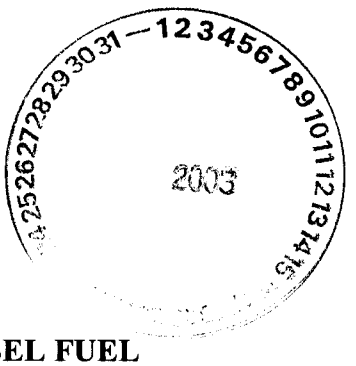
TA-03

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 665-1859/Fax: (505) 665-9344

Date: May 23, 2003
Refer to: RRES-WQH: 03-119



Mr. Kevin Krause
Environmental Scientist
New Mexico Environment Department
Hazardous Waste Bureau
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: SAMPLING AND ANALYSIS PLAN (SAP) FOR DIESEL FUEL CONTAMINATED SOIL DISCOVERED NEAR TA-3-26 ABOVEGROUND STORAGE TANK (AST)

Dear Mr. Krause:

On April 3, 2003 the Laboratory's Water Quality and Hydrology Group (RRES-WQH) notified your office of the discovery of diesel contaminated soil during the installation of cathodic protection near the TA-3 Power Plant AST (SM-26). This notification was pursuant to the New Mexico Water Quality Control Commission (NMWQCC) Regulations (20 NMAC 6.2). The 15-Day Release Discharge Notification is attached as Enclosure 1. Enclosed for your review is the "Assessment of Fuel Oil Contamination Near Fuel Storage Tank TA-3-26: Sampling and Analysis Plan (SAP)" (Enclosure 2).

Please contact Mark Haagenstad at (505) 665-2014 or Mike Saladen at (505) 665-6085 should you have any questions on this matter.

Sincerely,

Steven Rae
Group Leader
Water Quality & Hydrology Group

MS:MH/tml

Enclosures: a/s

Cy: John Young, NMED-HWB, Santa Fe, w/enc.
Vickie Maranville, NMED-HWB, Santa Fe, w/enc.
Steve Yanicak, NMED-OB, w/enc., MS J993
Joseph Vozella, DOE-OLASO, w/o enc., MS A316
Gene Turner, DOE-OLASO, w/enc., MS A316
David Padilla, FWO-UI, w/o enc., MS K718
Jerome Gonzales, FWO-UI, w/enc., MS K718
Beverly Ramsey, RRES-DO, w/o enc., MS J591
Kenneth Hargis, RRES-DO, w/o enc., MS J591
Tori George, RRES-DO, w/o enc., MS J591
Doug Stavert, RRES-EP, w/o enc., MS J591
Mike Saladen, RRES-WQH, w/enc., MS K497
Mark Haagenstad, RRES-WQH, w/enc., MS K497
Suzanne Moore, KSL-HENV, w/enc., MS A199
Bruce Baumgartner, KSL-HENV, w/enc. MS A199
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

ENCLOSURE 1

RELEASE / DISCHARGE NOTIFICATION

LOS ALAMOS NATIONAL LABORATORY

Permit Number: .

Calendar Year: [ ]

NPDES or Operational Spill/Release ☐
ER Spill/Release ☐
Other Spill/Release ☑
Indicate with "X" in appropriate box.

Release ID Number: 121

Responsible Facility/User Group: FMU-8 FWO-UI

Contact Person: David Padilla **Pager #:** 996-4583

Phone #: 667-2408 **Cell Phone #:** 699-2812

Release/Discharge Location:

TA: 3

Building: AST 26

Contractor was conducting excavation and coring operations for installing cathodic protection instrumentation at the 150K tank (SM-26) at the TA-3 Power Plant (LANL). Diesel odor coming from soil borings.

If the release/discharge is associated with a NPDES Outfall, Potential Release Site (PRS) or Solid Waste Management Unit (SWMU), indicate the site/unit number and its relationship to the release/discharge:

NPDES Outfall: ☐ **PRS:** ☐ **SWMU:** ☐ **PRS/SWMU Number:** N/A

Indicate with "X" in appropriate box(es).

Relationship of the Discharge to a SWMU or PRS:

NA

Discharge Occurred: TBD — **Date & Time**

Discharge Discovered: 4/2/2003 2:30 p.m. — **Date & Time**

Discharge Stopped: TBD — **Date & Time**

Cleanup Started: TBD — **Date & Time**

Cleanup Completed: TBD — **Date & Time**

Material(s) Released / Discharged:

No. 2 Diesel Fuel

Release/Discharge Mitigation Method:

To Be Determined (TBD)

Weather Conditions:

Sunny, cool

Duration of Release/ Discharge, in HOURS: TBD

Est. Volume Released/ Discharged, in GAL. TBD

Est. Volume Recovered, in GAL. TBD

Corrective Actions Taken (ie, type of BMPs, etc):

Coring operatioins drilled 7 holes around the tank to depths between 5 and 10 feet. Soil samples were collected and submitted for DRO and BTEX analysis. Analytical results will be provided upon receipt and data validation.

