LANL HSWA FU 1 TA 21 June 18

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JAN 25 1996

Date: January 22, 1996
Refer to: EM/ER:96-019

Mr. David Neleigh
NM Federal Facilities Section
EPA, Region 6, 6PD-N
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

SUBJECT: RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) FACILITY INVESTIGATION (RFI) REPORT FOR SOLID WASTE MANAGEMENT UNIT 21-029

Dear Mr. Neleigh:

Enclosed for your review is the subject RFI Report. Because this site has been investigated under the authority of the New Mexico Environment Department Underground Storage Tank Regulation, in addition to the regulations applying to RCRA corrective actions, it was necessary to delay the submission of the report until now.

If you have any questions, please call Garry Allen at (505) 667-3394 or Bonnie Koch at (505) 665-7202.

Sincerely,

Jorg Jansen, Program Manager
Environmental Restoration

Sincerely,

Theodore J. Taylor, Program Manager
Los Alamos Area Office

JJ/TT/bp

Environmental Restoration

DEPARTMENT OF ENERGY

10206

Enclosures: Two copies of RFI Report for SWMU 21-029

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CERTIFICATION

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

Document Title:

Resource Conservation And Recovery Act Facility Investigation Report For Solid Waste Management Unit 21-029

Name: _____ Date: 1-18-96

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RFI Report for Potential Release Site

21-029

Field Unit 1

Environmental Restoration Project

January 1996

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-95-3693

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EXECUTIVE SUMMARY

This report presents the results of the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) of Solid Waste Management Unit (SWMU) 21-029 at Los Alamos National Laboratory (LANL). SWMU 21-029, also known as DP Tank Farm, is located in Technical Area 21 near the western end of DP Mesa on a moderate slope descending from DP Road toward DP Canyon. This property is currently owned by the Department of Energy and is surrounded by a 6-ft chainlink fence. The site is bounded by the Knights of Columbus Hall on the west, a Los Alamos County fire station facility on the east, DP Road on the south, and DP Canyon on the north.

DP Tank Farm, which operated from January 1946 to February 1985, is the former location of 15 underground fuel storage tanks and two fill stations. Reported tank capacities ranged from approximately 2 100 to 51 000 gallons. The tanks were reportedly used for storage of petroleum hydrocarbon products (gasoline, diesel, kerosene, and No. 2 fuel oil), and they may have contained different substances at different times. One tank was reported to have contained ethanol. There are no known records of any radioactive materials stored in any of the tanks. All tanks and structures at the site were decommissioned and removed in 1988.

The objective of the Phase I RFI at DP Tank Farm was to determine the nature and extent of contamination, if any. Field work was conducted in 1994 and included geodetic surveying, borehole drilling, subsurface soil sampling, and surface soil sampling. Samples were screened in the field for volatile organic compounds (VOCs), and analyzed at the Mobile Radiological Analysis Laboratory for gross alpha, beta, and gamma radiation. All samples collected in 1994 were submitted for fixed lab analysis for VOCs, semivolatile organic compounds, metals, total petroleum hydrocarbons (TPH), and ethanol. Additionally, surface samples were submitted for gamma spectroscopy. The screening assessment performed as part of the 1994 investigation indicates that benzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene are present at the site at concentrations that exceed SALs. Butylbenzene, 4-isopropyltoluene, 2-methylnaphthalene, and propyl benzene, which do not have SALs for comparison, were also detected in site soil. All of these constituents are related to petroleum.

The data from the 1994 Phase I RFI indicate that TPH is present in the soil at concentrations greater than 100 parts per million, constituting a reportable release to the New Mexico Environment Department (NMED) Underground Storage Tank (UST) Bureau. Therefore, further field work was conducted in 1995 in accordance with NMED UST Bureau regulations. The results of this field work are also reported in this RFI Report. Field work in 1995 included borehole drilling and subsurface soil sampling, surface water and streambed sampling, and

field screening for VOCs and gross beta and gamma radiation. All 1995 samples were analyzed at the Mobile Chemistry Analytical Laboratory for benzene, toluene, ethyl benzene, and xylenes (known collectively as BTEX), methyl ethyl ketone (MEK, or 2-butanone), acetone, and TPH.

DP Tank Farm is recommended for no further action under the Hazardous and Solid Waste Amendments Module of LANL's RCRA operating permit based on criterion 3 of LANL's No Further Action Criteria Policy. Criterion 3 states that the site is regulated or closed under a different authority that addresses corrective action (in this case the New Mexico Environment Department). Based on this criterion, a Class III permit modification will be requested to remove SWMU 21-029 from the Hazardous and Solid Waste Amendments Module of LANL's RCRA operating permit.

TABLE ES-1

SUMMARY OF THE RESULTS OF THE PHASE I INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

		PROPOSED ACTION		
PRS[b]	HSWA[c]	NFA[d]	ACTION	RATIONALE
21-029	Yes	Criterion 3	---	Site is regulated or closed under a different authority that addresses corrective action.

[a] SWMU = Solid waste management unit.
[b] PRS = Potential release site.
[c] HSWA = Hazardous and Solid Waste Amendments.
[d] NFA = No further action.

1.0 INTRODUCTION

This report presents the results of the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at Solid Waste Management Unit (SWMU) 21-029. SWMU 21-029, also known as DP Tank Farm, is located in Technical Area (TA) 21 at Los Alamos National Laboratory (LANL). Included in this report are the data assessment and analysis approach, a summary of the Phase I investigation, and the site-specific results, conclusions, and recommendations for SWMU 21-029.

1.1 Facility Background

The DP Tank Farm site, SWMU 21-029, is located near the western end of DP Mesa on a moderate slope descending from DP Road toward DP Canyon (Fig. 1-1). This property is currently owned by the Department of Energy (DOE) and is surrounded by a 6-ft chainlink fence. The site is bounded by the Knights of Columbus Hall on the west, a Los Alamos County fire station facility on the east, DP Road on the south, and DP Canyon on the north. DP Tank Farm operated from January 1946 to February 1985, and was the location of 15 underground fuel storage tanks and two fill stations (Fig. 1-2). Reported tank capacities ranged from approximately 2 100 to 51 000 gallons. The tanks were reportedly used for storage of petroleum hydrocarbon products (gasoline, diesel, kerosene, and No. 2 fuel oil), and they may have contained different substances at different times. One tank was reported to have contained ethanol. There are no known records of any radioactive materials stored in any of the tanks. All tanks and structures at the site were decommissioned and removed in 1988. More detailed information about DP Tank Farm is available in the TA-21 Operable Unit RFI Work Plan (LANL 1991, 0689).

1.2 Phase I Work Plan Overview

The objective of the Phase I RFI at DP Tank Farm was to determine the nature and extent of contamination at the site, if any (LANL 1991, 0689).

1.3 Field Activities

Field activities in 1994 included geodetic surveying, borehole drilling, subsurface soil sampling, and surface soil sampling. All 1994 samples were screened in the field for volatile organic compounds (VOCs). Samples were also submitted to the LANL Mobile Radiological Analysis Laboratory (MRAL) for analysis of gross alpha, beta, and gamma radiation. Surface and subsurface samples were submitted to the LANL Sample Management Office (SMO) for

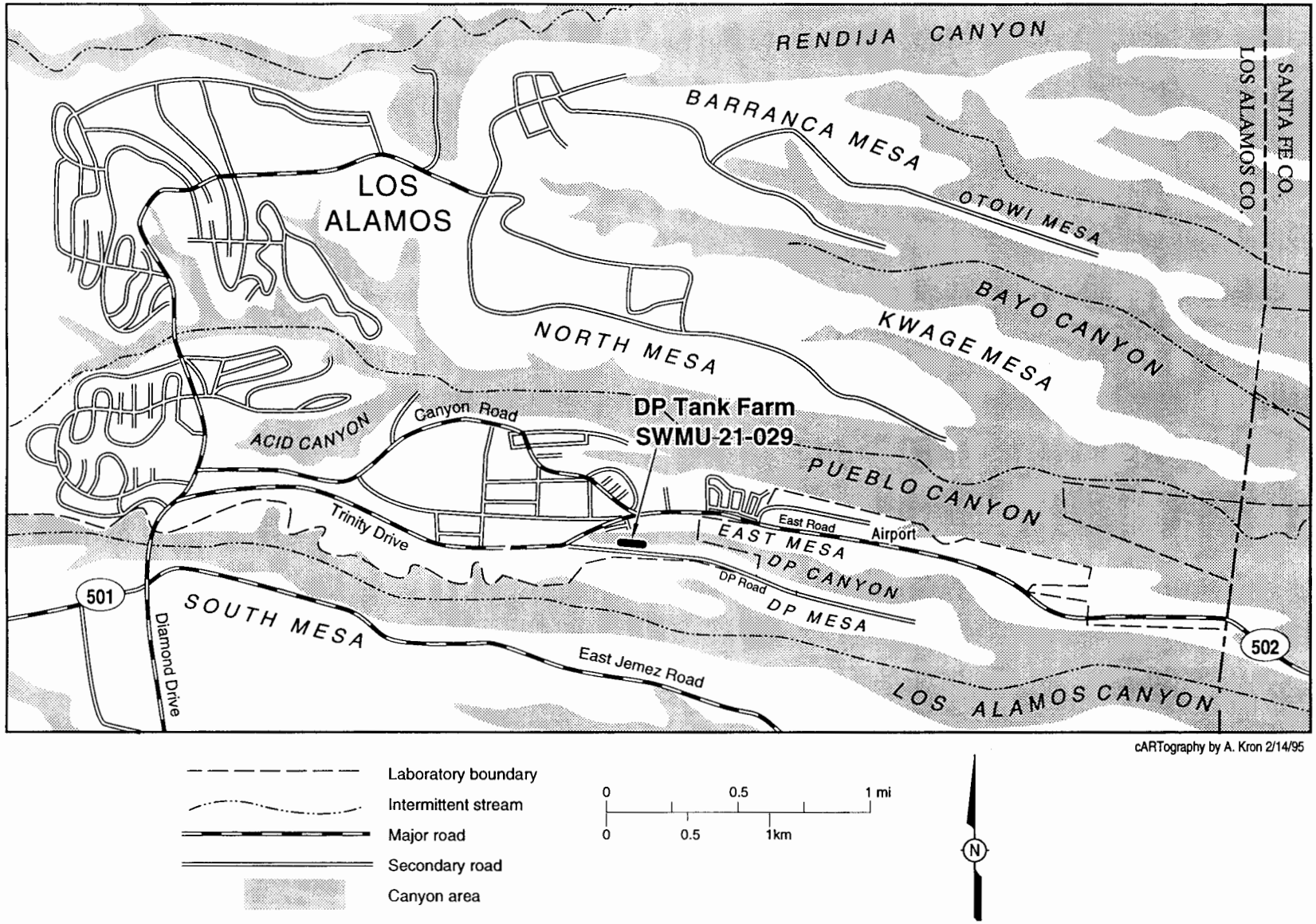

Fig. 1-1. General location of DP Tank Farm, SWMU 21-029.

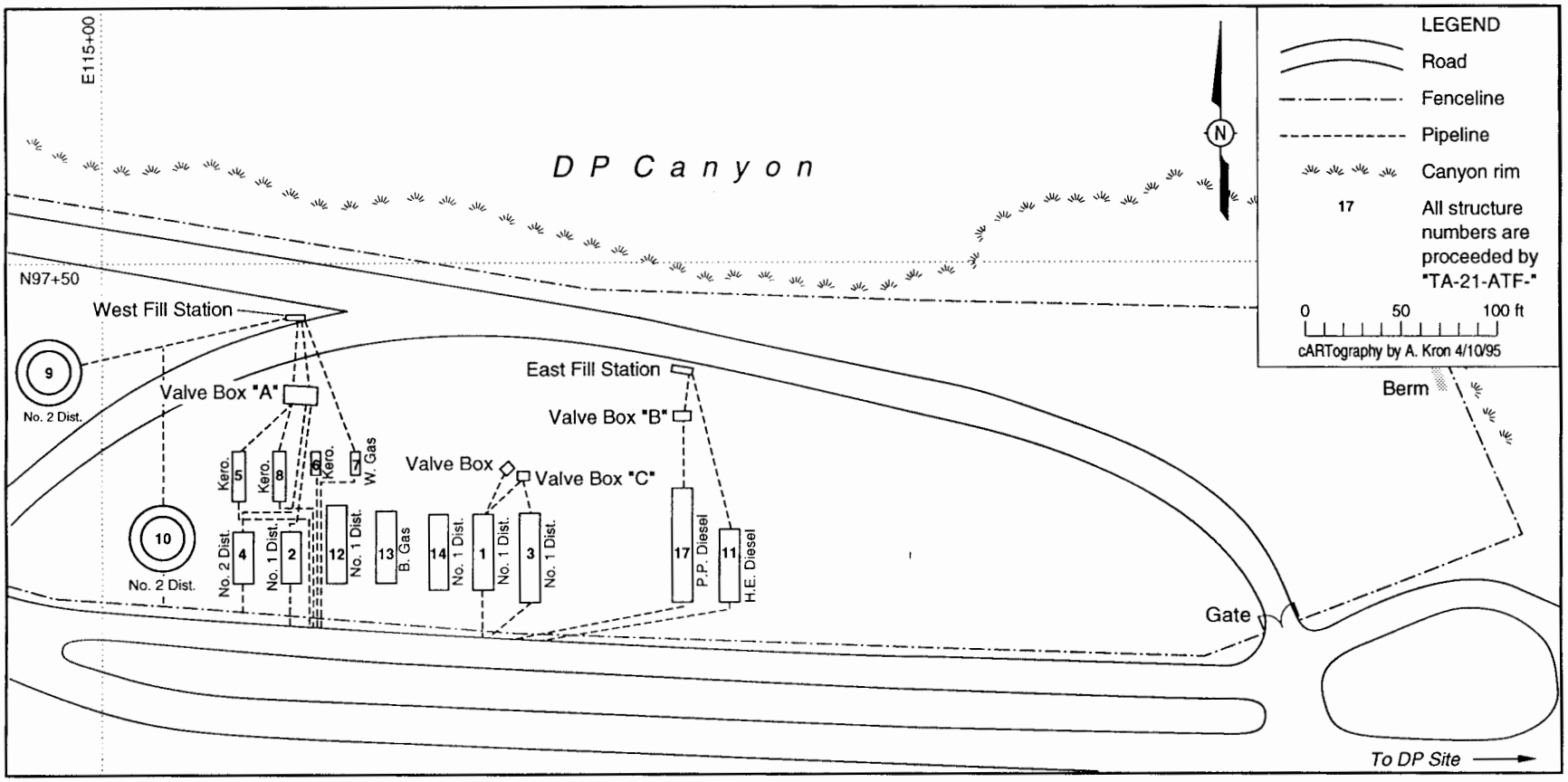

Fig. 1-2. Locations of structures at DP Tank Farm, SWMU 21-029.

analysis of VOCs, semivolatile organic compounds (SVOCs), metals, total petroleum hydrocarbons (TPH), and ethanol. Surface samples were also submitted for gamma spectroscopy.

Data from the 1994 investigation indicated that TPH was the only constituent in the soil at DP Tank Farm at levels greater than the screening action level (SAL). TPH levels exceeded 100 parts per million (ppm), constituting a reportable release to the New Mexico Environment Department (NMED) Underground Storage Tank (UST) Bureau. Therefore, further investigation was conducted in 1995 in accordance with NMED UST Bureau regulations in order to determine the extent of petroleum products contamination. Field activities in 1995 included borehole drilling, subsurface sampling, surface water sampling, and stream bed sampling. Recovered core was field screened for gross beta and gamma radiation and VOCs. All samples were analyzed using SW-846 methods at the LANL Mobile Chemistry Analytical Laboratory (MCAL) for benzene, toluene, ethyl benzene, and xylenes (known collectively as BTEX); methyl ethyl ketone (MEK) (also known as 2-butanone); acetone; and TPH.

All field activities were conducted in accordance with the TA-21 Operable Unit RFI Work Plan (LANL 1991, 0689) and LANL Environmental Restoration (ER) Standard Operating Procedure (SOP) LANL-ER-SOP-01.01,R0, "General Instructions for Field Investigations" (LANL, 0875).

2.0 ENVIRONMENTAL SETTING

2.1 Climate

DP Tank Farm is located in Los Alamos County. The Los Alamos area of north-central New Mexico has a semiarid, temperate mountain climate. Annual precipitation in the area normally reaches about 18 in. Forty percent of this precipitation occurs as brief, intense thunderstorms during July and August, which often result in significant runoff events. Snowfall averages about 51 in. annually, and usually produces brief periods of snowmelt runoff in the spring. In summer months, maximum daily temperatures in the area are usually below 90°F, dropping into the 50s at night. Winter temperatures typically range from 30°F to 50°F during the day, and from 15°F to 25°F at night, occasionally dropping to 0°F or below (LANL 1993, 1017). The climate of Los Alamos County is described in more detail in the LANL Installation Work Plan for Environmental Restoration (LANL 1993, 1017).

2.2 Geology

DP Tank Farm lies on DP Mesa immediately west of TA-21. DP Canyon begins just west of the site, passing along its northern boundary. The geologic unit underlying the site is the Tshirege Member of the Bandelier Tuff. The tuff at the site is moderately welded with many fractures that penetrate through the rock. The tuff is overlain by a thin layer of unconsolidated fluvial sands and gravel on which a moderately developed soil profile has formed. The relief of the site, from the mesa surface to the base of the DP Canyon channel, is about 45 ft. The channel bottom is composed of welded, Tshirege Member Bandelier Tuff and contains sizable reaches of bare rock with little sediment along the channel floor.

To understand possible fracture-controlled infiltration of petroleum products at DP Tank Farm, exposed fractures in the Tshirege Member of the Bandelier Tuff along a road west of the area have been characterized. The data set includes descriptions of fracture characteristics (strike, dip, aperture, and location) for 157 documented fractures. These data are augmented by similar data from 288 fractures along Los Alamos Canyon, approximately 750 ft to the south. All of these data were statistically analyzed to estimate the degree of fracture control in the region surrounding the West Fill Station at DP Tank Farm.

The location of the Guaje Mountain Fault Zone relative to DP Tank Farm, and how much it might influence fracture spacing, orientation, and aperture, is a major concern in estimating the degree of fracture control in the area of the West Fill Station. The fracture data confirm that the north-south trending Guaje Mountain Fault Zone extends on the west side of DP Tank Farm

from about 250 ft to 600 ft east of the intersection of Trinity Drive and DP Road. The West Fill Station is on the eastern side of the fault zone, and the fractures at the West Fill Station are affected by the fault zone's presence. In general, fracture spacing averages approximately 5 ft for DP Tank Farm, compared to approximately 2 ft over the Guaje Mountain Fault Zone. A spacing of 2 ft is typical in the area of the West Fill Station. At DP Tank Farm, most fractures strike between northwest and northeast, but nearly east-west trending fractures are also present. Average fracture dips are approximately 50 degrees, but nearly vertical and horizontal fractures are also present.

A hypothetical model of probable fractures in the tuff below the West Fill Station shows a preferred northerly strike, westward dip, and a 2-ft spacing. If infiltration of petroleum has occurred in this region, the plume would likely have migrated mostly in a north-south direction and slightly to the west, intersecting the drainage on the north side of the site. This information was used to determine the angle and location of an angled borehole drilled during the 1995 field work to investigate possible fracture infiltration of contaminants (see Subsection 5.1.3).

2.3 Hydrology

Surface water runoff from DP Tank Farm drains northward into the DP Canyon channel. The stream in this channel is ephemeral, flowing suddenly and heavily following summer downpours and periods of spring snowmelt. Typically, the channel does not flow for more than several days, and then it remains dry until the next event. The extensive paved areas of the Pine Crest Apartments drain into DP Canyon from the north, and the area that currently includes the Hilltop House and the Knights of Columbus properties drains into DP Canyon from the west.

Because water flows only sporadically in DP Canyon and moves rapidly downstream, there is minimal opportunity for infiltration of contaminants beneath the stream channel. Two alluvial aquifer monitoring wells in the mid-reach of DP Canyon, where infiltration is more likely due to the gradual gradient, have failed to confirm the presence of water beneath the channel. Since there is no evidence of an alluvial aquifer system in the upper or mid-reach of DP Canyon, it is unlikely that contamination at DP Tank Farm will impact the groundwater system.

The main aquifer beneath DP Tank Farm lies well below the base of the Bandelier Tuff at an approximate depth of 1 150 ft. There is no potential for petroleum product contaminants from DP Tank Farm to impact the main aquifer.

The Bandelier Tuff is only known to be a water-bearing formation in shallow and localized areas. Based on the absence of saturated zones in borehole LADP-4 (approximately 0.75 miles

east of DP Tank Farm) and the 1995 MDA-V deep borehole (0.5 miles east of DP Tank Farm), it is unlikely that a localized water-bearing zone is present in the Bandelier Tuff between the surface at DP Tank Farm and the main aquifer. No groundwater was encountered in the 95-ft borehole drilled at DP Tank Farm during the 1994 field season.

2.4 Wildlife Habitats

DP Tank Farm is located on DP Mesa in east Los Alamos, outside current LANL operating boundaries. The mesa top at DP Tank Farm is within the townsite. The surrounding area has heavy commercial development and urban disturbance. The affected habitat in this area is assessed in the ecological surveys of TAs 1, 32, and 21 (Bennett 1992, 01-0008; Biggs 1993, 01-0019). As these surveys show, there are no threatened or endangered species in the immediate vicinity of DP Tank Farm.

3.0 APPROACH TO DATA ASSESSMENT AND ANALYSIS

The decision approach used for DP Tank Farm, SWMU 21-029, involves a series of quantitative steps that occur after the field investigation, chemical analysis, and data reporting are complete. These steps begin with routine data validation and continue with more focused data validation, if necessary. Routine validation involves validating each data item against specific targets and adding qualifier flags to the data signifying a potential deficiency. Focused validation consists of analyzing quality assurance/quality control (QA/QC) data for their potential impact on the succeeding data assessment steps, i.e., comparing site data to background concentration data, verifying the identities of detected organic chemicals, comparing site data to SALs for human health impacts, and performing human health risk assessments when necessary. The following subsections provide overviews of the methods used to complete these quantitative steps. Further details can be found in Technical Approach to RFI reports (LANL in preparation, 1281).

3.1 Sample Analysis

All samples requiring chemical and radiological analysis and chain-of-custody documentation are submitted to the SMO, the MRAL, and/or the MCAL for analysis. All forms of analysis were used at DP Tank Farm.

3.1.1 Analytical Methods

All samples were analyzed using Environmental Protection Agency (EPA) SW-846 Methods or equivalent.

3.1.2 Data Validation

Data verification and validation procedures are used to determine whether data packages have been generated according to specifications, are of known quality, and contain the information necessary to determine data sufficiency for decision making.

Data verification is a check of data deliverables against a set of stated requirements to ensure that what has been ordered has been delivered, thus indicating that the laboratories can be paid. All analytical data generated in support of the ER Project are verified.

Data validation is the process of determining whether individual results (a datum) can be reliably used to support the decision-making process. During the process, validators determine whether data should be qualified or used with caution because of the potential impact of noted flaws or the failure to achieve analytical precision or bias constraints.

Routine validation is the comparison of quality indicators (such as surrogate recovery, measurements of method blanks, holding times, and differences between replicate measurements) with clearly defined limits to determine whether limitations may need to be placed on the use of the data. Routine validation is most suitable for routine analyses and for those nonroutine analyses for which clearly defined limits have been established.

The focused data validation process addresses those characteristics of the data (e.g., precision and bias) that directly affect the decisions to be based on the data. The same data set may undergo different focused validations for different decisions.

3.2 Background Comparisons

Once the data validation process is complete and the site data are finalized, the next step in the process is to compare site data to available background data. The results of a focused data validation should exclude from consideration for background comparison any contaminant that is identified as an artifact of laboratory or field contamination, analytical interference, or improper analyte identification or quantitation. The purpose of this decision step is to determine if chemicals that have natural or anthropogenic background distributions should be retained as chemicals of potential concern (COPCs) or eliminated from further consideration. Background data are available from two sources: 1) soil samples collected throughout Los Alamos County for which chemical analyses were performed for certain inorganic (metal) chemicals and naturally occurring radioactive chemicals (Longmire et al. in preparation, 1142 and 1266); and, 2) background concentrations of radioactive chemicals associated with global fallout from atmospheric nuclear testing (e.g., plutonium, cesium, strontium, and tritium) reported in LANL Environmental Surveillance reports (Purtymun et al. 1987, 0211; ESG 1988, 0408; ESG 1989, 0308; Environmental Protection Group 1990, 0497; Environmental Protection Group 1992, 0740).

Comparisons between site data and background data are initially performed by comparing each observed concentration datum to an upper tolerance limit (UTL) estimated from background data. Details of statistical methods used to generate UTLs from the background data sets and suggestions for statistical methods for comparing site and background concentration distributions are presented in the guidance document, Statistical Comparisons to Background, Part I (Environmental Restoration Project Assessments Council 1995, 1218). Further statistical comparisons between site and background data might be performed when UTLs are exceeded.

If a chemical has a reported concentration that exceeds its UTL, or fails other statistical background comparison tests (i.e., the site data are statistically greater than background data), then that chemical is carried forward to the screening assessment process. If a chemical does

not have a reported concentration that exceeds the UTL, then that chemical is removed from further consideration.

The ER Project has developed UTLs for the most commonly sampled chemicals and the most commonly analyzed media. For chemicals and media not included in the LANL background data (or in the Facility for Information Management, Analysis, and Display), UTLs will be developed by the Decision Support Council as needed.

3.3 Evaluation of Organic Constituents

Background data are not available for organic chemicals. The preliminary evaluation of organic chemicals considers detected chemicals and chemicals that were analyzed for but not detected in any sample. The purpose of this decision step is to determine if organic chemicals should be retained as COPCs or eliminated from further consideration based on detection status. Detection status is determined by the analytical laboratory on a sample-by-sample, analyte-by-analyte basis. Estimated quantitation limits (EQLs) have been established for each analyte as reporting limits when the analyte is not detected. It should be noted that the EQLs reported for individual samples are dependent on a number of factors and may vary from sample to sample and from analysis to analysis. Therefore, the sample-specific EQL for a chemical must be used in this comparison.

If a chemical has a reported concentration that exceeds its reporting limits, then that chemical is generally carried forward through the screening assessment process. If a chemical does not have a reported concentration that exceeds its reporting limits, then that chemical is generally removed from further consideration. Exceptions to these general rules may be made if site-specific process knowledge so indicates. A chemical that is detected may be removed from further consideration if it can be determined that its presence is not due to Laboratory operations, and a chemical that is not detected in any sample may be carried through the decision process if the chemical can be expected to be present at the site based on historical operations.

3.4 Human Health

3.4.1 Screening Assessment

The purpose of this decision step is to determine if chemicals should be retained as COPCs or eliminated from further consideration based on comparisons with SALs. This is the last step in the screening assessment process for human health concerns. If COPCs remain after this step, then further action may be proposed. If no COPCs remain after this step, then no further action

(NFA) may be proposed based on human health concerns. SALs are medium-specific concentrations that are calculated using chemical-specific toxicity information and conservative, default exposure assumptions. For those chemicals for which SALs are available, each observed concentration datum is compared to the chemical's SAL. If a chemical has a reported concentration greater than its SAL, then that chemical is retained as a COPC pending further analysis. If a chemical does not have a reported concentration greater than its SAL, then that chemical is generally removed from further consideration. If more than one chemical is present at the site, this decision is deferred pending the results of the multiple chemical evaluation (described below). The decision to identify a chemical as a COPC when a SAL is not available is made on a case-by-case basis, taking into account the availability of process knowledge and toxicological information.

It is possible that COPCs should be retained because of the combined adverse health effects of several chemicals. This possibility is evaluated in the multiple chemical evaluation, in which the reported concentration for each chemical is divided by its respective SAL, and the resulting "normalized" values are incorporated into a simple additive model. If the sum of the normalized values (i.e., the total normalized value) is less than one, then the chemicals are removed from further consideration. If the total normalized value is greater than one, then chemicals having an individual normalized value greater than or equal to 0.1 are retained as COPCs pending further evaluation.

Only those chemicals that exceed background concentration thresholds (certain inorganics and radionuclides), fail other background comparison tests, or exceed reporting limits (organics) in at least one sample are included in the multiple chemical evaluation. These chemicals are divided into three classes: noncarcinogens, chemical carcinogens, and radionuclides. Additive effects are assumed within each class, but each class is evaluated separately. For further information on the calculation of multiple chemical evaluations see Technical Approach to RFI reports (LANL in preparation, 1281).

3.4.2 Risk Assessment

No human health risk assessment is included with this report.

3.5 Ecological

All information obtained from the Phase I investigation at DP Tank Farm will be considered as part of a larger ecological exposure unit once the ecological exposure unit approach has been

formally approved by our regulators. DP Tank Farm is a mesa top site surrounded by disturbed areas. The area provides limited habitat for biota, does not contain sensitive habitats, and threatened or endangered species are not present there (Ebinger et al. 1994, 01-0007). Therefore, there is no immediate ecological risk at this site.

4.0 QUALITY ASSURANCE/QUALITY CONTROL ACTIVITIES

4.1 1994 Quality Assurance/Quality Control Activities

All samples from the 1994 Phase I investigation were submitted with chain-of-custody documentation to the Sample Coordination Facility (SCF), now called the Sample Management Office (SMO), or to the MRAL for analysis. The following analyses were performed for selected samples using the methods described:

- Target analyte list (TAL) metals analyses were performed as follows:
    - Mercury analyses were performed using cold vaporization atomic absorption (EPA SW-846 Method 7471).
    - Arsenic and selenium analyses were performed using graphite furnace atomic absorption (EPA SW-846 Methods 7060, 7741, 7421, and 7841).
    - Antimony, lead, and thallium analyses were performed using inductively coupled plasma/mass spectroscopy (EPA SW-846 Method 6020).
    - Aluminum, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, silver, sodium, vanadium, and zinc, and in some cases arsenic, selenium, thallium, and lead analyses were performed using inductively coupled plasma emission spectroscopy (EPA SW-846 Method 6010).
- VOC analyses were conducted using gas chromatography/mass spectroscopy (EPA SW-846 Method 8260, Purge and Trap/Capillary Column Method).
- SVOC analyses were conducted using gas chromatography/mass spectroscopy (EPA SW-846 Method 8270, Solvent Extraction/Direct Injection).
- Fixed laboratory radioactive analyses were performed as follows: tritium was determined using liquid scintillation counting, and gamma activity was

determined using gamma spectroscopy. In addition, percent moisture was determined gravimetrically.

The MRAL analyses were conducted as follows:

- Percent moisture analyses were conducted gravimetrically using a Denver Instruments™ IR100 moisture analyzer.
- Tritium analyses were conducted using liquid scintillation counting.
- Gross alpha and gross beta analyses were conducted using a gas flow proportional counting technique.
- Gross gamma analyses were conducted by gamma spectroscopy using a Bicron™ 5-in. by 7-in. sodium iodide well counter.

The QC issues raised in these analyses are presented in Appendix A, Table A-3, and are described below.

TAL Metals. Thirty-five samples were analyzed for TAL metals under three requests: 19078, 19086, and 20061.

The samples in request 19078 exceeded the holding time for mercury by six days. However, the mercury data were not qualified because 1) holding times are based on unpreserved water samples and all of the samples were solid samples; 2) soil samples are less likely than water samples to undergo the biotransformation from elemental mercury to organomercury compounds, which is responsible for the 28-day holding time limit for mercury; and 3) the samples did not grossly exceed the holding time. Since all other QC results were within allowed limits, all data are valid and usable without qualification.

In request 19086, all QC parameters were within allowed limits, and all data are valid and usable without qualification.

Request 20061 had two QC problems. First, the QA water samples in this request exceeded the analytical holding time by 56 days. Because loss of mercury from the water matrix is likely, all mercury data for these water samples are qualified "R," rejected data. Secondly, the soil samples in this request exceeded the analytical holding time by up to 85 days. This situation is similar to that described above for request 19078. However, in this case the holding time was exceeded by two to three months. Therefore, the mercury data for soil samples in this request are qualified "J" or "UJ," estimated detected or undetected quantities.

Ethanol. Thirty-one samples were analyzed for ethanol under three separate requests: 19017, 19018, and 19129. All QC parameters were within allowed limits for all three requests, and all data are valid and usable without qualification.

SVOCs. Thirty-seven samples were analyzed for SVOCs under three requests: 19017, 19018, and 19129.

In requests 19017 and 19018, there were two QC problems. First, the samples exceeded the analytical holding time of 40 days by five days and one day, respectively. Secondly, TPH and diesel were found in the samples, which necessitated dilution of the samples. When the samples were diluted, many of the surrogates were well below the detection limits of the instrument, and many of the EQLs were elevated. Because of these problems, all data associated with these requests are qualified "J" or "UJ."

In request 19129 there were many QC problems:

- Two water samples (AAB9821 and AAB9822) exceeded the extraction holding time of seven days by one day. All data for these samples are qualified "UJ."
- Bis(2-ethylhexyl)phthalate was found in the water method blank below the EQL of 10 µg/L. Bis(2-ethylhexyl)phthalate was also detected in water sample AAB9743 at 11 µg/L. Because this value was less than five times the amount found in the water blank, the EQL was raised to 11 µg/L for this sample.
- Three analytes had recoveries of between 10% and 50% in the water QC sample. They were 2-methylphenol, 4-methylphenol, and 2,4,6-trichlorophenol. Because of the low recoveries, the data for these three analytes are qualified "UJ" in all water samples in this request.
- For soil samples AAB9720, AAB9732, and AAB9885, there were low surrogate recoveries of 10% to 25% for two of the acid surrogates. Because of the low recoveries, all of the acid fraction analytes are qualified "UJ" for these samples.
- Samples AAB9708, AAB9742, and AAB9884 had four low surrogate recoveries of 10% to 25%. All data for these samples are qualified "UJ."

- The surrogates were diluted out in samples AAB9818, AAB9819, AAB9820, AAB9702, and AAB9710 because of high concentrations of TPH or diesel. Data are not qualified when surrogates are diluted out and other QC information must therefore be relied upon. Fourteen analytes had recoveries of 10% to 50% in the soil QC sample. They were anthracene; benzo-a-pyrene; bis(2-chloroethyl)ether; 4-chloro-3-methylphenol; 2-chloronaphthalene; dibenzofuran; 1,2-dichlorobenzene; 2,6-dinitrotoluene; hexachloroethane; 2-methylphenol; 4-methylphenol; naphthalene; 1,2,4-trichlorobenzene; and 2,4,6-trichlorophenol. Bis(2-ethylhexyl)phthalate had a high surrogate recovery of 135% in the QC sample. Since bis(2-ethylhexyl)phthalate was also found in the water method blank, there is a good possibility that the detected soil concentrations are due to laboratory contamination. All data for these analytes are qualified "J" or "UJ" for the soil samples in this request.

VOCs. Thirty-eight samples were analyzed for VOCs under three requests: 19017, 19018, and 19129.

Request 19018 had no obvious QC problems. However, there was one possible problem concerning the detection of 2-butanone (MEK) in three of the samples (AAB9713, AAB9714, and AAB9715) and acetone in one sample (AAB9714). MEK was reported at concentrations from 22 000 µg/kg to 27 000 µg/kg in these samples. However, because of petroleum products in the samples, all three samples were diluted by a factor of 200. The actual detected amounts of MEK were between 40 µg/L and 52 µg/L in the sample extracts. Although it was not detected in the method blank on the day of analysis, MEK was detected in the water QC blank the previous day at 8 µg/L and 15 µg/L. Since MEK is a common laboratory contaminant and was not expected to be present at this site, it is possible that the MEK detected in these samples is present due to laboratory contamination. The same argument is true for acetone, which is also a common laboratory contaminant. Like MEK, acetone was not detected in the blank the day of analysis, but was detected in the method blank the day before. Because MEK and acetone were not detected in the method blank on the day of analysis, the data cannot be dismissed. However, the possibility of laboratory contamination and the large dilution of the sample extract suggest that the detected MEK and acetone values may represent false positives. Therefore, the MEK data are qualified "J" for samples AAB1913, AAB1914, and AAB1915, and the acetone data are qualified "J" for sample AAB9714. All other data associated with VOCs in this request are valid and usable without qualification.

In request 19017, one sample, AAB9721, had a low recovery of 69% for one surrogate. All analytes except 1,3,5-trimethylbenzene, which was reanalyzed later at a higher dilution, are qualified "J" or "UJ" for this sample. EQLs were higher than normal for this request because of the high concentration of TPH and diesel.

Request 19129 had two QC problems. First, three samples had internal standards below acceptable values and low surrogate recoveries for 4-bromofluoro benzene (BFB): AAB9818 at 69%, AAB9819 at 54%, and AAB9820 at 61%. All data associated with these samples are qualified "UJ." Secondly, 4-methyl-2-pentanone was not detected in the QC sample. Since the QC sample was spiked just above the quantitation limit for this analyte, all data for 4-methyl-2-pentanone are qualified "UJ" for samples in this request.

Radionuclides. Thirty samples were analyzed by gamma spectroscopy under three request numbers: 19090, 19091, and 19929.

The QC data for requests 19091 and 19929 were all within allowed limits, and all data are valid and usable without qualification.

In request 19090 there was a problem with the cesium-137 QC sample. Two separate analytical laboratories have repeatedly had high cesium-137 recoveries of 121% for this particular QC sample. Because the QC sample may be biased low, the data are not qualified.

There were no analytes of interest found in requests 19090 and 19091. All of the detected analytes were the parent or daughters in the decay chains of thorium-232, uranium-235, and uranium-238, or were isotopes found at levels not significantly above the instrument detection limit (cobalt-57, cobalt-60, and cesium-134). For request 19929, cesium-137 was the only isotope reported.

Fourteen samples were analyzed for tritium and ten were analyzed for unbound water under requests 19090 and 19929. The QC data for these requests were all within allowed limits, and all data are valid and usable without qualification.

4.2 1995 Quality Assurance/Quality Control Activities

The 1995 investigation at DP Tank Farm was performed in accordance with NMED UST Bureau regulations, and focused on defining the extent of petroleum products contamination.

Samples collected during the 1995 field activities were taken to the on-site MCAL for analysis. The samples were analyzed for BTEX and selected VOCs, including MEK and acetone, and also for TPH/diesel. BTEX analyses were conducted using gas chromatography/mass

spectroscopy and SW-846 Method 8020 with all appropriate QC controls. TPH/diesel analyses were performed using a gas chromatography/flame ionization detector and Modified SW-846 Method 8015. The QC parameter included with this analysis was a daily performance standard. The QC issues raised in these analyses are presented in Appendix A, Table A-11, and are described below.

BTEX, MEK, and Acetone Analyses. In all BTEX, MEK, and acetone analyses, the MCAL analyst subtracted the analyte levels detected in the method blanks from the analyte levels detected in the samples. If the analyte concentration in a sample was within the range of concentrations detected in the blanks, the concentration was qualified as not detected, and the detection limit was listed as the concentration. This method resulted in a low estimate for the detection limit. To correct this problem, a more realistic detection limit for BTEX, MEK, and acetone was calculated by multiplying the value in the blank by 25 to account for dilution and an approximate 10 gram sample.

The following discussion summarizes the QC results for BTEX, MEK, and acetone analyses.

On May 17, 1995, one sample was analyzed for BTEX, MEK, and acetone. All QC data were within allowed limits. Two analytes were found in the method blank: acetone (48 µg/L) and MEK (150 µg/L). All data are valid without qualification.

On May 18, 1995, ten samples were analyzed for BTEX, MEK, and acetone. There were high surrogate recoveries for sample 0121-95-0042. The recovery for toluene-d8 was 173%. This high surrogate recovery, which may have been caused by the 100-fold dilution of the sample, could cause a high bias for the sample data. Therefore, all detected analytes for this sample are qualified "J." Two analytes were found in the method blank: acetone (98 µg/L) and MEK (17 µg/L). All data are valid without qualification except as noted above.

On May 19, 1995, ten soil samples and one rinsate blank were analyzed for BTEX, MEK, and acetone. There were several high surrogate recoveries in several samples for 1,2-dichloroethane, from 127% to 135%. However, no analytes were detected above blank levels in these samples. Therefore, these high surrogate recoveries do not affect the undetected analytes. Two analytes were found in the method blank: acetone (46 µg/L) and MEK (156 µg/L). All data are valid without qualification.

On May 22, 1995, fourteen soil samples were analyzed for BTEX, MEK, and acetone. There were problems with high internal standards for six of the samples: 0121-95-0057, 0121-95-0059, 0121-95-0060, 0121-95-0062, 0121-95-0130, and

0121-95-0131. There were also a number of high surrogate recoveries for 1,2-dichloroethane. Because of these problems, all of the analytes for the six samples mentioned above are qualified "J" or "UJ." Two analytes were found in the method blank: acetone (8 µg/L) and MEK (53 µg/L). All data are valid without qualification except as noted above.

On May 23, 1995, fifteen samples were analyzed for BTEX, MEK, and acetone. There were problems with high surrogate recoveries for 1,2-dichloroethane, BFB, and toluene-d8. Toluene-d8 is the most relevant surrogate for BTEX, and since no analytes were detected above blank levels in the samples in which the recovery was high, no data are qualified. Two analytes were found in the method blank: acetone (42 µg/L) and MEK (82 µg/L). The blank subtraction for these two analytes was originally done incorrectly for six samples, and acetone and/or MEK were reported as detected in these samples. However, when proper blank subtraction was performed, all of these detects became nondetects. The affected samples are 0121-95-0063, 0121-95-0064, 0121-95-0083, 0121-95-0087, 0121-95-0089, and 0121-95-0132. All data are valid without qualification.

On May 24, 1995, thirteen soil samples were analyzed for BTEX, MEK, and acetone. All QC data were within allowed parameters. Two analytes were found in the method blank: acetone (42 µg/L) and MEK (82 µg/L). The blank subtraction for MEK was originally done incorrectly for three samples, and MEK was reported as detected in these samples. However, when proper blank subtraction was performed, all of these detects became nondetects. The affected samples are 0121-95-0066, 0121-95-0091, and 0121-95-0097. All data are valid without qualification.

On May 25, 1995, fifteen soil samples were analyzed for BTEX, MEK, and acetone. All QC data were within allowed limits except in sample 0121-95-0067, which had a high surrogate recovery of 123% for toluene-d8 (120% is the upper limit). Because of the high recovery, all detects for this sample are qualified "J." Two analytes were found in the method blank: acetone (44 µg/L) and MEK (119 µg/L). MEK was detected in four of the samples at levels two to three times the blank levels. Validation guidelines allow for raising the EQLs when sample concentrations are less than five times the concentration found in the blank sample (or ten times the blank concentration for common laboratory contaminants such as MEK). Therefore, the EQLs have been raised to the level of detection and MEK is considered not detected in the samples. The affected samples are 0121-95-0010, 0121-95-0011, 0121-95-0012, 0121-95-0139, and 0121-95-0140. All data are valid without qualification except as noted above.

On May 26, 1995, eight soil samples were analyzed for BTEX, MEK, and acetone. All QC parameters were within allowed limits. Two analytes were found in the method blank: acetone

(20 µg/L) and MEK (76 µg/L). MEK was detected in all eight of the samples at levels two to three times the blank levels. Validation guidelines allow for raising the EQLs when sample concentrations are less than five times the concentration found in the blank sample (or ten times the blank concentration for common laboratory contaminants such as MEK). Therefore, the EQLs have been raised to the level of detection and MEK is considered not detected in the samples. The affected samples are 0121-95-0032 through 0121-95-0039.

On May 30, 1995, seventeen soil samples were analyzed for BTEX, MEK, and acetone. All QC parameters were within allowed limits. Two analytes were found in the method blank: acetone (99 µg/L) and MEK (51 µg/L). All data are valid without qualification.

On May 31, 1995, fourteen samples were analyzed for BTEX, MEK, and acetone. All QC parameters were within allowed limits for all of the samples. Two analytes were found in the method blank: acetone (20 µg/L) and MEK (67 µg/L). All data are valid without qualification.

On June 1, 1995, eight samples were analyzed for BTEX, MEK, and acetone. All QC parameters were within allowed limits for all of the samples. Two analytes were found in the method blank: acetone (36 µg/L) and MEK (106 µg/L). All data are valid without qualification.

On June 8, 1995, eight samples were analyzed for BTEX, MEK, and acetone. There were problems with high surrogate recoveries for 1,2-dichloroethane, but since there were no detects above blank levels the data are not affected. Two analytes were found in the method blank: acetone (15 µg/L) and MEK (228 µg/L). The blank subtraction for these two analytes was originally done incorrectly for five samples, and acetone and/or MEK were reported as detected in these samples. However, when proper blank subtraction was performed, all of these detects became nondetects. The affected samples are 0121-95-0218, 0121-95-0219, 0121-95-0220, 0121-95-0221, and 0121-95-0223. All data are valid without qualification.

On June 14, 1995, eight samples were analyzed for BTEX, MEK, and acetone. All QC parameters were within allowed limits. Two analytes were found in the method blank: acetone (28 µg/L) and MEK (82 µg/L). The blank subtraction for acetone was originally done incorrectly for four samples, and acetone was reported as detected in these samples. However, when proper blank subtraction was performed, all of these detects became nondetects. The affected samples are 0121-95-0185, 0121-95-0187, 0121-95-0233, and 0121-95-0234. All data are valid without qualification.

TPH/Diesel Analyses. For nine of the 13 days during which TPH/diesel analyses were performed, the standards were within allowed limits. The numbers of samples analyzed and dates of these analyses are:

- 14 samples on May 19, 1995 (0121-95-0049 through 0121-95-0056, 0121-95-0114, 0121-95-0124 through 0121-95-0127, and 0121-95-0129);
- 15 samples on May 22, 1995 (0121-95-0057 through 0121-95-0062, 0121-95-0074 through 0121-95-0080, and 0121-95-0130 through 0121-95-0131);
- 13 samples on May 24, 1995 (0121-95-0065 through 0121-95-0066, 0121-95-0090 through 0121-95-0097, and 0121-95-0136 through 0121-95-0138);
- 15 samples on May 25, 1995 (0121-95-0008 through 0121-95-0012, 0121-95-0067, 0121-95-0098 through 0121-95-0102, 0121-95-0104 through 0121-95-0105, and 0121-95-0139 through 0121-95-0140);
- 8 samples on May 26, 1995 (0121-95-0032 through 0121-95-0039);
- 14 samples on May 31, 1995 (0121-95-0019, 0121-95-0026 through 0121-95-0031, 0121-95-0117, 0121-95-0160 through 0121-95-0165, and 0121-95-0168 through 0121-95-0169);
- 8 samples on June 1, 1995 (0121-95-0118, 0121-95-0171 through 0121-95-0174, and 0121-95-0243 through 0121-95-0245);
- 8 samples on June 8, 1995 (0121-95-0218 through 0121-95-0221, and 0121-95-0223 through 0121-95-0226); and
- 8 samples on June 14, 1995 (0121-95-0185 through 0121-95-0187, 0121-95-0228 through 0121-95-0229, 0121-95-0233 through 0121-95-0234, and 0121-95-0247).

All data are valid without qualification except as noted below.

On May 17, 1995 and May 18, 1995, 11 samples were analyzed for TPH/diesel. For these first two days of analysis, the gas chromatography/mass spectroscope in the MCAL was programmed to look only for diesel constituents. TPH values were determined for these samples from the spectra using several estimations. Therefore, the TPH data for these two days are qualified "J" or "UJ" to account for uncertainties in the determination of the TPH values. The affected samples are 0121-95-0041 through 0121-95-0048, and 0121-95-0121 through 0121-95-0123.

On May 23, 1995, 14 samples were analyzed for TPH/diesel. The performance sample recovery was high for diesel (125%) and TPH (146%). Because of the high recoveries and the possible high bias to the sample data, all detected analyte data are qualified "J." The affected samples are 0121-95-0063, 0121-95-0064, 0121-95-0082 through 0121-95-0089, 0121-95-0115, 0121-95-0132, 0121-95-0133, and 0121-95-0135.

On May 30, 1995, 14 samples were analyzed for TPH/diesel. The performance sample recovery was high for diesel (122%) and TPH (134%). Because of the high recoveries, all detected analyte data are qualified "J." The affected samples are 0121-95-0015 through 0121-95-0026, 0121-95-0116, and 0121-95-0141.

In a number of the analyses, concentrations were reported with "greater than" values, indicating concentrations above the linear calibration of the instrument. Unfortunately, subsequent dilutions of the samples were not performed. All of the concentrations with "greater than" values must be qualified "J" due to possibilities of significant low bias. Samples containing data with "greater than" values are: 0121-95-0017, 0121-95-0018, 0121-95-0058 through 0121-95-0061, 0121-95-0085, 0121-95-0086, 0121-95-0130, 0121-95-0131, 0121-95-0228, 0121-95-0229, 0121-95-0233, and 0121-95-0234.

5.0 SITE-SPECIFIC RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Field Investigation and Sampling Activities

5.1.1 Previous Investigations

As described in the TA-21 Operable Unit RFI Work Plan, DP Tank Farm and its structures (15 underground fuel storage tanks and two fill stations) were investigated previous to the RFI Phase I activities. In 1985, samples of liquids and sludges collected from the tanks were found to consist primarily of petroleum distillates. One tank reportedly contained up to 50% ethanol. No radioactive materials were found in the liquids from the tanks. In 1984 and 1985, surface soil samples were collected from a drain outfall, the two fill stations, and along the southern base of a 4-ft earthen berm that encompassed the northern boundary. Lead results for these samples were all less than the detection limit. Arsenic results for seven of eleven samples were below the detection limit, and the remaining samples had concentrations that were very low (LANL 1991, 0689). Background samples yielded similar results. Net total organic compounds were detected in five out of eleven samples and were highest in those samples collected at the fill stations (LANL 1991, 0689).

All tanks and structures were removed from DP Tank Farm in 1988. During site decommissioning, only one tank, TA-21-ATF-10, was found to have leaked, possibly because of a faulty gasket at the tank exit (Fig. 1-2). Approximately 4 yd^3 of visibly contaminated soil were removed from the area underlying the leak. The remaining tanks and underground distribution piping were reported to have been in good condition. In addition, soil near the two fill stations was excavated and sampled using EPA Extraction Procedure Toxicity, and lead concentrations were less than 2 µg/L (LANL 1991, 0689). The excavated soils reportedly contained elevated concentrations of benzene, toluene, and xylenes, but concentrations in soil remaining at the site were considerably lower. At that point, the area around the excavations was considered clean and was backfilled.

A recent site inspection revealed two 24-in. culverts discharging into DP Canyon. No storm drains associated with the culverts were located, although a storm drain reportedly discharged surface runoff through the berm at the northeast corner of the property. The drains are presumed to have been removed during site decommissioning activities.

