM	
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL		
		Analysis Time...: 10:45		Analyst ID.....: 063161	Instrument ID...: 61E		
		MDL.....: 0.00020					
Cadmium	0.00098 B	0.12	mg/L	SW846 6010B	07/11-07/17/01	EF1PL1AG	
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL		
		Analysis Time...: 10:45		Analyst ID.....: 063161	Instrument ID...: 61E		
		MDL.....: 0.00020					
Chromium	ND	0.25	mg/L	SW846 6010B	07/11-07/17/01	EF1PL1AH	
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL		
		Analysis Time...: 10:45		Analyst ID.....: 063161	Instrument ID...: 61E		
		MDL.....: 0.0020					
Lead	0.0076 B	0.25	mg/L	SW846 6010B	07/11-07/17/01	EF1PL1AJ	
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL		
		Analysis Time...: 10:45		Analyst ID.....: 063161	Instrument ID...: 61E		
		MDL.....: 0.00090					
Selenium	ND	0.12	mg/L	SW846 6010B	07/11-07/17/01	EF1PL1AL	
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL		
		Analysis Time...: 10:45		Analyst ID.....: 063161	Instrument ID...: 61E		
		MDL.....: 0.0028					

(Continued on next page)

SANDIA NATIONAL LABORATORIES

Client Sample ID: 056517-002/CY94H-BE21-4

TCLP Metals

Lot-Sample #...: F1G060102-004

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING			METHOD	PREPARATION-	WORK
		LIMIT	UNITS			ANALYSIS DATE	ORDER #
Prep Batch #...: 1193375							
Mercury	ND	0.010	mg/L		SW846 7470A	07/12-07/13/01	EF1PL1AD
		Dilution Factor: 5			Initial Wgt/Vol: 6 mL	Final Wgt/Vol...: 30 mL	
		Analysis Time...: 15:09			Analyst ID.....: 400646	Instrument ID...: PS2	
		MDL.....: 0.00018					

NOTE(S):

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311
 B Estimated result. Result is less than RL.

METHOD BLANK REPORT

TCLP GC/MS Volatiles

Client Lot #....: FIG060102	Work Order #....: EF5A41AA	Matrix.....: SOLID
MB Lot-Sample #: FIG100000-238		
Leach Date.....: 07/10/01	Prep Date.....: 07/12/01	Analysis Date...: 07/12/01
Leach Batch #...: P119107	Prep Batch #....: 1194138	Analysis Time...: 15:26
Dilution Factor: 1	Initial Wgt/Vol: 0.5 mL	Final Wgt/Vol...: 5 mL
	Analyst ID.....: 400452	Instrument ID...: MSE

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	METHOD
Vinyl chloride	ND	100	ug/L	SW846 8260B
1,1-Dichloroethene	ND	50	ug/L	SW846 8260B
2-Butanone	ND	200	ug/L	SW846 8260B
Chloroform	ND	50	ug/L	SW846 8260B
Carbon tetrachloride	ND	50	ug/L	SW846 8260B
1,2-Dichloroethane	ND	50	ug/L	SW846 8260B
Benzene	ND	50	ug/L	SW846 8260B
Trichloroethene	ND	50	ug/L	SW846 8260B
Tetrachloroethene	ND	50	ug/L	SW846 8260B
Chlorobenzene	ND	50	ug/L	SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	110	(75 - 127)
Toluene-d8	95	(79 - 117)
4-Bromofluorobenzene	85	(60 - 119)
1,2-Dichloroethane-d4	109	(71 - 133)

NOTE(S) :

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

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: F1G060102
 MB Lot-Sample #: F1G130000-136

Work Order #....: EF9VQ1AA

Matrix.....: WATER

Analysis Date...: 07/12/01
 Dilution Factor: 1

Prep Date.....: 07/12/01

Analysis Time...: 10:11

Prep Batch #....: 1194136

Final Wgt/Vol...: 5 mL

Initial Wgt/Vol: 5 mL

Instrument ID...: MSE

Analyst ID.....: 400452

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	METHOD
Chloromethane	ND	10	ug/L	SW846 8260B
Vinyl chloride	ND	5.0	ug/L	SW846 8260B
Bromomethane	ND	10	ug/L	SW846 8260B
Chloroethane	ND	10	ug/L	SW846 8260B
Acetone	3.0 J	20	ug/L	SW846 8260B
1,1-Dichloroethene	ND	5.0	ug/L	SW846 8260B
Methylene chloride	0.59 J	5.0	ug/L	SW846 8260B
Carbon disulfide	ND	5.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/L	SW846 8260B
2-Butanone	ND	20	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	5.0	ug/L	SW846 8260B
Chloroform	ND	5.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	5.0	ug/L	SW846 8260B
Benzene	ND	5.0	ug/L	SW846 8260B
Trichloroethene	ND	5.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	5.0	ug/L	SW846 8260B
Bromodichloromethane	ND	5.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B
Toluene	ND	5.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	5.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/L	SW846 8260B
2-Hexanone	ND	20	ug/L	SW846 8260B
Tetrachloroethene	ND	5.0	ug/L	SW846 8260B
Dibromochloromethane	ND	5.0	ug/L	SW846 8260B
Chlorobenzene	ND	5.0	ug/L	SW846 8260B
Ethylbenzene	ND	5.0	ug/L	SW846 8260B
Xylenes (total)	ND	5.0	ug/L	SW846 8260B
Styrene	ND	5.0	ug/L	SW846 8260B
Bromoform	ND	5.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L	SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
4-Bromofluorobenzene	92	(60 - 119)
Toluene-d8	106	(79 - 117)
Dibromofluoromethane	114	(75 - 127)

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F1G060102

Work Order #...: BP9VQ1AA

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
1,2-Dichloroethane-d4	109	(71 - 133)		

NOTE(S):

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

F Estimated result. Result is less than RL.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: F1G060102
 MB Lot-Sample #: F1G130000-138

Work Order #....: BFSVR1AA

Matrix.....: SOLID

Analysis Date...: 07/12/01
 Dilution Factor: 1

Prep Date.....: 07/12/01

Analysis Time...: 11:21

Prep Batch #....: 1194138

Final Wgt/Vol...: 5 mL

Initial Wgt/Vol: 0.5 mL

Instrument ID...: MSE

Analyst ID.....: 400452

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	METHOD
Vinyl chloride	690	100	ug/L	SWB46 8260B
1,1-Dichloroethene	620	50	ug/L	SWB46 8260B
2-Butanone	590	200	ug/L	SWB46 8260B
Chloroform	550	50	ug/L	SWB46 8260B
Carbon tetrachloride	550	50	ug/L	SWB46 8260B
1,2-Dichloroethane	490	50	ug/L	SWB46 8260B
Benzene	500	50	ug/L	SWB46 8260B
Trichloroethene	500	50	ug/L	SWB46 8260B
Tetrachloroethene	430	50	ug/L	SWB46 8260B
Chlorobenzene	490	50	ug/L	SWB46 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	108	(75 - 127)
Toluene-d8	103	(79 - 117)
4-Bromofluorobenzene	90	(60 - 119)
1,2-Dichloroethane-d4	100	(71 - 133)

NOTE(S):

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

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: F1G060102
 MB Lot-Sample #: F1G160000-141

Work Order #...: EGD4A1AA

Matrix.....: SOLID

Analysis Date...: 08/07/01
 Dilution Factor: 1

Prep Date.....: 07/14/01
 Prep Batch #...: 1197141
 Initial Wgt/Vol: 200 mL
 Analyst ID.....: 400697

Analysis Time...: 22:54
 Final Wgt/Vol...: 1 mL
 Instrument ID...: MSJ

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Pyridine	ND	100	ug/L	SW846 8270C
1,4-Dichlorobenzene	ND	50	ug/L	SW846 8270C
2-Methylphenol	ND	50	ug/L	SW846 8270C
4-Methylphenol	ND	50	ug/L	SW846 8270C
Hexachloroethane	ND	50	ug/L	SW846 8270C
Nitrobenzene	ND	50	ug/L	SW846 8270C
Hexachlorobutadiene	ND	50	ug/L	SW846 8270C
2,4,6-Trichloro- phenol	ND	50	ug/L	SW846 8270C
2,4,5-Trichloro- phenol	ND	50	ug/L	SW846 8270C
2,4-Dinitrotoluene	ND	50	ug/L	SW846 8270C
Hexachlorobenzene	ND	50	ug/L	SW846 8270C
Pentachlorophenol	ND	250	ug/L	SW846 8270C

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
2-Fluorophenol	37	(10 - 90)
Phenol-d5	22	(10 - 91)
Nitrobenzene-d5	48	(32 - 113)
2-Fluorobiphenyl	45	(32 - 110)
Terphenyl-d14	63	(22 - 106)
2,4,6-Tribromophenol	53	(22 - 133)

NOTE(S):

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

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: F1G060102
 MB Lot-Sample #: F1G160000-141

Work Order #...: EGD4A1AD

Matrix.....: SOLID

Analysis Date...: 08/07/01
 Dilution Factor: 1

Prep Date.....: 07/14/01
 Prep Batch #...: 1197141
 Initial Wgt/Vol: 200 mL
 Analyst ID.....: 400697

Analysis Time...: 23:33
 Final Wgt/Vol...: 1 mL
 Instrument ID...: MSJ

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Pyridine	ND	100	ug/L	SW846 8270C
1,4-Dichlorobenzene	ND	50	ug/L	SW846 8270C
2-Methylphenol	ND	50	ug/L	SW846 8270C
4-Methylphenol	ND	50	ug/L	SW846 8270C
Hexachloroethane	ND	50	ug/L	SW846 8270C
Nitrobenzene	ND	50	ug/L	SW846 8270C
Hexachlorobutadiene	ND	50	ug/L	SW846 8270C
2,4,6-Trichloro- phenol	ND	50	ug/L	SW846 8270C
2,4,5-Trichloro- phenol	ND	50	ug/L	SW846 8270C
2,4-Dinitrotoluene	ND	50	ug/L	SW846 8270C
Hexachlorobenzene	ND	50	ug/L	SW846 8270C
Pentachlorophenol	ND	250	ug/L	SW846 8270C

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
2-Fluorophenol	34	(10 - 90)
Phenol-d5	21	(10 - 91)
Nitrobenzene-d5	45	(32 - 113)
2-Fluorobiphenyl	43	(32 - 110)
Terphenyl-d14	63	(22 - 106)
2,4,6-Tribromophenol	56	(22 - 133)

NOTE(S) :

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

METHOD BLANK REPORT

TCLP Metals

Client Lot #...: FIG060102

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: FIG100000-235 Prep Batch #...: 1192366						
Leach Date.....: 07/10/01 Leach Batch #...: P119106						
Arsenic	ND	0.75	mg/L	SW846 6010B	07/11-07/17/01	EF5AV1AM
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 09:55		Analyst ID.....: 063161	Instrument ID...: 61E	
Barium	ND	0.50	mg/L	SW846 6010B	07/11-07/17/01	EF5AV1AN
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 09:55		Analyst ID.....: 063161	Instrument ID...: 61E	
Beryllium	ND	0.12	mg/L	SW846 6010B	07/11-07/17/01	EF5AV1AV
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 09:55		Analyst ID.....: 063161	Instrument ID...: 61E	
Cadmium	ND	0.12	mg/L	SW846 6010B	07/11-07/17/01	EF5AV1AP
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 09:55		Analyst ID.....: 063161	Instrument ID...: 61E	
Chromium	ND	0.25	mg/L	SW846 6010B	07/11-07/17/01	EF5AV1AQ
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 09:55		Analyst ID.....: 063161	Instrument ID...: 61E	
Lead	0.010 B	0.25	mg/L	SW846 6010B	07/11-07/17/01	EF5AV1AR
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 09:55		Analyst ID.....: 063161	Instrument ID...: 61E	
Selenium	ND	0.12	mg/L	SW846 6010B	07/11-07/17/01	EF5AV1AU
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 09:55		Analyst ID.....: 063161	Instrument ID...: 61E	
Silver	ND	0.25	mg/L	SW846 6010B	07/11-07/17/01	EF5AV1AT
		Dilution Factor: 2.5		Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 09:55		Analyst ID.....: 063161	Instrument ID...: 61E	

MB Lot-Sample #: FIG100000-235 Prep Batch #...: 1193375

Leach Date.....: 07/10/01 Leach Batch #...: P119106

Mercury	ND	0.010	mg/L	SW846 7470A	07/12-07/13/01	EF5AV1AL
		Dilution Factor: 5		Initial Wgt/Vol: 6 mL	Final Wgt/Vol...: 30 mL	
		Analysis Time...: 14:50		Analyst ID.....: 400646	Instrument ID...: PS2	

NOTE(S):

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

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client lot #...: F1G060102 Work Order #...: EF9VQ1AE-LCS Matrix.....: WATER
 LCS Lot-Sample#: F1G130000-136 EF9VQ1AF-LCSD
 Prep Date.....: 07/12/01 Analysis Date...: 07/12/01
 Prep Batch #...: 1194136 Analysis Time...: 10:46
 Dilution Factor: 1 Initial Wgt/Vol: 5 mL Final Wgt/Vol...: 5 mL
 Analyst ID.....: 400452 Instrument ID...: MSE

PARAMETER	SPIKE		MEASURED		PERCENT		METHOD
	AMOUNT	AMOUNT	UNITS	RECOVERY	RPD		
1,1-Dichloroethene	50.0	60.7	ug/L	121			SW846 8260B
	50.0	61.5	ug/L	123	1.4		SW846 8260B
1,4-Dichlorobenzene	50.0	44.1	ug/L	88			SW846 8260B
	50.0	45.3	ug/L	91	2.6		SW846 8260B
Benzene	50.0	48.7	ug/L	97			SW846 8260B
	50.0	49.8	ug/L	100	2.2		SW846 8260B
Trichloroethene	50.0	48.6	ug/L	97			SW846 8260B
	50.0	49.9	ug/L	100	2.6		SW846 8260B
Toluene	50.0	47.0	ug/L	94			SW846 8260B
	50.0	48.2	ug/L	96	2.6		SW846 8260B
Chlorobenzene	50.0	48.1	ug/L	96			SW846 8260B
	50.0	49.3	ug/L	99	2.4		SW846 8260B

SURROGATE	PERCENT		RECOVERY
	RECOVERY	LIMITS	
4-Bromofluorobenzene	90	(60 - 119)	
	90	(60 - 119)	
Toluene-d8	102	(79 - 117)	
	103	(79 - 117)	
Dibromofluoromethane	108	(75 - 127)	
	108	(75 - 127)	
1,2-Dichloroethane-d4	102	(71 - 133)	
	100	(71 - 133)	

NOTE(S) :

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

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #....: F1G060102 Work Order #....: EP9VR1AE-LCS Matrix.....: SOLID
 LCS Lot-Sample#: F1G130000-138 EP9VR1AF-LCSD
 Prep Date.....: 07/12/01 Analysis Date...: 07/12/01
 Prep Batch #....: 1194138 Analysis Time...: 10:46
 Dilution Factor: 1 Initial Wgt/Vol: 0.5 mL Final Wgt/Vol...: 5 mL
 Analyst ID.....: 400452 Instrument ID...: MSE

PARAMETER	SPIKE	MEASURED	UNITS	PERCENT	RPD	METHOD
	AMOUNT	AMOUNT		RECOVERY		
Vinyl chloride	500	703	ug/L	141		SW846 8260B
	500	689	ug/L	138	2.0	SW846 8260B
1,1-Dichloroethene	500	607	ug/L	121		SW846 8260B
	500	615	ug/L	123	1.4	SW846 8260B
2-Butanone	500	606	ug/L	121		SW846 8260B
	500	590	ug/L	118	2.7	SW846 8260B
Chloroform	500	536	ug/L	107		SW846 8260B
	500	551	ug/L	110	2.9	SW846 8260B
Carbon tetrachloride	500	540	ug/L	108		SW846 8260B
	500	550	ug/L	110	1.7	SW846 8260B
1,2-Dichloroethane	500	482	ug/L	96		SW846 8260B
	500	490	ug/L	98	1.7	SW846 8260B
Benzene	500	487	ug/L	97		SW846 8260B
	500	498	ug/L	100	2.2	SW846 8260B
Trichloroethene	500	486	ug/L	97		SW846 8260B
	500	499	ug/L	100	2.6	SW846 8260B
Tetrachloroethene	500	413	ug/L	83		SW846 8260B
	500	427	ug/L	85	3.3	SW846 8260B
Chlorobenzene	500	481	ug/L	96		SW846 8260B
	500	493	ug/L	99	2.4	SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	108	(75 - 127)
	108	(75 - 127)
Toluene-d8	102	(79 - 117)
	103	(79 - 117)
4-Bromofluorobenzene	90	(60 - 119)
	90	(60 - 119)
1,2-Dichloroethane-d4	102	(71 - 133)
	100	(71 - 133)

NOTE(S):

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

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

TCLP Metals

Lot-Sample #...: FIG060102

Matrix.....: SOLID

PARAMETER	SPIKE		MEASURED		PERCENT		PREPARATION- PREP	
	AMOUNT	AMOUNT	UNITS	RECVRY	RPD	METHOD	ANALYSIS DATE	BATCH #
Arsenic	2.50	2.56	mg/L	102		SW846 6010B	07/11-07/17/01	1192366
	2.50	2.59	mg/L	104	1.2	SW846 6010B	07/11-07/17/01	1192366
			Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
						Instrument ID...: 61E	TCLP Date.....: 063161	
Barium	2.50	2.43	mg/L	97		SW846 6010B	07/11-07/17/01	1192366
	2.50	2.46	mg/L	98	0.98	SW846 6010B	07/11-07/17/01	1192366
			Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
						Instrument ID...: 61E	TCLP Date.....: 063161	
Beryllium	2.50	2.53	mg/L	101		SW846 6010B	07/11-07/17/01	1192366
	2.50	2.56	mg/L	102	1.2	SW846 6010B	07/11-07/17/01	1192366
			Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
						Instrument ID...: 61E	TCLP Date.....: 063161	
Cadmium	2.50	2.41	mg/L	96		SW846 6010B	07/11-07/17/01	1192366
	2.50	2.44	mg/L	98	1.5	SW846 6010B	07/11-07/17/01	1192366
			Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
						Instrument ID...: 61E	TCLP Date.....: 063161	
Chromium	2.50	2.39	mg/L	95		SW846 6010B	07/11-07/17/01	1192366
	2.50	2.42	mg/L	97	1.4	SW846 6010B	07/11-07/17/01	1192366
			Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
						Instrument ID...: 61E	TCLP Date.....: 063161	
Lead	2.50	2.39	mg/L	95		SW846 6010B	07/11-07/17/01	1192366
	2.50	2.39	mg/L	95	0.04	SW846 6010B	07/11-07/17/01	1192366
			Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
						Instrument ID...: 61E	TCLP Date.....: 063161	
Selenium	2.50	2.54	mg/L	102		SW846 6010B	07/11-07/17/01	1192366
	2.50	2.53	mg/L	101	0.50	SW846 6010B	07/11-07/17/01	1192366
			Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
						Instrument ID...: 61E	TCLP Date.....: 063161	
Silver	0.625	0.591	mg/L	95		SW846 6010B	07/11-07/17/01	1192366
	0.625	0.599	mg/L	96	1.3	SW846 6010B	07/11-07/17/01	1192366
			Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
						Instrument ID...: 61E	TCLP Date.....: 063161	

(Continued on next page)

LABORATORY CONTROL SAMPLE DATA REPORT

TCLP Metals

Lot-Sample #...: FIG060102

Matrix.....: SOLID

PARAMETER	SPIKE	MEASURED	UNITS	PERCENT		METHOD	PREPARATION-	PREP
	AMOUNT	AMOUNT		RECVRY	RPD		ANALYSIS DATE	BATCH #
Mercury	0.0250	0.0223	mg/L	89		SW846 7470A	07/12-07/13/01	1193375
	0.0250	0.0205	mg/L	82	8.4	SW846 7470A	07/12-07/13/01	1193375
				Dilution Factor: 5		Initial Wgt/Vol: 6 mL	Final Wgt/Vol...: 30 mL	
						Instrument ID...: PS2	TCLP Date.....: 400646	

NOTE(S):

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

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #....: F1G060102 Work Order #....: EF9VQ1AE-LCS Matrix.....: WATER
 LCS Lot-Sample#: F1G130000-136 EF9VQ1AF-LCSD
 Prep Date.....: 07/12/01 Analysis Date...: 07/12/01
 Prep Batch #....: 1194136 Analysis Time...: 10:46
 Dilution Factor: 1 Initial Wgt/Vol: 5 mL Final Wgt/Vol...: 5 mL
 Analyst ID.....: 400452 Instrument ID...: MSE

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>RPD</u>	<u>RPD LIMITS</u>	<u>METHOD</u>
1,1-Dichloroethene	121	(64 - 132)			SW846 8260B
	123	(64 - 132)	1.4	{0-25}	SW846 8260B
1,4-Dichlorobenzene	88	(75 - 125)			SW846 8260B
	91	(75 - 125)	2.6	{0-25}	SW846 8260B
Benzene	97	(75 - 121)			SW846 8260B
	100	(75 - 121)	2.2	{0-21}	SW846 8260B
Trichloroethene	97	(63 - 116)			SW846 8260B
	100	(63 - 116)	2.6	{0-18}	SW846 8260B
Toluene	94	(77 - 112)			SW846 8260B
	96	(77 - 112)	2.6	{0-17}	SW846 8260B
Chlorobenzene	96	(80 - 114)			SW846 8260B
	99	(80 - 114)	2.4	{0-11}	SW846 8260B

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
4-Bromofluorobenzene	90	(60 - 119)
	90	(60 - 119)
Toluene-d8	102	(79 - 117)
	103	(79 - 117)
Dibromofluoromethane	108	(75 - 127)
	108	(75 - 127)
1,2-Dichloroethane-d4	102	(71 - 133)
	100	(71 - 133)

NOTE(S):

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

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #....: F1G060102 Work Order #....: EF9VR1AE-LCS Matrix.....: SOLID
 LCS Lot-Sample#: F1G130000-138 EF9VR1AF-LCSD
 Prep Date.....: 07/12/01 Analysis Date...: 07/12/01
 Prep Batch #....: 1194138 Analysis Time...: 10:46
 Dilution Factor: 1 Initial Wgt/Vol: 0.5 mL Final Wgt/Vol...: 5 mL
 Analyst ID.....: 400452 Instrument ID...: MSE

PARAMETER	PERCENT	RECOVERY	RPD	RPD	METHOD
	RECOVERY	LIMITS		LIMITS	
Vinyl chloride	141	(17 - 169)			SW846 8260B
	138	(17 - 169)	2.0	(0-40)	SW846 8260B
1,1-Dichloroethene	121	(46 - 161)			SW846 8260B
	123	(46 - 161)	1.4	(0-40)	SW846 8260B
2-Butanone	121	(39 - 172)			SW846 8260B
	118	(39 - 172)	2.7	(0-40)	SW846 8260B
Chloroform	107	(64 - 141)			SW846 8260B
	110	(64 - 141)	2.9	(0-40)	SW846 8260B
Carbon tetrachloride	108	(56 - 155)			SW846 8260B
	110	(56 - 155)	1.7	(0-40)	SW846 8260B
1,2-Dichloroethane	96	(69 - 145)			SW846 8260B
	98	(69 - 145)	1.7	(0-40)	SW846 8260B
Benzene	97	(69 - 142)			SW846 8260B
	100	(69 - 142)	2.2	(0-40)	SW846 8260B
Trichloroethene	97	(63 - 129)			SW846 8260B
	100	(63 - 129)	2.6	(0-40)	SW846 8260B
Tetrachloroethene	83	(50 - 131)			SW846 8260B
	85	(50 - 131)	3.3	(0-40)	SW846 8260B
Chlorobenzene	96	(77 - 120)			SW846 8260B
	99	(77 - 120)	2.4	(0-40)	SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	108	(75 - 127)
	108	(75 - 127)
Toluene-d8	102	(79 - 117)
	103	(79 - 117)
4-Bromofluorobenzene	90	(60 - 119)
	90	(60 - 119)
1,2-Dichloroethane-d4	102	(71 - 133)
	100	(71 - 133)

NOTE(S):

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

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TCLP Metals

Lot-Sample #: FIG060102

Matrix: SOLID

PARAMETER	PERCENT	RECOVERY	RPD		METHOD	PREPARATION-	PREP-
	RECOVERY	LIMITS	RPD	LIMITS		ANALYSIS DATE	BATCH #
Arsenic	102	(80 - 120)			SW846 6010B	07/11-07/17/01	1192366
	104	(80 - 120)	1.2	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 3.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol: 50 mL	
					Instrument ID: 61E	TCLP Date: 063161	
Barium	97	(80 - 120)			SW846 6010B	07/11-07/17/01	1192366
	98	(80 - 120)	0.98	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol: 50 mL	
					Instrument ID: 61E	TCLP Date: 063161	
Beryllium	101	(80 - 120)			SW846 6010B	07/11-07/17/01	1192366
	102	(80 - 120)	1.2	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol: 50 mL	
					Instrument ID: 61E	TCLP Date: 063161	
Cadmium	96	(80 - 120)			SW846 6010B	07/11-07/17/01	1192366
	98	(80 - 120)	1.5	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol: 50 mL	
					Instrument ID: 61E	TCLP Date: 063161	
Chromium	95	(80 - 120)			SW846 6010B	07/11-07/17/01	1192366
	97	(80 - 120)	1.4	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol: 50 mL	
					Instrument ID: 61E	TCLP Date: 063161	
Lead	95	(80 - 120)			SW846 6010B	07/11-07/17/01	1192366
	95	(80 - 120)	0.04	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol: 50 mL	
					Instrument ID: 61E	TCLP Date: 063161	
Selenium	102	(80 - 120)			SW846 6010B	07/11-07/17/01	1192366
	101	(80 - 120)	0.50	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol: 50 mL	
					Instrument ID: 61E	TCLP Date: 063161	
Silver	95	(49 - 135)			SW846 6010B	07/11-07/17/01	1192366
	96	(49 - 135)	1.3	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol: 50 mL	
					Instrument ID: 61E	TCLP Date: 063161	

(Continued on next page)

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TCLP Metals

Lot-Sample #...: FIG060102

Matrix.....: SOLID

PARAMETER	PERCENT	RECOVERY	RPD		METHOD	PREPARATION-	FREP-
	RECOVERY	LIMITS	RPD	LIMITS		ANALYSIS DATE	BATCH #
Mercury	89	(80 - 120)			SW846 7470A	07/12-07/13/01	1193375
	82	(80 - 120)	8.4	(0-20)	SW846 7470A	07/12-07/13/01	1193375
			Dilution Factor: 5		Initial Wgt/Vol: 6 mL		Final Wgt/Vol...: 30 mL
					Instrument ID...: PS2		TCLP Date.....: 400646

NOTE(S):

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

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Semivolatiles

Client Lot #....: FIG060102 Work Order #....: EGD4A1AC Matrix.....: SOLID
 LCS Lot-Sample#: FIG160080-141
 Prep Date.....: 07/14/01 Analysis Date...: 08/08/01
 Prep Batch #....: 1197141 Analysis Time...: 00:12
 Dilution Factor: 1 Initial Wgt/Vol: 200 mL Final Wgt/Vol...: 1 mL
 Analyst ID.....: 400697 Instrument ID...: MSJ

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
Pyridine	250	86.4 J	ug/L	35	SW846 8270C
1,4-Dichlorobenzene	250	107	ug/L	43	SW846 8270C
2-Methylphenol	250	123	ug/L	49	SW846 8270C
4-Methylphenol	500	220	ug/L	44	SW846 8270C
Hexachloroethane	250	96.2	ug/L	38	SW846 8270C
Nitrobenzene	250	139	ug/L	55	SW846 8270C
Hexachlorobutadiene	250	85.6	ug/L	34	SW846 8270C
2,4,6-Trichloro-phenol	250	113	ug/L	45	SW846 8270C
2,4,5-Trichloro-phenol	250	120	ug/L	48	SW846 8270C
2,4-Dinitrotoluene	250	127	ug/L	51	SW846 8270C
Hexachlorobenzene	250	128	ug/L	51	SW846 8270C
Pentachlorophenol	250	69.6 J	ug/L	28	SW846 8270C

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
2-Fluorophenol	34	(10 - 90)
Phenol-d5	21	(10 - 91)
Nitrobenzene-d5	46	(32 - 113)
2-Fluorobiphenyl	42	(32 - 110)
Terphenyl-d14	57	(22 - 106)
2,4,6-Tribromophenol	50	(22 - 133)

NOTE (S) :

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

bold print denotes control parameters

J Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Semivolatiles

Client Lot #...: F1G060102 Work Order #...: EGD4A1AC Matrix.....: SOLID
 LCS Lot-Sample#: F1G160000-141
 Prep Date.....: 07/14/01 Analysis Date...: 08/08/01
 Prep Batch #...: 1197141 Analysis Time...: 00:12
 Dilution Factor: 1 Initial Wgt/Vol: 200 mL Final Wgt/Vol...: 1 mL
 Analyst ID.....: 400697 Instrument ID...: MSJ

PARAMETER	PERCENT	RECOVERY	METHOD
	RECOVERY	LIMITS	
Pyridine	35 J	(10 - 88)	SW846 8270C
1,4-Dichlorobenzene	43	(19 - 102)	SW846 8270C
2-Methylphenol	49	(17 - 114)	SW846 8270C
4-Methylphenol	44	(14 - 104)	SW846 8270C
Hexachloroethane	38	(10 - 100)	SW846 8270C
Nitrobenzene	55	(37 - 112)	SW846 8270C
Hexachlorobutadiene	34	(10 - 102)	SW846 8270C
2,4,6-Trichloro-phenol	45	(29 - 115)	SW846 8270C
2,4,5-Trichloro-phenol	48	(29 - 120)	SW846 8270C
2,4-Dinitrotoluene	51	(36 - 117)	SW846 8270C
Hexachlorobenzene	51	(37 - 127)	SW846 8270C
Pentachlorophenol	28 J	(10 - 124)	SW846 8270C

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
2-Fluorophenol	34	(10 - 90)
Phenol-d5	21	(10 - 91)
Nitrobenzene-d5	46	(32 - 113)
2-Fluorobiphenyl	42	(32 - 110)
Terphenyl-d14	57	(22 - 106)
2,4,6-Tribromophenol	50	(22 - 133)

NOTE(S) :

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

Bold print denotes control parameters

J Estimated result. Result is less than RL.

MATRIX SPIKE SAMPLE DATA REPORT

TCLP GC/MS Volatiles

Client Lot #...: F1G060102 Work Order #...: EF1PH1AD-MS Matrix.....: SOLID
 MS Lot-Sample #: F1G060102-001 EF1PH1AE-MSD
 Date Sampled...: 07/02/01 09:29 Date Received...: 07/06/01
 Leach Date.....: 07/10/01 Prep Date.....: 07/12/01 Analysis Date...: 07/12/01
 Leach Batch #...: P119107 Prep Batch #...: 1194138 Analysis Time...: 13:06
 Dilution Factor: 1 Initial Wgt/Vol: 0.5 mL Final Wgt/Vol...: 5 mL
 Analyst ID.....: 400452 Instrument ID...: MSE

PARAMETER	SAMPLE SPIKE MEASRD			UNITS	PERCENT		METHOD
	AMOUNT	AMT	AMOUNT		RECOVERY	RPD	
Vinyl chloride	ND	500	646	ug/L	129		SW846 8260B
	ND	500	722	ug/L	144	11	SW846 8260B
1,1-Dichloroethene	ND	500	508	ug/L	102		SW846 8260B
	ND	500	547	ug/L	109	7.4	SW846 8260B
2-Butanone	ND	500	514	ug/L	103		SW846 8260B
	ND	500	498	ug/L	100	3.2	SW846 8260B
Chloroform	ND	500	522	ug/L	104		SW846 8260B
	ND	500	560	ug/L	112	7.1	SW846 8260B
Carbon tetrachloride	ND	500	450	ug/L	90		SW846 8260B
	ND	500	488	ug/L	98	8.1	SW846 8260B
1,2-Dichloroethane	ND	500	506	ug/L	101		SW846 8260B
	ND	500	517	ug/L	103	2.2	SW846 8260B
Benzene	ND	500	462	ug/L	92		SW846 8260B
	ND	500	504	ug/L	101	8.6	SW846 8260B
Trichloroethene	ND	500	439	ug/L	88		SW846 8260B
	ND	500	486	ug/L	97	10	SW846 8260B
Tetrachloroethene	ND	500	354	ug/L	71		SW846 8260B
	ND	500	391	ug/L	78	9.8	SW846 8260B
Chlorobenzene	ND	500	466	ug/L	93		SW846 8260B
	ND	500	492	ug/L	98	5.4	SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	109	(75 - 127)
	110	(75 - 127)
Toluene-d8	98	(79 - 117)
	102	(79 - 117)
4-Bromofluorobenzene	86	(60 - 119)
	89	(60 - 119)
1,2-Dichloroethane-d4	105	(71 - 133)
	105	(71 - 133)

NOTE (S) :

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

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

TCLP Metals

Client Lot #....: F1G060102

Matrix.....: SOLID

Date Sampled....: 07/02/01 09:29 Date Received...: 07/06/01

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCENT RECVRY	REP	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
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MS Lot-Sample #: F1G060102-002 Prep Batch #....: 1193375

Leach Date.....: 07/10/01 Leach Batch #...: P119106

Mercury

ND	0.025	0.0196	mg/L	78			SW846 7470A	07/12-07/13/01	EF1PJ1CF
ND	0.025	0.0198	mg/L	79	1.3		SW846 7470A	07/12-07/13/01	EF1PJ1CG
				Dilution Factor: 5	Initial Wgt/Vol: 6 mL		Final Wgt/Vol...: 30 mL		
				Analysis Time...: 15:03	Instrument ID...: PE2		Analyst ID.....: 400646		

NOTE(S):

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

MATRIX SPIKE SAMPLE DATA REPORT

TCLP GC/MS Volatiles

Lot-Sample #: F1G060102 Work Order #: EF1PH1AD Matrix: SOLID
 MS Lot-Sample #: F1G060102-001
 Date Sampled: 07/02/01 09:29 Date Received: 07/06/01
 Leach Date: 07/10/01 Prep Date: 07/12/01 Analysis Date: 07/12/01
 Leach Batch #: F119107 Prep Batch #: 1194138
 Dilution Factor: 1 Initial Wgt/Vol: 0.5 mL Final Wgt/Vol: 5 mL
 Analyst ID: 400452 Instrument ID: MSE

PARAMETER	SAMPLE SPIKE MEASRD			UNITS	PERCENT RECOVERY	METHOD
	AMOUNT	AMT	AMOUNT			
Vinyl chloride	ND	500	646	ug/L	129	SW846 8260B
1,1-Dichloroethene	ND	500	508	ug/L	102	SW846 8260B
2-Butanone	ND	500	514	ug/L	103	SW846 8260B
Chloroform	ND	500	522	ug/L	104	SW846 8260B
Carbon tetrachloride	ND	500	450	ug/L	90	SW846 8260B
1,2-Dichloroethane	ND	500	506	ug/L	101	SW846 8260B
Benzene	ND	500	462	ug/L	92	SW846 8260B
Trichloroethene	ND	500	439	ug/L	88	SW846 8260B
Tetrachloroethene	ND	500	354	ug/L	71	SW846 8260B
Chlorobenzene	ND	500	466	ug/L	93	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	109	(75 - 127)
Toluene-d8	98	(79 - 117)
4-Bromofluorobenzene	86	(60 - 119)
1,2-Dichloroethane-d4	105	(71 - 133)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

TCLP Metals

Client Lot #...: FIG060102

Matrix.....: SOLID

Date Sampled...: 07/02/01 09:29 Date Received...: 07/06/01

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: FIG060102-002 Prep Batch #...: 1192366								
Arsenic	ND	12.5	12.0	mg/L	96	SW846 6010B	07/11-07/17/01	EF1PJ1AV
						Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
						Analysis Time...: 12:38	Analyst ID.....: 063161	
Barium	1.6	12.5	12.8	mg/L	90	SW846 6010B	07/11-07/17/01	EF1PJ1AW
						Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
						Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Beryllium	ND	2.50	2.38	mg/L	95	SW846 6010B	07/11-07/17/01	EF1PJ1A4
						Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
						Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Cadmium	0.0016	2.50	2.28	mg/L	91	SW846 6010B	07/11-07/17/01	EF1PJ1AX
						Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
						Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Chromium	ND	12.5	11.1	mg/L	89	SW846 6010B	07/11-07/17/01	EF1PQ1A0
						Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
						Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Lead	0.0062	12.5	11.4	mg/L	91	SW846 6010B	07/11-07/17/01	EF1PQ1A1
						Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
						Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Selenium	0.0058	2.50	2.42	mg/L	97	SW846 6010B	07/11-07/17/01	EF1PQ1A3
						Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
						Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Silver	ND	2.50	2.31	mg/L	92	SW846 6010B	07/11-07/17/01	EF1PQ1A2
						Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
						Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
MS Lot-Sample #: FIG060102-002 Prep Batch #...: 1193375								
Mercury	ND	0.025	0.0196	mg/L	78	SW846 7470A	07/12-07/13/01	EF1PQ1CF
						Dilution Factor: 5	Initial Wgt/Vol: 6 mL	Final Wgt/Vol...: 30 mL
						Analysis Time...: 15:00	Instrument ID...: PS2	Analyst ID.....: 400646

NOTE(S):

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

MATRIX SPIKE SAMPLE EVALUATION REPORT

TCLP GC/MS Volatiles

Lot-Sample #....: F1G060102 Work Order #....: EF1PH1AD Matrix.....: SOLID
 MS Lot-Sample #: F1G060102-001
 Date Sampled...: 07/02/01 09:29 Date Received...: 07/06/01
 Leach Date.....: 07/10/01 Prep Date.....: 07/12/01 Analysis Date...: 07/12/01
 Leach Batch #...: P119107 Prep Batch #....: 1194138
 Dilution Factor: 1 Initial Wgt/Vol: 0.5 mL Final Wgt/Vol...: 5 mL
 Analyst ID.....: 400452 Instrument ID...: MSE

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Vinyl chloride	129	(17 - 169)	SW846 8260B
1,1-Dichloroethene	102	(46 - 161)	SW846 8260B
2-Butanone	103	(39 - 172)	SW846 8260B
Chloroform	104	(64 - 141)	SW846 8260B
Carbon tetrachloride	90	(56 - 155)	SW846 8260B
1,2-Dichloroethane	101	(69 - 145)	SW846 8260B
Benzene	92	(69 - 142)	SW846 8260B
Trichloroethene	88	(63 - 129)	SW846 8260B
Tetrachloroethene	71	(50 - 131)	SW846 8260B
Chlorobenzene	93	(77 - 120)	SW846 8260B

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Dibromofluoromethane	109	(75 - 127)
Toluene-d8	98	(79 - 117)
4-Bromofluorobenzene	86	(60 - 119)
1,2-Dichloroethane-d4	105	(71 - 133)

NOTE (S):

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

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

TCLP Metals

Client Lot #...: F1G060102

Matrix.....: SOLID

Date Sampled...: 07/02/01 09:29 Date Received...: 07/06/01

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
MS Lot-Sample #: F1G060102-002 Prep Batch #...: 1192366					
Arsenic	96	(75 - 125)	SW846 6010B	07/11-07/17/01	EF1PJ1AV
			Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
			Analysis Time...: 12:38	Analyst ID.....: 063161	
Barium	90	(75 - 125)	SW846 6010B	07/11-07/17/01	EF1PJ1AW
			Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
			Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Beryllium	95	(75 - 125)	SW846 6010B	07/11-07/17/01	EF1PJ1A4
			Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
			Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Cadmium	91	(75 - 125)	SW846 6010B	07/11-07/17/01	EF1PJ1AX
			Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
			Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Chromium	89	(75 - 125)	SW846 6010B	07/11-07/17/01	EF1PJ1AO
			Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
			Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Lead	91	(75 - 125)	SW846 6010B	07/11-07/17/01	EF1PJ1A1
			Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
			Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Selenium	97	(75 - 125)	SW846 6010B	07/11-07/17/01	EF1PJ1A3
			Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
			Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161
Silver	92	(49 - 135)	SW846 6010B	07/11-07/17/01	EF1PJ1A2
			Dilution Factor: 2.5	Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL
			Analysis Time...: 12:38	Instrument ID...: 61E	Analyst ID.....: 063161

MS Lot-Sample #: F1G060102-002 Prep Batch #...: 1193375

Mercury	78	(75 - 125)	SW846 7470A	07/12-07/13/01	EF1PJ1CF
			Dilution Factor: 5	Initial Wgt/Vol: 6 mL	Final Wgt/Vol...: 30 mL
			Analysis Time...: 15:00	Instrument ID...: PS2	Analyst ID.....: 400646

NOTE (S):

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

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: FIG060102 Work Order #...: EFH2M-SMP Matrix.....: SOLID
 EFH2M-DUP

Date Sampled...: 06/18/01 14:20 Date Received...: 06/26/01

% Moisture.....: 16

<u>PARAM RESULT</u>	<u>DUPLICATE RESULT</u>	<u>UNITS</u>	<u>RPD</u>	<u>RPD LIMIT</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Moisture	15.8	15.2	%	2.5	(0-0.0) MCAWW 160.3 MOD	07/20/01	1204279
					SD Lot-Sample #: F1F260195-016		
					Dilution Factor: 2	Initial Wgt/Vol: 10 g	Final Wgt/Vol...: 10 g
					Analysis Time...: 09:40	Analyst ID.....: 400666	Instrument ID...: WET CHEM

SAMPLE DUPLICATE EVALUATION REPORT

Metals

Client Lot #....: F1G060102 Work Order #....: EF1PJ-SMP Matrix.....: SOLID
EF1PJ-DUP

Date Sampled....: 07/02/01 09:29 Date Received...: 07/06/01

% Moisture.....: 15

PARAM RESULT	DUPLICATE RESULT	UNITS	RPD RED	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Silver						SD Lot-Sample #: F1G060102-002	
ND	ND	mg/L	0	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38			Analyst ID.....: 063161	Instrument ID...: 61E	
Arsenic						SD Lot-Sample #: F1G060102-002	
ND	0.0022	mg/L	200	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38			Analyst ID.....: 063161	Instrument ID...: 61E	
Barium						SD Lot-Sample #: F1G060102-002	
1.6	1.6	mg/L	1.3	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38			Analyst ID.....: 063161	Instrument ID...: 61E	
Beryllium						SD Lot-Sample #: F1G060102-002	
ND	0.00040	mg/L	200	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38			Analyst ID.....: 063161	Instrument ID...: 61E	
Cadmium						SD Lot-Sample #: F1G060102-002	
0.0016 B	0.0012	mg/L	28	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38			Analyst ID.....: 063161	Instrument ID...: 61E	
Chromium						SD Lot-Sample #: F1G060102-002	
ND	ND	mg/L	0	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38			Analyst ID.....: 063161	Instrument ID...: 61E	
Lead						SD Lot-Sample #: F1G060102-002	
0.0062 B	0.0082	mg/L	29	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38			Analyst ID.....: 063161	Instrument ID...: 61E	
Selenium						SD Lot-Sample #: F1G060102-002	
0.0058 B	ND	mg/L	200	(0-20)	SW846 6010B	07/11-07/17/01	1192366
		Dilution Factor: 2.5			Initial Wgt/Vol: 20 mL	Final Wgt/Vol...: 50 mL	
		Analysis Time...: 12:38			Analyst ID.....: 063161	Instrument ID...: 61E	

NOTE(S):

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

B Estimated result. Result is less than RL.

PSL20300
Page 1SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. LouisRun Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES

PROJECT MANAGER: Mark J. Loeb

PROJECT #: 604647

REPORT TO: Suzi Jensen

P.O. NUMBER:

SITE: Mixed Waste Treatment

AMOUNT REC'D: 120G

STORAGE LOC: V9

LOT COMMENTS: Client requires LCS/LCSD Both must be in SAMPLING TIME: 9:29

MATRIX: SOLID

RECEIVING TIME: 7:15

SAMPLE ID: 056516-001/CY94H-BH20-4

QC PACKAGE: Expanded Deliverables

SDG# : F1G060102

SAMPLE COMMENTS:

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Volatile Organics, GC/MS (8260B)	06	7/06/01	7/16/01	7/30/01
TCLP(1311-ZHE/filter) -> PURGE-AND-TRAP (Low Level)				
STL: SW-846 8260-TCLP				
(A-58-QK-01) EF1PH-1-AA Protocol: C QC Program: STANDARD TEST SET				

PSL20300
Page 1

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 120G
STORAGE LOC: V9
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056515-001/CY94H-BH20-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G060102-001-D
WORK ORDER: EF1PH MSD
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:29
RECEIVING TIME: 7:15
SDG# : FIG060102

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Volatile Organics, GC/MS (8260B)	06	7/06/01	7/16/01	7/30/01
TCLP(1311-ZHE/filter) -> PURGE-AND-TRAP (Low Level)				
STL: SW-846 8260-TCLP				
(A-58-QK-01) EF1PH-1-AB Protocol: C QC Program: STANDARD TEST SET				

PSL20300
Page 1SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. LouisRun Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES

PROJECT MANAGER: Mark J. Loeb

PROJECT #: 604647

REPORT TO: Suzi Jensen

P.O. NUMBER:

SITE: Mixed Waste Treatment

AMOUNT REC'D: 120G

STORAGE LOC: V9

LOT COMMENTS: Client requires LCS/LCSD Both must be in SAMPLING TIME: 9:29

MATRIX: SOLID

SAMPLE ID: 056516-001/CY94H-BH20-4

QC PACKAGE: Expanded Deliverables

SAMPLE COMMENTS:

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Volatile Organics, GC/MS (8260B)	06	7/06/01	7/16/01	7/30/01
TCLP(1311-ZHE/filter) -> PURGE-AND-TRAP (Low Level)				
STL: SW-846 8260-TCLP				
(A-58-QK-01) EF1PH-1-AD Protocol: C QC Program: STANDARD TEST SET				

PSL20300

SEVERN TRENT LABORATORIES, INC.

Run Date: 7/12/01

Page 1

CLIENT ANALYSIS SUMMARY

Time: 5:30:38

STL St. Louis

User Id.: CLARKEJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES

QUOTE/SAR #: 34180

PROJECT MANAGER: Mark J. Loeb

LAB ID: F-1G060102-002

PROJECT #: 604647

WORK ORDER: EF1PJ

REPORT TO: Suzi Jensen

RECEIVING DATE: 7/06/01

P.O. NUMBER:

SAMPLING DATE: 7/02/01

SITE: Mixed Waste Treatment

ANALYTICAL DUE DATE: 8/03/01N

AMOUNT REC'D: 250G

REPORT DUE DATE: 8/06/01

STORAGE LOC: T162

PRIORITY: 28

LOT COMMENTS: Client requires LCS/LCSD Both must be in SAMPLING TIME: 9:29

MATRIX: SOLID

RECEIVING TIME: 7:15

SAMPLE ID: 056516-002/CY94H-BH20-4

SDG# : F1G060102

QC PACKAGE: Expanded Deliverables

SAMPLE COMMENTS:

METALS REQUIRE DUPLICATE!!

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Archive NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-ZZ-01) EF1PJ-1-AA Protocol: A QC Program: STANDARD TEST SET	06	7/06/01	0/00/00	10/09/01
Base/Neutrals and Acids (8270C) TCLP(1311) -> LIQ/LIQ, SEP FUNNEL - Acid->Base STL: SW-846 8270C-TCLP (A-62-QL-01) EF1PJ-1-AC Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	7/17/01	8/26/01
Mercury (7470A, Cold Vapor) - Liquid TCLP(1311) -> METALS, TOTAL (Method exclusive) M7470TP HG (A-0M-08-01) EF1PJ Protocol: C QC Program: STANDARD TEST SET	05	7/06/01	7/30/01	8/27/01
Inductively Coupled Plasma (6010B Trace) TCLP(1311) -> METALS, TOTAL M6010TP AG,AS,BA,BE,CD,CR,PB,SE (A-34-QM-01) EF1PJ Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	12/29/01	1/07/02
Moisture, Percent (160.3) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-WM-01) EF1PJ-1-A5 Protocol: A QC Program: STANDARD TEST SET	06	7/06/01	0/00/00	10/09/01

PSL20300
Page 1

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 250G
STORAGE LOC: T162

QUOTE/SAR #: 34180
LAB ID: F-1G060102-002-D
WORK ORDER: EF1PJ MSD
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:29
RECEIVING TIME: 7:15

LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056516-002/CY94H-BH20-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:
METALS REQUIRE DUPLICATE!!
Beginning Depth: .00 Ending Depth: .00

SDG# : F1G060102

***** ANALYSIS *****

	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Base/Neutrals and Acids (8270C)	05	7/06/01	7/17/01	8/26/01
TCLP(1311) -> LIQ/LIQ, SEP FUNNEL - Acid->Base				
STL: SW-846 8270C-TCLP				
(A-62-OL-01) EF1PJ-1-AT Protocol: C QC Program: STANDARD TEST SET				

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Page 1

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 250G
STORAGE LOC: T162
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056516-002/CY94H-BH20-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:
METALS REQUIRE DUPLICATE!!
Beginning Depth: .00 Ending Depth: .00

QUOTE/SAR #: 34180
LAB ID: F-1G060102-002-S
WORK ORDER: EF1PJ MS
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DGE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:29
RECEIVING TIME: 7:15
SDG# : F1G060102

***** ANALYSIS *****

	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Base/Neutrals and Acids (8270C) TCLP(1311) -> LIQ/LIQ, SEP FUNNEL - Acid->Base STL: SW-846 8270C-TCLP (A-62-QL-01) EF1PJ-1-AR Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	7/17/01	8/26/01
Mercury (7470A, Cold Vapor) - Liquid TCLP(1311) -> METALS, TOTAL (Method exclusive) M7470TP HG (A-0M-08-01) EF1PJ Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	7/30/01	8/27/01
Inductively Coupled Plasma (6010B Trace) TCLP(1311) -> METALS, TOTAL MT6010TP AG, AS, BA, BE, CD, CR, PB, SE (A-34-QM-01) EF1PJ Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	12/29/01	1/07/02

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Page 1

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: WATSONJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 120G
STORAGE LOC: V9
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056517-001/CY94H-BH21-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G060102-003
WORK ORDER: EF1PK
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:46
RECEIVING TIME: 7:15
SDG# : FIG060102

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	WRK	REQUEST	EXTRACTION	ANALYSIS
	LOC	DATE	EXP DATE	EXP DATE

Volatile Organics, GC/MS (8260B)	06	7/06/01	7/16/01	7/30/01
TCLP(1311-ZHE/Filter) -> PURGE-AND-TRAP (Low Level)				
STL: SW-846 8260-TCLP				
(A-58-QK-01) EF1PK-1-AA Protocol: C QC Program: STANDARD TEST SET				

PSL20300
Page 1

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:30:38
User Id.: CLARKEJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 250G
STORAGE LOC: T162
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: SOLID
SAMPLE ID: 056517-002/CY94H-BH21-4
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G060102-004
WORK ORDER: EF1PL
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01N
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:46
RECEIVING TIME: 7:15
SDG# : F1G060102

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	WRK LOC	REQUEST DATE	EXTRACTION EXP DATE	ANALYSIS EXP DATE
Archive NO SAMPLE PREPARATION PERFORMED / DIRECT-INJECTION (A-88-ZZ-01) EF1PL-1-AA Protocol: A QC Program: STANDARD TEST SET	06	7/06/01	0/00/00	10/09/01
Base/Neutrals and Acids (8270C) TCLP(1311) -> LIQ/LIQ; SEP FUNNEL - Acid->Base STL: SW-846 8270C-TCLP (A-62-QL-01) EF1PL-1-AC Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	7/17/01	8/26/01
Mercury (7470A, Cold Vapor) - Liquid TCLP(1311) -> METALS, TOTAL (Method exclusive) M7470TP HG (A-0M-08-01) EF1PL Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	7/30/01	8/27/01
Inductively Coupled Plasma (6010B Trace) TCLP(1311) -> METALS, TOTAL MT6010TP AG,AS,BA,BE,CD,CR,PB,SE (A-34-QM-01) EF1PL Protocol: C QC Program: STANDARD TEST SET	06	7/06/01	12/29/01	1/07/02
Moisture, Percent (160.3) NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION (A-88-WM-01) EF1PL-1-AW Protocol: A QC Program: STANDARD TEST SET	06	7/06/01	0/00/00	10/09/01

STL ST. LOUIS

PSL20300
Page 1

SEVERN TRENT LABORATORIES, INC.
CLIENT ANALYSIS SUMMARY
STL St. Louis

Run Date: 7/12/01
Time: 5:26:34
User Id.: CLARKEJ

CLIENT: 122657 SANDIA NATIONAL LABORATORIES
PROJECT MANAGER: Mark J. Loeb
PROJECT #: 604647
REPORT TO: Suzi Jensen
P.O. NUMBER:
SITE: Mixed Waste Treatment
AMOUNT REC'D: 3XVIAL40
STORAGE LOC: V2J
LOT COMMENTS: Client requires LCS/LCSD Both must be in
MATRIX: WATER
SAMPLE ID: 056518-001/CY94H-BH20-TB
QC PACKAGE: Expanded Deliverables
SAMPLE COMMENTS:

QUOTE/SAR #: 34180
LAB ID: F-1G060102-005
WORK ORDER: EF1PM
RECEIVING DATE: 7/06/01
SAMPLING DATE: 7/02/01
ANALYTICAL DUE DATE: 8/03/01M
REPORT DUE DATE: 8/06/01
PRIORITY: 28
SAMPLING TIME: 9:46
RECEIVING TIME: 7:15
SDG# : F1G060102

Beginning Depth: .00 Ending Depth: .00

***** ANALYSIS *****

	<u>WRK</u>	<u>REQUEST</u>	<u>EXTRACTION</u>	<u>ANALYSIS</u>
	<u>LOC</u>	<u>DATE</u>	<u>EXP DATE</u>	<u>EXP DATE</u>
Volatile Organics, GC/MS (8260B)	06	7/06/01	0/00/00	7/16/01
PURGE AND TRAP - 5 mL purge				
STL: SW-846 8260B				
(I-15-QK-01) EF1PM-1-AA Protocol: A				
QC Program: STANDARD TEST SET				

**CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY**

Internal Lab **N/A** SARWR No. **604647**

Dept. No./Mail Stop: 6152/1088
 Project/Task Manager: P Freshour
 Project Name: SWMU 94H
 Record Center Code: #3
 Logbook Ref. No.: QFO 107-01
 Service Order No. NA

Contract No: **AT-2000B PO-2161A**
 Project/Task No.: 7214.02.02.21
 SMO Authorization of: *[Signature]*

Lab Contact: M Loeb 314-298-8386
 Lab Destination: Savannah
 SMO Contact/Phone: D Sahmi 505-644-3110
 SMO Report to SMO: S Jensen 505-644-3184

Waste Characterization - RCRA Dates:
 Solid: Preliminary report to
 Validation Required
 Released by COC No.:
 Bill To: Sandia National Labs (Accounts Payable)
 P.O. Box 5800, MS-0154
 Albuquerque, NM, 87185-0154

Sample No. - Fraction	Building	NA	Room	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Volume	Preserve All@4C	Collector Method	Sample Type	Parameter & Method Requested	Lab Sample ID
056516-001				CY94H-BH20-4	4	94H	070201 0829	S	AG	4oz	None	G	SA	TCLP VOC(1311/8260)	
056516-002				CY94H-BH20-4	4	94H	070201 0929	S	AG	8oz	None	G	SA	TCLP SVOCs; TCLP metals + Be(1311/8270)	
056517-001				CY94H-BH21-4	4	94H	070201 0946	S	AG	4oz	None	G	SA	TCLP VOC(1311/8260)	
056517-002				CY94H-BH21-4	4	94H	070201 0946	S	AG	8oz	None	G	SA	TCLP SVOCs; TCLP metals + Be(1311/8270)	
056518-001				CY94H-BH20-TB	N/A	94H	070201 0929	DIW	G	3x40ml	HCl	N/A	TB	VOC(8260)	

Return Samples By:
 Yes No
 Return to Client Disposal by lab
 7 Day 15 Day 30 Day
 Negotiated TAT

Signature: *[Signature]*
 Name: M Sanchez
 Company/Organization/Phone/Cellular: Westco/615/845-3267

Special Instructions/QC Requirements:
 EDD Yes No
 Raw Data Package Yes No
 *Please send report to:
 MThacker MS1088 PH505-284-2575 Fax 505-284-2617
 msthack@sandia.gov

Chain of Custody:

1. Relinquished by	2. Received by	3. Relinquished by	4. Received by	5. Relinquished by	6. Received by
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
Date: 07/28/01	Date: 07/28/01	Date: 07/28/01	Date: 07/28/01	Date: 07/28/01	Date: 07/28/01
Time: 12:28	Time: 13:28	Time: 11:00	Time: 07:55	Time: 07:55	Time: 07:55

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

STL ST. LOUIS

Shipping Code: Control No:

SHIPPER

SF 6951-AEP (8-88)
Supersedes (1-98) Issue

Sandia National Laboratories
1515 Eubank SE
Albuquerque, NM 87123

Books with RED letters are required.
Press F1 for instructions for each field.
NOTE: If text entered wraps, the form could print on second page.