Nearest Watercourse (Canyon Name) Not Applicable

If the release/discharge reached a watercourse, describe the estimated surface area affected, presence of release/discharge now in the watercourse, and the media the release/discharge was detected in:

NA

Depth to Groundwater, in FT, if known: ~1000

Distance to Nearest Drinking Water Well, in FT, if known: ~13500 **Well ID#** PM-5

24-HOUR RELEASE / DISCHARGE NOTIFICATIONS

	Contact Person	Phone	Fax	Date & Time (or Comment)	
EPA:	E. Spencer	214-665-6475	214-665-2168	4/17/2003	FAX
NMED/SWQB:	Bret Lucas	827-2933	827-0160	4/17/2003	FAX
NMED/GWQB:	Curt Frischkorn	827-2918	827-2965	4/17/2003	FAX
NMED/HRMB:	John Young	428-2538	428-2567	4/17/2003	FAX
NMED/DOE-OB:	Steve Yanicak	672-0448	672-0466	4/17/2003	FAX
RRES-WQH:	Mike Saladen	665-6085	665-9344	4/17/2003	FAX
DOE:	Gene Turner	667-5794	505-665-4872	4/17/2003	FAX
OTHER:	Patricia Vadaro-Charles	665-6976	665-6977	4/17/2003	FAX
OTHER:	Kevin Krause	425-2500	425-2567	4/17/2003	FAX

Comments: Mike Saladen of RRES-WQH provided a verbal 24-Hour Notification to Kevin Krause of NMED-HZWB on 4/3/2003 at 2:58 p.m.. Site evaluation is on-going.

Form Completed By: Mark Haagenstad

7 DAY RELEASE / DISCHARGE ACTIONS

7 Day Notice ☑ **7 Day Notice Date:** 4/9/2003 **7 Day Notice By:** Mark Haagenstad

Mark "X" when done.

Comments: Site evaluation is on-going.

15 DAY RELEASE / DISCHARGE ACTIONS

15 day Follow-up Due: 4/17/2003 **15-day Follow-Up By:** Mark Haagenstad

Comments: Preliminary and provisional analytical results from initial sampling of soil indicates diesel contamination. Contractor personnel developing Sampling and Analysis Plan (SAP) to continue assessment of nature and extent of diesel contamination. Site evaluation continues.

NMED 30 DAY APPROVAL / DISAPPROVAL

NMED 30 Day Response Date:

Comments:

Ralph Erickson, Director
Office of Los Alamos Site Operations
Department of Energy
Los Alamos, New Mexico 87544
(505) 667-5105

Beverly Ramsey, RRES Division Director
University of California
Los Alamos National Laboratory
P.O. Box 1663, MS K491
Los Alamos, New Mexico 87544
(505) 667-4218

ENCLOSURE 2

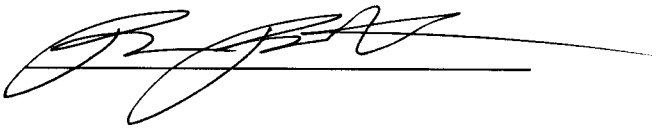
Sampling and Analysis Plan
Assessment of Fuel Oil Contamination Near Fuel Storage Tank TA-3-26
Revision 0

May 22, 2003

Project Number: 9901-310

Prepared by:
Eberline Services/KSL-HENV
1900 Diamond Drive, Room 203
Los Alamos, New Mexico 87544

Author:

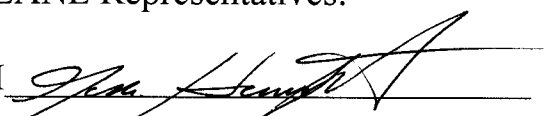


Prepared under Work Order No. 00116960.91 for:

FWO-UI
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Reviewed by:

LANL Representatives:

RRES-WQH 

FWO-UI 

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List of Acronyms

AHA	Activity Hazard Analysis
AST	Aboveground Storage Tank
DOE	Department of Energy
DRO	Diesel Range Organics
EPA	Environmental Protection Agency
FWO-SWO	Facility Waste Operations-Solid Waste Operations
FWO-UI	Facility Waste Operations – Utilities and Infrastructure
KSL	KBR-Shaw-LATA
KSL-CDDO	KSL-Construction Department Department Office
KSL-HENV	KSL Environmental Group (a.k.a. Eberline Services)
KSL-HSEO	KSL-Health, Safety, and Environment Office
LANL	Los Alamos National Laboratory
NMED	New Mexico Environment Department
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
RRES-SWRC	Risk Reduction Environmental Stewardship-Solid Waste Regulatory Compliance
RRES-WQH	Risk Reduction Environmental Stewardship-Water Quality and Hydrology
SAP	Sampling and Analysis Plan
TPH	Total Petroleum Hydrocarbons
VOA	Volatile Organic Analytes

1.0 INTRODUCTION

Eberline Services/KSL-HENV has prepared this site sampling and analysis plan (SAP) to describe sampling and contaminated material handling activities associated with soil contamination discovered near the above ground storage tank (Tank SM-26) at the TA-3 Power Plant at Los Alamos National Laboratory (LANL). Sampling and analysis is required to further define the extent of contamination discovered during modifications to Tank SM-26. Sampling and analysis activities will also investigate the release source of the contaminated soil. This SAP will be implemented in conjunction with a detailed Quality Control Plan (QCP) and Activity Hazard Analysis (AHA).