5.1.2 1994 Field Investigation and Sampling Activities

RFI Phase I activities were conducted in August and September 1994. A geodetic survey was performed in August 1994 to determine the locations of former tanks and structures at DP Tank

Farm. Drill sites and surface sampling locations were surveyed to document the location of each sample.

Subsurface sampling. A total of eleven boreholes were drilled to depths ranging from 10 ft below ground surface (bgs) to 94 ft bgs, and subsurface material was collected by scooping the pulverized tuff fragments directly off the auger flights (Fig. 5-1). Borehole locations are described in Appendix A, Table A-2. Two boreholes were placed near the former locations of each of the two fill stations and at tanks TA-21-ATF-6, TA-21-ATF-10, and TA-21-ATF-13. According to the TA-21 Operable Unit RFI Work Plan, the planned nominal depth of each borehole was 10 ft bgs (LANL 1991, 0689). However, in several boreholes adjacent to the fill stations, photoionization detector (PID) readings indicated that subsurface contamination extended below 10 ft. Therefore, the field work differed from the work plan in that drilling and sampling continued until contamination was no longer detected with a PID. All PID results are presented in Appendix A, Table A-4. The field work also differed from the work plan in that one additional borehole (21-2607) was added to the drilling plan after field screening detected high concentrations of VOCs in the two boreholes at the East Fill Station (Fig. 5-1). This borehole was located directly north of the East Fill Station and adjacent to the fence at the northern boundary of the site. While the work plan called for additional boreholes to bound the horizontal and vertical extent of contamination at the two fill stations, additional boreholes were delayed to allow for a complete review of results.

Recovered core was field-screened for gross beta and gamma radiation and for VOCs immediately after the core barrel was opened and before the core was logged and sampled. VOCs in the workers' breathing zone and emanating from the core were monitored with a PID. Drill cuttings were also screened for VOCs as the cuttings were discharged from the borehole. The air within and around each borehole was monitored for combustible gases. A portion of each sampled core was analyzed in the field using headspace analysis to provide a quick indication of the presence of VOCs in soils or tuff. Results of headspace analysis were used as a gross indication of the presence of VOCs and to help determine if drilling should continue. Core extracted from each borehole was lithologically logged within the exclusion zone. Boreholes were backfilled with a cement/bentonite grout mix.

Subsurface samples were submitted to the LANL SMO for analysis of VOCs, SVOCs, metals, and ethanol. Samples were also collected and submitted to analytical laboratories for analysis of gross alpha, beta, and gamma radiation.

Surface sampling. Samples were collected from the top 6 in. of soil at two locations associated with the outfall into DP Canyon (Fig. 5-1). Samples were submitted to the SMO for analysis of

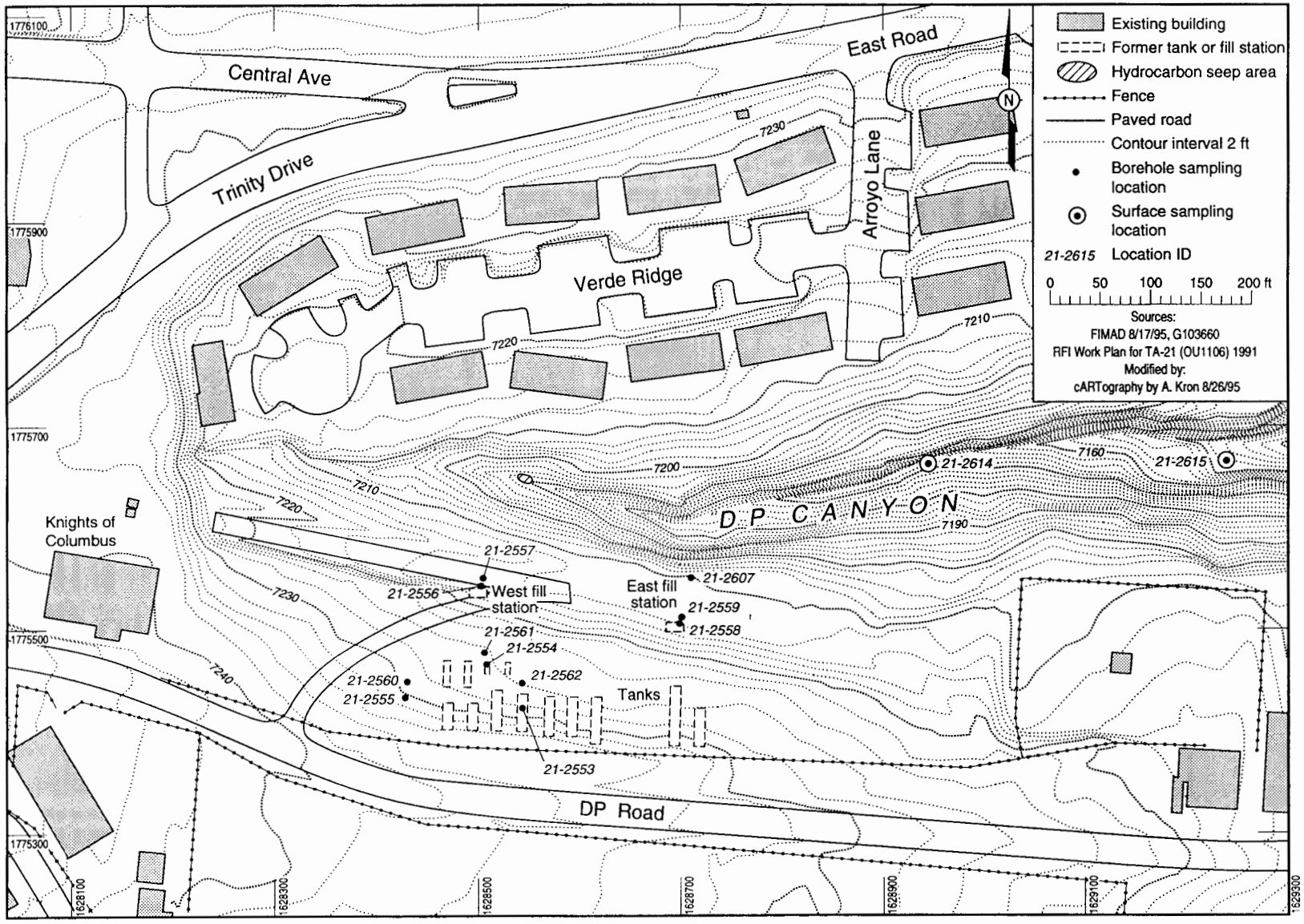

Fig. 5-1. Locations of samples collected during the 1994 investigation of DP Tank Farm, SWMU 21-029.

VOCs, SVOCs, ethanol, metals, and gamma spectroscopy. Additional samples were submitted to the MRAL for determination of gross alpha, beta, and gamma radiation.

5.1.2.1 1994 Field Screening Results

The results from field screening activities conducted during the 1994 Phase I investigation at DP Tank Farm are presented in Appendix A, Table A-4 and A-5. During the 1994 investigation, field screening results for radioactivity showed that no borehole or soil samples had radiation levels greater than background. Field screening for VOCs during drilling operations near the former fill stations often yielded VOC concentrations of up to several thousand parts per million. Combustible gas readings of up to 100% of the lower explosive limit (LEL) were detected in the borehole or at the top of the auger flights as drilling continued. When these high LEL percentages were encountered, the borehole gases were displaced from the borehole by inserting dry ice into the hollow stem of the auger flights.

5.1.3 1995 Field Investigation and Sampling Activities

Based on the results from the 1994 samples, the only COPCs identified at DP Tank Farm were associated with petroleum products. Concentrations of TPH detected at the site exceeded 100 ppm, which necessitated a reportable release to the NMED UST Bureau. Therefore, the 1995 investigation proceeded with a focus on those regulations, and aimed at defining the extent of the petroleum products contamination. The 1995 field activities included borehole drilling and subsurface sampling, surface water and stream bed sampling, field screening, and MCAL analysis.

Subsurface sampling. Thirteen boreholes were drilled during the 1995 investigation (Fig. 5-2). Placement of the boreholes was determined by the NMED UST Bureau requirement that the zone of subsurface contamination be horizontally and vertically bounded in four directions. Borehole locations are described in Appendix A, Table A-10.

At the West Fill Station, four vertical boreholes (21-3002, 21-3004, 21-3005, and 21-3014) were placed along the arms of a four-armed array centered on borehole 21-2556, which was drilled in 1994 (Fig. 5-2). Each borehole was placed approximately 20 ft from the center of the array. Boreholes were drilled to a minimum depth of 35 ft bgs. In addition, an angled borehole (21-3003) was drilled to investigate possible fracture infiltration of contaminants. Based on the geologic model described in Subsection 2.2, borehole 21-3003 was drilled beginning east of a line from the fill station to the drainage at a 45-degree angle dipping toward the west to a total linear depth of 45 ft. According to the model, this would maximize the chances of intersecting the maximum possible number of fractures (Fig. 5-2).

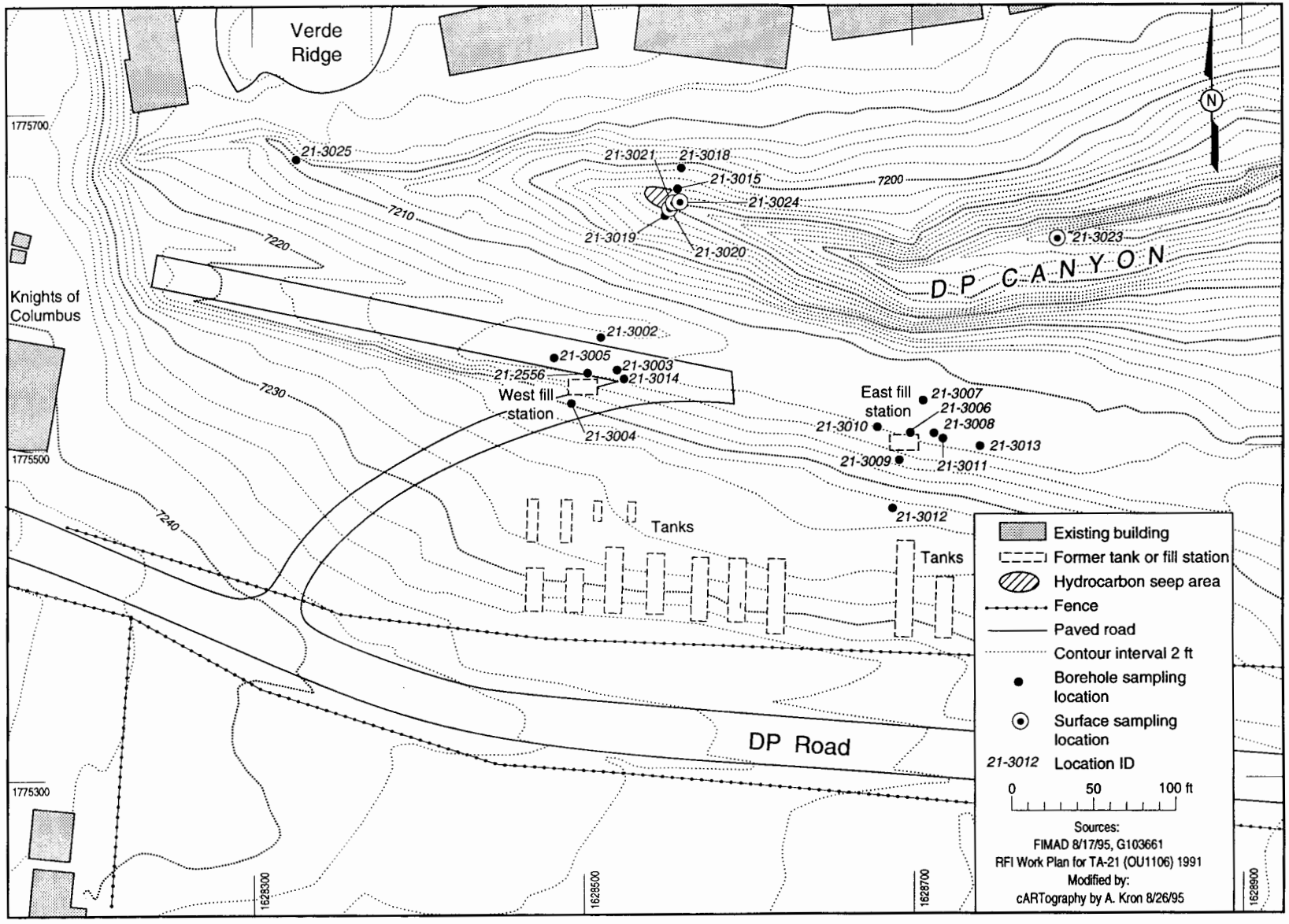

Fig. 5-2. Locations of samples collected during the 1995 investigation of DP Tank Farm, SWMU 21-029.

At the East Fill Station, five vertical boreholes and one angled borehole were drilled in an initial array, and two more vertical boreholes were added to bound the extent of contamination (Fig. 5-2). The initial borehole (21-3006) was located adjacent to the former fill station and drilled to a total depth of 65 ft bgs. Subsequent vertical boreholes were placed 20 ft apart along the arms of a four-armed array centered on borehole 21-3006 and drilled to a minimum depth of 30 ft bgs. Because contamination was found at boreholes 21-3006 and 21-3011, borehole 21-3012 was drilled 20 ft further to the south and borehole 21-3013 was drilled 20 ft further to the east. An angled borehole (21-3008) was also drilled beginning 15 ft east of borehole 21-3006 at a 45-degree angle dipping to the west to a total linear depth of 50 ft.

Recovered core was field screened for gross beta and gamma radiation and VOCs immediately after the core barrel was opened and before the core was logged and sampled. VOCs in the workers' breathing zone and emanating from the core were monitored with a PID. A portion of each sampled core was analyzed in the field using headspace analysis to provide a quick indication of the approximate concentration of VOCs in soils or tuff. Results of headspace analysis were used as a gross indication of the presence of VOCs and to help determine if drilling would continue within a borehole. Drill cuttings were also screened for VOCs as the cuttings were discharged from the borehole. The air within and around each borehole was monitored for combustible gases. Screening results were recorded on sample collection logs, and are summarized in Appendix A, Table A-12.

Core extracted from each borehole was lithologically logged within the exclusion zone. Boreholes were backfilled with drill cuttings and capped with a 2-ft-thick concrete surface seal. Cuttings were placed in the borehole in the reverse order from which they were displaced, such that materials removed from the bottom of the borehole were returned to the bottom, and so on. Samples were submitted to the MCAL for analysis of VOCs, acetone, MEK, and TPH.

Hydrocarbon Seep and DP Canyon Sampling. During 1994 field work, ER Project personnel discovered what appeared to be a seep of petroleum products discharging slowly and intermittently from a small area in the DP Canyon drainage directly north of the West Fill Station. The location of this seep is shown on Fig. 5-2.

The results of the 1994 investigation indicated that the only contaminant source at DP Tank Farm was petroleum products. In order to determine if the seep could potentially be related to this source, samples were collected after the 1994 investigation from seep sediments and from drummed West Fill Station core materials. These samples were sent to a fixed laboratory where they were analyzed qualitatively using peak patterns to identify contaminants. The

results from these analyses indicate that both the West Fill Station core and the seep sediments contain diesel, although the seep sediment sample results show a stronger resemblance to weathered diesel.

Because the qualitative analysis indicated a potential relationship between the seep and the West Fill Station, the DP Canyon stream channel was investigated in 1995 to determine if the petroleum products in the seep are associated with the petroleum products contamination at the West Fill Station. Three shallow boreholes were drilled near the seep in the DP Canyon stream channel north of the West Fill Station (Fig. 5-2). While the sampling plan stated that all three boreholes would be drilled south of the seep, only the first borehole was drilled south of the seep. Because no contaminants were found in the first borehole, the remaining two boreholes were drilled north of the seep to assess the direction from which the contamination originated. All boreholes were drilled with a Bosch Rotohammer® equipped with 3-ft, 2.5-in. diameter, solid-stem auger flights. The total depth drilled for each borehole was 9 ft bgs. Samples were collected by scooping the pulverized tuff fragments directly off the auger flights. Several attempts were made to collect samples with a drive sampler and a bucket auger, but the hard tuff bedrock prevented extraction of a clean, undisturbed sample.

Samples of surface materials or tuff were collected at five locations along the stream bed (Fig. 5-2). The samples were collected from a location approximately 100 ft upstream from the seep, a location approximately 250 ft downstream from the seep, and three locations at or near the seep. A total of seven samples (including field duplicate samples) were collected.

In order to characterize the level of contamination in the water, four surface water samples were collected from the stream in DP Canyon (Fig. 5-2). Two of the water samples were collected from the hydrocarbon seep area. Because disturbance of the seep area would produce a visible sheen of petroleum products on the water surface, the first of these samples was collected before the seep area was disturbed and the second sample was collected after the seep area was disturbed. A visible sheen was noted in the samples collected after the seep was disturbed. The remaining two water samples were collected upstream and downstream from the seep at the same locations from which the surface material samples were collected.

All surface material or tuff samples and water samples collected in DP Canyon were submitted to the MCAL for analysis of VOCs and TPH. Because the 1994 investigation found acetone and MEK, both of which were likely laboratory contaminants (see Subsection 4.1), analyses for these constituents were also performed.

5.1.3.1 1995 Field Screening Results

The results of field screening activities conducted during the 1995 investigation at DP Tank Farm are presented in Appendix A, Table A-12 and A-13. Field screening results for radioactivity showed that no borehole or soil samples had radiation levels greater than background. Field screening results for VOCs showed high concentrations in several boreholes. To ensure worker safety, a fan was used to vent the borehole area when levels of VOCs approached limits set in the site-specific health and safety plan (LANL 1995, 06-0127).

5.2 Screening Assessment

Appendix A contains the analytical results for all DP Tank Farm samples collected during the 1994 and 1995 investigations. Samples collected in 1994 were analyzed for the COPCs listed in the work plan, including metals, radionuclides by gamma spectroscopy, SVOCs, VOCs, ethanol, and tritium (LANL 1991, 0689). Because the 1995 investigation was intended only to define the extent of petroleum products contamination in accordance with NMED UST Bureau regulations, 1995 samples were analyzed primarily for petroleum products (BTEX and TPH). Consequently, 1995 data are not addressed in the screening assessment. The 1995 data are summarized in Subsection 5.2.5.

5.2.1 Background Comparisons

Inorganics. Thirty-two soil and tuff samples were analyzed for inorganic analytes. Two inorganic analytes, lead and zinc, were detected at concentrations greater than their respective background UTLs, as shown in Table 5-1. Silver was detected, but does not have a background UTL (silver was not detected in any background samples at LANL) so it will be carried through the screening assessment process. Corresponding sample locations are shown in Fig. 5-3.

Further background comparisons were performed for lead and zinc because of the infrequency of their detections above background UTLs and because of the high probability of false positive results given the UTLs[1]. Because the data for these metals contain several nondetects and do not otherwise appear to satisfy normality assumptions, nonparametric tests were preferred for further background comparisons. The Gehan modification to the Wilcoxon Rank Sum test and the Quantile test, both of which account reasonably for nondetects, were used for these evaluations. The Gehan test is best suited for assessing complete shifts in distribution,

[1] Recent simulation studies performed at LANL and, independently, at Rocky Flats indicate that the probability of false positive results from background UTL comparisons, for which the UTLs are based on 95% upper confidence bounds on 99th percentiles, is very high even if the background data set contains a moderate number of observations. The LANL background data set contains many observations, greatly increasing the chance of a false positive result. Conversely, the probability of a false negative result is negligible.

TABLE 5-1

INORGANIC ANALYTES WITH CONCENTRATIONS GREATER THAN BACKGROUND UTLS AT DP TANK FARM, SWMU 21-029

ANALYTE	LOCATION ID	SAMPLE ID	SAMPLE VALUE (mg/kg)	UTL[a] (mg/kg)	SAL[b] (mg/kg)	DEPTH (ft)
Silver	21-2556	AAB9714	2.3	NA[c]	380	2.5 - 5
Lead	21-2556	AAB9716	23.4	23.3	400	7.5 - 10
	21-2614	AAB9818	160	23.3	400	0 - 0.5
	21-2615	AAB9819	64	23.3	400	0 - 0.5
	21-2615	AAB9820	64.1	23.3	400	0 - 0.5
Zinc	21-2614	AAB9818	77.6	50.8	23 000	0 - 0.5
	21-2615	AAB9819	56.6	50.8	23 000	0 - 0.5
	21-2615	AAB9820	58.1	50.8	23 000	0 - 0.5

[a] UTL = Background upper tolerance limit.
[b] SAL = Screening action level.
[c] NA = Not available.

whereas the Quantile test is better suited for assessing partial shifts. Using these two tests, most types of differences between distributions can be captured. Observed significance levels (P-values) for these tests are presented for the tests performed. If a P-value is less than some small probability, typically 0.05, then there is some reason to suspect that there is a difference between the background and site distributions; otherwise, no difference is indicated.

Further statistical analysis reveals that the site lead concentration distribution is not significantly different than the lead background distribution. The four samples in which the comparatively high site lead concentrations were observed are surface samples collected from the perimeter of the main site. Even when these data are included in more formal statistical tests, a difference between site and background data can not be demonstrated statistically using the tests indicated above. For example, the observed significance levels for the Wilcoxon/Gehan rank sum test and Quantile tests are 0.86, and 0.47, respectively. However, the slippage test, which tests the number of site observations that are greater than the maximum background value, had a P-value of approximately 0.004, indicating that the four comparatively high values from the three outlying locations may be greater than background.

Further statistical analysis also reveals that the site zinc concentration distribution is not significantly different than the zinc background distribution. The three samples in which the comparatively high zinc concentrations were observed were surface samples collected from the perimeter of the main site. Even when these data are included in more formal statistical tests, a difference between site and background data can not be demonstrated statistically

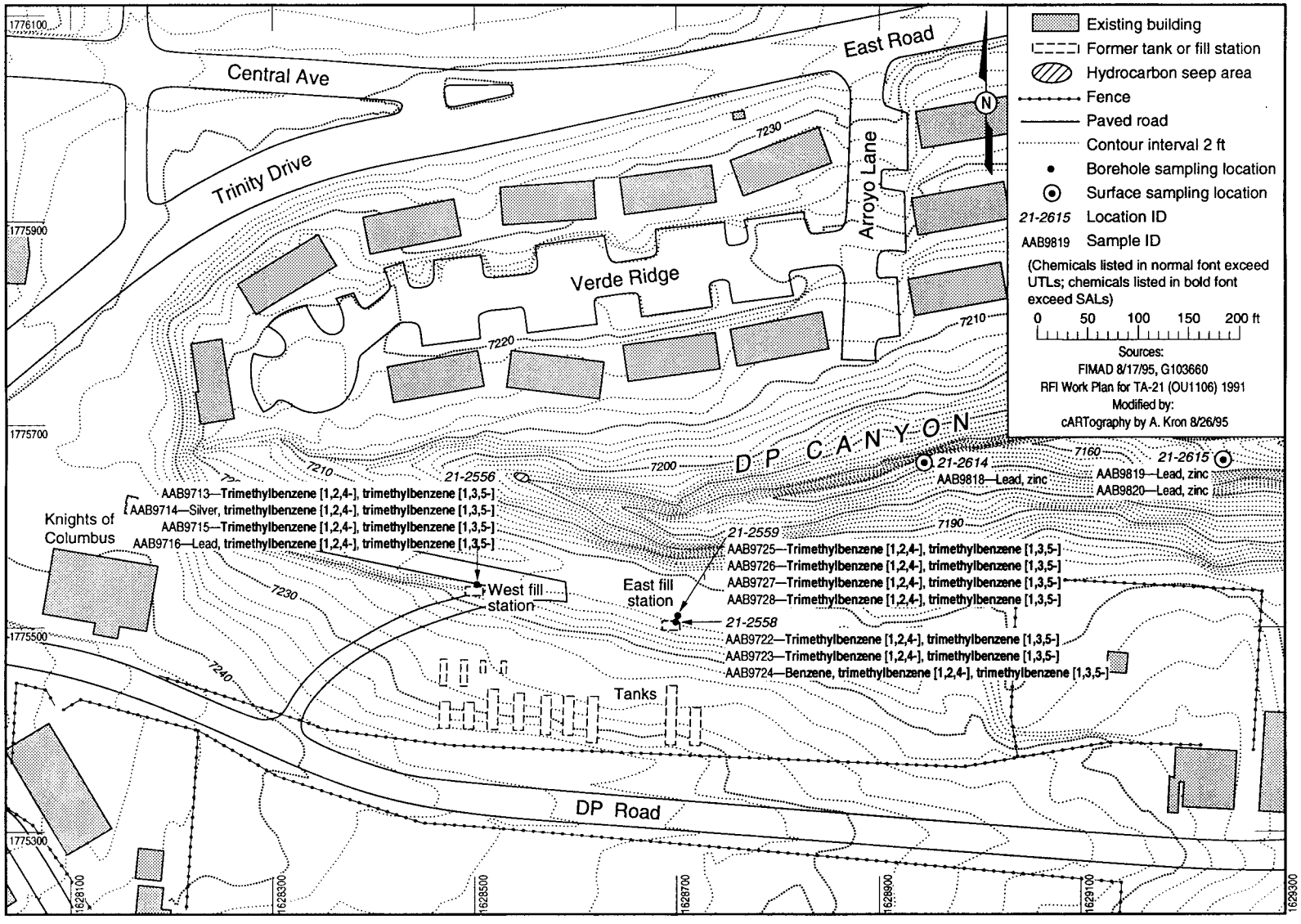

Fig. 5-3. Locations of samples with inorganic concentrations greater than UTLs and SALs, and organic concentrations greater than SALs at DP Tank Farm, SWMU 21-029.

using the above tests. For example, the observed significance levels for the Wilcoxon/Gehan rank sum test, quantile test, and slippage test are 0.99, 0.98, and 0.16, respectively.

If these outlying observations from the perimeter of the site are removed from the statistical testing procedures, then the statistical evidence indicates that the background distribution is slightly greater than the site distribution. The average concentration for background lead is 12.35 mg/kg compared with an average of 10.6 mg/kg for the site lead data set excluding the perimeter samples. Similarly, the average concentrations for zinc are 31.52 mg/kg for the background data set and 26.6 mg/kg for the site data set when the outlying observations are excluded. These comparisons make more clear that the site data may more appropriately be described as coming from two distributions: The first corresponding to the main site, for which lead and zinc concentrations are at the low end of background; and the second corresponding to a small outlying area, for which the site lead and zinc data are greater than background (based on three and four data points). Lead and zinc are carried forward in the screening process only because of the sample results in the small outlying area. The main DP Tank Farm site appears to be free of lead and zinc concentrations that are greater than background.

The data for silver consist of one detected value at 2.3 mg/kg and 31 values less than detection limits. Silver was not detected in LANL background studies, so background comparisons for silver are not applicable. Since there was one detect, silver is carried forward through the screening assessment process.

Radionuclides. 30 samples were analyzed for radionuclides using gamma spectroscopy. No radionuclides were detected at levels greater than background or instrument detection limits. Based on these results, no radionuclides are carried forward to the next step of the decision process.

5.2.2 Preliminary Evaluation of Organic Chemicals

Thirty-one soil and tuff samples were analyzed for organic chemicals. Twelve organic chemicals were detected, as shown in Table 5-2: benzene, butylbenzene, ethyl benzene, isopropylbenzene, isopropyltoluene[4-], methylnaphthalene[2-], naphthalene, propylbenzene, toluene, trimethylbenzene [1,2,4-], trimethylbenzene [1,3,5-], and xylenes (o + m + p) [Mixed-]. Acetone, bis[2-ethylhexyl]phthalate, and MEK were also detected, but are suspected laboratory contaminants (see Subsection 4.1). These three chemicals are, consequently, not carried forward through the decision process.

The 12 detected organic chemicals, which are all petroleum-related products, are carried forward through the screening assessment process. Organic chemicals that were not detected are eliminated from the decision process.

TABLE 5-2

DETECTED ORGANIC CHEMICALS AT DP TANK FARM, SWMU[a] 21-029[b]

ANALYTE	LOCATION ID	SAMPLE ID	SAMPLE VALUE (mg/kg)	SAL[c] (mg/kg)	DEPTH (ft)
Benzene	21-2558	AAB9724	8	1.4	7.5 –10
Butylbenzene [sec-]	21-2556	AAB9714	2.8	NA[d]	2.5 –5
Ethylbenzene	21-2556	AAB9714	2.9	690	2.5 –5
	21-2556	AAB9715	4.8		5 –7.5
	21-2556	AAB9716	6.3		7.5 – 10
	21-2558	AAB9723	55		5 – 7.5
	21-2558	AAB9724	110		7.5 – 10
	21-2559	AAB9727	90		5 – 7.5
	21-2559	AAB9728	99		7.5 – 10
Isopropylbenzene	21-2556	AAB9716	3.5	49	7.5 – 10
	21-2558	AAB9723	7.6		5 – 7.5
	21-2558	AAB9724	9.9		7.5 – 10
	21-2559	AAB9727	9.8		5 – 7.5
	21-2559	AAB9728	10		7.5 – 10
Isopropyltoluene [4-]	21-2556	AAB9714	16	NA	2.5 – 5
	21-2556	AAB9715	19		5 – 7.5
	21-2556	AAB9716	15		7.5 – 10
	21-2558	AAB9721	0.14		0 – 2.5
	21-2558	AAB9722	7.1		2.5 – 5
	21-2558	AAB9723	12		5 – 7.5
	21-2558	AAB9724	13		7.5 – 10
	21-2559	AAB9725	6.5		0 – 2.5
	21-2559	AAB9726	10		2.5 – 5
	21-2559	AAB9727	16		5 – 7.5
	21-2559	AAB9728	14		7.5 – 10
Methylnaphthalene [2-]	21-2556	AAB9714	110	NA	2.5 – 5
	21-2556	AAB9715	96		5 – 7.5
	21-2556	AAB9716	49		7.5 – 10
	21-2558	AAB9721	8		0 – 2.5
	21-2558	AAB9723	56		5 – 7.5
	21-2558	AAB9724	49		7.5 – 10
	21-2559	AAB9726	38		2.5 – 5

TABLE 5-2 (CONTINUED)

DETECTED ORGANIC CHEMICALS AT DP TANK FARM, SWMU[a] 21-029[b]

ANALYTE	LOCATION ID	SAMPLE ID	SAMPLE VALUE (mg/kg)	SAL[c] (mg/kg)	DEPTH (ft)
Methylnaphthalene [2-]	21-2559	AAB9727	79	NA	5 – 7.5
	21-2559	AAB9728	93		7.5 – 10
Naphthalene	21-2556	AAB9715	40	800	5 – 7.5
	21-2558	AAB9723	42		5 – 7.5
	21-2559	AAB9727	50		5 – 7.5
	21-2559	AAB9728	49		7.5 – 10
Propylbenzene	21-2556	AAB9715	3.4	NA	5 – 7.5
	21-2556	AAB9716	4		7.5 – 10
	21-2558	AAB9723	29		5 – 7.5
	21-2558	AAB9724	36		7.5 – 10
	21-2559	AAB9727	37		5 – 7.5
	21-2559	AAB9728	35		7.5 – 10
Toluene	21-2556	AAB9714	13	1 900	2.5 – 5
	21-2556	AAB9715	6.8		5 – 7.5
	21-2556	AAB9716	4.1		7.5 – 10
	21-2558	AAB9722	9.6		2.5 – 5
	21-2558	AAB9723	56		5 – 7.5
	21-2558	AAB9724	260		7.5 – 10
	21-2559	AAB9727	100		5 – 7.5
	21-2559	AAB9728	210		7.5 – 10
Trimethylbenzene [1,2,4-]	21-2556	AAB9713	19	8	0 – 2.5
	21-2556	AAB9714	110		2.5 – 5
	21-2556	AAB9715	100		5 – 7.5
	21-2556	AAB9716	50		7.5 – 10
	21-2558	AAB9721	0.051		0 – 2.5
	21-2558	AAB9722	120		2.5 – 5
	21-2558	AAB9723	270		5 – 7.5
	21-2558	AAB9724	260		7.5 – 10
	21-2559	AAB9725	160		0 – 2.5
	21-2559	AAB9726	210		2.5 – 5
	21-2559	AAB9727	270		5 – 7.5
	21-2559	AAB9728	250		7.5 – 10

TABLE 5-2 (CONTINUED)

DETECTED ORGANIC CHEMICALS AT DP TANK FARM, SWMU[a] 21-029[b]

ANALYTE	LOCATION ID	SAMPLE ID	SAMPLE VALUE (mg/kg)	SAL[c] (mg/kg)	DEPTH (ft)
Trimethylbenzene [1,3,5-]	21-2556	AAB9713	8.3	6.4	0 – 2.5
	21-2556	AAB9714	29		2.5 – 5
	21-2556	AAB9715	30		5 – 7.5
	21-2556	AAB9716	16		7.5 – 10
	21-2558	AAB9721	2.1		0 – 2.5
	21-2558	AAB9722	31		2.5 – 5
	21-2558	AAB9723	65		5 – 7.5
	21-2558	AAB9724	69		7.5 – 10
	21-2559	AAB9725	49		0 – 2.5
	21-2559	AAB9726	50		2.5 – 5
	21-2559	AAB9727	70		5 – 7.5
	21-2559	AAB9728	59		7.5 – 10
Xylenes (o + m + p) [Mixed-]	21-2553	AAB9702	0.009	990	2.5 – 5
	21-2556	AAB9713	15		0 – 2.5
	21-2556	AAB9714	66		2.5 – 5
	21-2556	AAB9715	71		5 – 7.5
	21-2556	AAB9716	45		7.5 – 10
	21-2558	AAB9721	0.029		0 – 2.5
	21-2558	AAB9722	160		2.5 – 5
	21-2558	AAB9723	420		5 – 7.5
	21-2558	AAB9724	630		7.5 – 10
	21-2559	AAB9725	144		0 – 2.5
	21-2559	AAB9726	221		2.5 – 5
	21-2559	AAB9727	470		5 – 7.5
	21-2559	AAB9728	530		7.5 – 10

[a] SWMU = Solid waste management unit.
[b] Reporting limits (RPLs) for organic constituents are provided in Appendix A, Table A-8. RPLs are known only for nondetected constituents, and they are shown in Table A-8 as "less than" values.
[c] SAL = Screening action level.
[d] NA = No applicable SAL is available.

5.2.3 Human Health Screening Action Level Comparisons

Lead, silver, zinc and petroleum-related products were carried forward from the background comparison and preliminary evaluation of organic chemicals.

Three constituents were detected at concentrations greater than or equal to their SALs: benzene, trimethylbenzene[1,2,4-], and trimethylbenzene[1,3,5-]. The data for these constituents are identified in Table 5-3, and the locations of the corresponding samples are shown in Fig. 5-3. These constituents are carried forward through the decision process.

TABLE 5-3

CHEMICALS WITH CONCENTRATIONS GREATER THAN SALs AT DP TANK FARM, SWMU[a] 21-029

ANALYTE	LOCATION ID	SAMPLE ID	SAMPLE VALUE (mg/kg)	SAL[b] (mg/kg)	DEPTH (ft)
Benzene	21-2558	AAB9724	8	0.67	7.5 – 10
Trimethylbenzene [1,2,4-]	21-2556	AAB9713	19	8	0 - 2.5
	21-2556	AAB9714	110		2.5 – 5
	21-2556	AAB9715	100		5 – 7.5
	21-2556	AAB9716	50		7.5 – 10
	21-2558	AAB9722	120		2.5 – 5
	21-2558	AAB9723	270		5 – 7.5
	21-2558	AAB9724	260		7.5 – 10
	21-2559	AAB9725	160		0 – 2.5
	21-2559	AAB9726	210		2.5 – 5
	21-2559	AAB9727	270		5 – 7.5
	21-2559	AAB9728	250		7.5 – 10
Trimethylbenzene [1,3,5-]	21-2556	AAB9713	8.3	6.4	0 – 2.5
	21-2556	AAB9714	29		2.5 – 5
	21-2556	AAB9715	30		5 – 7.5
	21-2556	AAB9716	16		7.5 – 10
	21-2558	AAB9722	31		2.5 – 5
	21-2558	AAB9723	65		5 – 7.5
	21-2558	AAB9724	69		7.5 – 10
	21-2559	AAB9725	49		0 – 2.5
	21-2559	AAB9726	50		2.5 – 5
	21-2559	AAB9727	70		5 – 7.5
	21-2559	AAB9728	59		7.5 – 10

[a] SWMU = Solid waste management unit.
[b] SAL = Screening action level.

In addition, four petroleum related products retained after the preliminary evaluation of organic chemicals do not have SALs for comparison: butylbenzene, 4-isopropyltoluene, 2-methylnaphthalene, and propylbenzene. Table 5-2 provided information about the detected values for these chemicals. Because these chemicals are petroleum-related products, they are retained in the decision process subsequent to this screening assessment.

Eight constituents carried forward from the background comparison and the preliminary evaluation of organic chemicals were detected at levels below their SALs: silver, lead, zinc, ethylbenzene, isopropyl benzene, napthalene, toluene, and xylenes. These constituents are evaluated in the multiple chemical evaluation, summarized in Table 5-4. The SALs used above for ethylbenzene, naphthalene, and xylenes, however, are based on the level of saturation for these chemicals; these numbers are not risk-based and do not reflect appropriately the additive effect of these constituents in association with other detected chemicals. In order to include ethylbenzene, naphthalene, and xylenes in the risk-based multiple chemical evaluation, the EPA Region 3 risk-based concentrations for these three chemicals are used.

TABLE 5-4

SUMMARY OF THE MULTIPLE CHEMICAL EVALUATION FOR DP TANK FARM, SWMU[a] 21-029

ANALYTE	SAMPLE ID	SAMPLE VALUE (mg/kg)	SOIL SAL[b] (mg/kg)	NORMALIZED VALUE
NONCARCINOGENIC EFFECTS				
Silver	AAB9714	2.3	380	0.006
Lead	AAB9818	160	400	0.40
Ethylbenzene	AAB9724	110	7 800[c]	0.014
Isopropyl benzene	AAB9724	10	49	0.2
Naphthalene	AAB9727	50	800[c]	0.06
Toluene	AAB9724	260	1 900	0.14
Xylenes	AAB9724	630	160 000[c]	0.0039
Zinc	AAB9818	77.6	23 000	0.003
				Total: 0.8269

[a] SWMU = Solid waste management unit.
[b] SAL = Screening action level.
[c] These values are from EPA Region III.

All of the chemicals included in the multiple chemical evaluation fall into the noncarcinogen category. The total normalized value is approximately 0.83; therefore, the chemicals evaluated in the multiple chemical evaluation are all eliminated as COPCs.

As a result of the human health screening assessment performed on the 1994 RFI Phase I data, seven petroleum-related products are retained as COPCs: benzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, butylbenzene, 4-isopropyltoluene, 2-methylnaphthalene, and propylbenzene.

5.2.4 Ecotoxicological Screening Action Level Comparisons

As described in Subsection 3.5, DP Tank Farm is a mesa top site surrounded by disturbed areas. The area provides limited habitat for biota, does not contain sensitive habitats, and threatened or endangered species are not present there (Ebinger et al. 1994, 01-0007). Therefore, there is no immediate ecological risk at this site. All information obtained from the Phase I investigation at DP Tank Farm will be considered as part of a larger ecological exposure unit once the ecological exposure unit approach has been formally approved.

5.2.5 Summary of the Results from the 1994 and 1995 Investigations

Based on the results of the screening assessment of the 1994 DP Tank Farm data, the only COPCs identified in site soil at DP Tank Farm are associated with petroleum products. Petroleum products were detected at the site at levels exceeding 100 ppm, constituting a reportable release to the NMED UST Bureau. Consequently, the 1995 investigation was performed in accordance with NMED UST Bureau regulations to define the extent of petroleum contamination and to determine the need for further action. The following discussion summarizes the results of the 1995 investigation, which are documented more fully in the "45-Day Report on Soil Contamination at the Former TA-21 UST Farm," included with this report as Attachment A.

The intent of the 1995 investigation was to delineate both the vertical and horizontal extent of petroleum contamination at the East and West Fill Stations, and to further investigate the source of contamination at the seep. Figure 5-2 shows these three areas of potential contamination, along with the locations of surface soil samples, water samples, and boreholes from the 1995 investigation. This summary focuses on the three areas separately. Because the 1995 investigation was performed to determine the extent of petroleum contamination, samples were analyzed for BTEX and TPH. Analyses were also performed for acetone and MEK in order to verify the apparent laboratory contamination associated with these chemicals in the 1994 investigation (see Subsection 4.1).

East Fill Station. A summary of the analytical results that exceeded UST regulatory thresholds at the East Fill Station is provided in Table 5-5; the complete data set is provided in Appendix A, Table A-15. Boreholes 21-3006, 21-3008, 21-3009, and 21-3011 exhibited comparatively high concentrations of BTEX and TPH in some samples. Figures 5-4 through 5-6 provide graphical summaries of the vertical extent of contamination at the East Fill Station, using the 1994 and 1995 results for TPH, BTEX, and benzene. The patterns of contamination for all three constituents are very similar. Comparatively high concentrations of these constituents are indicated in boreholes 21-3006, 21-3008, 21-3009, and 21-3011 starting near the surface and continuing to a depth of as much as 35 ft bgs. Figs. 5-7 through 5-9, which show the average concentrations by spatial location of the boreholes, indicate similar results. The large proportion of nondetects, together with the information portrayed in Figures 5-4 through 5-9, indicate that the release is contained within an area that is horizontally bounded by boreholes 21-3007, 21-3010, 21-3012, and 21-3013, and a volume bounded vertically by a depth of approximately 35 ft bgs.

TABLE 5-5

CONCENTRATIONS GREATER THAN NMED UST BUREAU[a] REGULATORY THRESHOLDS AT THE EAST FILL STATION

ANALYTE	LOCATION ID	SAMPLE ID	SAMPLE VALUE (mg/kg)	REGULATORY LIMIT (mg/kg)	DEPTH (ft)
Benzene	21-3006	0121-95-0042	18.388	10	9.3 – 9.8
	21-3008	0121-95-0059	18.645		13.8 – 14.2
	21-3008	0121-95-0060	12.757		18.5 – 19.1
BTEX[b]	21-3006	0121-95-0042	674.213	50	9.3 – 9.8
	21-3006	0121-95-0043	309.162		14 – 14.5
	21-3006	0121-95-0044	590.971		19 – 19.5
	21-3006	0121-95-0045	215.527		24 – 24.5
	21-3008	0121-95-0059	549.548		13.8 – 14.2
	21-3008	0121-95-0060	259.29		18.5 – 19.1
	21-3008	0121-95-0061	368.745		24 – 24.5
	21-3008	0121-95-0131	237.274		18.5 – 19.1
TPH[c]	21-3006	0121-95-0047	499	100	34 – 34.5
	21-3006	0121-95-0042	> 8 240		9.3 – 9.8
	21-3006	0121-95-0043	> 7 010		14 – 14.5
	21-3006	0121-95-0044	> 2 900		19 – 19.5
	21-3006	0121-95-0045	> 2 050		24 – 24.5
	21-3008	0121-95-0058	> 900		8.8 – 9.4
	21-3008	0121-95-0059	> 2 000		13.8 – 14.2
	21-3008	0121-95-0060	> 1 200		18.5 – 19.1
	21-3008	0121-95-0061	> 1 200		24 – 24.5
	21-3008	0121-95-0130	> 1 500		6.2 – 6.8
	21-3008	0121-95-0131	> 3 300		18.5 – 19.1
	21-3008	0121-95-0063	390		34 – 34.5
	21-3009	0121-95-0066	1 678		8.8 – 9.3
	21-3009	0121-95-0065	1 461		4.3 – 4.9
	21-3009	0121-95-0067	2 393		14.3 – 14.6
	21-3011	0121-95-0085	> 2 000		19 – 19.3
	21-3011	0121-95-0086	> 1 500		23.6 – 24.4

[a] NMED UST Bureau = New Mexico Environment Department Underground Storage Tank Bureau.
[b] BTEX = The sum of concentrations of benzene, toluene, ethylbenzene, and total xylenes.
[c] TPH = Total petroleum hydrocarbons.

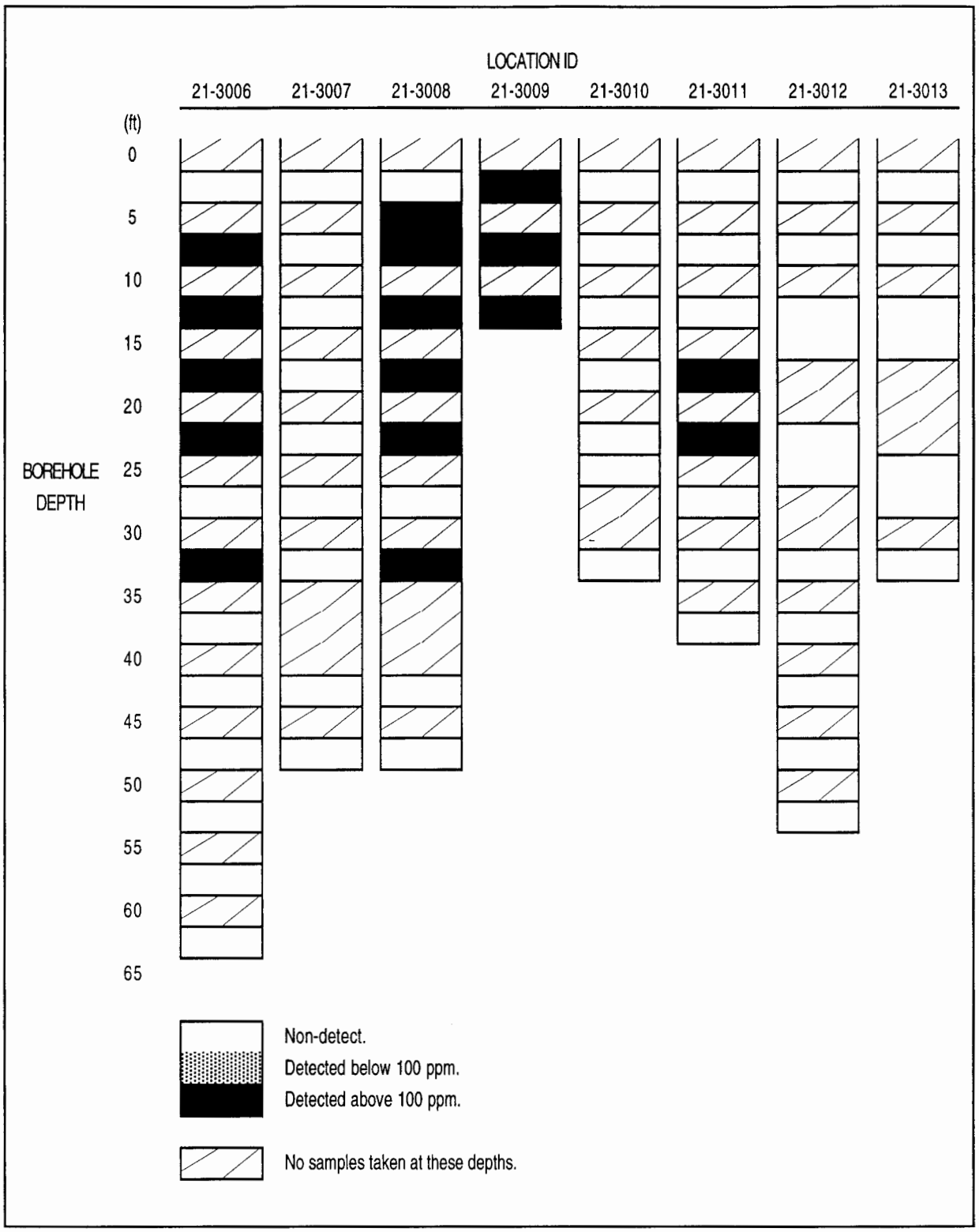

Fig. 5-4. DP Tank Farm East Fill Station TPH data by boreholes.

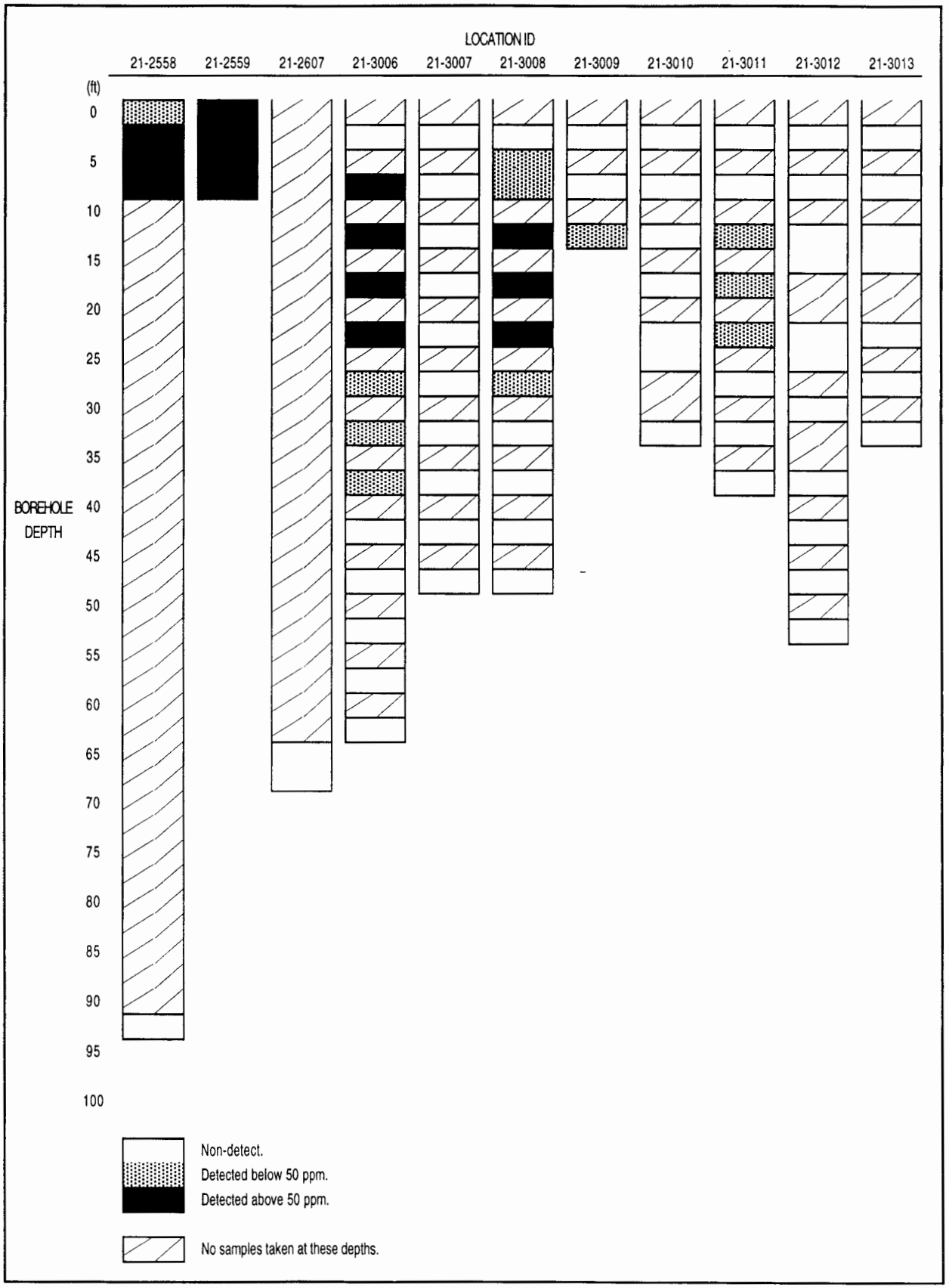

Fig. 5-5. DP Tank Farm East Fill Station BTEX data by boreholes.