(1) FROM:
 New Mexico
 California
 Other

Before Filling Out Form Call 845-0068 for Document Number

(2) Document No:
745269

(3) SHIP TO:
Severn Trent - St. Louis
Attn: Mark Loeb Tel: 800-333-3305
13715 Rider Trail North
Earth City, MO 63045

Contract#: AJ-2480B
COC #: 604647

(10) RMA # (if applicable) N/A

(4) Date Prepared: 7-5-01 (5) Highest Material Security Classification: UNC (6) Page 1 of 1

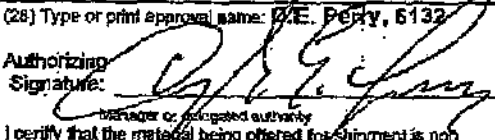
(7) Nuclear Explosive-Like Assembly (NELA)?
 Yes No (8) Date to be returned:
 No Return

(9) Date Due at Destination: 7-6-01 Firm: (CA only-see instructions or press F1 for PTA justification)
 Flex: (Most economical transportation)

* FIRST OVERNIGHT

(11a) Form Filled Out By (Name): Douglas E. Perry, 6132				(11b) Phone: 505-845-0867		(12) Case No: 10204 1.2		(13) Freight Billing: Sandia Pays <input checked="" type="checkbox"/> Consignee Pays <input type="checkbox"/> If Consignee Pays, Carrier & acct. no.					
(14a) Recipient Name: Same				(14b) Org: 6132		(14c) A/S: 0756		(14d) Phone: 505-845-0867		(14e) SSN: 212-56-6412			
(15a) Bldg: NA			(15b) Room: NA		New Sandia Location (if applicable): (15a) Site Code: NA		(15b) Bldg: NA		(15c) Room: NA		(16d) Org: NA		
(17) Reason for Shipment: (must select one): Analysis/Testing										(18) Authority Number: NA		(19) DOE Transportation Safeguards Dept. Counsel Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
(20) Item No.	(21) Sec. Class.	(22) Qty	(23) Unit	(24) Haz. Mat'l.	(25) Property Tag No. and/or MIP No.	(26) Description			(27) Unit Value	Total \$			
1	UNC	1	EA	N	NA	Environmental Solid/Liquid Samples			\$0.00	\$0.00			
						Last Item				\$0.00			
										\$0.00			
						accrual #: 3.0 4.0 30 1.0 COC 604647				\$0.00			
										\$0.00			
										\$0.00			
										\$0.00			
										\$0.00			
						SANDIA SHIPPING ONLY: Please FAX a copy of this Shipper to SMO at 844-4976. Thanks!				\$0.00			
									Grand Total	\$0.00			

(28) Type or print approval name: D.E. Perry, 6132

Authorizing Signature: 


(29) Special Approval (International):


(30) Special Approval (Service Clerk, DOE):

I certify that the material being offered for shipment is not hazardous unless noted as hazardous in block 24 and required information is being provided.


(31) Recipient's Signature/Co. _____ Date _____


(32) Contracting or GFP Rep. Signature _____ Date _____

Received by Shipping Clerk:  Date: 7-5-01

Property Management:  Date: 7-5-01

The listed material and accompanying information have been examined and the hazardous material restrictions and all preparations for shipment are certified correct.

Hazardous Material Consultant:  Date: _____

Date Shipped or Packaged: _____ Routing: _____ E/L No.: _____ No. of Boxes: 30 Weight: 3.0 Dimension: 3.0 Packed by: 

LOT# F1G060102

AR/COC 604647



Lot No: F1G060102

Condition Upon Receipt Form
St. Louis Laboratory

Client: Sandia

Date: 070601 Time: 0715

Quote No: 34436 34180

Initiated by: [Signature]

Shipper/No: 4708 8501 5442 FedEx

COC/RFA Numbers: 1eD46077

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample received in undamaged condition.	5. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample volume sufficient for analysis.
2. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample received within 4°C ± 2°C* Record temperature: <u>3</u>	6. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample received with Chain of Custody.
3. <input type="radio"/> Y <input checked="" type="radio"/> N <input type="radio"/> NA	Sample received with proper pH**.	7. <input checked="" type="radio"/> Y <input type="radio"/> N	Chain of Custody matches sample IDs on containers.
4. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample received in proper containers.	8. <input checked="" type="radio"/> Y <input type="radio"/> N	Custody seal received intact and tamper evident on cooler.
		9. <input checked="" type="radio"/> Y <input type="radio"/> N	Custody seal received intact and tamper evident on bottles.

* Temperature Variance Does Not Affect the Following Analyses: _____

** For DOE-AL (Pantex, LANL, Sandia, Timet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes: Blue ice frozen

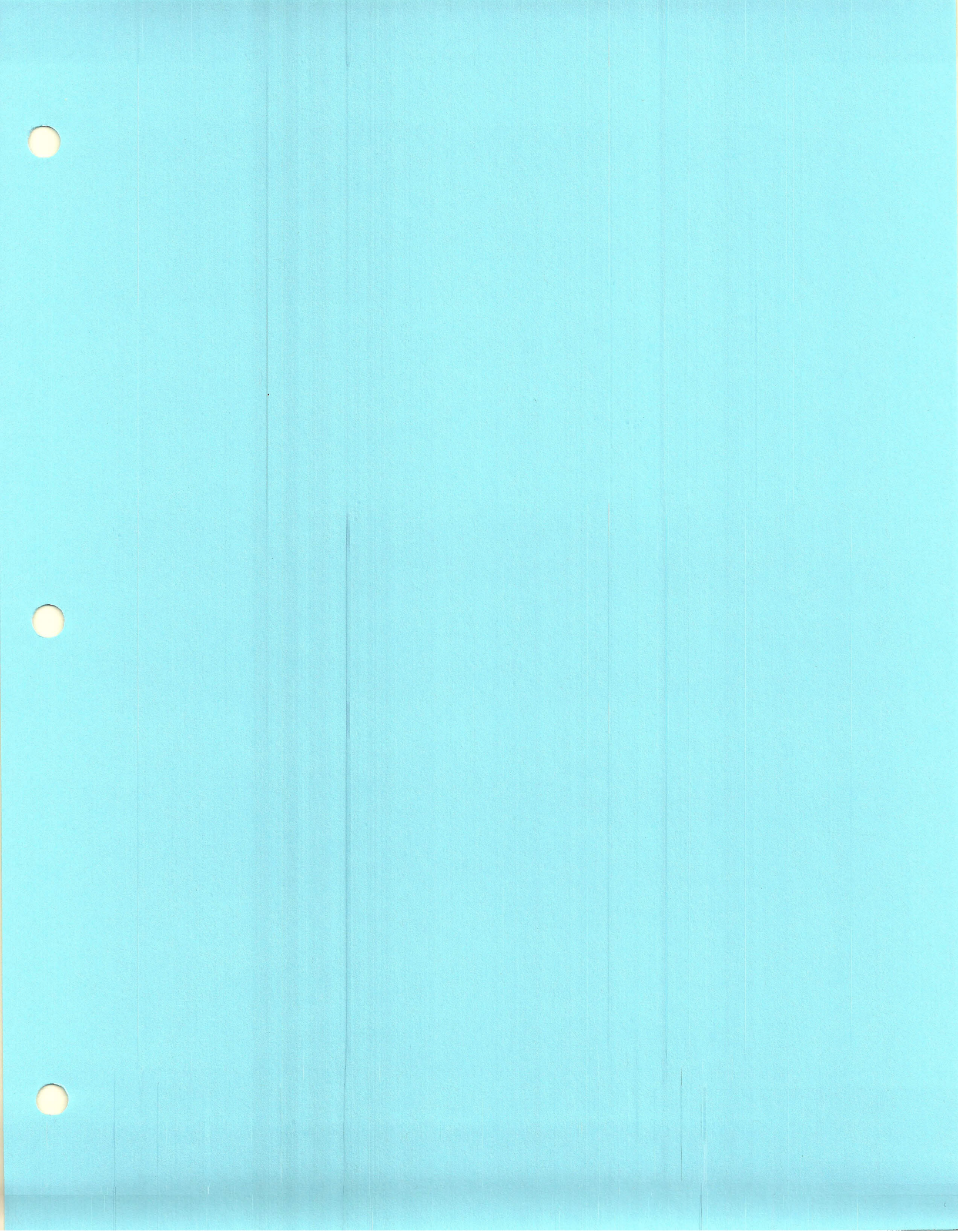
Corrective Action:

- Client's Name: _____ Informed verbally on: _____ By: _____
- Client's Name: _____ Informed in writing on: _____ By: _____
- Sample(s) processed "as is". _____
- Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: [Signature] Date: 070601

Project Management Review: [Signature] Date: 7-6-01

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIALS AND THE DATE NEXT TO THAT ITEM



Sample Findings Summary

Site: SWMU 94H

AR/COC: 604613

Data Type: Inorganic and organic

Sample ID	7440-39-3 (barium)	7440-38-2 (arsenic)	7440-47-3 (chromium)	7782-49-2 (selenium)	VOCs	110-75-8 (2-chloroethoxyethyl ether)	67-64-1 (acetone)	7-09-2 (methylene chloride)															
066178-002 CY94H-BH1-2-5	J/A2	J/A2	J	J/A2																			
066178-002 CY94H-BH1-2-5	J/A2	J/A2	J	R/A2																			
066180-002 CY94H-BH1-3-7	J/A2	J/A2	J	R/A2																			
066203-001 CY94H-BH1-7B						R	J																
066178-001 CY94H-BH1-2-5												20UJ,B,81	5.0UJ,B										
066178-001 CY94H-BH1-2-5													5.0UJ,B										
066180-001 CY94H-BH1-3-7													20UJ,B,81	5.0UJ,B									

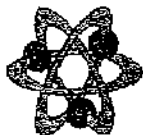
Validated By:



Ms. Marcia Hilshey

Date: 09/24/01

Analytical Quality Associates, Inc.



616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minteer@aol.com

MEMORANDUM

DATE: 09/24/01
TO: File
FROM: Marcia Hilchey
SUBJECT: Inorganic Data Review and Validation - SNL
Site: SWMU 94H, ARCO #604613
STSL SDG #F1F230197 Project/Task No. 7214.02.02.01

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

Summary

All samples were prepared and analyzed with approved procedures using methods EPA 6010B ICP-AES metals, EPA 6020 ICP-MS, and EPA 7471A CVAA mercury. Problems were identified with the data package that result in the qualification of data.

ICP: The replicate RPD for chromium exceeded acceptance criteria. Associated sample results are qualified "J."

MS recoveries for Ba and As were below acceptance criteria but >30%. Associated sample results are qualified "J,A2."

MS recovery for Se was 0%. Associated positive results are qualified "J,A2"; non-detects are qualified "R,A2."

It should be noted that ICP-MS (EPA 6020) was used for the analysis of beryllium, although the analysis request specifies EPA 6010. No sample data were qualified as a result.

Data are acceptable except as noted above. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

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

Calibration

All Analyses: The initial and continuing calibration verifications met all QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as follows.

ICP Analysis: Ag and Se were detected in an associated blank at >DL. All associated sample results were either non-detect or >5x the blank concentration. Thus, no sample data were qualified.

ICP-MS Analysis: Beryllium was detected in an associated blank at >DL. All associated sample results were >5x the blank concentration. Thus, no sample data were qualified.

CVAA Analysis: All blank acceptance criteria were met.

Matrix Spike (MS) Analysis

ICP Analysis: The MS analysis met QC acceptance criteria except as noted above in the summary section.

ICP-MS and CVAA Analyses: The MS analyses met QC acceptance criteria.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS analyses met all QC acceptance criteria.

Replicate Analysis

ICP Analysis: All replicate QC acceptance criteria were met except as noted above in the summary section.

ICP-MS and CVAA Analyses: The replicate analyses met all QC acceptance criteria.

ICP Interference Check Sample (ICS)

ICP and ICP-MS Analyses: The ICS met all QC acceptance criteria.

CVAA Analysis: No ICS analysis was required for this method.

ICP Serial Dilution

ICP and ICP-MS Analyses: All serial dilution acceptance criteria were met.

CVAA Analysis: No serial dilution was required for this method.

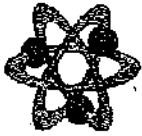
Other QC

All Analyses: No equipment blank or field blank was submitted on the AR/COG.

Field duplicate pairs were submitted, however there are no "required" review criteria for field duplicate analyses comparability.

No other specific issues were identified which affect data quality.

Analytical Quality Associates, Inc.



616 Maxine NE
Albuquerque, NM 87123
Phone: 505-299-5201
Fax: 505-299-6744
Email: minter@aol.com

MEMORANDUM

DATE: 09/24/01
TO: File
FROM: Marcia Hickey
SUBJECT: Organic Data Review and Validation - SNL
Site: SWMU 94H, ARCOG #604613
STSL SDG #F1F230197 Project/Task No. 7214.02.02.01

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

Summary

All samples were prepared and analyzed with approved procedures using method EPA 8260B VOCs. Problems were identified with the data package that result in the qualification of data.

VOC Analyses: The result for 2-chloroethylvinyl ether for sample 056200-001 (trip blank) is qualified "R" due to acidic preservation.

The result for acetone in the trip blank is qualified "J" due to high initial calibration RSD.

The initial calibration RSD and the CCV %Ds associated with all soil samples for acetone were >20 and <60. Associated positive sample results are qualified "J"; non-detects are not qualified

Methylene chloride was detected in the method blank associated with the aqueous sample at >DL. The associated positive sample result was <5x the blank concentration and <RL. This result is qualified "U,B" at the PQL.

Methylene chloride and acetone were detected in one or more blanks associated with the soil samples. All positive sample results for methylene chloride which were <10x the blank concentration and <PQL are qualified "U,B,B1" at the PQL. All positive sample results for acetone were <PQL and were previously qualified J. These results are further qualified "UJ,B,B1" at the PQL.

Data are acceptable except as noted above. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were properly preserved and analyzed within the prescribed holding times. Acidic preservation was performed on the aqueous sample, which could result in the degradation of 2-chloroethylvinyl ether. The sample result for this compound is qualified as noted above in the summary section.

Calibration

VOC Analyses: The initial calibration RSDs for chloroethane and acetone associated with the aqueous sample (TB) were >20 and <40. The result for chloroethane was non-detected and was not qualified. The acetone result was qualified as noted above in the summary section. The initial calibration RSD for 2-chloroethylvinyl ether associated with the TB was >40 and <60. The associated CCV %D was >60. The associated result for this compound was previously qualified R; no further qualification is required. All other initial and continuing calibration acceptance criteria were met for the aqueous sample.

The initial and continuing calibrations associated with the soil sample analyses met QC acceptance criteria except as noted above in the summary section.

Blanks

All blank acceptance criteria were met except as noted above in the summary section and as follows.

Carbon disulfide, 1,2-dichloropropane, and toluene were detected in one or more blanks associated with the soil samples at >DL. All associated sample results were non-detected and were therefore not qualified.

Surrogates

All surrogate acceptance criteria were met except for the following. One surrogate had slightly high recovery (128%) for sample 056179-001. No sample data were qualified as a result, based on professional judgment.

Internal Standards (ISs)

The IS areas and retention times (RTs) met QC acceptance criteria.

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

All MS/MSD acceptance criteria were met.

Laboratory Control Samples (LCS/LCSD) Analysis

The LCS/LCSD analyses met all QC acceptance criteria.

Other QC

No field blank or equipment blank was submitted on the ARCOG.

Field duplicate pairs were submitted, however there are no "required" review criteria for field duplicate analyses comparability.

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: Summ 944 Project/Task #: 7214-02-02-01 # of Samples: 7 Matrix: Soil Log
 AR/COC #: 604613 Laboratory Sample IDs: _____
 Laboratory: STSL

Laboratory Report #: FIF-230197

QC Element	Analysis													
	Organics					Inorganics					RAD	Other		
	VOC	SVOC	Pesticides/PCB	HPHC (HE)	ICP/AES	CHAL/PAH	CVAA (HE)	CN						
1. Holding Times/Preservation					✓	✓								
2. Calibrations					✓	✓								
3. Method Blanks					✓	✓								
4. MS/MSD					J	J/R								
5. Laboratory Control Samples					✓	✓								
6. Replicates					J	J								
7. Surrogates														
8. Internal Standards														
9. TCL Compound Identification														
10. ICP Interference Check Sample					✓	✓								
11. ICP Serial Dilution					✓	✓								
12. Carrier/Chemical Tracer Recoveries														
13. Other QC														

DL = ADL, not MDL

J = Estimated Check (✓) = Acceptable
 U = Not Detected Shaded Cells = Not Applicable (also "NA")
 UJ = Not Detected, Estimated NP = Not Provided
 R = Unusable Other: _____

Reviewed By: [Signature] Date: 12/9/01

Inorganic Metals

Laboratory Sample ID:

AR/COC #: 604613

Site/Project: SUMMA 94H

Laboratory Report #: F1 F2 30197

Laboratory: E. J. St. Sl.

Methods: 7418, 6010A3

of Samples: 3

Batch #: SCI

CAS # Analyte	GC Element																		
	TAL	ICV	CCV	ICP	OCR	Mixed Blanks	LCS	LCSB RPD	MS	MSD RPD	MSD RPD	Rep. RPD	ICS AB	Serial Dil. Ion	Field Dup. RPD	Equip. Blank	Field Blank	5x6k eq. / l	
7429-90-5 Al																			
7440-41-7 Be																			
7440-50-9 Br																			
7440-59-8 Ca																			
7440-70-2 Ce																			
7440-99-7 Cl																			
7440-44-4 Co																			
7440-30-8 Cu																			
7439-89-6 Fe																			
7439-95-4 Mg																			
7439-96-6 Mn																			
7440-02-0 Ni																			
7440-09-7 K																			
7440-12-0 Na																			
7440-23-5 Ni																			
7440-62-2 V																			
7440-66-6 Zn																			
7439-99-5 Pb																			
7440-12-0 Na																			
7440-36-0 Sb																			
7440-28-0 Tl																			
7439-99-5 Pb																			
Cyanide CN																			

Notes: Shaded rows are NORA metals. Solids-to-liquor conversion: $\text{ng/kg} = \text{ng/g} \times (\text{sample mass (g)} / \text{mercapto vol. (ml)}) \times (1000 \text{ ml/l liqor}) / \text{Dilution Factor} = \text{ng/l}$

Comments:
 * rem. (C & S)X FILL
 CUFFA of exposed gas. to solutions.
 be by ICP, MS 6020
 pio requested

Reviewed By: J. H. CLAGG
 Date: 7/2/01

FCAL 1001
3 110 114
VOCs

Volatile Organics (SW 846 Method 8260)

Site/Project: SWMU 94H AR/COC #: 609613 # of Samples: 3 Matrix: Soil
 Laboratory: STSL Laboratory Report #: FIF 23097 Laboratory Sample IDs: 178-150, 179, 180 - 179 - 180
 Batch #: 178-150, 179, 180

IS	CAS #	Name	1 Min. @ RT	Intercept	Calib. R ²	Calib. Slope	GCY %	Method	LOB	LOOB	MSD	MS KPP	Equip. Blanks	Trip Blanks	S(C%)
1	74-87-3	Chloromethane	0.10												
1	74-81-9	Bromomethane	0.10												
1	75-07-24	Dibromomethane	0.01												
1	74-00-3	Chloroethane	0.01												
1	75-09-2	methyl ethyl ketone (MEK)	0.01												
1	67-56-1	Acetone	0.01												
1	75-15-0	carbon disulfide	0.10												
1	75-84-4	1,1-dichloroethane	0.20												
1	75-34-9	1,1-dichloroethene	0.10												
1	67-58-3	Chloroform	0.01												
1	107-75-3	1,2-dichloroethane	0.10												
1	75-35-3	1,2-dichloroethene	0.10												
2	71-55-5	1,1,1-trichloroethane	0.10												
2	59-29-5	1,1,1-trichloroethene	0.10												
2	75-27-4	Bromodichloromethane	0.20												
2	74-87-3	Chloromethane	0.01												
2	10061-01-5	1,2-dichloropropane	0.20												
2	75-07-24	Dibromomethane	0.01												
2	124-48-1	Dibromochloromethane	0.10												
2	79-00-5	1,1,2-trichloroethane	0.10												
2	75-35-3	1,2-dichloroethene	0.50												
2	10061-02-6	trans-1,2-dichloropropane	0.10												
2	74-25-2	Bromoform	0.10												
3	108-10-1	4-methyl-2-pentanone	0.10												
3	59-178-6	2-hexanone	0.01												
3	108-90-4	2-pentanone	0.20												
3	79-34-5	1,1,2-trichloroethane	0.30												
3	108-88-3	Toluene (0.6%)	0.40												
3	108-90-4	2-pentanone	0.50												
3	100-41-4	Ethylbenzene	0.10												
3	100-42-5	Styrene	0.30												
3	1330-20-7	xylene (total)	0.30												
3	108-90-4	2-pentanone	0.50												
3	110-75-8	2-chloroethyl ethyl ether													

Comments: None
 Notes: Stated rows are RCRA compounds.
 Reviewed By: [Signature] Date: 7/18/01

Volatile Organics

Site/Project: _____ AR/COC #: 604613 Batch #: _____
 Laboratory: _____ Laboratory Report #: _____ # of Samples: _____ Matrix: soil

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

Sample	SMC 1 73-127	SMC 2	SMC 3	IS 1 area	IS 1 RT	IS 2 area	IS 2 RT	IS 3 area	IS 3 RT
056179	128								

*not
calculated*

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

4-bromofluorobenzene

Comments:

Volatile Organics (SW 846 Method 8260)

Matrix: cg reols

of Samples: 1

Site/Project: SWMU 94H

AR/COC #: 604613

Laboratory Report #: FLF 230197

Laboratory Sample IDs: 056200

Batch #: MSB 73101

Methods: 8260B

IS	CAS #	Name	M/L	Intercept	Calib. R ²	Calib. R ²	COV %	Method Bias	LCS	LCS/ RPD	MS	MSD	MSD	MSD	Field Cup. RPD	Equip. Blanks	Imp. Blanks	SP (10)
1	74-87-3	Chloromethane	✓	0.10	✓	✓	✓	✓										
1	74-83-9	Bromomethane	✓	0.10	✓	✓	✓	✓										
1	75-00-3	Chloroethane	✓	0.01	32.5	✓	✓	✓										
1	75-09-2	methylene chloride (10xblk)	✓	0.01	27.3	✓	✓	✓										1.3
1	75-15-0	carbon disulfide	✓	0.10	✓	✓	✓	✓										
1	75-35-4	1,1,1-trichloroethane	✓	0.20	✓	✓	✓	✓										
1	75-35-3	1,1,2-trichloroethane	✓	0.10	✓	✓	✓	✓										
1	75-35-2	1,2-dichloroethane	✓	0.20	✓	✓	✓	✓										
1	75-35-1	1,1,1,2-tetrachloroethane	✓	0.10	✓	✓	✓	✓										
1	75-35-0	1,1,2,2-tetrachloroethane	✓	0.10	✓	✓	✓	✓										
1	75-35-9	1,1,1,2,2-pentachloroethane	✓	0.10	✓	✓	✓	✓										
1	75-35-8	1,1,1,2,2,2-hexachloroethane	✓	0.10	✓	✓	✓	✓										
2	55-25-5	Carbon tetrachloride	✓	0.10	✓	✓	✓	✓										
2	75-27-4	Bromodichloromethane	✓	0.20	✓	✓	✓	✓										
2	75-27-5	1,2-dichloropropane	✓	0.01	✓	✓	✓	✓										
2	10061-01-5	cis-1,3-dichloropropene	✓	0.20	✓	✓	✓	✓										
2	79-01-6	Trichloroethene	✓	0.30	✓	✓	✓	✓										
2	79-00-5	Dibromochloromethane	✓	0.10	✓	✓	✓	✓										
2	71-43-2	Benzene	✓	0.30	✓	✓	✓	✓										
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	✓	✓	✓	✓										
3	591-78-6	2-hexanone	✓	0.01	✓	✓	✓	✓										
3	79-34-3	1,1,2-trichloroethane	✓	0.20	✓	✓	✓	✓										
3	79-34-5	1,1,2-tetrachloroethane	✓	0.30	✓	✓	✓	✓										
3	108-88-3	Toluene (10xblk)	✓	0.40	✓	✓	✓	✓										
3	108-90-7	Chlorobenzene	✓	0.30	✓	✓	✓	✓										
3	100-41-4	Ethylbenzene	✓	0.10	✓	✓	✓	✓										
3	100-42-5	Styrene	✓	0.30	✓	✓	✓	✓										
3	1330-20-7	Xylenes (total)	✓	0.30	✓	✓	✓	✓										
3	590-59-0	1,2-dichloroethane (total)	✓	0.01	✓	✓	✓	✓										
110-75-8		2-chloroethyl vinyl ether	✓		46.9	75.0												

Notes: Shaded rows are RCRA compounds.

Comments:

Reviewed By: [Signature] Date: 9/18/01

Volatile Organics

Site/Project: _____ AR/COC #: 604613 Batch #s: _____
 Laboratory Report #: _____ # of Samples: _____ Matrix: capillary
 Laboratory: _____

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
	<i>net</i>								
	<i>catch</i>					<i>net</i>			
						<i>catch</i>			

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:

SMO ANALYTICAL DATA ROUTING FORM

Project Name: SWMU 94H Task No./Service Order: 7214_02.02.21 / CF0 107
 SNL Task Leader: FRESHOUR Org/Mail Stop: 6134 / 1088
 SMO Project Coordinator: SALMI Sample Ship Date: 6/21/01

ARCOG	Lab	Lab ID	Preliminary Received	Final Received	EDD Req'd		EDD Rec'd	
					YES	NO	YES	NO
<u>604613</u>	<u>STSL</u>	<u>F1F230197</u>		<u>8/2/01</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Correction Requested from Lab: _____ Date: _____ Correction Request #: _____

Corrections Received: _____ Requester: _____

Review Complete: 8-21-01 Signature: W. Palencia

Priority Data Faxed: _____ Faxed To: _____

Preliminary Notification: _____ Person Notified: _____

Final Transmittal: 8-21-01 Transmitted To: Thacker

Transmitted By: Palencia

Filed in Records Center/ER: _____ Filed By: _____

Comments: Electronic data filed on Q:\SMO\STAR\EDD BY COC

To validation 8/21/01

Received (Records Center) By: _____

Contract Verification Review (CVR)

Project Leader FRESHOUR Project Name SWMU 94H Case No. 7214-02.02.21
 AR/COC No. 604613 Analytical Lab SEVERN TRENT SDG No. F1230197

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
1.1	All items on COC complete - data entry clerk initiated and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain	Resolved?	
		Yes	No		Yes	No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L _s	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	NA				
2.10	Narrative provided	X				
2.11	TAT met	X		X		X
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1	Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or µg/kg)? Tritium reported in picocuries per liter with percent moisture for soil samples. Units consistent between QC samples and sample data	X		
3.2	Quantitation limit met for all samples	X		
3.3	Accuracy	X		
a)	Laboratory control samples accuracy reported and met for all samples	X		
b)	Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c)	Matrix spike recovery data reported and met		X	ARSENIC, BARIUM & SELENIUM FAILED RECOVERY LIMITS FOR MATRIX SPIKE
3.4	Precision	X		
a)	Replicate sample precision reported and met for all inorganic and radiochemistry samples	NA		
b)	Matrix spike duplicate RPD data reported and met for all organic samples	NA		
3.5	Blank data	X		ACETONE, TOLUENE & METHYLENE CHLORIDE DETECTED IN METHOD BLANK
a)	Method or reagent blank data reported and met for all samples		X	ACETONE, METHYLENE CHLORIDE, CARBON DISULFIDE & 1,2-DICHLOROPROPANE DETECTED IN VOC TRIP BLANK
b)	Sampling blank (e.g., field, trip, and equipment) data reported and met		X	
3.6	Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time	X		
3.7	Narrative addresses planchet flaming for gross alpha/beta	NA		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	NA		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330 and 8010 and 8082)			
a) Initial calibration provided	NA		
b) Continuing calibration provided	NA		
c) Instrument run logs provided	NA		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided	NA		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? No Yes
Based on the review, this data package is complete. Yes No

If no, provide: nonconformance report or correction request number _____ and date correction request was submitted: _____

Reviewed by: L. M. Palencia Date: 3-21-2001 Closed by: _____ Date: _____

**CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY**

Internal Lab		SARWR No.		Date Samples Shipped:		Contract No.		Waste Characterization		AR/COC		604613	
Batch No. N/A		61321037		Date Samples Shipped: 6-22-01		Contract No. A124808		<input type="checkbox"/> Waste Characterization		RCRA Date: 7214.02.02.71			
Dept. No./Mail Stop:		F199hour		Contract/Task No. 745258		Project/Task No. 7214.02.02.71		<input type="checkbox"/> RCRA Date		Sandia Preliminary Report to:			
Project Name:		30M0194H		SARWR No. 745258		SMO Authorization:		<input type="checkbox"/> Validation Required		Released by COC No.:			
Resard Center Code:		30M0194H		SARWR No. 745258		SARWR No. 745258		<input type="checkbox"/> Released by COC No.:		Bill To: Sandia National Labs (Accounts Payable)			
Logbook Ref. No.:		CEG183-61		SARWR No. 745258		SARWR No. 745258		P.O. Box 5800, MS-0154		Albuquerque, NM, 87185-0154			
Service Order No.:		CEG183-61		SARWR No. 745258		SARWR No. 745258		Parameter & Method Requested		Lab Sample ID			
Location		NA		NA		NA		Parameter & Method Requested		Lab Sample ID			
Building		Room		NA		NA		Parameter & Method Requested		Lab Sample ID			
Sample No. - Fraction		ER Sample ID or Sample Location Detail		ER Site No.		Date Collected		Sample Matrix		Collection Method		Sample Type	
056178-001		CY94H-BH1-2-5		94H		062001 0940		S		None		SA+MS+MSE VOC(8260)	
056178-002		CY94H-BH1-2-5		94H		062001 0940		S		None		SA+MS+MSE RCRA Metals + Be(60107000)	
056178-001		CY94H-BH1-2-5		94H		062001 0940		S		None		DU VOC(8260)	
056178-002		CY94H-BH1-2-5		94H		062001 0940		S		None		DU RCRA Metals + Be(60107000)	
056180-001		CY94H-BH1-6-7		94H		062001 0959		S		None		SA VOC(8260)	
056180-002		CY94H-BH1-6-7		94H		062001 0959		S		None		SA RCRA Metals + Be(60107000)	
056200-001		CY94H-BH-TB		N/A		062001 0959		DIW		HCl		TB VOC(8260)	

RMMA		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Ref. No.		Smo Use		Special Instructions/QC Requirements:		Abnormal Conditions on Receipt	
Sample Disposal		Return to Client <input checked="" type="checkbox"/>		Disposal by Lab		Date Entered (mm/dd/yyyy) 06/22/01		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Turnaround Time		7 Day <input type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day <input checked="" type="checkbox"/>		Negotiated TAT		Entered by: JAC		Raw Data Package <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Return Samples By:		Name		Signature		Company/Organization/Phone/Fax/URL		Please send report to:			
Sample Team		M Sanchez		[Signature]		Western 5135/845-3267		MThecker MS 1088 Ph284-2575 Fax284-2517			
Members		G Guilmane		[Signature]		11/5135/284-3309		methack@sandia.gov			
		W Gibson		[Signature]		MDM 06136/845-3267					

1. Relinquished by		Date		Time		Date		Time	
1. Received by		07/13/01		12:55		07/13/01		12:55	
2. Relinquished by		07/13/01		12:55		07/13/01		12:55	
2. Received by		07/13/01		12:55		07/13/01		12:55	
3. Relinquished by		07/13/01		12:55		07/13/01		12:55	
3. Received by		07/13/01		12:55		07/13/01		12:55	

Sample Findings Summary

Site: SWMU 94H

ARI/COC: 604613

Data Type: Inorganic and organic

Sample ID	Method/CAS Number (Analysis/Analyte)							
	7440-39-3 (barium)	7440-38-2 (arsenic)	7440-47-3 (chromium)	7782-49-2 (selenium)	VOCS	110-75-9 (2-chloroethylvinyl ether)	67-64-1 (acetone)	7-03-2 (methylene chloride)
056178-002 CY94H-BH1-2-5	J,A2	J,A2	J	J,A2				
056179-002 CY94H-BH1-2-5	J,A2	J,A2	J	R,A2				
056180-002 CY94H-BH1-6-7	J,A2	J,A2	J	R,A2				
056200-001 CY94H-BH-TB					R		J	
056178-001 CY94H-BH1-2-5							20M,B,B1	5.0U,B
056179-001 CY94H-BH1-2-5							20M,B,B1	5.0U,B
056180-001 CY94H-BH1-6-7							20M,B,B1	5.0U,B

Ms. Marcia Fillohey

Validated By: [Signature]

Date: 09/24/01

MEMORANDUM

DATE: 09/24/01
TO: File
FROM: Marcia Hickey
SUBJECT: Organic Data Review and Validation - SNL
Site: SWMU 94H, ARCO #604613
STSL SDG #F1F230197 Project/Task No. 7214.02.02.01

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

Summary

All samples were prepared and analyzed with approved procedures using method EPA 8260B VOCs. Problems were identified with the data package that result in the qualification of data.

VOC Analyses: The result for 2-chloroethyl vinyl ether for sample 056200-001 (trip blank) is qualified "R" due to acidic preservation.

The result for acetone in the trip blank is qualified "J" due to high initial calibration RSD.

The initial calibration RSD and the CCV %Ds associated with all soil samples for acetone were >20 and <60. Associated positive sample results are qualified "J"; non-detects are not qualified

Methylene chloride was detected in the method blank associated with the aqueous sample at >DL. The associated positive sample result was <5x the blank concentration and <RL. This result is qualified "U,B" at the PQL.

Methylene chloride and acetone were detected in one or more blanks associated with the soil samples. All positive sample results for methylene chloride which were <10x the blank concentration and <PQL are qualified "U,B,B1" at the PQL. All positive sample results for acetone were <PQL and were previously qualified J. These results are further qualified "UJ,B,B1" at the PQL.

Data are acceptable except as noted above. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were properly preserved and analyzed within the prescribed holding times. Acidic preservation was performed on the aqueous sample, which could result in the degradation of 2-chloroethylvinyl ether. The sample result for this compound is qualified as noted above in the summary section.

Calibration

VOC Analyses: The initial calibration RSDs for chloroethane and acetone associated with the aqueous sample (TB) were >20 and <40. The result for chloroethane was non-detect and was not qualified. The acetone result was qualified as noted above in the summary section. The initial calibration RSD for 2-chloroethylvinyl ether associated with the TB was >40 and <60. The associated CCV %D was >60. The associated result for this compound was previously qualified R; no further qualifications required. All other initial and continuing calibration acceptance criteria were met for the aqueous sample.

The initial and continuing calibrations associated with the soil sample analyses met QC acceptance criteria except as noted above in the summary section.

Blanks

All blank acceptance criteria were met except as noted above in the summary section and as follows.

Carbon disulfide, 1,2-dichloropropane, and toluene were detected in one or more blanks associated with the soil samples at >DL. All associated sample results were non-detect and were therefore not qualified.

Surrogates

All surrogate acceptance criteria were met except for the following. One surrogate had slightly high recovery (128%) for sample 056179-001. No sample data were qualified as a result, based on professional judgment.

Internal Standards (ISs)

The IS areas and retention times (RTs) met QC acceptance criteria.

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

All MS/MSD acceptance criteria were met.

Laboratory Control Samples (LCS/LCSD) Analysis

The LCS/LCSD analyses met all QC acceptance criteria.

Other QC

No field blank or equipment blank was submitted on the ARCOG.

Field duplicate pairs were submitted, however there are no "required" review criteria for field duplicate analyses comparability.

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.

MEMORANDUM

DATE: 09/24/01
TO: File
FROM: Marcia Hilchey
SUBJECT: Inorganic Data Review and Validation - SNL
Site: SWMU 94H, ARCO #604613
STSL SDG #F1F230197 Project/Task No. 7214.02.02.01

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

Summary

All samples were prepared and analyzed with approved procedures using methods EPA 6010B ICP-AES metals, EPA 6020 ICP-MS, and EPA 7471A CVAA mercury. Problems were identified with the data package that result in the qualification of data.

ICP: The replicate RPD for chromium exceeded acceptance criteria. Associated sample results are qualified "J."

MS recoveries for Ba and As were below acceptance criteria but >30%. Associated sample results are qualified "J,A2."

MS recovery for Se was 0%. Associated positive results are qualified "J,A2"; non-detects are qualified "R,A2."

It should be noted that ICP-MS (EPA 6020) was used for the analysis of beryllium, although the analysis request specifies EPA 6010. No sample data were qualified as a result.

Data are acceptable except as noted above. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

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

Calibration

All Analyses: The initial and continuing calibration verifications met all QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as follows.

ICP Analysis: Ag and Se were detected in an associated blank at >DL. All associated sample results were either non-detect or >5x the blank concentration. Thus, no sample data were qualified.

ICP-MS Analysis: Beryllium was detected in an associated blank at >DL. All associated sample results were >5x the blank concentration. Thus, no sample data were qualified.

CVAA Analysis: All blank acceptance criteria were met.

Matrix Spike (MS) Analysis

ICP Analysis: The MS analysis met QC acceptance criteria except as noted above in the summary section.

ICP-MS and CVAA Analyses: The MS analyses met QC acceptance criteria.

Laboratory Control Sample (LCS/LCSD) Analyses

All Analyses: The LCS analyses met all QC acceptance criteria.

Replicate Analysis

ICP Analysis: All replicate QC acceptance criteria were met except as noted above in the summary section.

ICP-MS and CVAA Analyses: The replicate analyses met all QC acceptance criteria.

ICP Interference Check Sample (ICS)

ICP and ICP-MS Analyses: The ICS met all QC acceptance criteria.

CVAA Analysis: No ICS analysis was required for this method.

ICP Serial Dilution

ICP and ICP-MS Analyses: All serial dilution acceptance criteria were met.

CVAA Analysis: No serial dilution was required for this method.

Other QC

All Analyses: No equipment blank or field blank was submitted on the AR/COG.

Field duplicate pairs were submitted, however there are no "required" review criteria for field duplicate analyses comparability.

No other specific issues were identified which affect data quality.

Annex 3-C

ANNEX 3-C
Gamma Spectroscopy Results

ON-SITE LABORATORY (RPSD) ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No 101033		SARWR No.		AR/COC 604615																	
Spt No / Mail Stop: 6132/1087		Date Samples Shipped: 6-21-01		SMO USE																	
Project/Task Manager: Freahour		Carrier/Waybill No. MC		Logged By																	
Project Name: ER-1941		Lab Contact: R Reese 844-7683		Project/Task No: 7214 02 02 21																	
Report Center Code: WHS-0401		Lab Destination: RPSD		SMO Authorization: JPL																	
Logbook Ref. No.:		SMO Contact/Phone: D Salini 844-3110		Location_NA: _____ Tech Area_NA: _____																	
Service Order No.: CF001-01				Building_NA: _____ Room_NA: _____																	
<input type="checkbox"/> Characterization Only <input type="checkbox"/> Waste Characterization -RCRA Date = _____ -Send preliminary copy report to: _____ <input type="checkbox"/> Release to ERCL On-Site Lab <input type="checkbox"/> Release to Off-Site Lab -This COC Number Releases COC No(s): _____																					
Analysis Request																					
Sample No - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No	Date/Time (hr)	Reference LOV (available at SMO)																
					Screen	Sample Mass	Sample Quantity	Sample Matrix	Container	Preservative	Collection Method	Sample Type									
RPSD No.-Fraction	Remarks/Aliquot Amounts	CPM																			
058178-004	CY94-BH1-7-B	994	94H	062001 1005	S	M	16oz	None	G	SA											
01			705.1 g																		
Blank																					
02																					
LC3																					
03																					
RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref No _____ Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Sample Tracking SMO USE Special Instructions/OC Requirements Date Entered (mm/dd/yyyy) Entered by: JAR EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Raw Data Package <input type="checkbox"/> Yes <input type="checkbox"/> No Required Report Date: _____ OC info: _____ *Please send report to: _____																					
Sample Team Members: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Name</th> <th>Signature</th> <th>Ext</th> <th>Company/Organization/Address/Phone/City/State</th> </tr> <tr> <td>M Sanchez</td> <td><i>M Sanchez</i></td> <td></td> <td>Westing 6135/845-3267</td> </tr> <tr> <td>G Ouziana</td> <td><i>G Ouziana</i></td> <td></td> <td>176135/264-3309</td> </tr> <tr> <td>W Gibson</td> <td><i>W Gibson</i></td> <td></td> <td>ANDRM 6135/845-3267</td> </tr> </table> Please list as separate report.						Name	Signature	Ext	Company/Organization/Address/Phone/City/State	M Sanchez	<i>M Sanchez</i>		Westing 6135/845-3267	G Ouziana	<i>G Ouziana</i>		176135/264-3309	W Gibson	<i>W Gibson</i>		ANDRM 6135/845-3267
Name	Signature	Ext	Company/Organization/Address/Phone/City/State																		
M Sanchez	<i>M Sanchez</i>		Westing 6135/845-3267																		
G Ouziana	<i>G Ouziana</i>		176135/264-3309																		
W Gibson	<i>W Gibson</i>		ANDRM 6135/845-3267																		
1 Redemanded by <i>M Sanchez</i> Org 6135 Date 06/21/01 Time 1255 2 Received by <i>[Signature]</i> Org 1132 Date 6-21-01 Time 1255 3 Redemanded by <i>[Signature]</i> Org 1135 Date 6-21-01 Time 1255 4 Received by <i>[Signature]</i> Org 6132 Date 6/21/01 Time 1255 5 Redemanded by <i>[Signature]</i> Org 1132 Date 6/21/01 Time 1410 6 Received by <i>[Signature]</i> Org 1132 Date 6-21-01 Time 1410 7 Redemanded by <i>[Signature]</i> Org 7132 Date 7-5-01 Time 13:05 8 Received by <i>[Signature]</i> Org 7132 Date 7-5-01 Time 13:05 9 Redemanded by <i>[Signature]</i> Org 6132 Date 7/10/01 Time 10:47 10 Received by <i>[Signature]</i> Org 6132 Date 7/10/01 Time 10:47 11 Redemanded by <i>[Signature]</i> Org _____ Date _____ Time _____ 12 Received by _____ Org _____ Date _____ Time _____																					

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is crucial for the company's financial health and for providing reliable information to stakeholders.

2. The second part of the document outlines the specific procedures for recording transactions. It details the steps from identifying a transaction to entering it into the accounting system, ensuring that all necessary details are captured.

3. The third part of the document discusses the role of the accounting department in ensuring the accuracy and integrity of the financial records. It highlights the need for regular audits and the implementation of internal controls.

4. The fourth part of the document addresses the challenges associated with maintaining accurate records, such as the complexity of transactions and the need for consistent data entry. It offers strategies to overcome these challenges.

5. The fifth part of the document discusses the importance of training and education for the accounting staff. It emphasizes that ongoing training is necessary to keep the staff up-to-date on the latest accounting practices and technologies.

6. The sixth part of the document concludes by reiterating the importance of accurate financial records for the company's success. It encourages the accounting department to continue to strive for excellence in their work.

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * 6/26/01 3:29:18 PM *

* Analyzed by: *K 6/27/01* Reviewed by: *AM 6/28/01* *

Customer : FRESHOUR/PERRY (6132/SMO)
 Customer Sample ID : 056178-004
 Lab Sample ID : 10103301

Sample Description : CY94-BH1-7-8
 Sample Quantity : 708.100 gram
 Sample Date/Time : 6/20/01 10:05:00 AM
 Acquire Start Date/Time : 6/26/01 8:48:40 AM
 Detector Name : LAB02
 Elapsed Live/Real Time : 24000 / 24008 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	1.09E+000	7.06E-001	2.63E-001
RA-226	Not Detected		3.18E-001
PB-214	7.11E-001	9.73E-002	2.75E-002
BI-214	6.59E-001	9.56E-002	2.08E-002
PB-210	Not Detected		1.24E-001
TH-232	3.86E-001	1.78E-001	7.84E-002
RA-228	4.02E-001	1.06E-001	5.02E-002
AC-228	3.74E-001	6.63E-002	4.13E-002
TH-228	4.28E-001	1.74E-001	2.50E-001
RA-224	4.64E-001	9.46E-002	2.95E-002
PB-212	3.79E-001	6.36E-002	1.52E-002
BI-212	4.50E-001	1.35E-001	1.74E-001
TL-208	3.51E-001	5.52E-002	3.42E-002
U-235	6.54E-002	4.00E-002	6.13E-002
TH-231	1.10E-000	1.92E-000	4.86E+000
PA-231	Not Detected		5.22E-001
TH-227	Not Detected		1.27E-001
RA-223	Not Detected		1.09E-001
RN-219	Not Detected		1.37E-001
PB-211	Not Detected		3.05E-001
TL-207	Not Detected		4.69E+000
AM-241	Not Detected		1.94E-001
FU-239	Not Detected		1.58E+002
NP-237	Not Detected		8.64E-001
PA-233	Not Detected		2.10E-002
TH-229	Not Detected		9.41E-002

NOT DETECTED *K 6-27-01*

[Summary Report] - Sample ID: 10103301

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	-----	1.29E-002
AG-110m	Not Detected	-----	1.04E-002
BA-133	Not Detected	-----	1.85E-002
BE-7	Not Detected	-----	9.41E-002
CD-115	Not Detected	-----	1.50E-001
CE-139	Not Detected	-----	1.09E-002
CE-141	Not Detected	-----	2.19E-002
CE-144	Not Detected	-----	8.87E-002
CM-243	Not Detected	-----	6.37E-002
CO-56	Not Detected	-----	1.22E-002
CO-57	Not Detected	-----	1.17E-002
CO-58	Not Detected	-----	1.17E-002
CO-60	Not Detected	-----	1.19E-002
CR-51	Not Detected	-----	9.46E-002
CS-134	Not Detected	-----	1.96E-002
CS-137	Not Detected	-----	1.15E-002
EU-152	Not Detected	-----	3.48E-002
EU-154	Not Detected	-----	6.06E-002
EU-155	3.82E-002	4.00E-002	6.40E-002
FE-59	Not Detected	-----	2.50E-002
GD-153	Not Detected	-----	3.92E-002
HG-203	Not Detected	-----	1.25E-002
I-131	Not Detected	-----	1.61E-002
IR-192	Not Detected	-----	1.03E-002
K-40	6.62E+000	8.83E-001	1.36E-001
MN-52	Not Detected	-----	2.24E-002
MN-54	Not Detected	-----	8.14E-003
MO-99	Not Detected	-----	3.52E-001
NA-22	Not Detected	-----	1.32E-002
NA-24	Not Detected	-----	9.08E+000
ND-147	Not Detected	-----	9.71E-002
NI-57	Not Detected	-----	3.30E-001
RU-103	Not Detected	-----	1.09E-002
RU-106	Not Detected	-----	9.89E-002
SB-122	Not Detected	-----	6.39E-002
SB-124	Not Detected	-----	1.06E-002
SB-125	Not Detected	-----	2.97E-002
SN-113	Not Detected	-----	1.38E-002
SR-85	Not Detected	-----	1.36E-002
TA-182	Not Detected	-----	6.15E-002
TA-183	Not Detected	-----	3.80E-001
TL-201	Not Detected	-----	2.76E-001
Y-88	Not Detected	-----	9.42E-003
ZN-65	Not Detected	-----	4.11E-002
ZR-95	Not Detected	-----	2.00E-002

NOT DETECTED AT 0.07 -01

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * 6/27/01 4:53:47 AM *

* Analyzed by: *JK 6/27/01* Reviewed by: *ADM 6/28/01*

Customer : FRESHOUR/PERRY (6132/SMO)
 Customer Sample ID : BLANK FOR 101033/101034
 Lab Sample ID : 10103302

Sample Description : EMPTY COUNT CHAMBER
 Sample Quantity : 708.100 gram
 Sample Date/Time : 6/26/01 8:47:00 AM
 Acquire Start Date/Time : 6/26/01 10:13:17 PM
 Detector Name : LAB02
 Elapsed Live/Real Time : 24000 / 24003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	-----	1.17E-001
RA-226	Not Detected	-----	1.35E-001
PB-214	Not Detected	-----	1.30E-002
BI-214	Not Detected	-----	1.46E-002
PB-210	Not Detected	-----	6.57E+000
TH-232	Not Detected	-----	4.18E-002
RA-228	Not Detected	-----	3.75E-002
AC-228	Not Detected	-----	2.32E-002
TH-228	Not Detected	-----	1.33E-001
RA-224	Not Detected	-----	3.39E-002
PB-212	Not Detected	-----	1.12E-002
BI-212	Not Detected	-----	8.28E-002
TL-208	Not Detected	-----	1.96E-002
U-235	Not Detected	-----	4.38E-002
TH-231	Not Detected	-----	2.02E+000
PA-231	Not Detected	-----	2.73E-001
TH-227	Not Detected	-----	4.34E-002
RA-223	Not Detected	-----	3.14E-002
RN-219	Not Detected	-----	7.46E-002
PB-211	Not Detected	-----	1.66E-001
TL-207	Not Detected	-----	2.75E+000
AM-241	Not Detected	-----	8.85E-002
PU-239	Not Detected	-----	7.74E+001
NP-237	Not Detected	-----	4.19E-001
PA-233	Not Detected	-----	1.16E-002
TH-229	Not Detected	-----	4.25E-002

[Summary Report] - Sample ID: 10103302

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	-----	6.07E-003
AG-110m	Not Detected	-----	5.96E-003
BA-133	Not Detected	-----	7.61E-003
BE-7	Not Detected	-----	5.08E-002
CD-115	Not Detected	-----	1.28E-002
CE-139	Not Detected	-----	5.25E-003
CE-141	Not Detected	-----	9.29E-003
CE-144	Not Detected	-----	4.40E-002
CM-243	Not Detected	-----	3.09E-002
CO-56	Not Detected	-----	7.87E-003
CO-57	Not Detected	-----	5.41E-003
CO-58	Not Detected	-----	6.23E-003
CO-60	Not Detected	-----	6.25E-003
CR-51	Not Detected	-----	4.67E-002
CS-134	Not Detected	-----	6.80E-003
CS-137	Not Detected	-----	6.39E-003
EU-152	Not Detected	-----	1.64E-002
EU-154	Not Detected	-----	2.82E-002
EU-155	Not Detected	-----	2.43E-002
FE-59	Not Detected	-----	1.12E-002
GD-153	Not Detected	-----	1.77E-002
HG-203	Not Detected	-----	5.63E-003
I-131	Not Detected	-----	5.97E-003
IR-192	Not Detected	-----	5.53E-003
K-40	Not Detected	-----	1.07E-001
MN-52	Not Detected	-----	6.82E-003
MN-54	Not Detected	-----	6.15E-003
MO-99	Not Detected	-----	5.13E-002
NA-22	Not Detected	-----	5.73E-003
NA-24	Not Detected	-----	1.27E-002
ND-147	Not Detected	-----	3.60E-002
NI-57	Not Detected	-----	1.11E-002
RU-103	Not Detected	-----	5.77E-003
RU-106	Not Detected	-----	5.56E-002
SB-122	Not Detected	-----	9.38E-003
SB-124	Not Detected	-----	6.60E-003
SB-125	Not Detected	-----	1.68E-002
SN-113	Not Detected	-----	7.61E-003
SR-85	Not Detected	-----	9.02E-003
TA-182	Not Detected	-----	1.97E-002
TA-183	Not Detected	-----	8.40E-002
TL-201	Not Detected	-----	3.64E-002
Y-88	Not Detected	-----	6.46E-003
ZN-65	Not Detected	-----	1.42E-002
ZR-95	Not Detected	-----	9.50E-003

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * 6/27/01 7:10:48 AM *

Analyzed by: *K. W. [signature]* Reviewed by: *AM 6/28/01*

Customer : FRESHOUR/PERRY (6132/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE USING CG134
 Lab Sample ID : 10103303

Sample Description : MIXED GAMMA STANDARD CG134
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11/01/90 12:00:00 PM
 Acquire Start Date/Time : 6/27/01 7:00:32 AM
 Detector Name : LAB02
 Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	-----	4.20E+003
RA-226	Not Detected	-----	5.52E+003
PB-214	Not Detected	-----	6.03E+002
BI-214	Not Detected	-----	5.44E+002
PB-210	Not Detected	-----	2.51E+005
TH-232	Not Detected	-----	1.90E+003
RA-228	Not Detected	-----	1.97E+003
AC-228	Not Detected	-----	1.23E+003
TH-228	Not Detected	-----	2.90E+005
RA-224	Not Detected	-----	1.05E+004
PB-212	Not Detected	-----	2.19E+004
BI-212	Not Detected	-----	1.56E+005
TL-208	Not Detected	-----	3.86E+004
U-235	Not Detected	-----	1.59E+003
TH-231	Not Detected	-----	7.53E+004
PA-231	Not Detected	-----	1.29E+004
TH-227	Not Detected	-----	2.51E+003
RA-223	Not Detected	-----	1.00E+026
RN-219	Not Detected	-----	5.78E+003
PB-211	Not Detected	-----	1.31E+004
TL-207	Not Detected	-----	1.93E+005
AM-241	8.63E+004	1.38E+004	6.55E+003
PU-239	Not Detected	-----	2.76E+006
NP-237	Not Detected	-----	1.46E+004
PA-233	Not Detected	-----	5.42E+002
TH-229	Not Detected	-----	1.56E+003

[Summary Report] Sample ID: 10103303

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	-----	2.66E+002
AG-110m	Not Detected	-----	8.05E+007
BA-133	Not Detected	-----	7.67E+002
BE-7	Not Detected	-----	1.00E+026
CD-115	Not Detected	-----	1.00E+026
CE-139	Not Detected	-----	6.35E+010
CE-141	Not Detected	-----	1.00E+026
CE-144	Not Detected	-----	2.00E+007
CM-243	Not Detected	-----	1.93E+003
CO-56	Not Detected	-----	4.52E+017
CO-57	Not Detected	-----	4.19E+006
CO-58	Not Detected	-----	8.85E+018
CO-60	8.34E+004	1.08E+004	7.11E+002
CR-51	Not Detected	-----	1.00E+026
CS-134	Not Detected	-----	9.00E+003
CS-137	7.60E+004	9.82E+003	4.11E+002
EU-152	Not Detected	-----	1.07E+003
EU-154	Not Detected	-----	2.73E+003
EU-155	Not Detected	-----	4.21E+003
FE-59	Not Detected	-----	1.00E+026
GD-153	Not Detected	-----	4.60E+007
HG-203	Not Detected	-----	1.00E+026
I-132	Not Detected	-----	1.00E+026
IR-192	Not Detected	-----	1.93E+018
K-40	Not Detected	-----	1.33E+003
MN-52	Not Detected	-----	1.00E+026
MN-54	Not Detected	-----	1.56E+006
MO-99	Not Detected	-----	1.00E+026
NA-22	Not Detected	-----	2.86E+003
NA-24	Not Detected	-----	1.00E+026
ND-147	Not Detected	-----	1.00E+026
NI-57	Not Detected	-----	1.00E+026
RU-103	Not Detected	-----	1.00E+026
RU-106	Not Detected	-----	3.84E+006
SB-122	Not Detected	-----	1.00E+026
SB-124	Not Detected	-----	7.10E+021
SB-125	Not Detected	-----	1.49E+004
SN-113	Not Detected	-----	5.97E+012
SR-85	Not Detected	-----	3.98E+020
TA-182	Not Detected	-----	1.32E+013
TA-183	Not Detected	-----	1.00E+026
TL-201	Not Detected	-----	1.00E+026
Y-88	Not Detected	-----	1.48E+013
ZN-65	Not Detected	-----	4.33E+007
ZR-95	Not Detected	-----	8.27E+020