This SAP is organized into three main sections: project description, a work plan and a quality control and procedure. The work activities for this SAP include:

- Mobilization
- Drilling
- Core Sampling
- Sample Collection and Analysis
- Project Report Preparation
- Material Management

1.1 Scope of Work

The scope of work for this project is to drill investigative boreholes in the area around Tank SM-26 in an attempt to define the horizontal and vertical extent of contamination in this area and to perform core sampling in the sand beneath the tank and within the concrete retaining ring in an attempt to determine if the tank is leaking. Specific activities to accomplish the drilling and core sampling are provided in the Work Plan Section of this document.

The purpose of this SAP is to document the objectives, rationale and procedures for collecting, analyzing, and managing environmental samples taken from this site. Sampling methods for the investigation are in accordance with the objectives and procedures described in Chapter 1, Soil and Groundwater, Sampling and Disposal of the Guidelines For Corrective Action (New Mexico Environment Department [NMED] Petroleum Storage Tank Bureau, March 13, 2003). This plan outlines the methods and procedures to collect samples and gather data of sufficient quality and quantity to adequately verify the extent of the contaminated soil discovered to the north and east of Tank SM-26 at the TA-3 Power Plant. The project will receive appropriate LANL reviews and will be performed in accordance with approved site health, safety, and emergency response plans. The project will be performed in accordance with applicable DOE, LANL, and State of New Mexico requirements.

If the extent of the contaminated soil goes beyond the parameters of this SAP, further actions will be taken to determine the extent of the contamination and path forward action. This contingent plan information will be presented in an amendment to this SAP.

1.2 Project Organization and Responsibilities

LANL Facility Waste Operations (FWO) - Utilities and Infrastructure (UI) Division has overall responsibility for the project. Eberline Services/KSL-HENV is responsible for planning and directing of site sampling, conducting field screening, arranging for shipping of samples and laboratory analysis of samples, and reporting of results. KSL construction is responsible for removal of the soil and any mobilization/site preparation tasks required for obtaining necessary clearances and site access. A contract laboratory, under subcontract to LANL, will provide analytical services.

1.3 Key Individuals

Key project participants for this effort include the Project Manager, Site Manager, Health and Safety Officer, Sampling Personnel, Construction Supervisor. The proposed project assignments and responsibilities are provided as follows:

- Facility Manager (FWO-UI) - Responsible for operations and management of the Facility.
- LANL Water Quality & Hydrology Personnel (RRES-WQH) - Responsibility for institutional interface with external regulatory agencies for water quality issues, report notification and project recommendation support.
- LANL Solid Waste Regulatory Compliance (RRES-SWRC) – Responsible for institutional interface with external regulatory agencies for solid waste issues and project recommendation support.
- Project Manager (FWO-UI) - Responsible for overall management of the investigation. Coordinates between internal and client organizations, manages administrative requirements, schedules, technical approach, implementation, and report preparation.
- Site Manager (KSL)- Supervises all field investigation activities and is responsible for implementation of appropriate site health, safety and emergency response plans and quality control and sampling plans during the fieldwork phase of this project.
- Health and Safety Officer (KSL-HSEO) - Oversees and ensures proper implementation of the appropriate site health, safety and emergency response requirements and coordinates with the Site Manager to resolve site safety issues.
- Sampling Personnel (KSL-HENV) - Responsible for collecting soil samples from drilling boreholes and core samples for field test screening and laboratory analysis.
- Construction Supervisor (KSL-CDDO)- Responsible for coordinating all construction activities pertaining to the investigation activities.
- Geologist (Eberline Services/KSL-HENV) - Responsible for logging boreholes.

- Data validation personnel (KSL-HENV) – Responsible for ensuring the analytical data meets the data quality objectives.

1.4 Site Characteristics

A site diagram of the TA-3 Power Plant fuel tank area depicting the aboveground storage tanks (ASTs) is provided in Figure 1. There are two large #2 fuel oil ASTs located in the northeast corner of the property. Tank SM-26 has a capacity of 158,300 gallons and Tank SM-779 has a capacity of 230,300 gallons. Each tank is contained in an unlined earthen berm. Tank SM-26 was installed in 1950 while Tank SM-779 was constructed to replace another tank at the site in 1999. Fuel from the tanks is supplied to the power plant by underground lines from a pump house located between the tanks just to the south of the tanks berms. Fuel is transferred between the tanks and the pump house via underground piping. Fuel is delivered to the tanks by trucks which off load at a fuel station to the west of the pump house. There are also two previously unidentified pipes that have been capped that originate under valves on the north side of the two tanks. The approximate layout of the two lines is shown on Figure 1.