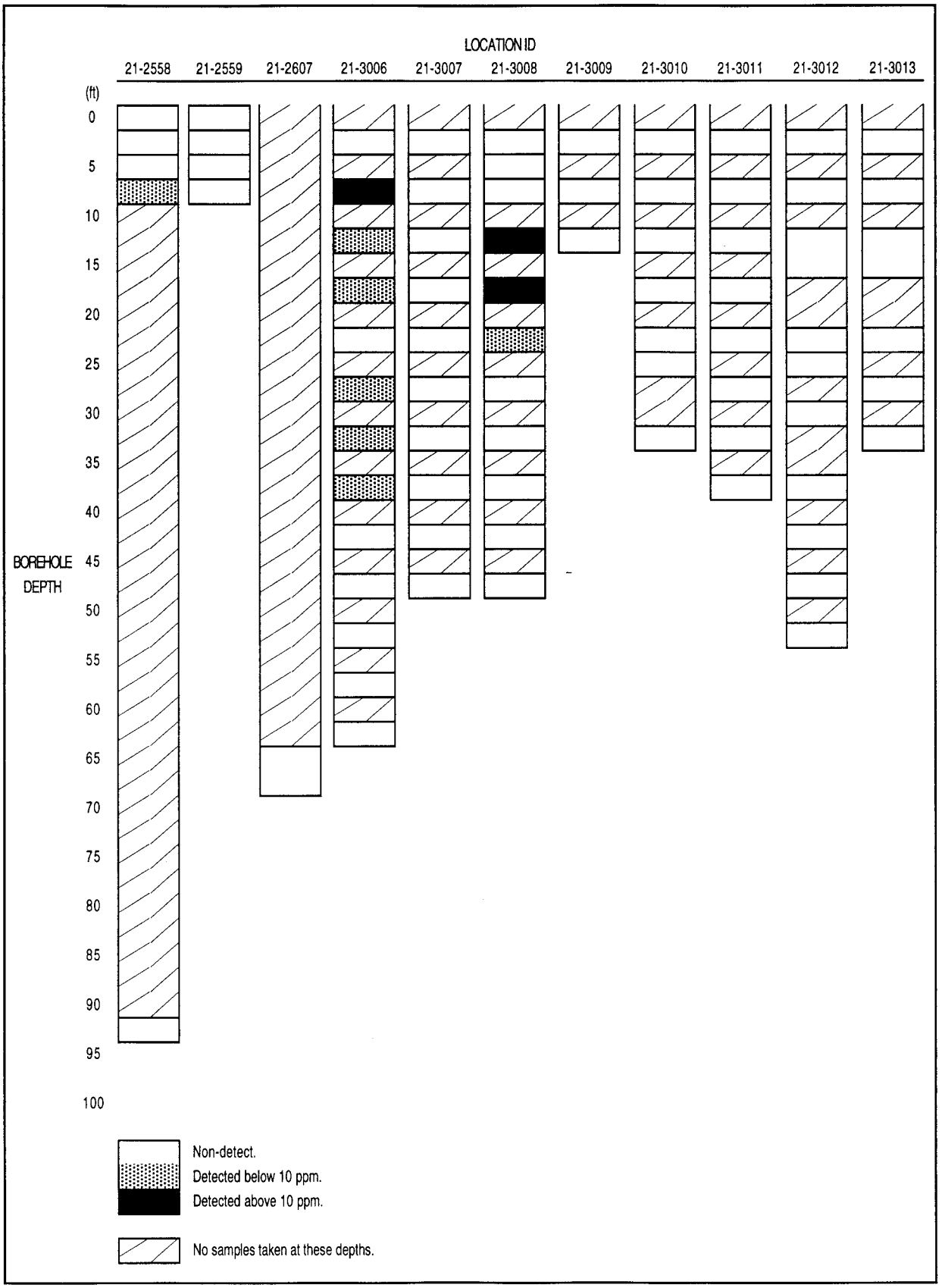

Fig. 5-6. DP Tank Farm East Fill Station benzene data by boreholes.

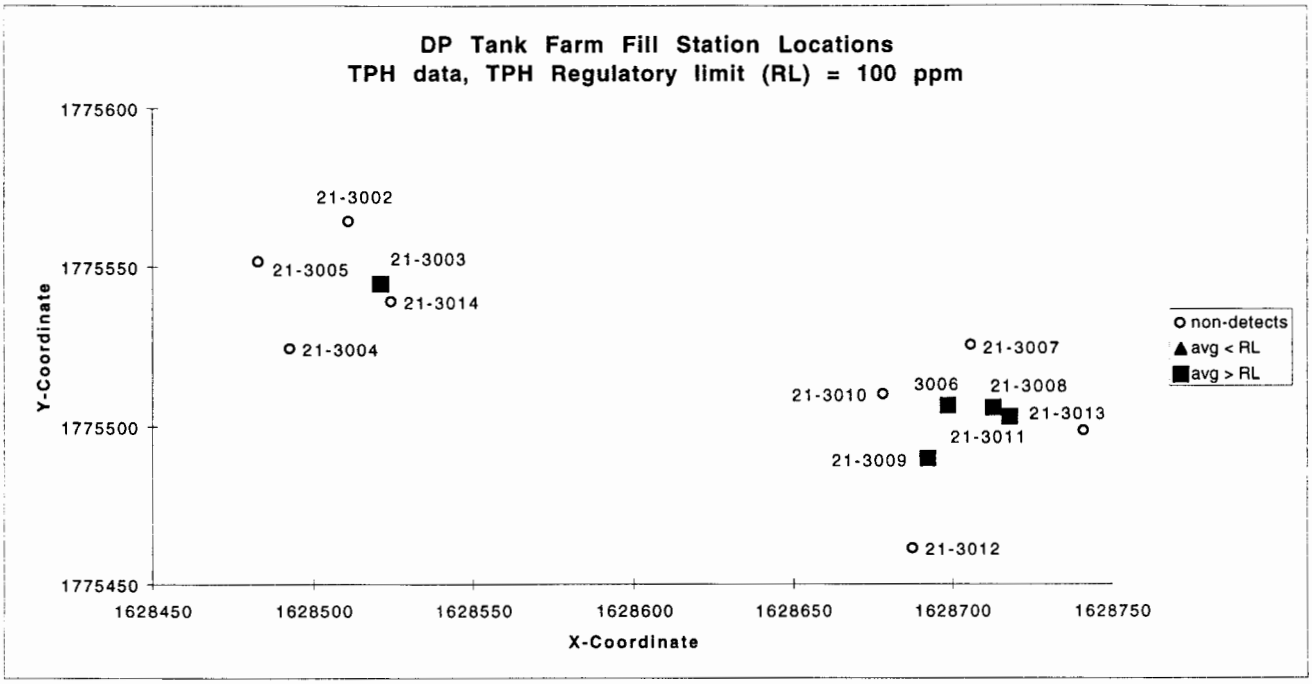

Fig. 5-7. DP Tank Farm TPH data summary.

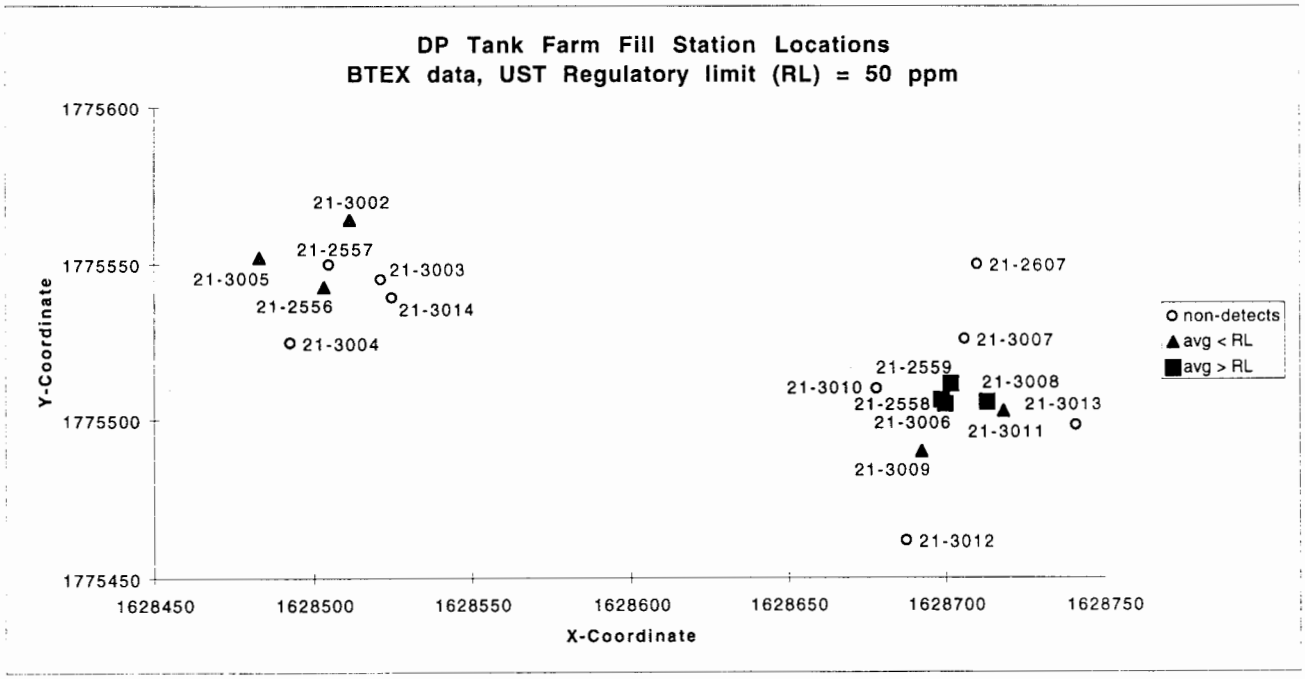

Fig. 5-8. DP Tank Farm BTEX data summary.

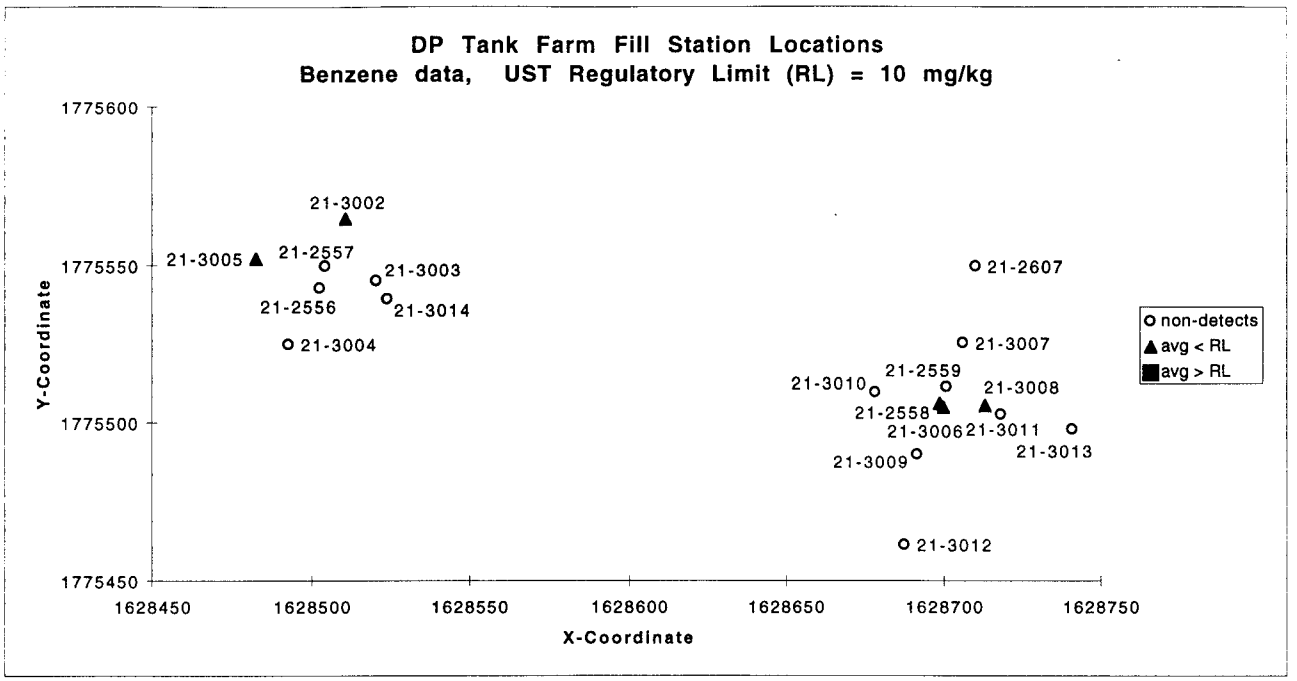

Fig. 5-9. DP Tank Farm benzene data summary.

West Fill Station. A summary of the analytical results that exceeded UST regulatory thresholds at the West Fill Station is provided in Table 5-6; the complete data set is provided in Appendix A, Table A-14. Borehole 21-3003 exhibited comparatively high levels of TPH in samples collected at depths of 13.5 ft to 19.2 ft. The 1995 sampling effort was centered on borehole 21-2556, which was part of the 1994 investigation. This borehole was anticipated to represent the center of the contaminated area. Several samples from borehole 21-2556 exhibited levels of BTEX that are greater than 50 mg/kg. Figures 5-10 through 5-12 provide graphical summaries of the vertical extent of contamination at the West Fill Station, using the 1994 and 1995 data for TPH, BTEX, and benzene. Figures 5-7 through 5-9, which portray average concentrations by spatial location of the boreholes, indicate similar results. The large proportion of nondetects, together with the information portrayed in Figures 5-7 through 5-12, indicate that the release is contained within an area that is horizontally bounded by boreholes 21-3002, 21-3004, 21-3005, and 21-3014, and a volume bounded vertically by a depth of approximately 20 ft bgs.

TABLE 5-6

CONCENTRATIONS GREATER THAN NMED UST BUREAU[a] REGULATORY THRESHOLDS AT THE WEST FILL STATION

ANALYTE	LOCATION ID	SAMPLE ID	SAMPLE VALUE	REGULATORY LIMIT	DEPTH (ft)
TPH[b]	21-3003	0121-95-0017	> 600	100	13.5 – 14.3
	21-3003	0121-95-0018	> 670		18.5 – 19.2

[a] NMED UST Bureau = New Mexico Environment Department Underground Storage Tank Bureau.
[b] TPH = Total petroleum hydrocarbons.

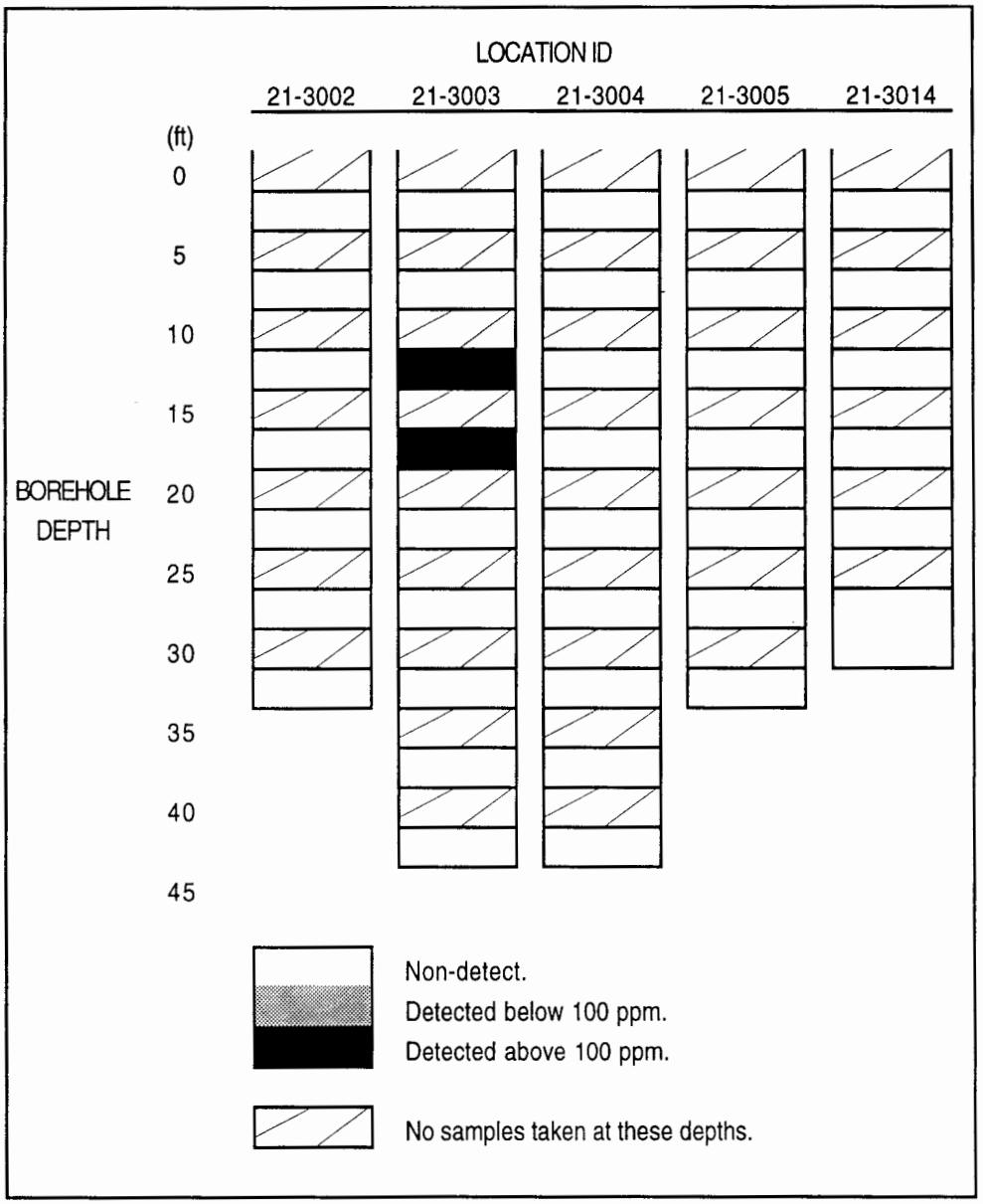

Fig. 5-10. DP Tank Farm West Fill Station TPH data by boreholes.

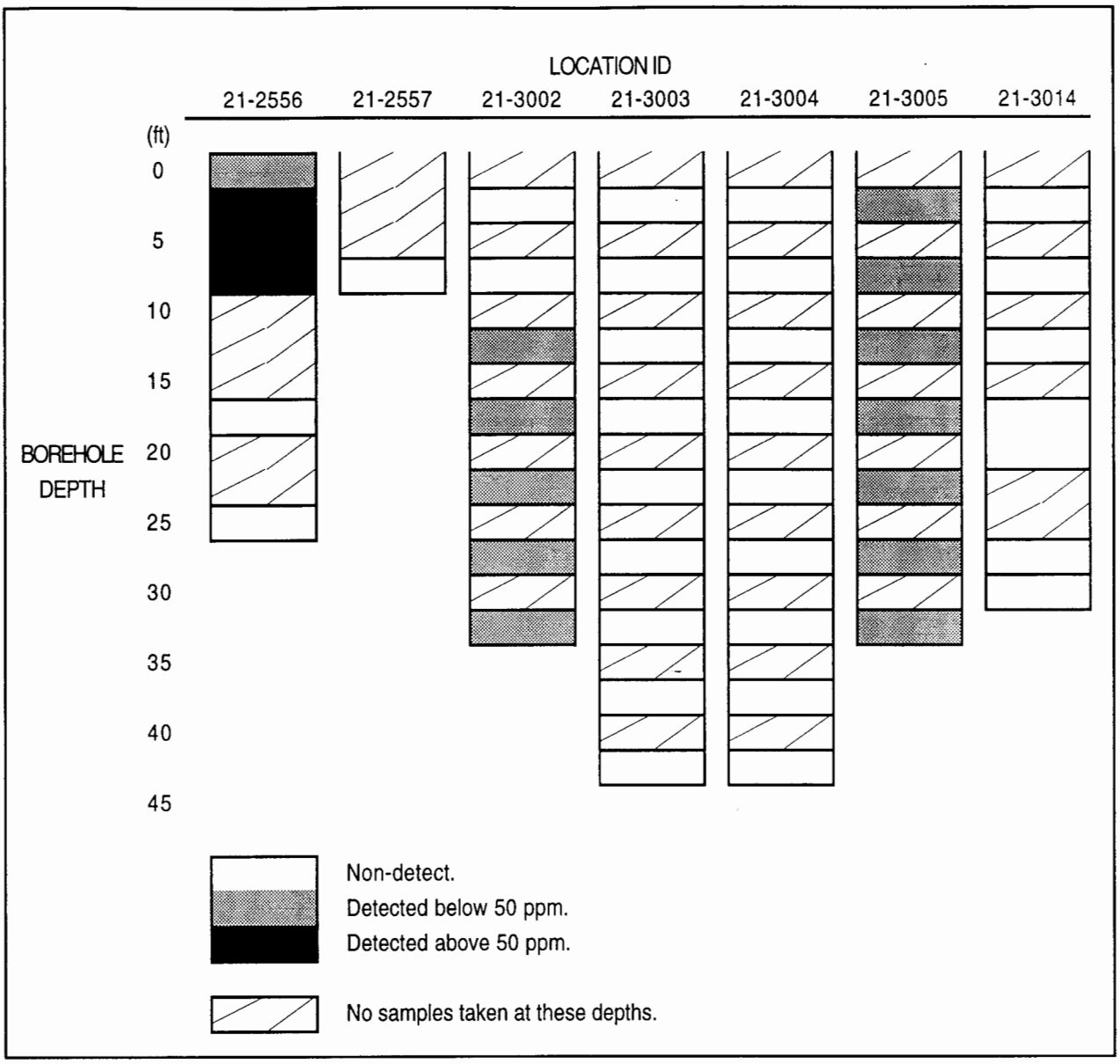

Fig. 5-11. DP Tank Farm West Fill Station BTEX data by boreholes.

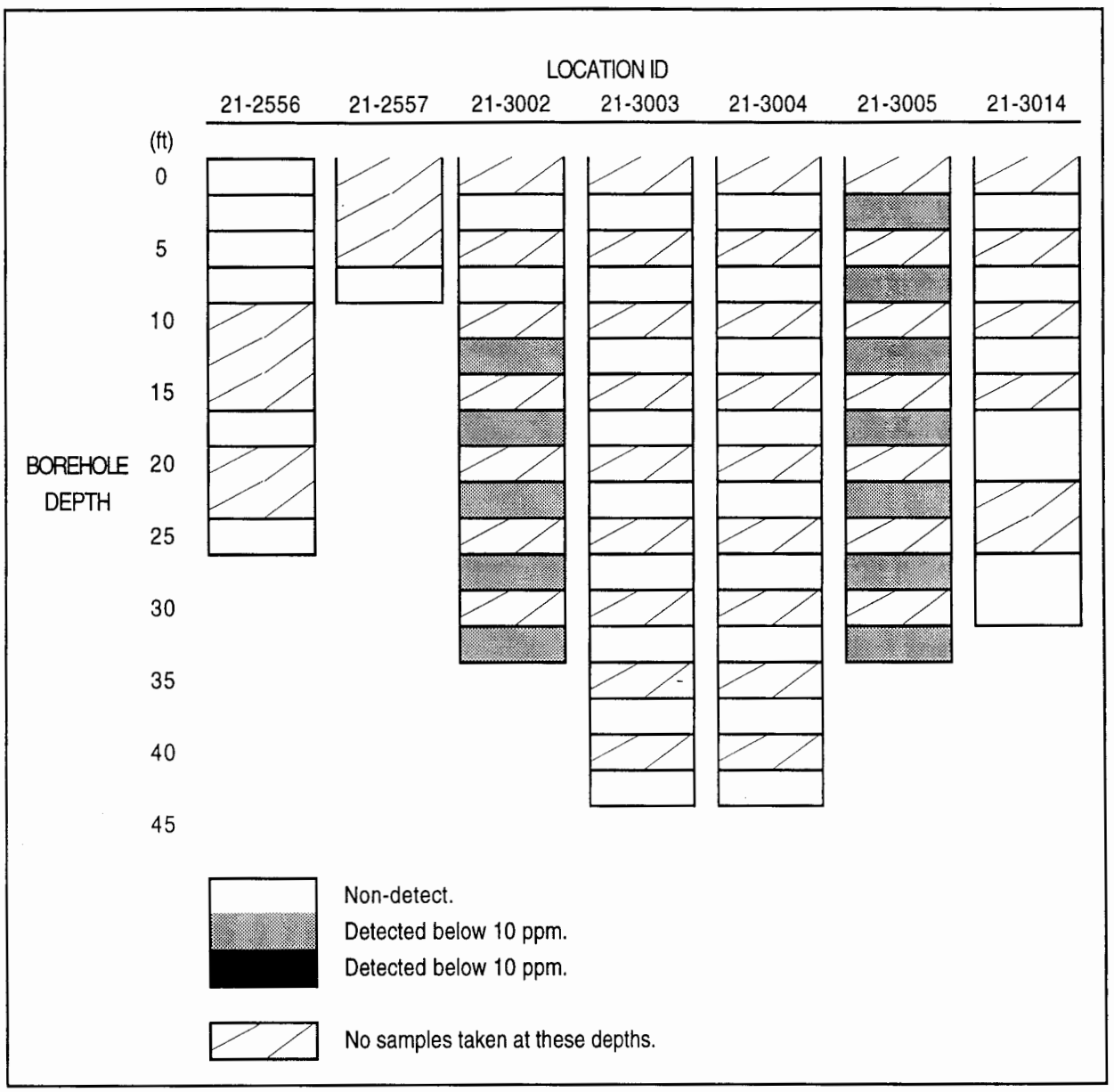

Fig. 5-12. DP Tank Farm West Fill Station benzene data by boreholes.

Stream Channel. The apparent seep in the stream channel north of DP Tank Farm was investigated in 1995 to assess whether the apparent contamination from petroleum products present in the channel is associated with the petroleum products contamination at the former West Fill Station location. The stream investigation indicated that TPH was present in the two boreholes drilled and sampled on the north bank of the stream channel, but not in the borehole drilled and sampled on the south bank of the stream channel. This suggests that the source of the petroleum is not related to DP Tank Farm.

Petroleum related products were not detected in water samples collected from the area of the apparent seep, nor at the upstream and downstream sampling locations. However, the MCAL detection limits during the analyses of these samples were rather high. The TPH peaks in the chromatograms were studied qualitatively. From these qualitative assessments, TPH levels were estimated at less than 1 ppm with a great deal of uncertainty. From these results, it was determined that there is currently no adverse impact to the surface water quality related to contaminants at DP Tank Farm. Nonetheless, LANL will continue to comply with NMED Water Quality Bureau requirements, if any, regarding the area of the seep. The data for the stream channel investigation are presented in Appendix A, Tables A-16 and A-17. The attached "45-Day Report on Soil Contamination at the Former TA-21 UST Farm," which is included with this report as Attachment A, provides further details.

5.3 Conclusions and Recommendations

The screening assessment performed as part of the 1994 investigation indicates that benzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene are present at the site at concentrations that exceed SALs. Butylbenzene, 4-isopropyltoluene, 2-methylnaphthalene, and propylbenzene, which do not have SALs for comparison, were also detected in site soil. Other constituents of petroleum products were also detected in site soil, but at concentrations below their respective SALs. Because all of the constituents detected are known to be present in the petroleum products that were stored at the site, product leakage and spills are the probable source of these contaminants.

Because the only constituents identified at DP Tank Farm during the 1994 investigation were petroleum products, the 1995 investigation proceeded under NMED UST Bureau regulations. The 1995 investigation was performed to define the extent of the petroleum contamination and to determine the necessity of site remediation. All current correspondence between LANL and NMED is included with this report as Attachment B. The letter indicating the NMED UST Bureau's recommendation for the site will be forwarded to the EPA upon receipt.

Based on the results of the Phase I RFI, DP Tank Farm, PRS 21-029, is recommended for no further action under the Hazardous and Solid Waste Amendments (HSWA) Module of LANL's RCRA operating permit. Based on LANL's No Further Action Criteria Policy, criterion 3, which states that the site is regulated or closed under a different authority that addresses corrective action (in this case the NMED UST Bureau), a Class III permit modification will be requested to remove this PRS from the HSWA Module of LANL's RCRA operating permit (Environmental Restoration Project 1995, 1173).

6.0 REFERENCES

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APPENDIX A ANALYTICAL RESULTS

This appendix contains the analytical results from samples collected during the 1994 and 1995 Phase I Resource Conservation and Recovery Act Facility Investigation of Solid Waste Management Unit 21-029, DP Tank Farm. The results from the 1994 investigation are summarized in nine tables:

(A-1) A summary table listing all of the samples collected during the 1994 Phase I investigation. This table presents the sampling location, depth, and analyses performed for each sample.

(A-2) A summary table describing the boreholes that were drilled and any unusual events that occurred during the field work associated with each borehole.

(A-3) A table summarizing issues that arose during the quality assurance/quality control activities.

(A-4) A table presenting the field screening results for volatile organic compound (VOC) and combustible gas monitoring.

(A-5) A table presenting the field screening results for radiation.

(A-6) A table presenting the specific results for inorganic analytes detected in the samples.

(A-7) A table presenting the specific results for radionuclides detected in the samples.

(A-8) A table presenting the specific results for organic analytes detected in the samples.

(A-9) A summary table listing all of the nondetected analytes for which analyses were performed. This table shows the total number of analyses performed and the minimum and maximum limits of detection reported by the laboratory. (The limit of detection may vary due to differences between laboratories, analysts, or sample matrix interference.)

The results from the 1995 investigations are summarized in eight tables:

(A-10) A summary table describing the boreholes that were drilled and any unusual events that occurred during the field work associated with each borehole.

(A-11) A table summarizing issues that arose during the quality assurance/quality control activities.

(A-12) A table presenting the field screening results for VOC and combustible gas monitoring.

(A-13) A table presenting the field screening results for radiation.

(A-14) A table summarizing the analytical results for the West Fill Station.

(A-15) A table summarizing the analytical results for the East Fill Station.

(A-16) A table summarizing the analytical results for the stream channel water samples.

(A-17) A table summarizing the analytical results for the stream channel soil samples.

TABLE A-1

SUMMARY OF 1994 SAMPLES COLLECTED FOR FIXED LAB ANALYSIS AT DP TANK FARM, SWMU[a] 21-029

LOCATION	LOCATION ID	SAMPLE ID	SAMPLE TYPE	DEPTH (ft)	ANALYSES PERFORMED							
					TCLP METALS[b]	TAL METALS[c]	GAMMA SPECTROSCOPY	SVOCs[d]	VOCs[e]	ETHANOL	TRITIUM	WATER
Tank TA-21-AFT-13	21-2553	AAB9702	Soil	2.5 - 5	X	X	X	X	X	X		
Tank TA-21-AFT-13	21-2553	AAB9704	Soil	7.5 - 10	X	X	X	X	X	X		
Tank TA-21-AFT-6	21-2554	AAB9706	Soil	2.5 - 5	X	X	X	X	X	X		
Tank TA-21-AFT-6	21-2554	AAB9708	Soil	7.5 - 10	X	X	X	X	X	X		
Tank TA-21-AFT-10	21-2555	AAB9710	Soil	2.5 - 5	X	X	X	X	X	X		
Tank TA-21-AFT-10	21-2555	AAB9712	Soil	7.5 - 10	X	X	X	X	X	X		
West Fill Station	21-2556	AAB9713	Soil	0 - 2.5		X	X	X	X	X		
West Fill Station	21-2556	AAB9714	Soil	2.5 - 5		X	X	X	X	X		
West Fill Station	21-2556	AAB9715	Soil	5 - 7.5		X	X	X	X	X		
West Fill Station	21-2556	AAB9716	Soil	7.5 -10		X	X	X	X	X		
West Fill Station	21-2556	AAB9749	Soil	17.5 - 20	X	X	X	X	X		X	X
West Fill Station	21-2556	AAB9884	Soil	25 - 27.5	X	X	X	X	X		X	X
West Fill Station	21-2557	AAB9720	Soil	7.5 - 10	X	X	X	X	X	X		
East Fill Station	21-2558	AAB9721	Soil	0 - 2.5		X	X	X	X	X		
East Fill Station	21-2558	AAB9722	Soil	2.5 - 5		X	X	X	X	X		
East Fill Station	21-2558	AAB9723	Soil	5 - 7.5		X	X	X	X	X		
East Fill Station	21-2558	AAB9724	Soil	7.5 - 10		X	X	X	X	X		
East Fill Station	21-2558	AAB9886	Soil	92.5 - 94		X	X	X	X		X	X
East Fill Station	21-2559	AAB9725	Soil	0 - 2.5		X	X	X	X	X		
East Fill Station	21-2559	AAB9726	Soil	2.5 - 5		X	X	X	X	X	X	X
East Fill Station	21-2559	AAB9727	Soil	5 - 7.5		X	X	X	X	X	X	X
East Fill Station	21-2559	AAB9728	Soil	7.5 - 10		X	X	X	X	X	X	X

TABLE A-1 (CONTINUED)

SUMMARY OF 1994 SAMPLES COLLECTED FOR FIXED LAB ANALYSIS AT DP TANK FARM, SWMU[a] 21-029

LOCATION	LOCATION ID	SAMPLE ID	SAMPLE TYPE	DEPTH (ft)	ANALYSES PERFORMED							
					TCLP METALS[b]	TAL METALS[c]	GAMMA SPECTROSCOPY	SVOCs[d]	VOCs[e]	ETHANOL	TRITIUM	WATER
Tank TA-21-AFT-10	21-2560	AAB9732	Soil	7.5 - 10	X	X	X	X	X	X	X	X
Tank TA-21-AFT-10	21-2560	AAB9742	Field Duplicate	7.5 - 10	X	X	X	X	X	X	X	X
Tank TA-21-AFT-10	21-2560	AAB9743	Equipment Blank	7.5 - 10		X	X	X	X	X		
Tank TA-21-AFT-10	21-2560	AAB9746	Field Reagent	NA[f]		X		X	X	X		
Tank TA-21-AFT-6	21-2561	AAB9736	Soil	7.5 - 10	X	X	X	X	X	X	X	X
Tank TA-21-AFT-6	21-2562	AAB9738	Soil	2.5 - 5	X	X	X	X	X	X	X	X
Tank TA-21-AFT-6	21-2562	AAB9741	Field Duplicate	2.5 - 5	X	X	X	X	X	X	X	X
Tank TA-21-AFT-6	21-2562	AAB9744	Equipment Blank	2.5 - 5		X	X	X	X	X	X	X
Tank TA-21-AFT-6	21-2562	AAB9745	Field Reagent	NA		X		X	X	X		
East Fill Station	21-2607	AAB9885	Soil	65 - 70	X	X	X	X	X		X	X
Stream Channel	21-2614	AAB9818	Soil	0 - 0.5	X	X	X	X	X	X	X	X
Stream Channel	21-2615	AAB9819	Soil	0 - 0.5	X	X	X	X	X	X	X	X
Stream Channel	21-2615	AAB9820	Field Duplicate	0 - 0.5	X	X	X	X	X	X	X	X
Stream Channel	21-2615	AAB9821	Equipment Blank	NA		X	X	X	X		X	X
Stream Channel	21-2615	AAB9822	Field Reagent	NA		X		X	X			
Stream Channel	NA	AAB9892	Equipment Blank	NA					X			

[a] SWMU = Solid waste management unit.
[b] TCLP metals = Toxicity characteristic leaching procedures metals.
[c] TAL metals = Target analyte list metals.
[d] SVOCs = Semivolatile organic compounds.
[e] VOCs = Volatile organic compounds.
[f] NA = Not applicable.

TABLE A-2

BOREHOLE SUMMARY FOR THE 1994 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

LOCATION ID	BOREHOLE DIAMETER (in.)	TOTAL DEPTH (ft bgs[b])	ASSOCIATED STRUCTURE	SAMPLED INTERVALS (ft bgs)	COMMENTS
21-2553	8.25	10	TA-21-ATF-13	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10	No unusual events.
21-2554	8.25	10	TA-21-ATF-6	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10	No unusual events.
21-2555	8.25	10	TA-21-ATF-10	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10	No unusual events.
21-2556	8.25	27.5	West fill station	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10 17.5 - 18.5 25 - 27.5	Strong petroleum odors. Core reportedly saturated with petroleum products. Oily sheen on core to 18.5 ft bgs. Fractures noted at 17.5 and 19.0 ft bgs.
21-2557	8.25	10	West fill station	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10	No unusual events.
21-2558	8.25	94	East fill station	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10 70 - 75 92.5 - 94	Strong petroleum odors in upper 10 ft of borehole, but noticeable to 60 ft bgs. Above background organic vapor meter readings noted throughout borehole. The borehole was advanced based on headspace analysis results.
21-2559	8.25	10	East fill station	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10	Above background organic vapor meter readings noted throughout borehole.
21-2560	8.25	10	TA-21-ATF-10	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10	No unusual events.
21-2561	8.25	10	TA-21-ATF-6	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10	No unusual events. Numerous fractures from 8.5 to 10.0 ft bgs.
21-2562	8.25	10	TA-21-ATF-13	0 - 2.5 2.5 - 5 5 - 7.5 7.5 - 10	No unusual events. Small clay-filled fractures at 7 to 8 ft bgs.
21-2607	8.25	70	East fill station	65 - 70	Low ppm organic vapor meter detections from 12.5 to 17.5 ft bgs. Clay-filled fractures noted at 12, 18.5, and 21 ft bgs.

[a] SWMU = Solid waste management unit.
[b] bgs = Below ground surface.

TABLE A-3

SUMMARY TABLE OF QUALITY CONTROL ISSUES FOR 1994 FIXED LABORATORY DATA FROM DP TANK FARM, SWMU[a] 21-029

LOCATION ID	SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	REQUEST NUMBER	QUALITY CONTROL COMMENTS
21-2553	AAB9702	Soil	SVOCs[b]	19129	14 analytes had recoveries of 10% to 25% in soil QC[c] sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."[d]
21-2553	AAB9702	Soil	VOCs[e]	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2553	AAB9702	Soil	TAL Metals[f]	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2553	AAB9704	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2553	AAB9704	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2553	AAB9704	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2554	AAB9706	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2554	AAB9706	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2554	AAB9706	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2554	AAB9708	Soil	SVOCs	19129	Four low surrogate recoveries (10 to 25%). Data qualified "UJ." Also,14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. Data already qualified.
21-2554	AAB9708	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2554	AAB9708	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2555	AAB9710	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."

TABLE A-3 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL ISSUES FOR 1994 FIXED LABORATORY DATA FROM DP TANK FARM, SWMU[a] 21-029

LOCATION ID	SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	REQUEST NUMBER	QUALITY CONTROL COMMENTS
21-2555	AAB9710	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2555	AAB9710	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soil sample.
21-2555	AAB9712	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2555	AAB9712	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2555	AAB9712	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2556	AAB9713	Soil	SVOCs	19018	Analytical holding time exceeded by one day. Many TICs[g] (associated with TPH[h] and diesel) found in samples, so samples were diluted and EQLs[i] were elevated. All data qualified "J" or "UJ."
21-2556	AAB9713	Soil	VOC	19018	Detected 2-butanone possibly due to lab contamination. All 2-butanone data qualified "J."
21-2556	AAB9714	Soil	SVOCs	19018	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2556	AAB9714	Soil	VOC	19018	Detected 2-butanone and acetone possibly due to lab contamination. All 2-butanone and acetone data qualified "J."
21-2556	AAB9715	Soil	SVOCs	19018	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2556	AAB9715	Soil	VOC	19018	Detected 2-butanone possibly due to lab contamination. All 2-butanone data qualified "J."
21-2556	AAB9716	Soil	SVOCs	19018	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2556	AAB9749	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2556	AAB9749	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.

TABLE A-3 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL ISSUES FOR 1994 FIXED LABORATORY DATA FROM DP TANK FARM, SWMU[a] 21-029

LOCATION ID	SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	REQUEST NUMBER	QUALITY CONTROL COMMENTS
21-2556	AAB9884	Soil	SVOCs	19129	Four low surrogate recoveries (10 to 25%). Data qualified "UJ." Also,14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. Data already qualified.
21-2556	AAB9884	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2557	AAB9720	Soil	SVOCs	19129	Low surrogate recoveries (10 to 25%) for two acid surrogates. All acid fraction analytes qualified "UJ." Also,14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2557	AAB9720	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2557	AAB9720	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2558	AAB9721	Soil	SVOCs	19017	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2558	AAB9721	Soil	VOCs	19017	Low recovery (69%) for one surrogate. All analytes except 1,3,5-trimethylbenzene, which was re-analyzed later, are qualified "J" or "UJ." EQLs higher than normal because of high TIC concentrations (associated with TPH and diesel).
21-2558	AAB9721	Soil	TAL Metals	19078	Samples exceeded analytical holding time for mercury (applicable to water) by six days. Data are not qualified; all data are valid.
21-2558	AAB9721	Soil	Gamma spectroscopy	19090	High cesium-137 recoveries (121%) in QC sample. All other QC within allowed limits. QC sample may be biased low, so data are not qualified. All data are valid.
21-2558	AAB9722	Soil	SVOCs	19017	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2558	AAB9722	Soil	VOCs	19017	EQLs higher than normal because of high TIC concentrations (associated with TPH and diesel).
21-2558	AAB9722	Soil	TAL Metals	19078	Samples exceeded analytical holding time for mercury (applicable to water) by six days. Data are not qualified; all data are valid.
21-2558	AAB9722	Soil	Gamma spectroscopy	19090	High cesium-137 recoveries (121%) in QC sample. All other QC within allowed limits. QC sample may be biased low, so data are not qualified. All data are valid.

TABLE A-3 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL ISSUES FOR 1994 FIXED LABORATORY DATA FROM DP TANK FARM, SWMU[a] 21-029

LOCATION ID	SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	REQUEST NUMBER	QUALITY CONTROL COMMENTS
21-2558	AAB9723	Soil	SVOCs	19017	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2558	AAB9723	Soil	VOCs	19017	EQLs higher than normal because of high TIC concentrations (associated with TPH and diesel).
21-2558	AAB9723	Soil	TAL Metals	19078	Samples exceeded analytical holding time for mercury (applicable to water) by six days. Data are not qualified; all data are valid.
21-2558	AAB9723	Soil	Gamma spectroscopy	19090	High cesium-137 recoveries (121%) in QC sample. All other QC within allowed limits. QC sample may be biased low, so data are not qualified. All data are valid.
21-2558	AAB9724	Soil	SVOCs	19017	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2558	AAB9724	Soil	VOCs	19017	EQLs higher than normal because of high TIC concentrations (associated with TPH and diesel).
21-2558	AAB9724	Soil	TAL Metals	19078	Samples exceeded analytical holding time for mercury (applicable to water) by six days. Data are not qualified; all data are valid.
21-2558	AAB9724	Soil	Gamma spectroscopy	19090	High cesium-137 recoveries (121%) in QC sample. All other QC within allowed limits. QC sample may be biased low, so data are not qualified. All data are valid.
21-2558	AAB9886	Soil	SVOCs	19017	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2558	AAB9886	Soil	VOCs	19017	EQLs higher than normal because of high TIC concentrations (associated with TPH and diesel).
21-2558	AAB9886	Soil	TAL Metals	19078	Samples exceeded analytical holding time for mercury (applicable to water) by six days. Data are not qualified; all data are valid.
21-2559	AAB9725	Soil	SVOCs	19017	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2559	AAB9725	Soil	VOCs	19017	EQLs higher than normal because of high TIC concentrations (associated with TPH and diesel).
21-2559	AAB9725	Soil	TAL Metals	19078	Samples exceeded analytical holding time for mercury (applicable to water) by six days. Data are not qualified; all data are valid.
21-2559	AAB9725	Soil	Gamma spectroscopy	19090	High cesium-137 recoveries (121%) in QC sample. All other QC within allowed limits. QC sample may be biased low, so data are not qualified. All data are valid.
21-2559	AAB9726	Soil	SVOCs	19017	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."

TABLE A-3 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL ISSUES FOR 1994 FIXED LABORATORY DATA FROM DP TANK FARM, SWMU[a] 21-029

LOCATION ID	SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	REQUEST NUMBER	QUALITY CONTROL COMMENTS
21-2559	AAB9726	Soil	VOCs	19017	EQLs higher than normal because of high TIC concentrations (associated with TPH and diesel).
21-2559	AAB9726	Soil	TAL Metals	19078	Samples exceeded analytical holding time for mercury (applicable to water) by six days. Data are not qualified; all data are valid.
21-2559	AAB9726	Soil	Gamma spectroscopy	19090	High cesium-137 recoveries (121%) in QC sample. All other QC within allowed limits. QC sample may be biased low, so data are not qualified. All data are valid.
21-2559	AAB9727	Soil	SVOCs	19017	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2559	AAB9727	Soil	VOCs	19017	EQLs higher than normal because of high TIC concentrations (associated with TPH and diesel).
21-2559	AAB9727	Soil	TAL Metals	19078	Samples exceeded analytical holding time for mercury (applicable to water) by six days. Data are not qualified; all data are valid.
21-2559	AAB9727	Soil	Gamma spectroscopy	19090	High cesium-137 recoveries (121%) in QC sample. All other QC within allowed limits. QC sample may be biased low, so data are not qualified. All data are valid.
21-2559	AAB9728	Soil	SVOCs	19017	Analytical holding time exceeded by one day. Many TICs (associated with TPH and diesel) found in samples, so samples were diluted and EQLs were elevated. All data qualified "J" or "UJ."
21-2559	AAB9728	Soil	VOCs	19017	EQLs higher than normal because of high TIC concentrations (associated with TPH and diesel).
21-2559	AAB9728	Soil	TAL Metals	19078	Samples exceeded analytical holding time for mercury (applicable to water) by six days. Data are not qualified; all data are valid.
21-2559	AAB9728	Soil	Gamma spectroscopy	19090	High cesium-137 recoveries (121%) in QC sample. All other QC within allowed limits. QC sample may be biased low, so data are not qualified. All data are valid.
21-2560	AAB9732	Soil	SVOCs	19129	Low surrogate recoveries (10 to 25%) for two acid surrogates. All acid fraction analytes qualified "UJ." Also,14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2560	AAB9732	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2560	AAB9732	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.

TABLE A-3 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL ISSUES FOR 1994 FIXED LABORATORY DATA FROM DP TANK FARM, SWMU[a] 21-029

LOCATION ID	SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	REQUEST NUMBER	QUALITY CONTROL COMMENTS
21-2560	AAB9742	Soil	SVOCs	19129	Four low surrogate recoveries (10 to 25%). Data qualified "UJ." Also,14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. Data already qualified.
21-2560	AAB9742	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2560	AAB9742	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2560	AAB9743	Water	SVOCs	19129	2-Methylphenol, 4-methylphenol, and 2,4,6-trichlorophenol had recoveries between 10 and 50% in water QC sample. These analytes qualified "UJ." Bis(2-ethylhexyl)phthalate detected in this sample at 11 µg/L, which is less than five times the amount found in the water blank. EQL raised to 11 µg/L for this sample.
21-2560	AAB9743	Water	TAL Metals	20061	Analytical holding time for water exceeded by 56 days. All data qualified "R," rejected.
21-2560	AAB9746	Water	SVOCs	19129	2-Methylphenol, 4-methylphenol, and 2,4,6-trichlorophenol had recoveries between 10 and 50% in water QC sample. These analytes qualified "UJ."
21-2560	AAB9746	Water	TAL Metals	20061	Analytical holding time for water exceeded by 56 days. All data qualified "R."[j]
21-2561	AAB9736	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2561	AAB9736	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2561	AAB9736	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2562	AAB9738	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2562	AAB9738	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2562	AAB9738	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.

TABLE A-3 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL ISSUES FOR 1994 FIXED LABORATORY DATA FROM DP TANK FARM, SWMU[a] 21-029

LOCATION ID	SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	REQUEST NUMBER	QUALITY CONTROL COMMENTS
21-2562	AAB9741	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2562	AAB9741	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2562	AAB9741	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2562	AAB9744	Water	SVOCs	19129	2-Methylphenol, 4-methylphenol, and 2,4,6-trichlorophenol had recoveries between 10 and 50% in water QC sample. These analytes qualified "UJ."
21-2562	AAB9744	Water	TAL Metals	20061	Analytical holding time for water exceeded by 56 days. All data qualified "R."
21-2562	AAB9745	Water	SVOCs	19129	2-Methylphenol, 4-methylphenol, and 2,4,6-trichlorophenol had recoveries between 10 and 50% in water QC sample. These analytes qualified "UJ."
21-2562	AAB9745	Water	TAL Metals	20061	Analytical holding time for water exceeded by 56 days. All data qualified "R."
21-2607	AAB9885	Soil	SVOCs	19129	Low surrogate recoveries (10 to 25%) for two acid surrogates. All acid fraction analytes qualified "UJ." Also,14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2607	AAB9885	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample.
21-2607	AAB9885	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2614	AAB9818	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2614	AAB9818	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample. Internal standards below acceptable values and low surrogate recovery for BFB at 69%. All data qualified "J" or "UJ."
21-2614	AAB9818	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.