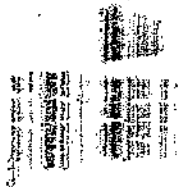
 Sandia National Laboratories
 Radiation Protection Sample Diagnostics Program
 Quality Assurance Report

Report Date : 6/27/01 7:10:53 AM
 QA File : C:\GENIE2K\CAMFILES\LCS2.QAF
 Analyst : KICHAVE
 Sample ID : 10103303
 Sample Quantity : 1.00 Each
 Sample Date : 11/01/90 12:00:00 PM
 Measurement Date : 6/27/01 7:00:32 AM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 Activity	8.242E-002	3.547E-003	8.633E-002	< : : : >
CS-137 Activity	7.195E-002	2.702E-003	7.599E-002	< : : : >
CO-60 Activity	8.022E-002	3.051E-003	8.308E-002	< : : : >

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: 6/27/01



**ON-SITE LABORATORY (RPSD)
ANALYSIS REQUEST AND CHAIN OF CUSTODY**

Internal Lab

No 101019

SAR/WR No

AR/COC

604618

No (Mail Stop)	6132/1087	Date Samples Shipped	06/20/01	Logged By		<input checked="" type="checkbox"/> Characterization Only	
Project Name	Fireflow	Carrier/Vehicle No		Project Task No	T214 02 0221	<input type="checkbox"/> Waste Characterization	
Record Center Code	SISMA 891	Lab Contact	R Name - R15-7083	SMID Authorization		-RCRA Date =	
Keyboard Ref No		Lab Destination	RPSD	Location	IIA	-Send preliminary copy report to	
Service Order No	CE0107-01	SAR Contact Person	D School R14 3110	Building	IIA	Room	IIA

Sample No - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER SR- Screen	Date/Time/Qty Collected	Reference LOV (available at SMO)					
					Sample Label	Container Type	Volume	Description	Collection Method	Sample Type
RPSD No - Fraction	Remarks/Amount	CPM	Sample Mass	Quantity						
056102-004	CY90-BH7-4	4	2481	051901 0255	S	M	18oz	None	G	SA
01										
02										
Blank 03										

RMMA	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	RM No		Sample Tracking	Smg Use	Special Instructions/DOC Requirements
Sample Disposal	<input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab	Date Entered (mm/dd/yyyy)			EDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Turnaround Time	<input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush	Entered by			Raw Data Package	<input type="checkbox"/> Yes <input type="checkbox"/> No

Sample Team Members	Name	Signature	Job	Company/Organization/Phone/Cellular	DOC Inits	Please send report to:
	Mesaecher	<i>[Signature]</i>	Chief	Western 6135/845-3267		Mesaecher MS108B Ph284-2575 Fax284-2617
	G. Compton	<i>[Signature]</i>		MS126 one 9300		mthack@sandia.gov
	M. Gibson			MDMMS 105045-0267		

1. Relinquished by	<i>[Signature]</i>	Org. 6135	Date 6/20/01	Time 16:00	4. Relinquished by	<i>[Signature]</i>	Org. 6132	Date 6/20/01	Time 14:00
2. Relinquished by	<i>[Signature]</i>	Org. 6132	Date 6/20/01	Time 16:00	5. Relinquished by	<i>[Signature]</i>	Org. 6133	Date 6/20/01	Time 14:00
3. Relinquished by	<i>[Signature]</i>	Org. 6132	Date 6-20-01	Time 10:48	6. Relinquished by	<i>[Signature]</i>	Org.	Date	Time
4. Relinquished by	<i>[Signature]</i>	Org. 6132	Date 6-21-01	Time 09:01	7. Relinquished by	<i>[Signature]</i>	Org.	Date	Time
5. Relinquished by	<i>[Signature]</i>	Org. 6132	Date 6/21/01	Time 09:05	8. Relinquished by	<i>[Signature]</i>	Org.	Date	Time

General Spec (9011) **EPA**

Please use appropriate report

 Sandia National Laboratories
 Radiation Protection Sample Diagnostics Program
 6/20/01 5:45:29 PM

* Analyzed by: *K. 6/21/01* Reviewed by: *AM 6/21/01* *

Customer : FRESHOUR/SALMI (6132/SMO)
 Customer Sample ID : 056192-004
 Lab Sample ID : 10101901
 Sample Description : CY94-BH7-4
 Sample Quantity : 596.200 gram
 Sample Date/Time : 6/19/01 8:55:00 AM
 Acquire Start Date/Time : 6/20/01 11:04:55 AM
 Detector Name : LAB01
 Elapsed Live/Real Time : 24000 / 24008 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	5.24E-001	1.83E-001	2.78E-001
RA-226	8.03E-001	3.64E-001	4.34E-001
PB-214	7.42E-001	1.04E-001	3.79E-002
BI-214	6.81E-001	1.02E-001	3.51E-002
DR-210	Not Detected	-----	4.38E+000
TH-232	8.30E-001	3.75E-001	1.19E-001
RA-228	7.89E-001	2.00E-001	8.98E-002
AC-228	7.94E-001	1.36E-001	7.10E-002
TH-228	8.29E-001	1.67E-001	2.50E-001
RA-224	8.63E-001	1.80E-001	4.59E-002
PB-212	8.24E-001	1.34E-001	2.30E-002
BI-212	1.04E+000	2.39E-001	2.59E-001
TL-208	7.59E-001	1.14E-001	5.62E-002
U-235	4.66E-002	5.68E-002	9.14E-002
TH-231	Not Detected	-----	4.02E+000
PA-231	Not Detected	-----	7.21E-001
TH-227	Not Detected	-----	1.71E-001
RA-223	Not Detected	-----	7.12E-002
RN-219	Not Detected	-----	2.01E-001
PB-211	Not Detected	-----	4.59E-001
TL-207	Not Detected	-----	8.20E+000
AM-241	Not Detected	-----	1.07E-001
PU-239	Not Detected	-----	1.92E+002
NP-237	Not Detected	-----	1.04E+000
PA-233	Not Detected	-----	3.12E-002
TH-229	Not Detected	-----	9.15E-002

{Summary Report} Sample ID: 10101901

Slide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	-----	2.22E-002
AG-110m	Not Detected	-----	1.96E-002
BA-133	Not Detected	-----	2.67E-002
BE-7	Not Detected	-----	1.41E-001
CD-115	Not Detected	-----	5.59E-002
CE-139	Not Detected	-----	1.33E-002
CE-141	Not Detected	-----	2.37E-002
CE-144	Not Detected	-----	1.03E-001
CM-243	Not Detected	-----	8.97E-002
CO-56	Not Detected	-----	2.06E-002
CO-57	Not Detected	-----	1.32E-002
CO-58	Not Detected	-----	1.92E-002
CO-60	Not Detected	-----	2.09E-002
CR-51	Not Detected	-----	1.29E-001
CS-134	Not Detected	-----	2.35E-002
CS-137	3.60E-002	1.67E-002	1.30E-002
EU-152	Not Detected	-----	3.98E-002
EU-154	Not Detected	-----	1.07E-001
EU-155	Not Detected	-----	6.19E-002
FE-59	Not Detected	-----	4.23E-002
GD-153	Not Detected	-----	3.59E-002
HG-203	Not Detected	-----	1.63E-002
I-131	Not Detected	-----	1.67E-002
IR-192	Not Detected	-----	1.49E-002
40	1.29E+001	1.72E+000	2.02E-001
MN-52	Not Detected	-----	2.04E-002
MN-54	Not Detected	-----	2.06E-002
MO-99	Not Detected	-----	1.79E-001
NA-22	Not Detected	-----	1.06E-002
NA-24	Not Detected	-----	6.93E-002
ND-147	Not Detected	-----	1.26E-001
NI-57	Not Detected	-----	4.98E-002
RU-103	Not Detected	-----	1.66E-002
RU-106	Not Detected	-----	1.63E-001
SB-122	Not Detected	-----	3.07E-002
SB-124	Not Detected	-----	1.69E-002
SB-125	Not Detected	-----	4.65E-002
SN-113	Not Detected	-----	2.05E-002
SR-85	Not Detected	-----	2.15E-002
TA-182	Not Detected	-----	9.53E-002
TA-183	Not Detected	-----	1.07E-001
TL-201	Not Detected	-----	6.54E-002
Y-88	Not Detected	-----	1.69E-002
ZN-65	Not Detected	-----	6.39E-002
ZR-95	Not Detected	-----	3.43E-002

 * Sandia National Laboratories *
 * Radiation Protection Sample Diagnostics Program *
 * 6/21/01 7:37:36 AM *

* Analyzed by: *K. Kubota* Reviewed by: *AM 6/21/01* *

Customer : FRESHOUR/SALMI (6132/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE USING CG134
 Lab Sample ID : 10101902

 Sample Description : MIXED GAMMA STANDARD CG134
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11/01/90 12:00:00 PM
 Acquire Start Date/Time : 6/21/01 7:27:22 AM
 Detector Name : LAB01
 Elapsed Live/Real Time : 600 / 604 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	-----	2.64E+003
RA-226	Not Detected	-----	5.28E+003
PB-214	Not Detected	-----	6.65E+002
BI-214	Not Detected	-----	6.01E+002
PB-210	Not Detected	-----	7.49E+004
TH-232	Not Detected	-----	2.11E+003
RA-228	Not Detected	-----	2.65E+003
AC-228	Not Detected	-----	1.51E+003
TH-228	Not Detected	-----	3.07E+005
RA-224	Not Detected	-----	1.55E+004
PB-212	Not Detected	-----	1.99E+004
BI-212	Not Detected	-----	2.02E+005
TL-208	Not Detected	-----	4.24E+004
U-235	Not Detected	-----	1.32E+003
TH-231	Not Detected	-----	4.26E+004
PA-231	Not Detected	-----	1.27E+004
TH-227	Not Detected	-----	2.33E+003
RA-223	Not Detected	-----	1.00E+026
RN-219	Not Detected	-----	5.86E+003
PB-211	Not Detected	-----	1.34E+004
TL-207	Not Detected	-----	2.36E+005
AM-241	8.54E+004	1.23E+004	1.87E+003
PU-239	Not Detected	-----	2.29E+006
NP-237	Not Detected	-----	1.22E+004
PA-233	Not Detected	-----	5.74E+002
TH-229	Not Detected	-----	1.06E+003

{Summary Report} - Sample ID: 10101902

Isotope Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	-----	3.18E+002
AG-110m	Not Detected	-----	8.30E+007
BA-133	Not Detected	-----	8.34E+002
BE-7	Not Detected	-----	1.00E+026
CD-115	Not Detected	-----	1.00E+026
CE-139	Not Detected	-----	5.36E+010
CE-141	Not Detected	-----	1.00E+026
CE-144	Not Detected	-----	1.67E+007
CM-243	Not Detected	-----	1.82E+003
CO-56	Not Detected	-----	5.23E+017
CO-57	Not Detected	-----	3.32E+006
CO-58	Not Detected	-----	1.06E+019
CO-60	7.80E+004	1.03E+004	7.95E+002
CR-51	Not Detected	-----	1.00E+026
CS-134	Not Detected	-----	9.89E+003
CS-137	6.90E+004	8.91E+003	4.32E+002
EU-152	Not Detected	-----	8.54E+002
EU-154	Not Detected	-----	3.28E+003
EU-155	Not Detected	-----	3.55E+003
FE-59	Not Detected	-----	1.00E+026
GD-153	Not Detected	-----	3.11E+007
HG-203	Not Detected	-----	1.00E+026
I-131	Not Detected	-----	1.00E+026
IR-192	Not Detected	-----	1.88E+018
40	Not Detected	-----	1.32E+003
MN-53	Not Detected	-----	1.00E+026
MN-54	Not Detected	-----	1.95E+006
MO-99	Not Detected	-----	1.00E+026
NA-22	Not Detected	-----	2.88E+003
NA-24	Not Detected	-----	1.00E+026
ND-147	Not Detected	-----	1.00E+026
NI-57	Not Detected	-----	1.00E+026
RU-103	Not Detected	-----	1.00E+026
RU-106	Not Detected	-----	4.35E+006
SB-122	Not Detected	-----	1.00E+026
SB-124	Not Detected	-----	7.31E+021
SB-125	Not Detected	-----	1.65E+004
SN-113	Not Detected	-----	6.08E+012
SR-85	Not Detected	-----	4.12E+020
TA-182	Not Detected	-----	1.67E+013
TA-183	Not Detected	-----	1.00E+026
TL-201	Not Detected	-----	1.00E+026
Y-88	Not Detected	-----	1.48E+013
ZN-65	Not Detected	-----	5.31E+007
ZR-95	Not Detected	-----	1.04E+021

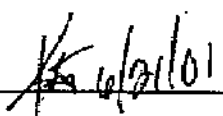
 Sandia National Laboratories
 Radiation Protection Sample Diagnostics Program
 Quality Assurance Report

Report Date : 6/21/01 7:37:40 AM
 QA File : C:\GENIE2K\CAMFILES\LCS1.QAF
 Analyst : KICHAVE
 Sample ID : 10101902
 Sample Quantity : 1.00 Each
 Sample Date : 11/01/90 12:00:00 PM
 Measurement Date : 6/21/01 7:27:22 AM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 604 seconds

Parameter	Mean	1S Error	New Value	< LU : SD : UD : BS >
AM-241 ACTIVITY	8.510E-002	2.619E-003	8.538E-002	< : : : >
CS-137 Activity	6.833E-002	1.224E-003	6.900E-002	< : : : >
CO-60 Activity	7.659E-002	2.504E-003	7.830E-002	< : : : >

Keys Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____



 ** Sandia National Laboratories **
 * Radiation Protection Sample Diagnostics Program *
 * 6/21/01 12:28:48 AM *

* Analyzed by: *K. W. 6/21/01* Reviewed by: *AM 6/21/01* *

Customer : FRESHOUR/SALMI (6132/SMO)
 Customer Sample ID : BLANK
 Lab Sample ID : 10101903

Sample Description : EMPTY COUNT CHAMBER
 Sample Quantity : 596.200 gram
 Sample Date/Time : 6/20/01 11:03:00 AM
 Acquire Start Date/Time : 6/20/01 5:48:28 PM
 Detector Name : LAB01
 Elapsed Live/Real Time : 24000 / 24003 seconds

Comments:

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	Not Detected	-----	1.23E-001
RA-226	Not Detected	-----	1.86E-001
PB-214	Not Detected	-----	1.79E-002
BI-214	Not Detected	-----	2.04E-002
PB-210	Not Detected	-----	2.07E+000
Th-232	Not Detected	-----	5.67E-002
RA-228	Not Detected	-----	6.17E-002
AC-228	Not Detected	-----	3.58E-002
TH-228	Not Detected	-----	1.87E-001
RA-224	Not Detected	-----	5.11E-002
PB-212	9.65E-003	1.00E-002	1.60E-002
BI-212	Not Detected	-----	1.28E-001
TL-208	Not Detected	-----	2.99E-002
U-235	Not Detected	-----	4.92E-002
TH-231	Not Detected	-----	1.60E+000
PA-231	Not Detected	-----	3.54E-001
TH-227	Not Detected	-----	5.24E-002
RA-223	Not Detected	-----	2.58E-002
RN-219	Not Detected	-----	1.05E-001
PB-211	Not Detected	-----	2.23E-001
TL-207	Not Detected	-----	3.43E+000
AM-241	Not Detected	-----	4.30E-002
PU-239	Not Detected	-----	8.49E+001
NP-237	Not Detected	-----	4.59E-001
PA-233	Not Detected	-----	1.68E-002
TH-229	Not Detected	-----	4.05E-002

[Summary Report] - Sample ID: 10101903

Isotope Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	-----	8.97E-003
AG-110m	Not Detected	-----	8.70E-003
BA-133	Not Detected	-----	1.06E-002
BE-7	Not Detected	-----	6.96E-002
CD-115	Not Detected	-----	1.61E-002
CE-139	Not Detected	-----	6.24E-003
CE-141	Not Detected	-----	1.09E-002
CE-144	Not Detected	-----	4.80E-002
CM-243	Not Detected	-----	4.11E-002
CO-56	Not Detected	-----	1.21E-002
CO-57	Not Detected	-----	5.99E-003
CO-58	Not Detected	-----	8.97E-003
CO-60	Not Detected	-----	9.87E-003
CR-51	Not Detected	-----	6.50E-002
CS-134	Not Detected	-----	9.66E-003
CS-137	Not Detected	-----	9.37E-003
EU-152	Not Detected	-----	1.83E-002
EU-154	Not Detected	-----	4.12E-002
EU-155	Not Detected	-----	2.73E-002
FE-59	Not Detected	-----	1.50E-002
GD-153	Not Detected	-----	1.62E-002
HG-203	Not Detected	-----	7.51E-003
I-131	Not Detected	-----	8.12E-003
IR-192	Not Detected	-----	7.52E-003
I-40	Not Detected	-----	1.36E-001
MN-52	Not Detected	-----	9.30E-003
MN-54	Not Detected	-----	9.33E-003
MO-99	Not Detected	-----	6.20E-002
NA-22	Not Detected	-----	7.18E-003
NA-24	Not Detected	-----	1.50E-002
ND-147	Not Detected	-----	5.70E-002
NI-57	Not Detected	-----	1.56E-002
RU-103	Not Detected	-----	8.26E-003
RU-106	Not Detected	-----	8.30E-002
SB-122	Not Detected	-----	1.18E-002
SB-124	Not Detected	-----	9.45E-003
SB-125	Not Detected	-----	2.31E-002
SN-113	Not Detected	-----	9.79E-003
SR-85	Not Detected	-----	1.24E-002
TA-182	Not Detected	-----	2.86E-002
TA-183	Not Detected	-----	3.91E-002
TL-201	Not Detected	-----	2.27E-002
Y-88	Not Detected	-----	9.94E-003
ZN-65	Not Detected	-----	2.05E-002
ZR-95	Not Detected	-----	1.50E-002

**ON-SITE LABORATORY (RPSD)
ANALYSIS REQUEST AND CHAIN OF CUSTODY**

Internal Lab

Page 1 of 1

Batch No. 101034	SAR/WR No.	AR/COC 604619	
Dept. No./Mail Stop: 6132/H007	Date Samples Shipped: 7-5-01	Logged By: _____	<input type="checkbox"/> Characterization Only
Lab Manager: F. Johnson	Container/Worksheet No. HC	Project/Task No. 7214 02.02.21	<input type="checkbox"/> Waste Characterization
Lab Name: SAR/WR	Lab Contact: R Reese 844-7643	SMO Authorization: J.P. [Signature]	- RCRA Data = _____
Record Center Code: SU010 944	Lab Destination: KPSD	Location: N/A	- Send preliminary/copy report to: _____
Logbook Ref. No.:	SMO Contact/Phone: D Salini 844-3110	Tech Area: N/A	<input type="checkbox"/> Release to ERCL On-Site Lab
Service Order No.: RPO-01		Building: N/A	<input type="checkbox"/> Release to Off-Site Lab
		Room: N/A	- This COC Number Releases _____
			COC No(s): _____

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date/Time (hr)	Reference LOV (available at SMO)					
					Sample Matrix	Container Type	Volume	Preservative	Collection Method	Sample Type
RPSD No.-Fraction	Remarks/Alcohol Amounts	Screen CPM	Sample Mass	Sample Quantity						
056214-004	CYS4-BH13-4	4	94H	062001 1309	S	M	16oz	None	G	SA
01				652.6						
02	BLANK - 10-33 10103302 /									
03										

RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Ref. No.:	Sample Tracking	SMO Use	Special Instructions/QC Requirements
Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab		Date Entered (mm/dd/yy)	07/13/01	EDB <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush		Entered by:	ETAC	Raw Data Package <input type="checkbox"/> Yes <input type="checkbox"/> No
	Required Report Date	QC Init.	4	*Please send report to:
Sample Team Members	Name	Signature	Int.	Company/Organization/Phone/Cellular
	M Sanchez	<i>[Signature]</i>	PH	Weston/E135/845-3267
	G Quintana	<i>[Signature]</i>	PH	HT6135/284-3380
	W Gibson	<i>[Signature]</i>	PH	INDL46 135/845-3267

Non-releasing COC per R. Rivera

Please list as separate report.

1. Relinquished by [Signature] Org 6135 Date 6/21/01 Time 12:55	4. Relinquished by [Signature] Org 7132 Date 7-5-01 Time 13:05
2. Received by [Signature] Org 6135 Date 6/21/01 Time 12:55	5. Relinquished by [Signature] Org 6135 Date 7-5-01 Time 13:05
3. Relinquished by [Signature] Org 6135 Date 6-21-01 Time 12:55	6. Received by [Signature] Org 6135 Date 7/5/01 Time 10:45
7. Relinquished by [Signature] Org 6135 Date 6/21/01 Time 12:55	8. Relinquished by [Signature] Org 6135 Date 7/5/01 Time 10:45
9. Received by [Signature] Org 7132 Date 7-5-01 Time 14:10	10. Received by [Signature] Org 7132 Date 7-5-01 Time 14:10

Sandia National Laboratories
Radiation Protection Sample Diagnostics Program
6/26/01 10:11:33 PM

Analyzed by: *JK 6/28/01*

Reviewed by: *AM 6/28/01*

Customer : FRESHOUR/PERRY (6132/SMO)
Customer Sample ID : 056214-004
Lab Sample ID : 10103401

Sample Description : CY94-BH13-4
Sample Quantity : 632.800 gram
Sample Date/Time : 6/20/01 1:09:00 PM
Acquire Start Date/Time : 6/26/01 3:31:03 PM
Detector Name : LAB02
Elapsed Live/Real Time : 24000 / 24010 seconds

Comments:

-235/Ra-226 peaks not resolved. Either isotope may be overestimated.

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
U-238	7.81E-001	1.97E-001	3.19E-001
RA-226	1.60E+000	3.07E-001	3.09E-001
PB-214	7.16E-001	1.00E-001	4.07E-002
BI-214	6.11E-001	9.20E-002	4.01E-002
PB-210	Not Detected	-----	1.65E+001
TH-232	6.26E-001	2.85E-001	1.10E-001
RA-228	6.86E-001	1.54E-001	6.75E-002
AC-228	6.39E-001	1.07E-001	5.54E-002
TH-228	5.81E-001	2.06E-001	2.85E-001
RA-224	6.78E-001	1.36E-001	4.18E-002
PB-212	6.15E-001	8.98E-002	1.72E-002
BI-212	6.75E-001	1.79E-001	2.21E-001
TL-208	5.75E-001	8.39E-002	3.49E-002
U-235	1.03E-001	8.48E-002	1.05E-001
TH-231	1.74E+000	2.92E+000	5.66E+000
PA-231	Not Detected	-----	6.34E-001
TH-227	Not Detected	-----	1.64E-001
PA-223	Not Detected	-----	1.30E-001
PN-219	Not Detected	-----	1.65E-001
PB-211	Not Detected	-----	3.77E-001
TL-207	Not Detected	-----	5.72E+000
AM-241	Not Detected	-----	2.33E-001
PU-239	Not Detected	-----	1.94E+002
NP-237	Not Detected	-----	1.07E+000
PA-233	Not Detected	-----	2.54E-002
TH-229	Not Detected	-----	1.14E-001

ND. *AM 6/28/01*

[Summary Report] - Sample ID: : 10103401

Nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	-----	1.67E-002
AG-110m	Not Detected	-----	2.63E-002
BA-133	Not Detected	-----	2.13E-002
BE-7	Not Detected	-----	1.18E-001
CD-115	Not Detected	-----	2.01E-001
CE-139	Not Detected	-----	1.30E-002
CE-141	Not Detected	-----	2.59E-002
CE-144	Not Detected	-----	1.07E-001
CM-243	Not Detected	-----	7.65E-002
CO-56	Not Detected	-----	1.50E-002
CO-57	Not Detected	-----	1.40E-002
CO-58	Not Detected	-----	1.46E-002
CO-60	8.12E-003	6.29E-003	9.71E-003
CR-51	Not Detected	-----	1.17E-001
CS-134	Not Detected	-----	2.14E-002
CS-137	2.88E-001	3.88E-002	9.42E-003
EU-152	Not Detected	-----	4.13E-002
EU-154	Not Detected	-----	7.86E-002
EU-155	Not Detected	-----	6.40E-002
FE-59	Not Detected	-----	3.14E-002
ED-153	Not Detected	-----	4.87E-002
FG-203	Not Detected	-----	1.52E-002
I-131	Not Detected	-----	2.02E-002
IR-192	Not Detected	-----	1.26E-002
K-40	1.26E+001	1.65E+000	1.72E-001
N-52	Not Detected	-----	2.83E-002
IN-54	Not Detected	-----	9.92E-003
MO-99	Not Detected	-----	4.66E-001
IA-22	Not Detected	-----	1.77E-002
IA-24	Not Detected	-----	1.34E+001
JD-147	Not Detected	-----	1.25E-001
II-57	Not Detected	-----	3.87E-001
RU-103	Not Detected	-----	1.34E-002
RU-106	Not Detected	-----	1.23E-001
SB-122	Not Detected	-----	8.34E-002
SB-124	Not Detected	-----	1.38E-002
SB-125	Not Detected	-----	3.77E-002
SN-113	Not Detected	-----	1.69E-002
SR-85	Not Detected	-----	1.72E-002
TA-182	Not Detected	-----	7.04E-002
TA-183	Not Detected	-----	4.68E-001
TL-201	Not Detected	-----	3.44E-001
T-88	Not Detected	-----	1.13E-002
ZN-65	Not Detected	-----	4.72E-002
ZR-95	Not Detected	-----	2.44E-002

 Sandia National Laboratories
 Radiation Protection Sample Diagnostics Program
 6/27/01 7:21:56 AM

Analyzed by: *K. 6/27/01* Reviewed by: *APM 6/28/01*

Customer : FRESHOUR/PERRY (6132/SMO)
 Customer Sample ID : LAB CONTROL SAMPLE USING CG134
 Lab Sample ID : 10103403

Sample Description : MIXED GAMMA STANDARD CG134
 Sample Quantity : 1.000 Each
 Sample Date/Time : 11/01/90 12:00:00 PM
 Acquire Start Date/Time : 6/27/01 7:11:42 AM
 Detector Name : LAB02
 Elapsed Live/Real Time : 600 / 605 seconds

Comments:

Nuclide Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
U-238	Not Detected	-----	4.11E+003
RA-226	Not Detected	-----	5.56E+003
PB-214	Not Detected	-----	6.01E+002
BI-214	Not Detected	-----	5.32E+002
PB-210	Not Detected	-----	2.56E+005
TH-232	Not Detected	-----	1.97E+003
RA-228	Not Detected	-----	1.93E+003
AC-228	Not Detected	-----	1.23E+003
TH-228	Not Detected	-----	2.89E+005
RA-224	Not Detected	-----	7.15E+003
PB-212	Not Detected	-----	2.20E+004
BI-212	Not Detected	-----	1.53E+005
TL-208	Not Detected	-----	3.75E+004
U-235	Not Detected	-----	1.53E+003
TH-231	Not Detected	-----	7.30E+004
PA-231	Not Detected	-----	1.27E+004
TH-227	Not Detected	-----	2.55E+003
RA-223	Not Detected	-----	1.00E+026
RN-219	Not Detected	-----	5.71E+003
PB-211	Not Detected	-----	1.29E+004
TL-207	Not Detected	-----	1.92E+005
AM-241	8.92E+004	1.41E+004	5.85E+003
PU-239	Not Detected	-----	2.73E+006
NP-237	Not Detected	-----	1.47E+004
PA-233	Not Detected	-----	5.53E+002
TH-229	Not Detected	-----	1.61E+003

[Summary Report] - Sample ID: : 10103403

Nuclide)Name	Activity (pCi/Each)	2-sigma Error	MDA (pCi/Each)
AG-108m	Not Detected	-----	2.53E+002
AG-110m	Not Detected	-----	8.06E+007
BA-133	Not Detected	-----	7.68E+002
BE-7	Not Detected	-----	1.00E+026
CD-115	Not Detected	-----	1.00E+026
CE-139	Not Detected	-----	6.49E+010
CE-141	Not Detected	-----	1.00E+026
CE-144	Not Detected	-----	2.02E+007
CM-243	Not Detected	-----	1.90E+003
CO-56	Not Detected	-----	4.50E+017
CO-57	Not Detected	-----	4.26E+006
CO-58	Not Detected	-----	9.33E+018
CO-60	8.41E+004	1.09E+004	7.53E+002
CR-51	Not Detected	-----	1.00E+026
CS-134	Not Detected	-----	9.20E+003
CS-137	7.60E+004	9.82E+003	3.85E+002
EU-152	Not Detected	-----	1.08E+003
EU-154	Not Detected	-----	2.60E+003
EU-155	Not Detected	-----	4.23E+003
FE-59	Not Detected	-----	1.00E+026
GD-153	Not Detected	-----	4.66E+007
HG-203	Not Detected	-----	1.00E+026
I-131	Not Detected	-----	1.00E+026
IR-192	Not Detected	-----	1.83E+018
LA-140	Not Detected	-----	1.10E+003
MA-52	Not Detected	-----	1.00E+026
MA-54	Not Detected	-----	1.58E+006
MO-99	Not Detected	-----	1.00E+026
NA-22	Not Detected	-----	2.85E+003
NA-24	Not Detected	-----	1.00E+026
ND-147	Not Detected	-----	1.00E+026
NI-57	Not Detected	-----	1.00E+026
RU-103	Not Detected	-----	1.00E+026
RU-106	Not Detected	-----	3.73E+006
SB-122	Not Detected	-----	1.00E+026
SB-124	Not Detected	-----	7.28E+021
SB-125	Not Detected	-----	1.48E+004
SN-113	Not Detected	-----	6.12E+012
SR-85	Not Detected	-----	3.87E+020
TA-182	Not Detected	-----	1.41E+013
TA-183	Not Detected	-----	1.00E+026
TL-201	Not Detected	-----	1.00E+026
Y-88	Not Detected	-----	1.22E+013
ZN-65	Not Detected	-----	4.38E+007
ZR-95	Not Detected	-----	8.27E+020

 Sandia National Laboratories
 Radiation Protection Sample Diagnostics Program
 Quality Assurance Report

Report Date: 6/27/01 7:22:00-AM
 QA File : C:\GENIE2K\CAMFILES\LCS2.QAF
 Analyst : KICHAVE
 Sample ID : 10103403
 Sample Quantity : 1.00 Each
 Sample Date : 11/01/90 12:00:00 PM
 Measurement Date : 6/27/01 7:11:42 AM
 Elapsed Live Time : 600 seconds
 Elapsed Real Time : 605 seconds

Parameter	Mean	1S Error	New Value	< LU	: SD	: UD	: BS >
M-241 Activity	8.242E-002	3.548E-003	8.919E-002	<	:	:	>
CS-137 Activity	7.196E-002	2.704E-003	7.604E-002	<	:	:	>
Co-60 Activity	8.023E-002	3.051E-003	8.394E-002	<	:	:	>

Flags Key: LU = Boundary Test (Ab = Above, Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
 UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
 BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: K 6/27/01



 Sandia National Laboratories
 Radiation Protection Sample Diagnostics Program
 6/27/01 4:53:47 AM

Analyzed by: *JK 6/27/01*

Reviewed by: *ADM 6/28/01*

Customer : FRESHOUR/PERRY (6132/SMO)
 Customer Sample ID : ~~BLANK FOR 101033/101034~~
 Lab Sample ID : 10103302

Sample Description : EMPTY COUNT CHAMBER
 Sample Quantity : 708.100 gram
 Sample Date/Time : 6/26/01 8:47:00 AM
 Acquire Start Date/Time : 6/26/01 10:13:17 PM
 Detector Name : LAB02
 Elapsed Live/Real Time : 24000 / 24003 seconds

Comments:

Isotope Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
Y-238	Not Detected	-----	1.17E-001
LA-226	Not Detected	-----	1.35E-001
EB-214	Not Detected	-----	1.30E-002
BI-214	Not Detected	-----	1.46E-002
EB-210	Not Detected	-----	6.57E+000
EB-232	Not Detected	-----	4.18E-002
EA-228	Not Detected	-----	3.75E-002
EC-226	Not Detected	-----	2.32E-002
EW-228	Not Detected	-----	1.33E-001
EA-224	Not Detected	-----	3.39E-002
ES-212	Not Detected	-----	1.12E-002
ET-212	Not Detected	-----	8.28E-002
EL-208	Not Detected	-----	1.96E-002
EA-235	Not Detected	-----	4.38E-002
EB-231	Not Detected	-----	2.02E+000
EA-231	Not Detected	-----	2.73E-001
EB-227	Not Detected	-----	4.34E-002
EA-223	Not Detected	-----	3.14E-002
EN-219	Not Detected	-----	7.46E-002
EB-211	Not Detected	-----	1.66E-001
EL-207	Not Detected	-----	2.75E+000
EM-241	Not Detected	-----	8.85E-002
EU-239	Not Detected	-----	7.74E+001
EP-237	Not Detected	-----	4.19E-001
EA-233	Not Detected	-----	1.16E-002
EH-229	Not Detected	-----	4.25E-002

[Summary Report] - Sample ID: 10103302

nuclide Name	Activity (pCi/gram)	2-sigma Error	MDA (pCi/gram)
AG-108m	Not Detected	-----	6.07E-003
AG-110m	Not Detected	-----	5.96E-003
SA-133	Not Detected	-----	7.61E-003
SE-7	Not Detected	-----	5.08E-002
TD-115	Not Detected	-----	1.28E-002
TE-139	Not Detected	-----	5.25E-003
TE-141	Not Detected	-----	9.29E-003
TE-144	Not Detected	-----	4.40E-002
TM-243	Not Detected	-----	3.09E-002
TO-56	Not Detected	-----	7.87E-003
TO-57	Not Detected	-----	5.41E-003
TO-58	Not Detected	-----	6.23E-003
TO-60	Not Detected	-----	6.25E-003
TR-51	Not Detected	-----	4.67E-002
TS-134	Not Detected	-----	6.80E-003
TS-137	Not Detected	-----	6.39E-003
TU-152	Not Detected	-----	1.64E-002
TU-154	Not Detected	-----	2.82E-002
TU-155	Not Detected	-----	2.43E-002
TE-59	Not Detected	-----	1.12E-002
TD-153	Not Detected	-----	1.77E-002
AG-202	Not Detected	-----	5.63E-003
T-131	Not Detected	-----	5.97E-003
TR-192	Not Detected	-----	5.53E-003
T-40	Not Detected	-----	1.07E-001
TS-52	Not Detected	-----	6.82E-003
TS-54	Not Detected	-----	6.15E-003
TS-99	Not Detected	-----	5.13E-002
TS-22	Not Detected	-----	5.73E-003
TS-24	Not Detected	-----	1.27E-002
TD-147	Not Detected	-----	3.60E-002
TI-57	Not Detected	-----	1.11E-002
TU-103	Not Detected	-----	5.77E-003
TU-106	Not Detected	-----	5.56E-002
TS-122	Not Detected	-----	9.38E-003
TS-124	Not Detected	-----	6.60E-003
TS-125	Not Detected	-----	1.68E-002
TS-113	Not Detected	-----	7.61E-003
TR-85	Not Detected	-----	9.02E-003
TA-182	Not Detected	-----	1.97E-002
TA-183	Not Detected	-----	8.40E-002
TD-201	Not Detected	-----	3.64E-002
TS-88	Not Detected	-----	6.46E-003
TS-65	Not Detected	-----	1.42E-002
TR-95	Not Detected	-----	9.50E-003

Annex 3-D

ANNEX 3-D
Diesel and Gasoline Range Organics Results

CUSTOMER
COPY

CASE NARRATIVE
for
Sandia National Laboratories
ARCOC-603643
29376
Case No. 8933.33.04

RECEIVED

SEP 7 2000

SNL/SMO

September 6, 2000

Laboratory Identification:

General Engineering Laboratories, Inc.

Mailing Address:

P.O. Box 30712
Charleston, South Carolina 29417

Express Mail Delivery and Shipping Address:

2040 Savage Road
Charleston, South Carolina 29407

Telephone Number:

(843) 556-8171

Summary:

Sample receipt

Sandia collected four soil samples on August 7, 2000. The samples arrived at General Engineering Laboratories, Inc., (GEL) Charleston, South Carolina on August 9, 2000, for environmental analyses. Cooler clearance (screening, temperature check, etc.) was done upon login. The cooler arrived without any visible signs of tampering or breakage and with custody seals intact. The samples were delivered with chain of custody documentation and signatures. The temperature of the samples was 1.1°C, which was below the required temperature limits. Mr. Sahmi was notified and permission obtained to proceed with the analyses. The samples were screened according to GEL Standard Operating Procedures (SOP) EPI SOP S-007 rev. 2 "The Receiving of Radioactive Samples." The samples were stored properly according to SW-846 procedures and GEL SOP.

The following samples were received by the laboratory:

<u>Laboratory ID</u>	<u>Description</u>
ARCOC: 603643:	
29376001	053051-001
29376002	053051-002
29376003	053051-003
29376004	053051-004

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Internal Chain of Custody:

Custody was maintained for the samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Qualifier Flag and Data Package Definitions, Laboratory Certifications, Sample Data, QC Summary and Level C Data Package.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Edith M. Kent



Project Manager

fc:snls29376

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GENERAL
NARRATIVE

AR/COC

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Relog # 2000086557
ARICOC 603643

Batch No. NA SARWR No. 7131 MS 1042	Date Samples Shipped: 8-8-00	SMO USE Contract No. A5-2480A	Waste Characterization RCRA Date: ARICOC 603643
Project/Task Manager: C. Fink	Carrier/Manifest No. 735186	Project/Task No.: 893333.04	Send Preliminary Report to
Project Name: Oil Storage	Lab Contact: EDW KUNT	SMO Authorization: [Signature]	Validation Required
Record Carrier Code: NA	Lab Destination: GEL		Released by COC No.:
Logbook Ref. No.: CFO.032	SMO Contact/Phone: Doug Sabini/844-3110		Bill To: Sandia National Labs (Accounts Payable)
Service Order No. Tech Area CTF	Sand Report to SMO: Susan Montano		P.O. Box 5800, MS-0154 Albuquerque, NM., 87155-0154

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date Collected	Sample Matrix	Container Type	Volume	Preserve/Collection		Sample Type	Lab Sample ID
								Aliq#	Method		
Q 53051-001	Burn Site	2	65/94	8-7-00 14:30	S	G	250 ml	4C	G	SA	2937602
Q 53051-002	Burn Site	2	65/94	8-7-00 14:32	S	G	250 ml	4C	G	SA	2937607
Q 53051-003	Burn Site	2	65/94	8-7-00 14:35	S	G	260 ml	4C	G	SA	2937603
Q 53051-004	Burn Site	2	65/94	8-7-00 14:40	S	G	250 ml	4C	G	SA	2937604

RMMA	Yes	No	Ref. No.	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Abnormal Conditions on Receipt
Sample Disposal	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Date Entered (mm/dd/yy)		EDD <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Turnaround Time	<input type="checkbox"/> 7 Day*	<input checked="" type="checkbox"/> 15 Day*	<input type="checkbox"/> 30 Day	Entered by:		Raw Data Packag <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Return Samples By:			Negotiated TAT	QC Init.	*Send e-mail report to:		
Sample Team Members	Name: Charles Fink		Signature: [Signature]	Init: CF	Company/Organization/Phone/Cellular: SNL7131/845-7826		

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
[Signature]	SNL	8-7-00	11:15	[Signature]	SNL	8-7-00	11:15
[Signature]	SNL	8-7-00	11:15	[Signature]	SNL	8-7-00	11:15
[Signature]	SNL	8-7-00	11:15	[Signature]	SNL	8-7-00	11:15
[Signature]	SNL	8-7-00	11:15	[Signature]	SNL	8-7-00	11:15
[Signature]	SNL	8-7-00	11:15	[Signature]	SNL	8-7-00	11:15
[Signature]	SNL	8-7-00	11:15	[Signature]	SNL	8-7-00	11:15

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

COOLER
RECEIPT
CHECKLIST

SAMPLE RECEIPT REVIEW

Client SNLS

Received by PAJ

Date 8/9/00

GEL COOLER _____ GEL POLY COOLER _____ CLIENT COOLER OTHER _____

SAMPLE REVIEW CRITERIA	YES	NO	COMMENTS/QUALIFIERS
1. Were shipping containers received intact and sealed? If no, notify Project Manager	✓		
2. Was the Shipment screened following the radiocesium survey procedure (EPI SOP 5-007)? Were the survey results negative? If so, notify Project Manager	✓		
Are any of the samples identified by the client as radioactive? If yes, did client provide RAD activity?	✓		
3. Were chain of custody documents included?	✓		
4. Were chain of custody documents completed correctly? (ink, signed, match containers)	✓		
5. Were all sample containers properly labeled?	✓		
6. Were proper sample containers received?	✓		
7. Preserved samples checked for pH?	✓		NA
8. Were samples preserved correctly? If no, list samples & tests	✓		
9. Shipping container temperature checked?	-		1.1°
10. Was shipping container temperature within specifications (4±1°C)? If no, notify Project Manager	-		
11. Is temperature documented on the Chain of Custody?	✓		
12. Were samples received within holding time? If No, notify Project Manager	✓		
13. Were VOA vials free of headspace?	✓		NA
14. ARCO# IF REQUIRED	-		603398 & 603643
15. SDG# IF REQUIRED	-		

REVIEW Patricia Dew DATE 8/9/00

SA - SEALS ATTACHED NSA - NO SEALS ATTACHED

TRACKER # 4708-8693-8078

DATA REVIEW
QUALIFIER FLAG
DEFINITION SHEET

The Level II Certificate of Analysis contains the following headings:

Client Sample ID:	Sample Identification
Sample ID:	This is the laboratory identification number
Matrix:	Sample matrix
Collect Date:	Date of sample collection
Receive Date:	Date of sample receipt by the laboratory
Collector:	Party responsible for sample collection.

The detail on the Certificate includes the following:

Parameter:	Analyte or characteristic tested for in the sample
Qualifier:	Qualifier used for data interpretation**
Result:	Final result of each parameter. ND for non-radiochemistry (RAD) tests when result is less than the effective MDL
DL:	Static Method Detection Limit for non-RAD, actual critical level for RAD
RL:	Effective Practical Quantitation Limit (PQL) for non-RAD, MDA (as defined in the DOE-AL Statement of Work) for RAD
Units:	Units of final result
DF:	Dilution factor
Analyst:	Initials of analyst who performed the test
Date:	Date of analysis
Time:	Time of analysis
Batch:	Analytical batch in which the sample was analyzed
Method:	Analytical method used for the analysis of the sample. Identified on the report numerically with a corresponding table.
Surrogate Recovery:	Provided for organics analysis only. Surrogate compound identified.
Test:	Analytical test associated with surrogate compound.
Percent %:	Surrogate percent recovery
Acceptable Limits:	Limits established for surrogate recoveries based upon the method requirements.

The QC Summary Report contains the following headings:

Paramname:	Analyte or characteristic tested for in the QC sample
NOM:	Nominal concentration of the spiking compound
Sample:	Amount of compound found in the sample associated with the QC sample.
Qual:	Qualifier used for data interpretation**
QC:	Amount of compound found in the QC sample.
Units:	Units of final result
RPD %:	Relative percent difference between LCS/LCS dup, MS/MSD, and Sample/Sample duplicate for non-RAD; for RAD relative error ratio (RER) between Sample/Sample duplicate
REC %:	Recovery for the control samples

Range: Acceptance limits for control samples. May not be applicable for certain matrices such as TCLP.
Analyst: Initials of analyst who performed the test
Date: Date of analysis
Time: Time of analysis

The calculations for Percent Recovery and Relative Percent Recovery are given below. These calculations are taken from EPA data validation guidelines.

Percent Recovery	$\left(\frac{\text{value of spiked sample} - \text{value of unspiked sample}}{\text{Value of added spike}} \right) \times 100$
------------------	---

Value of added spike = "NOM" on the QC Summary Report

Value of spiked sample = "QC"

Value of unspiked = "Sample"

Relative Percent Difference	$\left(\frac{x_1 - x_2}{(x_1 + x_2)/2} \right) \times 100$
-----------------------------	---

Where:

x_1 = Percent Recovery from spike

x_2 = Percent Recovery from spike duplicate

Values reported for RPD are calculated by LIMS from raw instrument values, preparation factors and dilutions. The values are then rounded and reported on the Quality Control Summary Report. Because of this, verification of the calculated result using the data presented on the report may give slightly different values.

Verification of the percent recovery calculation for PS and PSD using the data from the QC Summary Report is not possible for QC samples that have been diluted. The data can be obtained by contacting your project manager.

A percent recovery value of "N/A" indicates that the concentration of the original sample was greater than four times the amount spiked into the sample and is considered not applicable. This rule is referenced in EPA Data Validation Guidelines. It is footnoted on the very last page of the Quality Control Summary Report.

The calculation for relative error ratio is found in the DOE-AI Statement of Work.

Types of QC samples that may be found on the QC Summary Report are:

Blank:	Results of the blank analysis for the sample batch
Dup:	Duplicate analysis of sample
LCS:	Lab control sample
LCS dup:	Lab control sample duplicate
MS:	Matrix spike
MSD:	Matrix spike duplicate
PS:	Post spike (spike that does not require prep or spiked after prep)
PSD:	Post spike duplicate
TS:	TCLP spike
SDILT:	Serial dilution (metals analysis only)

The matrix spike, matrix spike duplicate, and sample duplicate will be reported on the QC Summary Report only if the sample chosen for the matrix spike, matrix spike duplicate, or sample duplicate is part of the ARCOG group being reported. However, this QC is a Sandia contract requirement and the acceptability of the QC for the batch in which the Sandia samples were analyzed will be addressed in the technical case narratives whether or not they are a part of the QC Summary.

The following are definitions of reporting limits used at General Engineering Laboratories:

DL Static Detection Limit: The minimum level of an analyte that can be determined (identified not quantified) with 99% confidence. The values are normally achieved by preparing and analyzing seven aliquots of laboratory water spiked 1 to 5 times the estimated MDL, taking the standard deviation and multiplying it against the one-tailed t-statistic at 99%. This computed value is then verified for reasonableness by repeating the study using the concentration found in the initial study, calculating an F-ratio, and computing the final limit. For soil samples, the static-prep factor is taken into account.

Effective Detection Limit: The minimum level of an analyte that can be determined (identified not quantified) with 99% confidence. The values are normally achieved by preparing and analyzing seven aliquots of laboratory water spiked 1 to 5 times the estimated MDL, taking the standard deviation and multiplying it against the one-tailed t-statistic at 99%. This computed value is then verified for reasonableness by repeating the study using the concentration found in the initial study, calculating an F-ratio, and computing the final limit. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The detection limit is the minimum concentration of a substance that can be identified, measured, and reported with 99% confidence that the analyte concentration is above zero. It answers the question "Is It Present".

It is a requirement of the Sandia contract that the static MDL be reported on both the Certificate of Analysis (COA) and the EDD rather than the effective MDL. However, results data qualifiers reflect the effective MDL.

QL Quantitation Limit: The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The QL is generally 5 to 10 times the MDL. However, it may be nominally chosen within these guidelines to simplify data reporting. For many analytes the QL analyte concentration is selected as the lowest non-zero standard in the calibration curve.

Sample QL's are highly matrix-dependent. Sample specific preparation and dilution factors are applied to these limits when they are reported

The QL is always \geq DL.

RL Reporting Limit: Same as the QL except where driven by contract or client specifications. If the sample specific preparation and dilution factors cause the QL to be elevated above the RL, then the QL is used as the RL.

The quantitation limit is the lowest level at which a chemical may be accurately and reproducibly quantitated. It answers the question "HOW MUCH IS PRESENT".

NOTE: Per contract specifications Sandia has requested that for radiochemistry samples only the actual critical level be reported on the Certificate of Analysis (COA) and the EDD where the MDL would normally be reported and that the MDA be reported where the RL would normally be reported.

Interpretation of RESULT column on the Certificate of Analysis:

If the final concentration in the sample was found to be equal to or above the RL, then the value is reported without a qualifier; for RAD samples if the final concentration in the sample was found to be above the MDA, then the value is reported without a qualifier.

If the final concentration in the sample was found to be below the RL but equal to or above the effective DL, then the value reported is qualified with a "J"; there are no "J" qualifiers reported for RAD data.

If the final concentration in the sample was found to be below the effective DL, the value is reported as "ND" and is qualified with a "U"; for RAD samples if the final

concentration in the sample was found to be below the MDA, the value reported is qualified with a "U".

For organics, if the concentration of the compound is detected in the blank above the effective MDL, the sample result is qualified with a "B". For inorganics, if the concentration of the compound is detected in the blank above the effective PQL, the sample result is qualified with a "B". There are no "B" qualifiers reported for RAD data.

LABORATORY CERTIFICATIONS

APR 11 1984
FBI LABORATORY

List of current GEL Certifications as of 25 August 2000

State	Certification
AL	41040
CA	I-2089
CO	N/A
CT	PH-0169
DE	SCD12
FL	E87156/87284
GA	938
ID	N/A
MD	270
MI	N/A
MS	29417
NC	233
ND	R-158
NJ	79082
NV	N/A
NY	11501
OK	9904
PA	68-485
RI	135
SC	10120/362
TN	02934
TX	213
UT	E-251
VA	00151
VT	N/A
WA	C223
WI	999887790

**GENERAL
CHEMISTRY
ANALYSIS**

**General Chemistry Narrative
Sandia National Laboratories (SNLS)
SDG 29376**

Method/Analysis Information

Procedure: Total Petroleum Hydrocarbons
Analytical Method: EPA 418.1 Modified
Prep Method: EPA 418.1 Modified Prep
Analytical Batch Number: 40590
Prep Batch Number: 40308

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 418.1 MODIFIED:

Sample ID	Client ID
29376001	053051-001
29376002	053051-002
29376003	053051-003
29376004	053051-004
1000091497	MB for HBN 40590
1000091498	LCS for HBN 40590
1000091499	LCSD for HBN 40590
1000091985	DUP of 29376001
1000091986	MS of 29376001

SOP Reference

Procedures for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, Inc. as Standard Operating Procedures (SOP). The data discussed in this narrative has been prepared and analyzed in accordance with GL-GC-E-021.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by General Engineering Laboratories, Inc. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information:

The instrument used in this analysis was the following: Perkin Elmer 1600 Series FTIR

Initial Calibration

The instrument was properly calibrated.

Quality Control (QC) Information:

Blank Acceptance

The method blank associated with this data was within the required acceptance limits.

Laboratory Control Sample Recovery

The recovery for the laboratory control sample was within the required acceptance limits.

LCS Duplicate Recovery

The LCS Duplicate recovery was within the required acceptance limits.

LCS Duplicate RPD

The Relative Percent Difference between the LCS and LCS Duplicate was within the required acceptance limits.

Quality Control

The following sample was designated for Quality Control for this sample group:
29376001

Sample Spike Recovery

The spike recovery is not applicable when the sample concentration exceeds the spike concentration by a factor of four or more.

Sample Duplicate Acceptance

The Relative Percent Difference between the sample and its duplicate was outside of the normal acceptance limits because of the heterogeneous matrix of the sample.

Technical Information:

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples from this sample group were analyzed within the required holding time for this method.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The following samples in this sample group were diluted due to matrix interference. See the Certificate(s) of Analysis for the individual dilution factors for this analysis for the following sample(s):

1000091985

1000091986

29376001

29376003

29376004

Miscellaneous Information:**Nonconformance Reports**

The following Nonconformance Report (NCR) was submitted for samples in this sample group for this analysis.

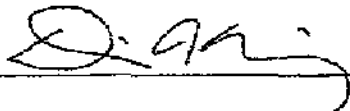
GEL-AS-GC-2168

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The data presented in this sample group has been verified by the following qualified person:

Reviewer: _____



Date: _____

08/24/00

COMPANY-WIDE NONCONFORMANCE REPORT

COMPLETE EVERY ITEM

(See Instructions on Reverse Side)

4. Mo. Day Yr. 08 | 21 | 00 5. Division: Industrial Federal Radiochemistry Bioassay Other
 6. Type: Material Process
 Product

7. Instrument Type: N/A 8. Quality Criteria: SOP QAP or QAPJP Client Contract
 Purchase Document Drawing Specifications Others

9. Supplier/Client Name & Code: SNLS 00396 10. Test/Method: EPA 418.1

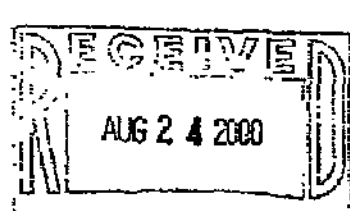
11. Numerical Reference Identification: (Batch Number, Sample Number, ID number)
40590 / 29376001, 002, 003, 004, 1000091985

12. Specifications and Requirements
 Nonconformance Description:

Item No.	Description
	Samples not scanned into custody, sample dup + ms outside SPC limits

14. NRG Disposition:

Item No.	Disposition
	PM notified, other ac's within limits so data is deemed valid - matrix interference was most likely cause for matrix spike values. Sample was not homogeneous. The samples were in the analyst's custody during analysis.



15. NRG's Printed Name & Signature Erin Stanley Date 8-21-00
Erin Stanley

List NRG Participants:
Joseph M. Boyl Joseph M. Boyl

13. Originator's Printed Name & Signature Erin Stanley Date 8-21-00
Erin Stanley

Management Review or Management Approval

Please review within 24 hours of receipt.

NCR Review & Disposition Review or Approval: Corrective Action Request and Approval: ER

16. Quality Review: Date 8/21/00 18. CA Requested: Print Name and Sign Date

17. Originator's Director/Group Leader: Date 19. Corrective Action Approval & Number Date

**SAMPLE
DATA
SUMMARY**

Certificate of Analysis

Company : Sandia National Laboratories
 Address : MS-1042
 P.O. Box 5800
 Albuquerque, NM 87185-1042
 Contact : Mr. Doug Sahmi
 Project : Doug Sahmi Forms Package

Report Date: August 24, 2000

Page 1 of 1

Client Sample ID:	053051-001	Project:	SNLS00396
Sample ID:	29376001	Client ID:	SNLS001
Matrix:	Soil		
Collect Date:	07-AUG-00		
Receive Date:	09-AUG-00		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Fourier Transform IR Federal											
<i>EPA 418.1 Modified TPH by IR</i>											
Total Petroleum Hydrocarbons		1830	9.9	500	mg/kg	25	EOS1	08/18/00	1445	40590	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 418.1 MOD1	EPA 418.1 MOD TPH by IR-FED PREP	EOS1	08/18/00	0830	40308

The following Analytical Methods were performed:

Method	Description
1	EPA 418.1 MODIFIED

Notes:

The Qualifiers in this report are defined as follows :

- * Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- ** Indicates analyte is a surrogate compound.
- B The analyte was found in the blank above the effective MDL (Organics), or the effective PQL (Inorganics)
- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Edie M. Kent at 843-769-7385 Ext. .

Reviewed by _____

Certificate of Analysis

Company : Sandia National Laboratories
 Address : MS-1042
 P.O. Box 5800
 Albuquerque, NM 87185-1042
 Contact : Mr. Doug Salmi
 Project : Doug Salmi Forms Package

Report Date: August 24, 2000

Page 1 of 1

Client Sample ID: 053051-002
 Sample ID: 29376002
 Matrix: Soil
 Collect Date: 07-AUG-00
 Receive Date: 09-AUG-00
 Collector: Client

Project: SNLS00396
 Client ID: SNLS001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Fourier Transform IR Federal											
<i>EPA 418.1 Modified TPH by IR</i>											
Total Petroleum Hydrocarbons		368	9.9	20.0	mg/kg	1	EOS1	08/18/00	1445	40590	

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
EPA 418.1 MOD1	EPA 418.1 MOD TPH by IR-FED PREP	EOS1	08/18/00	0830	40308

The following Analytical Methods were performed

Method	Description
J	EPA 418.1 MODIFIED

Notes:

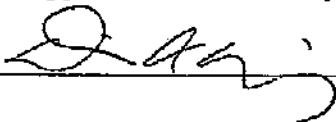
The Qualifiers in this report are defined as follows:

- * Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- ** Indicates analyte is a surrogate compound.
- B The analyte was found in the blank above the effective MDL (Organics), or the effective PQL (Inorganics)
- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Edie M. Kent at 843-769-7385 Ext. .