During work to install cathodic protection for Tank SM-26, a trench was cut at a distance of approximately 5-feet from the outer edge of the tank. The trench is approximately 6-inches wide and 2-feet deep. Six holes were augered to a depth of approximately 9.5 feet in the trench, distributed at approximately even distances around the tank. A seventh partial hole (3A) was augered just to the south of Hole 3. Figure 2 provides a more detailed diagram of the area around Tank SM-26 including the location of the augered holes. Hole 3A was the first hole augered and soil contaminated with diesel fuel was encountered at 4-5 feet in depth. Augering at this hole was suspended and the auger was moved to Hole 1. Hole 1 was augered to a depth of 9.5 feet with no fuel odor or visible signs of contamination. The remaining holes were augered to a total depth of 9.5 feet in the following order: Hole 3, Hole 4, Hole 2, Hole 6, and Hole 5. For holes in which contamination was evident, samples were collected from the midpoint of the hole and at total depth. Samples were collected at total depth (9.5 feet) from holes in which no contamination was evident. Results of the cathodic protection augering analysis are provided in Table 1.

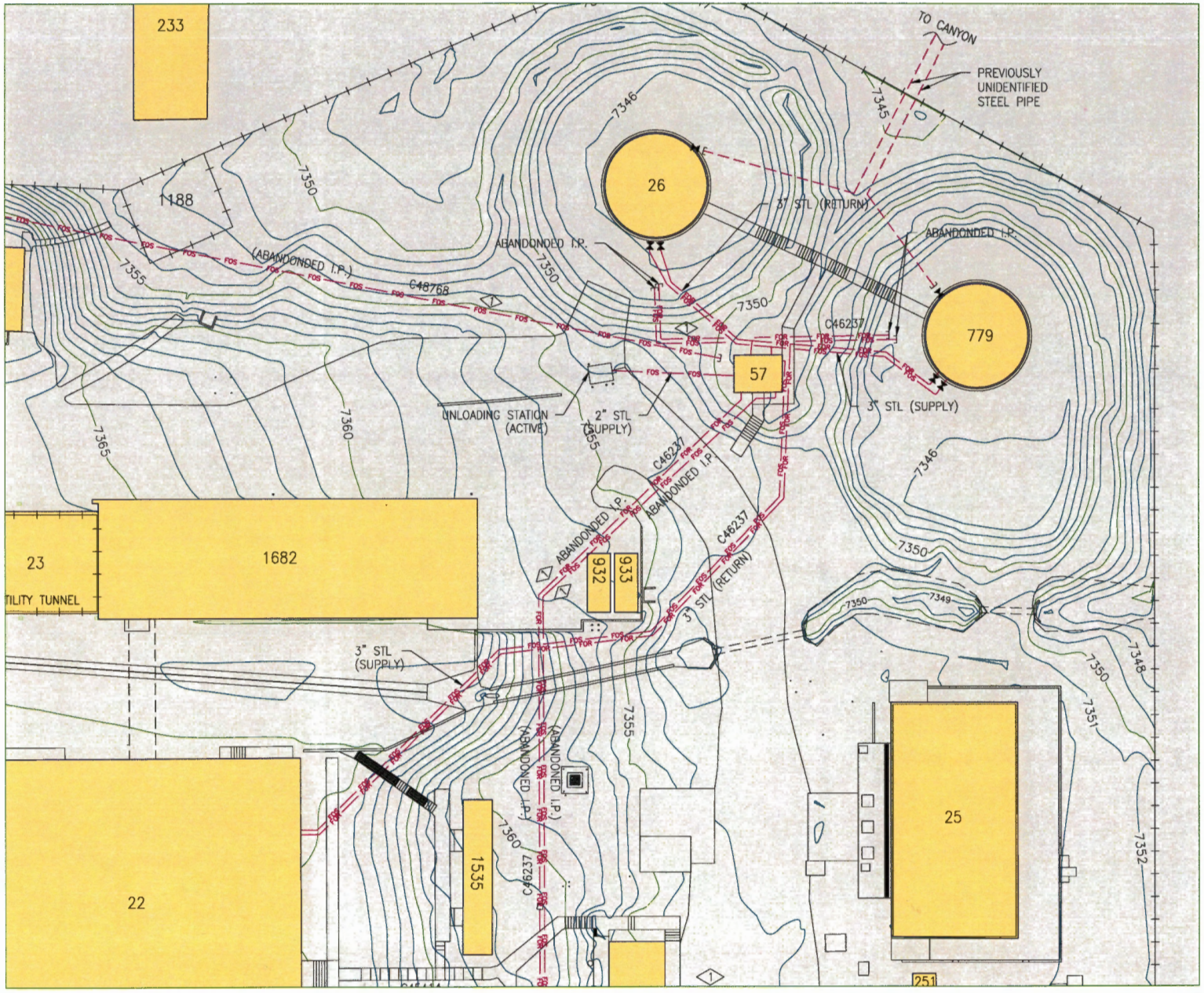
Table 1
Cathodic Protection Auger Hole Analytical Results