TABLE A-3 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL ISSUES FOR 1994 FIXED LABORATORY DATA FROM DP TANK FARM, SWMU[a] 21-029

LOCATION ID	SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	REQUEST NUMBER	QUALITY CONTROL COMMENTS
21-2615	AAB9819	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2615	AAB9819	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample. Internal standards below acceptable values and low surrogate recovery for BFB at 54%. All data qualified "J" or "UJ."
21-2615	AAB9819	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2615	AAB9820	Soil	SVOCs	19129	14 analytes had recoveries of 10% to 25% in soil QC sample. Bis(2-ethylhexyl)phthalate had high recovery (135%), so detected soil concentrations are possibly due to lab contamination. All data for these analytes qualified "J" or "UJ."
21-2615	AAB9820	Soil	VOCs	19129	4-Methyl-2-pentanone qualified "UJ" for low recovery in QC sample. Internal standards below acceptable values and low surrogate recovery for BFB at 61%. All data qualified "J" or "UJ."
21-2615	AAB9820	Soil	TAL Metals	20061	Analytical holding time (applicable to water) exceeded by up to 85 days. Data qualified "J" or "UJ" for soils sample.
21-2615	AAB9821	Water	SVOCs	19129	Sample exceeded extraction holding time of seven days by one day. Data qualified "UJ." 2-Methylphenol, 4-methylphenol, and 2,4,6-trichlorophenol had recoveries between 10 and 50% in water QC sample. Data already qualified
21-2615	AAB9821	Water	TAL Metals	20061	Analytical holding time for water exceeded by 56 days. All data qualified "R," rejected.
21-2615	AAB9822	Water	SVOCs	19129	Sample exceeded extraction holding time of seven days by one day. Data qualified "UJ." 2-Methylphenol, 4-methylphenol, and 2,4,6-trichlorophenol had recoveries between 10 and 50% in water QC sample. Data already qualified
21-2615	AAB9822	Water	TAL Metals	20061	Analytical holding time for water exceeded by 56 days. All data qualified "R," rejected.

[a] SWMU = Solid waste managment unit.
[b] SVOCs = Semivolatile organic compounds.
[c] QC = Quality control.
[d] "J" = Estimated detected quantities; "UJ" = Estimated undetected quantities.
[e] VOCs = Volatile organic compounds.
[f] TAL Metals = Target analyte list metals.
[g] TICs = Tentatively identified compounds.
[h] TPH = Total petroleum hydrocarbons.
[i] EQLs = Estimated quantitation limits.
[j] "R" = Rejected.

TABLE A-4

PID[a] AND COMBUSTIBLE GAS FIELD SCREENING DATA SUMMARY FOR THE 1994 INVESTIGATION AT DP TANK FARM, SWMU[b] 21-029

SCREENING DATE	LOCATION ID	SAMPLE ID[c]	DRILLING DEPTH (ft bgs[d])	PID READINGS			COMBUSTIBLE GAS MONITORING DATA	
				BREATHING ZONE (ppm[e])	DOWNHOLE (ppm)	HEADSPACE (ppm)	% LEL[f]	% OXYGEN
9/6/94	21-2553	AAB9701	2.5	0.0	0.0	0.0	0	21
9/6/94		AAB9702	5.0	0.0	0.0	0.0	0	21
9/6/94		AAB9703	7.5	0.0	0.0	0.0	0	21
9/6/94		AAB9704	10.0	0.0	0.0	0.0	0	21
9/6/94	21-2554	AAB9705	2.5	0.0	0.0	0.0	0	21
9/6/94		AAB9706	5.0	0.0	0.0	0.0	0	21
9/6/94		AAB9707	7.5	0.0	0.0	0.0	0	21
9/6/94		AAB9708	10.0	0.0	0.0	0.0	0	21
9/6/94	21-2555	AAB9709	2.5	0.0	0.0	0.0	0	21
9/6/94		AAB9710	5.0	0.0	0.0	0.0	0	21
9/6/94		AAB9711	7.5	0.0	0.0	0.0	0	21
9/6/94		AAB9712	10.0	0.0	0.0	0.0	0	21
9/7/94	21-2556	AAB9713	2.5	0.0	279	NM[g]	4	21
9/7/94		AAB9714	5.0	0.0	139	NM	4	21
9/7/94		AAB9715	7.5	0.0	279	NM	4	21
9/7/94		AAB9716	10.0	0.0	325	NM	4	21
9/7/94	21-2557	AAB9717	2.5	0.0	0.0	0.0	0	21
9/7/94		AAB9718	5.0	0.0	0.0	0.0	0	21
9/7/94		AAB9719	7.5	0.0	0.0	0.0	0	21
9/7/94		AAB9720	10.0	0.0	0.0	0.0	0	21
9/7/94	21-2558	AAB9721	2.5	0.0	957	46	12	18
9/7/94		–	2.5	NM	NM	NM	8	19
9/7/94		AAB9722	5.0	4 890	0.0	7 350	100	18
9/7/94		–	5.0	NM	NM	NM	4	20
9/7/94		AAB9724	10.0	0.0	0.0	2 500	8	1
9/7/94		–	12.5	0.0	2 500	2 500	NM	NM
9/7/94		–	15.0	0.0	4 491	2 500	NM	NM
9/7/94		–	17.5	0.0	139	9 233	100	8
9/7/94		–	20.0	0.0	410	2 800	NM	NM
9/7/94		–	22.5	0.0	139	8 577	2	20
9/7/94		–	25.0	0.0	1 346	2 050	NM	NM
9/7/94		–	27.5	0.0	46	5 792	NM	NM
9/7/94	21-2559	AAB9725	2.5	565	0.0	5 000	50	16
9/8/94	21-2558	–	30.0	0.0	NM	2 500	NM	NM
9/8/94		–	32.5	0.0	NM	2 933	100	7
9/8/94		–	35.0	0.0	NM	767	100	7
9/8/94		–	37.5	0.0	NM	767	100	6
9/8/94		–	40.0	0.0	NM	534	100	1
9/8/94		–	42.5	0.0	NM	51	100	1
9/8/94	21-2558	–	45.0	0.0	NM	51	100	1
9/8/94		–	47.5	0.0	NM	51	100	1
9/8/94		–	50.0	0.0	NM	51	100	8
9/8/94		–	52.5	0.0	NM	53	NM	NM

TABLE A-4 (CONTINUED)

PID[a] AND COMBUSTIBLE GAS FIELD SCREENING DATA SUMMARY FOR THE 1994 INVESTIGATION AT DP TANK FARM, SWMU[b] 21-029

SCREENING DATE	LOCATION ID	Sample ID[c]	DRILLING DEPTH (ft bgs[d])	PID READINGS			COMBUSTIBLE GAS MONITORING DATA	
				BREATHING ZONE (ppm[e])	DOWNHOLE (ppm)	HEADSPACE (ppm)	% LEL[f]	% OXYGEN
9/8/94	21-2558	–	55.0	0.0	NM	51	NM	NM
9/8/94		–	57.5	0.0	NM	51	NM	NM
9/8/94		–	60.0	0.0	NM	51	80	6
9/8/94		–	62.5	0.0	NM	604	80	16
9/8/94		–	65.0	0.0	NM	235	NM	NM
9/8/94		–	67.5	0.0	NM	102	NM	NM
9/8/94		–	70.0	0.0	NM	1 471	NM	NM
9/8/94		–	72.5	0.0	NM	305	NM	NM
9/8/94		–	75.0	0.0	NM	204	NM	NM
9/8/94		–	77.5	0.0	NM	256	NM	NM
9/8/94		–	80.0	0.0	NM	344	NM	NM
9/8/94		–	82.5	0.0	NM	102	NM	NM
9/8/94		–	85.0	0.0	NM	51	NM	NM
9/8/94		–	87.5	0.0	NM	51	NM	NM
9/9/94		–	94.0	0.0	0.0	48	2	19
9/9/94	21-2559	–	5.0	0.0	379	3 900	100	15
9/9/94		–	7.5	0.0	315	4 800	NM	NM
9/9/94		–	10.0	0.0	315	2 566	100	17
9/9/94	21-2607	–	2.5	0.0	12.6	5.4	0	21
9/9/94		–	5.0	0.0	5.4	0.0	0	21
9/9/94		–	7.5	0.0	5.4	1.8	0	21
9/9/94		–	10.0	0.0	5.4	0.0	0	21
9/9/94		–	12.5	0.0	0.0	0.0	0	21
9/9/94		–	15.0	0.0	0.0	0.0	0	21
9/9/94		–	17.5	0.0	0.0	9.0	0	21
9/9/94		–	20.0	0.0	0.0	0.0	0	21
9/9/94		–	22.5	0.0	0.0	0.0	0	21
9/9/94		–	25.0	0.0	0.0	0.0	0	21
9/9/94		–	27.5	0.0	0.0	0.0	0	21
9/9/94		–	30.0	0.0	0.0	0.0	0	21
9/9/94		–	32.5	0.0	0.0	9.0	NM	NM
9/9/94		–	35.0	0.0	0.0	0.0	NM	NM
9/9/94		–	37.5	0.0	0.0	0.0	NM	NM
9/9/94		–	40.0	0.0	0.0	0.0	NM	NM
9/9/94	21-2607	–	42.5	0.0	0.0	0.0	0	21
9/12/94		–	45.0	0.0	0.0	0.0	0	21
9/12/94		–	47.5	0.0	0.0	0.0	0	21
9/12/94		–	50.0	0.0	0.0	0.0	0	21
9/12/94		–	52.5	0.0	0.0	0.0	0	21
9/12/94		–	55.0	0.0	0.0	0.0	0	21
9/12/94		–	57.5	0.0	0.0	0.0	0	21
9/12/94		–	60.0	0.0	0.0	0.0	0	21
9/12/94		–	62.5	0.0	0.0	0.0	0	20

TABLE A-4 (CONTINUED)

PID[a] AND COMBUSTIBLE GAS FIELD SCREENING DATA SUMMARY FOR THE 1994 INVESTIGATION AT DP TANK FARM, SWMU[b] 21-029

SCREENING DATE	LOCATION ID	Sample ID[c]	DRILLING DEPTH (ft bgs[d])	PID READINGS			COMBUSTIBLE GAS MONITORING DATA	
				BREATHING ZONE (ppm[e])	DOWNHOLE (ppm)	HEADSPACE (ppm)	% LEL[f]	% OXYGEN
9/12/94	21-2607	–	65.0	0.0	0.0	0.0	0	20
9/12/94		–	67.5	0.0	0.0	0.0	0	20
9/12/94		–	70.0	0.0	0.0	0.0	0	20
9/12/94	21-2556	–	10.0	0.0	225	NM	8	18
9/12/94		–	12.5	0.0	60.4	NM	4	19
9/12/94		–	15.0	0.0	79	NM	4	19
9/12/94		–	17.5	6.0	85	NM	1	19
9/12/94		–	20.0	6.0	6.0	NM	0	20
9/12/94		–	22.5	0.0	195	NM	8	18
9/12/94		–	25.0	0.0	60	18	4	19
9/12/94		–	27.5	0.0	347	12	8	19
9/13/94	21-2560	–	2.5	0.0	0.0	0.0	0	21
9/13/94		–	5.0	0.0	0.0	0.0	0	21
9/13/94		–	7.5	0.0	0.0	0.0	0	21
9/13/94		–	10.0	0.0	0.0	0.0	0	21
9/13/94	21-2561	–	2.5	0.0	0.0	0.0	0	21
9/13/94		–	5.0	0.0	0.0	0.0	0	21
9/13/94		–	7.5	0.0	0.0	0.0	0	21
9/13/94		–	10.0	0.0	0.0	0.0	0	21
9/13/94	21-2562	–	2.5	0.0	0.0	0.0	0	21
9/13/94		–	5.0	0.0	0.0	0.0	0	21
9/13/94		–	7.5	0.0	0.0	0.0	0	21
9/13/94		–	10.0	0.0	0.0	0.0	0	21

[a] PID = Photoionization detector.
[b] SWMU = Solid waste management unit.
[c] Sample IDs were not assigned for all readings.
[d] bgs = Below ground surface.
[e] ppm = Parts per million.
[f] LEL = Lower explosive limit.
[g] NM = No measurement.

TABLE A-5

RADIATION FIELD SCREENING DATA SUMMARY FOR THE 1994 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

SCREENING DATE	BOREHOLD NUMBER	DRILLING DEPTH (ft bgs[d])	DIRECT b/g READING[b] (cpm[e])	DIRECT a READING[c] (cpm)
9/6/94	21-2553	2.5	100 - 120	NM[f]
9/6/94		5.0	120 - 200	NM
9/6/94		7.5	120 - 200	NM
9/6/94		10.0	180 - 200	0.0
9/6/94	21-2554	2.5	160 - 200	0.0
9/6/94		5.0	140 - 200	0.0
9/6/94		7.5	140 - 200	0.0
9/6/94		10.0	120 - 200	0.0
9/6/94	21-2555	2.5	120 - 140	0.0
9/6/94		5.0	120 - 160	0.0
9/6/94		7.5	120 - 160	0.0
9/6/94		10.0	120 - 180	0.0
9/7/94	21-2556	2.5	140 - 200	0.0
9/7/94		5.0	120 - 160	0.0
9/7/94		7.5	120 - 200	0.0
9/7/94		10.0	120 - 200	0.0
9/12/94		20.0	160 - 200	0.0
9/12/94		27.5	160 - 200	0.0
9/7/94	21-2557	2.5	120 - 200	0.0
9/7/94		5.0	120 - 200	0.0
9/7/94		7.5	120 - 180	0.0
9/7/94		10.0	160 - 200	0.0
9/7/94	21-2558	2.5	120 - 200	0.0
9/7/94		5.0	120 - 180	0.0
9/7/94		7.5	140 - 180	0.0
9/7/94		10.0	120 - 140	0.0
9/8/94		75.0	140 - 180	0.0
9/9/94		94.0	160 - 200	0.0
9/7/94	21-2559	2.5	180 - 200	0.0
9/9/94		5.0	120 - 200	0.0
9/9/94		7.5	140 - 200	0.0
9/9/94		10.0	120 - 200	0.0
9/12/94	21-2607	70.0	160 - 200	0.0
9/13/94	21-2560	2.5	110 - 160	0.0
9/13/94		5.0	140 - 200	0.0
9/13/94		7.5	140 - 200	0.0
9/13/94		10.0	160 - 200	0.0
9/13/94	21-2561	2.5	140 - 200	0.0
9/13/94		5.0	140 - 200	NM
9/13/94		7.5	140 - 200	NM
9/13/94		10.0	120 - 200	NM
9/13/94	21-2562	2.5	120 - 180	NM
9/13/94		5.0	110 - 180	NM
9/13/94		7.5	120 - 200	NM
9/13/94		10.0	120 - 200	NM

[a] SWMU = Solid waste management unit.
[b] The mean background for b/g (beta/gamma) is 200 cpm.
[c] The mean background for a (alpha) is 0 cpm.
[d] bgs = Below ground surface.
[e] cpm = Counts per minutes.
[f] NM = No measurement.

TABLE A-6

1994 ANALYTICAL RESULTS FOR INORGANIC ANALYTES DETECTED AT DP TANK FARM, SWMU 21-029

		Aluminium	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Silver	Sodium	Thallium	Vanadium	Zinc
COMPARISON LEVELS FOR SOIL SAMPLES (mg/kg)	UTL[a]	123 000	11.6	1 140	3.31	2.7	54 400	34.2	51.1	15.7	35 600	39	16 100	1 030	0.1	26.7	6 180	1.61	3 320	0.9	66.2	101
	SAL[b]	NA[c]	NA	5 600	NA	80	NA	400	NA	3 000	NA	400	NA	11 000	NA	1 600	NA	400	NA	6.4	560	24 000

		ANALYSIS RESULTS (mg/kg)																				
LOCATION ID	SAMPLE ID	Aluminium	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Silver	Sodium	Thallium	Vanadium	Zinc
21-2553	AAB9702	5 140	<1.6	91.7	<0.47	<0.43	1 690	3.9	<3.5	<3.9	7 180	10.1	1090	286	<0.02	<5.8	1 110	<2.2	<116	<0.22	13.5	25.2
21-2553	AAB9704	1 060	<0.64	<9.4	<0.21	<0.43	<310	5.1	<1.5	<0.86	2 560	3.9	<326	126	<0.02	<4.2	<474	<2.1	<138	<0.21	<1.7	25.9
21-2554	AAB9706	2 780	<1.1	55.6	<0.38	<0.41	1 710	<1.6	<1.4	<2.7	4 500	6.1	<597	285	<0.02	<4.3	<565	<2	<84.7	<0.2	<6.2	28.1
21-2554	AAB9708	620	<0.86	<12.3	<0.31	<0.41	<434	<0.89	<1.4	<1.7	2 370	2.7	<96.8	199	<0.02	<1.6	<385	<2	<147	<0.2	<1.9	29
21-2555	AAB9710	6 440	2.3	156	<0.62	<0.69	2 670	6.4	<4	6.4	10 300	15.4	1 630	381	<0.02	<7.4	1 130	<2.2	<143	<0.22	19.8	28.9
21-2555	AAB9712	8 340	<2	55.8	<0.66	<0.6	1 930	6.3	<4	5.5	10 300	9.1	1 670	247	<0.02	<5.6	1 320	<2.2	<67.8	<0.22	15.4	31.3
21-2556	AAB9713	2 890	<0.67	60.2	<0.24	<0.42	1 360	3.6	<2	<2	4 090	13.7	<678	165	<0.02	<2.9	<314	<2.1	<89.1	<0.21	<8.4	20.4
21-2556	AAB9714	569	<0.67	<6.7	<0.25	<0.45	<259	<2.1	<1.6	<1	2 270	14.3	<45.5	224	<0.02	<1.8	<150	2.3	<62	<0.22	<2.1	26.5
21-2556	AAB9715	517	<0.81	<9.6	<0.24	<0.47	<312	<1.3	<1.7	<1.8	2 490	21.4	<40.7	351	<0.02	<1.9	<159	<2.4	<65.1	<0.24	<2.3	28
21-2556	AAB9716	770	<0.73	15.9	<0.24	<0.49	405	1.7	<1.7	1.3	2 723	23.4	91.5	689	<0.02	2.8	<163	<2.43	64.4	<0.24	2	30.6
21-2556	AAB9716R[d]	815	<0.85	<16.1	<0.25	<0.49	<346	<1.6	<1.7	<1.1	2 550	22.8	<91	355	<0.02	<2.4	<211	<2.4	<69.8	<0.24	<2	28.4
21-2557	AAB9720	830	<0.68	<9.9	<0.29	<0.46	<201	<0.46	<1.6	<1.1	2 400	7.8	<96.5	288	<0.02	<1.8	<313	<2.3	<183	<0.23	<1.7	27.8
21-2558	AAB9721	3 600	<0.75	<33.3	<0.45	<0.43	<639	2.6	<1.5	<1.8	4 680	13.7	<464	231	<0.02	<2.5	<347	<2.1	<85.3	<0.21	<4.7	24.5
21-2558	AAB9722	1 100	<0.65	<8.9	<0.23	<0.43	<357	2.2	<1.5	<1.1	2 760	12.5	<168	162	<0.02	<1.7	<180	<2.2	<80.6	<0.22	<2	32.4
21-2558	AAB9723	788	<0.66	<7.1	<0.23	<0.44	<295	<1.7	<1.5	<1.1	2 170	4.6	<121	182	<0.02	<2	<196	<2.2	<70.2	<0.22	<1.5	29.6
21-2558	AAB9724	1 040	<0.69	<12.4	<0.35	<0.46	<317	<2.3	<1.6	<1.4	2 240	3.7	<176	207	<0.02	<2	<201	<2.3	<70.1	<0.23	<2.1	26.2
21-2558	AAB9886	227	<0.63	<11.7	<0.25	<0.42	<439	4.8	<1.5	<0.84	2 400	2.8	<87.9	225	<0.02	<2.1	<141	<2.1	<91.1	<0.21	<1.5	25.2
21-2559	AAB9725	5 126	1.9	43.5	0.34	<0.44	1 532	3.4	<1.6	2.3	5 260	12.3	740	194	<0.02	2.6	436	<2.22	331	<0.22	6.3	26.7
21-2559	AAB9725R	6 060	<1.9	59	<0.37	<0.44	1 640	3.6	<1.6	<2.6	5 670	12.3	<874	206	<0.02	<3.9	<527	<2.2	<385	<0.22	<7.2	27.8
21-2559	AAB9726	6 540	<1.4	55.1	<0.38	<0.44	2 200	6	<2.2	<2.7	6 460	12.7	<1 040	216	<0.02	<3.5	<682	<2.2	<310	<0.22	<8.1	28.8
21-2559	AAB9727	2 680	<1.3	13.9	<0.22	<0.44	1 310	<2.1	<1.5	<1.4	3 450	9.9	<550	129	<0.02	<1.8	<229	<2.2	<178	<0.22	<3.5	19.5
21-2559	AAB9728	547	<0.68	<9.5	<0.23	<0.45	<259	3.4	<1.6	<1.3	2 670	6	<140	256	<0.02	<1.8	<171	<2.3	<87.5	<0.23	<1.4	25.5
21-2560	AAB9732	6 923	1.1	102	0.68	0.57	1 677	5.9	3.3	5.3	8 383	9.8	1 388	268	<0.02	6.6	1 188	<2.2	249	0.22	12.8	28.2
21-2560	AAB9732R	6 990	<1.1	103	<0.67	<0.44	1 720	5.3	<2.5	<4.8	7 920	8.1	1 370	172	<0.02	<5.9	1 180	<2.2	<297	<0.22	12.8	26.4
21-2560	AAB9742	7 620	<0.76	97	<0.69	<0.64	1 730	5.4	<4	<5.3	8 920	10.2	1 450	299	<0.02	<8.4	1 340	<2.2	<246	<0.23	14	30.2
21-2561	AAB9736	806	<0.73	<12.4	<0.21	<0.42	<367	<1.7	<1.5	<0.93	2 200	3.5	<164	133	<0.02	<1.7	<282	<2.1	<91	<0.21	<2.9	20.4
21-2562	AAB9738	6 880	<1.2	152	<0.79	<0.87	4 190	7.1	<7.7	<5.2	12 300	18	1 920	611	<0.02	<8.1	<956	<2.2	<262	<0.22	26.3	25
21-2562	AAB9741	6 230	<0.92	143	<0.51	<0.86	4 520	6.7	<5.5	<5.3	9 850	12.7	1 740	401	<0.02	<6.9	1380	<2.2	<233	<0.22	22.3	24.7
21-2607	AAB9885	628	<0.7	<11.5	<0.52	<0.43	<114	<0.43	<1.5	<0.85	3 240	3.3	<39.5	250	<0.02	<1.7	<299	<2.1	<212	<0.21	<2.3	20.6
21-2614	AAB9818	4 590	<1.6	91.4	<0.43	<0.92	2 810	10.8	<3	9	7 630	160	<955	243	0.04	<5.1	<986	<2.2	<52.7	<0.22	14.2	77.6
21-2615	AAB9819	4 400	2.6	93.6	<0.49	<0.71	1 960	6	<3.4	7.5	7 060	64	<932	421	<0.04	<5.1	<843	<2.2	<49.4	<0.22	15.3	56.6
21-2615	AAB9820	5 000	2.6	91.1	<0.52	<0.9	2 060	6.5	<4.3	7.6	7 790	64.1	<1 010	409	<0.03	<5.1	<796	<2.2	<41.5	<0.22	14.7	58.1

[a] UTL = Upper tolerance limit.
[b] SAL = Screening action level.
[c] NA = No applicable value is available.
[d] Sample IDs with an "R" notation indicate laboratory replicates were performed.

TABLE A-7

1994 ANALYTICAL RESULTS FOR RADIONUCLIDES DETECTED AT DP TANK FARM, SWMU[a] 21-029

COMPARISON LEVELS FOR SOIL SAMPLES (pCi/g)		Cesium-137	Uranium-235
	UTL[b]	1.4	0.088
	SAL[c]	4	18

		ANALYTICAL RESULTS (pCi/g)	
LOCATION ID	SAMPLE ID	Cesium-137	Uranium-235
21-2553	AAB9702	0.0271	-
21-2553	AAB9704	0.0165	-
21-2554	AAB9706	-0.0324	-
21-2554	AAB9708	0.0238	-
21-2555	AAB9710	0.096	-
21-2555	AAB9712	0.0706	-
21-2556	AAB9713	-	0.4
21-2556	AAB9714	-	0.54
21-2556	AAB9715	-	0.27
21-2556	AAB9716	0.1399	0.32
21-2558	AAB9723	-	0.24
21-2558	AAB9724	-	0.47
21-2559	AAB9725	-	0.58
21-2559	AAB9725R	-	0.57
21-2559	AAB9726	-	0.25
21-2559	AAB9727	-	0.32
21-2559	AAB9728	-	0.34
21-2560	AAB9732	0.075	-
21-2560	AAB9732R	0.0019	-
21-2560	AAB9742	0.0091	-

COMPARISON LEVELS FOR SOIL SAMPLES (pCi/g)		Cesium-137	Uranium-235
	UTL[b]	1.4	0.088
	SAL[c]	4	18

		ANALYTICAL RESULTS (pCi/g)	
LOCATION ID	SAMPLE ID	Cesium-137	Uranium-235
21-2561	AAB9736	0.12	-
21-2562	AAB9738	-0.006	-
21-2562	AAB9741	0.001	-
21-2614	AAB9818	0.248	-
21-2615	AAB9819	0.357	-
21-2615	AAB9820	0.606	-

ADDITIONAL RADIONCUCLIDES INCLUDED IN THE GAMMA SPECTROSCOPY OUTPUT[d]	
Actinium-228	Protactinium-231
Americium-241	Radium-223
Bismuth-211	Radium-224
Bismuth-212	Radium-226
Cesium-134	Radon-219
Cobalt-57	Sodium-22
Cobalt-60	Thallium-208
Lead-210	Thorium-227
Lead-212	Thorium-234
Lead-214	Tritium
Potassium-40	Water (Unbound)

[a] SWMU = Solid waste management unit.
[b] UTL = Upper tolerance limit.
[c] SAL = Screening action level.
[d] Analytical results for these radionuclides are not included because there is no toxicity information or background information available for them and their reported activities were extremely low.

TABLE A-8

1994 ANALYTICAL RESULTS FOR DETECTED ORGANIC ANALYTES AT DP TANK FARM, SWMU 21-029

COMPARISON LEVELS FOR SOIL SAMPLES (mg/kg)		Acetone	Benzene	Bis(2-ethylhexyl)phthalate	Butanone [2-]	Butylbenzene [sec-]	Ethylbenzene	Isopropylbenzene	Isopropyltoluene [4-]	Methylnaphthalene [2-]	Naphthalene	Propylbenzene	Toluene	Trimethylbenzene [1,2,4-]	Trimethylbenzene [1,3,5-]	Xylenes (o + m + p) [Mixed-]
	SAL[a]	8 000	0.67	50	4 000	NA[b]	3 100	3 200	NA	NA	3 200	NA	910	40	32	160 000

		ANALYSIS RESULTS (mg/kg)														
LOCATION ID	SAMPLE ID	Acetone[c]	Benzene	Bis(2-ethylhexyl)phthalate[c]	Butanone [2-][c]	Butylbenzene [sec-]	Ethylbenzene	Isopropylbenzene	Isopropyltoluene [4-]	Methylnaphthalene [2-]	Naphthalene	Propylbenzene	Toluene	Trimethylbenzene [1,2,4-]	Trimethylbenzene [1,3,5-]	Xylenes (o + m + p) [Mixed-]
21-2553	AAB9702	<0.021	<0.005	<1.4	<0.021	<0.005	<0.005	<0.005	<0.005	<1.4	<1.4	<0.005	<0.005	<0.005	<0.005	0.009
21-2553	AAB9704	<0.021	<0.005	<0.33	<0.021	<0.005	<0.005	<0.005	<0.005	<0.33	<0.33	<0.005	<0.005	<0.005	<0.005	<0.005
21-2554	AAB9706	<0.02	<0.005	<0.32	<0.02	<0.005	<0.005	<0.005	<0.005	<0.32	<0.32	<0.005	<0.005	<0.005	<0.005	<0.005
21-2554	AAB9708	<0.02	<0.005	<0.31	<0.02	<0.005	<0.005	<0.005	<0.005	<0.31	<0.31	<0.005	<0.005	<0.005	<0.005	<0.005
21-2555	AAB9710	<0.026	<0.007	<1.4	<0.026	<0.007	<0.007	<0.007	<0.007	<1.4	<1.4	<0.007	<0.007	<0.007	<0.007	<0.007
21-2555	AAB9712	<0.022	<0.005	<0.34	<0.022	<0.005	<0.005	<0.005	<0.005	<0.34	<0.34	<0.005	<0.005	<0.005	<0.005	<0.005
21-2556	AAB9713	<11	<2.7	<37	22	<2.7	<2.7	<2.7	<2.7	<37	<37	<2.7	<2.7	19	8.3	15
21-2556	AAB9714	6.4	<1.4	<36	20	2.8	2.9	<1.4	16	110	<36	<1.4	13	110	29	66
21-2556	AAB9715	<10	<2.5	<37	27	<2.5	4.8	<2.5	19	96	40	3.4	6.8	100	30	71
21-2556	AAB9716	<3	<0.76	<39	<3	<0.76	6.3	3.5	15	49	<39	4	4.1	50	16	45
21-2556	AAB9749	<0.12	<0.031	<0.37	<0.12	<0.031	<0.031	<0.031	<0.031	<0.37	<0.37	<0.031	<0.031	<0.031	<0.031	<0.031
21-2556	AAB9884	<0.022	<0.006	<0.33	<0.022	<0.006	<0.006	<0.006	<0.006	<0.33	<0.33	<0.006	<0.006	<0.006	<0.006	<0.006
21-2557	AAB9720	<0.022	<0.006	<0.36	<0.022	<0.006	<0.006	<0.006	<0.006	<0.36	<0.36	<0.006	<0.006	<0.006	<0.006	<0.006
21-2558	AAB9721	<0.022	<0.005	<3.6	<0.022	<0.005	<0.005	<0.005	0.14	8	<3.6	<0.005	<0.005	0.051	2.1	0.029
21-2558	AAB9722	<27	<6.7	<36	<27	<6.7	<6.7	<6.7	7.1	<36	<36	<6.7	9.6	120	31	160
21-2558	AAB9723	<28	<6.9	<36	<28	<6.9	55	7.6	12	56	42	29	56	270	65	420
21-2558	AAB9724	<14	8	<37	<14	<3.6	110	9.9	13	49	<37	36	260	260	69	630
21-2558	AAB9886	<0.021	<0.005	<0.34	<0.021	<0.005	<0.005	<0.005	<0.005	<0.34	<0.34	<0.005	<0.005	<0.005	<0.005	<0.005
21-2559	AAB9725	<14	<3.4	<37	<14	<3.4	<3.4	<3.4	6.5	<37	<37	<3.4	<3.4	160	49	144
21-2559	AAB9726	<29	<7.3	<36	<29	<7.3	<7.3	<7.3	10	38	<36	<7.3	<7.3	210	50	221
21-2559	AAB9727	<14	<3.4	<37	<14	<3.4	90	9.8	16	79	50	37	100	270	70	470
21-2559	AAB9728	<29	<7.2	<36	<29	<7.2	99	10	14	93	49	35	210	250	59	530
21-2560	AAB9732	<0.022	<0.005	<0.34	<0.022	<0.005	<0.005	<0.005	<0.005	<0.34	<0.34	<0.005	<0.005	<0.005	<0.005	<0.005
21-2560	AAB9742	<0.023	<0.006	<0.36	<0.023	<0.006	<0.006	<0.006	<0.006	<0.36	<0.36	<0.006	<0.006	<0.006	<0.006	<0.006
21-2561	AAB9736	<0.021	<0.005	<0.33	<0.021	<0.005	<0.005	<0.005	<0.005	<0.33	<0.33	<0.005	<0.005	<0.005	<0.005	<0.005
21-2562	AAB9738	<0.022	<0.006	0.87	<0.022	<0.006	<0.006	<0.006	<0.006	<0.34	<0.34	<0.006	<0.006	<0.006	<0.006	<0.006
21-2562	AAB9741	<0.022	<0.005	<0.36	<0.022	<0.005	<0.005	<0.005	<0.005	<0.36	<0.36	<0.005	<0.005	<0.005	<0.005	<0.005
21-2607	AAB9885	<0.021	<0.005	<0.34	<0.021	<0.005	<0.005	<0.005	<0.005	<0.34	<0.34	<0.005	<0.005	<0.005	<0.005	<0.005
21-2614	AAB9818	<0.022	<0.006	<1.4	<0.022	<0.006	<0.006	<0.006	<0.006	<1.4	<1.4	<0.006	<0.006	<0.006	<0.006	<0.006
21-2615	AAB9819	<0.021	<0.005	<1.4	<0.021	<0.005	<0.005	<0.005	<0.005	<1.4	<1.4	<0.005	<0.005	<0.005	<0.005	<0.005
21-2615	AAB9820	<0.022	<0.005	<1.4	<0.022	<0.005	<0.005	<0.005	<0.005	<1.4	<1.4	<0.005	<0.005	<0.005	<0.005	<0.005

[a] SAL = Screening action level.
[b] NA = No applicable value is available.
[b] Detected values for these analytes are attributed to laboratory conatmination as described in Subsection 4.1.

TABLE A-9

1994 SUMMARY OF NONDETECTED ANALYTES AT DP TANK FARM, SWMU[a] 21-029

ANALYTE	TOTAL NUMBER OF ANALYSES	NUMBER OF NONDETECTS	RANGE OF NONDETECTS		NUMBER OF DETECTS	RANGE OF DETECTS		COMPARISON LEVELS	
			MINIMUM	MAXIMUM		MINIMUM	MAXIMUM	UTL[b]	SAL[c]
INORGANIC ANALYTES (mg/kg)									
Aluminium	32	0	NA[d]	NA	32	227	8 340	123 000	NA
Antimony	32	32	0.2	0.24	0	NA	NA	2.5	32
Arsenic	32	27	0.63	2	5	1.1	2.6	11.6	NA
Barium	32	14	6.7	33.3	18	13.9	156	1 140	5 600
Beryllium	32	30	0.21	0.79	2	0.34	0.68	3.31	NA
Cadmium	32	31	0.41	0.92	1	0.57	0.57	2.7	80
Calcium	32	14	114	639	18	405	4 520	54 400	NA
Chromium	32	11	0.43	2.3	21	1.7	10.8	34.2	400
Cobalt	32	31	1.4	7.7	1	3.3	3.3	51.1	NA
Copper	32	24	0.84	5.3	8	1.3	9	15.7	3 000
Iron	32	0	NA	NA	32	2 170	12 300	35 600	NA
Lead	32	0	NA	NA	32	2.7	160	39	400
Magnesium	32	22	39.5	1040	10	91.5	1 920	16 100	NA
Manganese	32	0	NA	NA	32	126	689	1030	11 000
Mercury	32	31	0.02	0.04	1	0.04	0.04	0.1	24
Nickel	32	29	1.6	8.4	3	2.6	6.6	26.7	1 600
Potassium	32	24	141	986	8	436	1 380	6 180	NA
Selenium	32	32	0.61	0.73	0	NA	NA	1.7	400
Silver	32	31	2	2.43	1	2.3	2.3	1.61	400
Sodium	32	29	41.5	385	3	64.4	331	3 320	NA
Thallium	32	31	0.2	0.24	1	0.22	0.22	0.9	6.4
Vanadium	32	19	1.4	8.4	13	2	26.3	66.2	560
Zinc	32	0	NA	NA	32	19.5	77.6	101	24 000

TABLE A-9 (CONTINUED)

1994 SUMMARY OF NONDETECTED ANALYTES AT DP TANK FARM, SWMU[a] 21-029

ANALYTE	TOTAL NUMBER OF ANALYSES	NUMBER OF NONDETECTS	RANGE OF NONDETECTS		NUMBER OF DETECTS	RANGE OF DETECTS		COMPARISON LEVELS	
			MINIMUM	MAXIMUM		MINIMUM	MAXIMUM	UTL[b]	SAL[c]
ORGANIC ANALYTES (mg/kg)									
Acenaphthene	31	31	0.31	39	0	NA	NA	NA	4800
Acenaphthylene	31	31	0.31	39	0	NA	NA	NA	NA
Acetone	31	30	0.02	29	1	6.4	6.4	NA	8 000
Aniline	31	31	0.31	39	0	NA	NA	NA	120
Anthracene	31	31	0.31	39	0	NA	NA	NA	24 000
Azobenzene	31	31	0.31	39	0	NA	NA	NA	6.4
Benzene	31	30	0.005	7.3	1	8	8	NA	0.67
Benzoic acid	31	31	0.76	95	0	NA	NA	NA	320 000
Benzo[a]anthracene	31	31	0.31	39	0	NA	NA	NA	1
Benzo[a]pyrene	31	31	0.31	39	0	NA	NA	NA	0.1
Benzo[b]fluoranthene	31	31	0.31	39	0	NA	NA	NA	1
Benzo[g,h,i]perylene	31	31	0.31	39	0	NA	NA	NA	NA
Benzo[k]fluoranthene	31	31	0.31	39	0	NA	NA	NA	1
Benzyl alcohol	31	31	0.31	39	0	NA	NA	NA	24 000
Bis(2-chloroethoxy)methane	31	31	0.31	39	0	NA	NA	NA	NA
Bis(2-chloroethyl)ether	31	31	0.31	39	0	NA	NA	NA	0.12
Bis(2-chloroisopropyl)ether	31	31	0.31	39	0	NA	NA	NA	100
Bis(2-ethylhexyl)phthalate	31	30	0.31	39	1	0.87	0.87	NA	50
Bromobenzene	31	31	0.005	7.3	0	NA	NA	NA	NA
Bromochloromethane	31	31	0.005	7.3	0	NA	NA	NA	NA
Bromodichloromethane	31	31	0.005	7.3	0	NA	NA	NA	11
Bromoform	31	31	0.005	7.3	0	NA	NA	NA	89
Bromomethane	31	31	0.01	15	0	NA	NA	NA	0.43

TABLE A-9 (CONTINUED)

1994 SUMMARY OF NONDETECTED ANALYTES AT DP TANK FARM, SWMU[a] 21-029

ANALYTE	TOTAL NUMBER OF ANALYSES	NUMBER OF NONDETECTS	RANGE OF NONDETECTS		NUMBER OF DETECTS	RANGE OF DETECTS		COMPARISON LEVELS	
			MINIMUM	MAXIMUM		MINIMUM	MAXIMUM	UTL[b]	SAL[c]
ORGANIC ANALYTES (mg/kg)									
Bromophenylphenyl ether [4-]	31	31	0.31	39	0	NA	NA	NA	NA
Butanone [2-]	31	28	0.02	29	3	20	27	NA	4 000
Butyl benzyl phthalate	31	31	0.31	39	0	NA	NA	NA	16 000
Butylbenzene [n-]	31	31	0.005	7.3	0	NA	NA	NA	NA
Butylbenzene [sec-]	31	30	0.005	7.3	1	2.8	2.8	NA	NA
Butylbenzene [tert-]	31	31	0.005	7.3	0	NA	NA	NA	NA
Carbon disulfide	31	31	0.005	7.3	0	NA	NA	NA	7.4
Carbon tetrachloride	31	31	0.005	7.3	0	NA	NA	NA	0.21
Chloro-3-methylphenol [4-]	31	31	0.31	39	0	NA	NA	NA	16 000
Chloroaniline [4-]	31	31	0.31	39	0	NA	NA	NA	320
Chlorobenzene	31	31	0.005	7.3	0	NA	NA	NA	67
Chlorodibromomethane	31	31	0.005	7.3	0	NA	NA	NA	83
Chloroethane	31	31	0.01	15	0	NA	NA	NA	2 900
Chloroform	31	31	0.005	7.3	0	NA	NA	NA	0.21
Chloromethane	31	31	0.01	15	0	NA	NA	NA	6.4
Chloronaphthalene [2-]	31	31	0.31	39	0	NA	NA	NA	6 400
Chlorophenol [o-]	31	31	0.31	39	0	NA	NA	NA	400
Chlorophenylphenyl ether [4-]	31	31	0.31	39	0	NA	NA	NA	NA
Chlorotoluene [o-]	31	31	0.005	7.3	0	NA	NA	NA	1 600
Chlorotoluene [p-]	31	31	0.005	7.3	0	NA	NA	NA	NA
Chrysene	31	31	0.31	39	0	NA	NA	NA	96
Di-n-butyl phthalate	31	31	0.31	39	0	NA	NA	NA	8 000
Di-n-octyl phthalate	31	31	0.31	39	0	NA	NA	NA	1 600

TABLE A-9 (CONTINUED)

1994 SUMMARY OF NONDETECTED ANALYTES AT DP TANK FARM, SWMU[a] 21-029

ANALYTE	TOTAL NUMBER OF ANALYSES	NUMBER OF NONDETECTS	RANGE OF NONDETECTS		NUMBER OF DETECTS	RANGE OF DETECTS		COMPARISON LEVELS	
			MINIMUM	MAXIMUM		MINIMUM	MAXIMUM	UTL[b]	SAL[c]
ORGANIC ANALYTES (mg/kg)									
Dibenzofuran	31	31	0.31	39	0	NA	NA	NA	NA
Dibenzo[a,h]anthracene	31	31	0.31	39	0	NA	NA	NA	0.1
Dibromo-3-chloropropane [1,2-]	31	31	0.01	15	0	NA	NA	NA	0.5
Dibromoethane [1,2-]	31	31	0.005	7.3	0	NA	NA	NA	NA
Dibromomethane	31	31	0.005	7.3	0	NA	NA	NA	0.0082
Dichlorobenzene (1,2) [o-] SVOA	31	31	0.005	39	0	NA	NA	NA	1 600
Dichlorobenzene (1,2) [o-] VOA	31	31	0.005	7.3	0	NA	NA	NA	1 600
Dichlorobenzene (1,3) [m-] SVOA	31	31	0.005	39	0	NA	NA	NA	7 200
Dichlorobenzene (1,3) [m-] VOA	31	31	0.005	7.3	0	NA	NA	NA	7 200
Dichlorobenzene (1,4) [p-] SVOA	31	31	0.005	39	0	NA	NA	NA	29
Dichlorobenzene (1,4) [p-] VOA	31	31	0.005	7.3	0	NA	NA	NA	29
Dichlorobenzidine [3,3'-]	31	31	0.31	39	0	NA	NA	NA	1.6
Dichlorodifluoromethane	31	31	0.01	15	0	NA	NA	NA	16 000
Dichloroethane [1,1-]	31	31	0.005	7.3	0	NA	NA	NA	410
Dichloroethane [1,2-]	31	31	0.005	7.3	0	NA	NA	NA	0.2
Dichloroethene [1,1-]	31	31	0.005	7.3	0	NA	NA	NA	0.4
Dichloroethene [trans-1,2-]	31	31	0.005	7.3	0	NA	NA	NA	1 600
Dichloroethylene [cis-1,2-]	31	31	0.005	7.3	0	NA	NA	NA	800
Dichlorophenol [2,4-]	31	31	0.31	39	0	NA	NA	NA	240
Dichloropropane [1,2-]	31	31	0.005	7.3	0	NA	NA	NA	6.5
Dichloropropane [1,3-]	31	31	0.005	7.3	0	NA	NA	NA	NA
Dichloropropane [2,2-]	31	31	0.005	7.3	0	NA	NA	NA	NA
Dichloropropene [1,1-]	31	31	0.005	7.3	0	NA	NA	NA	NA

TABLE A-9 (CONTINUED)

1994 SUMMARY OF NONDETECTED ANALYTES AT DP TANK FARM, SWMU[a] 21-029

ANALYTE	TOTAL NUMBER OF ANALYSES	NUMBER OF NONDETECTS	RANGE OF NONDETECTS		NUMBER OF DETECTS	RANGE OF DETECTS		COMPARISON LEVELS	
			MINIMUM	MAXIMUM		MINIMUM	MAXIMUM	UTL[b]	SAL[c]
ORGANIC ANALYTES (mg/kg)									
Dichloropropene [cis-1,3-]	31	31	0.005	7.3	0	NA	NA	NA	0.17
Dichloropropene [trans-1,3-]	31	31	0.005	7.3	0	NA	NA	NA	0.17
Diethyl phthalate	31	31	0.31	39	0	NA	NA	NA	64 000
Dimethyl phthalate	31	31	0.31	39	0	NA	NA	NA	800 000
Dimethylphenol [2,4-]	31	31	0.31	39	0	NA	NA	NA	1 600
Dinitrophenol [2,4-]	31	31	0.76	95	0	NA	NA	NA	160
Dinitrotoluene [2,4-]	31	31	0.31	39	0	NA	NA	NA	1
Dinitrotoluene [2,6-]	31	31	0.31	39	0	NA	NA	NA	1
Ethanol	27	27	16.2	16.2	0	NA	NA	NA	NA
Ethylbenzene	31	24	0.005	7.3	7	2.9	110	NA	3 100
Fluoranthene	31	31	0.31	39	0	NA	NA	NA	3 200
Fluorene	31	31	0.31	39	0	NA	NA	NA	3 200
Hexachlorobenzene	31	31	0.31	39	0	NA	NA	NA	0.44
Hexachlorobutadiene	31	31	0.31	39	0	NA	NA	NA	90
Hexachlorocyclopentadiene	31	31	0.31	39	0	NA	NA	NA	560
Hexachloroethane	31	31	0.31	39	0	NA	NA	NA	80
Hexanone [2-]	31	31	0.02	29	0	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	31	31	0.31	39	0	NA	NA	NA	1
Isophorone	31	31	0.31	39	0	NA	NA	NA	7 400
Isopropylbenzene	31	26	0.005	7.3	5	3.5	10	NA	3 200
Isopropyltoluene [4-]	31	20	0.005	2.7	11	0.14	19	NA	NA
Methyl iodide	31	31	0.005	7.3	0	NA	NA	NA	NA
Methyl-2-pentanone [4-]	31	31	0.02	29	0	NA	NA	NA	510

TABLE A-9 (CONTINUED)

1994 SUMMARY OF NONDETECTED ANALYTES AT DP TANK FARM, SWMU[a] 21-029

ANALYTE	TOTAL NUMBER OF ANALYSES	NUMBER OF NONDETECTS	RANGE OF NONDETECTS		NUMBER OF DETECTS	RANGE OF DETECTS		COMPARISON LEVELS	
			MINIMUM	MAXIMUM		MINIMUM	MAXIMUM	UTL[b]	SAL[c]
ORGANIC ANALYTES (mg/kg)									
Methyl-4,6-dinitrophenol [2-]	31	31	0.76	95	0	NA	NA	NA	NA
Methylene chloride	31	31	0.005	7.3	0	NA	NA	NA	5.6
Methylnaphthalene [2-]	32	22	0.31	37	10	8	110	NA	NA
Methylphenol [2-]	31	31	0.31	39	0	NA	NA	NA	4 000
Methylphenol [4-]	31	31	0.31	39	0	NA	NA	NA	400
Naphthalene	31	27	0.31	39	4	40	50	NA	3 200
Nitroaniline [2-]	31	31	0.76	95	0	NA	NA	NA	NA
Nitroaniline [3-]	31	31	0.76	95	0	NA	NA	NA	240
Nitroaniline [4-]	31	31	0.76	95	0	NA	NA	NA	240
Nitrobenzene	31	31	0.31	39	0	NA	NA	NA	5.3
Nitrophenol [2-]	31	31	0.31	39	0	NA	NA	NA	NA
Nitrophenol [4-]	31	31	0.76	95	0	NA	NA	NA	5 000
Nitrosodi-n-propylamine [N-]	31	31	0.31	39	0	NA	NA	NA	0.1
Nitrosodimethylamine [N-]	31	31	0.31	39	0	NA	NA	NA	0.014
Nitrosodiphenylamine [N-]	31	31	0.31	39	0	NA	NA	NA	140
Pentachlorophenol	31	31	0.76	95	0	NA	NA	NA	5.8
Phenanthrene	31	31	0.31	39	0	NA	NA	NA	NA
Phenol	31	31	0.31	39	0	NA	NA	NA	48 000
Propylbenzene	31	25	0.005	7.3	6	3.4	37	NA	NA
Pyrene	31	31	0.31	39	0	NA	NA	NA	2 400
Styrene	31	31	0.005	7.3	0	NA	NA	NA	3 300
Tetrachloroethane [1,1,1,2-]	31	31	0.005	7.3	0	NA	NA	NA	270
Tetrachloroethane [1,1,2,2-]	31	31	0.005	7.3	0	NA	NA	NA	3.9

TABLE A-9 (CONTINUED)

1994 SUMMARY OF NONDETECTED ANALYTES AT DP TANK FARM, SWMU[a] 21-029

ANALYTE	TOTAL NUMBER OF ANALYSES	NUMBER OF NONDETECTS	RANGE OF NONDETECTS		NUMBER OF DETECTS	RANGE OF DETECTS		COMPARISON LEVELS	
			MINIMUM	MAXIMUM		MINIMUM	MAXIMUM	UTL[b]	SAL[c]
ORGANIC ANALYTES (mg/kg)									
Tetrachloroethylene	31	31	0.005	7.3	0	NA	NA	NA	5.9
Toluene	31	23	0.005	7.3	8	4.1	260	NA	910
Trichloro-1,2,2-trifluoroethane [1,1,2-]	31	31	0.005	7.3	0	NA	NA	NA	NA
Trichlorobenzene [1,2,4-]	31	31	0.31	39	0	NA	NA	NA	160
Trichloroethane [1,1,1-]	31	31	0.005	7.3	0	NA	NA	NA	1 000
Trichloroethane [1,1,2-]	31	31	0.005	7.3	0	NA	NA	NA	6.3
Trichloroethene	31	31	0.005	7.3	0	NA	NA	NA	3.2
Trichlorofluoromethane	31	31	0.005	7.3	0	NA	NA	NA	24 000
Trichlorophenol [2,4,5-]	31	31	0.76	95	0	NA	NA	NA	8 000
Trichlorophenol [2,4,6-]	31	31	0.31	39	0	NA	NA	NA	64
Trichloropropane [1,2,3-]	31	31	0.005	7.3	0	NA	NA	NA	480
Trimethylbenzene [1,2,4-]	32	19	0.005	0.031	13	0.051	270	NA	NA
Trimethylbenzene [1,3,5-]	31	19	0.005	0.031	12	2.1	70	NA	32
Vinyl chloride	31	31	0.01	15	0	NA	NA	NA	0.013
Xylenes (o + m + p) [Mixed-]	31	18	0.005	0.031	13	0.009	630	NA	160 000
RADIONUCLIDES (pCi/g)									
Cesium-137	17	0	NA	NA	17	-0.0324	0.606	1.4	4
Uranium-235	11	0	NA	NA	11	0.24	0.58	0.088	18

[a] SWMU = Solid waste management unit.
[b] UTL = Upper tolerance limit.
[c] SAL = Screening action level.
[d] NA = No applicable value is available.