Reviewed by _____



Certificate of Analysis

Company: Sandia National Laboratories
 Address: MS-1042
 P.O. Box 5800
 Albuquerque, NM 87185-1042
 Contact: Mr. Doug Sahmi
 Project: Doug Sahmi Forms Package

Report Date: August 24, 2000

Page 1 of 1

Client Sample ID:	053051-003	Project:	SNLS00396
Sample ID:	29376003	Client ID:	SNLS001
Matrix:	Soil		
Collect Date:	07-AUG-00		
Receive Date:	09-AUG-00		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Fourier Transform IR Federal											
<i>EPA 418.1 Modified TPH by IR</i>											
Total Petroleum Hydrocarbons		1870	9.9	500	mg/kg	25	EOSJ	08/18/00	1445	40590	1

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
EPA 418.1 MODIFIED	EPA 418.1 MOD. TPH by IR-FED PREP	EOSJ	08/18/00	0830	40308

The following Analytical Methods were performed

Method	Description
1	EPA 418.1 MODIFIED

Notes:

The Qualifiers in this report are defined as follows:

- * Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- ** Indicates analyte is a surrogate compound.
- B The analyte was found in the blank above the effective MDL (Organics), or the effective PQL (Inorganics)
- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level.

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Eric M. Kent at 843-769-7385 Ext. .

Reviewed by _____

Certificate of Analysis

Company: Sandia National Laboratories
 Address: MS-1042
 P.O. Box 5800
 Albuquerque, NM 87185-1042
 Contact: Mr. Doug Sahmi
 Project: Doug Sahmi Forms Package

Report Date: August 24, 2000

Page 1 of 1

Client Sample ID: 053051-004 Project: SNLS00396
 Sample ID: 29376004 Client ID: SNLS001
 Matrix: Soil
 Collect Date: 07-AUG-00
 Receive Date: 09-AUG-00
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Fourier Transform IR Federal											
<i>EPA 418.1 Modified TPH by IR</i>											
Total Petroleum Hydrocarbons		4180	9.9	2000	mg/kg	100	EOS1	08/18/00	1445	40590	1

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
EPA 418.1 MOD1	EPA 418.1 MOD TPH by IR-FED PREP	EOS1	08/18/00	0830	40308

The following Analytical Methods were performed

Method	Description
1	EPA 418.1 MODIFIED

Notes:

The Qualifiers in this report are defined as follows :

- * Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- ** Indicates analyte is a surrogate compound.
- B The analyte was found in the blank above the effective MDL (Organics), or the effective PQL (Inorganics)
- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Edie M. Kent at 843-769-7385 Ext. .

Reviewed by _____

1. The first part of the document discusses the importance of maintaining accurate records of all transactions.

2. It is essential to ensure that all data is entered correctly and that the system is regularly updated.

3. The second section covers the various methods used to collect and analyze data, including surveys and interviews.

4. These methods allow researchers to gather valuable insights into consumer behavior and market trends.

5. Additionally, the document highlights the role of technology in streamlining data collection and analysis processes.

6. By leveraging advanced software tools, businesses can significantly reduce the time and cost associated with data management.

7. Finally, the document concludes by emphasizing the need for ongoing monitoring and evaluation to ensure the effectiveness of the data collection strategy.



**QUALITY
CONTROL
SUMMARY**

QC Summary

Report Date: August 23, 2000
Page 1 of 1

Client: Sandia National Laboratories
MS-1042
P.O. Box 5800
Albuquerque, NM 87188-1042
Contact: Mr. Doug Sahai
Workorder: 29376

Parameter	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Fourier Transform IR Federal									
Batch	40590								
QC1000091985 29376001 DUP									
Total Petroleum Hydrocarbons		1830	2550	mg/kg	N/A		(0%-27%)	EOS1	08/18/00 14:45
QC1000091498 LCS									
Total Petroleum Hydrocarbons	251		237	mg/kg		95	(70%-130%)		
QC1000091499 LCS									
Total Petroleum Hydrocarbons	251		221	mg/kg	7	88	(0%-30%)		
QC1000091497 MB									
Total Petroleum Hydrocarbons		U	ND	mg/kg					
QC1000091986 29376001 MS									
Total Petroleum Hydrocarbons	253	1830	3680	mg/kg		N/A	(70%-130%)		

Notes:

The Qualifiers in this report are defined as follows:

- * Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- Indicates analyte is a surrogate compound.
- B The analyte was found in the blank above the effective MDL (Organics), or the effective PQL (Inorganics)
- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL.
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

SAMPLE
DATA



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Certificate of Analysis

Company: Sandia National Laboratories
 Address: MS-1042
 P.O. Box 5800
 Albuquerque, NM 87185-1042
 Contact: Mr. Doug Salmi
 Project: Doug Salmi Forms Package

Report Date: August 23, 2000

Page 1 of 1

Client Sample ID: 053051-001 Project: SNLS00396
 Sample ID: 29376001 Client ID: SNLS001
 Matrix: Soil
 Collect Date: 07-AUG-00
 Receive Date: 09-AUG-00
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Fourier Transform IR Federal											
<i>EPA 418.1 Modified TPH by IR</i>											
Total Petroleum Hydrocarbons		1830	9.9	500	µg/kg	25	EOS1	08/18/00	1445	40590	1

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
EPA 418.1 MODI	EPA 418.1 MOD TPH by IR-FED PREP	EOS1	08/18/00	0830	40308

The following Analytical Methods were performed

Method	Description
1	EPA 418.1 MODIFIED

Notes:

The Qualifiers in this report are defined as follows:

- * Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- ** Indicates analyte is a surrogate compound.
- B The analyte was found in the blank above the effective MDL (Organics), or the effective PQL (Inorganics)
- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Edie M. Keat at 843-769-7385 Ext. .

Edie Keat
 Reviewed by _____



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Certificate of Analysis

Company: Sandia National Laboratories
Address: MS-1042
P.O. Box 5800
Albuquerque, NM 87185-1042
Contact: Mr. Doug Sabra
Project: Doug Sabra Forms Package

Report Date: August 23, 2000

Page 1 of 1

Client Sample ID: 053051-002
Sample ID: 29376002
Matrix: Soil
Collect Date: 07-AUG-00
Receive Date: 09-AUG-00
Collector: Client

Project: SNLS00396
Client ID: SNLS001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Fourier Transform IR Federal											
EPA 418.1 Modified TPH by IR											
Total Petroleum Hydrocarbons		368	9.9	20.0	mg/kg	1	BOS1	08/18/00	1445	40390	1

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
EPA 418.1 MOD	EPA 418.1 MOD TPH by IR-FED PREP	EOS1	08/18/00	0830	40308

The following Analytical Methods were performed

Method	Description
1	EPA 418.1 MODIFIED

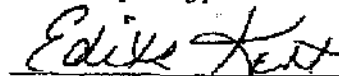
Notes:

The Qualifiers in this report are defined as follows:

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- B The analyte was found in the blank above the effective MDL (Organics), or the effective PQL (Inorganics)
- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL, and below the effective PQL.
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Edie M. Kent at 843-769-7385 Ext.


Reviewed by



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Certificate of Analysis

Company: Sandia National Laboratories
 Address: MS-1042
 P.O. Box 5800
 Albuquerque, NM 87185-1042
 Contact: Mr. Doug Salmi
 Project: Doug Salmi Forms Package

Report Date: August 23, 2000

Page 1 of 1

Client Sample ID: 053051-003 Project: SNLS00396
 Sample ID: 29376003 Client ID: SNLS001
 Matrix: Soil
 Collect Date: 07-AUG-00
 Receive Date: 09-AUG-00
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Fourier Transform IR Federal											
<i>EPA 418.1 Modified TPH by IR</i>											
Total Petroleum Hydrocarbons		1870	9.9	500	mg/kg	25	EOS1	08/18/00	1445	40590	1

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
EPA 418.1 MODI	EPA 418.1 MOD TPH by IR-FED PREP	EOS1	08/18/00	0830	40308

The following Analytical Methods were performed

Method	Description
1	EPA 418.1 MODIFIED

Notes:

The Qualifiers in this report are defined as follows:

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- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Edie M. Kent at 843-769-7385 Ext. .

Edie M. Kent

 Reviewed by



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Certificate of Analysis

Company: Sandia National Laboratories
 Address: MS-1042
 P.O. Box 5800
 Albuquerque, NM 87185-1042
 Contact: Mr. Doug Salmi
 Project: Doug Salmi Form Package

Report Date: August 23, 2000

Page 1 of 1

Client Sample ID: 053051-004 Project: SNL500396
 Sample ID: 29376004 Client ID: SNLS001
 Matrix: Soil
 Collect Date: 07-AUG-00
 Receive Date: 09-AUG-00
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst/Date	Time	Batch	Method
Fourier Transform IR Federal										
<i>EPA 418.1 Modified TPH by IR</i>										
Total Petroleum Hydrocarbons		4180	9.9	2000	mg/kg	100	EOS1 08/18/00	1445	40590	1

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
EPA 418.1 MODI	EPA 418.1 MOD TPH by IR-FED PREP	EOS1	08/18/00	0830	40908

The following Analytical Methods were performed

Method	Description
1	EPA 418.1 MODIFIED

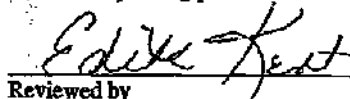
Notes:

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- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

The above sample is reported on an "as received" basis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Edie M. Kent at 843-769-7385 Ext. .


 Reviewed by

QUALITY CONTROL SUMMARY

QUALITY CONTROL SUMMARY
This document provides a summary of the quality control procedures and results for the project. It includes information on the quality control plan, the results of the quality control activities, and the corrective actions taken to address any quality issues.

DATE: 10/10/2023
BY: [Name]

QC Summary

Report Date: September 6, 2000
Page 1 of 1

Client: Sandia National Laboratories
MS-1042
P.O. Box 5800
Albuquerque, NM 87185-1042
Contact: Mr. Doug Salmi
Workorder: 29376

Parameter	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anst	Date Time
Fourier Transform IR Federal									
Batch 40590									
QC1000091985 29376001 DUP									
Total Petroleum Hydrocarbons		1830	2550	mg/kg	N/A		(0%-27%)	EOS1	08/18/00 14:45
QC1000091498 LCS									
Total Petroleum Hydrocarbons	251		237	mg/kg		95	(70%-130%)		
QC1000091499 LCSD									
Total Petroleum Hydrocarbons	251		221	mg/kg	7	88	(0%-30%)		
QC1000091497 MB									
Total Petroleum Hydrocarbons		U	ND	mg/kg					
QC1000091986 29376001 MS									
Total Petroleum Hydrocarbons	253	1830	3680	mg/kg		N/A	(70%-130%)		

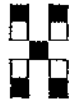
Notes:

The Qualifiers in this report are defined as follows:

- * Recovery or %RPD not within acceptance limits and/or spike amount not compatible with the sample or the duplicate RPD's are not applicable where the concentration falls below the effective PQL.
- ** Indicates analyte is a surrogate compound.
- B The analyte was found in the blank above the effective MDL (Organics), or the effective PQL (Inorganics)
- H Holding time was exceeded
- J Estimated value, the analyte concentration fell above the effective MDL and below the effective PQL
- U The analyte was analyzed for but not detected below this concentration. For Organic and Inorganic analytes the result is less than the effective MDL. For radiochemical analytes the result is less than the Decision Level

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
For PS, PSD, and SDLT results, the values listed are the measured amounts, not final concentrations.





Hall Environmental
Analysis Laboratory

November 28, 2000

Mark Thacker
Sandia National Laboratories
P O Box 5800
MS 0221
Albuquerque, NM 871850221
TEL: (505) 845-8607
FAX (505) 284-2617

RE: Site 94H Burnsite

Order No.: 0011099

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 9 samples on 11/17/00 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Detection limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Hall Environmental Analysis Laboratory

Date: 28-Nov-00

CLIENT: Sandia National Laboratories **Lab Order:** 0011099
Project: Site 94H Burnsites

Lab ID: 0011099-01A **Collection Date:** 11/17/00 10:40:00-AM
Client Sample ID: CYN94H-GR-001-SS **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015		Analyst: JT		
T/R Hydrocarbons: C10-C28	ND	5.0		mg/Kg	1	11/22/00
T/R Hydrocarbons: C28-C34+	ND	50		mg/Kg	1	11/22/00
Surr: DNOP	89.0	74-125		%REC	1	11/22/00

Lab ID: 0011099-02A **Collection Date:** 11/17/00 10:43:00 AM
Client Sample ID: CYN94H-GR-002-SS **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015		Analyst: JT		
T/R Hydrocarbons: C10-C28	430	5.0		mg/Kg	1	11/22/00
T/R Hydrocarbons: C28-C34+	ND	50		mg/Kg	1	11/22/00
Surr: DNOP	85.0	74-125		%REC	1	11/22/00

Lab ID: 0011099-03A **Collection Date:** 11/17/00 10:45:00 AM
Client Sample ID: CYN94H-GR-003-SS **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015		Analyst: JT		
T/R Hydrocarbons: C10-C28	270	5.0		mg/Kg	1	11/22/00
T/R Hydrocarbons: C28-C34+	ND	50		mg/Kg	1	11/22/00
Surr: DNOP	112	74-125		%REC	1	11/22/00

Lab ID: 0011099-04A **Collection Date:** 11/17/00 11:00:00 AM
Client Sample ID: CYN94H-GR-005-DU **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015		Analyst: JT		
T/R Hydrocarbons: C10-C28	72	5.0		mg/Kg	1	11/22/00
T/R Hydrocarbons: C28-C34+	ND	50		mg/Kg	1	11/22/00
Surr: DNOP	98.0	74-125		%REC	1	11/22/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Hall Environmental Analysis Laboratory

Date: 28-Nov-00

CLIENT: Sandia National Laboratories
Project: Site 94H Burns site

Lab Order: 0011099

Lab ID: 0011099-05A
Client Sample ID: CYN94H-GR-004-SS

Collection Date: 11/17/00 10:50:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015				Analyst: JT
T/R Hydrocarbons: C10-C28	33	5.0		mg/Kg	1	11/22/00
T/R Hydrocarbons: C28-C34+	ND	50		mg/Kg	1	11/22/00
Surr: DNOP	85.0	74-125		%REC	1	11/22/00

Lab ID: 0011099-06A
Client Sample ID: CYN94H-GR-005-SS

Collection Date: 11/17/00 11:00:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015				Analyst: JT
T/R Hydrocarbons: C10-C28	82	5.0		mg/Kg	1	11/22/00
T/R Hydrocarbons: C28-C34+	ND	50		mg/Kg	1	11/22/00
Surr: DNOP	74.0	74-125		%REC	1	11/22/00

Lab ID: 0011099-07A
Client Sample ID: CYN94H-GR-006-SS

Collection Date: 11/17/00 11:03:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015				Analyst: JT
T/R Hydrocarbons: C10-C28	4800	50		mg/Kg	10	11/27/00
T/R Hydrocarbons: C28-C34+	ND	500		mg/Kg	10	11/27/00
Surr: DNOP	91.0	74-125		%REC	10	11/27/00

Lab ID: 0011099-08A
Client Sample ID: CYN94H-GR-007-SS

Collection Date: 11/17/00 11:05:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015				Analyst: JT
T/R Hydrocarbons: C10-C28	1700	25		mg/Kg	5	11/27/00
T/R Hydrocarbons: C28-C34+	ND	250		mg/Kg	5	11/27/00
Surr: DNOP	107	74-125		%REC	5	11/27/00

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 28-Nov-00

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0011099

Lab ID: 0011099-09A

Collection Date: 11/17/00 11:09:00 AM

Client Sample ID: CYN94H-GR-008-SS

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015				Analyst: JT
T/R Hydrocarbons: C10-C28	8800	100		mg/Kg	20	11/27/00
T/R Hydrocarbons: C28-C34+	ND	1000		mg/Kg	20	11/27/00
Surr: DNOP	98.0	74-125		%REC	20	11/27/00

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
*- Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Date: 28-Nov-00

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT Method Blank

CLIENT: Sandia National Laboratories

Work Order: 0011099

Project: Site 94H Burnsite

Sample ID: MB-86	Batch ID: 86	Test Code: SW8015	Units: mg/Kg	Analysis Date: 11/22/00	Prep Date: 11/21/00						
Client ID:	Run ID: FIDHP_001132A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte	Result										
T/R Hydrocarbons: C10-C28	ND	5.0									S
T/R Hydrocarbons: C28-C34+	ND	50									
Sum: DNOP	70	0	100	0	70.0	74	125	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory

Date: 28-Nov-00

CLIENT: Sandia National Laboratories
 Work Order: 0011099
 Project: Site 94E Burnsite

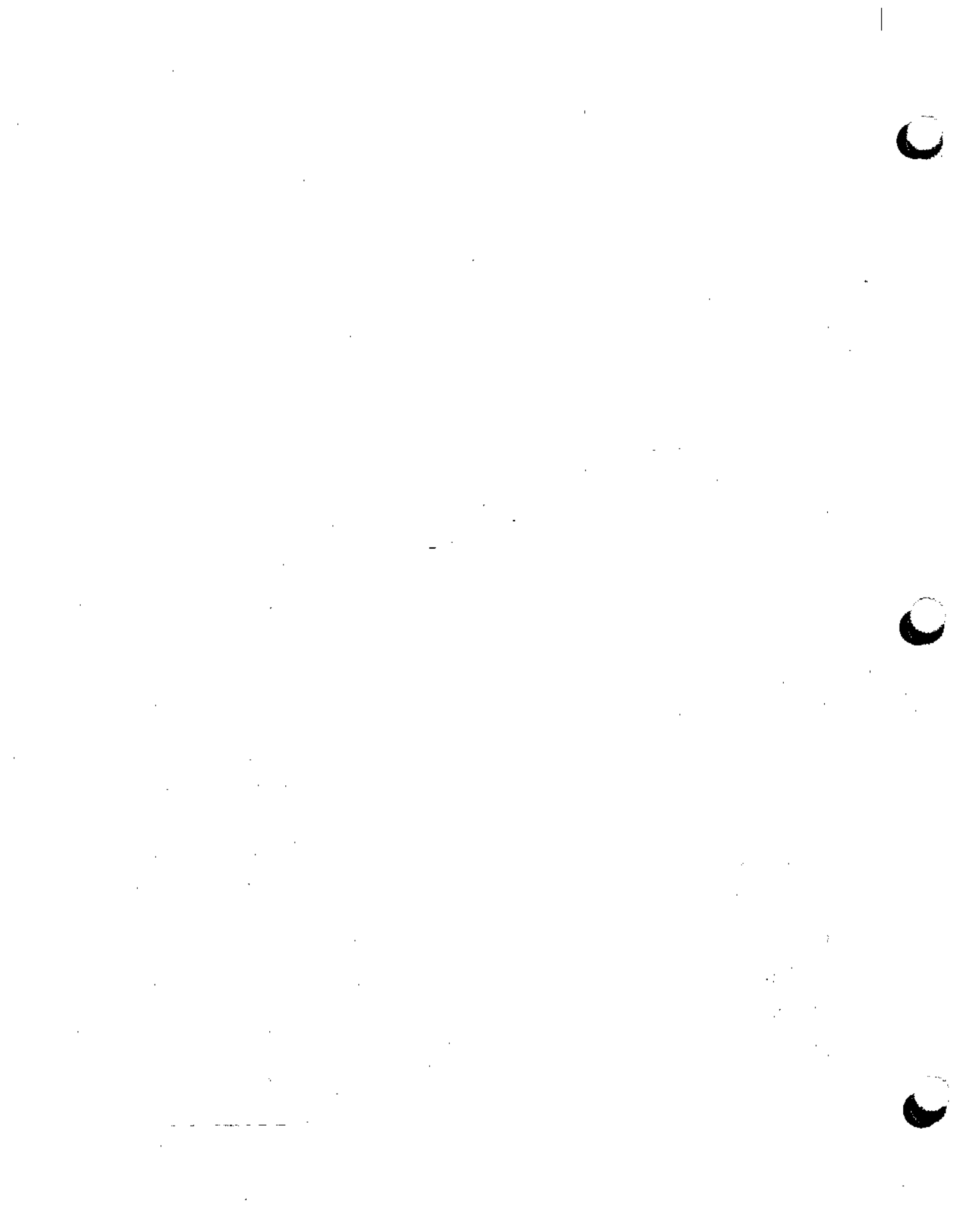
QC SUMMARY REPORT
 Sample Matrix Spike

Sample ID: 0011092-02AM6	Batch ID: 86	Test Code: SW8015	Units: mg/Kg	Analyte Date: 11/22/00	Prep Date: 11/21/00					
Client ID:	Run ID: FIDHP_001122A	SeqNo: 3482								
Analyte	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
T/R Hydrocarbons: C10-C28	50	5.0	0	100	78	121	0			
Sample ID: 0011092-02AMSD	Batch ID: 86	Test Code: SW8015	Units: mg/Kg	Analyte Date: 11/22/00	Prep Date: 11/21/00					
Client ID:	Run ID: FIDHP_001122A	SeqNo: 3483								
Analyte	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
T/R Hydrocarbons: C10-C28	44	5.0	0	98.0	75	121	50	12.8	15	

Qualifiers: ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab		Batch No. 6134/MS1088		Date Sample Shipped: _____		SARWR No. _____		Waste Characterization		ARICOC		603886	
Project/Task Manager: Thacker		Site 94H Burnsite		Lab Contact: Scott Hallenbeck		SMO Authorization: _____		-RCRA DATE = 7/14/02.03.01		-Send preliminary/copy report to: _____		Released by COC No.: _____	
Record Center Code: 1333 #3		SMO Contact/Phone: D Salmi 844-3110		Hall: _____		Tech Area: N/A		Room: N/A		Parameter & Method Requested		Lab Sample ID	
Service Order No. CPO 005		Send Report to SMO: S. Jensen 84403184		SMO Contact/Phone: D Salmi 844-3110		Building: N/A		Room: N/A		DRO (modified 8015) 001099-1		-2	
Reference LOV (available at SMO)													
Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Volume	Preserve Alt@4C	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID	
054395-001	CYN94H-GR-001-SS	0	94H	111700 1040	S	G	4oz	None	GR	SA	DRO (modified 8015)	001099-1	
054396-001	CYN94H-GR-002-SS	0	94H	111700 1043	S	G	4oz	None	GR	SA	DRO (modified 8015)		-2
054397-001	CYN94H-GR-003-SS	0	94H	111700 1045	S	G	4oz	None	GR	SA	DRO (modified 8015)		-3
054398-001	CYN94H-GR-005-DU	0	94H	111700 1100	S	G	4oz	None	GR	DU	DRO (modified 8015)		-4
054399-001	CYN94H-GR-004-SS	0	94H	111700 1050	S	G	4oz	None	GR	SA	DRO (modified 8015)		-5
054400-001	CYN94H-GR-005-SS	0	94H	111700 1100	S	G	4oz	None	GR	SA	DRO (modified 8015)		-6
054401-001	CYN94H-GR-006-SS	0	94H	111700 1103	S	G	4oz	None	GR	SA	DRO (modified 8015)		-7
054402-001	CYN94H-GR-007-SS	0	94H	111700 1105	S	G	4oz	None	GR	SA	DRO (modified 8015)		-8
054403-001	CYN94H-GR-008-SS	0	94H	111700 1109	S	G	4oz	None	GR	SA	DRO (modified 8015)		-9
RMMA		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Ref. No. _____		Sample Tracking SMO Use		Special Instructions/QC Requirements:		Abnormal Conditions on Receipt			
Sample Disposal		<input type="checkbox"/> Return to Client		<input checked="" type="checkbox"/> Disposal by lab		Date Entered (mm/dd/yy) _____		EDD <input type="checkbox"/> Yes <input type="checkbox"/> No		Raw Data Package <input type="checkbox"/> Yes <input type="checkbox"/> No			
Turnaround Time		<input type="checkbox"/> 7 Day <input type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day		Negotiated		Required Report Date		*Send results to: M Thacker at 284-2617		Standard turn			
Sample Team Members		Name: M Sanchez		Signature: <i>M Sanchez</i>		Init: _____		Company/Organization/Phone/Cellular: Weston/613/845-3267		Date: _____			
1. Relinquished by <i>Morgan Sanchez</i>		Date: 11/20		Time: 1440		4. Relinquished by _____		Date: _____		Time: _____			
1. Received by _____		Date: 11/20		Time: 1440		5. Relinquished by _____		Date: _____		Time: _____			
2. Relinquished by _____		Date: _____		Time: _____		5. Received by _____		Date: _____		Time: _____			
3. Received by _____		Date: _____		Time: _____		6. Relinquished by _____		Date: _____		Time: _____			
3. Relinquished by _____		Date: _____		Time: _____		6. Received by _____		Date: _____		Time: _____			





**Hall Environmental
Analysis Laboratory**

December 20, 2000

Mark Thacker
Sandia National Laboratories
P O Box 5800
MS 0221
Albuquerque, NM 871850221
TEL: (505) 845-8607
FAX (505) 284-2617

RE: Site 94H Burnsite

Order No.: 0012076

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 5 samples on 12/11/00 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Detection limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Hall Environmental Analysis Laboratory

Date: 20-Dec-00

CLIENT: Sandia National Laboratories Lab Order: 0012076
 Project: Site 94H Burnsite

Lab ID: 0012076-01 Collection Date: 12/11/00 8:45:00 AM
 Client Sample ID: CYN94H-GR-001-SP Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TPH BY 418.1 Petroleum Hydrocarbons, TR	700	E418.1 20		mg/Kg	1	12/11/00

Analyst: JT

Lab ID: 0012076-02 Collection Date: 12/11/00 9:00:00 AM
 Client Sample ID: CYN94H-GR-002-SP Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TPH BY 418.1 Petroleum Hydrocarbons, TR	570	E418.1 20		mg/Kg	1	12/11/00

Analyst: JT

Lab ID: 0012076-03 Collection Date: 12/11/00 9:10:00 AM
 Client Sample ID: CYN94H-GR-003-SP Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TPH BY 418.1 Petroleum Hydrocarbons, TR	160	E418.1 20		mg/Kg	1	12/11/00

Analyst: JT

Lab ID: 0012076-04 Collection Date: 12/11/00 9:16:00 AM
 Client Sample ID: CYN94H-GR-004-SP Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TPH BY 418.1 Petroleum Hydrocarbons, TR	590	E418.1 20		mg/Kg	1	12/11/00

Analyst: JT

Lab ID: 0012076-05 Collection Date: 12/11/00 9:19:00 AM
 Client Sample ID: CYN94H-GR-005-SP Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TPH BY 418.1 Petroleum Hydrocarbons, TR	350	E418.1 20		mg/Kg	1	12/11/00

Analyst: JT

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

CONTRACTORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab Batch No. SARWR No. AR/COC 603918

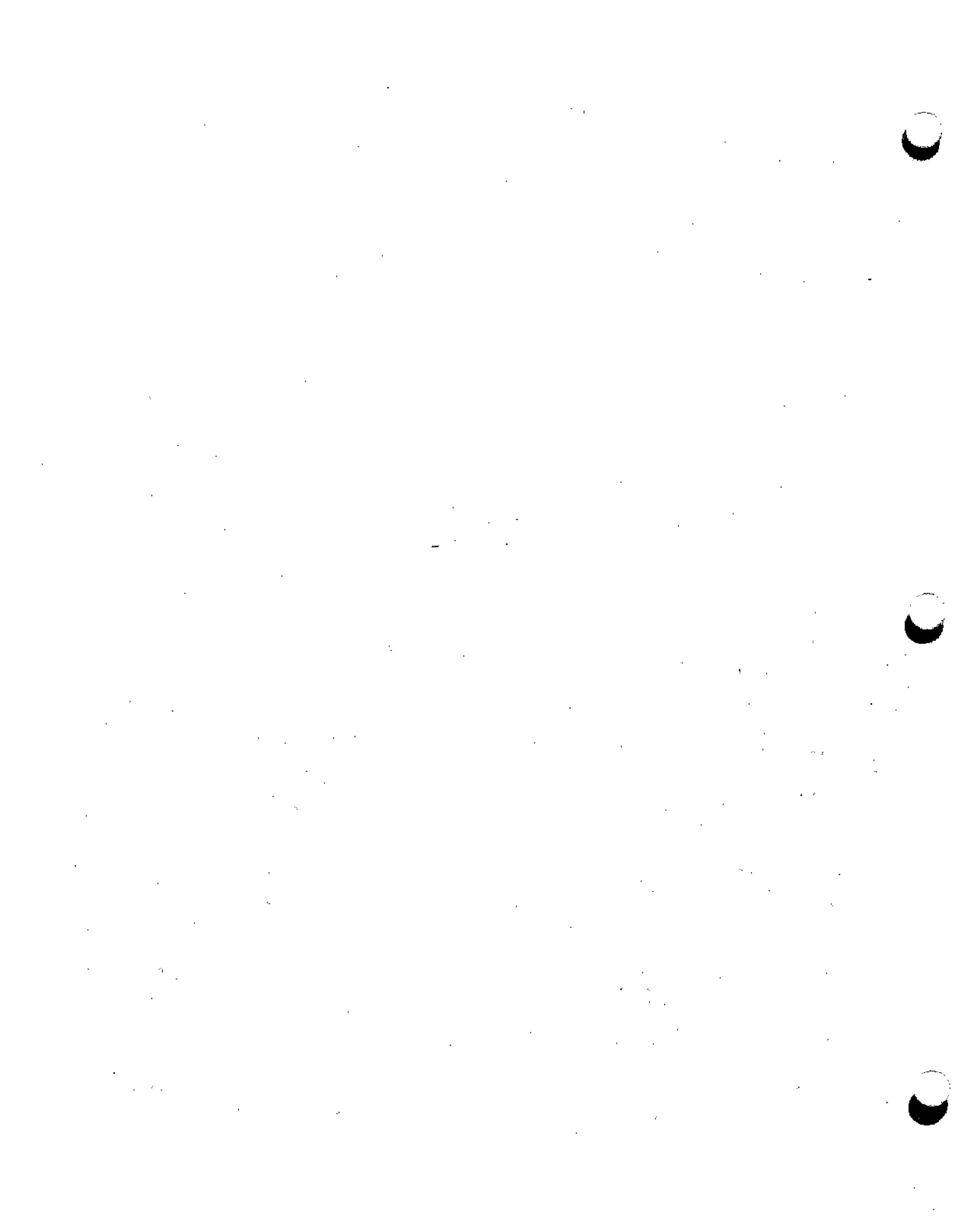
Header information including Dept. No., Project Manager, Project Name, Record Center Code, Logbook Ref. No., Service Order No., and various authorization checkboxes.

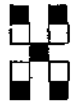
Main data table with columns for Sample No., Fraction, Building, Room, ER Sample ID, Location Detail, Beginning Depth, ER Site No., Date Collected, Sample Matrix, Container Type, Volume, Preserve Method, Sample Type, Parameter Requested, and Lab Sample ID.

Special Instructions/QC Requirements section, including checkboxes for EDO, Raw Data Package, and instructions for report preparation.

Chain of Custody table with columns for Relinquished/Received by, Date, and Time, containing multiple rows of signatures and dates.

*7 & 16 Day Turnaround Time: ERCL requires prior notification.





**Hall Environmental
Analysis Laboratory**

COVER LETTER

July 05, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burnsites

Order No.: 0106114

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 6 samples on 6/18/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0106114

Lab ID: 0106114-01
Client Sample ID: CY94H-BH8-5.5

Collection Date: 6/18/01 1:35:00 PM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	97.0	60-124		%REC	1	6/29/01

Lab ID: 0106114-02
Client Sample ID: CY94H-BH8-15

Collection Date: 6/18/01 1:31:00 PM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	77	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	97.0	60-124		%REC	1	6/29/01

Lab ID: 0106114-03
Client Sample ID: CY94H-BH9-5

Collection Date: 6/18/01 11:11:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	13000	250		mg/Kg	50	7/3/01
Motor Oil Range Organics (MRO)	ND	2500		mg/Kg	50	7/3/01
Surr: DNOP	101	60-124		%REC	1	6/29/01

Lab ID: 0106114-04
Client Sample ID: CY94H-BH9-16

Collection Date: 6/18/01 11:16:00 AM
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	95.0	60-124		%REC	1	6/29/01

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0106114

Lab ID: 0106114-05

Collection Date: 6/18/01 10:05:00 AM

Client Sample ID: CY94H-BH10-10

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	86.0	60-124		%REC	1	6/29/01

Lab ID: 0106114-06

Collection Date: 6/18/01 10:10:00 AM

Client Sample ID: CY94H-BH10-14

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	97.0	60-124		%REC	1	6/29/01

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

QC SUMMARY REPORT Method Blank

CLIENT: Sandia National Laboratories
 Work Order: 0106114
 Project: Site 94H Burnsite

Sample ID: MB-642 Batch ID: 642 Test Code: SW8015 Units: mg/Kg Analysis Date: 6/29/01 Prep Date: 6/25/01
 Client ID: Run ID: FIDHP_010629A SeqNo: 32932

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0									
Motor Oil Range Organics (MRO)	ND	50									
Surr: DNCP	95	0	100	0	95.0	60	124	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory

Date: 05-Jul-07

CLIENT: Sandia National Laboratories
 Work Order: 0106114
 Project: Site 94H Burnsite

QC SUMMARY REPORT
 Laboratory Control Spike - generic

Sample ID: LCS-642 Batch ID: 642 Test Code: SW6015 Units: mg/Kg Prep Date: 6/25/07
 Client ID: Run ID: FIDHP_010628A SeqNo: 32933 Analyze Date: 6/29/04
 Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
 Diesel Range Organics (DRO) 41 5.0 50 0 82.0 67.4 117 0

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 05-Jul-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Sample Matrix Spike

CLIENT: Sandia National Laboratories
Work Order: 0106114
Project: Site 94H Burnsite

Sample ID: 0106122-04AMS	Batch ID: 642	Test Code: SW8015	Units: mg/Kg	Analysis Date: 6/30/01	Prep Date: 6/25/01						
Client ID:		Run ID: FIDHP_010629A		SeqNo: 32955							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	5.0	60	0	82.0	87.4	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

CONTRACT LABORATORY CHAIN OF CUSTODY

Internal Lab

SARWR No. **604616** AR/COC

Batch No. 61321087

Dept. No./Mail Stop: Freshour/Thacker

Project/Task Manager: 94H Burnette

Project Name: S Hallenback 945-3975

Record Center Code: Lab Contact: 94H Burnette

Logbook Ref. No.: Lab Destination: Hall

Service Order No.: SMO Contract/Phone: D Salmt 844-3110

Sand Report to SMO: S Jansen 844-3184

Contract No. 94H Burnette

Project/Task No. SMO Authorization:

Waste Characterization: RCRA Dates: Send Preliminary report to: Validation Required: Released by COC No.:

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800, MS-0154
Albuquerque, NM., 87185-0154

Location		Tech Area		Reference LOV (available at SMO)										Lab Sample ID	
Building	NA	Room	NA	Beginning Depth (ft)	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Volume	Preserve All @ 4C	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID	
056194-003		CY94H-BH8-5.6		5.5	94H	061801 1335	S	G	4oz	None	G	SA	DRO(8015)modified	056194	
056195-003		CY94H-BH8-15		15	94H	061801 1331	S	G	4oz	None	G	SA	DRO(8015)modified		
056196-003		CY94H-BH9-5		5	94H	061801 1111	S	G	4oz	None	G	SA	DRO(8015)modified		
056197-003		CY94H-BH9-16 PK		16	94H	061801 1115	S	G	4oz	None	G	SA	DRO(8015)modified		
056198-003		CY94H-BH10-10		10	94H	061801 1005	S	G	4oz	None	G	SA	DRO(8015)modified		
056199-003		CY94H-BH10-14		14	94H	061801 1010	S	G	4oz	None	G	SA	DRO(8015)modified		

RMMA Yes No Ref. No. _____

Sample Disposal Return to Client Disposal by lab

Turnaround Time 7 Day 15 Day 30 Day

Return Samples By: Negotiated TAT

Name: M Sanchez Signature: *M Sanchez* Company/Organization/Phone/Cellular: Weston/51357845-3267

Special Instructions/OC Requirements:
 EDD Yes No
 Raw Data Package Yes No

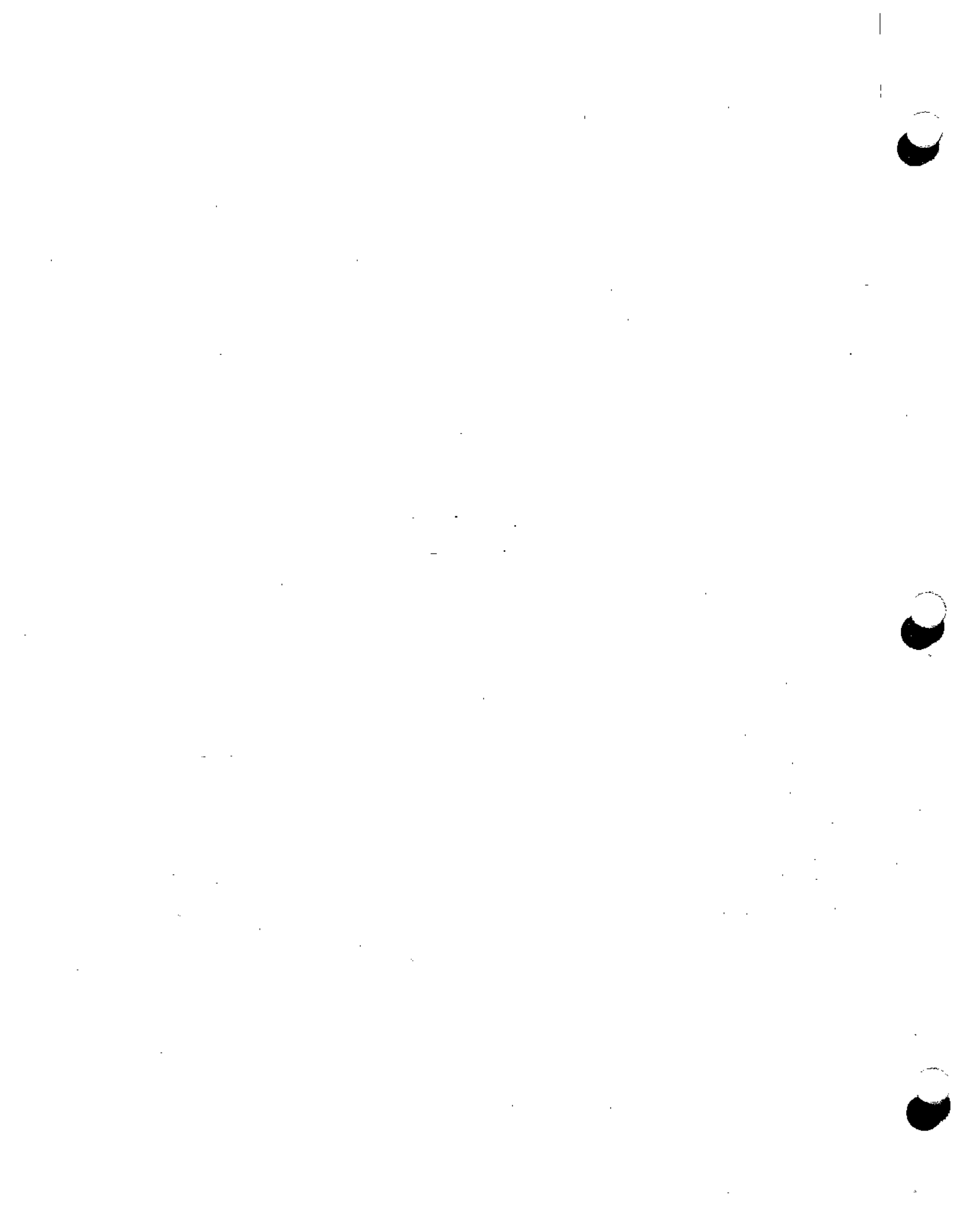
*Please send report to:
 M Thacker MS1088 Ph284-2576 Fax284-2517
 mssthack@sandia.gov

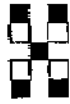
Please list as separate report:

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
1. Received by	Org.	Date	Time	4. Received by	Org.	Date	Time
2. Relinquished by	Org.	Date	Time	5. Relinquished by	Org.	Date	Time
2. Received by	Org.	Date	Time	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

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

18°C via telephone change BH9-15 IED to BH8-16
 Rev Margaret Sanchez through David Grady





**Hall Environmental
Analysis Laboratory**

COVER LETTER

July 05, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burnsite

Order No.: 0106122

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 12 samples on 6/19/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0106122

Lab ID: 0106122-01

Collection Date: 6/19/01 12:42:00 PM

Client Sample ID: CY94H-BH3-6

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	82.0	60-124		%REC	1	6/29/01

Lab ID: 0106122-02

Collection Date: 6/19/01 10:24:00 AM

Client Sample ID: CY94H-BH5-3

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	95.0	60-124		%REC	1	6/29/01

Lab ID: 0106122-03

Collection Date: 6/19/01 10:17:00 AM

Client Sample ID: CY94H-BH5-9.5

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	85.0	60-124		%REC	1	6/29/01

Lab ID: 0106122-04

Collection Date: 6/19/01 10:24:00 AM

Client Sample ID: CY94H-BH5-3 DU

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	86.0	60-124		%REC	1	6/29/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

CLIENT: Sandia National Laboratories
 Project: Site 94H Burnsitz

Lab Order: 0106122

Lab ID: 0106122-05

Collection Date: 6/19/01 9:23:00 AM

Client Sample ID: CY94H-BH6-3

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	71.0	60-124		%REC	1	6/29/01

Lab ID: 0106122-06

Collection Date: 6/19/01 9:17:00 AM

Client Sample ID: CY94H-BH6-10

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	63.0	60-124		%REC	1	6/29/01

Lab ID: 0106122-07

Collection Date: 6/19/01 8:53:00 AM

Client Sample ID: CY94H-BH7-3.5

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	12	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	76.0	60-124		%REC	1	6/29/01

Lab ID: 0106122-08

Collection Date: 6/19/01 8:57:00 AM

Client Sample ID: CY94H-BH7-14

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	71.0	60-124		%REC	1	6/29/01

Qualifiers: ND - Not Detected at the Reporting Limit
 I - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0106122

Lab ID: 0106122-09

Collection Date: 6/19/01 1:02:00 PM

Client Sample ID: CY94H-BH11-3

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	7.2	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	86.0	60-124		%REC	1	6/29/01

Lab ID: 0106122-10

Collection Date: 6/19/01 1:09:00 PM

Client Sample ID: CY94H-BH11-7

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	77.0	60-124		%REC	1	6/29/01

Lab ID: 0106122-11

Collection Date: 6/19/01 1:11:00 PM

Client Sample ID: CY94H-BH11-14

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	85.0	60-124		%REC	1	6/29/01

Lab ID: 0106122-12

Collection Date: 6/19/01 1:24:00 PM

Client Sample ID: CY94H-BH12-3

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/29/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/29/01
Surr: DNOP	95.0	60-124		%REC	1	6/29/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

QC SUMMARY REPORT
Method Blank

CLIENT: Sandia National Laboratories
 Work Order: 0106122
 Project: Site 94H Burnsite

Sample ID: MB-642 Batch ID: 642 Test Code: SW8015 Units: mg/Kg Analysis Date: 6/29/01 Prep Date: 6/25/01
 Client ID: Run ID: FIDHP_010629A SeqNo: 32932
 Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0									
Motor Oil Range Organics (MRO)	ND	50									
Surr: DNOP	95	0	100	0	95.0	.60	124	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 05-Jul-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Laboratory Control Spike - generic

CLIENT: Sandia National Laboratories
Work Order: 0106122
Project: Site 94H Burnsite

Sample ID: LCS-642 Batch ID: 642 Test Code: SW8015 Units: mg/Kg Analysis Date: 6/29/01 Prep Date: 6/25/01
Client ID: Run ID: FIDHP_010629A SeqNo: 32933
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Diesel Range Organics (DRO) 41 5.0 50 0 82.0 67.4 117 0

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 05-Jul-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Sample Matrix Spike

CLIENT: Sandia National Laboratories
Work Order: 0106122
Project: Site 94H Burnsite

Sample ID: 0106122-04AMS	Batch ID: 642	Test Code: SW8015	Units: mg/Kg	Analysis Date: 6/30/01	Prep Date: 6/25/01						
Client ID: CY94H-BH5-3 DU		Ruin ID: FIDHR_010829A		SeqNo: 32955							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	5.0	50	0	82.0	67.4	117	0			

Qualifiers	ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits	B - Analyte detected in the associated Method Blank
	J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits	

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. 6132/1087

Dept. No./Mail Stop: Freshour/Thacker

Project/Task Manager: 94H Burnette

Project Name: 94H Burnette

Request Center Code: 94H Burnette

Logbook Ref. No.: 94H Burnette

Service Order No. 94H Burnette

SARWR No. 94H Burnette

Contract No. 94H Burnette

Project/Task No. 94H Burnette

SMO Authorization: 94H Burnette

Lab Contact: S Hallenback 945-3975

Lab Destination: Hill

SMO Contact/Phone: D Salimi 844-3110

Send Report to SMO: S Jensen 844-3184

Waste Characterization

RCRA Date: 94H Burnette

Send Preliminary Report to: 94H Burnette

Validation Required: 94H Burnette

Released by COG No.: 94H Burnette

Bill To: Sandia National Labs (Accounts Payable)

P.O. Box 5600, MS-0164

Albuquerque, NM., 87185-0164

Reference LOV (available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container		Preserve All@4C	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
056183-003	CY94H-BH3-6	6	94H	061901 1242	S	G	4oz	None	G	SA	DRO(8015)modified	01010122
056187-003	CY94H-BH5-3	3	94H	061901 1024	S	G	4oz	None	G	SA	DRO(8015)modified	
056188-003	CY94H-BH5-9.5	9.5	94H	061901 1017	S	G	4oz	None	G	SA	DRO(8015)modified	
056189-003	CY94H-BH5-3 DU	3	94H	061901 1024	S	G	4oz	None	G	DU	DRO(8015)modified	
056180-003	CY94H-BH6-3	3	94H	061901 0923	S	G	4oz	None	G	SA	DRO(8015)modified	
056191-003	CY94H-BH6-10	10	94H	061901 0917	S	G	4oz	None	G	SA	DRO(8015)modified	
056182-003	CY94H-BH7-3.5	3.5	94H	061901 0853	S	G	4oz	None	G	SA	DRO(8015)modified	
056193-003	CY94H-BH7-14	14	94H	061901 0857	S	G	4oz	None	G	SA	DRO(8015)modified	
056210-003	CY94H-BH11-3	3	94H	061901 1302	S	G	4oz	None	G	SA	DRO(8015)modified	
056211-003	CY94H-BH11-7	7	94H	061901 1303	S	G	4oz	None	G	SA	DRO(8015)modified	

RMMA Yes No Ref. No. 94H Burnette

Sample Disposal Return to Client Disposal by lab

Turnaround Time 7 Day 15 Day 30 Day

Return Samples By: Negotiated TAT

Name: M Sanchez Signature: M Sanchez

Company/Organization/Phone/Cellular: Wastor/6135/845-3267

Special Instructions/QC Requirements: 94H Burnette

EDD Yes No

Raw Data Package Yes No

Please send report to: M Thacker MS1088 Ph284-2575 Fax284-2617

94H Burnette

Chain of Custody

1. Relinquished by M Sanchez Org. 94H Burnette Date 06/19/01 Time 15:25

1. Received by S Jensen Org. 94H Burnette Date 6/19/01 Time 3:15

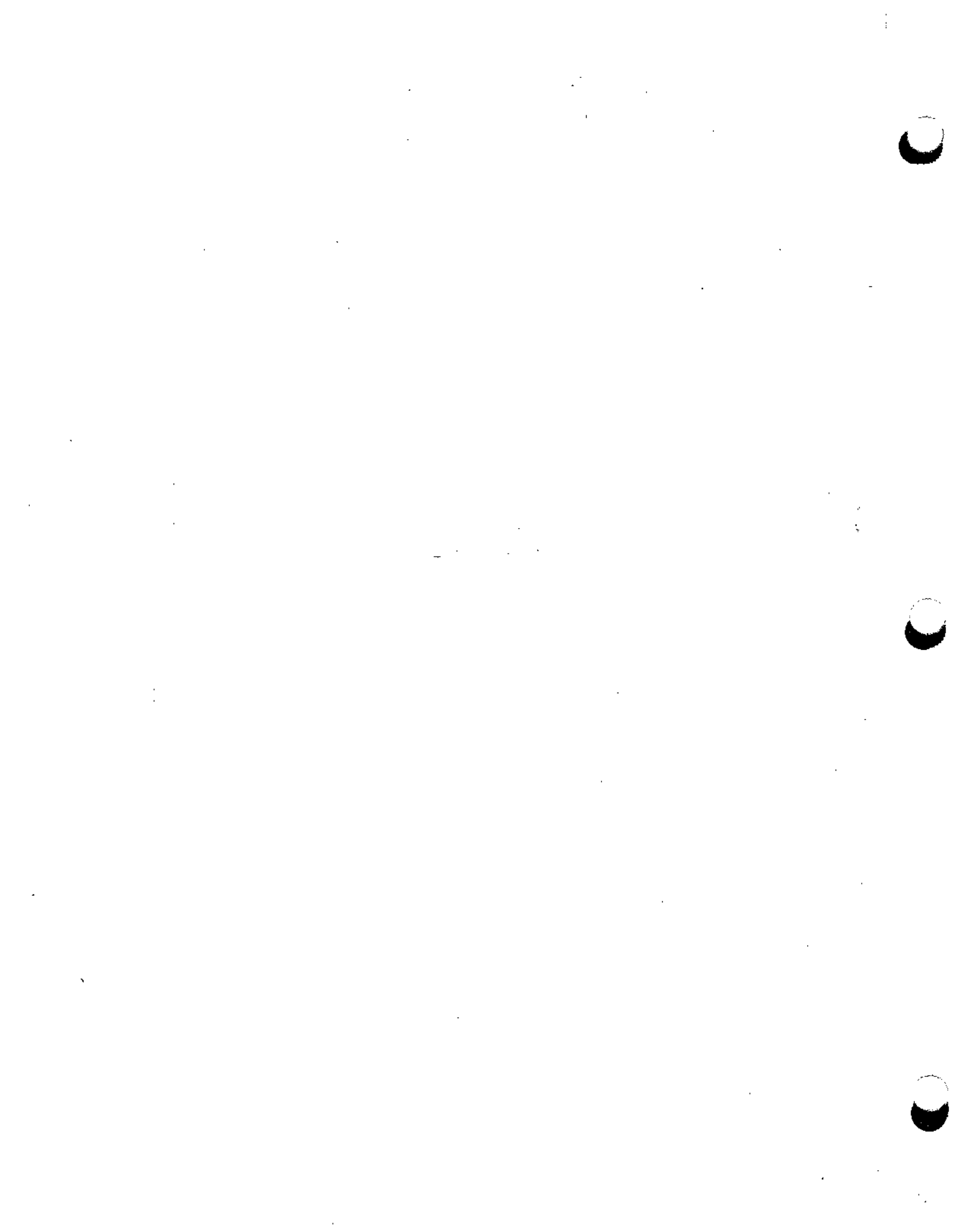
2. Relinquished by S Jensen Org. 94H Burnette Date 6/19/01 Time 3:15

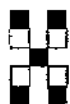
2. Received by S Jensen Org. 94H Burnette Date 6/19/01 Time 3:15

3. Relinquished by S Jensen Org. 94H Burnette Date 6/19/01 Time 3:15

3. Received by S Jensen Org. 94H Burnette Date 6/19/01 Time 3:15

*7 & 15 Day Turnaround Time: ERCL requires prior notification.