Sample ID	Hole	Description	Results (mg/kg)
3-0292	1	Composite from cuttings in drum 1	Benzene ND Ethyl benzene ND Toluene ND Xylene ND TPH ND
3-0291	1	Composite from cuttings in drum 1A	Benzene ND Ethyl benzene ND Toluene ND Xylene 0.011

			TPH	ND
0326H29.5	2	Sample from auger at 9.5' depth	Benzene	ND
			Ethyl benzene	ND
			Toluene	ND
			Xylene	ND
			TPH	ND
3-0287	3	Sample from auger at 5' depth	Benzene	ND
			Ethyl benzene	0.077
			Toluene	ND
			Xylene	0.14
			TPH	310
3-0290	3	Sample from auger at 9.5' depth	Benzene	ND
			Ethyl benzene	ND
			Toluene	ND
			Xylene	0.010
			TPH	150
3-0288	3	Composite from cuttings in drum 3	Benzene	ND
			Ethyl benzene	0.056
			Toluene	ND
			Xylene	0.12
			TPH	290
3-0289	3	Composite from cuttings in drum 3A	Benzene	ND
			Ethyl benzene	ND
			Toluene	ND
			Xylene	ND
			TPH	45
3-0293	4	Sample from auger at 4' depth	Benzene	ND
			Ethyl benzene	0.79
			Toluene	ND
			Xylene	3.5
			TPH	4800
3-0294	4	Sample from auger at 9.5' depth	Benzene	ND
			Ethyl benzene	0.21
			Toluene	ND
			Xylene	0.9
			TPH	1700
0326H55	5	Sample from auger at 5' depth	Benzene	ND
			Ethyl benzene	0.59
			Toluene	ND
			Xylene	1.83
			TPH	3100
0326H59.5	5	Sample from auger at 9.5' depth	Benzene	ND
			Ethyl benzene	1.1
			Toluene	ND
			Xylene	3.4
			TPH	18000
0326H69.5	6	Sample from auger at 9.5' depth	Benzene	ND
			Ethyl benzene	ND
			Toluene	ND
			Xylene	ND
			TPH	620

Cathode protection augering results indicate soil contamination extending from the west side of the tank around the north to the east side of the tank to a depth of at least 9.5 feet.

The source of the contamination has not been identified. All active lines for the two tanks were pressure tested in February of 2003 and no leaks were indicated. Reviews of the daily records of digital tank levels as well as a review of the monthly tank measurements do not reveal any large unexplained losses of fuel. There are no large stained areas on the ground surface and no fuel was encountered during the trenching operation. No organic vapor levels above background were detected in the pump house, which is the closest structure to the contamination. The only known utility in the contaminated area is the previously unidentified piping. No fuel was evident around the pipe where it was encountered in the trench indicating that the trench for this pipe is not providing a migration path for the contamination.