TABLE A-10

BOREHOLE SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

LOCATION ID	BOREHOLE DIAMETER (in.)	TOTAL DEPTH (ft bgs[b])	ASSOCIATED STRUCTURE	SAMPLED INTERVALS (ft bgs)	COMMENTS
21-3002	8.25	35	West fill station	3.9 - 4.4 8.8 - 9.4 13.9 - 14.5 19.2 - 19.8 22.5 - 23.0 29.0 - 29.5 32.0 - 32.5	No unusual events.
21-3003	8.25	45	West fill station	4.0 - 4.6 8.7 - 9.3 13.5 - 14.3 18.5 - 19.2 23.8 - 24.5 28.4 - 29.0 34.0 - 34.7 38.7 - 39.2 44.0 -44.5	No unusual events. Angled borehole drilled at 45-degree angle. Borehole finished at 32 ft bgs (corrected for angle). High total petroleum hydrocarbons concentrations at 19.2 and 24.5 ft bgs.
21-3004	8.25	45	West fill station	3.1 - 3.7 9.1 - 9.6 13.8 - 14.3 17.0 - 17.5 23.5 - 24.2 28.7 - 29.3 33.9 - 34.4 38.5 - 39.0 42.5 - 43.0	No unusual events. Approximately 7.5 ft of fill and soil overlying tuff. Horizontal partings and fractures common in tuff.
21-3005	8.25	35	West fill station	3.8 - 4.3 8.4 - 9.2 13.6 - 14.1 18.9 - 19.3 22.0 - 23.0 29.0 - 29.5 34.0 - 34.5	No unusual events. Low-angle fracturing in upper 10 ft. High-angle, clay-lined fractures near 31.0 ft bgs.
21-3006	8.25	65	East fill station	4.0 - 4.8 9.3 - 9.8 14.0 - 14.5 19.0 - 19.5 24.0 - 24.5 29.3 - 29.5 34.0 - 34.5 39.0 - 39.5 43.4 - 43.9 49.0 - 49.5 54.1 - 54.5 57.0 - 57.3 59.4 - 59.7 64.2 - 64.5	Petroleum odors noted to 45 ft bgs. High BTEX (benzene, toluene, ethylbenzene, and xylenes) concentrations to 25 ft bgs and high total petroleum hydrocarbons to 35 ft bgs. Numerous horizontal and low-angle fractures noted throughout borehole.

TABLE A-10 (CONTINUED)

BOREHOLE SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

LOCATION ID	BOREHOLE DIAMETER (in.)	TOTAL DEPTH (ft bgs[b])	ASSOCIATED STRUCTURE	SAMPLED INTERVALS (ft bgs)	COMMENTS
21-3007	8.25	50	East fill station	4.0 - 4.8 9.0 - 9.8 14.3 - 14.8 19.0 - 19.5 24.0 - 24.8 29.2 - 29.7 34.2 - 34.6 39.2 - 39.6 44.0 - 44.7 48.7 - 49.1	No unusual events.
21-3008	8.25	50	East fill station	3.0 - 3.5 6.2 - 6.8 8.8 - 9.4 13.8 - 14.2 18.5 - 19.1 24.0 - 24.5 29.0 - 29.5 34.0 - 34.5 38.4 - 39.0 43.8 - 44.2 49.1 - 49.6	Angled borehole drilled at 45-degree angle. Strong petroleum odors noted. Numerous horizontal fractures between 30.0 and 32.5 ft bgs. Highly fractured 47.0 to 50.0 ft bgs. Total BTEX (benzene, toluene, ethylbenzene, and xylenes) concentrations up to 550 parts per million (at 14.2 ft). High total petroleum hydrocarbons concentrations (greater than 3 300 parts per million).
21-3009	8.25	17.5	East fill station	4.3 - 4.9 8.8 - 9.3 14.3 - 14.6	Drilling terminated when obvious contamination encountered. Moved rig 20 ft south to 21-3012. High total petroleum hydrocarbons concentrations.
21-3010	8.25	35	East fill station	4.0 - 4.7 9.0 - 9.5 13.5 - 14.0 19.0 - 19.4 23.7 - 24.4 26.8 - 27.6 33.5 - 34.0	No unusual events. Tuff disaggregated or broken along narrowly-spaced horizontal partings.
21-3011	8.25	40	East fill station	3.2 - 3.7 8.4 - 8.9 13.1 - 13.6 19.0 - 19.3 23.6 - 24.4 29.0 - 29.4 33.5 - 34.4 39.0 - 39.5	High total petroleum hydrocarbons concentrations at 19.3 and 24.4 ft bgs. Horizontal to high-angle fractures throughout borehole.

TABLE A-10 (CONTINUED)

BOREHOLE SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

LOCATION ID	BOREHOLE DIAMETER (in.)	TOTAL DEPTH (ft bgs[b])	ASSOCIATED STRUCTURE	SAMPLED INTERVALS (ft bgs)	COMMENTS
21-3012	8.25	55	East fill station	3.2 - 3.6 8.6 - 9.2 14.0 - 14.7 16.7 - 17.3 23.8 - 24.6 26.3 - 26.8 33.9 - 34.7 38.9 - 39.4 43.0 - 43.5 49.0 - 49.5 54.0 - 54.5	No unusual events. Drilled to 55 ft to compensate for additional elevation.
21-3013	8.25	35	East fill station	3.5 - 4.2 8.4 - 9.1 14.0 - 14.5 18.8 - 19.4 24.0 - 24.5 29.0 - 29.5 32.7 - 33.2	No unusual events
21-3014	8.25	35	West fill station	3.8 - 4.5 8.4 - 9.0 13.7 - 14.4 18.5 - 19.2 21.4 - 22.0 29.0 - 29.5 31.5 - 32.0	No unusual events. Fractured zones at 14.0 to 15.0 ft bgs and 26.0 to 26.5 ft bgs.

[a] SWMU = Solid waste management unit.
[b] bgs = Below ground surface.

TABLE A-11

SUMMARY TABLE OF QUALITY CONTROL RESULTS FOR MCAL[a] DATA COLLECTED DURING THE 1995 UST INVESTIGATION AT DP TANK FARM, SWMU 21-029

MCAL SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	QUALITY CONTROL (QC) COMMENTS
0121-95-0041	Soil	TPH/Diesel[b]	TPH qualified "J" or "UJ"[c] for approximate values. All "greater than" values are qualified "J."
0121-95-0041	Soil	VOCs[d]	Method blank contained acetone (48µg/L) and 2-butanone (150 µg/L). All data are valid.
0121-95-0042	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0042	Soil	VOCs	High surrogate recoveries for toluene-d8 (173%). All detected data qualified "J." Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L).
0121-95-0043	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0043	Soil	VOCs	Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L). All data are valid.
0121-95-0044	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0044	Soil	VOCs	Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L). All data are valid.
0121-95-0045	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0045	Soil	VOCs	Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L). All data are valid.
0121-95-0046	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0046	Soil	VOCs	Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L). All data are valid.
0121-95-0047	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0047	Soil	VOCs	Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L). All data are valid.
0121-95-0048	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0048	Soil	VOCs	Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L). All data are valid.
0121-95-0121	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0121	Soil	VOCs	Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L). All data are valid.
0121-95-0122	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0122	Soil	VOCs	Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L). All data are valid.
0121-95-0123	Soil	TPH/Diesel	TPH qualified "J" or "UJ" for approximate values.
0121-95-0123	Soil	VOCs	Method blank contained acetone (98µg/L) and 2-butanone (17 µg/L). All data are valid.
0121-95-0049	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.

TABLE A-11 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL RESULTS FOR MCAL[a] DATA COLLECTED DURING THE 1995 UST INVESTIGATION AT DP TANK FARM, SWMU 21-029

MCAL SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	QUALITY CONTROL (QC) COMMENTS
0121-95-0050	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0051	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0052	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0053	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0054	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0055	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0056	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0114	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0127	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0129	Soil	VOCs	Method blank contained acetone (46 µg/L) and 2-butanone (156 µg/L). All data are valid.
0121-95-0057	Soil	VOCs	Internal standards above allowed limits. All data qualified "J" or "UJ." Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0058	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0058	Soil	VOCs	Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0059	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0059	Soil	VOCs	Internal standards above allowed limits. All data qualified "J" or "UJ." Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0060	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0060	Soil	VOCs	Internal standards above allowed limits. All data qualified "J" or "UJ." Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0061	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0061	Soil	VOCs	Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0062	Soil	VOCs	Internal standards above allowed limits. All data qualified "J" or "UJ." Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0074	Soil	VOCs	Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0076	Soil	VOCs	Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0077	Soil	VOCs	Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0078	Soil	VOCs	Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0079	Soil	VOCs	Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).

TABLE A-11 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL RESULTS FOR MCAL[a] DATA COLLECTED DURING THE 1995 UST INVESTIGATION AT DP TANK FARM, SWMU 21-029

MCAL SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	QUALITY CONTROL (QC) COMMENTS
0121-95-0080	Soil	VOCs	Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0130	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0130	Soil	VOCs	Internal standards above allowed limits. All data qualified "J" or "UJ." Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0131	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0131	Soil	VOCs	Internal standards above allowed limits. All data qualified "J" or "UJ." Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L).
0121-95-0063	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0063	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0064	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0064	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0075	Soil	VOCs	Method blank contained acetone (8 µg/L) and 2-butanone (53 µg/L). This sample was collected on May 22, 1995 and analyzed on May 23, 1995.
0121-95-0082	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0082	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0083	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0083	Soil	VOCs	Surrogate toluene-d8 had high recovery (131%). No analytes were detected above blank levels in the sample; therefore, no data are qualified. Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0084	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0084	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0085	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J." All "greater than" values are qualified "J."
0121-95-0085	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0086	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J." All greater values than are qualified "J."
0121-95-0086	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0087	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0087	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0088	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."

TABLE A-11 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL RESULTS FOR MCAL[a] DATA COLLECTED DURING THE 1995 UST INVESTIGATION AT DP TANK FARM, SWMU 21-029

MCAL SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	QUALITY CONTROL (QC) COMMENTS
0121-95-0088	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0089	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0089	Soil	VOCs	Surrogate toluene-d8 had high recovery (131%). No analytes were detected above blank levels in the sample; therefore, no data are qualified. Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0115	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0115	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0132	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0132	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0133	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0133	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0135	Soil	TPH/Diesel	Performance sample recovery high for diesel (125%) and TPH (146%). Detected data are qualified "J."
0121-95-0135	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0065	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0066	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0090	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0091	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0092	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0093	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0094	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0095	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0096	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0097	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0136	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0137	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0138	Soil	VOCs	Method blank contained acetone (42 µg/L) and 2-butanone (82 µg/L).
0121-95-0008	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0009	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0010	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0011	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).

TABLE A-11 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL RESULTS FOR MCAL[a] DATA COLLECTED DURING THE 1995 UST INVESTIGATION AT DP TANK FARM, SWMU 21-029

MCAL SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	QUALITY CONTROL (QC) COMMENTS
0121-95-0012	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0067	Soil	VOCs	High surrogate recovery for toluene-d8 (123%). Because of the high recovery, all detects are qualified "J." Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0098	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0099	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0100	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0101	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0102	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0104	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0105	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0139	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0140	Soil	VOCs	Method blank contained acetone (44 µg/L) and 2-butanone (119 µg/L).
0121-95-0032	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (76 µg/L).
0121-95-0033	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (76 µg/L).
0121-95-0034	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (76 µg/L).
0121-95-0035	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (76 µg/L).
0121-95-0036	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (76 µg/L).
0121-95-0037	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (76 µg/L).
0121-95-0038	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (76 µg/L).
0121-95-0039	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (76 µg/L).
0121-95-0015	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0015	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0016	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0016	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0017	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J." All "greater than" values are qualified "J."
0121-95-0017	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0018	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J." All "greater than" values are qualified "J."
0121-95-0018	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0019	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."

TABLE A-11 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL RESULTS FOR MCAL[a] DATA COLLECTED DURING THE 1995 UST INVESTIGATION AT DP TANK FARM, SWMU 21-029

MCAL SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	QUALITY CONTROL (QC) COMMENTS
0121-95-0020	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0020	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0021	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0021	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0022	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0022	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0023	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0023	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0024	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0024	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0025	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0025	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0116	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0116	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0124	Soil	VOCs	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J." This sample was collected on May 19, 1995 and analyzed on May 30, 1995.
0121-95-0125	Soil	VOCs	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J." This sample was collected on May 19, 1995 and analyzed on May 30, 1995.
0121-95-0126	Soil	VOCs	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J." This sample was collected on May 19, 1995 and analyzed on May 30, 1995.
0121-95-0141	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J."
0121-95-0141	Soil	VOCs	Method blank contained acetone (99 µg/L) and 2-butanone (51 µg/L).
0121-95-0019	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L). This sample was collected on May 30, 1995 and analyzed on May 31, 1995.
0121-95-0026	Soil	TPH/Diesel	Performance sample recovery high for diesel (122%) and TPH (134%). Detected data are qualified "J." This sample was collected on May 30, 1995 and analyzed on May 31, 1995.

TABLE A-11 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL RESULTS FOR MCAL[a] DATA COLLECTED DURING THE 1995 UST INVESTIGATION AT DP TANK FARM, SWMU 21-029

MCAL SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	QUALITY CONTROL (QC) COMMENTS
0121-95-0026	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L). This sample was collected on May 30, 1995 and analyzed on May 31, 1995.
0121-95-0027	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0028	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0029	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0030	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0031	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0117	Water	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0160	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0161	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0162	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0163	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0164	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0165	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0168	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0169	Soil	VOCs	Method blank contained acetone (20 µg/L) and 2-butanone (67 µg/L).
0121-95-0118	Water	VOCs	Method blank contained acetone (36 µg/L) and 2-butanone (106 µg/L).
0121-95-0171	Soil	VOCs	Method blank contained acetone (36 µg/L) and 2-butanone (106 µg/L).
0121-95-0172	Soil	VOCs	Method blank contained acetone (36 µg/L) and 2-butanone (106 µg/L).
0121-95-0173	Soil	VOCs	Method blank contained acetone (36 µg/L) and 2-butanone (106 µg/L).
0121-95-0174	Soil	VOCs	Method blank contained acetone (36 µg/L) and 2-butanone (106 µg/L).
0121-95-0243	Soil	VOCs	Method blank contained acetone (36 µg/L) and 2-butanone (106 µg/L).
0121-95-0244	Soil	VOCs	Method blank contained acetone (36 µg/L) and 2-butanone (106 µg/L).
0121-95-0245	Soil	VOCs	Method blank contained acetone (36 µg/L) and 2-butanone (106 µg/L).
0121-95-0218	Soil	VOCs	High surrogate recovery (131%). There were no detects above blank levels; therefore, the data are not affected. Method blank contained acetone (15 µg/L) and 2-butanone (228 µg/L).
0121-95-0219	Soil	VOCs	High surrogate recovery (171%). There were no detects above blank levels; therefore, the data are not affected. Method blank contained acetone (15 µg/L) and 2-butanone (228 µg/L).
0121-95-0220	Soil	VOCs	Method blank contained acetone (15 µg/L) and 2-butanone (228 µg/L).
0121-95-0221	Soil	VOCs	Method blank contained acetone (15 µg/L) and 2-butanone (228 µg/L).
0121-95-0223	Soil	VOCs	Method blank contained acetone (15 µg/L) and 2-butanone (228 µg/L).
0121-95-0224	Soil	VOCs	Method blank contained acetone (15 µg/L) and 2-butanone (228 µg/L).
0121-95-0225	Soil	VOCs	Method blank contained acetone (15 µg/L) and 2-butanone (228 µg/L).

TABLE A-11 (CONTINUED)

SUMMARY TABLE OF QUALITY CONTROL RESULTS FOR MCAL[a] DATA COLLECTED DURING THE 1995 UST INVESTIGATION AT DP TANK FARM, SWMU 21-029

MCAL SAMPLE ID	SAMPLE TYPE	ANALYTE SUITE	QUALITY CONTROL (QC) COMMENTS
0121-95-0226	Soil	VOCs	Method blank contained acetone (15 µg/L) and 2-butanone (228 µg/L).
0121-95-0185	Soil	VOCs	Method blank contained acetone (28 µg/L) and 2-butanone (82 µg/L).
0121-95-0186	Soil	VOCs	Method blank contained acetone (28 µg/L) and 2-butanone (82 µg/L).
0121-95-0187	Soil	VOCs	Method blank contained acetone (28 µg/L) and 2-butanone (82 µg/L).
0121-95-0228	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0228	Soil	VOCs	Method blank contained acetone (28 µg/L) and 2-butanone (82 µg/L).
0121-95-0229	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0229	Soil	VOCs	Method blank contained acetone (28 µg/L) and 2-butanone (82 µg/L).
0121-95-0233	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0233	Soil	VOCs	Method blank contained acetone (28 µg/L) and 2-butanone (82 µg/L).
0121-95-0234	Soil	TPH/Diesel	All "greater than" values are qualified "J."
0121-95-0234	Soil	VOCs	Method blank contained acetone (28 µg/L) and 2-butanone (82 µg/L).
0121-95-0247	Soil	VOCs	Method blank contained acetone (28 µg/L) and 2-butanone (82 µg/L).

[a] MCAL = Mobile chemistry analytical laboratory.
[b] TPH/Diesel = Total petroleum hydrocarbons /diesel analysis.
[c] "J" = Estimated detected uantities; "UJ" = Estimated undetected quantities.
[d] VOCs = Volatile organic compounds.

TABLE A-12

PID[a] AND COMBUSTIBLE GAS FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[b] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs[c])	PID READINGS			COMBUSTIBLE GAS MONITORING DATA	
			BREATHING ZONE (ppm[d])	HEADSPACE (ppm)	CORE (ppm)	% LEL[e]	% OXYGEN
5/17/95	21-3006	2.5	0.0	NM[f]	0.0	–	–
5/17/95		5.0	0.0	0.0	510	–	–
5/17/95		7.5	0.0	NM	710	–	–
5/17/95		10.0	20.5	8400	970	–	–
5/17/95		12.5	21.5	NM	1356	–	–
5/18/95		15.0	–	331	365	0	20.5
5/18/95		17.5	–	NM	580	5	20.5
5/18/95		20.0	–	NM	493	4	20.5
5/18/95		22.5	–	NM	585	10	20.5
5/18/95		25.0	–	702	498	–	–
5/18/95		27.5	–	NM	298	–	–
5/18/95		30.0	–	98	316	–	–
5/18/95		35.0	–	395	220	–	–
5/18/95		40.0	–	319	210	–	–
5/18/95		45.0	–	133	43	–	–
5/18/95		47.5	–	NM	16.9	–	–
5/18/95		50.0	–	2.7	1.1	–	–
5/18/95		52.5	–	NM	3.3	–	–
5/18/95		55.0	–	4.0	2.4	–	–
5/19/95		57.5	0.0	0.0	0	0	21
5/19/95		60.0	–	0.0	0	–	–
5/19/95		62.5	0.0	NM	0	–	–
5/19/95		65.0	–	0.0	0	–	–
5/19/95	21-3007	2.5	0.0	NM	0	–	–
5/19/95		5.0	–	0.0	0	–	–
5/19/95		10.0	–	0.0	0	–	–
5/19/95		15.0	–	0.0	0	–	–
5/19/95		20.0	0.0	0.0	0	–	–
5/19/95		25.0	–	0.0	0	–	–
5/19/95		30.0	0.0	155	38	–	–
5/19/95		35.0	0.0	206	105	–	–
5/19/95		37.5	–	NM	16.1	0	21
5/19/95		40.0	–	1.2	0.8		

TABLE A-12 (CONTINUED)

PID[a] AND COMBUSTIBLE GAS FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[b] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs[c])	PID READINGS			COMBUSTIBLE GAS MONITORING DATA	
			BREATHING ZONE (ppm[d])	HEADSPACE (ppm)	CORE (ppm)	% LEL[e]	% OXYGEN
5/19/95	21-3007	42.5	–	NM	0	–	–
5/19/95		45.0	0.0	0.0	0	–	–
5/19/95		47.5	–	NM	0	–	–
5/19/95		50.0	0.0	0.0	0	–	–
5/22/95	21-3010	2.5	0.0	NM	0	–	–
5/22/95		5.0	–	0.6	0	–	–
5/22/95		10.0	0.0	1.9	0	–	–
5/22/95		15.0	0.0	0.6	0	–	–
5/22/95		17.5	–	NM	0	–	–
5/22/95		20.0	–	0.3	0	–	–
5/22/95	21-3010	22.5	0.0	NM	0	–	–
5/22/95		25.0	–	0.3	0	–	–
5/22/95		30.0	0.0	0.3	0	–	–
5/22/95		32.5	–	NM	0	–	–
5/22/95		35.0	–	0.0	0	–	–
5/22/95	21-3008	2.5	0.0	NM	0	–	–
5/22/95		5.0	–	53	0.3	–	–
5/22/95		7.5	0.0	NM	364	–	–
5/22/95		10.0	0.0	1853	774	–	–
5/22/95		15.0	0.0	NM	179	–	–
5/22/95		17.5	–	NM	180	–	–
5/22/95		20.0	0.0	NM	308	–	–
5/22/95		25.0	0.2	NM	1350	–	–
5/22/95		30.0	0.0	NM	538	–	–
5/23/95		32.5	0.0	NM	241	–	–
5/23/95		35.0	0.0	517	93	–	–
5/23/95		40.0	–	47	74	–	–
5/23/95		45.0	0.0	4.9	51	–	–
5/23/95		50.0	0.2	13	72	–	–
5/23/95	21-3011	2.5	0.0	NM	0.3	–	–
5/23/95		5.0	–	91	0.8	–	–
5/23/95		10.0	–	210	50	–	–
5/23/95		15.0	0.0	57	–	–	–

TABLE A-12 (CONTINUED)

PID[a] AND COMBUSTIBLE GAS FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[b] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs[c])	PID READINGS			COMBUSTIBLE GAS MONITORING DATA	
			BREATHING ZONE (ppm[d])	HEADSPACE (ppm)	CORE (ppm)	% LEL[e]	% OXYGEN
5/23/95	21-3011	20.0	0.0	665	–	–	–
5/23/95		25.0	0.2	560	–	–	–
5/23/95		30.0	–	227	–	–	–
5/23/95		35.0	–	121	–	–	–
5/24/95	21-3009	2.5	0.0	NM	0.0	–	–
5/24/95		5.0	–	290	70	–	–
5/24/95		10.0	0.0	1098	138	–	–
5/24/95		15.0	–	NM	358	–	–
5/24/95		17.5	0.0	NM	250	–	–
5/24/95	21-3012	2.5	0.0	NM	0.0	–	–
5/24/95		5.0	–	0.1	0.0	–	–
5/24/95		7.5	–	NM	0.0	–	–
5/24/95		10.0	0.0	0.0	0.0	–	–
5/24/95		12.5	–	NM	0.0	–	–
5/24/95		15.0	0.0	0.0	0.0	–	–
5/24/95		20.0	–	0.0	0.0	–	–
5/24/95		22.5	–	NM	0.0	–	–
5/24/95		25.0	–	0.0	0.0	–	–
5/24/95		30.0	0.0	0.0	0.0	–	–
5/24/95		32.5	–	NM	0.0	–	–
5/24/95		35.0	0.0	0.0	0.0	–	–
5/24/95		40.0	–	0.0	0.0	–	–
5/24/95		45.0	–	0.0	0.0	–	–
5/24/95	21-3012	47.5	–	NM	0.0	–	–
5/24/95		50.0	0.0	NM	0.0	–	–
5/24/95		52.5	–	NM	0.0	–	–
5/24/95		55.0	–	NM	0.0	–	–
5/25/95	21-3013	2.5	0.0	NM	0.0	–	–
5/25/95		5.0	–	0.0	0.0	–	–
5/25/95		10.0	0.0	0.1	0.0	–	–
5/25/95		15.0	–	0.0	0.0	–	–
5/25/95		20.0	–	0.0	0.0	–	–
5/25/95		22.5	0.0	NM	0.0	–	–

TABLE A-12 (CONTINUED)

PID[a] AND COMBUSTIBLE GAS FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[b] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs[c])	PID READINGS			COMBUSTIBLE GAS MONITORING DATA	
			BREATHING ZONE (ppm[d])	HEADSPACE (ppm)	CORE (ppm)	% LEL[e]	% OXYGEN
5/25/95	21-3013	25.0	–	0.1	0.0	–	–
5/25/95		30.0	–	NM	0.0	–	–
5/25/95		35.0	0.0	NM	0.0	–	–
5/25/95	21-3002	2.5	–	NM	0.0	–	–
5/25/95		5.0	0.0	0.0	0.0	–	–
5/25/95		7.5	–	NM	0.0	–	–
5/25/95		10.0	0.0	0.1	0.0	–	–
5/25/95		15.0	–	0.0	0.0	–	–
5/25/95		20.0	0.0	0.0	0.0	–	–
5/25/95		25.0	0.0	0.0	0.0	–	–
5/25/95		27.5		NM	0.0	–	–
5/25/95		30.0	0.0	NM	0.0	–	–
5/25/95		35.0	–	NM	0.0	–	–
5/26/95	21-3005	2.5	0.0	NM	0.0	–	–
5/26/95		5.0	–	0.0	0.0	–	–
5/26/95		10.0	0.0	0.1	0.0	–	–
5/26/95		15.0	–	0.0	0.0	–	–
5/26/95		20.0	–	0.0	0.0	–	–
5/26/95		25.0	0.0	0.1	0.0	–	–
5/26/95		30.0	–	NM	0.0	–	–
5/26/95		35.0	0.0	NM	0.0	–	–
5/30/95	21-3003	2.5	0.0	NM	0	–	–
5/30/95		5.0	–	0.0	0	–	–
5/30/95		7.5	0.0	NM	0	–	–
5/30/95		10.0	–	0.0	0	–	–
5/30/95		12.5	–	NM	0	–	–
5/30/95		15.0	0.0	165	7.8	–	–
5/30/95		17.5	–	NM	39.4	–	–
5/30/95		20.0	0.0	181	52	–	–
5/30/95		22.5	0.0	NM	23.6	–	–
5/30/95		25.0	–	13	0.0	–	–
5/30/95		27.5	0.0	NM	0.0	–	–
5/30/95		30.0	–	0.0	0.0	–	–
5/30/95		32.5	–	NM	0.0	–	–
5/30/95		35.0	0.0	0.0	0.0	–	–
5/30/95	21-3003	37.5	–	NM	0.0	–	–
5/30/95		40.0	0.0	NM	0.0	–	–

TABLE A-12 (CONTINUED)

PID[a] AND COMBUSTIBLE GAS FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[b] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs[c])	PID READINGS			COMBUSTIBLE GAS MONITORING DATA	
			BREATHING ZONE (ppm[d])	HEADSPACE (ppm)	CORE (ppm)	% LEL[e]	% OXYGEN
5/30/95	21-3003	45.0	–	NM	0.0	–	–
5/30/95	21-3004	2.5	–	NM	0.0	–	–
5/30/95		5.0	0.0	0.0	0.0	–	–
5/30/95		7.5	–	NM	0.0	–	–
5/30/95		10.0	–	0.0	0.0	–	–
5/30/95		15.0	0.0	0.0	0.0	–	–
5/30/95		20.0	–	0.0	0.0	–	–
5/31/95		22.5	0.0	NM	0.0	–	–
5/31/95		25.0	–	0.0	0.0	–	–
5/31/95		27.5	–	NM	0.0	–	–
5/31/95		30.0	0.0	0.3	0.0	–	–
5/31/95		35.0	–	0.0	0.0	–	–
5/31/95		40.0	–	NM	0.0	–	–
5/31/95		45.0	0.0	NM	0.0	–	–
5/31/95	21-3014	2.5	0.0	NM	0.0	–	–
5/31/95		5.0	–	0.0	0.0	–	–
5/31/95		10.0	0.0	0.0	0.0	–	–
5/31/95		15.0	0.0	0.0	0.0	–	–
5/31/95		20.0	–	0.0	0.0	–	–
5/31/95		25.0	0.0	0.0	0.0	–	–
5/31/95		27.5	–	NM	0.0	–	–
5/31/95		30.0	0.0	NM	0.0	–	–
5/31/95		35.0	–	NM	0.0	–	–

[a] PID = Photoionization detector.
[b] SWMU = Solid waste management unit.
[c] bgs = Below ground surface.
[d] ppm = Parts per million.
[e] LEL = Lower explosive limit.
[f] NM = No measurement.

TABLE A-13

RADIATION MONITORING FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs)	DIRECT β/γ READING (cpm[c])	DAILY BACKGROUND β/γ[b] (cpm)	DIRECT α READING (cpm)	DAILY BACKGROUND α[b] (cpm)
5/17/95	21-3006	2.5	249	202	0.0	0.6
5/17/95		5	250		0.0	
5/17/95		7.5	245		0.0	
5/17/95		10	250		0.0	
5/17/95		12.5	240		0.0	
5/18/95		15	156	179	NM[d]	0.5
5/18/95		17.5	210		NM	
5/18/95		20	167		NM	
5/18/95		22.5	210		NM	
5/18/95		25	238		NM	
5/18/95		27.5	230		NM	
5/18/95		30	220		NM	
5/18/95		35	210		NM	
5/18/95		40	220		NM	
5/18/95		44	280		NM	
5/18/95		47.5	170		NM	
5/18/95		50	220		NM	
5/18/95		52.5	230		NM	
5/18/95		55	238		NM	
5/19/95		57.5	222	179	0.0	0.4
5/19/95		60	145		0.0	
5/19/95		62.5	240		0.0	
5/19/95		65	178		0.0	
5/19/95	21-3007	2.5	127		0.0	
5/19/95		5	180		0.0	
5/19/95		7.5	172		0.0	
5/19/95		10	171		0.0	
5/19/95		12.5	173		0.0	
5/19/95		15	184		0.0	
5/19/95		20	190		0.0	
5/19/95		25	163		0.0	
5/19/95		30	179		0.0	
5/19/95		35	212		0.0	
5/19/95		40	186		0.0	
5/19/95		42.5	134		0.0	

TABLE A-13 (CONTINUED)

RADIATION MONITORING FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs)	DIRECT β/γ READING (cpm[c])	DAILY BACKGROUND β/γ[b] (cpm)	DIRECT α READING (cpm)	DAILY BACKGROUND α[b] (cpm)
5/19/95	21-3007	45	207	179	0.0	0.4
5/19/95		47.5	214		0.0	
5/19/95		50	170		0.0	
5/22/95	21-3010	5	165	184	0.0	1.0
5/22/95		10	203		0.0	
5/22/95		15	199		0.0	
5/22/95		20	167		0.0	
5/22/95		22.5	198		0.0	
5/22/95		25	194		0.0	
5/22/95		27.5	204		0.0	
5/22/95		30	195		0.0	
5/22/95		32.5	160		0.0	
5/22/95		35	193		0.0	
5/22/95	21-3008	2.5	190		0.0	
5/22/95		5	181		0.0	
5/22/95		7.5	140		0.0	
5/22/95		10	183		0.0	
5/22/95		15	185		0.0	
5/22/95		17.5	170		0.0	
5/22/95		20	205		0.0	
5/22/95		25	188		0.0	
5/22/95		30	164		0.0	
5/23/95		32.5	174	179	0.0	1.2
5/23/95		35	201		0.0	
5/23/95		40	185		0.0	
5/23/95		45	172		0.0	
5/23/95		50	180		0.0	
5/23/95	21-3011	2.5	149		0.0	
5/23/95		5	182		0.0	
5/23/95		10	160		0.0	
5/23/95		15	187		0.0	
5/23/95		20	220		0.0	
5/23/95		25	192		0.0	
5/23/95		30	203		0.0	

TABLE A-13 (CONTINUED)

RADIATION MONITORING FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs)	DIRECT β/γ READING (cpm[c])	DAILY BACKGROUND β/γ[b] (cpm)	DIRECT α READING (cpm)	DAILY BACKGROUND α[b] (cpm)
5/23/95	21-3011	35	220	179	0.0	1.2
5/23/95		40	144		0.0	
5/24/95	21-3009	2.5	176	178	0.0	1.0
5/24/95		5	187		0.0	
5/24/95		10	203		0.0	
5/24/95		15	180		0.0	
5/24/95		17.5	185		0.0	
5/24/95	21-3012	2.5	139	178	0.0	1.0
5/24/95		5	200		0.0	
5/24/95		7.5	193		0.0	
5/24/95		10	183		0.0	
5/24/95		12.5	193		0.0	
5/24/95		15	196		0.0	
5/24/95		20	208		0.0	
5/24/95		22.5	190		0.0	
5/24/95		25	198		0.0	
5/24/95		30	185		0.0	
5/24/95		32.5	116		0.0	
5/24/95		35	167		0.0	
5/24/95		40	192		0.0	
5/24/95		45	202		0.0	
5/24/95		47.5	163		0.0	
5/24/95		50	205		0.0	
5/24/95		52.5	203		0.0	
5/24/95		55	200		0.0	
5/25/95	21-3013	2.5	184	182	0.0	1.0
5/25/95		5	167		0.0	
5/25/95		10	198		0.0	
5/25/95		15	175		0.0	
5/25/95		20	205		0.0	
5/25/95		22.5	191		0.0	
5/25/95		25	219		0.0	
5/25/95		30	190		0.0	
5/25/95		35	178		0.0	

TABLE A-13 (CONTINUED)

RADIATION MONITORING FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs)	DIRECT β/γ READING (cpm[c])	DAILY BACKGROUND β/γ[b] (cpm)	DIRECT α READING (cpm)	DAILY BACKGROUND α[b] (cpm)
5/25/95	21-3002	2.5	171	182	0.0	1.0
5/25/95		5	166		0.0	
5/25/95		7.5	190		0.0	
5/25/95		10	185		0.0	
5/25/95		15	201		0.0	
5/25/95		20	185		0.0	
5/25/95		25	212		0.0	
5/25/95		27.5	188		0.0	
5/25/95		30	208		0.0	
5/25/95		35	212		0.0	
5/26/95	21-3005	2.5	180	180	0.0	1.0
5/26/95		5	173		0.0	
5/26/95		10	187		0.0	
5/26/95		15	165		0.0	
5/26/95		20	167		0.0	
5/26/95		25	173		0.0	
5/26/95		30	185		0.0	
5/26/95		35	189		0.0	
5/27/95	21-3003	2.5	175	180	0.0	1.0
5/27/95		5	162		0.0	
5/27/95		7.5	175		0.0	
5/27/95		10	203		0.0	
5/27/95		12.5	186		0.0	
5/27/95		15	171		0.0	
5/27/95		17.5	178		0.0	
5/27/95		20	151		0.0	
5/27/95		22.5	194		0.0	
5/27/95		25	191		0.0	
5/27/95		27.5	195		0.0	
5/27/95		30	185		0.0	
5/27/95		32.5	190		0.0	
5/27/95		35	178		0.0	
5/27/95		37.5	191		0.0	
5/27/95		40	189		0.0	
5/27/95		45	187		0.0	

TABLE A-13 (CONTINUED)

RADIATION MONITORING FIELD SCREENING DATA SUMMARY FOR THE 1995 INVESTIGATION AT DP TANK FARM, SWMU[a] 21-029

SCREENING DATE	BOREHOLE NUMBER	DRILLING DEPTH (ft bgs)	DIRECT β/γ READING (cpm[c])	DAILY BACKGROUND β/γ[b] (cpm)	DIRECT α READING (cpm)	DAILY BACKGROUND α[b] (cpm)
5/27/95	21-3004	2.5	179	180	0.0	1.0
5/27/95		5	182		0.0	
5/27/95		7.5	172		0.0	
5/27/95		10	189		0.0	
5/27/95		15	190		0.0	
5/27/95		20	182		0.0	
5/31/95		22.5	150	179	0.0	1.0
5/31/95		25.0	176		0.0	
5/31/95		27.5	181		0.0	
5/31/95		30.0	176		0.0	
5/31/95		35.0	179		0.0	
5/31/95		40.0	193		0.0	
5/31/95		45.0	189		0.0	
5/31/95	21-3014	2.5	178	179	0.0	1.0
5/31/95		5.0	185		0.0	
5/31/95		10.0	187		0.0	
5/31/95		15.0	189		0.0	
5/31/95		20.0	175		0.0	
5/31/95		25.0	187		0.0	
5/31/95		27.5	176		0.0	
5/31/95		30.0	182		0.0	
5/31/95		35.0	187		0.0	

[a] SWMU = Solid waste management unit.
[b] The values shown are the mean daily background.
[c] cpm = Counts per minute.
[d] NM = No measurement.

TABLE A-14

1995 ANALYTICAL RESULTS FOR WEST FILL STATION SAMPLES AT DP TANK FARM, SWMU[a] 21-029[b]

LOCATION ID	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)								
		2-BUTANONE	ACETONE	BENZENE	DIESEL	ETHYLBENZENE	m+p-XYLENE	o-XYLENE	TOLUENE	TPH[c]
21-3002	0121-95-0008	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0009	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0010	4.995	<0.2	0.523	<200	<0.05	<0.05	<0.05	0.235	<50
	0121-95-0011	3.831	<0.2	0.594	<200	<0.05	<0.05	<0.05	0.272	<50
	0121-95-0012	6.434	<0.2	0.611	<200	<0.05	<0.05	<0.05	0.275	<50
	0121-95-0139	4.388	<0.2	0.605	<200	<0.05	<0.05	<0.05	0.269	<50
	0121-95-0140	3.929	<0.2	0.561	<200	<0.05	<0.05	<0.05	0.26	<50
21-3003	0121-95-0015	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0016	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0017	<0.2	<0.2	<0.05	578	<0.05	<0.05	<0.05	<0.05	>600
	0121-95-0018	<0.2	<0.2	<0.05	647	<0.05	<0.05	<0.05	<0.05	>670
	0121-95-0019	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0020	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0021	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0022	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0141	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
21-3004	0121-95-0023	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0024	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0025	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0026	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0027	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0028	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10

TABLE A-14 (CONTINUED)

1995 ANALYTICAL RESULTS FOR WEST FILL STATION SAMPLES AT DP TANK FARM, SWMU[a] 21-029[b]

LOCATION ID	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)								
		2-BUTANONE	ACETONE	BENZENE	DIESEL	ETHYLBENZENE	m+p-XYLENE	o-XYLENE	TOLUENE	TPH[c]
21-3004	0121-95-0029	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0030	<0.4	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0031	<0.4	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
21-3005	0121-95-0032	7.723	<0.2	0.53	<200	<0.05	<0.05	<0.05	0.191	<10
	0121-95-0033	2.78	<0.2	0.609	<200	<0.05	<0.05	<0.05	0.223	<10
	0121-95-0034	4.322	<0.2	0.654	<200	<0.05	<0.05	<0.05	0.234	<10
	0121-95-0035	3.374	<0.2	0.648	<200	<0.05	<0.05	<0.05	0.243	<50
	0121-95-0036	4.88	<0.2	0.704	<200	<0.05	<0.05	<0.05	0.258	<50
	0121-95-0037	4.797	<0.2	0.702	<200	<0.05	<0.05	<0.05	0.264	<50
	0121-95-0038	4.917	<0.2	0.607	<200	<0.05	<0.05	<0.05	0.234	<50
	0121-95-0039	3.954	<0.2	0.668	<200	<0.05	<0.05	<0.05	0.259	<10
21-3014	0121-95-0160	<0.3	<0.2	<0.08	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0161	<0.5	<0.2	<0.08	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0162	<0.4	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0163	<0.6	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0164	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0165	<0.5	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0168	<0.3	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0169	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10

[a] SWMU = Solid waste management unit.
[b] All 1995 analyses were performed in the Mobile Chemistry Analytical Laboratory.
[c] TPH = Total petroleum hydrocarbons.

TABLE A-15

1995 ANALYTICAL RESULTS FOR EAST FILL STATION SAMPLES AT DP TANK FARM, SWMU[a] 21-029[b]

LOCATION ID	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)								
		2-BUTANONE	ACETONE	BENZENE	DIESEL	ETHYLBENZENE	m+p-XYLENE	o-XYLENE	TOLUENE	TPH[c]
21-3006	0121-95-0041	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0042	<0.2	<0.2	18.388	8239	72.556	300.428	123.98	158.861	>8240
	0121-95-0043	<0.2	<0.2	6.304	7008	27.888	146.954	66.777	61.239	>7010
	0121-95-0044	<0.2	<0.2	6.851	2901	62.964	272.258	130.978	117.92	>2900
	0121-95-0045	<0.2	<20	<0.05	2049	15.251	108.441	54.069	37.766	>2050
	0121-95-0046	<0.2	<0.2	0.053	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0047	0.747	<0.2	0.062	2365	<0.05	<0.05	<0.05	<0.05	499
	0121-95-0048	<0.2	<0.2	0.065	213	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0121	0.252	0.638	<0.05	<200	<0.05	<0.05	<0.05	<0.05	29
	0121-95-0122	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0123	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0124	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0125	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0126	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
21-3007	0121-95-0049	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0050	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0051	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0052	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0053	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0054	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0055	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0056	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0127	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50

TABLE A-15 (CONTINUED)

1995 ANALYTICAL RESULTS FOR EAST FILL STATION SAMPLES AT DP TANK FARM, SWMU[a] 21-029[b]

LOCATION ID	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)								
		2-BUTANONE	ACETONE	BENZENE	DIESEL	ETHYLBENZENE	m+p-XYLENE	o-XYLENE	TOLUENE	TPH[c]
21-3007	0121-95-0129	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
21-3008	0121-95-0057	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0058	<0.2	<0.2	<0.05	<500	<0.05	3.374	2.892	<0.05	>900
	0121-95-0059	<0.2	<0.2	18.645	<500	75.044	218.141	122.588	115.13	>2000
	0121-95-0060	<0.2	<0.2	12.757	<500	34.672	100.67	56.193	54.998	>1200
	0121-95-0061	<0.2	<0.2	6.846	>1200	48.395	161.001	87.347	65.156	>1200
	0121-95-0062	<0.2	<0.2	<0.05	<200	<0.05	2.617	1.427	0.714	<50
	0121-95-0063	<0.2	<0.6	<0.05	390	<0.05	<0.05	<0.05	<0.05	390
	0121-95-0064	<0.2	<0.7	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0130	<0.2	<0.2	<0.05	>1500	0.125	2.559	2.696	0.452	>1500
	0121-95-0131	<0.2	<0.2	9.417	>3300	31.468	91.878	52.141	52.37	>3300
	0121-95-0132	<0.2	<0.33	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0133	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
21-3009	0121-95-0065	<0.2	<0.2	<0.05	767	<0.05	<0.05	<0.05	<0.05	1461
	0121-95-0066	<3.85	<0.2	<0.05	799	<0.05	<0.05	<0.05	<0.05	1678
	0121-95-0067	<0.2	<0.2	<0.05	1695	0.213	0.601	0.827	0.032	2393
21-3010	0121-95-0074	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0075	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0076	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0077	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0078	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0079	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50

TABLE A-15 (CONTINUED)

1995 ANALYTICAL RESULTS FOR EAST FILL STATION SAMPLES AT DP TANK FARM, SWMU[a] 21-029[b]

LOCATION ID	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)								
		2-BUTANONE	ACETONE	BENZENE	DIESEL	ETHYLBENZENE	m+p-XYLENE	o-XYLENE	TOLUENE	TPH[c]
21-3010	0121-95-0080	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
21-3011	0121-95-0082	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0083	<0.444	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0084	<0.2	<0.2	<0.05	<200	<0.05	0.115	0.141	<0.05	<50
	0121-95-0085	<0.2	<0.2	<0.05	>2000	<0.05	1.301	1.418	<0.05	>2000
	0121-95-0086	<0.2	<0.2	<0.05	>1500	0.028	0.29	0.337	<0.05	>1500
	0121-95-0087	<0.86	<0.27	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0088	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0089	<0.68	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0135	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
21-3012	0121-95-0090	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0091	<1.08	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0092	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0093	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0094	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0095	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0096	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0097	<0.6	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0136	<0.7	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0137	<0.3	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0138	<0.9	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50

TABLE A-15 (CONTINUED)

1995 ANALYTICAL RESULTS FOR EAST FILL STATION SAMPLES AT DP TANK FARM, SWMU[a] 21-029[b]

LOCATION ID	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)								
		2-BUTANONE	ACETONE	BENZENE	DIESEL	ETHYLBENZENE	m+p-XYLENE	o-XYLENE	TOLUENE	TPH[c]
21-3013	0121-95-0098	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0099	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0100	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0101	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0102	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0104	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0105	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<50
	0121-95-0114	<0.1	<0.1	<0.01	<200	<0.01	<0.01	<0.01	<0.01	<50
	0121-95-0115	<0.1	<0.1	<0.01	<200	<0.01	<0.01	<0.01	<0.01	<50
	0121-95-0116	<0.1	<0.1	<0.01	<200	<0.01	<0.01	<0.01	<0.01	<10
	0121-95-0117	<0.1	<0.1	<0.01	<200	<0.01	<0.01	<0.01	<0.01	<50
	0121-95-0118	<0.1	<0.1	<0.01	<200	<0.01	<0.01	<0.01	<0.01	<50

[a] SWMU = Solid waste management unit.
[b] All 1995 analyses were performed in the Mobile Chemistry Analytical Laboratory.
[c] TPH = Total petroleum hydrocarbons.

TABLE A-16

ANALYTICAL RESULTS FROM 1995 STREAM CHANNEL WATER SAMPLES AT SWMU[a] 21-029, THE DP TANK FARM[b]

LOCATION ID	SAMPLE ID	ANALYTICAL RESULTS (mg/L)								
		2-BUTANONE	ACETONE	BENZENE	DIESEL	ETHYLBENZENE	m+p-XYLENE	o-XYLENE	TOLUENE	TPH[c]
21-3023	0121-95-0243	<100	<100	<10	<200	<10	<10	<10	<10	<10
21-3024	0121-95-0244	<100	<100	<10	<200	<10	<10	<10	<10	<10
	0121-95-0247	<100	<100	<10	<200	<10	<10	<10	<10	<10
21-3025	0121-95-0245	<100	<100	<10	<200	<10	<10	<10	<10	<10

[a] SWMU = Solid waste management unit.
[b] All 1995 analyses were performed in the Mobile Chemistry Analytical Laboratory.
[c] TPH = Total petroleum hydrocarbons.

TABLE A-17

1995 ANALYTICAL RESULTS FOR STREAM CHANNEL SOIL SAMPLES AT DP TANK FARM, SWMU[a] 21-029[b]

LOCATION ID	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)								
		2-BUTANONE	ACETONE	BENZENE	DIESEL	ETHYLBENZENE	m+p-XYLENE	o-XYLENE	TOLUENE	TPH[c]
21-3015	0121-95-0171	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	131
	0121-95-0172	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	82
	0121-95-0173	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	51
	0121-95-0174	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	51
21-3018	0121-95-0218	<3.82	<1.9	<0.05	<200	<0.05	<0.05	<0.05	<0.05	296
	0121-95-0219	<0.9	<1.707	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0220	<1.662	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0221	<0.2	<0.535	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
21-3019	0121-95-0223	<0.2	<0.405	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0224	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0225	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0226	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
21-3020	0121-95-0228	<2	<2	<0.5	1382	<0.5	<0.5	<0.5	<0.5	1382
	0121-95-0229	<2	<2	<0.5	1796	<0.5	<0.5	<0.5	<0.5	1796
	0121-95-0233	<2	<6.288	<0.5	1042	<0.5	<0.5	<0.5	<0.5	1042
	0121-95-0234	<2	<8.208	<0.5	569	<0.5	<0.5	<0.5	<0.5	569
21-3023	0121-95-0185	<0.2	<0.755	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
	0121-95-0186	<0.2	<0.2	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10
21-3025	0121-95-0187	<0.2	<0.712	<0.05	<200	<0.05	<0.05	<0.05	<0.05	<10

[a] SWMU = Solid waste management unit.
[b] All 1995 analyses were performed in the Mobile Chemistry Analytical Laboratory.
[c] TPH = Total petroleum hydrocarbons.

ATTACHMENT A FORTY-FIVE-DAY REPORT ON SOIL CONTAMINATION AT THE FORMER TA-21 UNDERGROUND STORAGE TANK FARM

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Los Alamos
NATIONAL LABORATORY

Hazardous & Solid Waste Group
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: July 11, 1995
In Reply Refer To: ESH-19/HSW-95-0329
Mail Stop: K498
Telephone: (505) 665-2505

Mr. Anthony Moreland, Geologist
Remedial Action Section
Underground Storage Tank Bureau
New Mexico Environment Department
1190 St. Francis Drive
Harold Runnels Building
Santa Fe, New Mexico 87502

Dear Mr. Moreland:

SUBJECT: FORTY-FIVE-DAY REPORT ON SOIL CONTAMINATION AT THE FORMER TA-21 UNDERGROUND STORAGE TANK FARM

This letter transmits a forty-five-day investigation report involving petroleum contaminated soil. The soil contamination associated with the release is from two petroleum fill stations associated with a former underground storage tank farm (also called the DP Tank Farm) located at Technical Area 21. On April 27, 1995, Los Alamos National Laboratory (LANL) notified the New Mexico Environment Department, Underground Storage Tank Bureau of a confirmed petroleum release.

The enclosed forty-five-day investigation report and its associated enclosures will show that LANL has determined the extent of the petroleum contamination at the former DP Tank Farm site. The report also shows the source of the petroleum contamination in the "seep" in DP Canyon Creek is not from the former DP Tank Farm.

Lastly, the forty-five-day report only contains preliminary analytical data. Validated data should be available by July 21, 1995. As soon as this data is available it will be transmitted to NMED. Also, the preliminary data includes several samples that were reported to have contained methyl ethyl ketone (MEK) and acetone. It is believed that the presence of MEK and acetone are from laboratory contamination. LANL will discuss the presence of the MEK and acetone in our letter transmitting the validated data. If you should require any additional information, please contact me at 665-2505.

The foregoing report was prepared under my supervision by qualified staff who are personally familiar with the information submitted in the report and the enclosed documents.

Sincerely,

Jeff Carmichael
Technical Staff Member
Hazardous & Solid Waste

JAC:es

Enclosure: Former TA-21 UST Tank Farm Forty-Five-Day Report

Cy: T. Grieggs, ESH-19, MS K498, wo/enc.
P. Shanley, ESH-19, MS K498, wo/enc.
S. Cohen, ESH-19, MS K498, wo/enc.
D. McInroy, EM/ER, MS M992, w/enc.
B. Martin, CIC-12, MS E525, w/enc.
J. Vozella, DOE/LAAO, MS A316, wo/enc.
M. Johansen, DOE/LAAO, MS A316, w/enc.
B. Koch, DOE/LAAO, MS A316, w/enc.
T. Taylor, DOE/LAAO, MS A316, w/enc.
CIC-10, MS A150
ESH-19 Circ. File

Los Alamos
NATIONAL LABORATORY

Hazardous & Solid Waste Group
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

UNDERGROUND STORAGE TANK

FORMER TA-21 UNDERGROUND STORAGE TANK FARM

FORTY-FIVE DAY REPORT

The purpose of this letter is to fulfill the forty-five day reporting requirements of Part XII, Section 1206 B., of the New Mexico Underground Storage Tank Regulations (USTR). Under this regulation, the forty-five day report was due on June 12, 1995. However, an extension of time was granted by New Mexico Environmental Department (NMED) to submit the report. The report is now due on July 11, 1995.

On April 27, 1995, Los Alamos National Laboratory (LANL) notified the NMED, Underground Storage Tank Bureau of a confirmed petroleum release. The release is from two petroleum fill stations associated with a former underground storage tank (UST) farm (also called the DP Tank Farm) located at Technical Area 21.