**Hall Environmental
Analysis Laboratory**

COVER LETTER

July 05, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burnsite

Order No.: 0106147

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 16 samples on 6/21/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0106147

Lab ID: 0106147-01

Collection Date: 6/20/01 9:40:00 AM

Client Sample ID: CY94H-BH1-2-5

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	500	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	84.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-02

Collection Date: 6/20/01 10:03:00 AM

Client Sample ID: CY94H-BH1-6-7

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	87.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-03

Collection Date: 6/20/01 9:56:00 AM

Client Sample ID: CY94H-BH1-12.5

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	77.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-04

Collection Date: 6/20/01 8:52:00 AM

Client Sample ID: CY94H-BH2-8

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	77.0	60-124		%REC	1	6/30/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0106147

Lab ID: 0106147-05

Collection Date: 6/20/01 8:50:00 AM

Client Sample ID: CY94H-BH2-11

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015			Analyst: GT	
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	69.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-06

Collection Date: 6/20/01 1:09:00 PM

Client Sample ID: CY94H-BH13-3

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015			Analyst: GT	
Diesel Range Organics (DRO)	190	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	85.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-07

Collection Date: 6/20/01 1:09:00 PM

Client Sample ID: CY94H-BH13-7

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015			Analyst: GT	
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	77.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-08

Collection Date: 6/20/01 1:09:00 PM

Client Sample ID: CY94H-BH13-3 DU

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015			Analyst: GT	
Diesel Range Organics (DRO)	100	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	82.0	60-124		%REC	1	6/30/01

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0106147

Lab ID: 0106147-09

Collection Date: 6/20/01 1:26:00 PM

Client Sample ID: CY94H-BH14-9

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Sum: DNOP	77.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-10

Collection Date: 6/20/01 10:53:00 AM

Client Sample ID: CY94H-BH15-4

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Sum: DNOP	65.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-11

Collection Date: 6/20/01 10:57:00 AM

Client Sample ID: CY94H-BH15-9

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Sum: DNOP	61.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-12

Collection Date: 6/20/01 11:22:00 AM

Client Sample ID: CY94H-BH16-4

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Sum: DNOP	75.0	60-124		%REC	1	6/30/01

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 05-Jul-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0106147

Lab ID: 0106147-13

Collection Date: 6/20/01 9:30:00 AM

Client Sample ID: CY94H-BH17-7

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	69.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-14

Collection Date: 6/20/01 10:00:00 AM

Client Sample ID: CY94H-BH18-2

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	360	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	67.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-15

Collection Date: 6/20/01 10:30:00 AM

Client Sample ID: CY94H-BH19-3

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	65	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	60.0	60-124		%REC	1	6/30/01

Lab ID: 0106147-16

Collection Date: 6/20/01 10:30:00 AM

Client Sample ID: CY94H-BH19-7

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	6/30/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/30/01
Surr: DNOP	60.0	60-124		%REC	1	6/30/01

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Date: 05-Jul-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Method Blank

CLIENT: Sandia National Laboratories
Work Order: 0106147
Project: Site 94H Burnsite

Sample ID: MB-848 Batch ID: 848 Test Code: SW8815 Units: mg/Kg Analysis Date: 6/30/01 Prep Date: 6/28/01
Client ID: Run ID: FIDHP_010629A SeqNo: 32957
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0									
Motor Oil Range Organics (MRO)	ND	50									
Surr: DNOP	85	0	100	0	85.0	60	124	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 05-Jul-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Sample Duplicate

CLIENT: Sandia National Laboratories
Work Order: 0106147
Project: Site 94H Burnsile

Sample ID: 0106132-04ADup	Batch ID: 646	Test Code: SW8015	Units: mg/Kg	Analysis Date: 6/30/01	Prep Date: 6/26/01						
Client ID:		Run ID: FIDHP_010629A		SeqNo: 32979							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0	0	0	0	0	0	0	0	0	20
Motor Oil Range Organics (MRO)	ND	50	0	0	0	0	0	0	0	0	20

Sample ID: 0106147-13ADup	Batch ID: 646	Test Code: SW8015	Units: mg/Kg	Analysis Date: 7/1/01	Prep Date: 6/28/01						
Client ID: CY94H-BH17-7		Run ID: FIDHP_010629A		SeqNo: 33001							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0	0	0	0	0	0	0	0	0	20
Motor Oil Range Organics (MRO)	ND	50	0	0	0	0	0	0	0	0	20

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory

Date: 05-24-01

CLIENT: Sandia National Laboratories
 Work Order: 0106147
 Project: Site 94H Burnsite

QC SUMMARY REPORT
 Laboratory Control Spike - generic

Sample ID:	LCS-848	Batch ID:	646	Test Code:	SW8015	Units:	mg/Kg	Analysis Date:	6/30/01	Prep Date:	6/26/01					
Client ID:		Run ID:	FIDHP_010629A	SeqNo:	32858											
Analyte	Result	PQL	5.0	SPK value	50	SPK Ref Val	0	%REC	100	HighLimit	67.4	RPD Ref Val	117	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	5.0	50	0	100	67.4	117	0								
Sample ID:	LCS-848	Batch ID:	648	Test Code:	SW8015	Units:	mg/Kg	Analysis Date:	6/30/01	Prep Date:	6/26/01					
Client ID:		Run ID:	FIDHP_010629A	SeqNo:	32880											
Analyte	Result	PQL	5.0	SPK value	50	SPK Ref Val	0	%REC	78.0	HighLimit	67.4	RPD Ref Val	117	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	5.0	50	0	78.0	67.4	117	0								

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

CONTRACT LABORATORY ANALYSIS REQUEST CHAIN OF CUSTODY

Internal Lab

SAR/WR No. 604614 AR/COC											
Dept. No./Mail Stop: 6132/1087 Project/Task Manager: Freshour/Thacker Project Name: 94H Burnsile Record Center Code: Logbook Ref. No.: Service Order No.	Contract No.: Project/Task No.: 94H Burnsile SMO Authorization: SMO Contact/Phone: H-ell D. Salmi 944-3110 Send Report to SMO: S. Jensen 944-3184										
Waste Characterization -RCRA Date: Send Preliminary Report to: Validation Required: Released by COC No.:	Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800, MS-0154 Albuquerque, NM, 87185-0154										
Reference LOV (available at SMO)											
Sample No.-Fraction	ER Sample ID, or Sample Location Detail	Beginning Depth (ft)	ER Sile No.	Date/Time Collected	Sample Matrix	Container Type Volume	Preserve All @ 4C	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
056178-003	CY94H-BH1-2-5	2-5	94H	062001 0940	S	G 4oz	None	G	6A	DRO(8015)modified	0106147
056179-003	CY94H-BH1-6-7	6-7	94H	062001 1003	S	G 4oz	None	G	SA	DRO(8015)modified	
056180-003	CY94H-BH1-12.5	12.5	94H	062001 0958	S	G 4oz	None	G	SA	DRO(8015)modified	
056181-003	CY94H-BH2-8	8	94H	062001 0852	S	G 4oz	None	G	SA	DRO(8015)modified	
056182-003	CY94H-BH2-11	11	94H	062001 0850	S	G 4oz	None	G	SA	DRO(8015)modified	
Special Instructions/QC Requirements: EDD <input type="checkbox"/> Yes <input type="checkbox"/> No Raw Data Package <input type="checkbox"/> Yes <input type="checkbox"/> No *Please send report to: M Thacker MS1089 Ph:284-2575 Fax:284-2617 ms/thack@sandia.gov											
Return Samples BY: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Ref. No. <input type="checkbox"/> Disposal by lab <input type="checkbox"/> Return to Client <input type="checkbox"/> 7 Day <input type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day <input type="checkbox"/> Negotiated TAT											
Sample Team Members: M Sanchez G Quintana W Gibson											
1. Relinquished by: <i>Harriet Sanchez</i> Org: <i>MS-0154</i> Date: <i>06/20/01</i> Time: <i>1335</i> 1. Received by: <i>Chad Jones</i> Org: <i>MS-0154</i> Date: <i>06/20/01</i> Time: <i>1335</i> 2. Relinquished by: 2. Received by: 3. Relinquished by: 3. Received by:											

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

SARWR No.

Batch No. 61321087 Contract No. 60461920
 Dept. No./Mail Stop: Freshour/Thacker Project/Task No.: 94H Burnsite
 Project/Task Manager: 94H Burnsite SMO Authorization: AR/COG
 Project Name: 94H Burnsite SMO Authorization: AR/COG
 Record Center Code: 94H Burnsite SMO Authorization: AR/COG
 Logbook Ref. No.: 94H Burnsite SMO Authorization: AR/COG
 Service Order No. 94H Burnsite SMO Authorization: AR/COG

Location		Tech Area		Reference LOV (available at SMO)		Preserve Collection		Sample		Container		Sample		Lab Sample	
Building	NA	Room	NA	Beginning Depth (ft)	ER Site No.	Date Collected	Time Collected	Matrix	Type	Volume	Method	Method	Type	Parameter & Method Requested	Lab Sample ID
056214-003		CY94H-BH13-3		3	94H	062001 1309	062001 1309	S	G	4oz	None	G	SA	DRO(8015)modified	0109 M7
056215-003		CY84H-BH13-7		7	94H	062001 1309	062001 1309	S	G	4oz	None	G	SA	DRO(8015)modified	
056216-003		CY94H-BH13-3	DU	3	94H	062001 1309	062001 1309	S	G	4oz	None	G	DU	DRO(8015)modified	
056217-003		CY94H-BH14-9		B	94H	062001 1326	062001 1326	S	G	4oz	None	G	SA	DRO(8015)modified	
056219-003		CY94H-BH15-4		4	94H	062001 1053	062001 1053	S	G	4oz	None	G	SA	DRO(8015)modified	
056220-003		CY94H-BH15-9		9	94H	062001 1057	062001 1057	S	G	4oz	None	G	SA	DRO(8015)modified	
056221-003		CY94H-BH16-4		4	94H	062001 1122	062001 1122	S	G	4oz	None	G	SA	DRO(8015)modified	

RMMA Yes No Ref. No.
Sample Disposal Return to Client Disposed by lab
Turnaround Time 7 Day 15 Day 30 Day
Return Samples By: Negotiated TAT Negotiated TAT
 Signature: M Sanchez Name: M Sanchez Init: MS Company/Organization/Phone/Cellular: Weston/615/845-3287
G Quintana Name: G Quintana Init: GQ Company/Organization/Phone/Cellular: IT/615/5284-3309
W Gibson Name: W Gibson Init: WG Company/Organization/Phone/Cellular: MDM/615/845-3267

Special Instructions/QC Requirements: No No
 EDD Yes No
 Raw Data Package Yes No

*Please send report to:
 M Thacker MS1098 Ph284-2675 Fax284-2617
 msthack@sandia.gov

Please list as separate report.

1. Relinquished by	2. Received by	3. Relinquished by	4. Received by	5. Relinquished by	6. Received by
<u>M Sanchez</u>	<u>Clayton</u>	<u>M Sanchez</u>	<u>Clayton</u>	<u>M Sanchez</u>	<u>Clayton</u>
Date: <u>06/21/01</u>	Date: <u>06/21/01</u>	Date: <u>06/21/01</u>	Date: <u>06/21/01</u>	Date: <u>06/21/01</u>	Date: <u>06/21/01</u>
Time: <u>1335</u>	Time: <u>1335</u>	Time: <u>1335</u>	Time: <u>1335</u>	Time: <u>1335</u>	Time: <u>1335</u>

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

CONTRACT LABORATORY ANALYSIS REQUEST CHAIN OF CUSTODY

Intermal Lab

AR/COC **604641**

Waste Characterization
 -RCRA Date= _____
 Send Preliminary report to _____
 Validation Required _____
 Released by COC No.: _____
 Bill To: Sandia National Labs (Accounts Payable)
 P.O. Box 5800, MS-0154
 Albuquerque, NM., 87185-0154

Location		Tech Area		Reference LOV (available at SMO)		Preserve All@4C		Collection Method		Sample Type		Lab Sample ID	
Building	NA	Room	NA	ER Sample ID or Sample Location	Detail	Beginning Depth (ft)	ER Site No.	Date Collected	Sample Matrix	Container Type	Volume	Method	Requested
056431-003		CY94H-BH17-7		7	94H	062101	0930	S	G	4oz	None	G	DRO(8015)modified 0106147
056432-003		CY94H-BH18-2		2	94H	062101	1000	S	G	4oz	None	G	DRO(8015)modified
056433-003		CY94H-BH19-3		3	94H	062101	1030	S	G	4oz	None	G	DRO(8015)modified
056434-003		CY94H-BH19-7		7	94H	062101	1030	S	G	4oz	None	G	DRO(8015)modified

RMMA Yes No Ref. No. _____
 Sample Disposal Return to Client Disposal by lab
 Turnaround Time 7 Day 15 Day 30 Day
 Return Samples By: Negotiated TAT

Name	Signature	Int'l	Company/Organization	Phone/Cellular
M Sanchez	<i>[Signature]</i>		Weston/6135/845-3267	
G Quintana	<i>[Signature]</i>		IT/6135284-3309	
W Gibson	<i>[Signature]</i>		MDM/6135/845-3267	

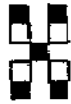
Special Instructions/QC Requirements:
 EDD Yes No
 Raw Data Package Yes No
 *Please send report to:
 M Thacker MS1068 Ph.284-2575 Fax284-2617
 msthack@sandia.gov

Please list as separate report.

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
<i>[Signature]</i>	Org. 6135	Date 06/10	Time 1335				
1. Received by	Org.	Date	Time	4. Received by	Org.	Date	Time
<i>[Signature]</i>		Date 06/14	Time 1335				
2. Relinquished by	Org.	Date	Time	5. Relinquished by	Org.	Date	Time
2. Received by	Org.	Date	Time	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

*7 & 15 Day Turnaround Time: ERCL requires prior notification.





**Hall Environmental
Analysis Laboratory**

COVER LETTER

August 01, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burnsite

Order No.: 0107154

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 1 sample on 7/30/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Mark Thacker

Hall Environmental Analysis Laboratory

Date: 01-Aug-01

CLIENT: Sandia National Laboratories
 Project: Site 94H Burnsite

Lab Order: 0107154

Lab ID: 0107154-01

Collection Date: 7/30/01 10:25:00 AM

Client Sample ID: CY94H-SW

Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	0.50		mg/L	1	7/30/01
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	7/30/01
Surr: DNOP	106	74-125		%REC	1	7/30/01
GRO BY 8015B		SW8015		Analyst: JEB		
Gasoline Range Organics (GRO)	0.091	0.050		mg/L	1	7/31/01 5:58:19 AM
Surr: BFB	102	74.5-115		%REC	1	7/31/01 5:58:19 AM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Date: 01-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Method Blank

CLIENT: Sandia National Laboratories
Work Order: 0107154
Project: Site 94H Burnsite

Sample ID: MB-773 Batch ID: 773 Test Code: SW8015 Units: mg/L Analysis Date: 7/30/01 Prep Date: 7/30/01
Client ID: Run ID: FIDHP_010730A SeqNo: 38108

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.50									
Motor Oil Range Organics (MRO)	ND	5.0									
Surr: DNOP	102	0	100	0	102	74	125	0			

Sample ID: Reagent Blank 5m Batch ID: R1723 Test Code: SW8015 Units: mg/L Analysis Date: 7/30/01 10:32:33 AM Prep Date:
Client ID: Run ID: PIDPID_010730A SeqNo: 38092

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.0464	0.050									
Surr: BFB	22.47	0	20	0	112	74.5	115	0			J

Qualifiers: ND - Not Detected at this Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory

Date: 01-Aug-01

CLIENT: Sandia National Laboratories
 Work Order: 0107154
 Project: Site 94H Burnsite

QC SUMMARY REPORT

Sample Duplicate

Sample ID: 0107154-01a Batch ID: R1741 Test Code: SW8016 Units: mg/L Analysis Date: 7/31/01 8:59:55 PM Prep Date:
 Client ID: CY94H-SW Run ID: PIDFID_010731A SeqNo: 38517

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.0912	0.050	0	0	0	0	0	0.0914	0.219	20	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

Date: 02-Aug-01

QC SUMMARY REPORT
Laboratory Control Spike - generic

CLIENT: Sandia National Laboratories
Work Order: 0107154
Project: Site 94H Burnsite

Sample ID:	LCS-767	Batch ID:	767	Test Code:	SW8015	Units:	mg/L	Analysis Date:	7/27/01	SeqNo:	38133	Prep Date:	7/27/01
Client ID:		Run ID:	FIDHP_010727A	PQL	SPK value	SPK Ref Val	0	%REC	86.0	71	161	%RPD	RPDLimit
Analyte	Diesel Range Organics (DRO)	Result	4.3	0.50	5	0	86.0	71	161	0	0	0	23
Sample ID:	LCS-D-767	Batch ID:	767	Test Code:	SW8015	Units:	mg/L	Analysis Date:	7/27/01	SeqNo:	38134	Prep Date:	7/27/01
Client ID:		Run ID:	FIDHP_010727A	PQL	SPK value	SPK Ref Val	0	%REC	86.0	71	161	%RPD	RPDLimit
Analyte	Diesel Range Organics (DRO)	Result	4.3	0.50	5	0	86.0	71	161	4.3	0	0	23

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantization limits R - RPD outside accepted recovery limits

Date: 01-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT Sample Matrix Spike

CLIENT: Sandia National Laboratories
Work Order: 0107154
Project: Site 94H Burnsite

Sample ID: 0107154-01a ms Batch ID: R1741 Test Code: SW8019 Units: mg/L Analysis Date: 8/1/01 12:52:42 PM Prep Date:
Client ID: CV84H-SW Run ID: PIDFID_010731A SeqNo: 38537
Analyte Result PQL SPK value SPK RefVal %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Gasoline Range Organics (GRO) 0.4716 0.050 0.4 0.0914 95.1 80.3 116 0

Qualifiers: MD - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

SARWR No. **61321D87** AR/COC **604705**

Dept. No./Mail Stop: **Freshour/Thacker**

Project/Task Manager: **94H Burnette**

Project Name: **94H Burnette**

Record Center Code: **43**

Logbook Ref. No.:

Service Order No.:

Contract No.: **94H Burnette**

Project/Task No.:

SMO Authorization:

S: Hallenback 945-3975

Hall

SMO Contact/Phone: **D Selmi 844-3110**

Sand Report to SMO: **S Jensen 844-3184**

Location

Building	NA	Tech Area	Room	NA

Reference LOV (available at SMO)

Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Volume	Preserve Method	Collection Method	Sample Type	Lab Sample ID	Parameter & Method Requested	Waste Characterization	
													RCRA Date	Send Preliminary report to
056921-001	CY94H-SW	0"-6"	94H	073001 1025	SW	G	3x40ml	HCl	G	SA		DRO/GRO 2107154 - 1	<input type="checkbox"/>	<input type="checkbox"/>

RMMA

Yes No Ref. No.

Return to Client Disposal by lab

7 Day 15 Day 30 Day

Negotiated TAT

Return Samples By:

Name	Signature	Init	Company/Organization/Phone/Cellular
M Sanchez			Weston/6135/645-3267

Special Instructions/QC Requirements:

EDD Yes No

Raw Data Package Yes No

*Please send report to:
M Thacker MS1088 Ph284-2575 Fax284-2617
msthack@sandia.gov

24 TAT

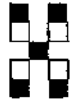
Sample Team Members

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
<i>Chanel Davis</i>		07/23/01	1310				

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

284-2417





**Hall Environmental
Analysis Laboratory**

COVER LETTER

August 02, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burns site

Order No.: 0107165

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 4 samples on 7/31/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Mark Thacker

Hall Environmental Analysis Laboratory

Date: 02-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsites

Lab Order: 0107165

Lab ID: 0107165-01 **Collection Date:** 7/31/01 12:50:00 PM
Client Sample ID: CY94H-SW-001-S **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/1/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/1/01
Surr: DNOP	98.0	60-124		%REC	1	8/1/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: JEB		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/01 7:29:16 PM
Surr: BFB	91.7	74-118		%REC	1	8/1/01 7:29:16 PM

Lab ID: 0107165-02 **Collection Date:** 7/31/01 1:05:00 PM
Client Sample ID: CY94H-SW-002-S **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/1/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/1/01
Surr: DNOP	101	60-124		%REC	1	8/1/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: JEB		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/01 8:05:37 PM
Surr: BFB	84.1	74-118		%REC	1	8/1/01 8:05:37 PM

Lab ID: 0107165-03 **Collection Date:** 7/31/01 1:35:00 PM
Client Sample ID: CY94H-SW-003-S **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	16	5.0		mg/Kg	1	8/1/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/1/01
Surr: DNOP	87.0	60-124		%REC	1	8/1/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: JEB		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/01 8:41:22 PM
Surr: BFB	96.6	74-118		%REC	1	8/1/01 8:41:22 PM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 02-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0107165

Lab ID: 0107165-04

Collection Date: 7/31/01 2:15:00 PM

Client Sample ID: CY94H-SW-004-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015				Analyst: GT
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/1/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/1/01
Surr: DNOP	94.0	60-124		%REC	1	8/1/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015				Analyst: JEB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/1/01 9:16:54 PM
Surr: BFB	90.6	74-118		%REC	1	8/1/01 9:16:54 PM

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Date: 02-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Method Blank

CLIENT: Sandia National Laboratories
Work Order: 0107165
Project: Site 94H Burnsite

Sample ID: MB-776	Batch ID: 776	Test Code: SW8015	Units: mg/Kg	Analysis Date: 7/31/01	Prep Date: 7/31/01						
Client ID:	Run ID: FIDHP_010731A	SeqNo: 38605									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0									
Motor Oil Range Organics (MRO)	ND	50				60	124	0			
Surr: DNOP	82	0	100	0	82.0						

Sample ID: MB-779	Batch ID: 779	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/1/01	Prep Date: 8/1/01						
Client ID:	Run ID: FIDHP_010731A	SeqNo: 38713									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0									
Motor Oil Range Organics (MRO)	ND	50				60	124	0			
Surr: DNOP	100	0	100	0	100						

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 02-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Sample Duplicate

CLIENT: Sandia National Laboratories
Work Order: 0107165
Project: Site 94H Burnsite

Sample ID: 0107157-03ADup Batch ID: 776 Test Code: SW6015 Units: mg/Kg Analysis Date: 7/31/01 Prep Date: 7/31/01
Client ID: FIDHP_010731A Run ID: FIDHP_010731A SeqNo: 38623

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0	0	0	0	0	0	0	0	0	20
Motor Oil Range Organics (MRO)	ND	50	0	0	0	0	0	0	0	0	20

Sample ID: 0107165-01a dup Batch ID: R1752 Test Code: SW6015 Units: mg/Kg Analysis Date: 8/2/01 2:27:48 AM Prep Date:
Client ID: CY94H-SW-001-S Run ID: PIDFID_010801A SeqNo: 38759

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0	0	0	0	0	0	0	0	0	20

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 02-Aug-01

Hall Environmental Analysis Laboratory

CLIENT: Sandia National Laboratories
Work Order: 0107165
Project: Site 94H Burnsite

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS-776 **Batch ID:** 776 **Test Code:** SW8016 **Units:** mg/Kg **Analysis Date:** 7/31/01 **Prep Date:** 7/31/01
Client ID: **Run ID:** FIDHP_010731A **SeqNo:** 38806

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	36	5.0	50	0	72.0	67.4	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 02-Avg-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

CLIENT: Sandia National Laboratories
Work Order: 0107165
Project: Site 94H Burnsite

Sample Matrix Spike

Sample ID:	0107157-11AMS	Batch ID:	776	Test Code:	SW8015	Units:	mg/Kg	Analysis Date:	7/31/01	SeqNo:	38624	Prep Date:	7/31/01
Client ID:		Run ID:	FIDHP_010731A	PQL	SPK value	SPK Ref Val	0	%REC	67.4	HighLimit	117	%RPD	RPDLimit
Analyte		Result	41	5.0	50	0	82.0	0	67.4	117	0		
Diesel Range Organics (DRO)													
Sample ID:	0107165-01a.ms	Batch ID:	R1752	Test Code:	SW8015	Units:	mg/Kg	Analysis Date:	8/2/01 3:01:49 AM	SeqNo:	38782	Prep Date:	
Client ID:	CY94H-SW-001-S	Run ID:	PIDFID_010801A	PQL	SPK value	SPK Ref Val	0	%REC	85.8	HighLimit	111	%RPD	RPDLimit
Analyte		Result	16.43	5.0	15	0	110	0	85.8	111	0		
Gasoline Range Organics (GRO)													

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

AR/COC **604658**

Batch No. 6132/1087
Dept. No./Mail Stop: Freshour/Thacker
Project/Task Manager: 94H Burnette
Project Name: #3
Record Center Code: CFC 107-01
Logbook Ref. No.: #3
Service Order No.: CFC 107-01

Lab Contact: S. Hallenback 505-345-3975
Lab Destination: Hall
SMO Contact/Phone: D Salmi 505-844-3110
Send Report to SMO: S. Jensen 505-844-3184

Contract No.: SWMU94H
Project/Task No.: SMO Authorization:
Waste Characterization:
 RCRA Date=
 Send Preliminary report to
 Validation Required
 Released by COC No.:

Bill To: Sandia National Labs (Accounts Payable)
 P.O. Box 5800, MS-0154
 Albuquerque, NM., 87185-0154

Location		Reference LOV (available at SMO)										Sample ID			
Building	NA	Room	ER Sample ID or Sample Location Data1	NA	Beginning Depth (ft)	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Volume	Preserve All@4C		Collection Method	Sample Type	Parameter & Method Requested
			CY94H-SW-001-S		2.9	94H	073101 1250	S	G	40Z	None	G	SA	DRO(8015) modified & GRO	010151
			CY94H-SW-002-S		3.4	94H	073101 1305	S	G	40Z	None	G	SA	DRO(8015) modified & GRO	010151
			CY94H-SW-003-S		1.9	94H	073101 1335	S	G	40Z	None	G	SA	DRO(8015) modified & GRO	010151
			CY94H-SW-004-S		3.2	94H	073101 1415	S	G	40Z	None	G	SA	DRO(8015) modified & GRO	010151

RMMA Yes No **Ref. No.** _____

Sample Disposal Return to Client Disposal by lab

Turnaround Time 7 Day 15 Day 30 Day

Return Samples By: Negotiated TAT _____

Signature: *Paul Wedgeworth* **Company/Organization/Phone/Cellular:** Weston/6134/284-6237

Name: B Wedgeworth

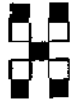
Special Instructions/QC Requirements:
 EDD Yes No
 Raw Data Package Yes No
 *Please send report to: 24 Hour Turn Around
 M Thacker MS 1088 Ph 284-2575 Fax 284-2617
 msthack@sandia.gov

Approximate Counters or Receipts

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
Paul Wedgeworth	6134	7/31/01	1705				
Chae-Kee Han		7/31/01	1705				

Please list as separate report.

*7 & 15 Day Turnaround Time: ERCL requires prior notification.



**Hall Environmental
Analysis Laboratory**

COVER LETTER

August 06, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burnsite

Order No.: 0108017

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 6 samples on 8/2/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Mark Thacker

Hall Environmental Analysis Laboratory

Date: 06-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite
Lab Order: 0108017

CASE NARRATIVE

Prep Comments for 5035_S, Sample 0108017-01A: x1 Prep Comments for 5035_S, Sample 0108017-02A: x1 Prep Comments for 5035_S, Sample 0108017-03A: x1 Prep Comments for 5035_S, Sample 0108017-04A: x1 Prep Comments for 5035_S, Sample 0108017-05A: x1 Prep Comments for 5035_S, Sample 0108017-06A: x1

Hall Environmental Analysis Laboratory

Date: 06-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108017

Lab ID: 0108017-01

Collection Date: 8/2/01 1:35:00 PM

Client Sample ID: CY94H-SW-005-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	1600	50		mg/Kg	10	8/3/01
Motor Oil Range Organics (MRO)	ND	500		mg/Kg	10	8/3/01
Surr: DNOP	80.0	60-124		%REC	1	8/3/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	380	250		mg/Kg	50	8/4/01 1:46:19 PM
Surr: BFB	279	74-118	S	%REC	50	8/4/01 1:46:19 PM

Lab ID: 0108017-02

Collection Date: 8/2/01 2:35:00 PM

Client Sample ID: CY94H-SW-006-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/3/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/3/01
Surr: DNOP	77.0	60-124		%REC	1	8/3/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/3/01 6:59:49 PM
Surr: BFB	116	74-118		%REC	1	8/3/01 6:59:49 PM

Lab ID: 0108017-03

Collection Date: 8/2/01 2:43:00 PM

Client Sample ID: CY94H-SW-007-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/3/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/3/01
Surr: DNOP	96.0	60-124		%REC	1	8/3/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/3/01 6:40:57 PM
Surr: BFB	89.8	74-118		%REC	1	8/3/01 6:40:57 PM

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 06-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108017

Lab ID: 0108017-04

Collection Date: 8/2/01 2:54:00 PM

Client Sample ID: CY94H-SW-008-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/3/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/3/01
Surr: DNOP	100	60-124		%REC	1	8/3/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/3/01 7:21:15 PM
Surr: BFB	75.1	74-118		%REC	1	8/3/01 7:21:15 PM

Lab ID: 0108017-05

Collection Date: 8/2/01 3:02:00 PM

Client Sample ID: CY94H-SW-009-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/3/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/3/01
Surr: DNOP	96.0	60-124		%REC	1	8/3/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/3/01 8:00:03 PM
Surr: BFB	78.8	74-118		%REC	1	8/3/01 8:00:03 PM

Lab ID: 0108017-06

Collection Date: 8/2/01 3:09:00 PM

Client Sample ID: CY94H-SW-010-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/3/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/3/01
Surr: DNOP	108	60-124		%REC	1	8/3/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/3/01 8:38:17 PM
Surr: BFB	90.0	74-118		%REC	1	8/3/01 8:38:17 PM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Date: 06-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Method Blank

CLIENT: Sandia National Laboratories

Work Order: 0108017

Project: Site 94H Burnsite

Prep Date: 8/2/01

Analysis Date: 8/2/01

Sample ID: MB-789 Batch ID: 789 Test Code: SW8015 Units: mg/Kg
 Client ID: Run ID: FIDHP_010802A SeqNo: 39287
 Analyte PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Diesel Range Organics (DRO)	ND	5.0											
Motor Oil Range Organics (MRO)	ND	50											
Surr: DNOP	80	0	100	0	80.0	60	124	0					

Prep Date: 8/2/01

Analysis Date: 8/3/01 4:36:06 PM

Sample ID: mb-793 Batch ID: 793 Test Code: SW8015 Units: mg/Kg
 Client ID: Run ID: PIDFID_010803A SeqNo: 39167
 Analyte PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Gasoline Range Organics (GRO)	ND	5.0											
Surr: BFB	819.5	0	1000	0	81.9	74	118	0					

Prep Date:

Analysis Date: 8/4/01 10:24:21 AM

Sample ID: Reagent Blank 5m Batch ID: R1776 Test Code: SW8015 Units: mg/Kg
 Client ID: Run ID: PIDFID_010804A SeqNo: 39270
 Analyte PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Gasoline Range Organics (GRO)	ND	5.0											
Surr: BFB	940.1	0	1000	0	84.0	74	118	0					

Prep Date:

Analysis Date: 8/4/01 10:11:37 PM

Sample ID: mb-770 Batch ID: R1776 Test Code: SW8015 Units: mg/Kg
 Client ID: Run ID: PIDFID_010804A SeqNo: 39305
 Analyte PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Gasoline Range Organics (GRO)	ND	5.0											
Surr: BFB	811.5	0	1000	0	81.1	74	118	0					

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 06-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Sample Duplicate

CLIENT: Sandia National Laboratories
Work Order: 0108017
Project: Site 94H Burnsite

Sample ID: 0108025-10a Batch ID: R1776 Test Code: SW0015 Units: mg/Kg Analysis Date: 8/4/01 7:06:41 PM Prep Date:
Client ID: Run ID: PIDFID_010804A SeqNo: 39345

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0	0	0	0	0	0	0	0	0	20

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 06-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT
Laboratory Control Spike - generic

CLIENT: Sandia National Laboratories
Work Order: 0108017
Project: Site 94H Burnsite

Sample ID: LCS-789 Batch ID: 789 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/2/01 Prep Date: 8/2/01
Client ID: Run ID: FIDHP_010802A SeqNo: 39285
Analyte PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Diesel Range Organics (DRO) 40 5.0 50 0 80.0 67.4 117 0

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Date: 06-Aug-01

Hall Environmental Analysis Laboratory

CLIENT: Sandia National Laboratories

Work Order: 0108017

Project: Site 94H Burnsite

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 0108025-10ms Batch ID: R1778 Test Code: SWM015 Units: mg/Kg Analysis Date: 8/4/01 5:09:58 PM Prep Date:
Client ID: Run ID: PIDFID_010804A SeqNo: 38340
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Gasoline Range Organics (GRO) 20.52 5.0 25 0 82.1 86.8 111 0 S

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

SARWR No.

AR/COG 604658

Waste Characterization
 RCRA Dates
 Send Preliminary report to
 Validation Required
 Released by COG No.:
 Bill To: Sandia National Labs (Accounts Payable)
 P.O. Box 5800, MS-0154
 Albuquerque, NM, 87185-0154

Contract No.:
 Project/Task No.: 6WMIU84H
 SMO Authorizations:

Lab Contact: S Hallenbeck 505-844-3975
 Lab Destination: Hall
 SMO Contact/Phone: D. Selmi 505-844-3110
 Send Report to SMO: S. Jenson 505-844-3184

Sample No. - Fraction	Tech Area	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date/Time Collected	Sample Matrix	Container		Preservd All@4C	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
							Type	Volume					
056681-001	CY94H-SW-005-S		3.6	94H	080201 1335	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	010107
056682-001	CY94H-SW-006-S		3.4	94H	080201 1435	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	010107
056683-001	CY94H-SW-007-S		3.0	94H	080201 1443	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	010107
056684-001	CY94H-SW-008-S		3.2	94H	080201 1454	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	010107
056685-001	CY94H-SW-009-S		2.7	94H	080201 1502	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	010107
056686-001	CY94H-SW-010-S		3.0	94H	080201 1509	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	010107

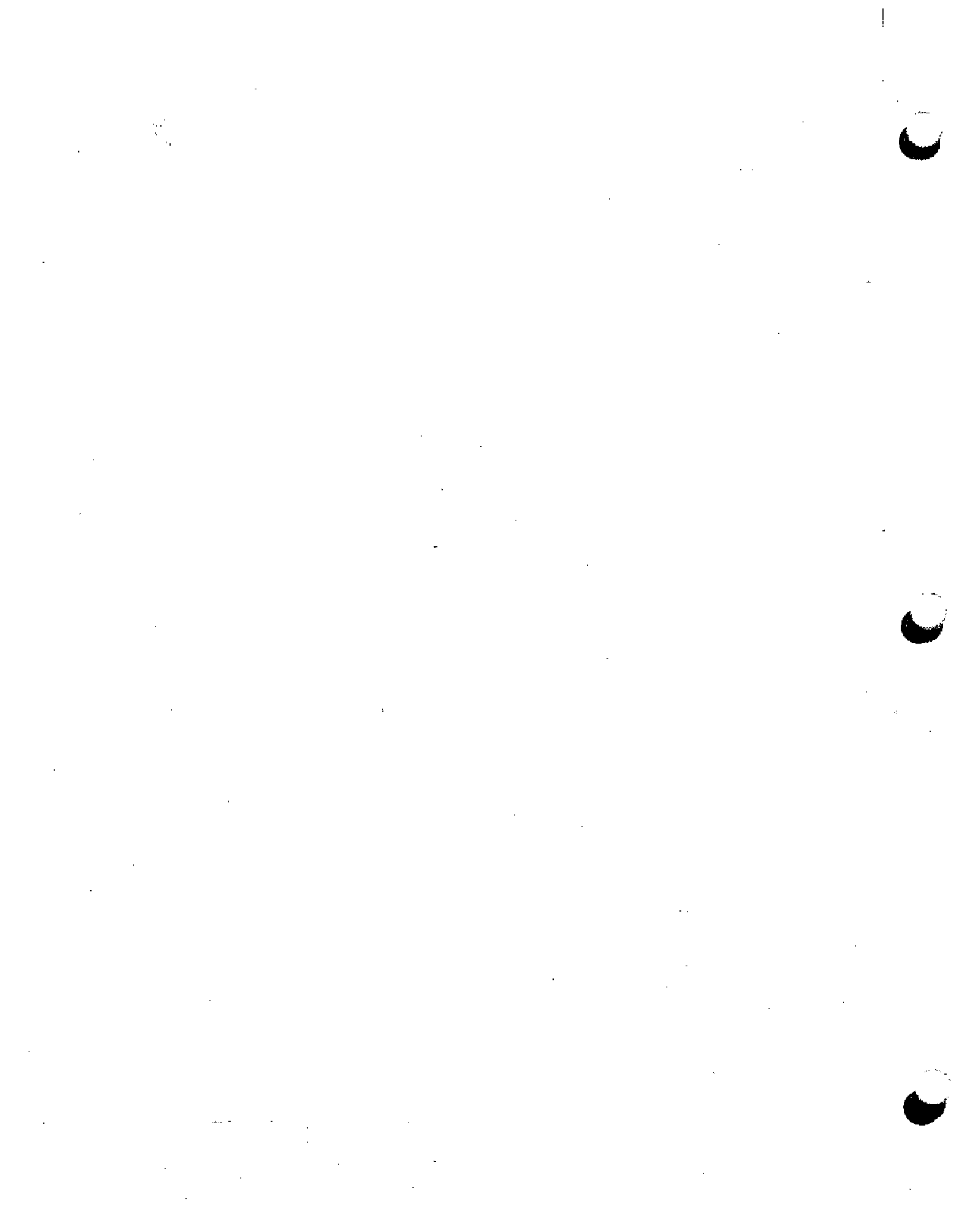
Yes No Ref. No.
 Return to Client Disposal by lab
 Turnaround Time 7 Day 15 Day 30 Day
 Return Samples By: Negotiated TAT

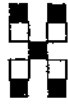
Signature: M Sanchez
 Name: M Sanchez
 Company/Organization/Phone/Cellular: Weston/6136/845-3267

Special Instructions/QC Requirements:
 EDD Yes No
 Raw Data Package Yes No
 Please send report to:
 M Thacker MS 1088 Ph 284-2575
 msthack@sandia.gov
 M Sanchez
 Please list as separate report.

1. Relinquished by	Date	Time	Org.	Date	Time	Org.
1. Received by <i>Thacker</i>	080201	1614	Org. 6136			
2. Relinquished by						
3. Relinquished by						
4. Relinquished by						
5. Relinquished by						
6. Relinquished by						

*7 & 15 Day Turnaround Time: ERGL requires prior notification.





**Hall Environmental
Analysis Laboratory**

COVER LETTER

August 13, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burnsite, SWMU94H

Order No.: 0108032

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 13 samples on 8/3/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Mark Thacker

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite, SWMU94H
Lab Order: 0108032

CASE NARRATIVE

Prep Comments for 5035_S, Sample 0108032-01A: x1 Prep Comments for 5035_S, Sample 0108032-02A: x1 Prep Comments for 5035_S, Sample 0108032-03A: x1 Prep Comments for 5035_S, Sample 0108032-04A: x1 Prep Comments for 5035_S, Sample 0108032-05A: x1 Prep Comments for 5035_S, Sample 0108032-06A: x1 Prep Comments for 5035_S, Sample 0108032-07A: x1 Prep Comments for 5035_S, Sample 0108032-08A: x1 Prep Comments for 5035_S, Sample 0108032-09A: x1 Prep Comments for 5035_S, Sample 0108032-10A: x10 Prep Comments for 5035_S, Sample 0108032-11A: x10 Prep Comments for 5035_S, Sample 0108032-12A: x10 Prep Comments for 5035_S, Sample 0108032-13A: x50 Analytical Comments for METHOD 8015GRO_S, SAMPLE 0108032-09a: TFT substituted for BFB due to matrix interference with BFB Analytical Comments for METHOD 8015GRO_S, SAMPLE 0108032-10a: TFT substituted for BFB due to matrix interference with BFB Analytical Comments for METHOD 8015GRO_S, SAMPLE 0108032-11a: TFT substituted for BFB due to matrix interference with BFB Analytical Comments for METHOD 8015GRO_S, SAMPLE 0108032-12a: TFT substituted for BFB due to matrix interference with BFB Analytical Comments for METHOD 8015GRO_S, SAMPLE 0108032-13a: TFT substituted for BFB due to matrix interference with BFB

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite, SWMU94H

Lab Order: 0108032

Lab ID: 0108032-01

Collection Date: 8/3/01 12:40:00 PM

Client Sample ID: CY94H-SW-011-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	82.0	60-124		%REC	1	8/6/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/6/01 2:20:52 PM
Surr: BFB	90.7	74-118		%REC	1	8/6/01 2:20:52 PM

Lab ID: 0108032-02

Collection Date: 8/3/01 12:42:00 PM

Client Sample ID: CY94H-SW-012-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	85.0	60-124		%REC	1	8/6/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	13	5.0		mg/Kg	1	8/6/01 2:59:10 PM
Surr: BFB	99.9	74-118		%REC	1	8/6/01 2:59:10 PM

Lab ID: 0108032-03

Collection Date: 8/3/01 12:57:00 PM

Client Sample ID: CY94H-SW-013-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	82.0	60-124		%REC	1	8/6/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/6/01 7:02:05 PM
Surr: BFB	84.5	74-118		%REC	1	8/6/01 7:02:05 PM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsife, SWMU94H

Lab Order: 0108032

Lab ID: 0108032-04

Collection Date: 8/3/01 1:12:00 PM

Client Sample ID: CY94H-SW-014-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	87.0	60-124		%REC	1	8/6/01

GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/6/01 8:55:21 PM
Surr: BFB	81.1	74-118		%REC	1	8/6/01 8:55:21 PM

Lab ID: 0108032-05

Collection Date: 8/3/01 1:25:00 PM

Client Sample ID: CY94H-SW-015-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	83.0	60-124		%REC	1	8/6/01

GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/6/01 9:31:55 PM
Surr: BFB	79.9	74-118		%REC	1	8/6/01 9:31:55 PM

Lab ID: 0108032-06

Collection Date: 8/3/01 1:27:00 PM

Client Sample ID: CY94H-SW-016-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	81.0	60-124		%REC	1	8/6/01

GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/6/01 10:08:14 PM
Surr: BFB	81.0	74-118		%REC	1	8/6/01 10:08:14 PM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite, SWMU94H

Lab Order: 0108032

Lab ID: 0108032-07

Collection Date: 8/3/01 1:45:00 PM

Client Sample ID: CY94H-SW-017-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	86.0	60-124		%REC	1	8/6/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/6/01 11:55:21 PM
Surr: BFB	80.9	74-118		%REC	1	8/6/01 11:55:21 PM

Lab ID: 0108032-08

Collection Date: 8/3/01 1:47:00 PM

Client Sample ID: CY94H-SW-018-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	99.0	60-124		%REC	1	8/6/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/7/01 4:34:50 AM
Surr: BFB	81.6	74-118		%REC	1	8/7/01 4:34:50 AM

Lab ID: 0108032-09

Collection Date: 8/3/01 10:02:00 AM

Client Sample ID: CY94H-CSP-001-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	620	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	64.0	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	31	5.0		mg/Kg	1	8/8/01 9:58:29 AM
Surr: BFB	86.4	74-118		%REC	1	8/8/01 9:58:29 AM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite, SWMU94H

Lab Order: 0108032

Lab ID: 0108032-10

Collection Date: 8/3/01 10:12:00 AM

Client Sample ID: CY94H-CSP-002-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	2800	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	40.0	60-124	S	%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	120	100		mg/Kg	20	8/8/01 10:33:54 AM
Surr: BFB	100	74-118		%REC	20	8/8/01 10:33:54 AM

Lab ID: 0108032-11

Collection Date: 8/3/01 10:27:00 AM

Client Sample ID: CY94H-CSP-003-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	4600	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	25.0	60-124	S	%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	290	100		mg/Kg	20	8/8/01 11:09:41 AM
Surr: BFB	95.1	74-118		%REC	20	8/8/01 11:09:41 AM

Lab ID: 0108032-12

Collection Date: 8/3/01 2:07:00 PM

Client Sample ID: CY94H-CSP-004-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	2100	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	8.00	60-124	S	%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	140	100		mg/Kg	20	8/8/01 11:45:47 AM
Surr: BFB	97.6	74-118		%REC	20	8/8/01 11:45:47 AM

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite, SWMU94H

Lab Order: 0108032

Lab ID: 0108032-13

Collection Date: 8/3/01 2:02:00 PM

Client Sample ID: CY94H-CSP-005-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	1700	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	30.0	60-124	S	%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	500	500	J	mg/Kg	100	8/8/01 4:55:14 PM
Surr: BFB	100	74-118		%REC	100	8/8/01 4:55:14 PM

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Date: 13-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT Method Blank

CLIENT: Sandia National Laboratories
Work Order: 0108032
Project: Site 94H Burnsite, SWMU94H

Sample ID: MB-788 Batch ID: 788 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/6/01 Prep Date: 8/6/01
Client ID: Run ID: FIDHP_010806A SeqNo: 39694
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Diesel Range Organics (DRO) ND 5.0
Motor Oil Range Organics (MRO) ND 50
Surr: DNOP 75 0 100 0 75.0 60 124 0

Sample ID: mb-797 Batch ID: 797 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/6/01 1:43:25 PM Prep Date: 8/4/01
Client ID: Run ID: PIDFID_010806A SeqNo: 39600
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Gasoline Range Organics (GRO) ND 5.0
Surr: BFB 850.8 0 1000 0 85.1 74 118 0

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
 Work Order: 0108032
 Project: Site 94H Burnsite, SWMU94H

QC SUMMARY REPORT
 Sample Duplicate

Sample ID: 0108032-06a Batch ID: 787 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/6/01 10:44:14 PM Prep Date: 8/4/01

Client ID: CY94H-SW-016-S Run ID: PIDFID_010806A SeqNo: 39845

Analyte	Result	PQL	SPK value	SPK RefVal	%REC	LowLimit	HghLimit	RPD RefVal	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0	0	0	0	0	0	0	0	20	
Suff: BFB	822.1	0	0	0	0	0	0	809.8	1.51	0	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spikes Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Date: 13-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Sample Matrix Spike

CLIENT: Sandia National Laboratories
Work Order: 0108032
Project: Site 94H Burnsite, SWMU94H

Sample ID: 0108032-09AMS	Batch ID: 798	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/7/01	Prep Date: 8/8/01						
Client ID: CY94H-CSP-001-S	Run ID: FIDHP_010807A	PQL	SPK value	SeqNo: 40291							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	774	5.0	50	618	312	67.4	117	0			S
Surr: DNOP	66	0	100	0	66.0	74	125	0			S

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

QC SUMMARY REPORT
Laboratory Control Spike - generic

CLIENT: Sandia National Laboratories
Work Order: 0108032
Project: Site 94H Burnsite, SWMU94H

Sample ID: LCS-798 Batch ID: 798 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/6/01 Prep Date: 8/6/01
Client ID: Run ID: FIDHP_010806A SeqNo: 39695
Analyte Result PQL SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Diesel Range Organics (DRO) 39 5.0 50 0 78.0 67.4 117 0

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab SARWR No. **604660**

Batch No.	6132/1937	Contract No.	SWMU94H
Dept. No./Mail Stop:	Freshour/Thacker	Project/Task No.:	
Project/Task Manager:	94H Burnette	SMO Authorization:	
Project Name:		Lab Contact:	S Hallenback 505-345-3975
Record Center Code:	#3	Hall:	
Logbook Ref. No.:	CFO 107-01	SMO Contact/Phone:	D Salmi 505-844-3110
Service Order No.		Send Report to SMO:	S Jensen 505-844-3184

Location		Reference LOV (available at SMO)										Parameter & Method Requested		Lab Sample ID
Building	Room	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date Collected	Sample Matrix	Container Type	Volume	Preserve All@4C	Collection Method	Sample Type			
056687-001	CY94H-SW-011-S	3.5	94H	080301	1240	S	G	4oz	None	G	SA	DRO(8015) modified & GRO		02/03/07
056688-001	CY94H-SW-012-S	4.3	94H	080301	1242	S	G	4oz	None	G	SA	DRO(8015) modified & GRO		
056689-001	CY94H-SW-013-S	3.3	94H	080301	1257	S	G	4oz	None	G	SA	DRO(8015) modified & GRO		
056690-001	CY94H-SW-014-S	3.8	94H	080301	1312	S	G	4oz	None	G	SA	DRO(8015) modified & GRO		
056691-001	CY94H-SW-015-S	6.1	94H	080301	1325	S	G	4oz	None	G	SA	DRO(8015) modified & GRO		
056692-001	CY94H-SW-016-S	6.6	94H	080301	1327	S	G	4oz	None	G	SA	DRO(8015) modified & GRO		
056693-001	CY94H-SW-017-S	6.2	94H	080301	1345	S	G	4oz	None	G	SA	DRO(8015) modified & GRO		
056694-001	CY94H-SW-018-S	8.0	94H	080301	1347	S	G	4oz	None	G	SA	DRO(8015) modified & GRO		

RMMA	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Ref. No. <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by lab	
Sample Disposal	<input type="checkbox"/> 7 Day <input type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day	
Turnaround Time	<input type="checkbox"/> Negotiated TAT	
Return Samples By:	Name: M Sanchez Signature: <i>[Signature]</i> Company/Organization/Phone/Cellular: Weston/6135/845-3267 MDM/6135/845-3267	

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
1. Received by	Org.	Date	Time	4. Received by	Org.	Date	Time
2. Relinquished by	Org.	Date	Time	5. Relinquished by	Org.	Date	Time
2. Received by	Org.	Date	Time	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

***7 & 15 Day Turnaround Time: ERCL requires prior notification.**

CONTRACT LABORATORY CHAIN OF CUSTODY ANALYSIS REQUEST

Internal Lab

AR/COC: **604661**

Waste Characterization
 RCRA Date:
 Send Preliminary report to:
 Validation Required
 Released by COC No.:
 Bill To: Sandia National Labs (Accounts Payable)
 P.O. Box 5800, MS-0154
 Albuquerque, NM., 87185-0154

Contract No.: SWM1094H
 Project/Task No.:
 SMO Authorization:

Lab Contact: S Heinenback 505-345-3876
 Lab Destination: Hill
 SMO Contact Phone: D Solmi 505-844-3110
 Send Report to SMO: S Jensen 505-844-3184

Reference LOV (available at SMO)												
Sample No. - Fraction	ER Sample ID or Sample Location Detail	Beginning Depth (ft)	ER Site No.	Date/Time Collected	Sample Matrix	Container Type	Volume	Preserve All@4C	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
056981-001	CY94H-CSP-001-S	6.7	94H	080301 1002	S	G	4oz	None	G	SA	TPH	20X002
056982-001	CY94H-CSP-002-S	6.7	94H	080301 1012	S	G	4oz	None	G	SA	TPH	20X003
056983-001	CY94H-CSP-003-S	6.7	94H	080301 1027	S	G	4oz	None	G	SA	TPH	20X004
056984-001	CY94H-CSP-004-S	N/A	94H	080301 1407	S	G	4oz	None	G	SA	TPH	20X005
056985-001	CY94H-CSP-005-S	N/A	94H	080301 1402	S	G	4oz	None	G	SA	TPH	20X006

Yes No Ref. No.
 Return to Client Disposal by lab
 7 Day 15 Day 30 Day
 Negotiated TAT

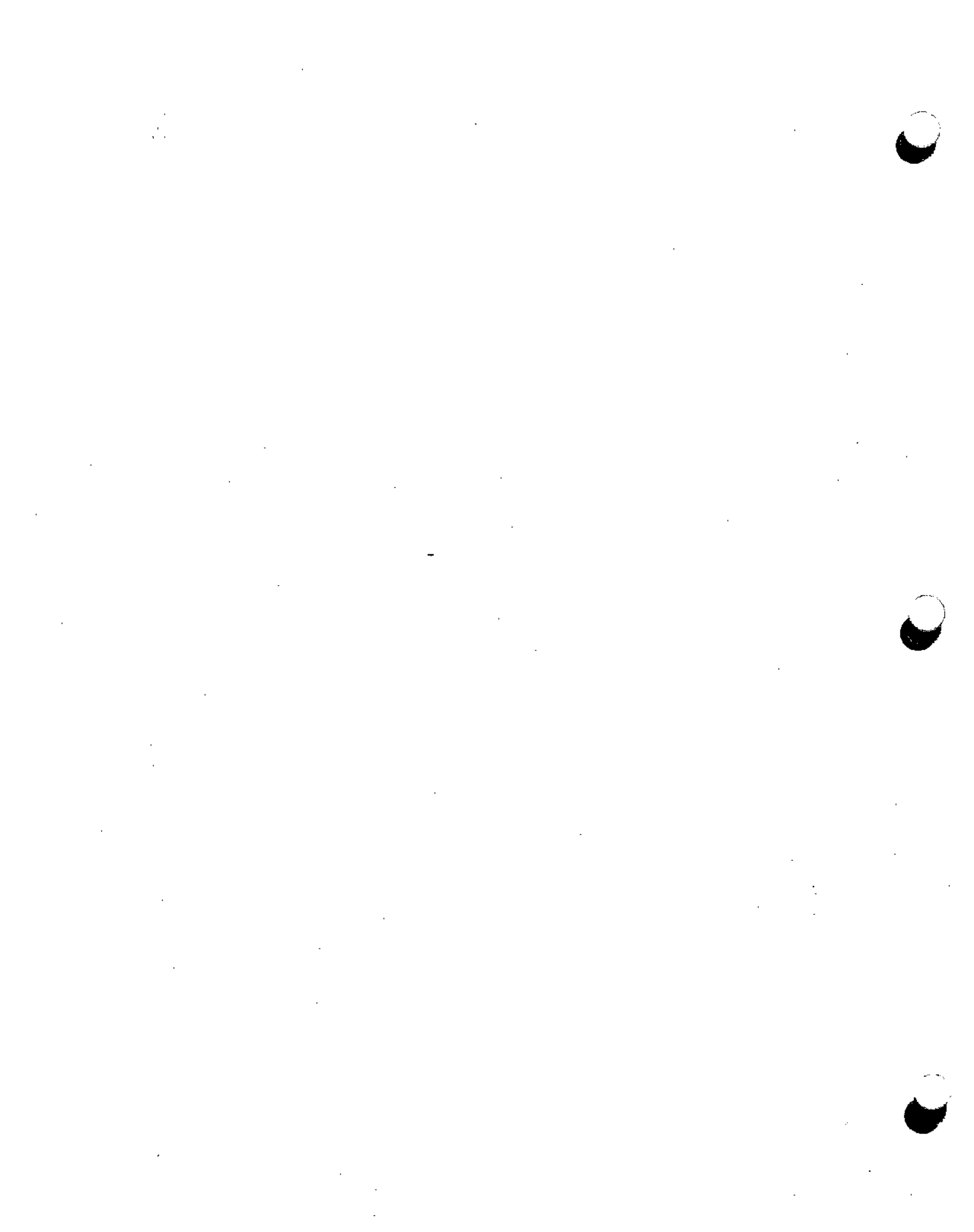
Name: M Sanchez
 Signature: *M Sanchez*
 Company/Organization/Phone/Cellular: M Thacker MS 1088 Ph 284-2875 Fax 284-2617
 Email: mthack@sandia.gov
 M Sanchez fax 284-3174

Special Instructions/QC Requirements:
 Yes No
 EDD Yes No
 Raw Data Package Yes No

Please send report to:

1. Relinequished by	Org.	Date	Time	4. Relinequished by	Org.	Date	Time
1. Received by	Org.	Date	Time	4. Received by	Org.	Date	Time
2. Relinequished by	Org.	Date	Time	5. Relinequished by	Org.	Date	Time
2. Received by	Org.	Date	Time	5. Received by	Org.	Date	Time
3. Relinequished by	Org.	Date	Time	6. Relinequished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

*7 & 15 Day Turnaround Time: ERCL requires prior notification.