Prepared for:
The Los Alamos National Laboratory

Prepared by:
KSL

FIGURE 1:
TA-03-22 POWERPLANT
FUEL STORAGE AREA DIAGRAM

LEGEND

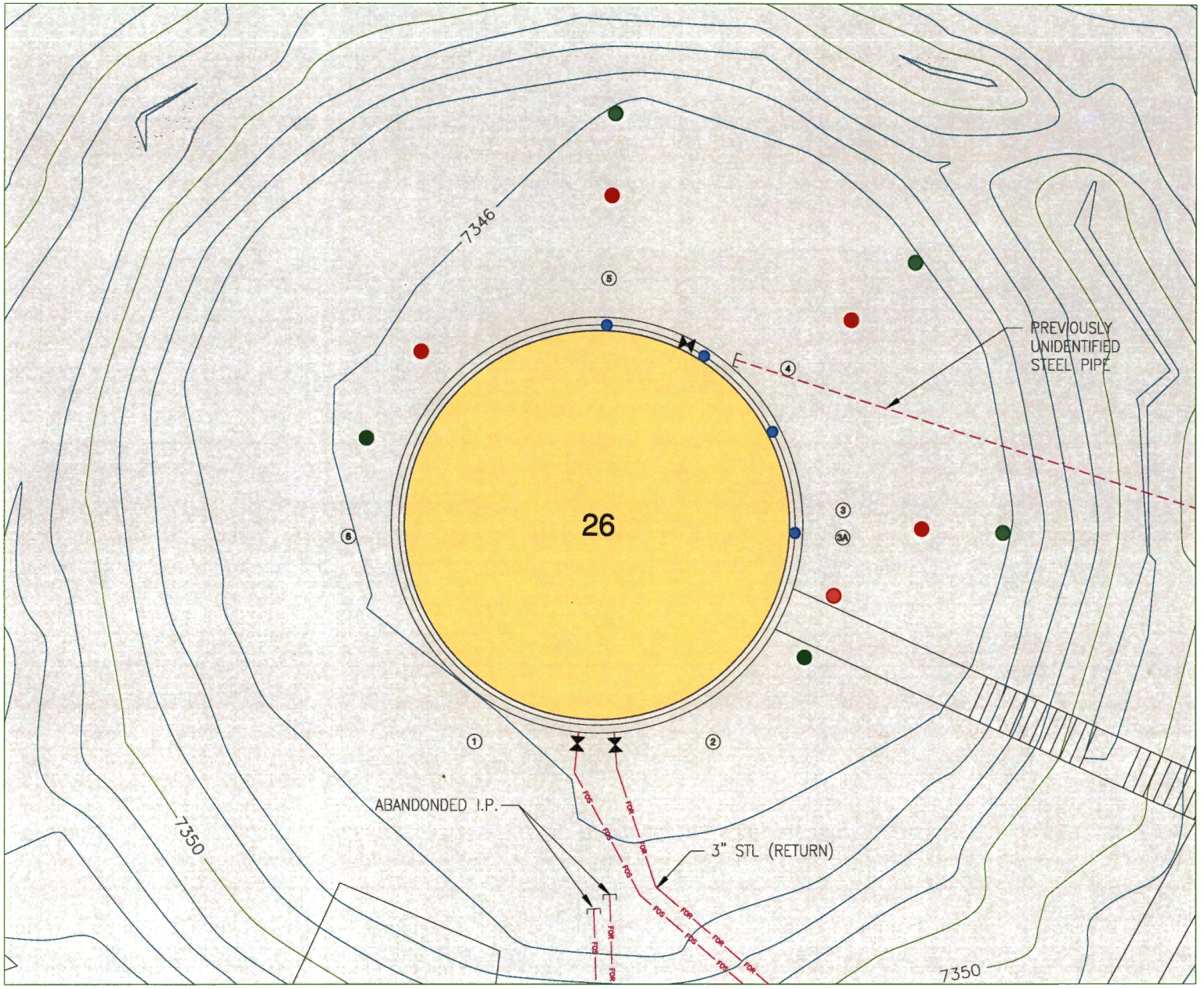
- 000 — Building With Nu
- Paved Road
- Dirt/Gravel Road
- Industrial Fence
- FOR — Fuel Oil Return
- FOS — Fuel Oil Supply
- Unable to Locate
- 1' Contour Interval
- 5' Contour Interval

N
W E
S

Scale 1"=30'
15 0 15 30
Feet

KSL
KBR • SHAW • LATA
Telephone: (505) 665-1051

P. O. Box 50, MS A199
Los Alamos, NM 87544
Drawing Number: L03050_A
Dated: April 9, 2003
Produced by: LMAP



Prepared for:
The Los Alamos National Laboratory

Prepared by:
KSL

FIGURE 2:
TA-03-26 SAMPLING POINTS

LEGEND

- 000 — Building With Number
- Paved Road
- Dirt/Gravel Road
- Industrial Fence
- FOR — Fuel Oil Return
- FOS — Fuel Oil Supply
- 1' Contour Interval
- 5' Contour Interval
- X — Cathodic Protection Auger Hole
- Initial Step-out Sampling Point
- Secondary Step-out Sampling Point
- Core Sampling Point

N
W E
S

Scale 1"=8'
4 0 4 8
Feet

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Los Alamos, NM 87544
Drawing Number: L030950_B
Dated: April 17, 2003
Produced by: LMAP

2.0 WORK PLAN

The following sections describe all major activities necessary to complete the sampling and analysis for determining the extent of soil contamination, the likelihood of a leak from the tank, and preparing a report to document project activities.

2.1 Field Mobilization

Field mobilization involves all tasks required to prepare for and support fieldwork at the site. These activities include contract laboratory notification, coordination within KSL, obtaining utility clearances and excavation permits, ordering and calibrating field equipment and instrumentation, procuring decontamination equipment, preparing the site for work (i.e., setting up decontamination station), development of an activity hazard analysis, and preparing this SAP. All field mobilization tasks must be complete prior to the initiation of any fieldwork or sampling activities. Tasks relative to the drilling, coring, and sampling activities are discussed within this plan.

2.2 Drilling

An auger drilling rig will be brought in to advance continuous core boreholes with split spoon sampling to define the vertical and horizontal extent of contamination. The horizontal extent of contamination will be determined using a step-out approach. Additional sampling points will be augered radially outward from the tank in the areas where contamination was confirmed during the cathodic protection augering. Additional sampling points will also be augered along the circumference of the tank between known contaminated points and points of no contamination. The initial step-out sampling points are depicted in Figure 2 and include positions halfway between the tank and the berm and between Holes 2 and 3A and Holes 1 and 6. If contamination is visible or confirmed by field analysis in any of the initial step-out sampling points, an analytical sample will be collected and a secondary step-out will be performed. Secondary step-out sampling points are also depicted on Figure 2 and include points along the inner edge of the berm and halfway between the initial step-out points and Holes 1 and 2. If secondary sampling points along the inner edge of the berm contain visible signs of contamination or contamination is confirmed by field tests, a plan will have to be devised to provide access for the drill rig to the north of the berms while maintaining secondary containment for the tank.