Site History and Petroleum Release Information

The former DP Tank Farm site is located on DP Mesa, east-southeast of the Los Alamos townsite (Enclosure 1). The site occupies property near the west end of DP Road bounded by the Knights of Columbus Hall on the west and a Los Alamos County fire station on the east. The DP Tank Farm is the former location of 15 fuel storage tanks and two fill stations (Enclosure 2). The tanks may not have been dedicated to the storage of a single petroleum product and may have contained different substances at different times. One tank was reported to have contained ethanol. There are no known records of any radioactive materials being stored in any of the tanks.

All tanks and structures at the site were decommissioned and removed in 1988. During site decommissioning, one tank was found to have leaked from a deteriorated gasket. Approximately 4 cubic yards of diesel-contaminated soil was excavated to remediate the area in the vicinity of the leaking gasket. The remaining tanks and underground distribution piping were reported to have been in good condition when removed.

In February 1993, the site was designated a Solid Waste Management Unit (SWMU) 21-029 and added to LANL's Hazardous Waste Permit pursuant to Resource Conservation and Recovery Act (RCRA) and amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA Permit). In 1994, LANL's Environmental Restoration (ER) Project performed a Phase I investigation of the site to confirm the absence or presence of contaminants as specified in the HSWA Permit.

The results of the investigation indicated that petroleum hydrocarbons, in the form of total aromatic hydrocarbons (benzene, toluene, ethylbenzene, and xylenes isomers [BTEX]), other volatile constituents of gasoline and diesel fuel, and semi-volatile organic compounds (SVOCs), and lead were not present in concentrations above LANL Screening Action Levels (SALs) or the USTR contaminant action levels in the immediate vicinity of the former USTs. However, concentrations of total aromatic hydrocarbons (TAHs) were detected above the USTR action levels in the subsurface surrounding the two former fill stations. The two former fill stations are distinguished as the west fill station and the east fill station.

In 1995, ERM/Golder a subcontractor to LANL continued the investigation at the former DP Tank Farm fill stations. The field work was conducted to determine the vertical and lateral extent of petroleum hydrocarbon contamination.

On-site Investigation and Analytical Data

A total of 13 boreholes were drilled near the two fill station locations, including four vertical borings and one angled boring at the west fill station location and seven vertical borings and one angled at the east fill station location (Enclosure 3). All borings were drilled with a CME 750 drill rig equipped with 8.625-inch (outside diameter) hollow stem auger flights. Samples of subsurface materials were collected on a continuous basis with a 3.5-inch diameter, 5-foot long stainless steel core barrel. Samples submitted for laboratory analysis were collected on approximate 5-foot intervals. A brief summary of each borehole is provided in the following sections.

All samples were analyzed in the on-site Mobile Chemical Analytical Laboratory (MCAL) for benzene, toluene, ethylbenzene, xylenes (BTEX), methyl ethyl ketone (MEK or 2-butanone), and acetone by EPA Method 8020 and total petroleum hydrocarbons (TPH) by modified EPA Method 8015. *This report only contains preliminary data received from the MCAL.* The preliminary data is provided in (Enclosure 4).

Validated data should be available by July 21, 1995. LANL expect no significant changes in the data presented in this report or in its conclusions. The preliminary data also included several samples that were reported to have contained MEK and acetone. It is believed that the presence of MEK and acetone are from laboratory contamination. LANL will discuss the presence of MEK and acetone in its letter transmitting the validated data.

Because a hydrocarbon sheen was observed on the surface of the water in DP Canyon Creek, four surface water samples and seven streambed samples (including duplicates) were collected from the intermittent stream. It appeared that the hydrocarbons entered the stream channel through the "seep." Surface water and streambed samples were collected at the "seep" location as well as upstream and downstream of the "seep." Furthermore, three shallow borings were drilled in the vicinity of a "seep." These borings were drilled with a Bosch "Rotohammer" equipped with 3-foot, 2.5-inch diameter solid stem auger flights. The total depth drilled for each boring was 9 feet below ground surface (bgs). Samples were collected by scooping the pulverized tuff fragments directly off of the auger flights. Several attempts were made to collect samples with a drive sampler and a bucket auger, but the hardness and integrity of the tuff bedrock prevented the successful collection of the samples.

Soil Borings

The following summary includes data from soil samples collected from boreholes drilled in the vicinity of two former fill station locations, data from the streambed, and data from the surface water samples. A brief description of the soils and lithology is included with the borehole descriptions and copies of Core Sample Logs are located in (Enclosure 5). A general summary of the soils and geology of LANL and the site are provided in (Enclosure 6).

West Fill Station

Boring 21-3002 was drilled and sampled approximately 23 feet north of the former west fill station location. The vertical boring was drilled to a total depth of 35 feet bgs. Approximately one foot of fill, consisting of fine sand, silt and clay overlay the tuff bedrock at this location. The remainder of the boring was drilled through nonwelded to moderately welded grey tuff. Low- to moderate-angle fractures were rare. Total BTEX concentrations ranged from below detection levels to 0.89 parts per million (ppm). TPH concentrations were found to be below detection limits throughout the boring. MEK concentrations ranged from below detection limits to 6.43 ppm (at 23 feet bgs).

Boring 21-3003 was located approximately 15 feet east and slightly north of the former west fill station location. The boring was drilled at a 45-degree angle in an east-to-west orientation. Approximately 1.7 feet (corrected for angle) of fill material consisting of fine sand, silt and gravel overlay the tuff bedrock in this location. The remainder of the boring was drilled through nonwelded to moderately welded tuff to a total linear depth of 45 feet, or 32 feet vertical feet bgs. A large proportion of the recovered sample material was completely disaggregated, making the observation of fractures impossible. Concentrations of BTEX compounds were below detection limits throughout the boring. TPH concentrations of greater than 600 ppm and greater than 670 ppm were encountered at sample depths of 14.3 and 19.2 linear feet (10.1 and 13.6 feet bgs, respectively).

Boring 21-3004 was located approximately 20 feet south of the former west fill station location. The vertical boring was drilled to a total depth of 45 feet bgs. This borehole was drilled 10 additional feet bgs (compared to 21-3002 and 21-3003) to compensate for the higher elevation of the site relative to the fill station location. Approximately 7.5 feet of fill, consisting of fine sand, silt and clay, was encountered. The remainder of the boring was drilled through nonwelded to moderately welded grey tuff. Horizontal fractures and partings were common throughout the boring. Total BTEX and TPH concentrations were below detection levels throughout the boring.

Boring 21-3005 was located approximately 20 feet west of the former west fill station location. The vertical boring was drilled to a total depth of 35 feet bgs. Approximately 1.0 to 2.5 feet of fill consisting of silty sand and gravel overlay the tuff bedrock at this location. The remainder of the boring was drilled through nonwelded to moderately welded grey tuff. Low-angle fracturing was noted in the upper 10 feet. High-angle, clay-lined fractures were noted near 31 feet bgs. Total BTEX concentrations ranged from 0.72 to 0.97 ppm. TPH concentrations were not detected above MCAL detection levels. MEK concentrations ranged from 2.78 to 7.72 ppm with the maximum concentration at 4.3 feet bgs.

Boring 21-3014 was located approximately 20 feet east of the former west fill station site. The vertical boring was drilled to a total depth of 35 feet below ground surface. Approximately 2.0 feet of fill consisting of fine sand and silt overlay the tuff bedrock at

this location. The remainder of the boring was drilled through nonwelded to moderately welded grey tuff. Zones of fracturing were noted at 14.0 to 15.0 feet bgs and at 26.0 to 26.5 feet bgs. Total BTEX and TPH concentrations were below detection levels throughout the boring.

East Fill Station

Boring 21-3006 was drilled adjacent to the east fill station location and boring 21-2558 (drilled and sampled in September 1994). The vertical boring was drilled to a total depth of 65 feet bgs. Approximately 4.5 feet of fill consisting of silt, fine sand and gravel overlay the tuff bedrock at this location. The remainder of the boring was drilled in nonwelded to moderately welded tuff. Numerous horizontal to low-angle fractures were noted throughout the boring. Petroleum odors were noted during the initial 45 feet of drilling. Total BTEX concentrations ranged from below the detection limit upwards to 674.3 ppm. Benzene concentrations ranged from below the detection limit upwards to 18.4 ppm. TPH concentrations ranged from below the detection limit to greater than 1800 ppm. The maximum concentrations of each of these analytes were found at 9.8 feet bgs.

Boring 21-3007 was located approximately 20 feet north-northeast of the former east fill station. The vertical boring was drilled to a total depth of 50 feet bgs. Approximately 3.5 feet of fill consisting of silt, fine sand and gravel overlay the tuff bedrock at this location. The remainder of the boring was drilled in nonwelded to moderately welded tuff. No prominent fractures were noted throughout the boring. Total BTEX and TPH concentrations were below detection levels throughout the boring.

Boring 21-3008 was located approximately 15 feet east and slightly north of the former east fill station location. The boring was drilled at a 45-degree angle in an east-to-west orientation. The angled boring was advanced to a total linear depth of 50 feet, or 35 vertical feet bgs. Approximately 4.7 vertical feet of fill consisting of sand, silt and tuff fragments overlay the tuff bedrock in this location. The remainder of the boring was drilled in nonwelded to moderately welded tuff. Numerous horizontal fractures were noted between 30 and 32.5 linear feet. The recovered core was highly fractured by low- to high-angle fractures from 47.0 to 50.0 linear feet. Strong petroleum odors were noted during most of the drilling operation. Total BTEX concentrations ranged from below detection levels to 550 ppm (at 14.2 feet). Benzene concentrations ranged from below detection levels to 18.6 ppm (at 14.2 feet). TPH concentrations ranged from below detection levels to greater than 3300 ppm (at 19.1 feet).

Boring 21-3009 was located on the north-facing slope approximately 20 feet south-southwest of the former east fill station location. The vertical boring was advanced to a total depth of 17.5 feet bgs. Drilling was terminated because of the instability of the drilling rig on the steep slope. Approximately 3.0 feet of fill consisting of fine sand, silt and gravel overlay the tuff bedrock at this location. The remainder of the boring was drilled in moderately welded tuff, which was highly fractured with horizontal and low-angle fractures between 5.0 and 10.0 feet bgs. Slight petroleum odors were noted throughout the boring operation. Total BTEX concentrations ranged from below detection levels to 1.67 ppm. TPH concentrations ranged from 1461 ppm to a high of 2393 ppm. Maximum concentrations were noted at 14.6 feet bgs. An MEK concentration of 3.80 ppm was noted at a depth of 9.3 feet bgs.

Boring 21-3010 was located approximately 20 feet west-northwest of the former east fill station location. The vertical boring was advanced to a total depth of 35 feet bgs. Approximately 6.5 feet of fill consisting of sandy silt and gravel overlay the tuff bedrock at this location. The remainder of the boring was drilled in nonwelded to poorly welded tuff. Much of the tuff intercepted by the boring was completely disaggregated or disaggregated along narrowly spaced horizontal partings. An unusual reddish-brown clay layer was noted between 14.0 and 14.5 feet bgs. Total BTEX and TPH concentrations were below detection levels throughout the boring.

Boring 21-3011 was located approximately 20 feet east-southeast of the former east fill station location. The vertical boring was advanced to a total depth of 40 feet bgs. Approximately 3.3 feet of fill consisting of fine sand, silt and clay overlay the tuff bedrock at this location. The remainder of the boring was drilled in poorly welded to moderately welded tuff. Horizontal to high-angle fractures were noted throughout the boring. Total BTEX concentrations ranged from below detection levels to a high of 2.70 ppm at 19.3 feet bgs. High TPH concentrations were noted at 19.3 feet bgs and 24.4 feet bgs (greater than 2000 ppm and greater than 1500 ppm, respectively). The remainder of the boring contained TPH concentrations below detection levels. Low levels (less than 1 ppm) of MEK and acetone were also detected.

Boring 21-3012 was located approximately 40 feet south-southwest of the former east fill station location. The vertical boring was located on a terrace at a higher elevation than the fill station location. Therefore, it was advanced to a total depth of 55 feet bgs to compensate for the additional elevation. Approximately 6.5 feet of fill material consisting of fine sand, silt and clay overlay the tuff bedrock in this location. The remainder of the boring was drilled in nonwelded to moderately welded tuff. Horizontal to high-angle fractures were noted throughout the boring. Total BTEX and TPH concentrations were below detection levels throughout the boring.

Boring 21-3013 was located approximately 40 feet east-southeast of the former east fill station location. The vertical boring was advanced to a total depth of 35 feet bgs. Approximately 0.5 feet of fill consisting of fine sand and silt overlay the tuff bedrock at this location. The remainder of the boring was drilled in nonwelded to moderately welded tuff. Portions of the tuff were completely disaggregated. Few fractures were noted in the remaining samples. Total BTEX and TPH concentrations were below detection levels throughout the boring.

Records of tightness tests, repairs to the UST system, release detection monitoring results, and other pertinent records for the DP Tank Farm have not been found.

DP Canyon Creek Investigation

The nearest surface water course is approximately 120 feet north of the former DP Tank Farm site. An oil sheen was reported on a pool of water located in DP Canyon directly north of the former west fill station location. LANL has now confirmed the presence of petroleum hydrocarbons in the streambed of DP Canyon Creek.

Boring 21-3015 was located approximately 10 feet north of the north bank of the stream channel in DP Canyon. The vertical boring was drilled to a total depth of 9 feet bgs. Samples were collected on approximately 2- to 2.5-foot intervals and submitted to the MCAL for analysis of volatile organic compounds by Method 8020 and TPH by modified Method 8015. No surficial soil was encountered as the boring was drilled directly into the exposed tuff bedrock. No BTEX compounds were detected above detection levels. TPH concentrations of 131 ppm, 82 ppm, and 51 ppm were detected in

samples collected at depths of 3.5, 5.0, and 7.5 feet bgs, respectively. The remaining sample collected at 9.0 feet bgs did not contain TPH above the method detection limit.

Boring 21-3018 was located approximately 20 feet north of the north bank of the stream channel in DP Canyon and drilled vertically to a total depth of 9 feet bgs. Samples were collected on approximately 2- to 2.5-foot intervals and submitted to the MCAL for analysis of volatile organic compounds by Method 8020 and TPH by modified Method 8015. No surficial soil was encountered as the boring was drilled directly into the exposed tuff bedrock. No BTEX compounds were detected above detection levels. A TPH concentration of 296 ppm was detected in the sample collected at a depths of 2.5 feet bgs. The remaining samples did not contain TPH above the method detection limit. Acetone was detected in concentrations up to 1.90 ppm. MEK was detected in concentrations up to 3.82 ppm. Maximum concentrations for both acetone and MEK occurred at a depth of 2.5 feet bgs.

Boring 21-3019 was located approximately 5 feet south of the south bank of the stream channel in DP Canyon and was drilled vertically to a total depth of 9 feet bgs. Samples were collected on approximately 2- to 2.5-foot intervals and submitted to the MCAL for analysis of volatile organic compounds by Method 8020 and TPH by modified Method 8015. No surficial soil was encountered as the boring was drilled directly into the exposed tuff bedrock. No BTEX compounds or TPH were detected above method detection levels. Acetone at a concentration of 0.41 ppm was detected at 2.5 feet bgs.

Four surface water samples were collected from the creek. Two were collected from the "seep" area (one with the "seep" left undisturbed and one after intentionally disturbing the "seep"), one was collected 250 feet downstream of the "seep," and one was collected 100 feet upstream of the "seep." MCAL results revealed no acetone, MEK, BTEX compounds, or TPH in the water samples in concentrations above their respective detection limits.

Seven surface material, or tuff, samples were collected *from the streambed* at approximately the same locations as the surface water samples. Two samples, including one duplicate collected for QA/QC purposes, were collected downstream of the "seep" and one was collected upstream of the "seep." Analytical results revealed no petroleum constituents in concentrations above the detection limits in either the upstream or the downstream samples. Four samples, including two duplicates, were collected at the "seep" location (two on the north side of the creek and two on the south side). All samples were analyzed by the MCAL for BTEX, MEK, and acetone by EPA Method 8020 and TPH by modified EPA Method 8015. No BTEX, MEK, or acetone were detected above their respective detection limits in the samples collected from the "seep" location. However, TPH was detected in a concentration of 1382 ppm from the sample collected from the south side while the duplicate contained 1796 ppm. TPH was also detected in a concentration of 1042 ppm from the sample collected from the north side while the duplicate contained 569 ppm.

The investigation of potential impact *from the former DP Tank Farm* petroleum release on the surface water in DP Canyon Creek indicates that no impact had occurred. The petroleum contamination on the north bank of DP Canyon, just north of the "seep" has been traced towards privately owned property located on the north side of the canyon. However, this petroleum contamination appears to have no adverse impact to the surface water quality of the creek.

USTR Required Information

The depth to groundwater beneath TA-21 is approximately 1000 feet. There are no private water supply wells or municipal water wells within a mile radius of this UST site. The nearest utility corridor is over 120 feet away from the petroleum release sites, running parallel with DP Road. No gasoline or potentially explosive or harmful vapors have been detected in this corridor or in the vicinity of the release. This report also contains information that is required in Part XII, §1206 B., of the USTR (see Enclosures 7 and 8).

Conclusion

LANL believes there is no threat to human health and the environment from the former DP Tank Farm petroleum release. Based on the data collected, no additional field investigations are proposed for the former Tank Farm or creek in DP Canyon. The data collected shows that the lateral and vertical extent of the petroleum hydrocarbon contamination has been bounded in the vicinity of the fill station locations. In addition, petroleum hydrocarbon contamination was detected in the subsurface on the north side of the creek in the "seep" area but not on the south side. However, the source of the petroleum may originate from off-site. Analytical results of the surface water samples revealed no petroleum constituents in concentrations above the analytical detection limits, indicating that there is no adverse impact to the surface water quality.

As discussed earlier in this report, LANL will transmit copies of validated data as soon as this data is available. Also, the presence of MEK and acetone in some of the soil samples will be discussed in LANL's up coming letter. If you have questions, please contact Jeff Carmichael at 665-2505.

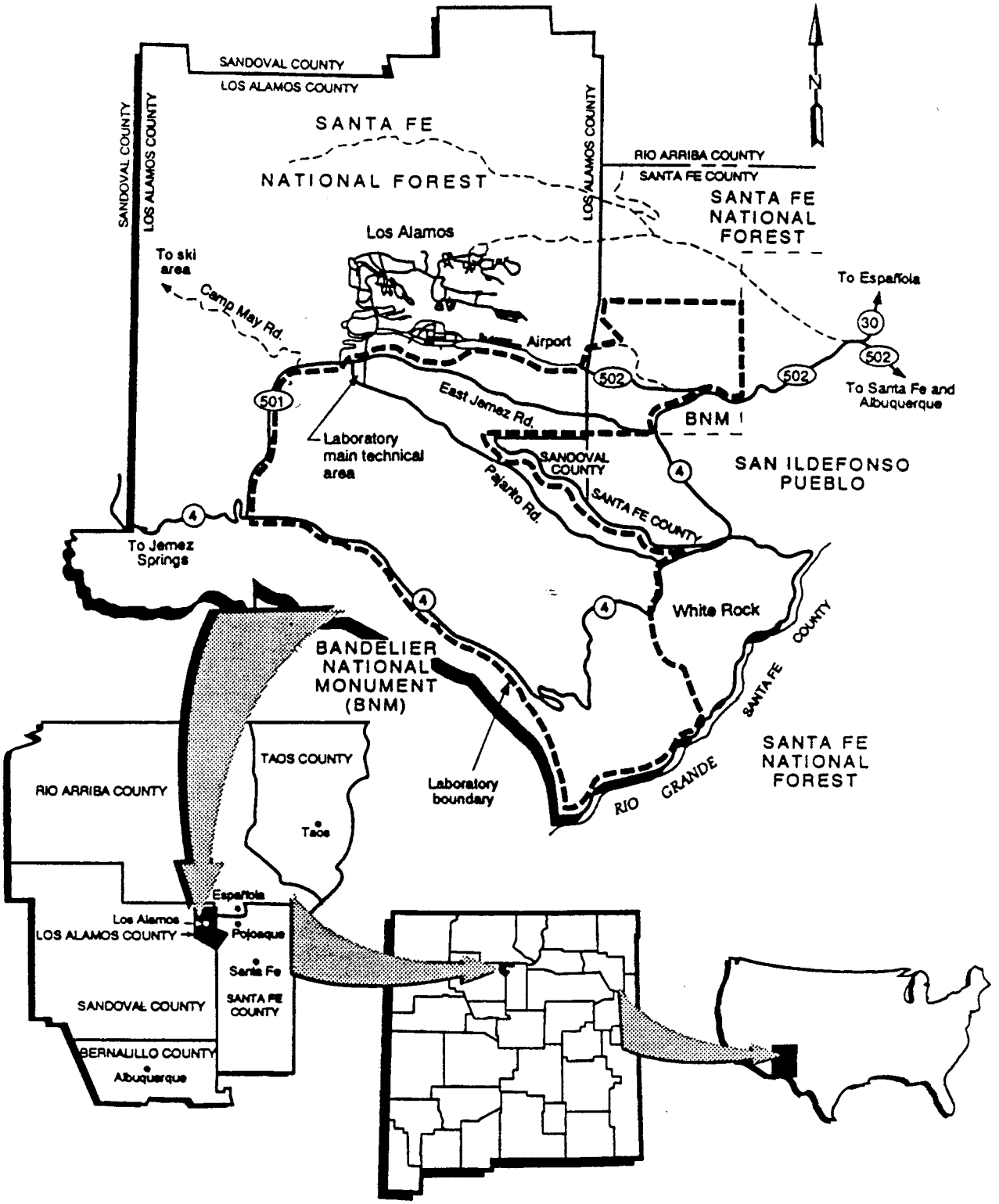
Enclosures:

1. LANL Property Boundaries, Technical Areas, and The Location of The Former UST Tank Farm Located at TA-21
2. List of Former DP Tank Farm USTs and Site Map
3. Corehole Locations
4. Preliminary Soil Analyses
5. Core Sample Logs
6. LANL General Geology and Hydrology Information
7. Engineering Drawings of Utility Lines South of Former TA-21 DP Tank Farm
8. Groundwater Wells and Other Penetrations & Drawings

ENCLOSURE 1

LANL PROPERTY BOUNDARIES, TECHNICAL AREAS, AND THE LOCATION OF FORMER UST TA-21 TANK FARM

Note: No surface impoundments, or pit areas reside in the vicinity of this former tank farm.



Regional location of Los Alamos National Laboratory.

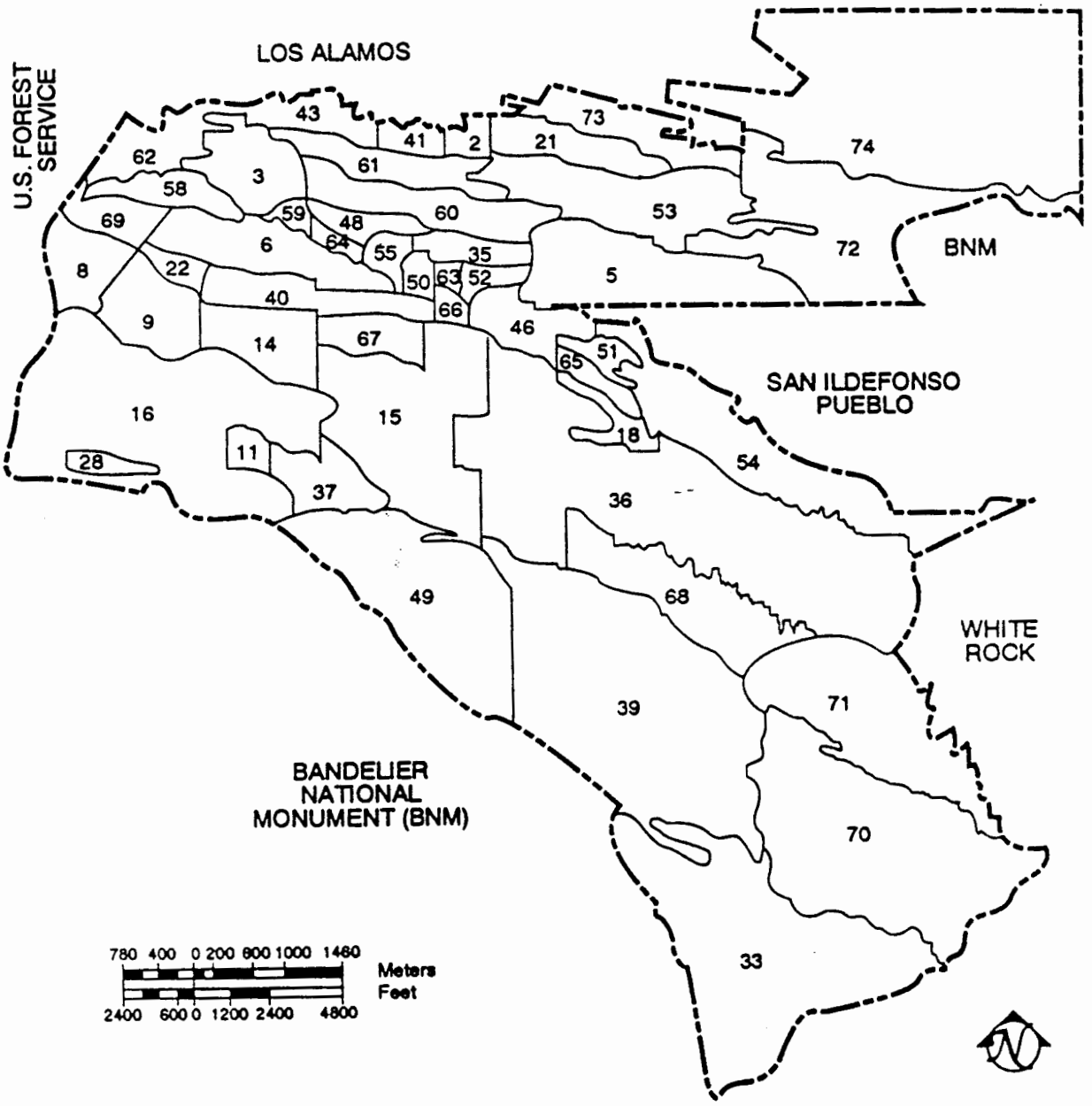
ENCLOSURE 2

LIST OF FORMER DP TANK FARM

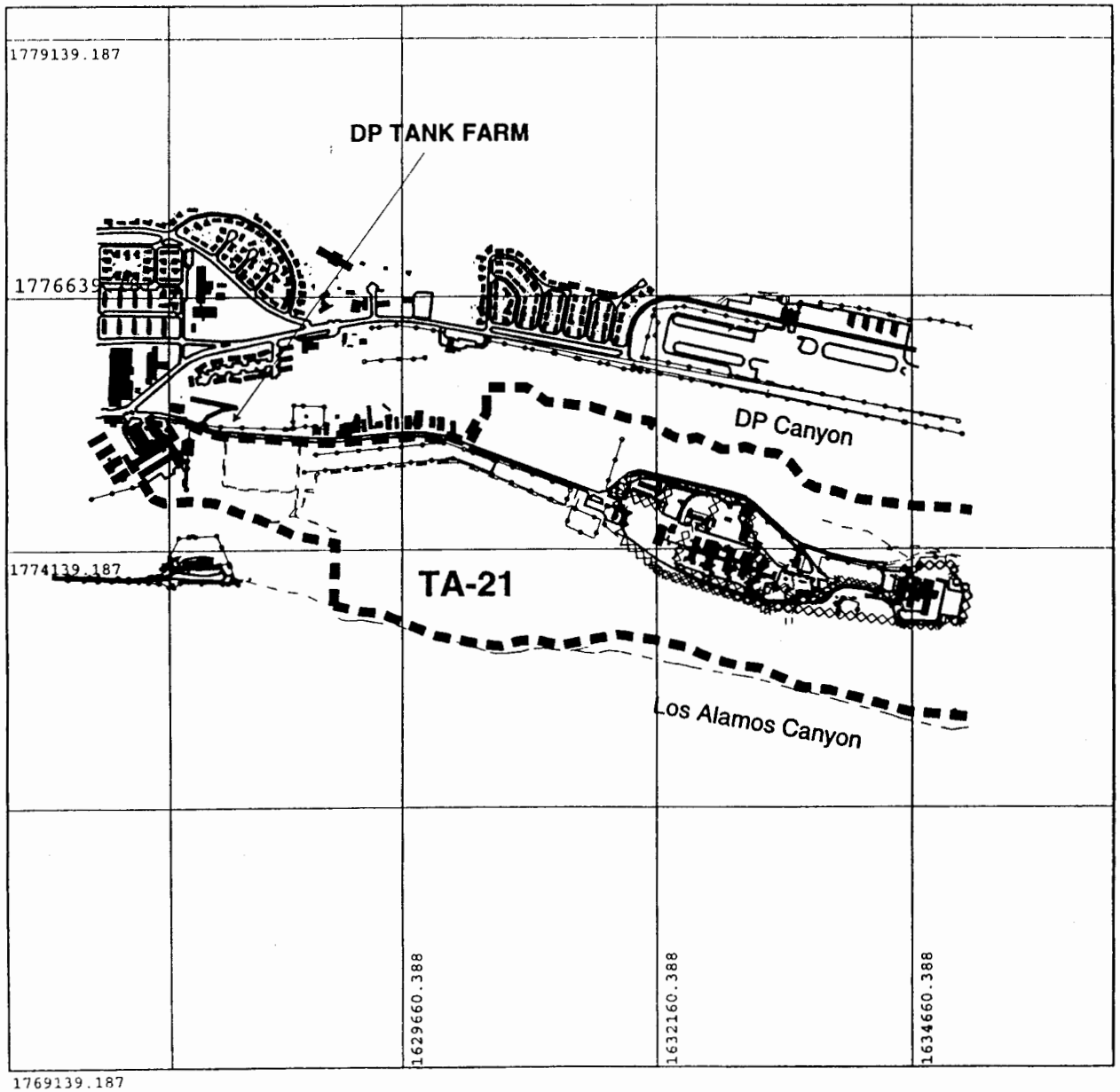
USTs AND SITE MAP

DESCRIPTION OF FORMER STORAGE TANKS AT DP TANK FARM (SWMU 21-030)[a]

Tank No.	Tank Structure Number	Capacity (gallons)	Substance Stored
1	TA-21-ATF-1	28,500 or 21,000	No. 2 fuel oil or diesel
2	TA-21-ATF-2	14,900 or 21,500 or 14,994	No. 2 fuel oil or diesel
3	TA-21-ATF-3	23,900 or 26,000 or 23,967	No. 2 fuel oil or diesel
4	TA-21-ATF-4	14,900 or 22,000 or 14,994	No. 2 fuel oil or diesel
5	TA-21-ATF-5	5100 or 5500 or 5170	kerosene or diesel
6	TA-21-ATF-6	2100 or 3000 or 2099	kerosene or gasoline
7	TA-21-ATF-7	2900 or 2500 or 2978	kerosene or leaded gasoline or gasoline
8	TA-21-ATF-8	5100 or 5500 or 5170	kerosene or diesel
9	TA-21-ATF-9	21,600 or 25,000 or 21,644	No. 2 fuel oil or diesel
10	TA-21-ATF-10	21,600 or 25,000 or 21,644	No. 2 fuel oil or diesel
11	TA-21-ATF-11	23,900 or 38,000 or 23,967	diesel or leaded gasoline or ethanol alcohol



Technical areas (TAs) of Los Alamos National Laboratory in relation to surrounding landholdings.



LEGEND

- Dirt Roads
- Road, Paved
- Outline for TA-21
- Industrial Fences
- Security Fences
- Buildings

Produced by: Belinda Scheber, 103248

Modified by: Kirsten Oschwald 5/8/95

N

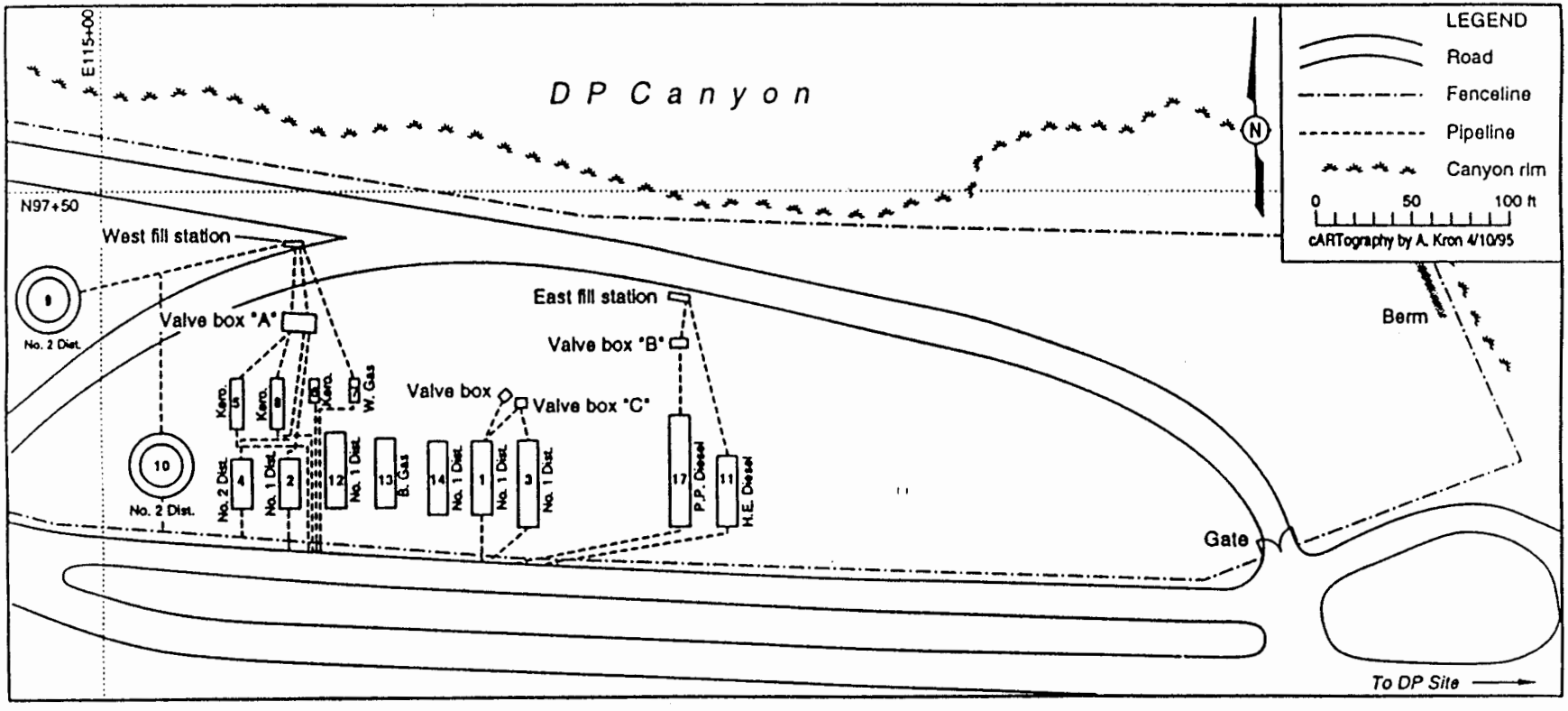
State Plane Coordinate System, New Mexico Central Zone
1983 North American Datum

NOTICE: The information on this map is provisional. Feature locations are dependent on scale and symbology and their accuracy may not have been confirmed. Los Alamos National Laboratory boundary is based on legal description established in 1995. Other boundary, structure and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data are from Los Alamos National Laboratory Environmental Restoration Project aerial survey, September, 1991.

TA-21, DP Tank Farm Site Location

Tank No.	Tank Structure Number	Capacity (gallons)	Substance Stored
12	TA-21-ATF-12	20,200 or 38,000 or 20,266	No. 2 fuel oil or kerosene
13	TA-21-ATF-13	24,700 or 36,000 or 24,770	gasoline or diesel
14	TA-21-ATF-14	20,200 or 26,500 or 20,226	No. 2 fuel oil or diesel
17	TA-21-ATF-17	51,000 or 49,000 or 51,015	diesel or leaded gasoline or gasoline

IT Corp. 1987; LANL 1989a; Pan Am. 1986a; and Zia Co. 1983.

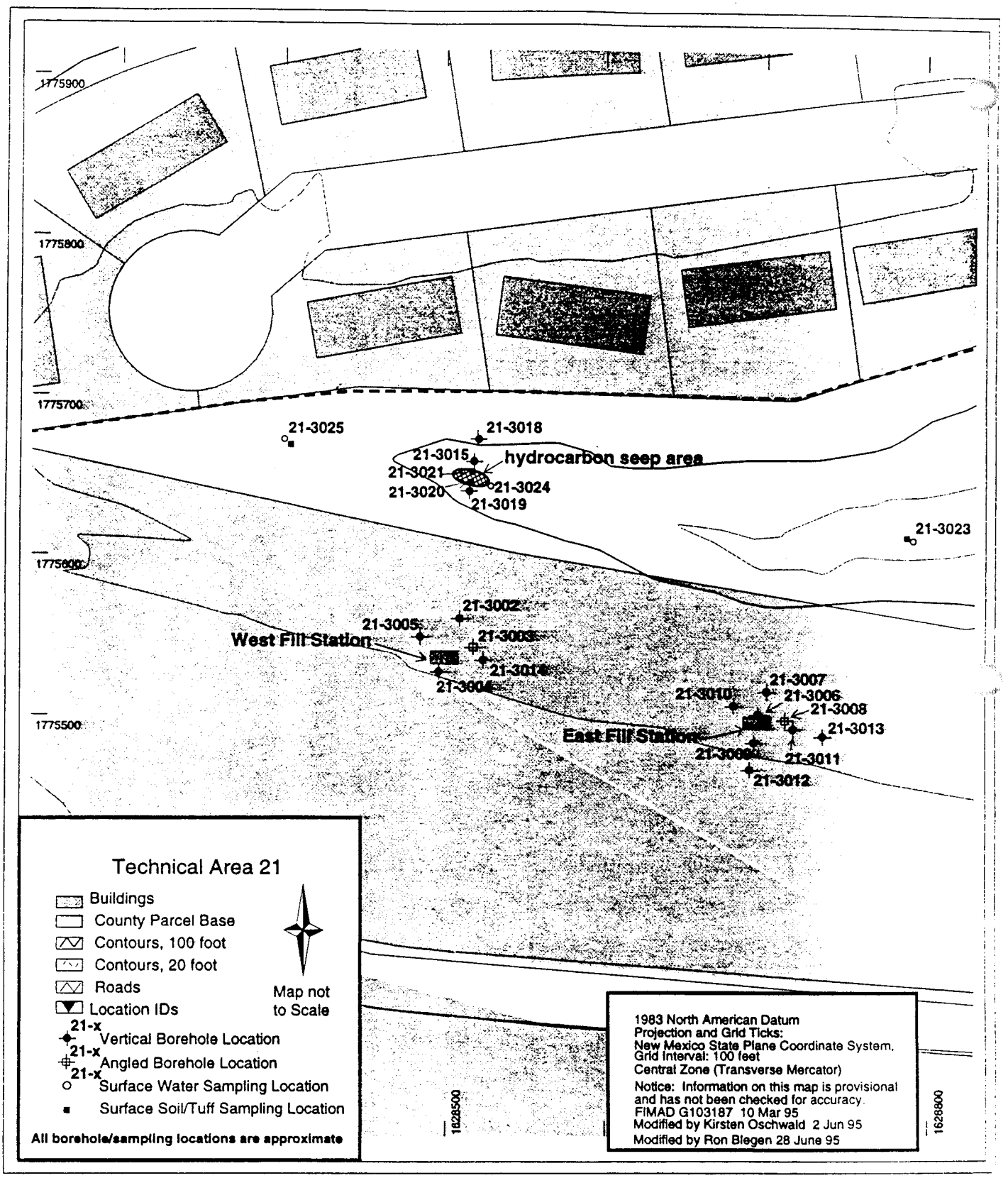


DP Tank Farm (SWMU 21-029) showing layout of tanks, pipelines, and fill stations.

ENCLOSURE 3

COREHOLE

LOCATIONS



Boreholes Drilled at DP Tank Farm

ENCLOSURE 4

PRELIMINARY SOIL ANALYSES

PRELIMINARY ANALYTICAL RESULTS (1)
DP TANK FARM
MAY/JUNE 1995

Borehole 21-3002 May 25, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) (2) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0008	3.9	4.4	0.0	ND (3)	ND	ND	ND	ND	ND	ND	ND	ND
0009	8.8	9.4	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
0010	13.9	14.5	0.0	ND	5.00	0.52	0.24	ND	ND	ND	0.76	ND
0011	19.2	19.8	0.0	ND	3.83	0.59	0.27	ND	ND	ND	0.87	ND
0012	22.5	23.0	0.0	ND	6.43	0.61	0.28	ND	ND	ND	0.89	ND
0139	29.0	29.5	NA (4)	ND	4.39	0.61	0.27	ND	ND	ND	0.87	ND
0140	32.0	32.5	NA	ND	3.93	0.56	0.26	ND	ND	ND	0.82	ND

Borehole 21-3003 May 30, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0015	4.0	4.6	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0016	8.7	9.3	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0017	13.5	14.3	165.0	ND	ND	ND	ND	ND	ND	ND	ND	>600
0018	18.5	19.2	181.0	ND	ND	ND	ND	ND	ND	ND	ND	>670
0019	23.8	24.5	13.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
0020	28.4	29.0	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0021	34.0	34.7	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0022	38.7	39.2	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0141	44.0	44.5	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Borehole 21-3004 May 30-31, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0023	3.1	3.7	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0024	9.1	9.6	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0025	13.8	14.3	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0026	17.0	17.5	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0027	23.5	24.2	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0028	28.7	29.3	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
0029	33.9	34.4	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0030	38.5	39.0	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0031	42.5	43.0	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

Borehole 21-3005 May 26, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0032	3.8	4.3	0.0	ND	7.72	0.53	0.19	ND	ND	ND	0.72	ND
0033	8.4	9.2	0.1	ND	2.78	0.61	0.22	ND	ND	ND	0.83	ND
0034	13.6	14.1	0.0	ND	4.32	0.65	0.23	ND	ND	ND	0.89	ND
0035	18.9	19.3	0.0	ND	3.37	0.65	0.24	ND	ND	ND	0.89	ND
0036	22.0	23.0	0.1	ND	4.88	0.70	0.26	ND	ND	ND	0.96	ND
0037	22.0	23.0	0.1	ND	4.80	0.70	0.26	ND	ND	ND	0.97	ND
0038	29.0	29.5	NA	ND	4.92	0.61	0.23	ND	ND	ND	0.84	ND
0039	34.0	34.5	NA	ND	3.95	0.67	0.26	ND	ND	ND	0.93	ND

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Borehole 21-3006 May 17-19, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0041	4.0	4.8	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0042	9.3	9.8	8400.0	ND	ND	18.4	158.9	72.6	300.4	124	674.3	>1800
0043	14.0	14.5	331.0	ND	ND	6.3	61.2	27.9	147	66.8	309.2	>1600
0044	19.0	19.5	NA	ND	ND	6.9	117.9	63	272.3	131	591.1	>700
0045	24.0	24.5	702.0	ND	ND	ND	37.8	15.3	108.4	54.1	215.6	>550
0046	29.3	29.5	98.0	ND	ND	0.053	ND	ND	ND	ND	0.053	ND
0047	34.0	34.5	395.0	ND	0.75	0.062	ND	ND	ND	ND	0.062	503
0048	39.0	39.5	219.0	ND	ND	0.065	ND	ND	ND	ND	0.065	ND
0121	43.4	43.9	133.0	0.64	0.35	ND	ND	ND	ND	ND	ND	ND
0122	49.0	49.5	2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
0123	54.1	54.5	4.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0124	57.0	57.3	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0125	59.4	59.7	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0126	64.2	64.5	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Borehole 21-3007 May 19, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0049	4.0	4.8	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0050	9.0	9.8	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0051	14.3	14.8	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0052	19.0	19.5	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0053	24.0	24.8	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0054	29.2	29.7	154.9	ND	ND	ND	ND	ND	ND	ND	ND	ND
0055	34.2	34.6	205.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
0056	39.2	39.6	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
0127	44.0	44.7	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0129	48.7	49.1	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Borehole 21-3008 May 22-23, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0057	3.0	3.5	52.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
0130	6.2	6.8	1452.0	ND	ND	ND	0.45	0.13	2.60	2.70	5.88	>1500
0058	8.8	9.4	1853.0	ND	ND	ND	ND	ND	3.40	2.90	6.30	>900
0059	13.8	14.2	NA	ND	ND	18.60	115.00	75.00	218.00	123.00	549.60	>2000
0060	18.5	19.1	NA	ND	ND	12.80	55.00	34.70	101.00	56.20	259.70	>1200
0131	18.5	19.1	NA	ND	ND	9.40	52.40	31.50	91.90	52.10	237.30	>3300
0061	24.0	24.5	NA	ND	ND	6.80	65.20	48.40	161.00	87.30	368.70	>1200
0062	29.0	29.5	NA	ND	ND	ND	0.71	ND	2.60	1.40	4.71	ND
0063	34.0	34.5	517.0	0.60	ND	ND	ND	ND	ND	ND	ND	ND
0064	38.4	39.0	47.0	0.70	ND	ND	ND	ND	ND	ND	ND	ND
0132	43.8	44.2	4.9	1.40	ND	ND	ND	ND	ND	ND	ND	ND
0133	49.1	49.6	12.6	ND	ND	ND	ND	ND	ND	ND	ND	ND

Borehole 21-3009 May 24, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0065	4.3	4.9	290.0	ND	ND	ND	ND	ND	ND	ND	ND	1461
0066	8.8	9.3	1098.0	ND	3.80	ND	ND	ND	ND	ND	ND	1678
0067	14.3	14.6	NA	ND	ND	ND	0.03	0.21	0.60	0.83	1.67	2393

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Borehole 21-3010 May 22, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0074	4.0	4.7	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
0075	9.0	9.5	1.9	ND	ND	ND	ND	ND	ND	ND	ND	ND
0076	13.5	14.0	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
0077	19.0	19.4	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
0078	23.7	24.4	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
0079	26.8	27.6	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
0080	33.5	34.0	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND

Borehole 21-3011 May 23, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0082	3.2	3.7	91.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0083	8.4	8.9	210.0	ND	0.44	ND	ND	ND	ND	ND	ND	ND
0084	13.1	13.6	57.0	ND	ND	ND	ND	ND	0.12	0.14	0.26	ND
0085	19.0	19.3	665.0	ND	ND	ND	ND	ND	1.30	1.40	2.70	>2000
0086	23.6	24.4	560.0	ND	ND	ND	ND	0.03	0.29	0.34	0.66	>1500
0087	29.0	29.4	227.0	0.27	0.86	ND	ND	ND	ND	ND	ND	ND
0088	33.5	34.4	121.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0089	33.5	34.4	NA	ND	0.68	ND	ND	ND	ND	ND	ND	ND
0135	39.0	39.5	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Borehole 21-3012 May 24, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0090	3.2	3.6	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
0091	8.6	9.2	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0092	14.0	14.7	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0093	16.7	17.3	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0094	23.8	24.6	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0095	26.3	26.8	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0096	33.9	34.7	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0097	38.9	39.4	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0136	43.0	43.5	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0137	49.0	49.5	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0138	54.0	54.5	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

Borehole 21-3013 May 25, 1994

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0098	3.5	4.2	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0099	8.4	9.1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
0100	14.0	14.5	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0101	18.8	19.4	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0102	24.0	24.5	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
0104	29.0	29.5	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0105	32.7	33.2	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Borehole 21-3014

May 31, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0160	3.8	4.5	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0161	8.4	9.0	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0162	13.7	14.4	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0163	18.5	19.2	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0164	18.5	19.2	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0165	21.4	22.0	0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
0168	29.0	29.5	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0169	31.5	32.0	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

Borehole 21-3015

Shallow Borehole Approximately 10 Feet North of Seep

June 1, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0171	3.0	3.5	NA	ND	ND	ND	ND	ND	ND	ND	ND	131
0172	4.5	5.0	NA	ND	ND	ND	ND	ND	ND	ND	ND	82
0173	7.0	7.5	NA	ND	ND	ND	ND	ND	ND	ND	ND	51
0174	8.5	9.0	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Borehole 21-3018

Shallow Borehole Approximately 20 Feet North of Seep

June 8, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0218	1.5	2.5	NA	1.90	3.82	ND	ND	ND	ND	ND	ND	296
0219	4.0	4.5	NA	0.90	1.71	ND	ND	ND	ND	ND	ND	ND
0220	6.0	7.0	NA	ND	1.66	ND	ND	ND	ND	ND	ND	ND
0221	8.0	9.0	NA	0.54	ND	ND	ND	ND	ND	ND	ND	ND

Borehole 21-3019

Shallow Borehole Approximately 5 Feet South of Seep

June 8, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0223	1.5	2.5	NA	0.41	ND	ND	ND	ND	ND	ND	ND	ND
0224	4.0	5.0	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0225	6.0	7.0	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0226	8.0	9.0	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Surface Soil/Tuff Sample Sites 21-3023, -3024, and -3025

June 14, 1995

Sample Number	Approximate Sample Location (relative to seep)	Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
			Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0185	250' downstream	NA	0.76	ND	ND	ND	ND	ND	ND	ND	ND
0186	250' downstream	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
-	At Seep (see sample sites 21-3020 and 21-3021 below)										
0187	100' upstream	NA	0.71	ND	ND	ND	ND	ND	ND	ND	ND

Surface Sample Site 21-3020

Sample collected from stream bed at seep just above waterline. South bank.

June 14, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0228	0.0	0.4	NA	ND	ND	ND	ND	ND	ND	ND	ND	>1382
0229	0.0	0.4	NA	ND	ND	ND	ND	ND	ND	ND	ND	>1796

Surface Sample Site 21-3021

Sample collected from stream bed at seep just above waterline. North bank.

June 14, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0233	0.0	0.4	NA	6.29	ND	ND	ND	ND	ND	ND	ND	>1042
0234	0.0	0.4	NA	8.21	ND	ND	ND	ND	ND	ND	ND	>569

PRELIMINARY ANALYTICAL RESULTS (con't)
DP TANK FARM

Surface Water Samples June 1, 1995

Sample Number	Approximate Sample Location (relative to seep)	Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
			Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0243	250' downstream	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0244	At Seep	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0245	100' upstream	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
0247*	At Seep	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

* Sample 0247 (collected 6/8/95) was collected downgradient of the seep after intentionally disturbing the seep to produce a visible sheen on the water.

Footnotes:

(1) All data is preliminary, pending validation

(2) ppm - parts per million

(3) ND - Not detected above the MCAL detection limits, which are as follows:

Acetone: 0.2 ppm
MEK: 0.2 ppm
Benzene: 0.05 ppm
TPH: 50 ppm
Toluene: 0.05 ppm
Ethylbenzene: 0.05 ppm
Xylenes: 0.05 ppm

(4) NA - Not analyzed

Note that, for investigation purposes, the UST action level for total BTEX is 100 ppm. For remediation purposes, UST action levels are 50 ppm for total BTEX and 10 ppm for benzene, or 100 ppm for TPH. These remediation action levels are used at sites contaminated with "highly contaminated" or saturated soils and contaminated soils that are 50 feet or less above the seasonal high groundwater level.