**Hall Environmental
Analysis Laboratory**

COVER LETTER

August 08, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burnsite

Order No.: 0108037

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 9 samples on 8/6/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Mark Thacker

Hall Environmental Analysis Laboratory

Date: 08-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108037

Lab ID: 0108037-01

Collection Date: 8/6/01 9:56:00 AM

Client Sample ID: CY94H-B-001-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	103	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/7/01 11:36:50 PM
Surr: BFB	77.8	74-118		%REC	1	8/7/01 11:36:50 PM

Lab ID: 0108037-02

Collection Date: 8/6/01 10:00:00 AM

Client Sample ID: CY94H-B-002-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	105	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 12:11:14 AM
Surr: BFB	81.4	74-118		%REC	1	8/8/01 12:11:14 AM

Lab ID: 0108037-03

Collection Date: 8/6/01 10:33:00 AM

Client Sample ID: CY94H-B-003-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	88.0	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 12:46:02 AM
Surr: BFB	79.7	74-118		%REC	1	8/8/01 12:46:02 AM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 08-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108037

Lab ID: 0108037-04

Collection Date: 8/6/01 10:38:00 AM

Client Sample ID: CY94H-B-004-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	101	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 1:21:01 AM
Surr: BFB	80.1	74-118		%REC	1	8/8/01 1:21:01 AM

Lab ID: 0108037-05

Collection Date: 8/6/01 10:50:00 AM

Client Sample ID: CY94H-B-005-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	76.0	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 1:55:57 AM
Surr: BFB	81.9	74-118		%REC	1	8/8/01 1:55:57 AM

Lab ID: 0108037-06

Collection Date: 8/6/01 10:59:00 AM

Client Sample ID: CY94H-B-006-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	840	100		mg/Kg	20	8/7/01
Motor Oil Range Organics (MRO)	ND	1000		mg/Kg	20	8/7/01
Surr: DNOP	88.0	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	100		mg/Kg	20	8/8/01 3:39:51 AM
Surr: BFB	89.1	74-118		%REC	20	8/8/01 3:39:51 AM

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 08-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108037

Lab ID: 0108037-07 **Collection Date:** 8/6/01 11:28:00 AM
Client Sample ID: CY94H-B-007-S **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B SW8015 Analyst: GT						
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	89.0	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS SW8015 Analyst: BDH						
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 7:40:04 AM
Surr: BFB	80.7	74-118		%REC	1	8/8/01 7:40:04 AM

Lab ID: 0108037-08 **Collection Date:** 8/6/01 9:26:00 AM
Client Sample ID: CY94H-B-019-S **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B SW8015 Analyst: GT						
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	63.0	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS SW8015 Analyst: BDH						
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 8:48:34 AM
Surr: BFB	82.4	74-118		%REC	1	8/8/01 8:48:34 AM

Lab ID: 0108037-09 **Collection Date:** 8/6/01 9:30:00 AM
Client Sample ID: CY94H-B-020-S **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B SW8015 Analyst: GT						
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/7/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/7/01
Surr: DNOP	88.0	60-124		%REC	1	8/7/01
GRO BY 8015B-DRY WEIGHT BASIS SW8015 Analyst: BDH						
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 9:23:28 AM
Surr: BFB	82.5	74-118		%REC	1	8/8/01 9:23:28 AM

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Hall Environmental Analysis Laboratory

Date: 08-Aug-01

CLIENT: Sandia National Laboratories
 Work Order: 0108037
 Project: Site 94H Burnsite

QC SUMMARY REPORT
 Method Blank

Sample ID: MB-805	Batch ID: 805	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/7/01	Prep Date: 8/6/01					
Client ID:	Run ID: FIDHP_010808A	SeqNo: 39936								
Analyte	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.0									
Motor Oil Range Organics (MRO)	50									
Surr: DNOP	73	0	100	0	73.0	60	124	0		

Sample ID: mb-804	Batch ID: 804	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/7/01 10:24:48 PM	Prep Date: 8/6/01					
Client ID:	Run ID: PIDFID_010807A	SeqNo: 39799								
Analyte	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	5.0									
Surr: BFB	822.3	0	1000	0	82.2	74	118	0		

Sample ID: Reagent Blank 5m	Batch ID: R1789	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/7/01 1:29:17 PM	Prep Date:					
Client ID:	Run ID: PIDFID_010807A	SeqNo: 39800								
Analyte	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	5.0									
Surr: BFB	1033	0	1000	0	103	74	118	0		

Qualifiers: NID - Not Detected at the Reporting Limit
 J - Analyte detected below quantification limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

Date: 08-Aug-01

QC SUMMARY REPORT

Sample Duplicate

CLIENT: Sandia National Laboratories

Work Order: 0108037

Project: Site 94H Burnsite

Sample ID: 0108037-91ADup	Batch ID: 805	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/7/01	Prep Date: 8/6/01						
Client ID: CY94H-B-001-S		Run ID: FIDHP_010806A		SeqNo: 38847							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0	0	0	0	0	0	0	0	0	20
Motor Oil Range Organics (MRO)	ND	50	0	0	0	0	0	0	0	0	20
Surr: DNOP	77	0	0	0	0	0	0	103	28.9	0	0

Sample ID: 0108037-05a	Batch ID: 804	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/8/01 2:30:39 AM	Prep Date: 8/6/01						
Client ID: CY94H-B-005-S		Run ID: PIDFID_010807A		SeqNo: 38806							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	3.98	5.0	0	0	0	0	0	4.04	0	20	J
Surr: BFB	914.3	0	0	0	0	0	0	818.5	11.1	0	0

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Date: 08-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Laboratory Control Spike - generic

CLIENT: Sandia National Laboratories
Work Order: 0108037
Project: Site 94H Burnsite

Sample ID: LCS-806	Batch ID: 806	Test Code: SW8015	Units: mg/Kg	Analyte Data: 8/7/01	Prep Date: 8/6/01						
Client ID:	Run ID: FIDHP_010806A	SeqNo: 39937									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	5.0	50	0	92.0	67.4	117	0			
Surr: DNOP	88	0	100	0	88.0	74	125	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

Date: 08-Aug-01

QC SUMMARY REPORT

Sample Matrix Spike

CLIENT: Sandia National Laboratories
 Work Order: 0108037
 Project: Site 94H Burnsite

Sample ID: 0108037-08AMS Batch ID: 805 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/7/01 Prep Date: 8/6/01
 Client ID: CY94H-B-019-S Run ID: FIDHP_010808A SeqNo: 39948
 Analyte Result PQL SPK value SPK RefVal %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
 Diesel Range Organics (DRO) 43 5.0 0 50 0 86.0 67.4 117 0
 Surr: DNOP 87 0 100 0 87.0 74 125 0

Sample ID: 0108037-05ms Batch ID: 804 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/6/01 3:05:14 AM Prep Date:
 Client ID: PIDFID_010807A SeqNo: 38812
 Analyte Result PQL SPK value SPK RefVal %REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
 Gasoline Range Organics (GRO) 27.43 5.0 25 0 110 85.8 111 0

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CONTRACT LABORATORY ANALYSIS REQUEST CHAIN OF CUSTODY

Internal Lab SARWR No. **AR/COC** **604663**

Batch No. **61321087** Contract No. **SWMU94H**

Dept. No./Mail Stop: **Freshour/Thacker** Project/Task No. **SMO Authorization:**

Project/Task Manager: **94H Burnette** Lab Contact: **S Hellerbeck 605-345-3375**

Project Name: **#3** Lab Destination: **Hill**

Record Center Code: **CFO 107-01** SMO Contract Phone: **610 605-844-3110**

Logbook Ref. No.: **#3** Senior Report to SMO: **S Jensen 605-844-3184**

Service Order No. **CFO 107-01**

Location		Tech Area		Reference LOV (available at SMO)		Parameter & Method Requested		Lab Sample ID						
Building	NA	Room	NA	ER Sample ID or Sample Location Detail	ER Site No.	Begin/Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Volume	Preserve All @ 4C	Collection Method	Sample Type	Lab Sample ID
				CY94H-B-001-S	94H	4.5	080601 0956	S	G	4oz	None	G	SA	DRO(8015) modified & GRO <i>2/10/03</i>
				CY94H-B-002-S	94H	4.5	080601 1000	S	G	4oz	None	G	SA	DRO(8015) modified & GRO
				CY94H-B-003-S	94H	4.6	080601 1033	S	G	4oz	None	G	SA	DRO(8015) modified & GRO
				CY94H-B-004-S	94H	3.8	080601 1038	S	G	4oz	None	G	SA	DRO(8015) modified & GRO
				CY94H-B-005-S	94H	4.5	080601 1050	S	G	4oz	None	G	SA	DRO(8015) modified & GRO
				CY94H-B-006-S	94H	5	080601 1059	S	G	4oz	None	G	SA	DRO(8015) modified & GRO
				CY94H-B-007-S	94H	5	080601 1128	S	G	4oz	None	G	SA	DRO(8015) modified & GRO

RMMA Yes No Ref. No. Return to Client Disposal by lab

Sample Disposal 7 Day 15 Day 30 Day

Turnaround Time 7 Day 15 Day 30 Day

Return Samples By: Negotiated TAT Please send report to:

Name: **M Sanchez** Signature: *M Sanchez* Company/Organization/Phone/Cellular: **Western/6135/845-3267**

Special Instructions/QC Requirements: **24 Hour Turn Around**

EDD Yes No No

Raw Data Package Yes No

1. Relinquished by *Margaret Sanchez* Org. *6135* Date *08/06/03* Time *1330*

2. Relinquished by *Chae Hwa* Org. *6135* Date *10/01* Time *1330*

3. Relinquished by _____ Org. _____ Date _____ Time _____

4. Relinquished by _____ Org. _____ Date _____ Time _____

5. Relinquished by _____ Org. _____ Date _____ Time _____

6. Relinquished by _____ Org. _____ Date _____ Time _____

***7 & 15 Day Turnaround Time: ERCL requires prior notification.**



Hall Environmental Analysis Laboratory

COVER LETTER

August 13, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burnsite

Order No.: 0108044

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 13 samples on 8/7/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

Mark Thacker

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108044

Lab ID: 0108044-01

Collection Date: 8/7/01 10:13:00 AM

Client Sample ID: CY94H-B-008-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	70.0	60-124		%REC	1	8/6/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 7:31:26 PM
Surr: BFB	68.9	74-118		%REC	1	8/8/01 7:31:26 PM

Lab ID: 0108044-02

Collection Date: 8/7/01 10:17:00 AM

Client Sample ID: CY94H-B-009-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	68.0	60-124		%REC	1	8/6/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 8:08:23 PM
Surr: BFB	96.2	74-118		%REC	1	8/8/01 8:08:23 PM

Lab ID: 0108044-03

Collection Date: 8/7/01 10:24:00 AM

Client Sample ID: CY94H-B-010-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	58.0	60-124	S	%REC	1	8/6/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 8:45:03 PM
Surr: BFB	84.9	74-118		%REC	1	8/8/01 8:45:03 PM

Qualifiers:
 ND - Not Detected at the Reporting Limit
 I - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories Lab Order: 0108044
 Project: Site 94H Burnsite

Lab ID: 0108044-04 Collection Date: 8/7/01 10:27:00 AM
 Client Sample ID: CY94H-B-011-S Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: GT		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/6/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/6/01
Surr: DNOP	66.0	60-124		%REC	1	8/6/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 9:21:18 PM
Surr: BFB	82.0	74-118		%REC	1	8/8/01 9:21:18 PM

Lab ID: 0108044-05 Collection Date: 8/7/01 10:43:00 AM
 Client Sample ID: CY94H-B-012-S Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	61.0	60-124		%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 11:43:15 PM
Surr: BFB	87.3	74-118		%REC	1	8/9/01 3:07:07 PM

Lab ID: 0108044-06 Collection Date: 8/7/01 10:50:00 AM
 Client Sample ID: CY94H-B-013-S Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	53.0	60-124	S	%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 12:18:09 AM
Surr: BFB	81.8	74-118		%REC	1	8/9/01 12:18:09 AM

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108044

Lab ID: 0108044-07

Collection Date: 8/7/01 11:30:00 AM

Client Sample ID: CY94H-B-014-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	63.0	60-124		%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 12:52:58 AM
Surr: BFB	86.4	74-118		%REC	1	8/9/01 12:52:58 AM

Lab ID: 0108044-08

Collection Date: 8/7/01 11:36:00 AM

Client Sample ID: CY94H-B-015-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	64.0	60-124		%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 1:27:43 AM
Surr: BFB	81.5	74-118		%REC	1	8/9/01 1:27:43 AM

Lab ID: 0108044-09

Collection Date: 8/7/01 10:56:00 AM

Client Sample ID: CY94H-SW-021-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	53.0	60-124	S	%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 2:02:21 AM
Surr: BFB	86.7	74-118		%REC	1	8/9/01 2:02:21 AM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsitz

Lab Order: 0108044

Lab ID: 0108044-10

Collection Date: 8/7/01 11:02:00 AM

Client Sample ID: CY94H-SW-022-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	57.0	60-124	S	%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 2:36:54 AM
Surr: BFB	79.4	74-118		%REC	1	8/9/01 2:36:54 AM

Lab ID: 0108044-11

Collection Date: 8/7/01 11:11:00 AM

Client Sample ID: CY94H-SW-023-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	49.0	60-124	S	%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 3:11:22 AM
Surr: BFB	85.4	74-118		%REC	1	8/9/01 3:48:31 PM

Lab ID: 0108044-12

Collection Date: 8/7/01 11:07:00 AM

Client Sample ID: CY94H-SW-024-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	55.0	60-124	S	%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 3:45:50 AM
Surr: BFB	80.7	74-118		%REC	1	8/9/01 3:45:50 AM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108044

Lab ID: 0108044-13

Collection Date: 8/7/01 12:47:00 PM

Client Sample ID: CY94H-SW-025-S*

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015				Analyst: JLS
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	67.0	60-124		%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015				Analyst: BDH
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 6:02:48 AM
Surr: BFB	76.9	74-118		%REC	1	8/9/01 6:02:48 AM

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

QC SUMMARY REPORT

Method Blank

CLIENT: Sandia National Laboratories
 Work Order: 0108044
 Project: Site 94H Burnsite

Sample ID: MB-814 Batch ID: 814 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/8/01 Prep Date: 8/8/01
 Client ID: Run ID: FIDHP_010808A SeqNo: 38853

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0									
Motor Oil Range Organics (MRO)	ND	50									
Surr: DNOP	73	0	100	0	73.0	50	124	0			

Sample ID: mb-811 Batch ID: 811 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/8/01 8:35:14 PM Prep Date: 8/7/01
 Client ID: Run ID: PIDFID_010808A SeqNo: 40108

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	4.12	5.0									
Surr: BFB	914	0	1000	0	91.4	74	118	0			

Sample ID: Reagent Blank 5m Batch ID: R1815 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/9/01 11:21:28 AM Prep Date:
 Client ID: Run ID: PIDFID_010809A SeqNo: 40188

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0									
Surr: BFB	1041	0	1000	0	104	74	118	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 I - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Date: 13-Aug-01

Hall Environmental Analysis Laboratory

CLIENT: Sandia National Laboratories
Work Order: 0108044
Project: Site 94H Burnsite

QC SUMMARY REPORT

Sample Duplicate

Sample ID:	0108044-02Adup	Batch ID:	814	Test Code:	SW8015	Units:	mg/Kg	Analysis Date:	8/8/01	SeqNo:	40198	Prep Date:	8/8/01
Client ID:	CY94H-B-009-S	Run ID:	FIDHP_010808B	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte		Result											
Diesel Range Organics (DRO)		ND		5.0	0	0	0	0	0	0	0	0	20
Motor Oil Range Organics (MRO)		ND		50	0	0	0	0	0	0	0	0	20
Surr: DINOP		62		0	0	0	0	0	0	68	8.23	0	0

Sample ID:	0108044-04a dup	Batch ID:	811	Test Code:	SW8015	Units:	mg/Kg	Analysis Date:	8/8/01 9:57:16 PM	SeqNo:	40121	Prep Date:	
Client ID:	CY94H-B-011-S	Run ID:	PIDFID_010808A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte		Result											
Gasoline Range Organics (GRO)		ND		5.0	0	0	0	0	0	0	0	0	20
Surr: BFB		899		0	0	0	0	0	0	819.9	9.20	0	0

Sample ID:	0108048-01a	Batch ID:	R1815	Test Code:	SW8015	Units:	mg/Kg	Analysis Date:	8/9/01 8:20:12 PM	SeqNo:	40221	Prep Date:	
Client ID:		Run ID:	PIDFID_010809A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte		Result											
Gasoline Range Organics (GRO)		ND		5.0	0	0	0	0	0	0	0	0	20
Surr: BFB		840.1		0	0	0	0	0	0	855	1.76	0	0

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory

Date: 13-Aug-01

QC SUMMARY REPORT

Sample Matrix Spike

CLIENT: Sandia National Laboratories
 Work Order: 0108044
 Project: Site 94H Burnsite

Sample ID: 0108044-11Ams Batch ID: 814 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/8/01 Prep Date: 8/8/01
 Client ID: CY94H-SW-023-S Run ID: FIDHP_010808B SeqNo: 40199

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	5.0	50	0	86.0	67.4	117	0			
Surr: DNOP	63	0	100	0	63.0	74	125	0			S

Sample ID: 0108044-04a ms Batch ID: 811 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/8/01 10:32:54 PM Prep Date:
 Client ID: CY94H-B-011-S Run ID: PIDFID_010808A SeqNo: 40123

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27.02	5.0	25	0	108	85.8	111	0			

Sample ID: 0108048-01ms Batch ID: R1815 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/9/01 6:57:36 PM Prep Date:
 Client ID: Run ID: PIDFID_010809A SeqNo: 40223

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24.89	5.0	25	0	98.6	85.8	111	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CONTRACT LABORATORY ANALYSIS REQUEST CHAIN OF CUSTODY

Internal Lab

SAR/WR No.

AR/COC

604665

Dept. No./Mail Stop: 6132/1087 Project/Task Manager: Freshour/Thacker Project Name: 94H Burnelle Record Center Code: #3 Logbook Ref. No.: CFO 107-01 Service Order No. Tech Area		Contract No.: SWMU94H Project/Task No.: SMO Authorization:									
Lab Contact: S. Hallenback 505-345-3975 Lab Destination: Hall SMO Contact/Phone: D. Salini 505-844-3110 Send Report to SMO: S. Jensen 505-844-3194		Waste Characterization -RCRA Date- <input type="checkbox"/> Sent to Preliminary Report to <input type="checkbox"/> Validation Required <input type="checkbox"/> Released by COC No.:									
Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800, MS-D154 Albuquerque, NM, 87185-0154											
Reference LOV (available at SMO)											
Sample No.-Fraction	ER Sample ID or Sample Location Detail	ER Site No.	Date/Time (hr) Collected	Sample Matrix	Container Type	Volume	Preserve Alt@4C	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
056707-001	CY94H-B-008-S	94H	080701 1013	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	0765974
056708-001	CY94H-B-009-S	94H	080701 1017	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
056709-001	CY94H-B-010-S	94H	080701 1024	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
056710-001	CY94H-B-011-S	94H	080701 1027	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
057021-001	CY94H-B-012-S	94H	080701 1043	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
057022-001	CY94H-B-013-S	94H	080701 1050	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
057023-001	CY94H-B-014-S	94H	080701 1130	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
057024-001	CY94H-B-015-S	94H	080701 1136	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No. _____ Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by lab _____ Turnaround Time <input type="checkbox"/> 7 Day <input type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day _____ Return Samples By: <input type="checkbox"/> Negotiated TAT _____ Name: M Sanchez Signature: <i>M Sanchez</i> Infill: Weston/6135/845-3267 Company/Organization/Phone/Cellular: M Sanchez fax 284-3174 Special Instructions/QC Requirements: EDD <input type="checkbox"/> Yes <input type="checkbox"/> No Raw Data Package <input type="checkbox"/> Yes <input type="checkbox"/> No *Please send report to: 24 Hour Turn Around M Thacker MS 1088 Ph 284-2576 Fax 284-2617 mssthack@sandia.gov											
Sample Team Members 1. Relinquished by <i>Thacker</i> Org. <i>MS</i> Date <i>8/20/01</i> Time <i>1500</i> 1. Received by <i>Carol Spivey</i> Org. <i>MS</i> Date <i>8/20/01</i> Time <i>1500</i> 2. Relinquished by _____ Org. _____ Date _____ Time _____ 2. Received by _____ Org. _____ Date _____ Time _____ 3. Relinquished by _____ Org. _____ Date _____ Time _____ 3. Received by _____ Org. _____ Date _____ Time _____											

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

AR/COC **604664**

Waste Characterization
 RCRA Dates
 Send Preliminary report to
 Validation Required
 Released by COC No.:

Contract No.: SWMU84H
 Project/Task No.:
 SMO Authorization:

S Hallenbeck 505-845-3875
 Mail:
 D Salmi 505-844-3110
 SMO Contact/Phone:
 Send Report to SMO: S Jensen 505-844-3184

BIM To: Sandia National Labs (Accounts Payable)
 P.O. Box 5800, MS-0154
 Albuquerque, NM., 87185-0154

Sample No.-Fracton	ER Sample ID or Sample Location Detail	NA	Room	Tech Area	Beginning Depth (ft)	ER Site No.	Data Collected	Sample Matrix	Container Type	Volume	Preserve All@QC	Collection Method	Sample Type	Paramater & Method Requested	Lab Sample ID
058985-001	CY94H-SW-021-S				11.6	94H	080701 1056	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
058986-001	CY94H-SW-022-S				11.0	94H	080701 1102	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
058987-001	CY94H-SW-023-S				10.4	94H	080701 1111	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
058988-001	CY94H-SW-024-S				16.5	94H	080701 1107	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	
058989-001	CY94H-SW-025-S*				3.6	94H	080701 1247	S	G	4oz	None	G	SA	DRO(8015) modified & GRO	

Yes No Ref. No.
 Return to Client Disposal by lab
 7 Day 15 Day 30 Day

Turnaround Time: 7 Day 15 Day 30 Day

Negotiated TAT: _____

Return Samples By: _____

Name: M Sanchez Signature: *M Sanchez*
 Company/Organization/Phone/Cellular: Western/6135/845-3267
 Email: msanchez@sandia.gov
 M Sanchez fax 284-3174

Special Instructions/QC Requirements:
 EDD Yes No
 Raw Data Package Yes No
 *Please send report to: _____

1. Relinquished by	Org.	Date	Time	4. Relinquished by	Org.	Date	Time
1. Relinquished by <i>M Sanchez</i>		08/09/01	1500	4. Relinquished by			
2. Relinquished by <i>Chad Brown</i>		8/7/01	1500	5. Relinquished by			
3. Relinquished by				6. Relinquished by			

*7 & 15 Day Turnaround Time: ERCL requires prior notification.



**Hall Environmental
Analysis Laboratory**

COVER LETTER

August 14, 2001

Mark Thacker
Sandia National Laboratories
PO Box 5800
MS 1088
Albuquerque, NM 871850221
TEL: (505) 284-2575
FAX (505) 284-2617

RE: Site 94H Burnsité

Order No.: 0108048

Dear Mark Thacker:

Hall Environmental Analysis Laboratory received 8 samples on 8/8/01 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Senior Project Manager
Nancy McDuffie, Assistant Laboratory Manager

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite
Lab Order: 0108048

CASE NARRATIVE

Prep Comments for 5035_S, Sample 0108048-01A: x1 Prep Comments for 5035_S, Sample 0108048-02A: x1 Prep Comments for 5035_S, Sample 0108048-03A: x1 Prep Comments for 5035_S, Sample 0108048-04A: x5 Prep Comments for 5035_S, Sample 0108048-05A: x5 Prep Comments for 5035_S, Sample 0108048-06A: x5 Prep Comments for 5035_S, Sample 0108048-07A: x5 Prep Comments for 5035_S, Sample 0108048-08A: x5

Hall Environmental Analysis Laboratory

Date: 14-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108048

Lab ID: 0108048-01

Collection Date: 8/8/01 9:09:00 AM

Client Sample ID: CY94H-USP-001-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	56.0	60-124	S	%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 5:42:29 PM
Surr: BFB	85.5	74-118		%REC	1	8/9/01 5:42:29 PM

Lab ID: 0108048-02

Collection Date: 8/8/01 9:12:00 AM

Client Sample ID: CY94H-USP-002-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	54.0	60-124	S	%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/8/01 7:34:18 PM
Surr: BFB	91.9	74-118		%REC	1	8/9/01 7:34:18 PM

Lab ID: 0108048-03

Collection Date: 8/8/01 9:23:00 AM

Client Sample ID: CY94H-USP-003-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	62.0	60-124		%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 8:10:59 PM
Surr: BFB	93.3	74-118		%REC	1	8/9/01 8:10:59 PM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Hall Environmental Analysis Laboratory

Date: 14-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108048

Lab ID: 0108048-04

Collection Date: 8/8/01 9:26:00 AM

Client Sample ID: CY94H-USP-004-S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	59.0	60-124	S	%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 9:22:55 PM
Surr: BFB	85.7	74-118		%REC	1	8/9/01 9:22:55 PM

Lab ID: 0108048-05

Collection Date: 8/8/01 10:18:00 AM

Client Sample ID: CY94H-SW-026S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	65.0	60-124		%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 9:58:41 PM
Surr: BFB	86.9	74-118		%REC	1	8/9/01 9:58:41 PM

Lab ID: 0108048-06

Collection Date: 8/8/01 10:29:00 AM

Client Sample ID: CY94H-SW-027S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	67.0	60-124		%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 10:34:14 PM
Surr: BFB	85.6	74-118		%REC	1	8/9/01 10:34:14 PM

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range



Hall Environmental Analysis Laboratory

Date: 14-Aug-01

CLIENT: Sandia National Laboratories
Project: Site 94H Burnsite

Lab Order: 0108048

Lab ID: 0108048-07

Collection Date: 8/8/01 10:33:00 AM

Client Sample ID: CY94H-SW-028S

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	ND	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	67.0	60-124		%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/9/01 11:09:38 PM
Surr: BFB	85.2	74-118		%REC	1	8/9/01 11:09:38 PM

Lab ID: 0108048-08

Collection Date: 8/8/01 10:21:00 AM

Client Sample ID: CY94H-B-016-S*

Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DRO BY 8015B		SW8015		Analyst: JLS		
Diesel Range Organics (DRO)	8.0	5.0		mg/Kg	1	8/8/01
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/8/01
Surr: DNOP	65.0	60-124		%REC	1	8/8/01
GRO BY 8015B-DRY WEIGHT BASIS		SW8015		Analyst: BDH		
Gasoline Range Organics (GRO)	4	5.0	J	mg/Kg	1	8/9/01 11:44:55 PM
Surr: BFB	90.4	74-118		%REC	1	8/9/01 11:44:55 PM

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Date: 14-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

Method Blank

CLIENT: Sandia National Laboratories
Work Order: 0108048
Project: Site 94H Burnsite

Sample ID: MB-819	Batch ID: 819	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/8/01	Prep Date: 8/8/01						
Client ID:	Run ID: FIDHP_010809C	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte	Result	5.0									
Diesel Range Organics (DRO)	ND	5.0									S
Motor Oil Range Organics (MRO)	ND	60			58.0	60	124	0			
Surr: DNDP	58	0	100	0							

Sample ID: Reagent Blank 8m	Batch ID: R1815	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/9/01 11:21:25 AM	Prep Date:						
Client ID:	Run ID: PIDFID_010809A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte	Result	5.0									
Gasoline Range Organics (GRO)	ND	5.0			104	74	118	0			
Surr: BFB	1041	0	1000	0							

Sample ID: mb-818	Batch ID: 818	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/9/01 5:04:34 PM	Prep Date: 8/8/01						
Client ID:	Run ID: PIDFID_010809A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Analyte	Result	5.0									
Gasoline Range Organics (GRO)	ND	5.0			93.4	74	118	0			
Surr: BFB	933.6	0	1000	0							

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Date: 14-Aug-01

Hall Environmental Analysis Laboratory

QC SUMMARY REPORT

CLIENT: Sandia National Laboratories

Work Order: 0108048

Sample Duplicate

Project: Site 94H Burnsite

Sample ID: 0108048-02ADup	Batch ID: 819	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/8/01	Prep Date: 8/8/01
Client ID: CY94H-USP-002-S		Run ID: FIDHP_010808C		SeqNo: 40242	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	5.0	0	0	0	0	0	0	0		
Motor Oil Range Organics (MRO)	ND	50	0	0	0	0	0	0	0		
Surr: DNOP	71	0	100	0	71.0	0	0	0	0		S

Sample ID: 0108048-01a	Batch ID: R1815	Test Code: SW8015	Units: mg/Kg	Analysis Date: 8/8/01 8:20:12 PM	Prep Date:
Client ID: CY94H-USP-001-S		Run ID: PIDFID_010809A		SeqNo: 40221	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0	0	0	0	0	0	0	0	20	
Surr: BFB	840.1	0	0	0	0	0	0	855	1.78	0	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory

Date: 14-Aug-01

CLIENT: Sandia National Laboratories
 Work Order: 0108048
 Project: Site 94H Burnsite

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 0108048-07AMS Batch ID: 818 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/8/01 Prep Date: 8/9/01
 Client ID: CY94H-SW-0285 Run ID: FIDHP_010808C SeqNo: 40248

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	5.0	50	0	94.0	67.4	117	0			
Surr: DNOP	53	0	100	0	53.0	74	125	0			9

Sample ID: 0108048-01ms Batch ID: R1815 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/9/01 6:57:38 PM Prep Date:
 Client ID: PIDFID_010809A Run ID: SeqNo: 40223

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24.88	5.0	25	0	89.6	85.6	111	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory

Date: 14-Aug-01

QC SUMMARY REPORT
Laboratory Control Spike - generic

CLIENT: Sandia National Laboratories
Work Order: 0108048
Project: Site 94H Burnsite

Sample ID: LCS-619 Batch ID: 819 Test Code: SW8015 Units: mg/Kg Analysis Date: 8/8/01 Prep Date: 8/8/01
Client ID: Run ID: FIDHP_010808C SeqNo: 40239

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	5.0	50	0	94.0	67.4	117	0			S
Surr: DNOP	54	0	100	0	54.0	74	125	0			S

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab		SARWR No.		AR/COC		604668	
Batch No. 6132/1087		Contract No. SWMU94H		<input type="checkbox"/> Waste Characterization			
Dept. No./Mail Stop: Freshour/Thacker		Project/Task No.:		-RCRA Dater			
Project Name: 94H Burnsita		SMO Authorization:		<input type="checkbox"/> Send: Preliminary report to			
Record Center Code: #3		Lab Contact: S. Hallenback 505-345-3976		<input type="checkbox"/> Validation Required			
Logbook Ref. No.: GFO 107-01		Lab Destination: Hall		<input type="checkbox"/> Released by COC No.:			
Service Order No.:		SMO Contact/Phone: D. Selmi 505-644-3110		Bill To: Sandia National Labs (Accounts Payable)			
Tech Area		Send Report to SMO: S. Jensen 505-844-3184		P.O. Box 5800, MS-0154			
Building NA		Room NA		Albuquerque, NM., 87185-0154			
ER Sample ID or Sample Location Detail		ER Site No.		Parameter & Method Requested		Lab Sample ID	
Sample No.-Fraction	Beginning Depth (ft)	Date/Time Collected	Container Type	Volume	Preserve Method	Collection Method	Sample Type
058976-001	N/A	080801 0908	G	4oz	None	G	SA
058977-001	N/A	080801 0912	G	4oz	None	G	SA
058978-001	N/A	080801 0923	G	4oz	None	G	SA
058979-001	N/A	080801 0926	G	4oz	None	G	SA
Reference LOV (available at SMO)							
RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No.		Sample Tracking		Special Instructions/QC Requirements:		EDD <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by lab		Date Entered by		Raw Data Package <input type="checkbox"/> Yes <input type="checkbox"/> No		Please send report to:	
Turnaround Time <input type="checkbox"/> 7 Day <input type="checkbox"/> 15 Day <input type="checkbox"/> 30 Day		Negotiated TAT		24 Hour Turn Around		M Thacker MS 1088 Ph 284-2575 Fax 284-2617	
Return Samples By:		Signature		Company/Organization/Phone/Cellular		msthack@sandia.gov	
Name		M Sanchez		Weston/6135/845-3267		M Sanchez fax 284-3174	
Sample Team Members		Date		Date		Date	
1. Relinquished by		Date		Date		Date	
1. Received by		Date		Date		Date	
2. Relinquished by		Date		Date		Date	
2. Received by		Date		Date		Date	
3. Relinquished by		Date		Date		Date	
3. Received by		Date		Date		Date	

*7 & 15 Day Turnaround Time: ERCL requires prior notification.

Annex 3-E

ANNEX 3-E
Risk Screening Assessment



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SWMU 94H: RISK SCREENING ASSESSMENT REPORT**I. Site Description and History**

Solid Waste Management Unit (SWMU) 94H, the jet propulsion fuel grade 8 (JP-8) Fuel Site, Lurance Canyon Burn Site (LCBS), Operable Unit (OU) 1333, at Sandia National Laboratories/New Mexico (SNL/NM), encompasses approximately 0.5 acre at an elevation of approximately 6,350 feet above sea level. The site is located on the canyon floor alluvium in the closed upper reaches of the Lurance Canyon drainage, on land that is owned by Kirtland Air Force Base (KAFB) and leased to the U.S. Department of Energy (DOE).

SWMU 94H is situated in the immediate vicinity of the Large Open Burn Pool (LOBP) and the former site of the Small Open Burn Pool (SOBP). The LOBP is an active burn unit located approximately 200 feet southeast of the Smoke Emissions Reduction Facility and consists of a 3-foot deep rectangular concrete basin that measures 30 by 60 feet. The basin is lined with concrete/fiber-ceramic material. The SOBP was located approximately 8 feet west of the LOBP. Built in 1992 to reduce the amount of fuel required to perform burn tests in the LOBP, the SOBP was an active burn facility until it was decommissioned in November 2000. The SOBP consisted of a 20-by-20-foot-square concrete basin, that was 3 feet deep and lined with sheet steel. Additional information regarding the LOBP and SOBP is presented in Annex 3-A of the Proposals for No Further Action (NFA), Environmental Restoration (ER) Project, SWMUs 94C, 94G, and 228B (SNL/NM March 2001).

With the exception of one burn test in the LOBP that involved a U1501 accident-resistant container unit that contained U-238 and beryllium (SNL/NM November 1994), burn tests were primarily performed on transportation containers and weapons components that contained no radioactive materials (Paimieri November 1994). Jet propulsion fuel grade 4 (JP-4) or JP-8 was used as the fuel source for the test fires. JP-8 is a technical mixture that contains trace amounts of a number of volatile organic compounds (VOCs). During removal of the SOBP and associated piping, approximately 295 cubic yards (yd³) of JP-8-contaminated soil were removed from a portion of the excavation. Diesel range organics (DRO) were detected in soil samples collected from the base of the excavation where this soil had been removed, indicating that contamination was present below the excavation grade.

The vicinity of SWMU 94H is unpaved with some native vegetation, and no storm sewers are used to direct surface water. Lurance Canyon drains to the west and intersects the Tijeras Arroyo floodplain, which is the most significant surface-water drainage feature on KAFB. The arroyo originates in Tijeras Canyon, which is bounded by the Sandia Mountains to the north and the Manzano Mountains to the south, and trends southwest, eventually draining into the Rio Grande.

The annual precipitation for the area, as measured at the Albuquerque International Sunport, is 8.1 inches. No springs or perennial surface-water bodies are located in the immediate vicinity of the site. During most rainfall events, rainfall quickly infiltrates the soil at SWMU 94H. However, virtually all of the moisture subsequently undergoes evapotranspiration. The estimates of evapotranspiration for the KAFB area range from 95 to 99 percent of the annual rainfall. Most rainwater probably evaporates before it reaches the bedrock underlying the fuel site.

Based upon data from the Lurance Canyon wells, the groundwater beneath Lurance Canyon occurs under semiconfined to confined conditions in fractured metamorphic rock. The depth to groundwater in the vicinity of SWMU 94H is approximately 200 feet below ground surface (bgs). The only water-supply well within 5 miles is the Burn Site Production Well that is no longer used as a water supply well due to nitrate contamination.

ii. Data Quality Objectives

The Data Quality Objectives (DQOs) presented in the OU 1333 Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) work plan (SNL/NM September 1995), the SWMU 94H Field Implementation Plan (FIP) (SNL/NM June 2001a), and the SWMU 94H Voluntary Corrective Action (VCA) plan (SNL/NM June 2001b) identified the site-specific sample locations, sample depths, sampling procedures, and analytical requirements. The DQOs outlined the Quality Assurance (QA)/Quality Control (QC) requirements necessary for producing defensible analytical data suitable for risk assessment purposes. The RFI sampling was designed to determine whether contamination was present in the subsurface soils, to characterize the nature and extent of the contamination, and to collect data that would support planning a soil removal VCA. Post-VCA verification samples were collected to confirm that clean-up goals had been met and to provide data to support this risk screening assessment. Table 1 summarizes the rationale for the sampling performed to meet DQOs.

The source of potential constituents of concern (COCs) at SWMU 94H was the release of JP-8 fuel into the subsurface soil. The RFI sampling was conducted to evaluate the nature and extent of the fuel contamination and to collect waste characterization data to assist in planning the VCA. A Geoprobe was used to collect 36 subsurface soil samples from 20 soil borings installed in and around the area of the fuel spill. Severn Trent Laboratories, Inc. (STL) performed the VOC, semivolatiles organic compound (SVOC), Toxicity Characteristic Leaching Procedure (TCLP), and metals analyses on the soil samples. The Radiation Protection Sample Diagnostics (RPSD) Laboratory analyzed three samples utilizing gamma spectroscopy. Hall Environmental Analysis Laboratory (HEAL) performed DRO analyses on the most contaminated samples collected from the geoprobe boreholes for site characterization. Waste characterization data indicated that the soils were nonhazardous and disposal of soil during the VCA could be accomplished according to state regulations governing the disposal of petroleum-contaminated soil. The analytical results were evaluated, and it was determined that further evaluation of contamination would be best achieved utilizing the DRO results.

A VCA clean-up goal of 100 milligrams (mg)/kilogram (kg) DRO had been established with the New Mexico Environment Department (NMED). During the SWMU 94H VCA, all contaminated soil identified during the RFI was excavated and disposed of at an approved facility. Approximately 1,200 yd³ of fuel-contaminated soil was excavated during the VCA. After the excavation was completed, 45 VCA soil samples were collected from the sidewalls and bottom of the excavation and analyzed for DRO and gasoline range organics (GRO). Eight samples also were analyzed for VOCs, SVOCs, metals, and gross alpha/beta in order to collect data to support the post-VCA risk screening assessment. None of the soil samples collected from the sidewalls or bottom of the excavation had concentrations of DRO or GRO greater than the clean-up goal of 100 mg/kg.

Table 1
Summary of Sampling Performed to Meet Data Quality Objectives

SWMU 94H Sampling	Potential COC Source	Number of Sampling Locations	Sample Density (samples/acre)	Sampling Location Rationale
RFI ^a – VOC, SVOC, Metals, Gamma Spec, TCLP sampling	Soil containing residual JP-8	9	18	Determine whether contamination is present in subsurface soil
RFI – DRO/GRO sampling	Soil containing residual JP-8	34	68	Confirm that clean-up goal of 100 mg/kg DRO was achieved
VCA – VOC, SVOC, Metals sampling	Soil containing residual JP-8	8	16	Collect post-VCA verification samples for risk screening data
VCA – DRO/GRO sampling	Soil containing residual JP-8	45	90	Collect post-VCA verification samples for risk screening data

^aSoil excavated and removed. Metals results used in risk screening assessments.

COC = Constituent of concern.

DRO = Diesel range organics.

GRO = Gasoline range organics.

JP-8 = Jet propulsion fuel grade 8.

mg/kg = Milligram(s) per kilogram.

RCRA = Resource Conservation and Recovery Act.

RFI = RCRA Facility Investigation.

SVOC = Semivolatile organic compound.

SWMU = Solid Waste Management Unit.

TCLP = Toxicity Characteristic Leaching Procedure.

VCA = Voluntary Corrective Action.

VOC = Volatile organic compound.

QA/QC samples were collected during the RFI sampling effort according to the ER Project Quality Assurance Project Plan. However, since the soil associated with these investigations was excavated and disposed of at an approved off-site facility, QA/QC data associated with these investigations is not discussed in detail. An equipment blank was collected with the verification samples. A review of these data indicates that the field QA/QC procedures were adequate.

All of the verification sampling results were verified/validated by SNL/NM. The off-site laboratory results from STL were reviewed according to "Data Validation Procedure for Chemical and Radiochemical Data" SNL/NM ER Project Analytical Operating Procedure (AOP 00-03), Rev. 0 (SNL/NM December 1999). The data validation reports are presented in Annex 3-B of the SWMU 94H NFA proposal. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines," Procedure No: RPSD-02-11, Issue No: 02 (SNL/NM July 1996). The gamma-spectroscopy results are presented in Annex 3-C of the NFA proposal. The reviews confirmed that the analytical data

are defensible and therefore acceptable for use in the NFA proposal. Therefore, the DQOs have been fulfilled.

III. Determination of Nature, Rate, and Extent of Contamination

III.1 Introduction

The determination of the nature, migration rate, and extent of contamination at SWMU 94H was based upon an initial conceptual model validated during the VCA and post-VCA verification sampling at the site. The initial conceptual model was developed from archival research, soil sampling, aerial photographs, and radiological surveys from other SWMU 94 sites. The DQOs contained in the SWMU 94H FIP and VCA plan identified the sample locations, sample density, sample depth, and analytical requirements. The sample data were subsequently used to develop the final conceptual model for SWMU 94H, which is presented in Section 2.5 of the NFA proposal. The quality of the data used to specifically determine the nature, migration rate, and extent of contamination is described below.

III.2 Nature of Contamination

Both the nature of contamination and the potential for the degradation of COCs at SWMU 94H were evaluated using laboratory analyses of the soil samples (Section IV). Initial COCs included VOCs, SVOCs, metals, TCLP, and radionuclides. However, after reviewing the data associated with the RFI, it was determined that further characterization/verification of clean-up goals could be achieved utilizing DRO and GRO as the primary analyses. A limited number of verification samples were collected in order to have data for a post-VCA risk screening assessment. As stated previously, the metals analytical results from the RFI data were used in this risk screening assessment. The analytes and methods listed in Tables 2 and 3 are appropriate and adequate for characterizing the COCs and potential degradation products at SWMU 94H.

III.3 Rate of Contaminant Migration

SWMU 94H is an active site that has been remediated during a VCA. The primary risk pathway is from residual COCs that may have been present in subsurface soil. The rate of COC migration from subsurface soil depends predominantly upon precipitation and occasional surface-water flow, as described in Section V. Data available from the Canyons Test Area Groundwater Investigation (SNL/NM November 2001); numerous SNL/NM monitoring programs for air, water, and radionuclides; various biological surveys; and meteorological monitoring are adequate for characterizing the rate of COC migration at SWMU 94H.

III.4 Extent of Contamination

Contamination at SWMU 94H consisted of fuel-contaminated soil underlying the JP-8 spill area near the SOBP. The soil was visibly contaminated and could be readily identified in the field

Table 2
Number of Confirmatory Soil Samples Collected During the SWMU 94H VCA

Sample type	Number of Samples	Gamma Spectroscopy	VOCs, SVOCs, Metals + Beryllium, Gross Alpha/Beta	DRO/GRO
RFI	45	3	8	34
VCA	52	0	8	44
Analytical laboratory	-	RPSD	STL	HEAL

DRO = Diesel range organics.
 GRO = Gasoline range organics.
 HEAL = Hall Environmental Analysis Laboratory.
 RCRA = Resource Conservation and Recovery Act.
 RFI = RCRA Facility Investigation.
 RPSD = Radiation Protection Sample Diagnostics Laboratory.

STL = Severn Trent Laboratories, Inc.
 SVOC = Semivolatile organic compound.
 SWMU = Solid Waste Management Unit.
 VCA = Voluntary Corrective Action.
 VOC = Volatile organic compound.
 - = Not applicable.

Table 3
Summary of Data Quality Requirements

Analytical Requirement	Data Quality Level	STL	HEAL	RPSD Laboratory
Gamma Spectroscopy EPA Method 901.1	Defensible	not analyzed	not analyzed	3 samples ^a
Gross alpha/Gross beta EPA Method 900.0	Defensible	8 samples ^a	not analyzed	not analyzed
VOCs EPA Method 8260	Defensible	10 samples ^a	not analyzed	not analyzed
RCRA metals + Beryllium EPA Method 6010/7000	Defensible	14 samples ^a	not analyzed	not analyzed
SVOCs EPA Method 8270	Defensible	8 samples ^a	not analyzed	not analyzed
TCLP, VOC, SVOC, metals SW 6010/7000	Defensible	4 samples ^a	not analyzed	not analyzed
DRO/GRO EPA Method 8015 (mod)	Defensible ^b	not analyzed	78 samples ^a	not analyzed

^aThe number of samples does not include QA/QC samples, such as duplicates, trip blanks, and equipment blanks.

^bAnalyzed by HEAL, an off-site laboratory. SNL/NM data validation is not performed on off-site data reports. HEAL is a qualified laboratory as defined under the UST regulations of the State of New Mexico Environmental Improvement Board and the State of New Mexico Water Quality Control Commission regulations.

DRO = Diesel range organics.
 EPA = U.S. Environmental Protection Agency.
 GRO = Gasoline range organics.
 HEAL = Hall Environmental Analysis Laboratory.
 mod = Modified.
 QA/QC = Quality assurance/quality control.
 RCRA = Resource Conservation and Recovery Act.
 RPSD = Radiation Protection Sample Diagnostics.

SNL/NM = Sandia National Laboratories/New Mexico.
 STL = Severn Trent Laboratories.
 SVOC = Semivolatile organic compound.
 SW = Solid waste.
 VOC = Volatile organic compound.
 TCLP = Toxicity Characteristic Leaching Procedure.
 UST = Underground storage tank.

using a photoionization detector. A local laboratory (HEAL) was used to provide quick turnaround DRO and GRO analyses. Approximately 1,200 yd³ of fuel-contaminated soil were removed from an area approximately 65 by 85 feet in areal extent and up to 18 feet in depth. The fuel contamination migrated through soil underlying the spill area but did not reach the top of the fractured bedrock surface. Groundwater monitoring data indicate that fuel-contaminated wastewater has migrated into the fractured bedrock aquifer underlying the site, but the source area was probably a different site (SWMU 94F) rather than SWMU 94H. Verification soil sampling was sufficient to characterize potential residual contamination present after completion of the VCA.

IV. Comparison of COCs to Background Screening Levels

Site history and characterization activities are used to identify potential COCs. The SWMU 94H NFA proposal describes the identification of COCs and the sampling that was conducted in order to determine the concentration levels of those COCs across the site. Generally, COCs that were evaluated in this risk assessment included all detected organic as well as inorganic and radiological COCs for which samples were analyzed. When the detection limit of an organic compound was too high (i.e., could possibly cause an adverse effect to human health or the environment), the compound was retained. Nondetected organic constituents not included in this assessment were determined to have detection limits low enough to ensure protection of human health and the environment. In order to provide conservatism in this risk assessment, the calculation used only the maximum concentration value of each COC found for the entire site. The SNL/NM maximum background concentration (Dinwiddie September 1997, Garcia November 1998) was selected to provide the background screening values listed in Tables 4 and 5. Human health nonradiological COCs also were compared to SNL/NM proposed Subpart S action levels, if appropriate (IT July 1994).

Nonradiological inorganic constituents that are essential nutrients, such as iron, magnesium, calcium, potassium, and sodium, were not included in this risk assessment (EPA 1989). Both radiological and nonradiological COCs were evaluated. The nonradiological COCs evaluated were limited to inorganic compounds because all organic compounds were either not detected or the product of laboratory contamination.

Table 4 lists the nonradiological COCs and Table 5 lists radiological COCs for the human health and ecological risk assessments performed at SWMU 94H. Both tables show the associated SNL/NM maximum background concentration values (Dinwiddie September 1997, Garcia November 1998). Sections VI.4, VII.2, and VII.3 discuss the results presented in Tables 4 and 5 in more detail.

V. Fate and Transport

The primary release of COCs at SWMU 94H occurred to the subsurface soil as a result of the discharge of JP-8 fuel from pipelines entering the northern side of the SOBP. Wind, water, and biota are natural mechanisms of COC transport from the primary release point. Because the fuel discharge occurred in the subsurface, the potentially contaminated soils at this site were generally protected from the strong winds at ground surface. Therefore, wind is not considered a significant transport mechanism for COCs at this site.

Table 4
 Nonradiological COCs for Human Health Risk Assessment at SWMU 94H with Comparison to the Associated SNL/NM Background Screening Value, BCF, Log K_{ow}, and Subpart S Screening Value

COC Name	Maximum Concentration (mg/kg)	SNL/NM Background Concentration (mg/kg) ^a	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K _{ow} (for organic COCs)	Bioaccumulator? ^b (BCF >40, Log K _{ow} >4)	Subpart S Screening Value	Is Individual COC less than 1/10 of the Action Level?
Arsenic	3.3	9.8	Yes	44 ^d	NA	Yes	0.5	No
Barium	159	246	Yes	170 ^e	NA	Yes	6000	Yes
Beryllium	0.99 J	0.76	No	19 ^d	NA	No	0.2	No
Cadmium	0.45	0.84	Yes	84 ^d	NA	Yes	80	Yes
Chromium, total	12	18.8	Yes	16 ^d	NA	No	400 ^f	Yes
Lead	13.3	18.9	Yes	49 ^d	NA	Yes	NA	NA
Mercury	0.009	0.055	Yes	5500 ^d	NA	Yes	20	Yes
Selenium	0.89	2.7	Yes	800 ^g	NA	Yes	400	Yes
Silver	3.9	<0.5	No	0.5 ^d	NA	No	400	Yes

Note: **Bold** indicates the COCs that exceed background screening values and/or are bioaccumulators.

^aFrom Garcia (November 1998) Canyon Area Soils.

^bNMED (March 1998).

^cIT Corporation (July 1994).

^dYanicak (March 1997).

^eNeumann (1976).

^fParameter was nondetect. Concentration is 0.5 of the detection limit.

^gCallahan et al. (1979).

BCF = Bioconcentration factor.

COC = Constituent of concern.

J = Estimated concentration.

K_{ow} = Octanol-water partition coefficient.

Log = Logarithm (base 10).

mg/kg = Milligram(s) per kilogram.

NA = Not applicable.

NMED = New Mexico Environment Department.

SNL/NM = Sandia National Laboratories/New Mexico.

SWMU = Solid Waste Management Unit.

Table 5
Radiological COCs for Human Health and Ecological Risk Assessments at SWMU 94H
with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC Name	Maximum Concentration (pCi/g)	SNL/NM Background Concentration (pCi/g) ^a	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator? ^b (BCF >40)
Th-232	0.83	1.03	Yes	3000 ^c	No ^d
U-238	1.09	2.31	Yes	900 ^c	Yes
U-235	0.103	0.16	Yes	900 ^c	Yes
Cs-137	0.288	0.515	Yes	3000 ^e	Yes

Note: **Bold** indicates COCs that exceed background screening values and/or are bioaccumulators.

^aFrom Dinwiddie (September 1997), Canyons Area Soils.

^bNMED (March 1998).

^cBaker and Soldat (1992).

^dYanicak (March 1997).

^eBCF from Whicker and Schultz (1982).

BCF = Bioconcentration factor.

COC = Constituent of concern.

NMED = New Mexico Environment Department.

pCi/g = Picocurie(s) per gram.

SNL/NM = Sandia National Laboratories/New Mexico.

SWMU = Solid Waste Management Unit.

Water at SWMU 94H is received as precipitation (rain and occasionally snow) that will evaporate at or near the point of contact, infiltrate into the soil, or form runoff. Because the site is now a backfilled excavation and the fuel-contaminated soil was removed during the VCA, runoff will not be a significant transport mechanism at the site. Infiltration of precipitation into the soil at the site is enhanced by the coarse nature of the canyon soil (primarily Tesajo-Millett stony sandy loam [USDA 1977]). COCs potentially remaining in the soil may be leached deeper into the subsurface soil with the percolation of this water through the soil. However, evapotranspiration from the soil will reduce the potential depth of percolation and may reverse the direction of COC migration in the near-surface soil. Based upon observations made during the installation of a piezometer in an arroyo channel approximately 400 feet northwest of SWMU 94H, the alluvium above the bedrock is 57 feet in thickness. Moist soil was observed in the first 5 feet of alluvium, and the remaining 52 feet (to bedrock) were dry. However, during the excavation of the site, bedrock was observed at a depth of only about 18 feet bgs. Groundwater at the site is estimated to be approximately 200 feet bgs based upon the Final Groundwater Investigation Report for the Canyons Test Area (SNL/NM November 2001). Therefore, infiltration is probably not enough to contact groundwater in the area of the LCBS. In addition, the fuel-contaminated soils were excavated and removed from the site. Therefore, infiltration is not considered to be a mechanism for transport of COCs at SWMU 94H.

COCs can enter the food chain via uptake by plant roots. These COCs may be transported to the aboveground tissues and then may be either consumed by herbivores or returned to the soil as litter. Aboveground litter is capable of transport by wind until consumed by decomposer organisms in the soil. Constituents in plant tissues that are consumed by herbivores may be

absorbed into tissues or may be returned to the soil in feces (at the site or transported from the site by the herbivore). A carnivore or scavenger may eat the herbivore and the constituents in the tissues will again be either absorbed or excreted. The potential for transport of the constituents within the food chain is dependent upon both the mobility of the species that comprise the food chain and the potential for the constituent to accumulate in tissues and be transferred across the links in the food chain. Although the natural habitat at SWMU 94H has been disturbed, ruderal plants growing near the site may come into contact with COCs in the soil. Potential herbivores that could feed on these plants include rodents, such as mice and ground squirrels. Therefore, food chain uptake is a potential transport mechanism at this site. However, the small size of the site, the lack of appreciable vegetation, and the degree of disturbance make this an insignificant mechanism of COC transport from the site.

The COCs identified at SWMU 94H include only inorganic analytes. The inorganic COCs are elemental in form and generally are not considered to be degradable. Other transformations of inorganic constituents may include changes in valence (oxidation/reduction reactions), but the rates of these processes are expected to be slow due to the aridity of the environment at this site.

Table 6 summarizes the fate and transport processes that may occur at SWMU 94H. Because the site is now a backfilled excavation, neither wind nor surface-water runoff are expected to be significant mechanisms for COC transport. COCs are not expected to leach into groundwater due to the depth to groundwater in this area and lack of COC source material. Some sparse vegetation and small animals inhabit the site; therefore, uptake into the food chain is possible, but is unlikely to be a significant transport mechanism. The potential for degradation and/or transformation of the COCs also is expected to be low or none at all. Loss through volatilization is expected to be minimal.

Table 6
Summary of Fate and Transport at SWMU 94H

Transport and Fate Mechanism	Existence at Site	Significance
Wind	Yes	Low
Surface runoff	Yes	Low
Migration to groundwater	No	None
Food chain uptake	Yes	Low
Transformation/degradation	No	None

SWMU = Solid Waste Management Unit.

VI. Human Health Risk Screening Assessment

VI.1 Introduction

Human health risk screening assessment of this site includes a number of steps that culminate in a quantitative evaluation of the potential adverse human health effects caused by constituents located at the site. The steps to be discussed include the following:

Step 1.	Site data are described that provide information on the potential COCs, as well as the relevant physical characteristics and properties of the site.
Step 2.	Potential pathways are identified by which a representative population might be exposed to the COCs.
Step 3.	The potential intake of these COCs by the representative population is calculated using a tiered approach. The first component of the tiered approach includes two screening procedures. One screening procedure compares the maximum concentration of the COC to an SNL/NM maximum background screening value. COCs that are not eliminated during the first screening procedure are subjected to a second screening procedure, if applicable, that compares the maximum concentration of the COC to the SNL/NM proposed Subpart S action level.
Step 4.	Toxicological parameters are identified and referenced for COCs that were not eliminated during the screening steps.
Step 5.	Potential toxicity effects (specified as a hazard index [HI]) and estimated excess cancer risks are calculated for nonradiological COCs and background. For radiological COCs, the incremental total effective dose equivalent (TEDE) and incremental estimated cancer risk are calculated by subtracting applicable background concentrations directly from maximum on-site contaminant values. This background subtraction applies only when a radiological COC occurs as contamination and exists as a natural background radionuclide.
Step 6.	These values are compared with guidelines established by the U.S. Environmental Protection Agency (EPA), NMED and DOE to determine whether further evaluation and potential site cleanup are required. Nonradiological COC risk values also are compared to background risk so that an incremental risk can be calculated.
Step 7.	Uncertainties of the above steps are addressed.

VI.2 Step 1. Site Data

Section I of this risk assessment provides the site description and history for SWMU 94H. Section II presents a comparison of results to DQOs. Section III discusses the nature, rate, and extent of contamination.

VI.3 Step 2. Pathway Identification

SWMU 94H has been designated with a future land use scenario of recreational (DOE et al. October 1995) (see Appendix 1 for default exposure pathways and parameters). Because of the location and characteristics of the potential contaminants, the primary pathway for human exposure is considered to be soil ingestion for the nonradiological COCs and direct gamma exposure for the radiological COCs. The inhalation pathway for both nonradiological and radiological COCs is included because the potential exists to inhale dust. Soil ingestion is included for the radiological COCs as well. No water pathways to the groundwater are considered. Depth to groundwater at SWMU 94H is in excess of 200 feet bgs. Because of the lack of surface water or other significant mechanisms for dermal contact, the dermal exposure pathway is not considered significant. No intake routes through plant, meat, or milk ingestion are considered appropriate for the recreational land use scenario. However, plant uptake is considered for the residential land use scenario.

Pathway Identification

Nonradiological Constituents	Radiological Constituents
Soil ingestion	Soil ingestion
Inhalation (dust)	Inhalation (dust)
Plant uptake (residential only)	Plant uptake (residential only)
	Direct gamma

VI.4 Step 3. COC Screening Procedures

This section discusses Step 3, which includes the two screening procedures. The first screening procedure compares the maximum COC concentration to the background screening level. The second screening procedure compares maximum COC concentrations to SNL/NM proposed Subpart S action levels. This second procedure was applied only to COCs that were not eliminated during the first screening procedure.

VI.4.1 Background Screening Procedure

VI.4.1.1 Methodology

Maximum concentrations of nonradiological COCs were compared to the approved SNL/NM maximum screening levels for this area (Dinwiddie September 1997, Garcia November 1998). The SNL/NM maximum background concentration was selected to provide the background screen in Table 4 and used to calculate risk attributable to background in Sections VI.6.2 and VI.7. Only the COCs that either were detected above their respective SNL/NM maximum background screening levels or did not have either a quantifiable or a calculated background screening level were considered in further risk assessment analyses.

For radiological COCs that exceeded the SNL/NM background screening levels, background values were subtracted from the individual maximum radionuclide concentrations. Those that did not exceed these background levels were not carried any further in the risk assessment. This approach is consistent with DOE Order 5400.5, "Radiation Protection of the Public and the Environment" (DOE 1993). Radiological COCs that did not have a background value and were detected above the analytical minimum detectable activity were carried through the risk assessment at maximum concentration levels. The resultant radiological COCs remaining after this step are referred to as background-adjusted radiological COCs.

VI.4.1.2 Results

Tables 4 and 5 show maximum COC concentrations that were compared to the SNL/NM maximum background values (Dinwiddie September 1997, Garcia November 1998) for the SWMU 94H human health risk assessment. For the nonradiological COCs, two constituents (beryllium and silver) were measured at concentrations greater than background screening values.

For the radiological COCs, none of the constituents exhibited activity concentrations greater than background screening values.