Continuous core boreholes will be advanced at the location of Holes 3 and 5 to determine the vertical extent of contamination in those two areas. Field screening samples will be collected at 5-foot intervals beginning at a depth of 15 feet. Analytical samples will be collected at 10-foot intervals beginning at a depth of 20 feet. The borehole at Hole 5 will be advanced to 50-feet below the first sample depth with a field screening result below 100ppm. The borehole at Hole 3 will be advanced to 10-feet below the first sample depth with a field screening result below 100ppm. If the horizontal-extent borehole field

analysis results indicate a higher concentration of contamination in the step-out samples, a vertical-extent borehole will be advanced at the location of the highest concentration. This borehole will be advanced to 50-feet below the first sample depth with a field screening result below 100ppm. A geologist will log each vertical-extent borehole.

2.3 Core Sampling

An attempt will be made to collect field analytical samples from the sand bed beneath the tank and within the concrete retainer using a soil probe to collect a core sample. An engineering drawing of the tank foundation indicates the presence of only ½-inch of sand beneath the tank with a 2-inch layer of asphalt beneath the sand and 6-inches of gravel beneath the asphalt. The asphalt and gravel layers would impede sample collection and the asphalt could interfere with the TPH analysis. The soil probe will be driven into the soil between the tank and the concrete retainer, angled towards the center of the tank as much as the gap between the tank and the concrete retainer will allow. Four core samples will be collected, evenly spaced between Holes 5 and 3A. The proposed core sampling locations are shown on Figure 2.

2.4 Sample Collection and Analysis

Field analyses will be performed using the heated headspace analysis as described in Chapter 1 of the NMED Guidelines For Corrective Action. A pre-cleaned, 16oz glass jar will be half filled with sample then capped with a sheet of aluminum foil and retaining ring. The sample will be placed in a warm water bath and heated until the sample is between 60 and 80 degrees Fahrenheit. Once the sample is warmed the volatile organic concentration in the headspace will be measured using a photoionization detector calibrated and operated to accurately detect organic vapors between 0 and 1000 ppm.

Analytical samples will be placed in an 8oz amber-glass jar with no headspace. Laboratory samples will be sent to a contract laboratory for analysis. All analytical samples will be analyzed for diesel range total petroleum hydrocarbons (TPH-DRO) by method 8015M. The first analytical sample and the last analytical sample with a field analytical result above 100ppm from each vertical extent borehole will be analyzed for TPH-DRO and the target analyte list in Table 2 using Methods 8260/8270. Sample analysis will be performed to achieve the method detection limits specified in Table 1-1 of the NMED Corrective Action Guidelines unless the detection limits are unobtainable for the sample. If the detection limit is unobtainable the analytical report will include a narrative discussion of why the limits are unobtainable. Samples will be identified, labeled, handled, and preserved as specified in section 3.3.

Table 2
Target Analyte List

Benzene	Benz(a)anthracene	Flouranthene
Toluene	Benzo(a)pyrene	Flourene
Ethyl benzene	Benzo(b)fluoranthene	Naphthalene
Xylene	Benzo(k)flouranthene	Phenanthrene
Acenaphthalene	Chrysene	Pyrene
Anthracene	Dibenz(a,h)anthracene	

2.5 Site Restoration

As each borehole is completed it will be covered and barricaded to prevent personnel from accidentally stepping in the hole and to prevent soil and debris from falling in the hole. Once the determination that the boreholes are no longer needed they will be abandoned in accordance with the Chapter 3 of the NMED Guidelines For Corrective Action. All sampling equipment and materials and drilling equipment will be removed from the site upon completion of the investigation. Drill cuttings and decontamination water will be handled in accordance with Section 2.7 of this document.

2.6 Project Report Preparation

Eberline Services/KSL-HENV will prepare a report summarizing the analytical results, compliance with QC requirements (data validation), and estimating the extent of soil contamination based on the analytical results. The report will contain sample collection and control documentation, analytical reports, and borehole logs. LANL RRES-WQH will provide this information to the regulators.

2.7 Material Management

Drill cuttings and spent field analytical samples will be placed in drums and stored with the drummed auger cuttings from the cathodic protection installation pending receipt of the analytical results. Contaminated soil with TPH levels higher than 1000 mg/Kg will be managed as New Mexico Special Waste. All decontamination solutions generated during this assessment will be properly characterized (waste profiles) and disposed of through FWO-SWO in accordance with LANL, NMED, and DOE requirements.