ENCLOSURE 5

CORE SAMPLE LOGS

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-30008 TA/~~OU~~ FUPC 21/1 NB 6/8/95 Drill Depth From 0.0 To 50.0 Page 1 of 2

Driller Stewart Bros. Box #(s) — Start Date/Time 5-30-95/1608 End Date/Time 5-23-95/0917

Drilling Equip./Method CME-750/Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger w/ 5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	2.0/2.5		BT=14cpm OVM=60ppm	—	0-2.5' Very fine sand, silt (2.5YR 5/6) and grey pieces of tuff to ~1.5cm. (Fill material). No Recovery: 2.0-2.5'		Fill Material I	Run #1 1508 hrs Roll 3 Photo —
2.5	1.5/2.5	CH-95-0057-01 CH-95-0057-02 3.0-3.5	BT=16cpm OVM=0.3ppm HS=52.5ppm	—	2.5-4.0 Fill material as above. (5YR 5/6) Tuff pieces to 1.5cm. 4.0-5.0 No Recovery			Run #2 1524 hrs Roll 3 Photo 9
5.0	2.5/2.5 100%	6.2-6.4 CH-95-0130	BT=14cpm OVM=36ppm HS=1452ppm	—	5.0-6.7 Fill Material as Above. (moist) 6.7-7.5 Pale Red Tuff. 5R 6/2 w/ Grey Pumice to 2.5 cm (unaltered). ~9% crystals in ashy matrix.			Run #3 Petrol. odors. Roll 3 Photo 10
	2.5/2.5 100%	CH-95-0058-02 CH-95-0058-01 5.8-9.4	BT=18cpm OVM=7.7ppm HS=1563ppm	—	7.5-10.0 Pale Red Tuff as above. Core is horizontally fractured due to drilling.		Bandelier Tuff	Run #4 1538 hrs odors present Roll 3 Photo —
10.0	5.0/5.0 100%		BT=18cpm OVM=77ppm	>17ppm	10.0-15.0 Pale Red Tuff as above (5R-6/2).			Run #5 1610 odors Roll 3 Exp 12
		CH-95-0059-01 CH-95-0059-02	BT= — OVM= — HS=	—				Run #5 Roll 3 Exp 11
15.0	5.0/5.0 100%		BT=20cpm OVM=308ppm	—	15.0-20.0 Poorly-moderately welded dark grey tuff (N6), pumice as large as 3.5cm. Matrix ~15% crystals			Run #6 1635 odors Roll 3 Exp —
		CH-95-0061-01 CH-95-0061-02 6/21/95-131 (OHP)	BT= — OVM: —	—				Run #6 Roll 3 Exp 13
20.0	5.0/5.0 100%		BT: — OVM: —	—	20.0-22.5 Grey Tuff as above. Somewhat moist, less moist at bottom of Run. Pumice as large as 2.5cm ~12% crystals in ash matrix.		Tshirege Member of The	Run #7 ~~1450~~ 1650 odors Roll 3 Exp 15/16
		CH-95-0062-01 CH-95-0062-02	BT=14cpm OVM=35ppm	—	(10R 6/2)			Run #7 Roll 3 Exp 14
25.0	5.0/5.0 100%		BT= — OVM: —	—	25.0-30.0. Pinkish grey Tuff. Pumice are altered to a reddish grey and as large as 4.0cm. ~14% crystals in ash matrix		Unit 3	Run #8 1705 Petrol odors Roll 3. Exp 18
		CH-95-0063-01 CH-95-0063-02	BT=11cpm OVM=57ppm	—				Run #8 Roll 3 Exp 17
30.0								

Prepared by J. Crooker Date 5-23/03-95 Checked By [signature] Date 6/8/95

LOS ALAMOS NATIC . LABORATO.. / ENVIRONMENTAL REST .TION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 21-3005 TA/~~OU~~ FUPC 21/1 Drill Depth From ~~0.0~~ 30.0 ft To 35.0 Page 2 of 2

Driller Stewart Bros. Box #(s) — Start Date/Time 5-26-95/1015 End Date/Time 5-26-95/1130

Drilling Equip./Method CME 750 - Hollow Stem Auger Sampling Equip./Method 3.5" Stainless Steel Core Barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
30.0	5.0/5.0 100%	0121-95-0039 34.0-34.5	BT=189 OVM=0.0	—	30.0 - 35.0 TUFF. Medium gray (N5). Moderately welded. 5% elongated pumice to 2 cm., many lined with iron-oxidical material. 5% lithics. High angle fractures at 30.8' and 31.5' lined with iron-oxide stained clays.			Run # 8 1128 Headspace - None
32.5	—	—	BT= OVM=	—				~~Run #~~ 1115 Photos of fractures Roll 5, #20 + #21
35.0			BT= OVM=	—	TD Borehole @ 35 ft. bgs			Run #
			BT= OVM=	—				Run #
~~40.0~~			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
~~45.0~~			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
~~50.0~~			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
~~55.0~~			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
~~60.0~~			BT= OVM=	—				Run #

Prepared by R. Bleyen Date 5/26/95 Checked By [signature] Date 6/8/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3006 TA/~~OU~~ FUDC 21 / 1 (DP TANK FARM LFR 5/24/95) Drill Depth From 0.0 To 65.0 Page 1 of 3

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-17-95 0950 End Date/Time 5/19/95 (0830 hrs)

Drilling Equip./Method CME 750 Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger w/ 5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	2.4'/5.5' 76%		BT=249 cm OVM=0.0 ppm	—	Fill Material. Reddish Brown (10R 4/6). S:LT, Fine Sand and Pebbles to ~1.25 cm. No Odors.			Run #1 0950 hrs DC 5-17-95 ~~Photo #20~~ ~~Roll #1~~ DC 5-17-95
2.5	2.5'/2.5' 100%	0121-95-0041-01 0121-95-0041-02 (4.5'-5.0')	BT=250 cm OVM=510 ppm HS: 0.0 ppm	—	2.5'-4.5' Fill material as above. Notice Petrol odors. 4.5'-5.0' grey Poorly welded Tuff. (N5). Pumice to ~0.5 cm. Matrix of ash and ~10% crystals.	Fill		Run #2 1005 hrs Photo #20 Roll #1
5.0	2.5'/2.5' 100%		BT=245 cm OVM=710 ppm	—	5.0 - 7.5 Grey Tuff (N5). No Fractures. Pumice Lighter grey (N7) as large as 1.0 cm.			Run #3 Photo #21 Roll #1 Petrol. odors.
7.5	2.5'/2.5' 100%	0121-95-0042-01 0121-95-0042-02 (7.5'-10.0')	BT=250 cm OVM=970 ppm HS=[illegible] ppm	—	7.5-10.0 Grey poorly welded Tuff (N5). Pumice as large as 4.0 cm are light grey (N7). ~10% crystals in matrix.			Run #4 1050 Petrol. odors Photo #22 Roll #1
10.0	2.5'/2.5' 100%		BT=240 cm OVM=1350 ppm	—	10.0 - 12.5 Grey Tuff (N5) with both light grey pumice (N7) and possibly altered pumice (reddish) as large as 4.0 cm. moderate angle clay filled fracture w/ minor carbonate(?). At 11.2'			Run #5 Petrol. odors. (strong.) Photo: #23 Roll #1
12.5	2.5'/2.5' 100%	0121-95-0043-01 0121-95-0043-02 (12.5'-15.0')	BT=160 OVM=366 HS=931	—	12.5-15.0 Grey Tuff N5 Rubble 12.5-13.2 Pumice light grey, poorly welded. ~15% crystals. 13.4 low angle w/ CaCO3 14.0 Horiz. No Fracs (minor oxides)		Bandelier Tuff	Run #6 0800 Photo # — Roll # —
15.0	2.5/2.5 100%		BT=210 OVM=566	—	15-17.5 Non Welded Grey Tuff N5 Multiple moderate + Horiz. Fracts @ 16.5-17.0 16-17% crystal. in matrix.			Run #7 0804 (5- Photo 24 Roll #1
17.5	2.5/2.5 100%	0121-95-0044-01 0121-95-0044-02 (19.0-19.5')	BT=187 OVM=493 HS=	—	17.5-20 Grey Tuff (N5) ~7% cryst in ash matrix Pumice to ~1.25 cm Horiz Fract 18.0' minor silt Fill		Member of	Run #8 0810 Photo 25 Roll
20.0	2.5/2.5 100%		BT=210 OVM=545	—	20-22.5 Grey Tuff (N5) Pumice ~1.1 cm and 15% of Tuff. ~12% crystals in ash matrix Lowl Fract @ 22.0' No Fill material			Run #9 0815 Photo 26 Roll #1
22.5	2.5/2.5 100%	0121-95-0045-01 0121-95-0045-02 (24.0-24.5)	BT=238 OVM=498 HS=702	—	22.5-25.0 Grey Tuff as above. Pumice sugary appearance crystals ~7% of matrix Horiz Fracs @ Minor to oxides, No silt or other Fill (23.0 and High Horiz + mod w/ oxides No Fill 24.5		Tshirege	Run #10 0827 Photo 28 Roll #1
25.0	5.0/5.0 100%		BT=230 OVM=294	—	25-30 Grey Tuff N5. Pumice to 2.0 cm have a reddish color and sugary appearance. Matrix ~7% crystals. Multiple Horiz fractures @ 27.5-28.5 No Fill materials		Unit 3	Run #11 0835 Photo 29 Roll #1
27.5		0121-95-0046-01 0121-95-0046-02 (29.3-29.8)	BT=220 OVM=316 HS=44	—				Run #11
30.0								

Prepared by John Crocker Date (5-17-95/5-19)1995 Checked By [signature] Date 5/23/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3006 TA/~~OU~~ FUDS 21^/FU-1 Drill Depth From 0.0 To 650 Page 2 of 3

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-17-95/ 0930 hrs End Date/Time 5-19-95/ 0830 hrs

Drilling Equip./Method CME-750/ Hollow Stem Augers Sampling Equip./Method Hollow Stem Auger w/ 5' Core Barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	5.0/5.0 100%		BT=210 OVM=220	—	Gray Tuff N5. Pumice To 3.0 cm. reddish color and Sugary Texture. N 7% crystals in matrix. 31.5' mild fract w/ No Fill material. 30.0-32.3 Horiz fract. Tuff is slightly welded.			Run #12 0911
5		0121-95-0047-01 0121-95-0047-02 (34.0'-34.5')	BT=210 OVM=220 HS 395	—				Run # —
10	5.0/5.0 100%		BT=197 OVM=	—	Gray Tuff (N5) 35-40.0 Pumice to 2.0cm w/ Sugary appearance. Matrix ~8% crystals. 35.5-36.5 low ∠ fracts w No Fill material. 38.5-39.0 core disaggregated. Possibly low ∠ fractures		Tuff	Run #13 0939 Petrol odors
		0121-95-0048-01 0121-95-0048-02 (39.0-39.5)	BT=[illegible] OVM=[illegible] HS 219	—				Run # —
0	4.0/5.0 80%	0121-95-0121-01 0121-95-0121-02 (43.0-43.5)	BT=220 OVM=43.0 HS	—	40-43.0 gray Non Welded Tuff. Completely disaggregated. Moderate to mple fract at 43.5-44.0 No Fill material. Gray N5 ~7% crystal in matrix. No large pumice. Absorbed		The Bandelier	Run #14 1116 1.0' No Rec. 44.0-45.0 Slight odor Photo #32 Roll #1
			BT=NA OVM=NA HS-133	—	~~44~~		Member of	Run # —
	2.5/2.5 100%	0121-95-0122-01 0121-95-0122-02 (46.0-46.5)	BT=170 OVM=21	—	46.0-47.5 Gray Non Welded Tuff as above completely disaggregated			Run #15 1125 No Strong odors
	2.5/2.5 100%		BT=200 OVM=1.1 HS:27	—	47.5-50 Non Welded, disaggregated Tuff as above. @ 48.5-49.0 Possible fract. Moderate ∠ w/ abundant oxides.		Tshirege Unit 3	Run #16 1130 No Strong odors Photo #33 Roll #1
0	2.5/2.5 100%		BT=230 OVM=2.0 (3.0)	—	50.0-52.5 Non Welded Gray (N5) Tuff. Completely disaggregated. Oxide Trace of low ∠ fract.			Run #17 Photo 33 Roll 1 Fract Trace = 2.0cm 1147 3.0cm elsewhere
	2.5/2.5 100%	0121-95-0123-01 0121-95-0123-02 (54.1-54.5)	BT=234 OVM=3.4 HS 4.0	—	52.5 to 55.0 as above No fractures			Run #18 1165 No Photo 5/16/95
0	2.5/2.5 100%	0121-95-0124-01 0121-95-0124-02 57.0-57.3'	BT=[illegible] OVM=[illegible] HS=0.0mm	—	55.0-57.5 Non-Weld Gray Tuff (N5), ~7% pumice To 1.0cm. Completely disaggregated. No Fractures.			Run #19 1500 Photo #36 Roll #1 No odors 5/19/95
0	2.5/2.5 100%	0121-95-0125-01 0121-95-0125-02 59.4-59.7	BT=146 OVM=0.0 HS=0.0mm	—	57.5-60.0 Non-Welded Tuff as above. w/ pumice To 3.0cm			Run #20 0813 No odors Photo 36

Prepared by John Crocker Date 5-19-95 Checked By [signature] Date 5/23/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3006 TA~~00~~ FUR 21 / FU-1 Drill Depth From 0.0 To 65.0 Page 3 of 3

Driller Stewart Bros Box #(s) — Start Date/Time 5-17-95 / 0930 hrs End Date/Time 5-19-95 / 0930 hrs

Drilling Equip./Method CME 750 / Hollow Stem Augers Sampling Equip./Method Hollow stem auger w/ 5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
60.0	2.5/5.0 100%		BG=240cpm OVM=0.0ppm		60.0-62.5 Grey Tuff as above (N6). Core is disaggregated. Brown staining present at 60.5' (possible fracture?)		Tshirege	Run 21 0810 hrs No odors.
62.5	2.3/5.0 46%	01-21-95-0126-01 01-21-95-0126-02	BG=178cpm OVM=13.6 HS=26ppm		62.5-65.0 Grey Tuff (N6). Core disaggregated. N6 to lumice to 1.0cm. No Fractures.		Unit 3	Roll #1 Photo #37 Run 22 0830 hrs 0.3' less. No Recovery 64.7-65.0.
65.0		64.2 64.5			End of Hole. TD = 65.0'			

Prepared by John Crocker Date 5-19-95 Checked By [signature] Date 5/23/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3007 TA/~~OU~~ FUDS OF THE FILM 21^/FU-1 Drill Depth From 0.0 To 50.0' Page 1 of 2

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-19-95 (@ 11:00) End Date/Time 5/19/95 1500 hrs

Drilling Equip./Method CME 750 Hollow Stem Auger Sampling Equip./Method Hollow Stem Augers w/ 5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	1.5/2.5 60%	~~0121-95-0048~~ gc	βγ= OVM=00	—	0-1.5' Fill material. Fine sand and silt with pebbles to ~1.0 cm. No Recovery 1.5' to 2.5'		Fill material	Run #1 1100 hrs 0-2.5' Roll 2 Exp 2
2.5	2.5/2.5 100%	0121-95-0049 -01 0121-95-0049 -02 4.0'-4.8'	βγ= 180 cpm OVM=0.0 ppm HS=0.0 ppm	—	2.5'-3.5' Fill material as above. (N5) 3.1'-5.0' Grey, moderately-welded Tuff. Pumice to ~3.0 cm. matrix ~15% crystals quartz and sanidine (blue iridescence).		Bandelier TUFF	Run #2 1105 hrs 2.5'-5.0' Roll 2 Exp 3
5.0	2.5/5.0 100%		βγ=-NA- OVM=-NA-	—	5.0'-10.0' Grey (N5) poorly-moderately welded Tuff. Pumice to ~1.0 cm are lighter grey in color w/ a few having a sugary texture.			Run #3 1115 hrs 5.0'-10.0' Roll 2 Exp 4
		0121-95-0050 -01 0121-95-0050 -02 9.0'-9.8'	βγ= 171 cpm OVM=0.0 ppm HS=0.0 ppm	—			Tshirege Member	Run #3
10.0	5.0/5.0 100%		βγ=-NA- OVM=-NA-	—	10-15' Grey Tuff as above.			Run #4 1146 hrs 10.0'-15.0' Roll 2 Exp 8
		0121-95-0051 -01 0121-95-0051 -02 14.3'-14.8'	βγ=184 cpm OVM=0.0 ppm HS=0.0 ppm	—				Run #4 Roll 2 Exp 7
15.0	5.0/5.0 100%		βγ=-NA- OVM=-NA-	—	15.0-20.0: Grey Tuff as above. Locally non-welded and disaggregated (15.0'-16.5') Pumice as large as 3.0 cm. Some pumice have a sugary texture due to phenocrysts. Rare reddish grey coloration is			Run #5 1145 hrs 15.0'-20.0'
		0121-95-0052 -01 0121-95-0052 -02 19.0'-19.5'	βγ= 190.0 cpm OVM=0.0 ppm HS=0.0 ppm	—	present in some pumice and as "stringers" in the matrix (possibly along bedding planes) (vapor phase alteration?) Crystal content of matrix ~20%		UNIT 3	Run #5
20.0	5.0/5.0 100%		βγ=-NA- OVM=-NA-	—	20.0-25.0 Grey Tuff as above. Pumice to 5.0 cm in an ash (40%) and crystal (20%) matrix.			Run #6 1155 hrs 20.0'-25.0' Roll 2 Exp 10
		0121-95-0053 -01 0121-95-0053 -02 24.0'-24.8'	βγ= 163.0 cpm OVM=0.0 ppm HS=0.0 ppm	—				Run #6 Roll 2 Exp 9
25.0	5.0/5.0 100%		βγ=179 cpm OVM=38.8 ppm	—	25.0-30.0 Grey (N5) poorly to moderately welded Tuff. Pumice are Grey to reddish brown (vapor phase altered?) and as large as 3.0 cm. Matrix is grey and locally altered (vapor phase?) to reddish brown.			Run #7 1200 hrs 25.0'-30.0' Roll 2 Exp 12
		0121-95-0054 -01 0121-95-0054 -02 29.2-29.7	βγ=174 cpm OVM=35.0 HS=154.9	—	(Most prominent at 25.2')			Run #7 Roll 2 Exp 11
30.0								

Prepared by J. Crocker Date 5-19-95 Checked By [signature] Date 5/21/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3007 TA/~~OU~~ FUPC 21/1 Drill Depth From 0.0 To 50.0 Page 2 of 2

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-19-95 1100 hrs End Date/Time 5/19/95 1500 hrs

Drilling Equip./Method CME Hollow Stem Augers Sampling Equip./Method Hollow Stem augers w/5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
30.0	~~2.5~~ 5.0/5.0 100%		βγ=8.12cpm OVM=105ppm	—	Grey Tuff as Above (30.0-35.0). Tuff is non-welded to poorly welded at bottom of run. Pumice to 2.0cm. Matrix ~12% crystals.			Run #8 1340 hrs 30.0-35.0' Roll 2 Exp 14
2.5		0121-95-0066-01 0121-95-0066-02 34.2-34.6	βγ=-NA- OVM=-NA- HS=20.5ppm	—			Tuff	Run #8 ~~1330 hrs~~ QC Roll 2 Exp 13
35.0	2.5/2.5 100%		βγ=16.6cpm OVM=16.1ppm	—	Non-Welded Grey Tuff (35.0-37.5') NG. ~15% crystals in matrix. Pumice as large as ~1.6cm. Core is mostly disaggregated.		Bandelier	Run #9 1350 hrs 35.0'-37.5' Roll 2 Exp 15
37.5	2.5/2.5 100%	0121-95-0046-01 0121-95-0046-02 34.2-34.6	βγ=18.6cpm OVM=0.9ppm HS=1.2ppm	—	37.5-40.0 Poorly Welded Grey Tuff (NS). Core is almost completely disaggregated. Pumice are greyish white to altered and reddish brown in color and as large as 2.5cm. matrix ~14% crystals and ~80% ash.		Tshirege Member	Run #10 1400 hrs 37.5'-40.0' Roll 2 Exp 16
40.0	2.5/2.5 100%		βγ=13.4cpm OVM=10.0ppm	—	40.0-42.5 Non welded Grey Tuff as above. Pumice alteration to reddish brown color more common. Pumice to 3.5cm. ~4% crystals and 96% ash matrix.			Run #11 40.0'-42.5' Roll 2 Exp 17
42.5	2.5/2.5 100%	0121-95-0133-01 0121-95-0133-02 44.0-44.7	βγ=17.0cpm OVM=0.0ppm HS=0.0ppm	—	42.5-45.0 Grey non-welded Tuff as above. Pumice to 2.0cm and ~12% crystals in matrix.			Run #12 1440 hrs 42.5'-45' Roll 2 Exp 18
45.0	2.5/2.5 100%		βγ=20.7cpm OVM=0.0ppm	—	45.0-47.5 Non welded Grey Tuff as above. Alteration of Pumice and stringers of matrix change color to reddish brown ~~[illegible]~~ (10R6.5/3). Pumice to 2.0cm. ~12% crystals in ash matrix.		UNIT 3	Run #13 45.0'-47.5' Roll 2 Exp 19
47.5	2.0/2.5 80%	0121-95-0129-01 0121-95-0129-02 48.7-49.1	βγ=21.9cpm OVM=0.0ppm HS=0.0ppm	—	47.5-49.5 Non-welded Tan to Reddish brown Tuff. ~20% crystals in rose colored matrix. LOSS: 0.5' @ 49.5-50.0' (No Recovery)			Run #14 1500 hrs 47.5'-50.0' Roll 2 Exp 20
50.0 ~~50.0~~ QC			βγ= OVM=	—	End of Hole: TD=50.0'			Run #
QC ~~50.0~~			βγ= OVM=	—				Run #
50.0 ~~50.0~~ QC			βγ= OVM=	—				Run #
QC ~~50.0~~			βγ= OVM=	—				Run #
50.0 ~~50.0~~ QC								

Prepared by J. Crocker Date 5-19-95 Checked By [signature] Date 5/21/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3008 TA/~~OU~~ FUPC 21/1 Drill Depth From 0.0 To 50.0 Page 1 of 2

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-22-95/1608 End Date/Time 5-23-95/0917

Drilling Equip./Method CME-75C/Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger w/ 5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	2.0/2.5		βγ=Meter OVM=0.0ppm	—	0-2.5' Very Fine Sand, silt (2.5Y 6/2) and grey pieces of Tuff to ~1.5cm. (Fill material). No Recovery: 2.0-2.5'		Fill Material	Run #1 1508 hrs Roll 3 Photo —
2.5	1.5/2.5 3.0-3.5	CH-95-0057-01 CH-95-0057-02	βγ=1.0mr/hr OVM=0.3ppm HS=52.5ppm	—	2.5-4.0 Fill material as above. (5YR 6/2) Tuff pieces to 4.5cm. 4.0-5.0 No Recovery			Run #2 1524 hrs Roll 3 Photo 9
5.0	2.5/2.5 100%	6.2-6.4 0U1-95-0130	βγ=1.0mr/hr OVM=3.4ppm HS=145.2ppm	—	5.0-6.7 Fill material as above. (moist) 6.7-7.5 Pale Red Tuff. 5R 6/2 w/ Grey Pumice to 2.5 cm (unaltered). ~9% crystals in ashy matrix.		Fill Material / Tuff	Run #3 Petrol. odors. Roll 3 Photo 10
	2.5/2.5 100%	OU1-95-0131-01 OU1-95-0131-02 4.8-7.4	βγ=1.0mr/hr OVM=3.7ppm HS=145.3ppm	—	7.5-10.0 Pale Red Tuff as above. Core is horizontally fractured due to drilling.		Tuff	Run #4 1538 hrs odors present Roll 3 Photo —
10.0	5.0/5.0 100%		βγ=1.0mr/hr OVM=>17ppm		10.0-15.0 Pale Red Tuff as above (5R-6/2).		Tuff	Run #5 1610 odors Roll 3 Exp 12
		OU1-95-0059-01 OU1-95-0059-02	βγ=— OVM=— HS=	—			Bandelier	Run #5 Roll 3 Exp 11
15.0	5.0/5.0 100%		βγ=2.0mr/hr OVM=2.0ppm	—	15.0-20.0 Poorly-Moderately Welded Dark Grey Tuff (N6), Pumice as large as 3.5cm. Matrix ~15% crystals			Run #6 1635 odors Roll 3 Exp —
		OU1-95-0060-01 OU1-95-0060-02 0121-95-131 (OU1)	βγ=— OVM=—	—			Member of The	Run #6 Roll 3 Exp 13
20.0	5.0/5.0 100%		βγ=— OVM=—	—	20.0-22.5 Grey Tuff as above. Somewhat moist. Less moist at bottom of Run. Pumice as large as 2.5cm ~12% crystals in ash matrix.		Tshirege	Run #7 ~~1450~~ 1650 odors Roll 3 Exp 15/16
		OU1-95-0061-01 OU1-95-0061-02	βγ=1.0mr/hr OVM=0.35ppm	—	(10R 6/2)			Run #7 Roll 3 Exp 14
25.0	5.0/5.0 100%		βγ=— OVM=—	—	25.0-30.0. Pinkish Grey Tuff. Pumice are altered to a reddish grey and as large as 4.0cm. ~14% crystals in ash matrix		Unit 3	Run #8 1705 Petrol odors Roll 3. Exp 18
		OU1-95-0062-01 OU1-95-0062-02	βγ=1.0mr/hr OVM=5.7ppm	—				Run #8 Roll 3 Exp 17
30.0								

Prepared by J. Crooker Date 5-23/23-95 Checked By [signature] Date 6/8/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3008 TA/~~OU~~ FUPC 21^/FU-1 (Op Task Form) Drill Depth From 0.0 To 50.0 Page 2 of 2

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-22-95/1504 End Date/Time 5-23-95/0917

Drilling Equip./Method CME 750/Hollow Stem Auger Sampling Equip./Method Hollow Stem w/ 5' core Barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes (5-23-95)
30.0	2.5/2.5 100%		BT=274cpm OVM=241ppm	—	30.0-32.5 Pinkish grey Tuff (10R 6/2). Pumice to 6.5cm are grey (N4), ~12% crystals in ash matrix, Run is fractured by multiple Horizontal fractures.			Run #9 0750 hrs; Rig Setup exp 19^; Roll 3 exp 20
32.5	2.5/2.5 100%	0121-95-0023 -01 and -02; 34.0-34.4	BT=201cpm OVM=93ppm; HS=517ppm	—	32.5-35.0 Greyish Brown (5YR 6/1) moderately welded Tuff. Pumice to 6.0cm. Some with altered rims and sugary interiors. ~17% crystals in ash matrix.			Run #10 0909; Roll 3 exp 21
35.0	4.5/5.0 90%		BT: — OVM: —	—	35.0-40.0 Greyish Red Tuff as above. Interval is highly fractured by horizontal fractures. Pumice to 2.5cm, ash matrix ~20% crystals. No Recovery 39.0-39.5		Bandelier Tuff	Run #11 0920; Roll 3 exp 23
37.5		0121-95-0024 -01 and -02; 38.4-39.0	BT=16cpm OVM=22ppm; HS=47ppm	—				Run #11; Roll 3 exp 22
40.0	5.0/5.0 100%		BT=172cpm OVM=61ppm	—	40.0-45.0 Greyish Red Tuff as above. Pumice as large as 1.5cm and matrix ~20% crystals.			Run #12 0950; Roll 3 exp 25
42.5		0121-95-0132 -01 and -02; 43.8-44.2	BT<12cpm OVM=6.2ppm; HS=4.9ppm	—				Run #12; Roll 3 exp 24
45.0	5.0/5.0 100%		BT=38cpm OVM=72ppm	—	45.0-50.0 Greyish Red Tuff as above. Pumice as large as 2.0cm. Some are altered red (5R 5/4) Matrix ~20% crystals. Core is highly fractured by low, moderate and high angle fractures from 47.0-50.0		Tshirege Member of The	Run #13 0917; Roll 4 exp 2
		0121-95-0133 -01 and -02; 49.1-49.6	BT: — OVM: —	—	End of Hole TD 50.0'			Run #13; Roll 4 exp 1
50.0			BT: OVM:	—			Unit 3,	Run #
			BT: OVM:	—				Run #
55.0			BT: OVM:	—				Run #
			BT: OVM:	—				Run #
60.0								

Prepared by John C Crocker Date 5-22/23-95 Checked By [illegible] Date 6/8/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 21-3009 TA/~~OU~~ PUBS/Drunk Farm 21/FH-1 Drill Depth From 0.0 To 17.5 Page 1 of 1

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-24-95/0938 End Date/Time 5-24-95/1030

Drilling Equip./Method CME-750/Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger/5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Anarytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	1.3/2.5 52%		βT=176 ppm OVM=66 ppm	—	0.0-2.5 Fine sand, silt, clay and pebbles to 1.0 cm of grey Tuff, moist. (10R 3/4). No Recovery 1.3'-2.5'.		Fill	Run #1 0938
2.5	2.5/2.5 100%	0121-95-0008 4.3'-4.9'	βT=147 ppm OVM=70 ppm HS=2[illegible] ppm	—	2.5-3.0 Fill material as above. 3.0-5.0 Grey Tuff (NT). Pumice are as large as 0.75 cm are mostly altered reddish brown (10R 3/4). Matrix is ash with ~17% crystals.		Tuff	Run #2 0948 slight petrol odor Roll 4 Exp 18
5.0	5.0/5.0 100%		βT=203 ppm OVM=139 ppm	—	5.0-10.0 Grey Tuff as above. Pumice are altered and as large as 3.5 cm. Ash matrix is ~20% crystals. Tuff is moderately welded. 5.0-10.0 Highly fractured by low and horizontal fracts, with Fe			Run #3 1000 slight petrol odor Roll 4 Exp 20
		0121-95-0016 8.6'-9.3'	βT=203 ppm OVM=38 ppm	—	10.0-15.0 Grey (NT) moderately welded Tuff. Matrix is ash with approximately 20% crystals. Pumice as large as 2.0 cm.		Unit 3 of Tshirege Member of Bandelier Tuff	Run #3 Roll 4 Exp 19
10.0	5.0/5.0 100%		βT= - OVM= -	—				Run #4 1018 Roll 4 Exp 22
		0121-95-0067 14.3-14.6	βT= OVM=	—				Run #4 odor Roll 4 Exp 21
15.0	2.5/2.5 100%		βT= OVM=	—	15.0-17.5 Grey Tuff as above. Becomes non-welded and disaggregated from 16.5-17.5			Run #5 1030 odor Roll 4 Exp 23
17.5			βT= OVM=	—	End of Hole 17.5'			Run #
~~20.0~~			βT= OVM=	—				Run #
			βT= OVM=	—				Run #
~~20.0~~			βT= OVM=	—				Run #
			βT= OVM=	—				Run #
~~20.0~~								

Prepared by John Crocker Date 5-24-95 Checked By [signature] Date 6/8/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3010 TA/~~OU~~ FUPS Blankfarm 21/FU-1 Drill Depth From 0.0 To 30.0 Page 1 of 1

Driller Stewart Bros. Box #(s) — Start Date/Time 5/22/95 1035 End Date/Time 5/23/95 1157

Drilling Equip./Method CME 750 w/ hollow Stem Auger Sampling Equip./Method Hollow Stem Auger w/ core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	1.7/2.5 64%		BT=165 cpm OVM=0.0 ppm	—	0-2.5' Fill material, Reddish Brown (10R 5/4), Silt, very Fine sand w/ pebbles to ≈ 1.5cm. Loss: 0.8' No recovery. 1.7'-2.5'. (Fill is moist).		Fill Material	Run #1 1035 hrs Roll 2 #21
2.5	2.5/2.5 100%	0121-95-0074-01 0121-95-0074-02 4.0-4.7	BT=147 cpm OVM=0.7 ppm	—	2.5-5.0 Fill material as above.			Run #2 1040 hrs Roll 2 #22
5.0	5/5 100%		BT: — OVM: —	—	5.0-6.5 Fill as above. 6.5-10.0 Greyish Red Tuff (5R 4/2) w/ Grey pumice (N8) To 1.5cm. Small pumice altered dark Red (5R 4/6).			Run #3 1052 hrs Roll 2 #24
	—	0121-95-0075-01 0121-95-0075-02 7.0-7.5	BT=203 cpm OVM=0.8 ppm HS=1.9 ppm	—	~~6.5-10.0 Greyish Red Tuff 5R 4/2 w/ Pumice~~ oc			Run #3 Roll 2 #23
10.0	~~5.0/5.0~~ 4.5/5.0 90%	40%	BT: — OVM: —	—	10.0-14.0 Greyish Red Tuff as above. Highly Fractured. Pumice to 4.0cm. Crystals in ash matrix ~ 13%			Run #4 1105 hrs
	—	0121-95-0076-01 0121-95-0076-02 13.5-14.0	BT=199 OVM=0.0 HS 0.6	—	14-14.5 Clay. Orange-brown 10R 4/6 w/ deep red mottling 5R 3/4, Slightly moist. No Recovery: 14.5 — 15.0			Run #4 Roll 2 #24
15.0	1.7/2.5 64%		BT: — OVM: —	—	15.0 — 16.2 Clay as above. Slightly moist. 16.2-16.7 Grey Non-Welded Tuff. Disaggregated. 16.7-17.5: No Recovery		Member of Tshirege	Run #5 1120 hrs Roll 3 Photos 1-2
	2.5/2.5 100%	0121-95-0077-01 0121-95-0077-02 19.0-19.4	BT=167 OVM=0.0 HS=0.3	—	17.5-20.0. Grey Non-Welded Tuff as above. Disaggregated along Horizontal Partings. Color = N5. Pumice to 2.5cm. w/ Sugary Texture. ~15% crystals in ash matrix. Some Pumice altered			Run #6 ~1130 hrs Roll 3 #3
20.0	2.5/2.5 100%		BT: OVM:	—	reddish Brown (5R 3/4). 20-22.5: Grey Tuff as above. Pumice to 4.0cm (N8). Other Pumice are altered reddish Brown.		Unit 3, Ts	Run #7 1140 hrs Roll 3 #4
	2.5/2.5 100%	0121-95-0078-01 0121-95-0078-02 23.7-24.4	BT=194 OVM=0.0 HS=0.3	—	22.5-25.0 Non Welded Grey Tuff. Disaggregated along Horizontal Partings from 22.5-24.5. Matrix ~14% Cryst. and 86% ash.			Run #8 1150 hrs Roll 3 #5
25.0	5.0/5.0 100%		BT: — OVM: —	—	25-30.0 Grey Tuff as above. Completely disaggregated. Pumice to 2.0cm (N8). Small <0.5cm are altered reddish Brown. ~12% crystals in ash matrix			Run #9 1157 hrs Roll 3 oc (#72)
30.0	—	0121-95-0079-01 0121-95-0079-02 26.9-27.6	BT=195 OVM=0.0 ppm HS=0.3 ppm	—				Run #9 Roll 3 #6

Prepared by John Crocker Date 5-23-95 Checked By [signature] Date 5/25/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 21-3010 TA/~~OU~~ FUDC-01 Tank Farm 21/FU-1 Drill Depth From 0.0 To 35.0 Page 2 of 2

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-22-95/1035 End Date/Time 5/22/95/ 1218 hrs

Drilling Equip./Method CME 750 w/ Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger w/ 5' core barrel.

Depth (feet)	Recovery (feet per feet / %)	Field Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
30.0	2.5/2.5 100%		BT= — OVM= —	—	30.0-30.5 Grey (N6) as Above. Pumice to 1.5cm are altered (10Y 6/2). ~ 12% crystals in ash matrix.			Run # 10 Roll #3 Photo 7
32.5	2.5/2.5 100%	21-21-95-0040-01 21-21-95-0040-02.	BT=193 cpm OVM= 0.0 ppm H2S 0.0 ppm	—	30.5-35.0 Grey (N5) Poorly Welded Tuff. Pumice are lt grey (N8). Some altered (10R4/6) on Rims			Run # 11 1218 hrs Roll #3 Photo 8
35.0			BT= OVM=	—	End of hole. TD 35.0'			Run #
~~10.0~~			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
~~15.0~~			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
~~20.0~~			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
~~25.0~~			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
~~30.0~~			BT= OVM=	—				Run #

Prepared by John C Crockett Date 5-22-95 Checked By [illegible] Date 6/8/95

LOS ALAMOS NA NAL LABORATO.. / ENVIRONMENTAL RE ORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 21-3011 TA/~~OU~~ FUDC or TANK FARM 21-FEU-1 Drill Depth From 0.0 To 40.0 Page 1 of 2

Driller Stewart Bros. Box #(s) — Start Date/Time 5-23-95/1400 End Date/Time 5-23-95/1630

Drilling Equip./Method CME-750/Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger/5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology / Soil	Graphic Log	Lithologic Unit	Notes
0.0	1.5/2.5 60%		BT=149 cpm OVM=83 ppm	—	0.0-2.5' Dark reddish-Brown Fill (10R 3/4) Fine sand, silt and clay with pebbles as large as 1.0 cm. No Recovery (1.5'-2.5')		Fill Material	Run #1 1417 Roll 4 Photo 3
2.5	2.5/2.5 100%	0121-95-0082 3.2'-3.7'	BT=182 cpm OVM=0.8 ppm HS=91.0 ppm	—	2.5'-3.3' Fill material as above. 3.3-5.0 Reddish grey Tuff (5R 4/2) Moderately welded. Pumice are grey and as large as 0.76 cm. Matrix is ash with ~12% crystals.		Fill	Run #2 1425 Roll 4 Photo 4
5.0	4.2/5.0 84%		BT= — OVM= —	—	5.0-10.0 Reddish grey poorly welded Tuff (5R 4/2). Light grey Pumice (N8) are as large as 4.0 cm. Ashy matrix has ~12% crystals. No Recovery 9.2'-10.0 Ft.			Run #3 1437 Roll 4 Photo 6
	—	0121-95-0083 8.4'-8.9'	BT=160 cpm OVM=52.0 ppm HS=210 ppm	—	@ 6.4' Horizontal fracture with oxide fill, @ 6.1' Intersecting ~~high~~ vertical and low angle fractures with minor oxides.		Tuff	Run #3 Roll 4 Photo 5
10.0	5.0/5.0 100%		BT= — OVM= —	—	10.0-15.0 Reddish grey Tuff as above. Pumice to 6.0 cm. ~12% crystals in ash matrix. 10.5-11.0' moderate angle fracture w/ oxide fill.		Bandelier	Run #4 1448 Roll 4 Photo 8
	—	0121-95-0084 13.1'-13.6'	BT=187 cpm OVM=104 ppm 57.0% HS=240 ppm	—	11.5 Low angle fracture w/ Light oxide fill (also at 11.8, 12.0, 12.8) 15.0 Low angle fracture w/ Heavy oxide fill.			Run #4 Roll 4 Photo 7
15.0	5.0/5.0 100%		BT= — OVM= —	—	15.0-20.0 Greyish Pink (5YR 7/2) moderately welded Tuff. Pumice are light grey (N8) and as large as 2.0 cm. Matrix is ash with ~15% crystals.		Member of the	Run #5 1504 Roll 4 —
		0121-95-0085 19.0-19.3	BT=200 cpm OVM=71.0 ppm HS=465 ppm	—	15.0-15.5 Moderate and Low angle fractures with no fill. ~15.5-16.2 Multiple Horizontal fractures (Rubble)		Tshirege	Run #5 Roll 4 Photo 9
20.0	5.0/5.0 100%		BT= — OVM= —	—	20.0-25.0 Grey (5YR 7/2), moderately welded Tuff. Pumice are grey and as large as 4.0 cm. Matrix is ash with ~15% crystals.			Run #6 1515 Roll 4 Photo 11
		0121-95-0086 23.6-24.4	BT=192 cpm OVM=96.0 ppm HS=540 ppm	—	Note: Fractures in middle of Run are not natural.		Unit 3	Run #6 Photo 10
25.0	5.0/5.0		BT= — OVM= —	—	25.0-30.0 Greyish Pink (5YR 7/2) moderately welded Tuff. Large Pumice to 5.0 cm are grey (N8), smaller Pumice are altered to greenish grey (5Y 6/1).			Run #7 1530 Roll 4 Photo 13
30.0		0121-95-0087 29.0-29.4	BT=203 cpm OVM=74.0 ppm	—	26.0 Horizontal fracture, minor oxides. 28.3-28.5 Horizontal fracture, No Fill. 29.5 Low angle fracture, No Fill			Run #7 Roll 4 Photo 12

Prepared by John C Cooper Date 5/23/95 Checked By [illegible] Date 6/6/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 21-3011 TA/~~OU~~ PUB 21/FU-1 Drill Depth From 0.0 To 40.0 Page 2 of 2

Driller Stewart Bros. Box #(s) — Start Date/Time 5-23-95/1400 End Date/Time 5/23/95/1630

Drilling Equip./Method CME-750/Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger/5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
30.0	5.0/5.0	~~[illegible]~~	βγc — OVM: —	—	30.0-35.0 Moderately welded greyish pink (5YR 7/2) Tuff. Pumice are grey (N8) and as large as 5.0 cm. Matrix is ash with ~15% crystals	‖ ‖		Run #6 Roll 4 Photo 15
32.5	—	OU-95-0088 0121-95-0089 (Duplicate) 33.5-34.4	βγ: 20 cpm OVM: 50.0 ppm HS: 101 ppm	—	30.8' Horizontal fracture. Minor oxides. 31.4' Low angle fracture, No fill 32.7' Moderate angle fracture, No fill. 33.8'-34.3' Vert. fracture, No fill	‖ ‖	Unit 3 of Tshirege	Run #6 Roll 4 Photo 14
35.0	5.0/5.0 100%		βγc — OVM: —	—	35.0-40.0 Moderately welded pinkish grey (5YR 7/2) Tuff. Pumice are grey (N8) and as large as 4.0 cm. Matrix is ash with ~15% crystals.	‖ ‖		Run #7 Roll 4 Photo 16
	—	OU-95-0095 39.0-39.5	βγ: 198 OVM:	—	35.2' Horizontal fracture, No fill. 36.0' Horizontal fracture, No fill. 36.6' Low angle fracture, No fill. 37.7-38.0 multiple low angle and horizontal fractures.	‖ ‖		Run #7 1630 Roll 4 Photo 17
40.0			βγ: OVM:	—	END of Hole. 40.0'			Run #
			βγ: OVM:	—				Run #
			βγ: OVM:	—				Run #
			βγ: OVM:	—				Run #
			βγ: OVM:	—				Run #
			βγ: OVM:	—				Run #
			βγ: OVM:	—				Run #
			βγc OVM:	—				Run #

Prepared by John A Dooley Date 5-23-95 Checked By [illegible] Date 6/8/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3012 TA/~~OU~~ FUPS 21 / DP TANK Farm EU-1 Drill Depth From 0.0 To 55.0 Page 1 of 2

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-24-95/1300 End Date/Time 5-24-95/1612

Drilling Equip./Method CME-750/Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger/5' Core Barrel

Depth (feet)	Recovery (feet per foot / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	~~2.5~~ 1.2 / 2.5 46%		βγ=139 cpm OVM=0.0 ppm	—	0.0-2.5 Fill material Very Fine sand, silt and clay. Reddish Brown (10R 3/4), Slightly moist. No Recovery (1.2'-2.5')		Fill Material	Run #1 1303 hrs; Roll 4 Exp 24
2.5	1.3 / 2.5 62%	01-21-95-0040 32-3.6	βγ=200 cpm OVM=0.0 H2S=0.1 ppm	—	2.5-6.5' Fill material as above. Fill has a piece of Grey Tuff 0.2' from 3.6-3.8'. No Recovery 3.8'-5.0' (1.2' Loss)			Run #2 1307 hrs; 1.2' Loss (No Recov.)
5.0	1.4 / 2.5 72%		βγ=193 cpm OVM=0.0 ppm	—	6.5-6.8 Grey (N7) Non-welded and disaggregated Tuff. No visible pumice clasts. ~20% crystals in ash matrix. No Recovery 6.8'-7.5' (0.7' loss).			Run #3 1320 hrs; Roll 4 Exp 25
7.5	2.2 / 2.5 88%	01-21-95-0041 8.6-9.2	βγ=183 cpm OVM=0.0 ppm H2S=0.0 ppm	—	7.5'-9.7' Grey (N7) Non-welded and disaggregated Tuff. Pieces of pumice are lacking. Matrix is ash with ~25% crystals. No Recovery: 9.7'-10.0' (0.3' Loss)		Bandelier Tuff	Run #4 1325
10.0	2.1 / 2.5 84%		βγ=197 cpm OVM=0.0 ppm	—	10.0-12.5 Grey Non-Welded Tuff as above. Core is disaggregated. ~18% crystals in ashy matrix. No Recovery 12.1-12.5 (0.4' Loss).			Run #5 1330
12.5	2.5 / 2.5 100%	01-21-95-0042 14.0-14.7	βγ=198 cpm OVM=0.0 ppm H2S=0.0 ppm	—	12.5'-15.0' Grey (N7) Tuff as above. Becomes moderately welded at 13.5 to end of Run. 14.0' intersecting Vert. and Horiz. Fractures (No Fill)			Run #6 1337; Roll 5 Exp 1
15.0	2.5 / 5.0 50%		βγ=206 cpm OVM=0.0 ppm	—	15.0-20.0 Grey Tuff as above. Partly welded from 15.0-15.5; Non-welded 15.5-17.8. Pumice are lacking. ~18% crystals in ash matrix.		Member of	Run #7; Roll 5 Exp 3
17.5	—	01-21-95-0043	βγ= — OVM= — H2S=0.0 ppm	—	15.5-16.5 Horizontal partings. No fill material. 17.0-17.8 core disaggregated. No Recovery 17.8-20.0' (2.2' loss)			Run #7; Roll 5 Exp 2
20.0	2.0 / 2.5 80%		βγ=164 cpm OVM=0.0 ppm	—	20.0-21.3 Grey Tuff separated along horizontal partings. (as Above). 21.3-22.0 Grey Non-welded and disaggregated Tuff (N7), Pumice Altered (10R 4/4) and as large as 1.5 cm.		Tshirege	Run #8 22.0-22.5 No Recovery. Roll 5 Exp 4
22.5	2.5 / 2.5 100%	01-21-95-0044 23.4-24.6	βγ=196 cpm OVM=0.0 ppm	—	^ ~15% crystals in ash matrix. 22.5-25.0 Moderately welded grey (N7) Tuff, Grey (N6) pumice to 5.0 cm ~17% crystals in ash matrix. 23.6 Horiz Fracture, minor oxide fill.		Unit 3	Run #9 1420; Roll 5 Exp 5
25.0	2.5 / 5.0 50%		βγ=185 cpm OVM=0.0 ppm	—	25.0-30.0 Grey (N7) Tuff. Non-welded and disaggregated along horizontal partings. Pumice to 1.0 cm. ~17% crystals in ash matrix with stringers of alteration (5YR 6/4)			Run #10 1430; Roll 5 Exp 6
27.5	—	01-21-95-0045 26.3-26.9	βγ= — OVM= —	—				Run #10
30.0								

Prepared by John Crocker Date 5/24/95 Checked By [illegible] Date 6/8/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3012 TA/~~OU~~ PUPC 21 / DP Tank Farm / FU-1 Drill Depth From 0.0 To 55.0 Page 2 of 2

Driller Stewart Bros. Box #(s) —— Start Date/Time 5-24-95/1300 End Date/Time 5-24-95/1612

Drilling Equip./Method CME-750/Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger/5' Core Barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
30.0	2.5/2.5 100%		BT=116 ppm OVM=0.0 ppm	—	30.0-32.5 Grey Tuff (N7) Non-Welded and completely disaggregated. (Except 30.2-31.0 which is moderately welded). Pumice are light grey (N8) and as large as 5cm. Matrix is ash with ~14% crystals.			Run# 11 Roll 5 Exp 7
32.5	2.5/2.5 100%	0121-95-0096 33.9-34.7	BT=167 ppm OVM=0.0 ppm	—	32.5-35.0 Grey Tuff (N7). Moderately Welded. Pumice are grey (N8) and as large as 0.75 cm. Matrix is ash with ~15% crystals. 32.7 Horizontal Fract (No Fill) - Also at 34.7'.			Run# 12 1504 Roll 5 Exp 8
35.0	5.0/5.0 100%		BT: — OVM: —	—	35.0-40.0 Grey Tuff (N7) Moderately Welded. Pumice are light grey (N8) to ~1.0cm. Matrix is ashy with ~15% crystals.			Run# 13 1523 Roll 5 Exp 9
37.5	—	0121-95-0097 38.9-39.4	BT=142 ppm OVM=0.0 ppm H2S 0.0 ppm	—	38.0-38.5 High angle fracture cut by a horizontal fracture. (Oxide fill.)		Bandelier Tuff	Run# 13 Roll 5 Exp 10
40.0	4.0/5.0 80%		BT=202 ppm OVM=0.0 ppm	—	40.0-44.0 Non-Welded and completely disaggregated Grey (N7) Tuff - Pumice as large as 1.0cm. and altered reddish-Brown (10R 5/4). Matrix is ash with ~15% crystals.			Run# Run 14 1540 Roll 5 Exp 11
42.5		0121-95-0136 43.0-43.4	BT= OVM=	—	42.5-44.0 Disaggregation in this interval may be due to vert. fracture(s). 44.0-45.0 No Recovery (1.0' loss)		of Bandelier Member	Run #14 Roll 5 Exp 12
45.0	2.5/2.5 100%		BT=167 ppm OVM=0.0 ppm	—	45.0-47.5 Poorly/Non-Welded Grey (N7) Tuff. Matrix is ash with ~20% crystals. Pumice to 1.5cm. 46.6 - oxid stains. 45.5-46.0 Non-Welded (No Fract.)			Run# 15 ~~1352~~ 1552
47.5	2.5/2.5 100%	0121-95-0137 47.0-47.5	BT=205 ppm OVM=0.0 ppm	—	47.5-50.0 Grey Tuff (N7). Pumice to 0.75cm. Matrix is ash with ~15% crystals. (Run was in Brass Sleeves. Completly broken up by the time I got the core out.)		of Tshirege Member	Run# 16 1600 Roll 5 Exp 13
50.0	2.5/2.5 100%		BT=202 ppm OVM=0.0 ppm	—	50.0-52.5 Grey (N7) Tuff as above. Completely disaggregated. Pumice as large as 3.0cm. Matrix is ash with ~15% cryst.			Run # 17
52.5	2.5/2.5 100%	0121-95-0138 54.0-54.5	BT=190 ppm OVM=0.0 ppm	—	52.5-55.0 Grey Tuff as above. Core run in Brass and completely disaggregated.		Unit 3	Run# 18 1612
55.0			BT: OVM:	—	END OF hole. TD. 55.0'			Run #
			BT: OVM:	—				Run #