VI.4.2 Subpart S Screening Procedure

VI.4.2.1 Methodology

The maximum concentrations of nonradiological COCs not eliminated during the background screening process were compared with action levels (IT July 1994) calculated using methods and equations promulgated in the proposed RCRA Subpart S (EPA 1990) and Risk Assessment Guidance for Superfund (RAGS) (EPA 1989) documentation. Accordingly, all calculations were based upon the assumption that receptor doses from both toxic and potentially carcinogenic compounds result most significantly from ingestion of contaminated soil. Because all of the samples were taken from the surface and near-surface soils, this assumption is considered valid. If there were ten or fewer COCs, and each had a maximum concentration of less than 1/10 the action level, the site was judged to pose no significant health hazard to humans. If there were more than ten COCs, the Subpart S screening procedure was not performed.

VI.4.2.2 Results

One constituent (beryllium) that failed the background screen also failed the Subpart S screening procedure. Therefore, all nonradiological COCs that were not eliminated during the background screening process for SWMU 94H were carried forward in the risk assessment process and an individual hazard quotient (HQ) and excess cancer risk value were calculated for each COC.

Because radiological COCs have no predetermined action levels analogous to proposed Subpart S levels, this step in the screening process was not performed for radiological COCs.

VI.5 Step 4. Identification of Toxicological Parameters

Table 7 lists the nonradiological COCs retained in the risk assessment and the values for the available toxicological information, obtained from the Integrated Risk Information System (IRIS) (EPA 1998a).

VI.6 Step 5. Exposure Assessment and Risk Characterization

Section VI.6.1 describes the exposure assessment for this risk assessment. Section VI.6.2 provides the risk characterization, including the HI and excess cancer risk for both the potential nonradiological COCs and associated background for recreational and residential land uses. The incremental TEDE and incremental estimated cancer risk are provided for the background-adjusted radiological COCs for both recreational and residential land uses.

Table 7
Toxicological Parameter Values for SWMU 94H Nonradiological COCs

COC Name	RfD _o (mg/kg-d)	Confidence ^a	RfD _{inh} (mg/kg-d)	Confidence ^a	SF _o (mg/kg-day) ⁻¹	SF _{inh} (mg/kg-day) ⁻¹	Cancer Class ^b
Beryllium	2.0E-3 ^c	L to M	5.7E-6 ^c	M	-	8.4E+0 ^c	B1
Silver	5.0E-3 ^c	L	-	-	-	-	D

^aConfidence associated with IRIS (EPA 1998a) database values. Confidence: L = low, M = medium.

^bEPA weight-of-evidence classification system for carcinogenicity (EPA 1989) obtained from IRIS (EPA 1998a):

B1 = Probable human carcinogen. Limited human data available.

D = Not classifiable as to human carcinogenicity.

^cToxicological parameter values from IRIS electronic database (EPA 1998a).

COC = Constituent of concern.

EPA = U.S. Environmental Protection Agency.

IRIS = Integrated Risk Information System.

mg/kg-d = Milligram(s) per kilogram per day.

(mg/kg-day)⁻¹ = Per milligram per kilogram per day.

RfD_{inh} = Inhalation chronic reference dose.

RfD_o = Oral chronic reference dose.

SF_{inh} = Inhalation slope factor.

SF_o = Oral slope factor.

SWMU = Solid Waste Management Unit.

- = Information not available.

VI.6.1 Exposure Assessment

Appendix 1 provides the equations and parameter input values used to calculate intake values and subsequent HI and excess cancer risk values for the individual exposure pathways. The appendix shows parameters for both recreational and residential land use scenarios. The equations for nonradiological COCs are based upon the RAGS (EPA 1989). Parameters are based upon information from the RAGS (EPA 1989), as well as other EPA guidance documents, and reflect the reasonable maximum exposure (RME) approach advocated by the RAGS (EPA 1989). For radiological COCs, the coded equations provided in the RESRAD computer code are used to estimate the incremental TEDE and cancer risk for individual exposure pathways.

Further discussion of this process is provided in the *Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD* (Yu et al. 1993).

Although the designated land use scenario for this site is recreational, risk and TEDE values for a residential land use scenario were also evaluated to provide perspective of potential risk to human health under the more restrictive land use scenario. No radiological COCs exceeded background concentrations; therefore, no incremental TEDE was calculated.

VI.6.2 Risk Characterization

Table 8 shows an HI of 0.00 for the SWMU 94H nonradiological COCs and an estimated excess cancer risk of 3E-11 for the designated recreational land use scenario. The numbers

Table 8
Risk Assessment Values for SWMU 94H Nonradiological COCs

COC Name	Maximum Concentration (mg/kg)	Recreational Land Use Scenario ^a		Residential Land Use Scenario ^a	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Beryllium	0.99 J	0.00	3E-11	0.00	7E-10
Silver	3.9	0.00	—	0.16	—
Total		0.00	3E-11	0.2	7E-10

^aFrom EPA (1989).

COC = Constituent of concern.

EPA = U.S. Environmental Protection Agency.

J = Estimated concentration.

mg/kg = Milligram(s) per kilogram.

SWMU = Solid Waste Management Unit.

— = Information not available.

presented include exposure from soil ingestion and dust inhalation for nonradiological COCs. Table 9 shows an HI of 0.00 and an excess cancer risk of 2E-11, assuming the maximum background concentrations of the SWMU 94H associated background constituents for the designated recreational land use scenario.

Table 9
Risk Assessment Values for SWMU 94H Nonradiological Background Constituents

COC Name	Background Concentration ^a (mg/kg)	Recreational Land Use Scenario ^b		Residential Land Use Scenario ^b	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Beryllium	0.75	0.00	2E-11	0.00	6E-10
Silver	<0.5	—	—	—	—
Total		0.00	2E-11	0.00	6E-10

^aFrom Garcia (November 1998), Canyons Area.

^bFrom 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.

No radiological COCs exceeded background concentrations; therefore, no incremental recreational TEDE was calculated for this site.

For the residential land use scenario, the HI for nonradiological COCs is 0.2, and the excess cancer risk is 7E-10 (Table 8). The numbers in the table include exposure from soil ingestion, dust inhalation, and plant uptake. Although EPA (EPA 1991) generally recommends that

inhalation not be included in a residential land use scenario, this pathway is included because of the potential for soil in Albuquerque, New Mexico, to be eroded and, subsequently, for dust to be present in predominantly residential areas. Because of the nature of the local soil, other exposure pathways are not considered (see Appendix 1). Table 9 shows that for the SWMU 94H associated background constituents, the HI is 0.00 and the excess cancer risk is $6E-10$.

No radiological COCs exceeded background concentrations; therefore, no incremental residential TEDE was calculated.

VI.7 Step 6. Comparison of Risk Values to Numerical Guidelines

The human health risk assessment analysis evaluated the potential for adverse health effects for both the recreational land use scenario (the designated land use scenario for this site) and the residential land use scenario.

For the recreational land use scenario, the HI for nonradiological COCs is 0.00 (less than the numerical guideline of 1 suggested in the RAGS [EPA 1989]). Excess cancer risk is estimated at $3E-11$. NMED guidance states that cumulative excess lifetime cancer risk must be less than $1E-5$ (Bearzi January 2001), thus the excess cancer risk for this site is below the suggested acceptable risk value. This assessment also determined risks considering background concentrations of the potential nonradiological COCs for both the recreational and the residential land use scenarios. Assuming the recreational land use scenario, for nonradiological COCs the HI is 0.00 and the excess cancer risk is $2E-11$. Incremental risk is determined by subtracting risk associated with background from potential COC risk. These numbers are not rounded before the difference is determined and, therefore, may appear to be inconsistent with numbers presented in tables and within the text. For conservatism, the background constituent that does not have a quantified background concentration (silver) is assumed to have an HQ of 0.00. Incremental HI is 0.00 and estimated incremental cancer risk is $1.00E-11$ for the recreational land use scenario. These incremental risk calculations indicate insignificant risk to human health from nonradiological COCs under a recreational land use scenario.

No radiological COCs exceeded background concentrations; therefore, no incremental recreational TEDE was calculated.

For the residential land use scenario, the calculated HI for nonradiological COCs is 0.2, which is below the numerical guidance. Excess cancer risk is estimated at $7E-10$. NMED guidance states that cumulative excess lifetime cancer risk must be less than $1E-5$ (Bearzi January 2001), thus the excess cancer risk for this site is below the suggested acceptable risk value. The HI for associated background for the residential land use scenario is 0.00 and the excess cancer risk is estimated at $6E-10$. For the residential land use scenario, the incremental HI is 0.16 and the estimated incremental cancer risk is $1.00E-10$. These incremental risk calculations indicate insignificant risk to human health from nonradiological COCs considering a residential land use scenario.

No radiological COCs exceeded background concentrations; therefore, no incremental residential TEDE was calculated.

VI.8 Step 7. Uncertainty Discussion

The determination of the nature, rate, and extent of contamination at SWMU 94H was based upon an initial conceptual model that was validated with sampling conducted across the site. The VCA and verification sampling were implemented in accordance with the SWMU 94H FIP (SNL/NM June 2001). The DQOs contained in the FIP are appropriate for use in risk screening assessments. The data collected, based upon sample location, density, and depth, are representative of the site. The analytical requirements and results satisfy the DQOs. Data quality was verified/validated in accordance with SNL/NM procedures (SNL/NM December 1999, SNL/NM July 1996). Therefore, there is no uncertainty associated with the data quality used to perform the risk screening assessment at SWMU 94H.

Because of the location, history of the site, and future land use (DOE et al. October 1995), there is low uncertainty in both the land use scenario and potentially affected populations that were considered in performing the risk assessment analysis. Because the COCs are found in surface and near-surface soils, and because of the location and physical characteristics of the site, there is little uncertainty in the exposure pathways relevant to the analysis.

An RME approach was used to calculate the risk assessment values. This means that the parameter values in the calculations are conservative and that calculated intakes are probably overestimates. Maximum values of COC concentrations measured in soil samples are used to provide conservative results. It should be noted that metals sampling was performed in the soil that was identified as contaminated and later removed from SWMU 94H.

Table 7 shows the uncertainties (confidence level) in nonradiological toxicological parameter values. There is a mixture of estimated values and values from the IRIS (EPA 1998a), Health Effects Assessment Summary Tables (HEAST) (EPA 1997a), the EPA Region 3 (EPA 1997b), and EPA Region 9 (EPA 1996) electronic databases. Where values are not provided, information is not available from these sources. Because of the conservative nature of the RME approach, uncertainties in toxicological values are not expected to change the conclusions of the risk assessment analysis.

Risk assessment values for nonradiological COCs are within the acceptable range for both the recreational and residential land use scenarios compared to established numerical guidance for human health.

No radiological COCs exceeded background screening values. Therefore, no incremental TEDE was calculated. For radiological COCs, the conclusion of the risk assessment is that potential effects on human health for both the recreational and residential land use scenarios represent only a small fraction of the estimated 360 millirems/year received by the average U.S. population (NCRP 1987).

The overall uncertainty in all of the steps in the risk assessment process is not considered to be significant with respect to the conclusion reached.

VI.9 Summary

SWMU 94H contains identified COCs consisting of some inorganic and radiological compounds. Because of the location of the site, the designated recreational land use scenario, and the nature of contamination, potential exposure pathways identified for this site included soil ingestion and dust inhalation. Plant uptake was included as an exposure pathway for the residential land use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for nonradiological COCs show that for the recreational land use scenario, the HI (0.00) is significantly lower than the accepted numerical guidance from EPA. Excess cancer risk ($3E-11$) is also below the acceptable risk value provided by NMED for a recreational land use scenario (Bearzi January 2001). The incremental HI is 0.00, and the incremental cancer risk is $1.00E-11$ for the recreational land use scenario. Incremental risk calculations indicate insignificant risk to human health for the recreational land use scenario.

No radiological COCs exceeded background screening values. Therefore, no incremental TEDE was calculated. Uncertainties associated with the calculations are considered small relative to the conservatism of the risk assessment analysis. Therefore, it is concluded that this site poses an insignificant risk to human health under both the recreational and residential land use scenarios.

VII. Ecological Risk Screening Assessment

VII.1 Introduction

This section addresses the ecological risks associated with exposure to constituents of potential ecological concern (COPEC) in soil at SWMU 94H. A component of the NMED Risk-Based Decision Tree (NMED March 1998) is to conduct an ecological screening assessment that corresponds with that presented in EPA's Ecological RAGS (EPA 1997c). The current methodology is tiered and contains an initial scoping assessment followed by a more detailed screening assessment. Initial components of NMED's decision tree (a discussion of DQOs, data assessment, and evaluations of bioaccumulation as well as fate and transport potential) are addressed in previous sections of this report. Following the completion of the scoping assessment, a determination is made as to whether a more detailed examination of potential ecological risk is necessary. If deemed necessary, the scoping assessment proceeds to a screening assessment, whereby a more quantitative estimate of ecological risk is conducted. Although this assessment incorporates conservatisms in the estimation of ecological risks, ecological relevance and professional judgment also are used as recommended by EPA (EPA 1998b) to ensure that predicted exposures of selected ecological receptors reflect those reasonably expected to occur at the site.

VII.2 Scoping Assessment

The scoping assessment focuses primarily on the likelihood of exposure of biota at or adjacent to the site to be exposed to constituents associated with site activities. Included in this section are an evaluation of existing data and a comparison of maximum detected concentrations to

background concentrations, examination of bioaccumulation potential, and fate and transport potential. A scoping risk-management decision (Section VII.2.4) involves summarizing the scoping results and determining whether further examination of potential ecological impacts is necessary.

VII.2.1 Data Assessment

As indicated in Section IV (Tables 4 and 5), inorganic constituents in soil within the 0- to 5-foot-depth interval that exceeded background concentrations were as follows:

- Beryllium
- Silver

VII.2.2 Bioaccumulation

Among the COPECs listed in Section VII.2.1, none are considered to have bioaccumulation potential in aquatic environments (Section IV, Tables 4 and 5).

It should be noted, however, that as directed by NMED (NMED March 1998), bioaccumulation for inorganic constituents is assessed exclusively based upon maximum reported bioconcentration factors (BCF) for aquatic species. Because only aquatic BCFs are used to evaluate the bioaccumulation potential for metals, bioaccumulation in terrestrial species is likely to be overpredicted.

VII.2.3 Fate and Transport Potential

The potential for the COPECs to move from the source of contamination to other media or biota is discussed in Section V. As noted in Table 6 (Section V), wind, surface water, and food chain uptake are expected to be of low significance as transport mechanisms for COPECs at this site and migration to groundwater is not anticipated. Degradation and/or transformation for the inorganic COPECs and radionuclides are expected to be of no significance.

VII.2.4 Scoping Risk-Management Decision

Based upon information gathered through the scoping assessment, it was concluded that complete ecological pathways may be associated with SWMU 94H and that COPECs also exist at the site. As a consequence, a screening assessment was deemed necessary to predict the potential level of ecological risk associated with the site.

VII.3 Screening Assessment

As concluded in Section VII.2.4, both complete ecological pathways and COPECs are associated with SWMU 94H. The screening assessment performed for the site involves a quantitative estimate of current ecological risks using exposure models in association with

exposure parameters and toxicity information obtained from the literature. The estimation of potential ecological risks is conservative to ensure that ecological risks are not underpredicted.

Components within the screening assessment include the following:

- **Problem Formulation**—sets the stage for the evaluation of potential exposure and risk.
- **Exposure Estimation**—provides a quantitative estimate of potential exposure.
- **Ecological Effects Evaluation**—presents benchmarks used to gauge the toxicity of COPECs to specific receptors.
- **Risk Characterization**—characterizes the ecological risk associated with exposure of the receptors to environmental media at the site.
- **Uncertainty Assessment**—discusses uncertainties associated with the estimation of exposure and risk.
- **Risk Interpretation**—evaluates ecological risk in terms of HQs and ecological significance.
- **Screening Assessment Scientific/Management Decision Point**—presents the decision to risk managers based upon the results of the screening assessment.

VII.3.1 Problem Formulation

Problem formulation is the initial stage of the screening assessment that provides the introduction to the risk evaluation process. Components that are addressed in this section include a discussion of ecological pathways and the ecological setting, identification of COPECs, and selection of ecological receptors. The conceptual model, ecological food webs, and ecological endpoints (other components commonly addressed in a screening assessment) are presented in the "Predictive Ecological Risk Assessment Methodology for SNL/NM ER Program" (IT July 1998) and are not duplicated here.

VII.3.1.1 Ecological Pathways and Setting

SWMU 94H is less than 0.5 acre in size. The LCBS is located in a woodland habitat; however, the natural vegetation at SWMU 94H was removed and the soil was highly disturbed during its operational use. Wildlife use the area, but the small size and disturbed nature of the site make significant transfers of COPECs through the food chain unlikely. Biological and sensitive species surveys of the entire LCBS were conducted in 1991 (Biggs May 1991, Biggs August 1991). No sensitive species were reported to exist at this facility. Although the gray vireo (*Vireo vicinior*), a New Mexico threatened species, has been recorded in the woodland habitats of Lurance Canyon (NMNHP 1995), this species is not known to be present at the LCBS.

Complete ecological pathways may exist at this site through the exposure of plants and wildlife to COPECs in soil. It was assumed that direct uptake of COPECs from the soil was the major route of exposure for plants and that exposure of plants to wind-blown soil was minor. Exposure modeling for the wildlife receptors was limited to the food and soil ingestion pathways and external radiation. Because of the lack of surface water at this site, exposure to COPECs through the ingestion of surface water was considered insignificant. Inhalation and dermal contact also were considered insignificant pathways with respect to ingestion (Sample and Suter 1994). Groundwater is not expected to be affected by COCs at this site.

VII.3.1.2 COPECs

COPECs for SWMU 94H are listed in Section VII.2.1. The COPECs are limited to inorganic constituents, which include both radiological and nonradiological analytes. No organic analytes were detected, and, therefore, no organic constituents were identified as COPECs. The concentrations of inorganic analytes detected at this site were screened against background concentrations (see Section IV) and those that exceeded the approved SNL/NM background screening levels (Dinwiddie September 1997, Garcia November 1998) for the area were considered to be COPECs. Nonradiological inorganic constituents that are essential nutrients, such as iron, magnesium, calcium, potassium, and sodium, were not included in this risk assessment as set forth by EPA (EPA 1989). In order to provide conservatism, this ecological risk assessment was based upon the maximum soil concentrations of the COPECs measured in the surface soil. Tables 4 and 5 present maximum concentrations for the COPECs.

VII.3.1.3 Ecological Receptors

A nonspecific perennial plant was selected as the receptor to represent plant species at the site (IT July 1998). Vascular plants are the principal primary producers at the site and are key to the diversity and productivity of the wildlife community associated with the site. The deer mouse (*Peromyscus maniculatus*) and the burrowing owl (*Speotyto cunicularia*) were used to represent wildlife use. Because of its opportunistic food habits, the deer mouse was used to represent a mammalian herbivore, omnivore, and insectivore. The burrowing owl was selected to represent a top predator at this site. Although burrowing owls are not expected to exist in the woodland habitat at SWMU 94H, they are used to conservatively represent exposure and risk to other small, predatory birds, such as the western screech owl (*Otus kennicottii*) that may inhabit this site. The burrowing owl is present at SNL/NM and is designated a species of management concern by the U.S. Fish and Wildlife Service in Region 2, which includes the state of New Mexico (USFWS September 1995).

VII.3.2 Exposure Estimation

For nonradiological COPECs, direct uptake from the soil was considered the only significant route of exposure for terrestrial plants. Exposure modeling for the wildlife receptors was limited to food and soil ingestion pathways. Inhalation and dermal contact were considered insignificant pathways with respect to ingestion (Sample and Suter 1994). Drinking water also was considered an insignificant pathway because of the lack of surface water at this site. The deer mouse was modeled under three dietary regimes: as an herbivore (100 percent of its diet as plant material), as an omnivore (50 percent of its diet as plants and 50 percent as soil

invertebrates), and as an insectivore (100 percent of its diet as soil invertebrates). The burrowing owl was modeled as a strict predator on small mammals (100 percent of its diet as deer mice). Because the exposure in the burrowing owl from a diet consisting of equal parts of herbivorous, omnivorous, and insectivorous mice would be equivalent to the exposure from a diet consisting of only omnivorous mice, the diet of the burrowing owl was modeled with intake of omnivorous mice only. Both species were modeled with soil ingestion comprising 2 percent of the total dietary intake. Table 10 presents the species-specific factors used in modeling exposures in the wildlife receptors. Justification for use of the factors presented in this table is described in the ecological risk assessment methodology document (IT July 1998).

Although home range also is included in this table, exposures for this risk assessment were modeled using an area use factor of 1.0, implying that all food items and soil ingested come from the site being investigated. The maximum measured COPEC concentrations from surface soil samples were used to conservatively estimate potential exposures and risks to plants and wildlife at this site.

No radiological COCs exceeded background screening values. Therefore, radiological doses to ecological receptors were not calculated.

Table 11 provides the transfer factors used to model the concentrations of COPECs through the food chain. Table 12 presents maximum concentrations in soil and derived concentrations in tissues of the various food chain elements that are used to model dietary exposures for each of the wildlife receptors.

VII.3.3 Ecological Effects Evaluation

Table 13 shows benchmark toxicity values for the plant and wildlife receptors. For plants, the benchmark soil concentrations are based upon the lowest-observed-adverse-effect level. For wildlife, the toxicity benchmarks are based upon the no-observed-adverse-effect level (NOAEL) for chronic oral exposure in a taxonomically similar test species. Sufficient toxicity information was not available to estimate the NOAELs for beryllium and silver for the burrowing owl.

The benchmark used for exposure of terrestrial receptors to radiation was 0.1 rad/day. This value has been recommended by the International Atomic Energy Agency (IAEA 1992) for the protection of terrestrial populations. Because plants and insects are less sensitive to radiation than vertebrates (Whicker and Schultz 1982), the dose of 0.1 rad/day also should protect other groups within the terrestrial habitat of SWMU 94H. However, because no radiological COCs exceeded background screening values, radiological doses to ecological receptors were not calculated.

VII.3.4 Risk Characterization

Maximum concentrations in soil and estimated dietary exposures were compared to plant and wildlife benchmark values, respectively. Table 14 presents the results of these comparisons. HQs are used to quantify the comparison with benchmarks for plant and wildlife exposure.

Table 10
Exposure Factors for Ecological Receptors at SWMU 94H

Receptor Species	Class/Order	Trophic Level	Body Weight (kg) ^a	Food Intake Rate (kg/day) ^b	Dietary Composition ^c	Home Range (acres)
Deer Mouse (<i>Peromyscus maniculatus</i>)	Mammalia/ Rodentia	Herbivore	2.39E-2 ^d	3.72E-3	Plants: 100% (+ Soil at 2% of intake)	2.7E-1 ^e
Deer Mouse (<i>Peromyscus maniculatus</i>)	Mammalia/ Rodentia	Omnivore	2.39E-2 ^d	3.72E-3	Plants: 50% Invertebrates: 50% (+ Soil at 2% of intake)	2.7E-1 ^e
Deer Mouse (<i>Peromyscus maniculatus</i>)	Mammalia/ Rodentia	Insectivore	2.39E-2 ^d	3.72E-3	Invertebrates: 100% (+ Soil at 2% of intake)	2.7E-1 ^e
Burrowing owl (<i>Speotyto cunicularia</i>)	Aves/ Strigiformes	Carnivore	1.55E-1 ^f	1.73E-2	Rodents: 100% (+ Soil at 2% of intake)	3.5E+1 ^g

^aBody weights are in kg wet weight.

^bFood intake rates are estimated from the allometric equations presented in Nagy (1987). Units are kg dry weight per day.

^cDietary compositions are generalized for modeling purposes. Default soil intake value of 2% of food intake.

^dFrom Silva and Downing (1995).

^eEPA (1993), based upon the average home range measured in semiarid shrubland in Idaho.

^fFrom Dunning (1993).

^gFrom Haug et al. (1993).

EPA = U.S. Environmental Protection Agency.

kg = Kilogram(s).

kg/day = Kilogram(s) per day.

SWMU = Solid Waste Management Unit.

Table 11
Transfer Factors Used in Exposure Models for
Constituents of Potential Ecological Concern at SWMU 94H

Constituent of Potential Ecological Concern	Soil-to-Plant Transfer Factor	Soil-to-Invertebrate Transfer Factor	Food-to-Muscle Transfer Factor
Beryllium	1.0E-2 ^a	1.0E+0 ^b	1.0E-3 ^a
Silver	1.0E+0 ^c	2.5E-1 ^d	5.0E-3 ^c

^aFrom Baes et al. (1984).

^bDefault value.

^cFrom NCRP (January 1989).

^dFrom Stafford et al. (1991).

NCRP = National Council on Radiation Protection and Measurements.

SWMU = Solid Waste Management Unit.

Table 12
Media Concentrations^a for Constituents of
Potential Ecological Concern at SWMU 94H

Constituent of Potential Ecological Concern	Soil (maximum) ^a	Plant Foliage ^b	Soil Invertebrate ^b	Deer Mouse Tissues ^c
Beryllium	9.9E-1	9.9E-3	9.9E-1	1.6E-3
Silver	3.9E+0	3.9E+0	9.8E-1	3.9E-2

^aIn milligrams per kilogram. All biotic media are based upon dry weight of the media. Soil concentration measurements are assumed to have been based upon dry weight. Values have been rounded to two significant digits after calculation.

^bProduct of the soil concentration and the corresponding transfer factor.

^cBased upon the deer mouse with an omnivorous diet. Product of the average concentration ingested in food and soil times the food-to-muscle transfer factor times a wet weight-dry weight conversion factor of 3.125 (EPA 1993).

SWMU = Solid Waste Management Unit.

Table 13
 Toxicity Benchmarks for Ecological Receptors at SWMU 94H

Constituent of Potential Ecological Concern	Plant Benchmark ^{a,b}	Mammalian NOAELs			Avian NOAELs		
		Mammalian Test Species ^{c,d}	Test Species NOAEL ^{d,e}	Deer Mouse NOAEL ^{e,f}	Avian Test Species ^d	Test Species NOAEL ^{d,e}	Burrowing Owl NOAEL ^{e,g}
Beryllium	10	Rat	0.66	1.29	-	-	
Silver	2	Rat	17.8 ^h	34.8	-	-	

^aIn milligram(s) per kilogram soil dry weight.

^bFrom Efroymson et al. (1997).

^cBody weight of the laboratory rat for the NOAEL conversion is 0.350 kilogram.

^dFrom Sample et al. (1996).

^eIn milligrams per kilogram body weight per day.

^fBased upon NOAEL conversion methodology presented in Sample et al. (1996), using a deer mouse body weight of 0.0239 kilogram and a mammalian scaling factor of 0.25.

^gBased upon NOAEL conversion methodology presented in Sample et al. (1996). The avian scaling factor of 0.0 was used, making the NOAEL independent of body weight.

^hBased upon a rat lowest-observed-adverse-effect level of 89 milligram(s) per kilogram body weight per day (EPA 1988a) and an uncertainty factor of 0.2.

NOAEL = No-observed-adverse-effect level.

SWMU = Solid Waste Management Unit.

- = Insufficient toxicity data.

Table 14
 HQs for Ecological Receptors at SWMU 94H

Constituent of Potential Ecological Concern	Plant HQ	Deer Mouse HQ (Herbivorous)	Deer Mouse HQ (Omnivorous)	Deer Mouse HQ (Insectivorous)	Burrowing Owl HQ
Beryllium	9.9E-2	3.6E-3	6.3E-2	1.2E-1	-
Silver	2.0E+0	1.8E-2	1.1E-2	4.7E-3	-
HI ^a	2.1E+0	2.2E-2	7.4E-2	1.3E-1	-

Note: **Bold values** indicate the HQ or HI exceeds unity.

^aThe HI is the sum of individual HQs.

HI = Hazard Index.

HQ = Hazard quotient.

SWMU = Solid Waste Management Unit.

- = Insufficient toxicity data available for risk estimation purposes.

Of the two nonradiological COPECs, silver had an HQ exceeding unity, limited to the HQ for plants. No HQs were found to exceed unity for the deer mouse; HQs for the burrowing owl could not be determined for either beryllium or silver. As directed by NMED, HIs were calculated for each of the receptors (the HI is the sum of chemical-specific HQs for all pathways for a given receptor). Of these, only the HI of 2.1 for plants exceeded unity with the HQ for silver accounting for more than 95 percent of this value.

No radiological COCs exceeded background screening values. Therefore, radiological doses to ecological receptors were not calculated.

VII.3.5 Uncertainty Assessment

Many uncertainties are associated with the characterization of ecological risks at SWMU 94H, resulting from assumptions used in calculating risk that could overestimate or underestimate true risk presented at the site. For this risk assessment, assumptions are made that are more likely to overestimate exposures and risk than to underestimate them. These conservative assumptions are used to be more protective of the ecological resources potentially affected by the site. Conservatisms incorporated into this risk assessment include the use of maximum analyte concentrations measured in soil samples to evaluate risk, the use of wildlife toxicity benchmarks based upon NOAEL values, the incorporation of strict herbivorous and strict insectivorous diets for predicting the extreme HQ values for the deer mouse, and the use of 1.0 as the area use factor for wildlife receptors regardless of seasonal use or home range size. Each of these uncertainties, which are consistent among each of the SWMU-specific ecological risk assessments, is discussed in greater detail in the uncertainty section of the ecological risk assessment methodology document for the SNL/NM ER Project (IT July 1998).

In estimating ecological risk, background concentrations are included as a component of maximum on-site concentrations. For some inorganic COPECs, conservatisms in the modeling of exposure and risk resulted in the prediction of risk to ecological receptors when exposed at the background concentrations presented in Table 15.

Another significant source of uncertainty associated with the prediction of ecological risk at this site is the use of the maximum measured concentrations as the exposure point concentrations. This results in a conservative exposure scenario that does not necessarily reflect actual site conditions. In the case of silver, it should be noted that the mean (1.1 mg/kg) and the 95-percent upper confidence limit of the mean (2.0 mg/kg) have an HQ at or below 1. Therefore, the data for this site indicate that potential risk to plants is acceptable.

Based upon this uncertainty analysis, ecological risks at SWMU 94H are expected to be acceptable. An HQ greater than unity was initially predicted for plant exposure to silver; however, closer examination of the exposure assumptions and toxicity benchmarks revealed an overestimation of risk primarily attributed to conservatism in the exposure concentration of this COPEC.

Table 15
 HQs for Ecological Receptors Exposed to Background Concentrations at SWMU 94H

Constituent of Potential Ecological Concern	Plant HQ	Deer Mouse HQ (Herbivorous)	Deer Mouse HQ (Omnivorous)	Deer Mouse HQ (Insectivorous)	Burrowing Owl HQ
Beryllium	7.5E-2	2.7E-3	4.8E-2	9.2E-2	-
Silver	1.3E-1	1.1E-3	7.2E-4	3.0E-4	-
HI ^a	2.1E-1	3.8E-3	4.9E-2	9.2E-2	-

^aThe HI is the sum of individual HQs.

HI = Hazard index.

HQ = Hazard quotient.

SWMU = Solid Waste Management Unit.

- = Insufficient toxicity data available for risk estimation purposes.

VII.3.6 Risk Interpretation

Ecological risks associated with SWMU 94H were estimated through a screening assessment that incorporated site-specific information when available. Overall, risks to ecological receptors are expected to be acceptable because predicted risks associated with exposure to COPECs are based upon calculations using maximum detected values. Predicted risk to plants from exposure to silver was attributed to using maximum detected values. However, the upper 95-percent confidence limit of the mean silver concentration was found to be within the risk guideline for this COPEC. Based upon this final analysis, ecological risks associated with SWMU 94H are expected to be low.

VII.3.7 Screening Assessment Scientific/Management Decision Point

After potential ecological risks associated with the site have been assessed, a decision is made regarding whether the site should be recommended for NFA or whether additional data should be collected to assess actual ecological risk at the site more thoroughly. With respect to this site, ecological risks are predicted to be acceptable. The scientific/management decision is to recommend this site for NFA.

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APPENDIX 1 EXPOSURE PATHWAY DISCUSSION FOR CHEMICAL AND RADIONUCLIDE CONTAMINATION

Introduction

Sandia National Laboratories/New Mexico (SNL/NM) proposes that a default set of exposure routes and associated default parameter values be developed for each future land use designation being considered for SNL/NM Environmental Restoration (ER) project sites. This default set of exposure scenarios and parameter values would be invoked for risk assessments unless site-specific information suggested other parameter values. Because many SNL/NM solid waste management units (SWMU) have similar types of contamination and physical settings, SNL/NM believes that the risk assessment analyses at these sites can be similar. A default set of exposure scenarios and parameter values will facilitate the risk assessments and subsequent review.

The default exposure routes and parameter values suggested are those that SNL/NM views as resulting in a Reasonable Maximum Exposure (RME) value. Subject to comments and recommendations by the U.S. Environmental Protection Agency (EPA) Region VI and New Mexico Environment Department (NMED), SNL/NM proposes that these default exposure routes and parameter values be used in future risk assessments.

At SNL/NM, all SWMUs exist within the boundaries of the Kirtland Air Force Base (KAFB). Approximately 157 potential waste and release sites have been identified where hazardous, radiological, or mixed materials may have been released to the environment. Evaluation and characterization activities have occurred at all of these sites to varying degrees. Among other documents, the SNL/NM ER draft Environmental Assessment (DOE 1996) presents a summary of the hydrogeology of the sites, the biological resources present and proposed land use scenarios for the SNL/NM SWMUs. At this time, all SNL/NM SWMUs have been tentatively designated for either industrial or recreational future land use. The NMED has also requested that risk calculations be performed based upon a residential land-use scenario. All three land use scenarios will be addressed in this document.

The SNL/NM ER project has screened the potential exposure routes and identified default parameter values to be used for calculating potential intake and subsequent Hazard index (HI), excess cancer risk and dose values. The EPA (EPA 1989a) provides a summary of exposure routes that could potentially be of significance at a specific waste site. These potential exposure routes consist of:

- Ingestion of contaminated drinking water
- Ingestion of contaminated soil
- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products

- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water
- Dermal contact with chemicals in soil
- Inhalation of airborne compounds (vapor phase or particulate)
- External exposure to penetrating radiation (immersion in contaminated air, immersion in contaminated water, and exposure from ground surfaces with photon-emitting radionuclides).

Based upon the location of the SNL/NM SWMUs and the characteristics of the surface and subsurface at the sites, we have evaluated these potential exposure routes for different land use scenarios to determine which should be considered in risk assessment analyses (the last exposure route is pertinent to radionuclides only). At SNL/NM SWMUs, currently no consumption of fish, shellfish, fruits, vegetables, meat, eggs, or dairy occurs for products that originate on site. Additionally, no potential for swimming in surface water is present due to the high-desert environmental conditions. As documented in the RESRAD computer code manual (ANL 1993), risks resulting from immersion in contaminated air or water are not significant compared to risks from other radiation exposure routes.

For the industrial and recreational land use scenarios, SNL/NM ER has, therefore, excluded the following four potential exposure routes from further risk assessment evaluations at any SNL/NM SWMU:

- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming.

That part of the exposure pathway for radionuclides related to immersion in contaminated air or water also is eliminated.

For the residential land use scenario, we will include ingestion of contaminated fruits and vegetables because of the potential for residential gardening.

Based upon this evaluation, for future risk assessments the exposure routes that will be considered are shown in Table 1. Dermal contact is included as a potential exposure pathway in all land use scenarios. However, the potential for dermal exposure to inorganic compounds is not considered significant and will not be included. In general, the dermal exposure pathway is generally not considered to be significant relative to water ingestion and soil ingestion pathways, but will be considered for organic components. Because of the lack of toxicological parameter values for this pathway, the inclusion of this exposure pathway into risk assessment calculations may not be possible and may be part of the uncertainty analysis for a site where dermal contact is potentially applicable.

Table 1
Exposure Pathways Considered for Various Land Use Scenarios

Industrial	Recreational	Residential
Ingestion of contaminated drinking water	Ingestion of contaminated drinking water	Ingestion of contaminated drinking water
Ingestion of contaminated soil	Ingestion of contaminated soil	Ingestion of contaminated soil
Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)
Dermal contact	Dermal contact	Dermal contact
External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces	Ingestion of fruits and vegetables
		External exposure to penetrating radiation from ground surfaces

Equations and Default Parameter Values for Identified Exposure Routes

In general, SNL/NM expects that ingestion of compounds in drinking water and soil will be the more significant exposure routes for chemicals; external exposure to radiation also may be significant for radionuclides. All of the above routes will, however, be considered for their appropriate land use scenarios. The general equations for calculating potential intakes via these routes are shown below. The equations are from the Risk Assessment Guidance for Superfund (RAGS): Volume 1 (EPA 1989a, 1991). These general equations also apply to calculating potential intakes for radionuclides. A more in-depth discussion of the equations used in performing radiological pathway analyses with the RESRAD code may be found in the RESRAD Manual (ANL 1993). Also shown are the default values SNL/NM ER suggests for use in RME risk assessment calculations for industrial, recreational, and residential scenarios, based upon EPA and other governmental agency guidance. The pathways and values for chemical contaminants are discussed first, followed by those for radionuclide contaminants. RESRAD input parameters that are left as the default values provided with the code are not discussed. Further information relating to these parameters may be found in the RESRAD Manual (ANL 1993).

Generic Equation for Calculation of Risk Parameter Values

The equation used to calculate the risk parameter values (i.e., hazard quotients/hazard index [HI], excess cancer risk, or radiation total effective dose equivalent [dose]) is similar for all exposure pathways and is given by:

Risk (or Dose) = Intake x Toxicity Effect (either carcinogenic, noncarcinogenic, or radiological)

$$= C \times (CR \times EFD/BW/AT) \times \text{Toxicity Effect} \quad (1)$$

where

- C = contaminant concentration (site specific)
- CR = contact rate for the exposure pathway
- EFD = exposure frequency and duration
- BW = body weight of average exposure individual
- AT = time over which exposure is averaged.

The total risk/dose (either cancer risk or HI) is the sum of the risks/doses for all of the site-specific exposure pathways and contaminants.

The evaluation of the carcinogenic health hazard produces a quantitative estimate for excess cancer risk resulting from the constituents of concern (COC) present at the site. This estimate is evaluated for determination of further action by comparison of the quantitative estimate with the potentially acceptable risk range of 1E-6 for Class A and B carcinogens and 1E-5 for Class C carcinogens. The evaluation of the noncarcinogenic health hazard produces a quantitative estimate (i.e., the HI) for the toxicity resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of this quantitative estimate with the EPA standard HI of unity (1). The evaluation of the health hazard due to radioactive compounds produces a quantitative estimate of doses resulting from the COCs present at the site.

The specific equations used for the individual exposure pathways can be found in RAGS (EPA 1989a) and the RESRAD Manual (ANL 1993). Table 2 shows the default parameter values suggested for use by SNL/NM at SWMUs, based upon the selected land use scenario. References are given at the end of the table indicating the source for the chosen parameter values. The intention of SNL/NM is to use default values that are consistent with regulatory guidance and consistent with the RME approach. Therefore, the values chosen will, in general, provide a conservative estimate of the actual risk parameter. These parameter values are suggested for use for the various exposure pathways based upon the assumption that a particular site has no unusual characteristics that contradict the default assumptions. For sites for which the assumptions are not valid, the parameter values will be modified and documented.

Summary

SNL/NM proposes the described default exposure routes and parameter values for use in risk assessments at sites that have an industrial, recreational or residential future land use scenario. There are no current residential land use designations at SNL/NM ER sites, but this scenario has been requested to be considered by the NMED. For sites designated as industrial or recreational land use, SNL/NM will provide risk parameter values based upon a residential land use scenario to indicate the effects of data uncertainty on risk value calculations or in order to potentially mitigate the need for institutional controls or restrictions on SNL/NM ER sites. The parameter values are based upon EPA guidance and supplemented by information from other government sources. The values are generally consistent with those proposed by Los Alamos National Laboratory, with a few minor variations. If these exposure routes and parameters are acceptable, SNL/NM will use them in risk assessments for all sites where the assumptions are consistent with site-specific conditions. All deviations will be documented.

Table 2
Default Parameter Values for Various Land Use Scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure frequency	8 hr/day for 250 day	4 hr/wk for 52 wk/yr	350 day/yr
Exposure duration (yr)	25 ^{a,b}	30 ^{a,b}	30 ^{a,b}
Body weight (kg)	70 ^{a,b}	70 adult ^{a,b} 15 child	70 adult ^{a,b} 15 child
Averaging Time (days) for carcinogenic compounds (= 70 y x 365 day/yr)	25,550 ^a	25,550 ^a	25,550 ^a
for noncarcinogenic compounds (= ED x 365 day/yr)	9,125	10,950	10,950
Soil Ingestion Pathway			
Ingestion rate	100 mg/day ^c	200 mg/day child 100 mg/day adult	200 mg/day child 100 mg/day adult
Inhalation Pathway			
Inhalation rate (m ³ /yr)	5,000 ^{a,b}	260 ^d	7,000 ^{a,b,d}
Volatilization factor (m ³ /kg)	Chemical specific	chemical specific	chemical specific
Particulate emission factor (m ³ /kg)	1.32E9 ^a	1.32E9 ^a	1.32E9 ^a
Water Ingestion Pathway			
Ingestion rate (liter/day)	2 ^{a,b}	2 ^{a,b}	2 ^{a,b}
Food Ingestion Pathway			
Ingestion rate (kg/yr)	NA	NA	138 ^{b,d}
Fraction ingested	NA	NA	0.25 ^{b,d}
Dermal Pathway			
Surface area in water (m ²)	2 ^{b,e}	2 ^{b,e}	2 ^{b,e}
Surface area in soil (m ²)	0.53 ^{b,e}	0.53 ^{b,e}	0.53 ^{b,e}
Permeability coefficient	Chemical specific	chemical specific	chemical specific

^aRisk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).

^bExposure Factors Handbook (EPA 1989b).

^cEPA Region VI guidance.

^dFor radionuclides, RESRAD (Argonne National Laboratory, 1993. *Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD*, Version 5.0, ANL/EAD/LD-2, Argonne National Laboratory, Argonne, IL, 1993) is used for human health risk calculations; default parameters are consistent with RESRAD guidance.

^eDermal Exposure Assessment (EPA 1992).

ED = Exposure duration.

EPA = U.S. Environmental Protection Agency.

hr = Hour.

kg = Kilogram(s).

m² = Square meter(s).

m³ = Cubic meter(s).

mg = Milligram(s).

NA = Not available.

wk = Week.

yr = Year.

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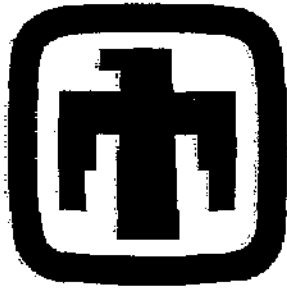
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**Sandia National Laboratories/New Mexico
Environmental Restoration Project**

**Supplemental Risk Document Supporting
Class 3 Permit Modification Process**

October 2003



United States Department of Energy
Sandia Site Office

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- 2 Calculation of the Upper 95% Confidence Limits of Mean Concentrations

ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
AOC	Area of Concern
COC	constituent of concern
DOE	U.S. Department of Energy
EBP	Explosive Burn Pft
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
gal	gallon
HE	high explosives
HI	hazard index
JP-4	jet propulsion fuel grade 4
JP-8	jet propulsion fuel grade 8
KAFB	Kirtland Air Force Base
kg	kilogram(s)
LAARC	Light Airtransport Accident Resistant Container
LCBS	Lurance Canyon Burn Site
mg	milligram(s)
NFA	no further action
NMED	New Mexico Environment Department
OU	Operable Unit
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RDX	cyclotrimethylenetrinitramine
SNL/NM	Sandia National Laboratories/New Mexico
SOBP	Small Open Burn Pool
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TA	Technical Area
TNT	2,4,6-trinitrotoluene
UCL	upper confidence limit
USAF	U.S. Air Force
USFS	U.S. Forest Service
VCM	voluntary corrective measure
VOC	volatile organic compound

1.0 INTRODUCTION

This supplemental risk document was prepared to support no further action (NFA) determination and subsequent removal of 16 Solid Waste Management Units (SWMUs) and 2 Areas of Concern (AOCs) from the Hazardous and Solid Waste Amendments Module of the Resource Conservation and Recovery Act (RCRA) Permit for Sandia National Laboratories/New Mexico (SNL/NM) (U.S. Environmental Protection Agency [EPA] ID No. 5890110518). See Figure 1-1 for the locations of these SWMUs and AOCs.

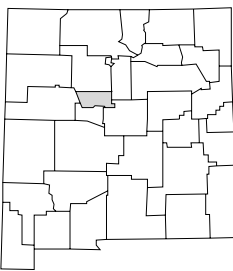
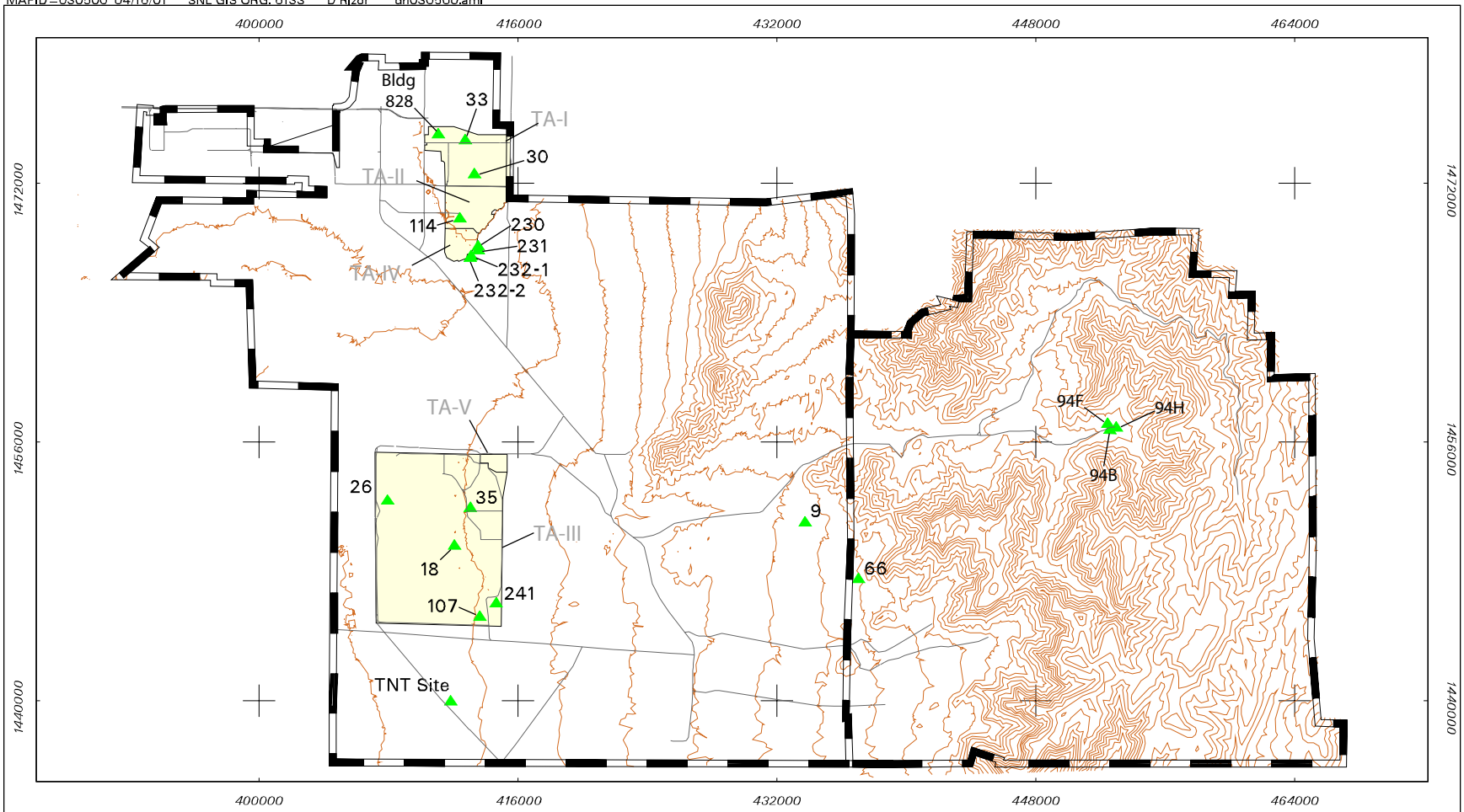
Initially, risk assessments were performed for these sites considering the designated land use provided in the land use workbooks (DOE et al. September 1995, DOE et al. October 1995, DOE and USAF January 1996, and DOE and USAF March 1996). However, in January 2001, the New Mexico Environment Department (NMED) promulgated risk-based screening levels for RCRA Corrective Action Sites in New Mexico (Bearzi January 2001). The letter stated that "until statutory authority exists allowing restriction of future land use, corrective action sites applying for NFA determination (an NFA) under a risk-based approach cannot use industrial risk-based screening levels for soils." SNL/NM has determined from the letter that no more SWMUs or AOCs will be approved for NFA, under either industrial or recreational land use, unless the site also poses an insignificant risk to human health under the residential land use scenario.

In addition, in April 2003, the NMED requested that SNL/NM change its risk approach to include the dermal pathway for all land use scenarios and to eliminate the food ingestion pathway for the residential land use scenario.

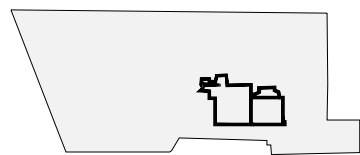
This report presents a short site history and additional risk assessment analysis of 16 SWMUs and 2 AOCs. Each of these sites has been proposed for NFA based upon industrial or recreational land use scenarios. This supplemental analysis evaluates each site using a residential scenario and is based upon guidance provided in NMED's "Technical Background Document for Development of Soil Screening Levels" (NMED December 2000). Appendix 1 contains the SNL/NM default exposure pathways and input parameters. For SWMUs and AOCs that exceeded NMED guidance risk levels, summary statistics (95% upper confidence level [UCL] of the mean) were calculated following standard EPA guidance (EPA 1992) for the chemicals that contributed the most to the overall risk.


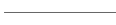



Additional information containing more detailed descriptions of site location, site history, site characterization, Voluntary Corrective Measures (VCMs)/Voluntary Corrective Actions (VCAs) (if applicable), verification sampling events, and other related data are contained in the respective SWMU's NFA proposal, Request for Supplemental Information (RSI), or Notice of Deficiency (NOD) documents. Supplemental information for each SWMU is identified in Table 1-1.

This report is organized by Operable Unit (OU) in ascending order with SWMUs in ascending order within each OU.



Legend



-  SWMU
-  Major Road
-  KAFB Boundary
-  100 Foot Contour
-  SNL Technical Area

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 1-1
Location of SNL/NM SWMUs
for Residential Risk Analysis
Albuquerque, NM

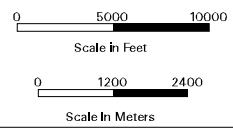


Table 1-1
Location of Supplemental Information for Each SNL/NM SWMU or AOC Proposed for NFA

OU Name	OU	SWMU/ AOC	NFA Date Submitted/ Batch No.	NQD or RSI Submittal Date	Comments
TA-I	1302	30	September 30, 2001/16	NA	
TA-I	1302	33	October 3, 1996/5	June 2001 September 10, 2001	The June 2001 response was not complete; the September 2001 response included results of additional sampling and risk assessment.
TA-I	1302	828	December 1996	June 2001 July 16, 2001 (SWMU Assessment Report)	PCB immunoassay data in letter of December 1996 indicated that SNL/NM did not consider this site a SWMU.
TA-II	1303	114	July 19, 1996/4	January 31, 2003	
TA-III/V	1306	18	Aug 11, 1997/8	October 1997 July 1998 June 2002	
TA-III/V	1306	26	June 1996	October 1997 July 1998 August 14, 2001	NFA originally proposed in the RFI report in June 1996.
TA-III/V	1306	35	June 1996	October 1997 July 1998 July 31, 2001	NFA originally proposed in the RFI report in June 1996.
TA-III/V	1306	107	June 1996	October 1997 July 1998 August 9, 2001	NFA originally proposed in the RFI report in June 1996.
TA-III/V	1306	241	June 1996	October 1997 July 1998 August 24, 2001	NFA originally proposed in the RFI report in June 1996.
Tijeras Arroyo	1309	230	August 28, 1995/2	December 2002	
Tijeras Arroyo	1309	231	August 28, 1995/2	December 2002	
Tijeras Arroyo	1309	232-1	August 11, 1997/8	December 2002	

Refer to footnotes at end of table.

Table 1-1 (Concluded)
 Location of Supplemental Information for Each SNL/NM SWMU or AOC Proposed for NFA

OU Name	OU	SWMU/ AOC	NFA Date Submitted/ Batch No.	NOD or RSI Submittal Date	Comments
Tijeras Arroyo	1309	232-2	August 11, 1997/8	December 2002	
Foothills Test Area	1332	66	October 3, 1996/5	May 11, 1998	
Canyons Test Area	1333	94B	September 30, 2001/16	NA	
Canyons Test Area	1333	94F	September 30, 2001/16	NA	
Canyons Test Area	1333	94H	September 24, 2002/17	NA	
Central Coyote Test Area	1334	9	August 31, 1999/14	July 6, 1998	
Southwest Test Area	1335	TNT Site	September 24, 2002/17	NA	

- AOC = Area of Concern.
- NA = Not applicable.
- NFA = No Further Action.
- NOD = Notice of Deficiency.
- OU = Operable Unit.
- PCB = Polychlorinated biphenyl.
- RCRA = Resource Conservation and Recovery Act.
- RFI = RCRA Facility Investigation.
- RSI = Request for Supplemental Information.
- SNL/NM = Sandia National Laboratories/New Mexico.
- SWMU = Solid Waste Management Unit.
- TA = Technical Area.
- TNT = 2,4,6-trinitrotoluene.

7.3 SWMU 94H: LCBS Fuel Spill Site

7.3.1 Site Location and Operational History

SWMU 94H, the jet propulsion fuel grade 8 (JP-8) Fuel Spill Site, LCBS, OU 1333, at SNL/NM, encompasses approximately 0.5 acre at an elevation of approximately 6,350 feet amsl (Figure 7.3.1-1). The site is located on the canyon floor alluvium in the closed upper reaches of the Lurance Canyon drainage, on land that is owned by KAFB and leased to the DOE.