3.0 QUALITY CONTROL PROCEDURES

The objective of the sampling is to obtain data of sufficient quantity and quality to determine the extent of the contamination, provide data to determine if Tank SM-26 is leaking, and to provide contaminant data for comparison with the NMED soil screening levels. The data must be of sufficient quantity and spatially distributed such that conclusions may be drawn with respect to the extent and quantity of contamination in the subsurface. The following sections detail the equipment, personnel, and procedures that will be used to conduct the field sampling and analysis for this project. Any deviations from this plan that are deemed necessary during conduct of fieldwork will be discussed with the Project Manager (Health and Safety Plan will be amended as needed) and clearly documented in the field logbook. All sampling and analyses will be verified in accordance to DOE, EPA and NMED requirements.

3.1 Soil Sampling Procedures

Whenever possible, disposable sampling equipment will be used to minimize the chance of cross-contamination of samples. Soil samples will be removed from the split spoon sampler and soil probe using disposable poly scoops. All non-disposable equipment will be decontaminated in accordance with Section 3.2 prior to use. Borehole samples will be collected in stainless steel split spoon samplers. Core samples will be collected using a stainless-steel soil probe.

3.1.1 Headspace Analysis

Headspace analysis will be conducted using a calibrated photoionization detector capable of measuring TPH from 100 to 10,000 ppm. Test results will be used to semi-quantitatively identify any residual contamination. The analyst/technician performing soil analyses will be trained and familiar with use of the method and instrumentation prior to the start of fieldwork. As each soil sample is collected, the Analyst will complete a Sample Collection Log and an entry will be made on the field activity log. The analyst will perform sample analyses using the test kit as soon as is practicable after sample collection. All results will be recorded on the Sample Collection Log as they are obtained.

3.1.2 Confirmatory Analytical Samples

The sampling will consist of obtaining samples from the split spoon sampler and the soil probe. Samples will be placed into the sample containers and submitted to the contract analytical laboratory for analysis as soon as practicable after collection.

3.1.3 QA/QC

In addition to field samples, field QC samples will be collected to assess the sample collection and handling techniques and the decontamination effectiveness. Field duplicate

samples will be collected at a frequency of 10-percent and will be collected, handled and analyzed exactly as the original sample for which it is a duplicate. A trip blank will be included in any cooler containing samples to be analyzed for volatile organics to identify any contamination which may occur during handling or transportation of the samples.

Batch laboratory QC samples will be analyzed to assess the laboratory's performance during analysis of the samples. Any laboratory QC sample results falling outside of the acceptable limits will be explained on the analytical report and its effect on the validity of the sample results will be evaluated.

3.1.4 Data Validation

Laboratory data will be checked for the following parameters to ensure validity of the data.

- Completeness – all samples and analysis have been processed.
- Detection and Quantitation Limits – Detection and quantitation limits are below the regulatory and/or action levels.
- Control Limits – Ensure that laboratory quality control sample analytical results are within acceptable control limits.
- Holding Times – Ensure that sample preparation and analysis were performed within the acceptable holding times.

3.2 Decontamination

The auger flights will be decontaminated between holes. The split spoon sampler and soil probe will be decontaminated before the collection of each sample. Field analysis jars will also be decontaminated prior to each use. Decontamination will consist of physically removing all gross contamination, followed by a wash with a laboratory detergent solution followed by two water rinses. Residues generated by decontamination procedures should be collected and disposed of in accordance with LANL and NMED requirements as specified in Section 2.7.

3.3 Sample Handling Protocol

When a sample is collected for off-site analysis, it will be promptly placed into a labeled 8 oz. amber-glass jar and fitted with a Teflon lined lid. The sample will be labeled with the following information,

- Unique sample identification number (including locations)
- Project number
- Date
- Time sampled
- Name of Sampler
- Requested analysis
- Preservation method,

sealed with custody tape, then placed in a reclosable poly bag and placed on ice to cool to 4°C for delivery to the analytical laboratory. Pertinent information will be recorded on the sample collection log and the chain-of-custody form.

3.3.1 Custody and Shipping

Samples will be packed to prevent breakage, using additional, inert packing material as necessary. Samples will be picked up by a representative from the contract analytical laboratory for delivery to the analytical laboratory. If overnight storage of the samples is required, the samples will be placed, under custody, in the KSL-HENV laboratory sample refrigerator. All chain-of-custody forms will be placed into a plastic bag and attached to the cooler lid, or otherwise included with the samples, prior to pickup. Samples will be relinquished to the laboratory representative by one of the sample team members and the transaction will be recorded on the chain-of-custody form.

3.3.2 Sample Preservation

All samples will be preserved by cooling on ice to approximately 4°C. Samples will be maintained on-site in a cooler filled with ice or blue ice. No samples will be held for more than 24 hours on site.

3.3.3 Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if disturbed or tampered with. Except for VOA vials, individual sample bottles are to be sealed over the cap by the person obtaining samples. Sample shipping containers (coolers, shipping boxes, etc.) are to be sealed in as many places as necessary to ensure that tampering will be obvious. Seals are signed and dated before application. On receipt at the contract laboratory, the receiving individual will check and certify that the seals on shipping containers and sample bottles are intact. Discrepancies shall be noted and communicated immediately to the Project Manager.