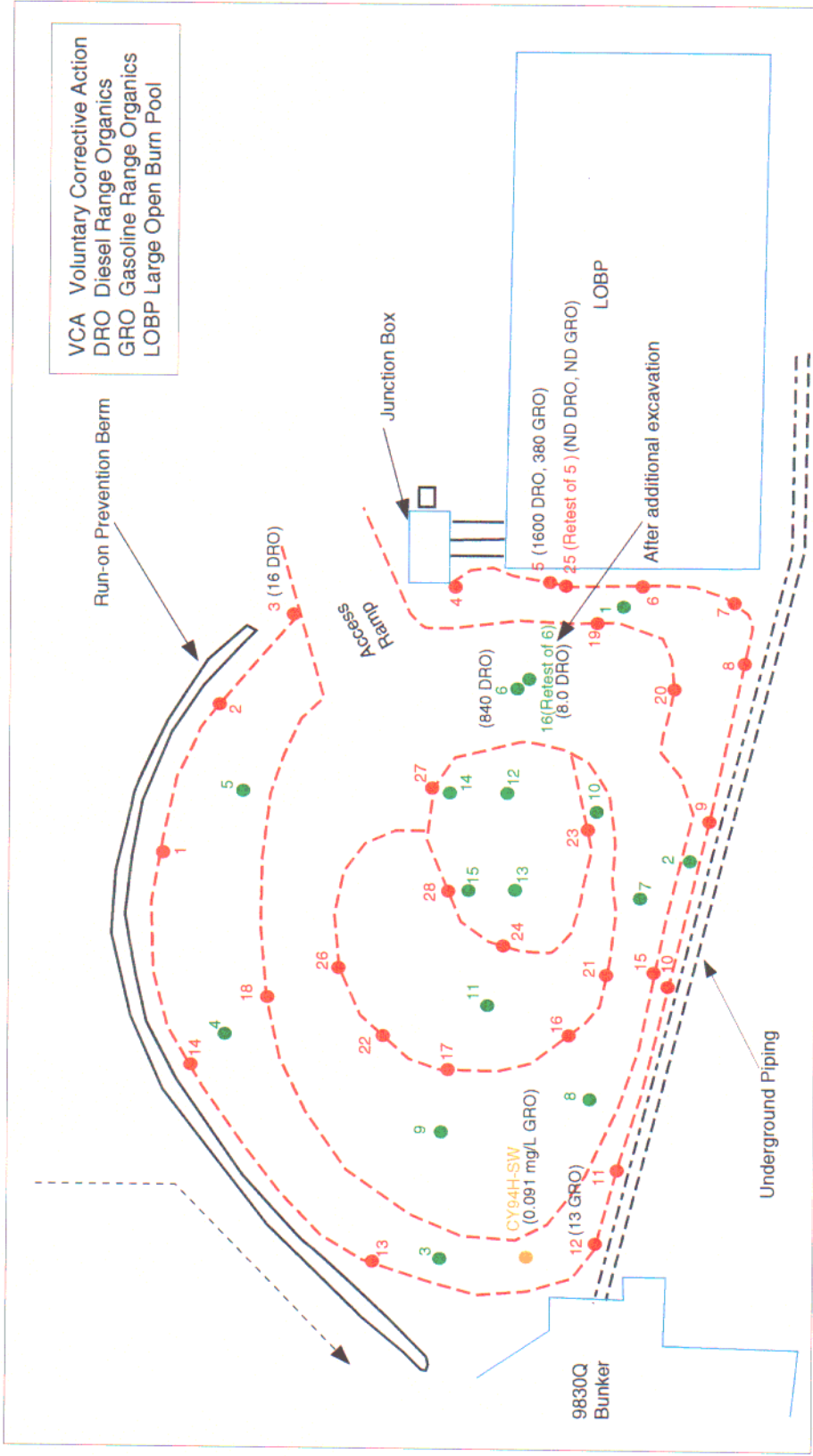
SWMU 94H is situated in the immediate vicinity of the Large Open Burn Pool and the former site of the Small Open Burn Pool (SOBP). On August 3, 2000, Burn Site personnel were installing a new conduit in a shallow trench on the north side of the SOBP. During excavation of the trench, the workers smelled fuel from a 3-inch-diameter fuel line connecting the SOBP to the aboveground fuel and water supply tanks to the north of the site. Work was stopped immediately and the Burn Site Manager notified, as well as the SNL/NM Environment, Safety, and Health Coordinator, and the Environmental Restoration (ER) Burn Site Project Leader. During removal of the SOBP and associated piping, approximately 295 cubic yards of JP-8-contaminated soil were removed from a portion of the excavation. DRO constituents were detected in soil samples collected from the base of the excavation where this soil had been removed, indicating that contamination was present below the excavation grade.

COCs included VOCs and SVOCs.

7.3.2 Results of Risk Analysis

The risk assessment calculation was performed using maximum COC concentrations and the methods specified in NMED's "Technical Background Document for Development of Soil Screening Levels" (NMED December 2000). As shown in Table 7.3.2-1, the total human health HI (0.02) is lower than the NMED guidance value of 1 for the residential land use scenario. The total estimated excess cancer risk is $9E-10$ for the residential land use scenario. NMED guidance states that cumulative excess lifetime cancer risk must be less than $1E-5$ (Bearzi January 2001), thus the excess cancer risk for this site is also lower than the suggested acceptable risk value.

In conclusion, human health risk is within the acceptable range according to NMED guidance for the residential land use scenario.



VCA Voluntary Corrective Action
 DRO Diesel Range Organics
 GRO Gasoline Range Organics
 LOBP Large Open Burn Pool

Legend
 - - - Excavation Lift Boundary
 Structure
 Surface Flow Direction
 5 (1600 DRO, 380 GRO)
 6 (840 DRO)
 Sidewall Confirmation Sample (CY94H-SW-005-S) Location*. DRO/GRO Concentrations** were ND (not detected) unless otherwise noted.
 Bottom Confirmation Sample (CY94H-B-006-S) Location*. DRO/GRO Concentrations** were ND unless otherwise noted.
 Pondered Stormwater Sample Location and GRO Concentration
 *Sample locations are approximate.
 ** Highest reported DRO or GRO concentration (mg/kg)

Sandia National Laboratories, New Mexico
 Environmental Geographic Information System

Scale in Feet
 0 15 30

Map is not georeferenced
 Contact Bruce Wedgeworth for questions concerning map data

Figure 7.3.1-1
Schematic Diagram of
SWMU 94 H VCA
Confirmation DRO/GRO
Sample Locations

Table 7.3.2-1
Human Health Risk Assessment Values for SWMU 94H Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Residential Land Use Scenario ^a	
		Hazard Index	Cancer Risk
Inorganic			
Beryllium	0.99 J	0.01	9E-10
Silver	3.9	0.01	--
Total		0.02	9E-10

^aEPA 1989.

COC = Constituent of concern.

EPA = U.S. Environmental Protection Agency.

J = Estimated concentration.

mg/kg = Milligram(s) per kilogram.

SWMU = Solid Waste Management Unit.

-- = Information not available.

10.0 REFERENCES

Bearzi, J.P. (New Mexico Environment Department), January 2001. Memorandum to RCRA-Regulated Facilities, "Risk-Based Screening Levels for RCRA Corrective Action Sites in New Mexico," Hazardous Waste Bureau, New Mexico Environment Department, Santa Fe, New Mexico. January 23, 2001.

DOE and USAF, see U.S. Department of Energy and U.S. Air Force.

EPA, see U.S. Environmental Protection Agency.

New Mexico Environment Department (NMED), December 2000. "Technical Background Document for Development of Soil Screening Levels", Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, December 18, 2000.

NMED, see New Mexico Environment Department.

U.S. Department of Energy, U.S. Air Force, and U.S. Forest Service, September 1995. "Workbook: Future Use Management Area 1," prepared by the Future Use Logistics and Support Working Group in cooperation with U.S. Department of Energy Affiliates, the U.S. Air Force, and the U.S. Forest Service.

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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.

U.S. Environmental Protection Agency (EPA), 1992. "Supplemental Guidance to RAGS: Calculating the Concentration Term," Publication 9285.7-081, Office of Solid Waste and Emergency Response, Washington, D.C.



APPENDIX 1
Exposure Pathway Discussion for Chemical and Radionuclide Contamination
Sandia National Laboratories/New Mexico

APPENDIX 1

EXPOSURE PATHWAY DISCUSSION FOR CHEMICAL AND RADIONUCLIDE CONTAMINATION

Introduction

Sandia National Laboratories/New Mexico (SNL/NM) uses a default set of exposure routes and associated default parameter values developed for each future land-use designation being considered for SNL/NM Environmental Restoration (ER) Project sites. This default set of exposure scenarios and parameter values are invoked for risk assessments unless site-specific information suggests other parameter values. Because many SNL/NM solid waste management units (SWMUs) have similar types of contamination and physical settings, SNL/NM believes that the risk assessment analyses at these sites can be similar. A default set of exposure scenarios and parameter values facilitates the risk assessments and subsequent review.

The default exposure routes and parameter values used are those that SNL/NM views as resulting in a Reasonable Maximum Exposure (RME) value. Subject to comments and recommendations by the U.S. Environmental Protection Agency (EPA) Region VI and New Mexico Environment Department (NMED), SNL/NM will use these default exposure routes and parameter values in future risk assessments.

At SNL/NM, all SWMUs exist within the boundaries of the Kirtland Air Force Base. Approximately 240 potential waste and release sites have been identified where hazardous, radiological, or mixed materials may have been released to the environment. Evaluation and characterization activities have occurred at all of these sites to varying degrees. Among other documents, the SNL/NM ER draft Environmental Assessment (DOE 1996) presents a summary of the hydrogeology of the sites and the biological resources present. When evaluating potential human health risk the current or reasonably foreseeable land use negotiated and approved for the specific SWMU/AOC, aggregate, or watershed will be used. The following references generally document these land uses: Workbook: Future Use Management Area 2 (DOE et al. September 1995); Workbook: Future Use Management Area 1 (DOE et al. October 1995); Workbook: Future Use Management Areas 3, 4, 5, and 6 (DOE and USAF January 1996); Workbook: Future Use Management Area 7 (DOE and USAF March 1996). At this time, all SNL/NM SWMUs have been tentatively designated for either industrial or recreational future land use. The NMED has also requested that risk calculations be performed based upon a residential land-use scenario. Therefore, all three land-use scenarios will be addressed in this document.

The SNL/NM ER Project has screened the potential exposure routes and identified default parameter values to be used for calculating potential intake and subsequent hazard index (HI), excess cancer risk and dose values. The EPA (EPA 1989) provides a summary of exposure routes that could potentially be of significance at a specific waste site. These potential exposure routes consist of:

- Ingestion of contaminated drinking water
- Ingestion of contaminated soil

- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water
- Dermal contact with chemicals in soil
- Inhalation of airborne compounds (vapor phase or particulate)
- External exposure to penetrating radiation (immersion in contaminated air; immersion in contaminated water; and exposure from ground surfaces with photon-emitting radionuclides)

Based upon the location of the SNL/NM SWMUs and the characteristics of the surface and subsurface at the sites, we have evaluated these potential exposure routes for different land-use scenarios to determine which should be considered in risk assessment analyses (the last exposure route is pertinent to radionuclides only). At SNL/NM SWMUs, there is currently no consumption of fish, shellfish, fruits, vegetables, meat, eggs, or dairy products that originate on site. Additionally, no potential for swimming in surface water is present due to the high-desert environmental conditions. As documented in the RESRAD computer code manual (ANL 1993), risks resulting from immersion in contaminated air or water are not significant compared to risks from other radiation exposure routes.

For the industrial and recreational land-use scenarios, SNL/NM ER has, therefore, excluded the following four potential exposure routes from further risk assessment evaluations at any SNL/NM SWMU:

- Ingestion of contaminated fish and shellfish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water

That part of the exposure pathway for radionuclides related to immersion in contaminated air or water is also eliminated.

Based upon this evaluation, for future risk assessments the exposure routes that will be considered are shown in Table 1.

Table 1
Exposure Pathways Considered for Various Land-Use Scenarios

Industrial	Recreational	Residential
Ingestion of contaminated drinking water	Ingestion of contaminated drinking water	Ingestion of contaminated drinking water
Ingestion of contaminated soil	Ingestion of contaminated soil	Ingestion of contaminated soil
Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)
Dermal contact (nonradiological constituents only) soil only	Dermal contact (nonradiological constituents only) soil only	Dermal contact (nonradiological constituents only) soil only
External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces

Equations and Default Parameter Values for Identified Exposure Routes

In general, SNL/NM expects that ingestion of compounds in drinking water and soil will be the more significant exposure routes for chemicals; external exposure to radiation may also be significant for radionuclides. All of the above routes will, however, be considered for their appropriate land-use scenarios. The general equation for calculating potential intakes via these routes is shown below. The equations are taken from "Assessing Human Health Risks Posed by Chemicals: Screening-Level Risk Assessment" (NMED March 2000) and "Technical Background Document for Development of Soil Screening Levels" (NMED December 2000). Equations from both documents are based upon the "Risk Assessment Guidance for Superfund" (RAGS): Volume 1 (EPA 1989, 1991). These general equations also apply to calculating potential intakes for radionuclides. A more in-depth discussion of the equations used in performing radiological pathway analyses with the RESRAD code may be found in the RESRAD Manual (ANL 1993). RESRAD is the only code designated by the U.S. Department of Energy (DOE) in DOE Order 5400.5 for the evaluation of radioactively contaminated sites (DOE 1993). The Nuclear Regulatory Commission (NRC) has approved the use of RESRAD for dose evaluation by licensees involved in decommissioning, NRC staff evaluation of waste disposal requests, and dose evaluation of sites being reviewed by NRC staff. EPA Science Advisory Board reviewed the RESRAD model. EPA used RESRAD in their rulemaking on radiation site cleanup regulations. RESRAD code has been verified, undergone several benchmarking analyses, and been included in the International Atomic Energy Agency's VAMP and BIOMOV5 II projects to compare environmental transport models.

Also shown are the default values SNL/NM ER will use in RME risk assessment calculations for industrial, recreational, and residential land-use scenarios, based upon EPA and other governmental agency guidance. The pathways and values for chemical contaminants are discussed first, followed by those for radionuclide contaminants. RESRAD input parameters that are left as the default values provided with the code are not discussed. Further information relating to these parameters may be found in the RESRAD Manual (ANL 1993) or by directly accessing the RESRAD websites at: <http://web.ead.anl.gov/resrad/home2/> or <http://web.ead.anl.gov/resrad/documents/>.

Generic Equation for Calculation of Risk Parameter Values

The equation used to calculate the risk parameter values (i.e., hazard quotients/HI, excess cancer risk, or radiation total effective dose equivalent [TEDE] [dose]) is similar for all exposure pathways and is given by:

Risk (or Dose) = Intake x Toxicity Effect (either carcinogenic, noncarcinogenic, or radiological)

where;

C = contaminant concentration (site specific)
CR = contact rate for the exposure pathway
EFD = exposure frequency and duration
BW = body weight of average exposure individual
AT = time over which exposure is averaged.

For nonradiological constituents of concern (COCs), the total risk/dose (either cancer risk or HI) is the sum of the risks/doses for all of the site-specific exposure pathways and contaminants. For radionuclides, the calculated radiation exposure, expressed as TEDE is compared directly to the exposure guidelines of 15 millirem per year (mrem/year) for industrial and recreational future use and 75 mrem/year for the unlikely event that institutional control of the site is lost and the site is used for residential purposes (EPA 1997).

The evaluation of the carcinogenic health hazard produces a quantitative estimate for excess cancer risk resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of the quantitative estimate with the potentially acceptable risk of 1E-5 for nonradiological carcinogens. The evaluation of the noncarcinogenic health hazard produces a quantitative estimate (i.e., the HI) for the toxicity resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of this quantitative estimate with the EPA standard HI of unity (1). The evaluation of the health hazard from radioactive compounds produces a quantitative estimate of doses resulting from the COCs present at the site. This estimated dose is used to calculate an assumed risk. However, this calculated risk is presented for illustration purposes only, not to determine compliance with regulations.

The specific equations used for the individual exposure pathways can be found in RAGS (EPA 1989) and are outlined below. The RESRAD Manual (ANL 1993) describes similar equations for the calculation of radiological exposures.

Soil Ingestion

A receptor can ingest soil or dust directly by working in the contaminated soil. Indirect ingestion can occur from sources such as unwashed hands introducing contaminated soil to food that is then eaten. An estimate of intake from ingesting soil will be calculated as follows:

$$I_s = \frac{C_s * IR * CF * EF * ED}{BW * AT}$$

where:

- I_s = Intake of contaminant from soil ingestion (milligrams [mg]/kilogram [kg]-day)
- C_s = Chemical concentration in soil (mg/kg)
- IR = Ingestion rate (mg soil/day)
- CF = Conversion factor (1E-6 kg/mg)
- EF = Exposure frequency (days/year)
- ED = Exposure duration (years)
- BW = Body weight (kg)
- AT = Averaging time (period over which exposure is averaged) (days)

It should be noted that it is conservatively assumed that the receptor only ingests soil from the contaminated source.

Soil Inhalation

A receptor can inhale soil or dust directly by working in the contaminated soil. An estimate of intake from inhaling soil will be calculated as follows (EPA August 1997):

$$I_s = \frac{C_s * IR * EF * ED * \left(\frac{1}{VF} \text{ or } \frac{1}{PEF} \right)}{BW * AT}$$

where:

- I_s = Intake of contaminant from soil inhalation (mg/kg-day)
- C_s = Chemical concentration in soil (mg/kg)
- IR = Inhalation rate (cubic meters [m³]/day)
- EF = Exposure frequency (days/year)
- ED = Exposure duration (years)
- VF = soil-to-air volatilization factor (m³/kg)
- PEF = particulate emission factor (m³/kg)
- BW = Body weight (kg)
- AT = Averaging time (period over which exposure is averaged) (days)

Soil Dermal Contact

$$D_a = \frac{C_s * CF * SA * AF * ABS * EF * ED}{BW * AT}$$

where:

- D_a = Absorbed dose (mg/kg-day)
- C_s = Chemical concentration in soil (mg/kg)
- CF = Conversion factor (1E-6 kg/mg)
- SA = Skin surface area available for contact (cm²/event)
- AF = Soil to skin adherence factor (mg/cm²)
- ABS = Absorption factor (unitless)
- EF = Exposure frequency (events/year)

- ED = Exposure duration (years)
 BW = Body weight (kg)
 AT = Averaging time (period over which exposure is averaged) (days)

Groundwater Ingestion

A receptor can ingest water by drinking it or through using household water for cooking. An estimate of intake from ingesting water will be calculated as follows (EPA August 1997):

$$I_w = \frac{C_w * IR * EF * ED}{BW * AT}$$

where:

- I_w = Intake of contaminant from water ingestion (mg/kg/day)
 C_w = Chemical concentration in water (mg/liter [L])
 IR = Ingestion rate (L/day)
 EF = Exposure frequency (days/year)
 ED = Exposure duration (years)
 BW = Body weight (kg)
 AT = Averaging time (period over which exposure is averaged) (days)

Groundwater Inhalation

The amount of a constituent taken into the body via exposure to volatilization from showering or other household water uses will be evaluated using the concentration of the constituent in the water source (EPA 1991 and 1992). An estimate of intake from volatile inhalation from groundwater will be calculated as follows (EPA 1991):

$$I_w = \frac{C_w * K * IR_i * EF * ED}{BW * AT}$$

where:

- I_w = Intake of volatile in water from inhalation (mg/kg/day)
 C_w = Chemical concentration in water (mg/L)
 K = volatilization factor (0.5 L/m³)
 IR_i = Inhalation rate (m³/day)
 EF = Exposure frequency (days/year)
 ED = Exposure duration (years)
 BW = Body weight (kg)
 AT = Averaging time (period over which exposure is averaged—days)

For volatile compounds, volatilization from groundwater can be an important exposure pathway from showering and other household uses of groundwater. This exposure pathway will only be evaluated for organic chemicals with a Henry's Law constant greater than 1×10^{-5} and with a molecular weight of 200 grams/mole or less (EPA 1991).

Tables 2 and 3 show the default parameter values suggested for use by SNL/NM at SWMUs, based upon the selected land-use scenarios for nonradiological and radiological COCs,

respectively. References are given at the end of the table indicating the source for the chosen parameter values. SNL/NM uses default values that are consistent with both regulatory guidance and the RME approach. Therefore, the values chosen will, in general, provide a conservative estimate of the actual risk parameter. These parameter values are suggested for use for the various exposure pathways, based upon the assumption that a particular site has no unusual characteristics that contradict the default assumptions. For sites for which the assumptions are not valid, the parameter values will be modified and documented.

Summary

SNL/NM will use the described default exposure routes and parameter values in risk assessments at sites that have an industrial, recreational, or residential future land-use scenario. There are no current residential land-use designations at SNL/NM ER sites, but NMED has requested this scenario to be considered to provide perspective of the risk under the more restrictive land-use scenario. For sites designated as industrial or recreational land use, SNL/NM will provide risk parameter values based upon a residential land-use scenario to indicate the effects of data uncertainty on risk value calculations or in order to potentially mitigate the need for institutional controls or restrictions on SNL/NM ER sites. The parameter values are based upon EPA guidance and supplemented by information from other government sources. If these exposure routes and parameters are acceptable, SNL/NM will use them in risk assessments for all sites where the assumptions are consistent with site-specific conditions. All deviations will be documented.

Table 2
Default Nonradiological Exposure Parameter Values for Various Land-Use Scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure Frequency (day/yr)	250 ^{a,b}	8.7 (4 hr/wk for 52 wk/yr) ^{a,b}	350 ^{a,b}
Exposure Duration (yr)	25 ^{a,b,c}	30 ^{a,b,c}	30 ^{a,b,c}
Body Weight (kg)	70 ^{a,b,c}	70 Adult ^{a,b,c} 15 Child ^{a,b,c}	70 Adult ^{a,b,c} 15 Child ^{a,b,c}
Averaging Time (days) for Carcinogenic Compounds (= 70 yr x 365 day/yr)	25,550 ^{a,b}	25,550 ^{a,b}	25,550 ^{a,b}
for Noncarcinogenic Compounds (= ED x 365 day/yr)	9,125 ^{a,b}	10,950 ^{a,b}	10,950 ^{a,b}
Soil Ingestion Pathway			
Ingestion Rate (mg/day)	100 ^{a,b}	200 Child ^{a,b} 100 Adult ^{a,b}	200 Child ^{a,b} 100 Adult ^{a,b}
Inhalation Pathway			
Inhalation Rate (m ³ /day)	20 ^{a,b}	15 Child ^a 30 Adult ^a	10 Child ^a 20 Adult ^a
Volatilization Factor (m ³ /kg)	Chemical Specific	Chemical Specific	Chemical Specific
Particulate Emission Factor (m ³ /kg)	1.36E9 ^a	1.36E9 ^a	1.36E9 ^a
Water Ingestion Pathway			
Ingestion Rate (liter/day)	2.4 ^a	2.4 ^a	2.4 ^a
Dermal Pathway			
Skin Adherence Factor (mg/cm ²)	0.2 ^a	0.2 Child ^a 0.07 Adult ^a	0.2 Child ^a 0.07 Adult ^a
Exposed Surface Area for Soil/Dust (cm ² /day)	3,300 ^a	2,800 Child ^a 5,700 Adult ^a	2,800 Child ^a 5,700 Adult ^a
Skin Adsorption Factor	Chemical Specific	Chemical Specific	Chemical Specific

^aTechnical Background Document for Development of Soil Screening Levels (NMED December 2000).

^bRisk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).

^cExposure Factors Handbook (EPA August 1997).

ED = Exposure duration.

EPA = U.S. Environmental Protection Agency.

hr = Hour(s).

kg = Kilogram(s).

m = Meter(s).

mg = Milligram(s).

NA = Not available.

wk = Week(s).

yr = Year(s).

Table 3
Default Radiological Exposure Parameter Values for Various Land-Use Scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure Frequency	8 hr/day for 250 day/yr	4 hr/wk for 52 wk/yr	365 day/yr
Exposure Duration (yr)	25 ^{a,b}	30 ^{a,b}	30 ^{a,b}
Body Weight (kg)	70 Adult ^{a,b}	70 Adult ^{a,b}	70 Adult ^{a,b}
Soil Ingestion Pathway			
Ingestion Rate	100 mg/day ^c	100 mg/day ^c	100 mg/day ^c
Averaging Time (days) (= 30 yr x 365 day/yr)	10,950 ^d	10,950 ^d	10,950 ^d
Inhalation Pathway			
Inhalation Rate (m ³ /yr)	7,300 ^{d,e}	10,950 ^e	7,300 ^{d,e}
Mass Loading for Inhalation g/m ³	1.36 E-5 ^d	1.36 E-5 ^d	1.36 E-5 ^d
Food Ingestion Pathway			
Ingestion Rate, Leafy Vegetables (kg/yr)	NA	NA	16.5 ^c
Ingestion Rate, Fruits, Non-Leafy Vegetables & Grain (kg/yr)	NA	NA	101.8 ^b
Fraction Ingested	NA	NA	0.25 ^{b,d}

^aRisk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).

^bExposure Factors Handbook (EPA August 1997).

^cEPA Region VI guidance (EPA 1996).

^dFor radionuclides, RESRAD (ANL 1993).

^eSNL/NM (February 1998).

EPA = U.S. Environmental Protection Agency.

g = Gram(s)

hr = Hour(s).

kg = Kilogram(s).

m = Meter(s).

mg = Milligram(s).

NA = Not applicable.

wk = Week(s).

yr = Year(s).

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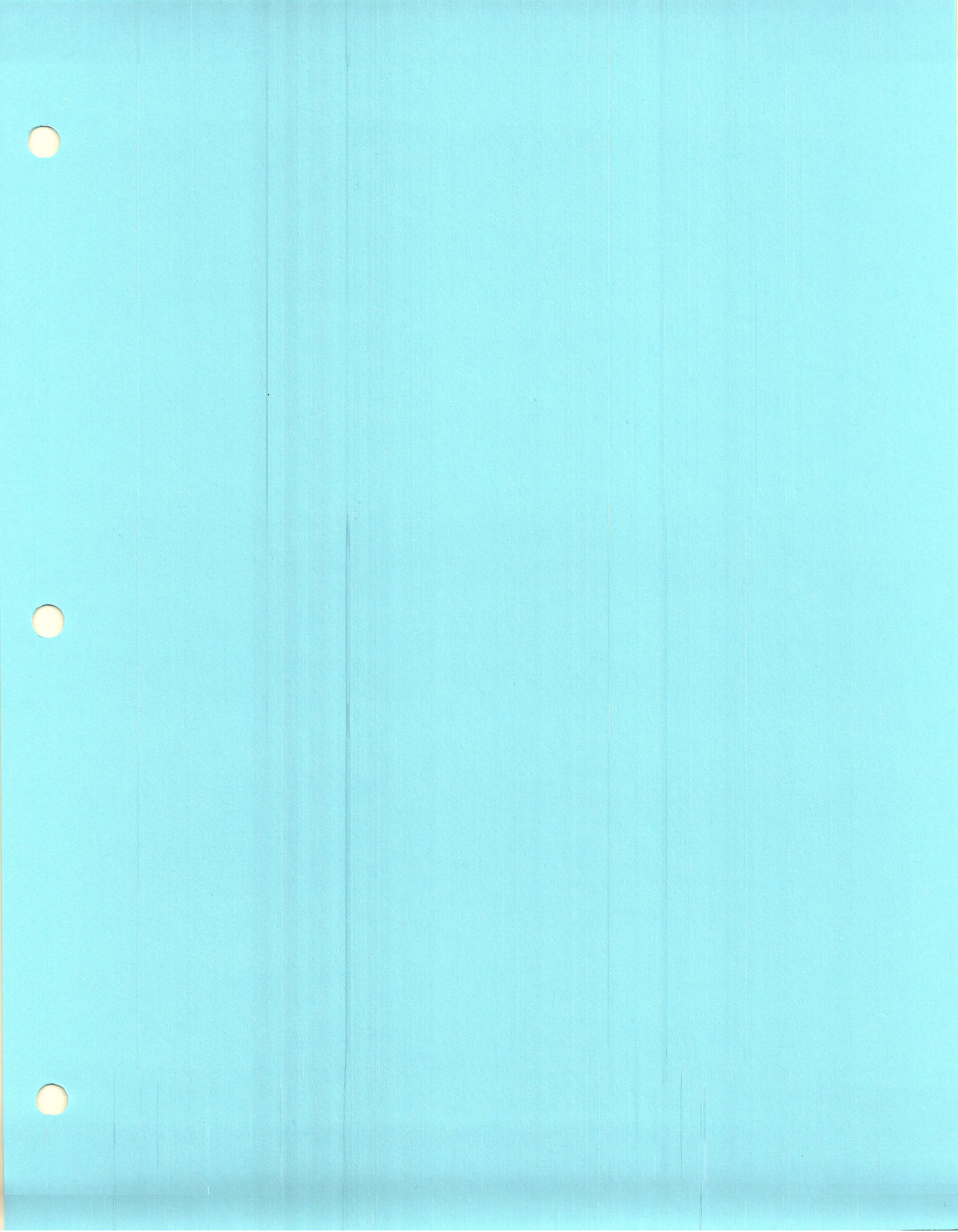
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APPENDIX 2
Calculation of the Upper 95% Confidence Limits of
Mean Concentrations

APPENDIX 2
CALCULATION OF THE UPPER 95% CONFIDENCE LIMITS OF
MEAN CONCENTRATIONS

For conservatism, Sandia National Laboratories/New Mexico uses the maximum concentration of the constituents of concern (COCs) for initial risk calculation. If the maximum concentrations produce risk above New Mexico Environment Department (NMED) guidelines, conservatism with this approach is evaluated and, if appropriate, a more realistic approach is applied. When the site has been adequately characterized, an estimate of the mean concentration of the COCs is more representative of actual site conditions. The NMED has proposed the use of the 95% upper confidence limit (UCL) of the mean to represent average concentrations at a site (NMED December 2000). The 95% UCL is calculated according to NMED guidance (Tharp June 2002) using the U.S. Environmental Protection Agency ProUCL program (EPA April 2002). Attached are the outputs from that program and the calculated UCLs used in the risk analysis.

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SWMU 30

General Statistics

SWMU 30	
Summary Statistics for Antimony	
Number of Samples	204
Minimum	0.592
Maximum	5.8
Mean	1.19702
Median	1.05
Standard Deviation	0.674566
Variance	0.455039
Coefficient of Variation	0.563538
Skewness	5.207189
Lilliefors Test Statistic	0.522539
Lilliefors 5% Critical Value	0.062032
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	1.275061
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	1.293103
Modified-t	1.27793
95% Non-parametric UCL	
CLT	1.274704
Jackknife	1.275061
Standard Bootstrap	1.274023
Bootstrap-t	1.301275
Chebyshev (Mean, Std)	1.402886

General Statistics

SWMU 30	
Summary Statistics for	Arsenic
Number of Samples	217
Minimum	1.3
Maximum	8.4
Mean	4.002535
Median	3.9
Standard Deviation	1.22699
Variance	1.505505
Coefficient of Variation	0.306553
Skewness	0.907574
Lilliefors Test Statistic	0.108883
Lilliefors 5% Critical Value	0.060146
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
97.5% UCL (Assuming Normal Data)	
Student's-t	4.166707
97.5% UCL (Adjusted for Skewness)	
Adjusted-CLT	4.173213
Modified-t	4.167562
97.5% Non-parametric UCL	
CLT	4.165787
Jackknife	4.166707
Standard Bootstrap	4.160514
Bootstrap-t	4.16847
Chebyshev (Mean, Std)	4.522702

General Statistics

SWMU 30			
Summary Statistics for Barium		Summary Statistics for ln(Barium)	
Number of Samples	217	Minimum	4.356709
Minimum	78	Maximum	6.927558
Maximum	1020	Mean	5.199119
Mean	199.659	Standard Deviation	0.421616
Median	179	Variance	0.17776
Standard Deviation	105.0009		
Variance	11025.2	Lilliefors Test Statistic	0.050666
Coefficient of Variation	0.525901	Lilliefors 5% Critical Value	0.060146
Skewness	3.144076	Data are Lognormal at 5% Significance Level	
95% UCL (Assuming Normal Data)		Estimates Assuming Lognormal Distribution	
Student's-t	211.4339	MLE Mean	197.947
95% UCL (Adjusted for Skewness)		MLE Standard Deviation	87.30759
Adjusted-CLT	213.009	MLE Coefficient of Variation	0.441065
Modified-t	211.6874	MLE Skewness	1.409001
95% Non-parametric UCL		MLE Median	181.1127
CLT	211.3834	MLE 80% Quantile	258.6265
Jackknife	211.4339	MLE 90% Quantile	311.3433
Standard Bootstrap	211.2211	MLE 95% Quantile	362.3743
Bootstrap-t	213.794	MLE 99% Quantile	482.8946
Chebyshev (Mean, Std)	230.7289	MVU Estimate of Median	181.0385
		MVU Estimate of Mean	197.8589
		MVU Estimate of Std. Dev.	87.11469
		MVU Estimate of SE of Mean	5.899481
		UCL Assuming Lognormal Distribution	
		95% H-UCL	208.2126
		95% Chebyshev (MVUE) UCL	223.5741
		99% Chebyshev (MVUE) UCL	256.558
		Recommended UCL to use:	
		Student's-t or H-UCL	

General Statistics

SWMU 30	
Summary Statistics for Cadmium	
Number of Samples	216
Minimum	0.038
Maximum	26
Mean	0.577157
Median	0.05
Standard Deviation	2.125555
Variance	4.517985
Coefficient of Variation	3.6828
Skewness	9.07822
Lilliefors Test Statistic	0.399881
Lilliefors 5% Critical Value	0.060285
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	0.916134
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	1.089653
Modified-t	0.931023
99% Non-parametric UCL	
CLT	0.913607
Jackknife	0.916134
Standard Bootstrap	0.920487
Bootstrap-t	1.443623
Chebyshev (Mean, Std)	2.016165

General Statistics

SWMU 30	
Summary Statistics for Chromium	
Number of Samples	217
Minimum	1.9
Maximum	35.3
Mean	6.657604
Median	6.3
Standard Deviation	3.184934
Variance	10.1438
Coefficient of Variation	0.47839
Skewness	4.020673
Lilliefors Test Statistic	0.16202
Lilliefors 5% Critical Value	0.060146
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	7.164337
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	7.276868
Modified-t	7.174172
99% Non-parametric UCL	
CLT	7.160577
Jackknife	7.164337
Standard Bootstrap	7.147358
Bootstrap-t	7.305035
Chebyshev (Mean, Std)	8.80884

General Statistics

SWMU 30	
Summary Statistics for Copper	
Number of Samples	217
Minimum	2.7
Maximum	1080
Mean	27.84719
Median	8
Standard Deviation	106.352
Variance	11310.75
Coefficient of Variation	3.819129
Skewness	7.75972
Lilliefors Test Statistic	0.407154
Lilliefors 5% Critical Value	0.060146
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	44.76812
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	52.13701
Modified-t	45.40197
99% Non-parametric UCL	
CLT	44.6426
Jackknife	44.76812
Standard Bootstrap	45.00691
Bootstrap-t	107.3865
Chebyshev (Mean, Std)	99.68175

General Statistics

SWMU 30	
Summary Statistics for Thallium	
Number of Samples	217
Minimum	0.1025
Maximum	1.8
Mean	0.63735
Median	0.5
Standard Deviation	0.299855
Variance	0.089913
Coefficient of Variation	0.470472
Skewness	0.990108
Lilliefors Test Statistic	0.340138
Lilliefors 5% Critical Value	0.060146
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.670976
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.672294
Modified-t	0.671204
95% Non-parametric UCL	
CLT	0.670832
Jackknife	0.670976
Standard Bootstrap	0.670844
Bootstrap-t	0.672638
Chebyshev (Mean, Std)	0.726078

General Statistics

SWMU 30	
Summary Statistics for	Benzo(a)anthracene
Number of Samples	203
Minimum	0.0105
Maximum	1.8
Mean	0.03954433498
Median	0.0105
Standard Deviation	0.1691337364
Variance	0.0286062208
Coefficient of Variation	4.277066147
Skewness	9.600429941
Lilliefors Test Statistic	0.4318272266
Lilliefors 5% Critical Value	0.0621850092
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.0591601219
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.06761699862
Modified-t	0.06049325538
95% Non-parametric UCL	
CLT	0.05907016396
Jackknife	0.0591601219
Standard Bootstrap	0.05903257542
Bootstrap-t	0.1467307946
Chebyshev (Mean, Std)	0.09128821899

General Statistics

SWMU 30:	
Summary Statistics for	Benzo(a)pyrene
Number of Samples	203
Minimum	0.0105
Maximum	1.4
Mean	0.03557881773
Median	0.0105
Standard Deviation	0.1393922228
Variance	0.01943019178
Coefficient of Variation	3.917843022
Skewness	9.421068241
Lilliefors Test Statistic	0.4286094696
Lilliefors 5% Critical Value	0.0621850092
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.05174524437
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.058583413
Modified-t	0.0528234247
95% Non-parametric UCL	
CLT	0.05167110519
Jackknife	0.05174524437
Standard Bootstrap	0.05196916335
Bootstrap-t	0.1148218532
Chebyshev (Mean, Std)	0.0782237398

General Statistics

SWMU 30	
Summary Statistics for Benzo(b)fluoranthene	
Number of Samples	203
Minimum	0.023
Maximum	2.2
Mean	0.06532019704
Median	0.048
Standard Deviation	0.1651837589
Variance	0.02728567419
Coefficient of Variation	2.528831301
Skewness	11.16394414
Lilliefors Test Statistic	
	0.4235276709
Lilliefors 5% Critical Value	
	0.0621850092
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.0844778736
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.09409666668
Modified-t	0.08599191486
95% Non-parametric UCL	
CLT	0.08439001656
Jackknife	0.0844778736
Standard Bootstrap	0.08404098284
Bootstrap-t	0.1178602954
Chebyshev (Mean, Std)	0.1158556457

General Statistics

SWMU 30	
Summary Statistics for	Benzo(ghi)perylene
Number of Samples	203
Minimum	0.038
Maximum	1.125
Mean	0.1176403941
Median	0.1125
Standard Deviation	0.1628316608
Variance	0.02651414975
Coefficient of Variation	1.384147529
Skewness	5.347718539
Lilliefors Test Statistic	0.4633309945
Lilliefors 5% Critical Value	0.0621850092
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.1365252791
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.1410221154
Modified-t	0.1372402035
95% Non-parametric UCL	
CLT	0.1364386731
Jackknife	0.1365252791
Standard Bootstrap	0.136196107
Bootstrap-t	0.1466069039
Chebyshev (Mean, Std)	0.1674562543

General Statistics

SMMU 30	
Summary Statistics for Dibenz[a,h]anthracene	
Number of Samples	203
Minimum	0.012
Maximum	0.31
Mean	0.01787684729
Median	0.012
Standard Deviation	0.02480437533
Variance	0.0006152570356
Coefficient of Variation	1.387513969
Skewness	9.236559483
Lilliefors Test Statistic	0.4407174179
Lilliefors 5% Critical Value	0.0621850092
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.02075360832
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.02194634773
Modified-t	0.02094170937
95% Non-parametric UCL	
CLT	0.0207404155
Jackknife	0.02075360832
Standard Bootstrap	0.02076194131
Bootstrap-t	0.02450798073
Chebyshev (Mean, Std)	0.02546536716

General Statistics

SWMU 30	
Summary Statistics for Indeno(1,2,3-c,d)pyrene	
Number of Samples	203
Minimum	0.011
Maximum	0.77
Mean	0.02982512315
Median	0.011
Standard Deviation	0.07208069398
Variance	0.005195626445
Coefficient of Variation	2.416777749
Skewness	8.831107245
Lilliefors Test Statistic	0.396981787
Lilliefors 5% Critical Value	0.0621850092
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.03818489551
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.04149712607
Modified-t	0.03870751648
95% Non-parametric UCL	
CLT	0.03814655762
Jackknife	0.03818489551
Standard Bootstrap	0.03804524108
Bootstrap-t	0.05624577682
Chebyshev (Mean, Std)	0.05187711082

General Statistics

SWMU 30	
Summary Statistics for	Phenanthrene
Number of Samples	203
Minimum	0.0115
Maximum	2.6
Mean	0.04084482759
Median	0.0115
Standard Deviation	0.2026506146
Variance	0.04106727159
Coefficient of Variation	4.961475579
Skewness	11.05978798
Lilliefors Test Statistic	0.4424323824
Lilliefors 5% Critical Value	0.0621850092
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.0643478339
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.07603725356
Modified-t	0.06618795938
95% Non-parametric UCL	
CLT	0.06424004919
Jackknife	0.0643478339
Standard Bootstrap	0.06453160258
Bootstrap-t	0.1529764859
Chebyshev (Mean, Std)	0.1028426887

SWMU 33

General Statistics

SWMU 33	
Summary Statistics for	Arsenic
Number of Samples	44
Minimum	0.84
Maximum	4.8
Mean	2.489545
Median	2.4
Standard Deviation	0.955654
Variance	0.913274
Coefficient of Variation	0.383867
Skewness	0.56107
Shapiro-Wilk Test Statistic	0.958688
Shapiro-Wilk 5% Critical Value	0.944
Data are Normal at 5% Significance Level	
Recommended UCL to use	Student's-t
95% UCL (Assuming Normal Data)	
Student's-t	2.731738
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	2.739541
Modified-t	2.733769
95% Non-parametric UCL	
CLT	2.72652
Jackknife	2.731738
Standard Bootstrap	2.722356
Bootstrap-t	2.741929
Chebyshev (Mean, Std)	3.117533

SWMU 114

General Statistics

SWMU 114		
Summary Statistics for		arsenic
Number of Samples		415
Minimum		0.05
Maximum		4.8
Mean		2.044892
Median		1.9
Standard Deviation		0.879985
Variance		0.774373
Coefficient of Variation		0.430333
Skewness		0.558008
Lilliefors Test Statistic		0.089123
Lilliefors 5% Critical Value		0.043492
Data not Normal at 5% Significance Level		
Data not Lognormal: Try Non-parametric UCL		
95% UCL (Assuming Normal Data)		
Student's-t		2.116103
95% UCL (Adjusted for Skewness)		
Adjusted-CLT		2.117208
Modified-t		2.1163
95% Non-parametric UCL		
CLT		2.115944
Jackknife		2.116103
Standard Bootstrap		2.115682
Bootstrap-t		2.116594
Chebyshev (Mean, Std)		2.233182

SWMU 18

General Statistics

SWMU 18:				
Summary Statistics for		cadmium	Summary Statistics for	ln(cadmium)
Number of Samples	34		Minimum	-4.961845
Minimum	0.007		Maximum	2.939162
Maximum	18.9		Mean	-1.088843
Mean	2.276644		Standard Deviation	2.047891
Median	0.25		Variance	4.193858
Standard Deviation	5.031886			
Variance	25.31988		Shapiro-Wilk Test Statistic	0.965653
Coefficient of Variation	2.210221		Shapiro-Wilk 5% Critical Value	0.933
Skewness	2.637362		Data are Lognormal at 5% Significance Level	
95% UCL (Assuming Normal Data)			Estimates Assuming Lognormal Distribution	
Student's-t	3.737085		MLE Mean	2.740352
95% UCL (Adjusted for Skewness)			MLE Standard Deviation	22.14062
Adjusted-CLT	4.113153		MLE Coefficient of Variation	8.079481
Modified-t	3.802139		MLE Skewness	551.6509
95% Non-parametric UCL			MLE Median	0.336606
CLT	3.696089		MLE 80% Quantile	1.899566
Jackknife	3.737085		MLE 90% Quantile	4.677189
Standard Bootstrap	3.646522		MLE 95% Quantile	9.776075
Bootstrap-t	4.531744		MLE 99% Quantile	39.43099
Chebyshev (Mean, Std)	6.038205		MVU Estimate of Median	0.316438
			MVU Estimate of Mean	2.322436
			MVU Estimate of Std. Dev.	10.3463
			MVU Estimate of SE of Mean	1.126493
			UCL Assuming Lognormal Distribution	
			95% H-UCL	10.77957
			95% Chebyshev (MVUE) UCL	7.232705
			99% Chebyshev (MVUE) UCL	13.5309
			Recommended UCL to use:	
			95 % Chebyshev (MVUE) UCL	

General Statistics

SWMU 18	
Summary Statistics for benzo(a)pyrene	
Number of Samples	22
Minimum	0.001
Maximum	0.289
Mean	0.01409090909
Median	0.001
Standard Deviation	0.06140180631
Variance	0.003770181818
Coefficient of Variation	4.357547545
Skewness	4.69041576
Shapiro-Wilk Test Statistic	0.2207134286
Shapiro-Wilk 5% Critical Value	0.911
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.03661699432
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.0496113644
Modified-t	0.0387988125
95% Non-parametric UCL	
CLT	0.0356235384
Jackknife	0.03661699432
Standard Bootstrap	0.03470468779
Bootstrap-t	-1.#QNAN
Chebyshev (Mean, Std)	0.0711528589

SWMU 241

General Statistics

SWMU 241				
Summary Statistics for		Antimony	Summary Statistics for In(Antimony)	
Number of Samples		8	Minimum	0.841567
Minimum		2.32	Maximum	3.387774
Maximum		29.6	Mean	1.754299
Mean		8.2525	Standard Deviation	0.825739
Median		5	Variance	0.681845
Standard Deviation		9.083127		
Variance		82.50319	Shapiro-Wilk Test Statistic	0.860459
Coefficient of Variation		1.100652	Shapiro-Wilk 5% Critical Value	0.818
Skewness		2.345822	Data are Lognormal at 5% Significance Level	
95% UCL (Assuming Normal Data)			Estimates Assuming Lognormal Distribution	
Student's-t		14.33669	MLE Mean	8.127239
95% UCL (Adjusted for Skewness)			MLE Standard Deviation	8.035384
Adjusted-CLT		16.38064	MLE Coefficient of Variation	0.988698
Modified-t		14.7806	MLE Skewness	3.932569
95% Non-parametric UCL			MLE Median	5.779393
CLT		13.53473	MLE 80% Quantile	11.61211
Jackknife		14.33669	MLE 90% Quantile	16.69941
Standard Bootstrap		13.21739	MLE 95% Quantile	22.48031
Bootstrap-t		38.05266	MLE 99% Quantile	39.4474
Chebyshev (Mean, Std)		22.25054	MVU Estimate of Median	5.537147
			MVU Estimate of Mean	7.716609
			MVU Estimate of Std. Dev.	6.557507
			MVU Estimate of SE of Mean	2.296024
			UCL Assuming Lognormal Distribution	
			95% H-UCL	21.16858
			95% Chebyshev (MVUE) UCL	17.72475
			99% Chebyshev (MVUE) UCL	30.56176
			Recommended UCL to use:	
			H-UCL	

SWMU 230

General Statistics

SWMU 230			
Summary Statistics for		arsenic	Summary Statistics for
Number of Samples	14		ln(arsenic)
Minimum	1.3		Minimum
Maximum	6.6		Maximum
Mean	2.504286		Mean
Median	2.15		Standard Deviation
Standard Deviation	1.307197		Variance
Variance	1.708765		Shapiro-Wilk Test Statistic
Coefficient of Variation	0.521984		Shapiro-Wilk 5% Critical Value
Skewness	2.651345		Data are Lognormal at 5% Significance Level
95% UCL (Assuming Normal Data)			Estimates Assuming Lognormal Distribution
Student's-t	3.122985		MLE Mean
95% UCL (Adjusted for Skewness)			MLE Standard Deviation
Adjusted-CLT	3.343458		MLE Coefficient of Variation
Modified-t	3.164244		MLE Skewness
95% Non-parametric UCL			MLE Median
CLT	3.078937		MLE 80% Quantile
Jackknife	3.122985		MLE 90% Quantile
Standard Bootstrap	3.051074		MLE 95% Quantile
Bootstrap-t	3.865287		MLE 99% Quantile
Chebyshev (Mean, Std)	4.027125		MVU Estimate of Median
			MVU Estimate of Mean
			MVU Estimate of Std. Dev.
			MVU Estimate of SE of Mean
			UCL Assuming Lognormal Distribution
			95% H-UCL
			95% Chebyshev (MVUE) UCL
			99% Chebyshev (MVUE) UCL
			Recommended UCL to use:
			Student's-t or H-UCL

SWMU 231

General Statistics

SWMU 231					
Summary Statistics for		arsenic	Summary Statistics for		ln(arsenic)
Number of Samples	12		Minimum	0.182322	
Minimum	1.2		Maximum	1.740466	
Maximum	5.7		Mean	0.766958	
Mean	2.374167		Standard Deviation	0.44689	
Median	2.25		Variance	0.199711	
Standard Deviation	1.217378				
Variance	1.482008		Shapiro-Wilk Test Statistic	0.930821	
Coefficient of Variation	0.51276		Shapiro-Wilk 5% Critical Value	0.859	
Skewness	1.953615		Data are Lognormal at 5% Significance Level		
95% UCL (Assuming Normal Data)			Estimates Assuming Lognormal Distribution		
Student's-t	3.005288		MLE Mean	2.379317	
95% UCL (Adjusted for Skewness)			MLE Standard Deviation	1.118658	
Adjusted-CLT	3.163982		MLE Coefficient of Variation	0.470159	
Modified-t	3.03832		MLE Skewness	1.514406	
95% Non-parametric UCL			MLE Median	2.153206	
CLT	2.952212		MLE 80% Quantile	3.141122	
Jackknife	3.005288		MLE 90% Quantile	3.823675	
Standard Bootstrap	2.921609		MLE 95% Quantile	4.491076	
Bootstrap-t	3.377078		MLE 99% Quantile	6.088639	
Chebyshev (Mean, Std)	3.906		MVU Estimate of Median	2.135352	
			MVU Estimate of Mean	2.358104	
			MVU Estimate of Std. Dev.	1.07576	
			MVU Estimate of SE of Mean	0.310095	
			UCL Assuming Lognormal Distribution		
			95% H-UCL	3.1481	
			95% Chebyshev (MVUE) UCL	3.709775	
			99% Chebyshev (MVUE) UCL	5.443506	
			Recommended UCL to use:		
			Student's-t or H-UCL		

SWMU 232-1

General Statistics

SWMU 232-1				
Summary Statistics for		arsenic	Summary Statistics for In(arsenic)	
Number of Samples		12	Minimum	-0.020203
Minimum		0.98	Maximum	1.629241
Maximum		5.1	Mean	0.609288
Mean		2.093333	Standard Deviation	0.516373
Median		1.7	Variance	0.266641
Standard Deviation		1.205354		
Variance		1.452879	Shapiro-Wilk Test Statistic	0.948733
Coefficient of Variation		0.575806	Shapiro-Wilk 5% Critical Value	0.859
Skewness		1.531818	Data are Lognormal at 5% Significance Level	
95% UCL (Assuming Normal Data)			Estimates Assuming Lognormal Distribution	
Student's-t		2.718222	MLE Mean	2.10141
			MLE Standard Deviation	1.161629
95% UCL (Adjusted for Skewness)			MLE Coefficient of Variation	0.552786
Adjusted-CLT		2.830077	MLE Skewness	1.827272
Modified-t		2.743866	MLE Median	1.839121
			MLE 80% Quantile	2.845171
95% Non-parametric UCL			MLE 90% Quantile	3.570934
CLT		2.66567	MLE 95% Quantile	4.300458
Jackknife		2.718222	MLE 99% Quantile	6.112718
Standard Bootstrap		2.64416		
Bootstrap-t		3.04951	MVU Estimate of Median	1.818784
Chebyshev (Mean, Std)		3.610037	MVU Estimate of Mean	2.075856
			MVU Estimate of Std. Dev.	1.101586
			MVU Estimate of SE of Mean	0.317199
			UCL Assuming Lognormal Distribution	
			95% H-UCL	2.94203
			95% Chebyshev (MVUE) UCL	3.458497
			99% Chebyshev (MVUE) UCL	5.231951
			Recommended UCL to use:	
			H-UCL	

SWMU 66

General Statistics

SWMU 66				
Summary Statistics for		Arsenic	Summary Statistics for In(Arsenic)	
Number of Samples	44		Minimum	0.741937
Minimum	2.1		Maximum	2.734368
Maximum	15.4		Mean	1.705288
Mean	6.1025		Standard Deviation	0.460243
Median	5.635		Variance	0.211824
Standard Deviation	2.891816			
Variance	8.362601		Shapiro-Wilk Test Statistic	0.967748
Coefficient of Variation	0.473874		Shapiro-Wilk 5% Critical Value	0.944
Skewness	1.121094		Data are Lognormal at 5% Significance Level	
95% UCL (Assuming Normal Data)			Estimates Assuming Lognormal Distribution	
Student's-t	6.835376		MLE Mean	6.11778
			MLE Standard Deviation	2.971565
95% UCL (Adjusted for Skewness)			MLE Coefficient of Variation	0.485726
Adjusted-CLT	6.898317		MLE Skewness	1.571775
Modified-t	6.847656		MLE Median	5.502968
			MLE 80% Quantile	8.118885
95% Non-parametric UCL			MLE 90% Quantile	9.941319
CLT	6.819587		MLE 95% Quantile	11.73279
Jackknife	6.835376		MLE 99% Quantile	16.05166
Standard Bootstrap	6.810294			
Bootstrap-t	6.954678		MVU Estimate of Median	5.489737
Chebyshev (Mean, Std)	8.002795		MVU Estimate of Mean	6.101627
			MVU Estimate of Std. Dev.	2.934049
			MVU Estimate of SE of Mean	0.441066
			UCL Assuming Lognormal Distribution	
			95% H-UCL	6.974174
			95% Chebyshev (MVUE) UCL	8.024188
			99% Chebyshev (MVUE) UCL	10.49018
			Recommended UCL to use:	
			Student's-t or H-UCL	

SWMU 9

General Statistics

SWMU 9	
Summary Statistics for 2-Amino-4,6-dinitrotoluene	
Number of Samples	76
Minimum	0.0033
Maximum	3.68
Mean	0.2118302632
Median	0.0067
Standard Deviation	0.5817663116
Variance	0.3384520413
Coefficient of Variation	2.746379592
Skewness	4.69054563
Lilliefors Test Statistic	0.3600058379
Lilliefors 5% Critical Value	0.1016311701
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.3229693582
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.3599618782
Modified-t	0.3289535719
95% Non-parametric UCL	
CLT	0.3215965643
Jackknife	0.3229693582
Standard Bootstrap	0.3234650063
Bootstrap-t	0.4583355893
Chebyshev (Mean, Std)	0.502713419

General Statistics

SWMU 9	
Summary Statistics for 4-Amino-2,6-dinitrotoluene	
Number of Samples	76
Minimum	0.00275
Maximum	2.29
Mean	0.1574065789
Median	0.00505
Standard Deviation	0.3890942839
Variance	0.1513943618
Coefficient of Variation	2.471906108
Skewness	3.830155045
Lilliefors Test Statistic	0.362837273
Lilliefors 5% Critical Value	0.1016311701
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.2317381202
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.2517725796
Modified-t	0.2350063032
95% Non-parametric UCL	
CLT	0.2308199745
Jackknife	0.2317381202
Standard Bootstrap	0.2310650059
Bootstrap-t	0.2743577913
Chebyshev (Mean, Std)	0.3519537209

General Statistics

SWMU 9	
Summary Statistics for Benzo(a)pyrene	
Number of Samples	73
Minimum	0.036
Maximum	0.12
Mean	0.03715068493
Median	0.036
Standard Deviation	0.009831456364
Variance	9.665753425E-005
Coefficient of Variation	0.2646372841
Skewness	8.544003745
Lilliefors Test Statistic	0.5328876937
Lilliefors 5% Critical Value	0.1036984564
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.03906806366
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.04027291673
Modified-t	0.03925984448
95% Non-parametric UCL	
CLT	0.03904339322
Jackknife	0.03906806366
Standard Bootstrap	0.03906780011
Bootstrap-t	-1.#QNAN
Chebyshev (Mean, Std)	0.04216640426

General Statistics

SWMU 9	
Summary Statistics for	Benzo(g,h,i)perylene
Number of Samples	73
Minimum	0.0405
Maximum	0.13
Mean	0.04267808219
Median	0.0405
Standard Deviation	0.01317309175
Variance	0.0001735303463
Coefficient of Variation	0.308661755
Skewness	6.060960979
Lilliefors Test Statistic	0.5382658485
Lilliefors 5% Critical Value	0.1036984564
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95% UCL (Assuming Normal Data)	
Student's-t	0.045247163
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	0.04638276345
Modified-t	0.04542944975
95% Non-parametric UCL	
CLT	0.04521410727
Jackknife	0.045247163
Standard Bootstrap	0.04516633511
Bootstrap-t	-1.#QNAN
Chebyshev (Mean, Std)	0.04939860543

General Statistics

From File	
Summary Statistics for	RDX
Number of Samples	76
Minimum	0.00485
Maximum	26
Mean	2.863429
Median	0.874
Standard Deviation	5.348326
Variance	28.60459
Coefficient of Variation	1.867805
Skewness	2.954668
Lilliefors Test Statistic	0.296504
Lilliefors 5% Critical Value	0.101631
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	4.321769
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	4.700381
Modified-t	4.356424
99% Non-parametric UCL	
CLT	4.290632
Jackknife	4.321769
Standard Bootstrap	4.30461
Bootstrap-t	5.294516
Chebyshev (Mean, Std)	8.967627

General Statistics

SWMU 9	
Summary Statistics for	2,4,6-Trinitrotoluene
Number of Samples	76
Minimum	0.00285
Maximum	18
Mean	0.8988052632
Median	0.00705
Standard Deviation	3.304352648
Variance	10.91874642
Coefficient of Variation	3.676383287
Skewness	4.555488479
Lilliefors Test Statistic	0.4199366114
Lilliefors 5% Critical Value	0.1016311701
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
99% UCL (Assuming Normal Data)	
Student's-t	1.799810502
99% UCL (Adjusted for Skewness)	
Adjusted-CLT	2.170886233
Modified-t	1.832821336
99% Non-parametric UCL	
CLT	1.780573098
Jackknife	1.799810502
Standard Bootstrap	1.771129398
Bootstrap-t	6.030904486
Chebyshev (Mean, Std)	4.670158322