Prepared by John Crocker Date 5/24/95 Checked By [signature] Date 6/8/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY — CORE SAMPLE LOG

Borehole ID 21-~~2~~3013 TA/~~OU~~ FUDS DP TANK Farm 21 / FH-1 Drill Depth From 0.0 To 35.0' Page 1 of 2

Driller Stewart Bros. Box #(s) — Start Date/Time 5-25-95/1010 End Date/Time 5/25/95/1155

Drilling Equip./Method CME 750/Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger/5' Core Barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	1.0/2.5 40%		BT=184 OVM=0.0	—	~~0-0.5~~ DC Loss 1.0-2.5 (5YR4/4) 0.0-0.5 Fill. Brownish red Fine sand + silt w/ Pumice to 1.0 cm 0.5-2.5 disaggregated Grey (N7) Tuff. Pumice to 2.0cm. ~10% crystals in ash matrix		Fill	Run #1 1017 hrs Roll 5 Exp ~~+6~~
2.5	2.5/5.5 100%	0121-95-0170 -01 and -02 3.5-4.2	BT=167 OVM= HS=0.0	—	2.5-4.5 Grey Tuff. Non Welded To 3.3'. 3.3-4.5 moderately welded grey Tuff (N7). Pumice to 1.5 altered reddish w 20% crystals in ash matrix 3.3 Horiz clean 4.5 Low Fe oxide		Bandelier Tuff	Run #2 1025 hrs Roll — Exp —
5.0	4.5/5.0 90%		BT=194 OVM=0.0	—	0.5 Loss (4.5-10.0) 5.0-10.0 Grey Tuff as above. Run is highly fractured because the driller had to repeatedly roll up.			Run #3 1037 hrs Roll — Exp —
		0121-95-0171 -01 and -02 4.4-4.1	BT= — OVM= — HS=0.1	—				Run #3 Roll — Exp —
10.0	5.0/5.0 100%		BT=175 OVM=0.0	—	10-15 Grey (N7) Tuff Moderately welded To 13.0. 13.0-15 Non welded and disaggregated. Pumice to 2.0cm unaltered lt. Grey (N8) ~23% crystals in ash matrix			Run #4 ~~1011~~ 1100 hrs Roll — Exp —
		0121-95-0200 -01 and -02 14.0-14.6	BT= OVM= HS 0.0	—	10.0-10.5 Horiz clean 11.0 Horiz clean 12.5-13.0 Multiple Horiz fractures, minor oxides			Run #4 Roll — Exp —
15.0	2.5/5.0 50%		BT=205 OVM=0.0	—	15.0-17.5 Grey Tuff (N7) completely disaggregated. ~20% crystals in ash matrix. Pumice to 2.0 cm.		Tshirege member of	Run #5 1105 Roll — Exp —
		0121-95-0171 -01 and -02 DC 16.3-16.4 ~~14.4-14.4~~	BT= — OVM= — HS 0.0	—	17.5-20 No Recovery (N7)			Run #5 Roll —
20.0	2.5/5.0 100%		BT=191 OVM=1.0	—	20.0-22.5 Grey Non-Welded Tuff disaggregated. Matrix ~20% crystals w/ stringers of tan alteration (5YR6/4) Pumice to 0.5 altered to Reddish Tan.		Unit 3	Run #6 1115 Roll —
	2.5/5.0 100%	0121-95-0172 -01 and -02 24.0 ~~24.5~~	BT=219 OVM=0.0 HS=0.0	—	22.5-24.0 completely disaggregated grey Tuff. Ten stringers of alteration in matrix. 24.0-25.0 moderately welded grey Tuff (N7) Pumice to 1.0 cm. Altered w 15% crystals in matrix			Run #7 1125 Roll —
25.0	5.0/5.0 100%	0124	BT=190 OVM=0.0	—	25.0-25.5 Vertical fracture No Fill 25.0-30.0 moderately welded grey Tuff (N7) Grey (N8) Pumice to ~~4~~ 1.5 cm. (some have thin alteration rims). ~15% crystals in ash matrix.			Run #8 1140 Roll —
		0121-95-0173 -01 and -02 27.0-29.5	BT= — OVM= — HS=0.0	—	(No Fractures.)			Run #8 Roll —
30.0								

Prepared by John C Crocker Date 5/25/95 Checked By [illegible] Date 6/8/95

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY | **CORE SAMPLE LOG**

Borehole ID 21-3013 TA/~~OU~~ FUPC DP Tank Farm 21 / FU-1 Drill Depth From 0.0 To 35.0' Page 2 of 2

Driller Stewart Bros. Box #(s) — Start Date/Time 5-25-95/1010 End Date/Time 5-25-95/1155

Drilling Equip./Method CME-750/Hollow Stem Auger Sampling Equip./Method Hollow Stem Auger/5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
30.0	4.3/5.0 86%		BT=17# OVM=0.0	—	30-35.0 moderately to non welded Tuff. (NT) Pumice to 1.5cm are white to reddish (when altered.) with crystals in ash matrix		Unit 3 of Bandelier Tuff	Run #9 1135
32.5		21N-95-3003-01 and -02	BT= — OVM= —	—				Run #9
35.0		327332			No Recovery 34.7 to 35.0			
			BT= OVM=	—	End of hole. TD = 35.0'			Run #
QC 40.0			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
QC 45.0			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
QC 50.0			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
QC 55.0			BT= OVM=	—				Run #
			BT= OVM=	—				Run #
QC 60.0			BT= OVM=	—				Run #

Prepared by John C Crocker Date 5/25/95 Checked By [illegible] Date 6/8/95

LOS ALAMOS NATIONAL LABORATC.. / ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 21-3014 TA/~~OU~~ PUPC DP TANK Farm 21 / FU-1 Drill Depth From 0.0 To 35.0 Page 1 of 2

Driller Stewart Bros. Box #(s) — Start Date/Time 5-31-95/1134 End Date/Time 5-31-95/1300

Drilling Equip./Method CME-750/Hollow Stem Augers Sampling Equip./Method Hollow Stem augers/ 5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0.0	2.5/2.5 100%		BT=174 cpm OVM=0.0 ppm	—	0.0-2.0 FT. Fine sand, silt and abundant clay with pebbles to 3.0cm. Moist. (10R 3/4) 2.0-3.5 Greyish Red Tuff (5R 4/2). Grey pumice (N8) to 3.0cm. Matrix is ash with 20% crystals and 2% lithics.		Fill Material	Run #1 1134 hrs
2.5	2.5/2.5 100%	OU1-95-0160 3.8-4.5	BT= OVM=	—	2.5-5.0 Greyish Red Tuff (5R 4/2). Pumice are grey (N8) and unaltered. Matrix is ash with 22% crystals and 1-2% lithics. 3.5-5.0: Tuff is altered to moderate orangish pink on one side of a clay/zeolite-filled fracture (high angle)			Run #2 Roll 5 (alteration across fracture). Photos 26 and 27
5.0	4.7/5.0 94%		BT=147 cpm OVM=0.0 ppm	—	5.0-10.0 Greyish brown Tuff. Pumice are grey (N8) and as large as 6.0 cm. (Most have a sugary texture). Matrix is ash with ~17% crystals and 3% lithic fragments.			Run #3 1152 hrs
		OU1-95-0161 9.4-9.8	BT= — OVM= —	—			Tuff	Run #3
10.0	5.0/5.0 100%		BT=149 cpm OVM=0.0 ppm	—	10.0-15.0 Greyish Brown Tuff (5YR 6/1). Pumice are as large as 2.0 cm, are grey (N4) and sugary textured. Rare pumice < 1.0 cm are altered to a reddish brown hue (10R 3/4). Matrix is ash with 25% crystals and 2% lithics. Tuff moderately			Run #4 1203 hrs
		0151-95-0162 13.7-14.4	BT= — OVM= —	—	welded. ~~15.0-20.0~~ pl 14.0-15.0' High angle and moderate angle fractures, No fill material.		of Bandelier	Run #4
15.0	5.0/5.0		BT=175 cpm OVM=0.0 ppm	—	15.0-20.0 Moderately welded greyish brown Tuff (5YR 6/1). Pumice to 4.5 cm average ~2.0 cm. Most are at least partly altered to reddish brown (10R 3/4). Matrix is ash with ~25% crystals and 2% lithics.		Member	Run #5 1220 hrs
		OU1-95-0163 OU1-95-0164 18.5-19.2	BT= — OVM= —	—				Run #5
20.0	5.0/5.0		BT=147 cpm OVM=0.0 ppm	—	20.0-25.0 Non-welded and completely disaggregated, Brownish grey Tuff (5YR 6/1). Pumice to 1.5 cm, most are altered to reddish brown color (10R 3/4). Matrix is ash with 17% crystals and 1% lithics.		Unit 3 of Tshirege	Run #6 1230 hrs
		OU1-95-0165 21.4-22.0	BT= — OVM= —	—				Run #6
25.0	2.5/2.5 100%		BT=174 cpm OVM=0.0 ppm	—	25.0-27.5 Moderately welded Brownish-grey Tuff (5YR 6/1). Pumice to 1.5 cm; most are altered to a reddish brown (10R 3/4) color. Matrix is ash with ~17% crystals and 1% lithics. 26' and 26.5' Horizontal Fractures w/ no fill material.			Run #7 1248 hrs
	2.5/2.5 100%	OU1-95-0166 29.0-29.5	BT=142 cpm OVM=0.0 ppm	—	27.5-30.0 Brownish Grey Tuff (5YR 6/1). Non-welded and Disaggregated. Pumice are altered Reddish-Brown (10R 3/4) and are as large as 1.5 cm. Matrix is ash with 15% crystals and 2% Lithics.			Run #8 1256 hrs
0.0								

Prepared by John C Crocker Date 5-31-95 Checked By [illegible] Date 6/6/95

LOS ALAMOS NATI L LABORATC / ENVIRONMENTAL REST ATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 21-3014 TA/~~OU~~ PUPa 21 / PA-1 Drill Depth From 0.0 To 35.00 Page 2 of 2

Driller Stewart Bros. Box #(s) — Start Date/Time 5-31-95/1134 End Date/Time 5-31-95/1300

Drilling Equip./Method CME-750/Hollow Stem Auger Sampling Equip./Method Hollowstem Auger/5' core barrel

Depth (feet)	Recovery (feet per feet / %)	Field Analytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology-Petrology - Soil	Graphic Log	Lithologic Unit	Notes
30.0	2.5 / 5.0 50%	[illegible]	BT= — OVM= —	—	30.0-35.0 Grey TUFF (N5), Non-Welded and disaggregated. Pumice to 0.75 cm are altered reddish brown (10R 3/4) Matrix is ash with ~15% crystals.	// //	Tshirege Member of Bandelier Tuff	Run #9 1257
32.5		0101-95-0169 31.5-32.0	BT= 147 OVM=0.0	—		// /	Unit 3	Run #9
35.0			BT= — OVM= —	—				Run #
			BT= — OVM= —	—				Run #
PC 40.0			BT= — OVM= —	—				Run #
			BT= — OVM= —	—				Run #
PC 45.0			BT= — OVM= —	—				Run #
			BT= — OVM= —	—				Run #
PC 50.0			BT= — OVM= —	—				Run #
			BT= — OVM= —	—				Run #
PC 55.0			BT= — OVM= —	—				Run #
			BT= — OVM= —	—				Run #
PC 60.0			BT= — OVM= —	—				Run #

Prepared by [illegible] Date 5-31-95 Checked By [illegible] Date 6/8/95

ENCLOSURE 6

LANL GENERAL GEOLOGY AND HYDROLOGY INFORMATION AND SURFICIAL GEOLOGY AT THE DP TANK FARM SITE

Surficial Geology - DP Tank Farm Site

According to the "Soil Survey of Los Alamos County, New Mexico" (LASL, LA-6779-MS), the surface soils found at the site are composed of the Hackroy sandy loam. The surface layer of this soil is typically described as follows: brown and moist; weak fine subangular blocky structure; hard and friable moist; common fine angular pores; mildly alkaline; and abrupt smooth boundary. ERM/Golder observed the surficial soils in the vicinity of the two fill station locations to be thin and poorly developed fine sand, silt and gravel overlaying the tuff bedrock. Soil thicknesses ranged from less than 1 foot at boring 21-3013 located near the east fill station to approximately 7.5 feet at boring 21-3004 located south of the former west fill station.

In all areas of the site, the soils overlay Unit 3 of the Tshirege Member of the Bandelier Tuff. This unit is typically described as a grey, nonwelded to moderately welded tuff containing pumice fragments up to 3 cm in diameter with up to 15 percent crystals and lithic fragments embedded in the matrix. Horizontal to high-angle fractures are common. Many of the fractures were lined with carbonate materials or clays. Much of the core recovered was completely disaggregated, making accurate lithologic descriptions and fracture characterization difficult to impossible.

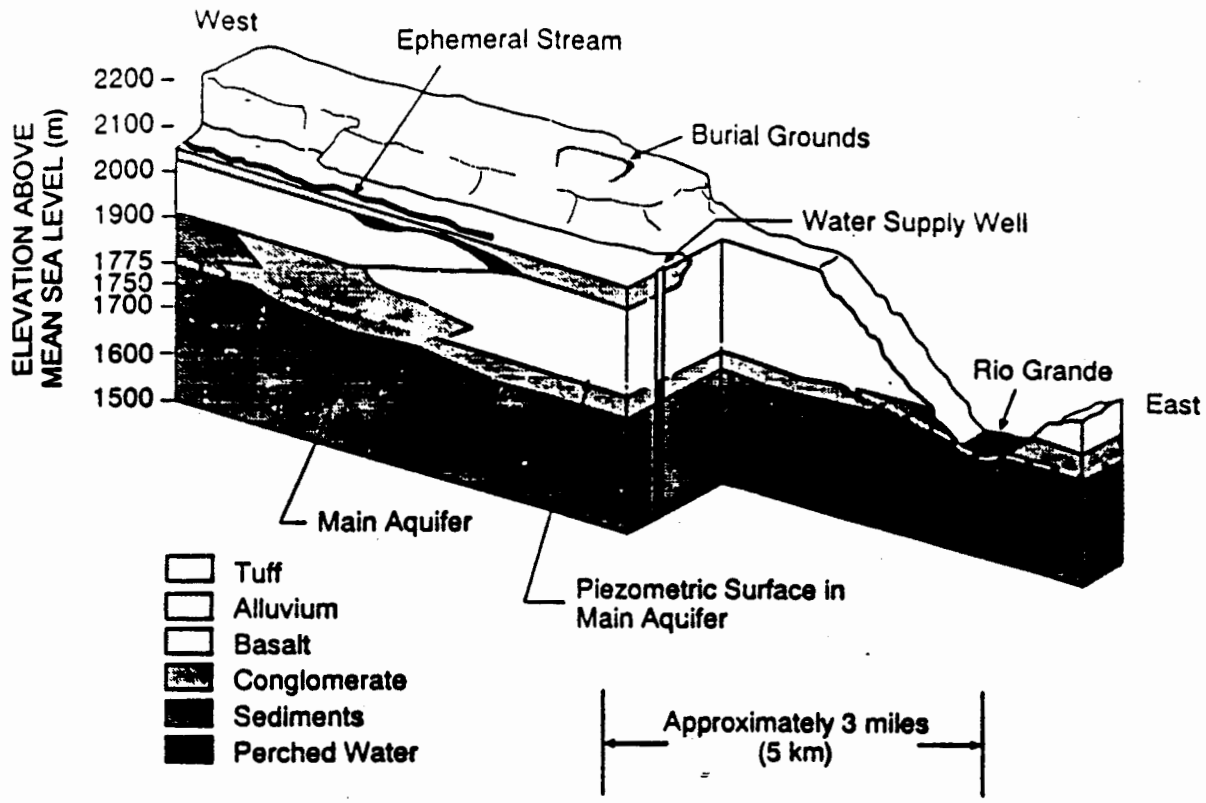


Fig. II-6. Conceptual illustration of geologic-hydrologic relationship in Los Alamos area.

(3 ft) to as much as 30 m (100 ft) in thickness. The alluvium is permeable, in contrast to the underlying volcanic tuff and sediments. Intermittent runoff in canyons infiltrates the alluvium until its downward movement is impeded by the less permeable tuff and volcanic sediment. This results in a shallow alluvial groundwater body that moves down gradient within the alluvium. As water in the alluvium moves down gradient, it is depleted by evapotranspiration and movement into underlying volcanics (Purtymun 1977).

Perched water occurs in conglomerate and basalts beneath the alluvium in portions of Pueblo, Los Alamos, and Sandia Canyons. It has been encountered at depths of about 37 m (120 ft) in the midreach of Pueblo Canyon, about 45 to 60 m (150 to 200 ft) beneath the surface in lower Pueblo and Los Alamos Canyons near their confluence, mainly in basalts in Los Alamos Canyon at 61-76 m (200-250 ft) (Fig. II-6), and in Sandia Canyon near the eastern Laboratory boundary at a depth of about 137 m (450 ft). Perched water has one discharge point at Basalt Spring in Los Alamos Canyon.

The main aquifer of the Los Alamos area is the only aquifer in the area capable of serving as a municipal water supply. The surface of the aquifer rises westward from the Rio Grande within the Tesuque Formation into the lower part of the Puye Formation beneath the central and western part of the plateau. Depth to the aquifer ranges from 360 m (1,200 ft) along the western margin of the plateau to about 180 m (600 ft) at the eastern margin. The main aquifer is isolated from alluvial and perched waters by about 110 to 190 m (350 to 620 ft) of dry tuff and volcanic sediments. Thus, there is little hydrologic connection or potential for recharge to the main aquifer from alluvial or perched water.

Water in the main aquifer is under artesian conditions in the eastern part and along the Rio Grande (Purtymun 1974b). Major recharge to the main aquifer is inferred to be from the west because of the slope of the piezometric surface. The main aquifer discharges into the Rio Grande through springs in White Rock

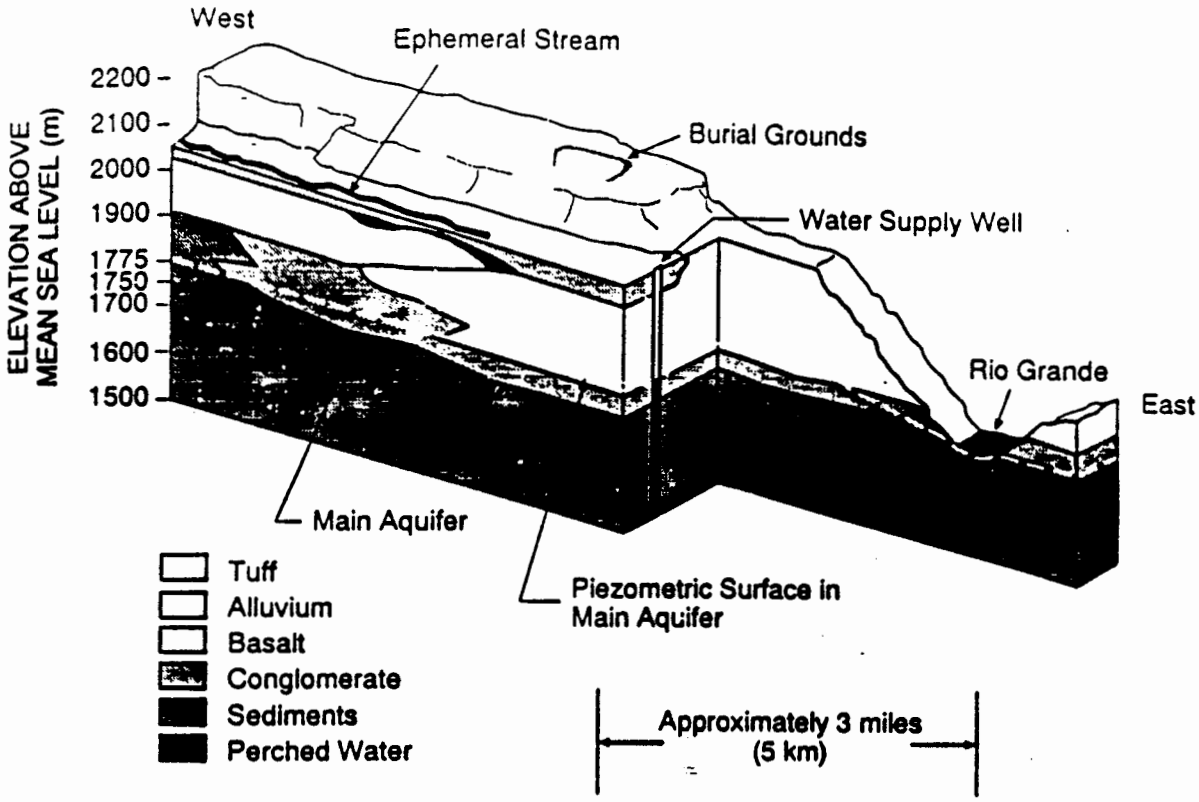


Fig. II-6. Conceptual illustration of geologic-hydrologic relationship in Los Alamos area.

(3 ft) to as much as 30 m (100 ft) in thickness. The alluvium is permeable, in contrast to the underlying volcanic tuff and sediments. Intermittent runoff in canyons infiltrates the alluvium until its downward movement is impeded by the less permeable tuff and volcanic sediment. This results in a shallow alluvial groundwater body that moves down gradient within the alluvium. As water in the alluvium moves down gradient, it is depleted by evapotranspiration and movement into underlying volcanics (Purtymun 1977).

Perched water occurs in conglomerate and basalts beneath the alluvium in portions of Pueblo, Los Alamos, and Sandia Canyons. It has been encountered at depths of about 37 m (120 ft) in the midreach of Pueblo Canyon, about 45 to 60 m (150 to 200 ft) beneath the surface in lower Pueblo and Los Alamos Canyons near their confluence, mainly in basalts in Los Alamos Canyon at 61-76 m (200-250 ft) (Fig. II-6), and in Sandia Canyon near the eastern Laboratory boundary at a depth of about 137 m (450 ft). Perched water has one discharge point at Basalt Spring in Los Alamos Canyon.

The main aquifer of the Los Alamos area is the only aquifer in the area capable of serving as a municipal water supply. The surface of the aquifer rises westward from the Rio Grande within the Tesuque Formation into the lower part of the Puye Formation beneath the central and western part of the plateau. Depth to the aquifer ranges from 360 m (1,200 ft) along the western margin of the plateau to about 180 m (600 ft) at the eastern margin. The main aquifer is isolated from alluvial and perched waters by about 110 to 190 m (350 to 620 ft) of dry tuff and volcanic sediments. Thus, there is little hydrologic connection or potential for recharge to the main aquifer from alluvial or perched water.

Water in the main aquifer is under artesian conditions in the eastern part and along the Rio Grande (Purtymun 1974b). Major recharge to the main aquifer is inferred to be from the west because of the slope of the piezometric surface. The main aquifer discharges into the Rio Grande through springs in White Rock

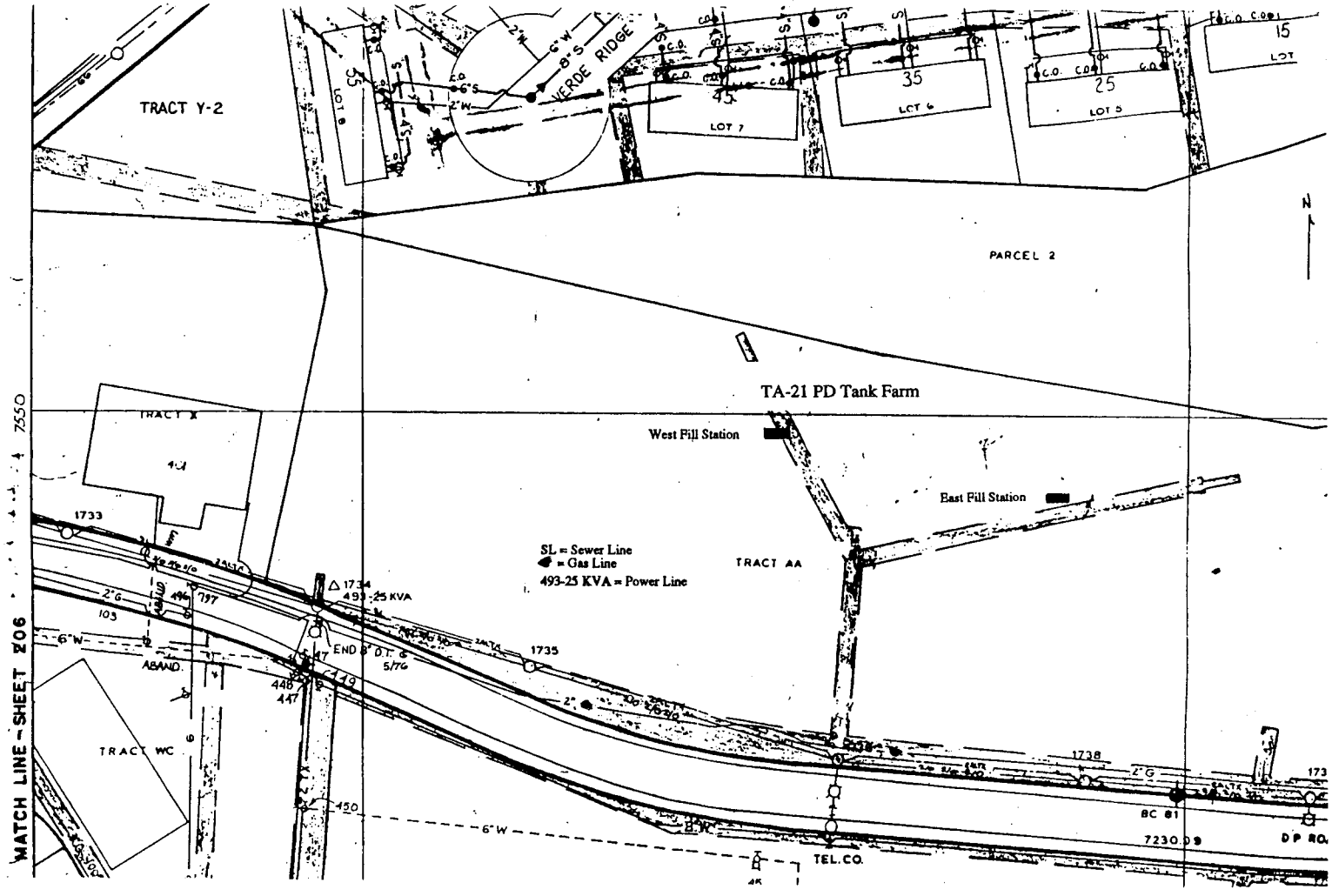
Surficial Geology - DP Tank Farm Site

According to the "Soil Survey of Los Alamos County, New Mexico" (LASL, LA-6779-MS), the surface soils found at the site are composed of the Hackroy sandy loam. The surface layer of this soil is typically described as follows: brown and moist; weak fine subangular blocky structure; hard and friable moist; common fine angular pores; mildly alkaline; and abrupt smooth boundary. ERM/Golder observed the surficial soils in the vicinity of the two fill station locations to be thin and poorly developed fine sand, silt and gravel overlaying the tuff bedrock. Soil thicknesses ranged from less than 1 foot at boring 21-3013 located near the east fill station to approximately 7.5 feet at boring 21-3004 located south of the former west fill station.

In all areas of the site, the soils overlay Unit 3 of the Tshirege Member of the Bandelier Tuff. This unit is typically described as a grey, nonwelded to moderately welded tuff containing pumice fragments up to 3 cm in diameter with up to 15 percent crystals and lithic fragments embedded in the matrix. Horizontal to high-angle fractures are common. Many of the fractures were lined with carbonate materials or clays. Much of the core recovered was completely disaggregated, making accurate lithologic descriptions and fracture characterization difficult to impossible.

ENCLOSURE 7

ENGINEERING DRAWING OF UTILITY LINES SOUTH OF THE FORMER TA-21 DP TANK FARM

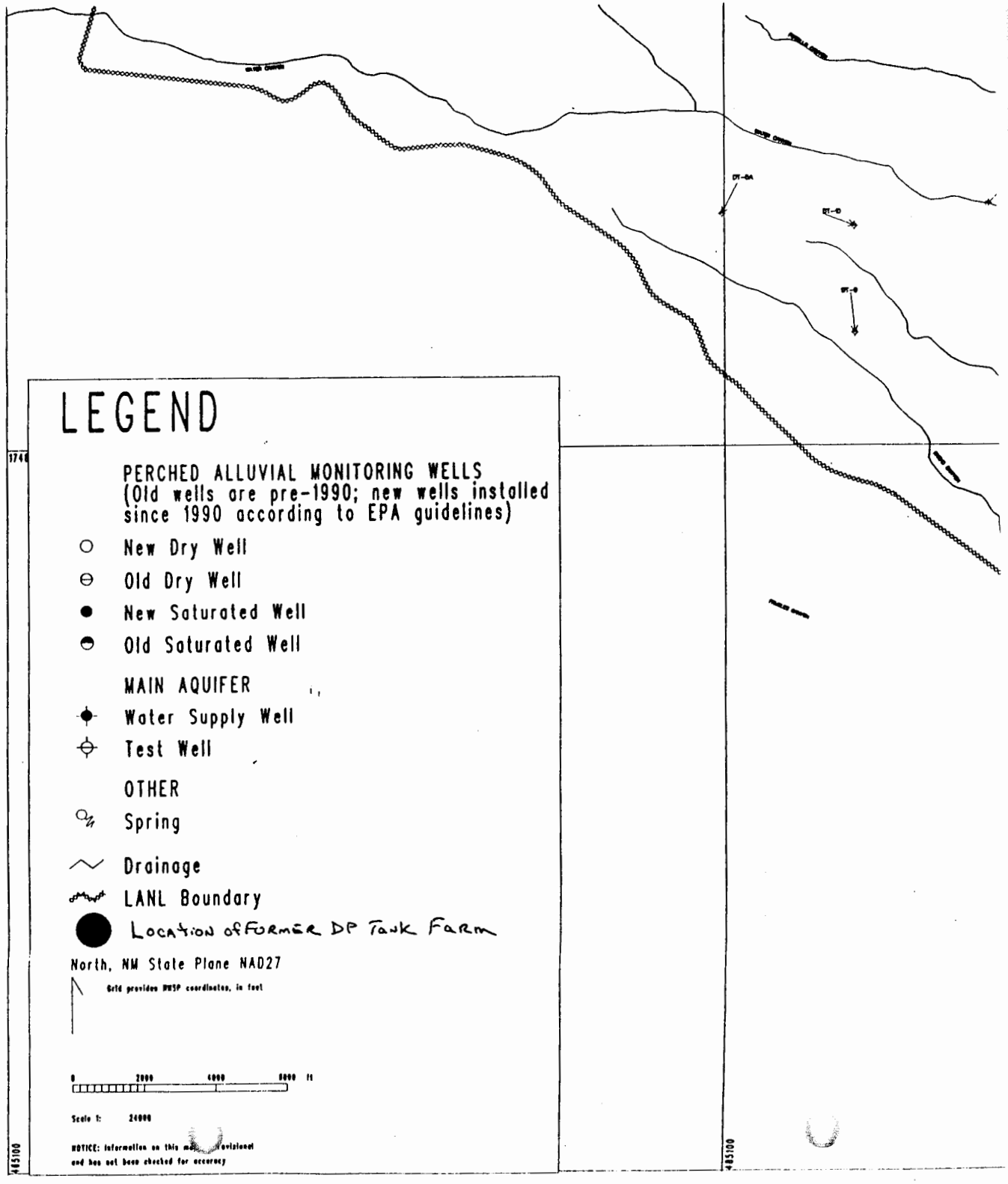

TA-21 PD Tank Farm
West Fill Station
East Fill Station
SL = Sewer Line
= Gas Line
493-25 KVA = Power Line
TRACT Y-2
TRACT X
TRACT AA
TRACT WC
PARCEL 2
VERDE RIDGE
LOT 7
LOT 6
LOT 5
LOT 8
MATCH LINE - SHEET Z06
7550
1733
1734
1735
1738
TEL.CO.
BC 81
N

ENCLOSURE 8

GROUNDWATER WELLS

AND OTHER PENETRATIONS AND DRAINAGES

Note: The nearest municipal water well from the former TA-21 PD Tank Farm is PM-3. PM-3 is approximately 15,000 feet, east south-east from the site.


LEGEND
PERCHED ALLUVIAL MONITORING WELLS
(Old wells are pre-1990; new wells installed since 1990 according to EPA guidelines)
New Dry Well
Old Dry Well
New Saturated Well
Old Saturated Well
MAIN AQUIFER
Water Supply Well
Test Well
OTHER
Spring
Drainage
LANL Boundary
Location of Former DP Tank Farm
North, NM State Plane NAD27
Grid provides NMSP coordinates, in feet
0
2000
4000
8000 ft
Scale 1: 24000
NOTICE: Information on this map is provisional and has not been checked for accuracy
1740
445100
485100

ENCLOSURE 9

SOIL SAMPLE RESULTS

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Borehole 21-3002 May 25, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) (2) Acetone	MEK (3)	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0121-95-0	3.9	4.4	0.0	U (4)	U	U	U	U	U	U	U	U
0009	8.8	9.4	0.1	U	U	U	U	U	U	U	U	U
0010	13.9	14.5	0.0	U	U	0.52	0.24	U	U	U	0.76	U
0011	19.2	19.8	0.0	U	U	0.59	0.27	U	U	U	0.87	U
0012	22.5	23.0	0.0	U	U	0.61	0.28	U	U	U	0.89	U
0139	29.0	29.5	NA (6)	U	U	0.61	0.27	U	U	U	0.87	U
0140	32.0	32.5	NA	U	U	0.56	0.26	U	U	U	0.82	U

Borehole 21-3003 (Angled at 45 degrees) May 30, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0015	4.0	4.6	0.0	U	U	U	U	U	U	U	U	U
0016	8.7	9.3	0.0	U	U	U	U	U	U	U	U	U
0017	13.5	14.3	165	U	U	U	U	U	U	U	U	>600 J
0018	18.5	19.2	181	U	U	U	U	U	U	U	U	>670 J
0019	23.8	24.5	13	U	U	U	U	U	U	U	U	U
0020	28.4	29.0	0.0	U	U	U	U	U	U	U	U	U
0021	34.0	34.7	0.0	U	U	U	U	U	U	U	U	U
0022	38.7	39.2	NA	U	U	U	U	U	U	U	U	U
0141	44.0	44.5	NA	U	U	U	U	U	U	U	U	U

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Borehole 21-3004 May 30-31, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0023	3.1	3.7	0.0	U	U	U	U	U	U	U	U	U
0024	9.1	9.6	0.0	U	U	U	U	U	U	U	U	U
0025	13.8	14.3	0.0	U	U	U	U	U	U	U	U	U
0026	17.0	17.5	0.0	U	U	U	U	U	U	U	U	U
0027	23.5	24.2	0.0	U	U	U	U	U	U	U	U	U
0028	28.7	29.3	0.3	U	U	U	U	U	U	U	U	U
0029	33.9	34.4	0.0	U	U	U	U	U	U	U	U	U
0030	38.5	39.0	NA	U	U	U	U	U	U	U	U	U
0031	42.5	43.0	NA	U	U	U	U	U	U	U	U	U

Borehole 21-3005 May 26, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0032	3.8	4.3	0.0	U	U	0.53	0.19	U	U	U	0.72	U
0033	8.4	9.2	0.1	U	U	0.61	0.22	U	U	U	0.83	U
0034	13.6	14.1	0.0	U	U	0.65	0.23	U	U	U	0.89	U
0035	18.9	19.3	0.0	U	U	0.65	0.24	U	U	U	0.89	U
0036	22.0	23.0	0.1	U	U	0.70	0.26	U	U	U	0.96	U
0037	22.0	23.0	0.1	U	U	0.70	0.26	U	U	U	0.97	U
0038	29.0	29.5	NA	U	U	0.61	0.23	U	U	U	0.84	U
0039	34.0	34.5	NA	U	U	0.67	0.26	U	U	U	0.93	U

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Borehole 21-3006 May 17-19, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0041	4.0	4.8	0.0	U	U	U	U	U	U	U	U	U
0042	9.3	9.8	8400	U	U	18.4 J	158.9 J	72.6 J	300.4 J	124 J	674.3 J	8239
0043	14.0	14.5	331	U	U	6.3	61.2	27.9	147	66.8	309.2	7008
0044	19.0	19.5	NA	U	U	6.9	117.9	63	272.3	131	591.1	>2901
0045	24.0	24.5	702	U	U	U	37.8 J	15.3 J	108.4 J	54.1 J	215.6 J	2049
0046	29.3	29.5	98	U	U	0.053	U	U	U	U	0.053	U
0047	34.0	34.5	395	U	U	0.062	U	U	U	U	0.062	2365
0048	39.0	39.5	219	U	U	0.065	U	U	U	U	0.065	213
0121	43.4	43.9	133	U	U	U	U	U	U	U	U	114
0122	49.0	49.5	2.7	U	U	U	U	U	U	U	U	U
0123	54.1	54.5	4.0	U	U	U	U	U	U	U	U	U
0124	57.0	57.3	0.0	U	U	U	U	U	U	U	U	U
0125	59.4	59.7	0.0	U	U	U	U	U	U	U	U	U
0126	64.2	64.5	0.0	U	U	U	U	U	U	U	U	U

Borehole 21-3007 May 19, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0049	4.0	4.8	0.0	U	U	U	U	U	U	U	U	U
0050	9.0	9.8	0.0	U	U	U	U	U	U	U	U	U
0051	14.3	14.8	0.0	U	U	U	U	U	U	U	U	U
0052	19.0	19.5	0.0	U	U	U	U	U	U	U	U	U
0053	24.0	24.8	0.0	U	U	U	U	U	U	U	U	U
0054	29.2	29.7	155	U	U	U	U	U	U	U	U	U
0055	34.2	34.6	206	U	U	U	U	U	U	U	U	U
0056	39.2	39.6	1.2	U	U	U	U	U	U	U	U	U
0127	44.0	44.7	0.0	U	U	U	U	U	U	U	U	U
0129	48.7	49.1	0.0	U	U	U	U	U	U	U	U	U

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Borehole 21-3008 (Angled at 45 degrees) May 22-23, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0057	3.0	3.5	53	UJ (7)	U	UJ	UJ	UJ	UJ	UJ	UJ	U
0130	6.2	6.8	1452	UJ	U	UJ	0.45 J	0.13 J	2.6 J	2.7 J	5.88 J	>1500 J
0058	8.8	9.4	1853	U	U	U	U	U	3.40	2.90	6.30	>900 J
0059	13.8	14.2	NA	UJ	U	18.6 J	115 J	75 J	218 J	123 J	549.6 J	>2000 J
0060	18.5	19.1	NA	UJ	U	12.8 J	55 J	34.7 J	101 J	56.2 J	259.7 J	>1200 J
0131	18.5	19.1	NA	UJ	U	9.4 J	52.4 J	31.5 J	91.9 J	52.1 J	237.3 J	>3300 J
0061	24.0	24.5	NA	U	U	6.80	65.20	48.40	161.00	87.30	368.70	>1200 J
0062	29.0	29.5	NA	UJ	U	U	0.71 J	U	2.6 J	1.4 J	4.71 J	U
0063	34.0	34.5	517	U	U	U	U	U	U	U	U	390 J
0064	38.4	39.0	47	U	U	U	U	U	U	U	U	U
0132	43.8	44.2	4.9	U	U	U	U	U	U	U	U	U
0133	49.1	49.6	13	U	U	U	U	U	U	U	U	U

Borehole 21-3009 May 24, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0065	4.3	4.9	290	U	U	U	U	U	U	U	U	1461
0066	8.8	9.3	1098	U	U	U	U	U	U	U	U	1678
0067	14.3	14.6	NA	U	U	U	0.03 J	0.21 J	0.60 J	0.83 J	1.67	2393

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Borehole 21-3010 May 22, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0074	4.0	4.7	0.6	U	U	U	U	U	U	U	U	U
0075	9.0	9.5	1.9	U	U	U	U	U	U	U	U	U
0076	13.5	14.0	0.6	U	U	U	U	U	U	U	U	U
0077	19.0	19.4	0.3	U	U	U	U	U	U	U	U	U
0078	23.7	24.4	0.3	U	U	U	U	U	U	U	U	U
0079	26.8	27.6	0.3	U	U	U	U	U	U	U	U	U
0080	33.5	34.0	0.0	U	U	U	U	U	U	U	U	U

Borehole 21-3011 May 23, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0082	3.2	3.7	91	U	U	U	U	U	U	U	U	U
0083	8.4	8.9	210	U	U	U	U	U	U	U	U	U
0084	13.1	13.6	57	U	U	U	U	U	0.12	0.14	0.26	U
0085	19.0	19.3	665	U	U	U	U	U	1.30	1.40	2.70	>2000 J
0086	23.6	24.4	560	U	U	U	U	0.03	0.29	0.34	0.66	>1500 J
0087	29.0	29.4	227	U	U	U	U	U	U	U	U	U
0088	33.5	34.4	121	U	U	U	U	U	U	U	U	U
0089	33.5	34.4	121	U	U	U	U	U	U	U	U	U
0135	39.0	39.5	NA	U	U	U	U	U	U	U	U	U

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Borehole 21-3012 May 24, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0090	3.2	3.6	0.1	U	U	U	U	U	U	U	U	U
0091	8.6	9.2	0.0	U	U	U	U	U	U	U	U	U
0092	14.0	14.7	0.0	U	U	U	U	U	U	U	U	U
0093	16.7	17.3	0.0	U	U	U	U	U	U	U	U	U
0094	23.8	24.6	0.0	U	U	U	U	U	U	U	U	U
0095	26.3	26.8	0.0	U	U	U	U	U	U	U	U	U
0096	33.9	34.7	0.0	U	U	U	U	U	U	U	U	U
0097	38.9	39.4	0.0	U	U	U	U	U	U	U	U	U
0136	43.0	43.5	0.0	U	U	U	U	U	U	U	U	U
0137	49.0	49.5	NA	U	U	U	U	U	U	U	U	U
0138	54.0	54.5	NA	U	U	U	U	U	U	U	U	U

Borehole 21-3013 May 25, 1994

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0098	3.5	4.2	0.0	U	U	U	U	U	U	U	U	U
0099	8.4	9.1	0.1	U	U	U	U	U	U	U	U	U
0100	14.0	14.5	0.0	U	U	U	U	U	U	U	U	U
0101	18.8	19.4	0.0	U	U	U	U	U	U	U	U	U
0102	24.0	24.5	0.1	U	U	U	U	U	U	U	U	U
0104	29.0	29.5	NA	U	U	U	U	U	U	U	U	U
0105	32.7	33.2	NA	U	U	U	U	U	U	U	U	U

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Borehole 21-3014 May 31, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0160	3.8	4.5	0.0	U	U	U	U	U	U	U	U	U
0161	8.4	9.0	0.0	U	U	U	U	U	U	U	U	U
0162	13.7	14.4	0.0	U	U	U	U	U	U	U	U	U
0163	18.5	19.2	0.0	U	U	U	U	U	U	U	U	U
0164	18.5	19.2	0.0	U	U	U	U	U	U	U	U	U
0165	21.4	22.0	0.0	U	U	U	U	U	U	U	U	U
0168	29.0	29.5	NA	U	U	U	U	U	U	U	U	U
0169	31.5	32.0	NA	U	U	U	U	U	U	U	U	U

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Borehole 21-3015

Shallow Borehole Approximately 10 Feet North of Hydrocarbon Seep — June 1, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0171	3.0	3.5	NA	U	U	U	U	U	U	U	U	131
0172	4.5	5.0	NA	U	U	U	U	U	U	U	U	82
0173	7.0	7.5	NA	U	U	U	U	U	U	U	U	51
0174	8.5	9.0	NA	U	U	U	U	U	U	U	U	U

Borehole 21-3018

Shallow Borehole Approximately 20 Feet North of Hydrocarbon Seep — June 8, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0218	1.5	2.5	NA	U	U	U	U	U	U	U	U	296
0219	4.0	4.5	NA	U	U	U	U	U	U	U	U	U
0220	6.0	7.0	NA	U	U	U	U	U	U	U	U	U
0221	8.0	9.0	NA	U	U	U	U	U	U	U	U	U

Borehole 21-3019

Shallow Borehole Approximately 5 Feet South of Hydrocarbon Seep — June 8, 1995

Sample Number	Sample Interval (ft) From	Sample Interval (ft) To	Headspace (ppm)	EPA Method 8020 (ppm) Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	EPA Method 8015 TPH (ppm)
0223	1.5	2.5	NA	U	U	U	U	U	U	U	U	U
0224	4.0	5.0	NA	U	U	U	U	U	U	U	U	U
0225	6.0	7.0	NA	U	U	U	U	U	U	U	U	U
0226	8.0	9.0	NA	U	U	U	U	U	U	U	U	U

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Surface Soil/Tuff Samples June 14, 1995

Sample Number	Approximate Sample Location (relative to seep)	Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
			Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0185	250' downstream	NA	U	U	U	U	U	U	U	U	U
0186	250' downstream	NA	U	U	U	U	U	U	U	U	U
-	At Seep (see sample sites 21-3020 at 21-3021 below)										
0187	100' upstream	NA	U	U	U	U	U	U	U	U	U

Surface Sample Site 21-3020

Sample collected from stream bed at seep just above waterline. South bank. June 14, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0228	0.0	0.4	NA	U	U	U	U	U	U	U	U	>1382
0229	0.0	0.4	NA	U	U	U	U	U	U	U	U	>1796

Surface Sample Site 21-3021

Sample collected from stream bed at seep just above waterline. North bank. June 14, 1995

Sample Number	Sample Interval (ft)		Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
	From	To		Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0233	0.0	0.4	NA	U	U	U	U	U	U	U	U	>1042
0234	0.0	0.4	NA	U	U	U	U	U	U	U	U	>569

SOIL SAMPLE RESULTS (1)
DP TANK FARM
May 1995

Surface Water Samples June 1, 1995

Sample Number	Approximate Sample Location (relative to seep)	Headspace (ppm)	EPA Method 8020 (ppm)								EPA Method 8015 TPH (ppm)
			Acetone	MEK	Benzene	Toluene	Ethylbenzene	M,P-Xylene	O-Xylene	Total BTEX	
0243	250' downstream	NA	U	U	U	U	U	U	U	U	U
0244	At Seep	NA	U	U	U	U	U	U	U	U	U
0245	100' upstream	NA	U	U	U	U	U	U	U	U	U
0247*	At Seep	NA	U	U	U	U	U	U	U	U	U

* Sample 0247 (collected 6/8/95) was collected downgradient of the hydrocarbon seep just after intentionally disturbing the hydrocarbon seep to produce a visible sheen on the water.

Notes:

(1) All data is validated.
(2) ppm - parts per million
(3) MEK - Methyl Ethyl Ketone
(4) U - Not detected above the MCAL detection limit.
(5) J-Estimated quantities
(6) NA - Not analyzed
(7) UJ-Not detected, but qualified as an estimate.

Note 1 - MCAL detection limits are as follows:
Acetone: 0.2 ppm
MEK: 0.2 ppm
Benzene: 0.05 ppm
Toluene: 0.05 ppm
Ethylbenzene: 0.05 ppm
Xylenes: 0.05 ppm
TPH: 50 ppm

Note 2 - For investigation purposes, the UST action level for total BTEX is 100 ppm. For remediation purposes, UST action levels are 50 ppm for total BTEX and 10 ppm for benzene, or 100 ppm for TPH. These remediation action levels are used at sites contaminated with "highly contaminated" or saturated soils that are 50 feet or less above the seasonal high groundwater level.

ATTACHMENT B CORRESPONDENCE

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Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: May 19, 1995
In Reply Refer To: ESH-18/WQ&H:95-0252
Mail Stop: K497
Telephone: (505) 665-1859

Mr. Jim Piatt, Chief
Surface Water Quality Bureau
New Mexico Environment Department
1190, St. Francis Drive
Santa Fe, NM 87502

SUBJECT: RELEASE OF DIESEL FUEL AT TA-21

Dear Mr. Piatt:

The enclosed data package contains additional information associated with a release of diesel fuel discovered at Solid Waste Management Unit (SWMU) 21-029 located at TA-21. The release was verbally reported to your office on May 10, 1995, pursuant to Section 1-203.A of the New Mexico Water Quality Control Commission Regulations.

This site is currently being investigated pursuant to Module VIII of the Laboratory's Resource Conservation and Recovery Act Permit. Additionally, the Water Quality & Hydrology Group (ESH-18) will collect water samples from the ephemeral watercourse adjacent to SWMU 21-029 to determine if contaminants have migrated from the release site.

If you have any questions associated with the attached information regarding SWMU 21-029, please contact me at 665-1859 or Alex Puglisi at 667-4882.

Sincerely,

Steve Rae
Acting Group Leader
Water Quality and Hydrology Group

AP:SR/em

Enclosures: a/s

Cy: G. Saums, NMED, Surface Water Quality Bureau, w/enc.
H. Decker, AIP Bureau, w/enc.. MS J993
S. Yanicek, AIP Bureau, w/enc., MS J993
D. McInroy, EM/ER, w/enc., MS M992
M. Leavitt, NMED, Ground Water Protection and Remediation Bureau, w/enc.
B. Koch, DOE/LAAO, w/enc., MS A316
T. Taylor, DOE/LAAO, w/enc., MS A316
WQ&H File, MS K497
CRM-4, MS A150

Release Notification
DP Tank Farm
TA-21, SWMU 21-029

Description of Release: A site investigation at the former DP Tank Farm located at TA-21 has indicated that contaminants may have migrated to DP Canyon by flow through fractures in the tuff. Due to the position of a hydrocarbon seep in the DP Canyon drainage, contaminants migrating to the surface may be impacting water quality in this ephemeral watercourse. (See attached Technical Memorandum for further information).

Los Alamos National Laboratory
NPDES Permit No. NM0028355
Release Notification Form

Responsible Facility/User Group LANL/ER Program Contact Person Alex Puglisi / James Alarid

Phone # 667-4882 / 665-9736 Pager # 699-1947

Discharge Location: TA-21, SWMU-21-029

Discharge Occurred: Ongoing (date time) Discharge Discovered: See Attached Technical Report (date time)

Discharge Stopped: Ongoing (date time) Method: _____

Corrective Actions: See Attached Technical Memorandum.

Nearest watercourse and/or canyon affected: None _____ Describe: DP Canyon

Source and cause of discharge: Underground storage tanks and spillage of petroleum products at former fueling area.

Materials Spilled: Diesel, gasoline and other fuel products

Estimate Amount: Unknown

Cleanup Started: Yes _____ No X Date _____ Time _____

Cleanup Finished: Yes _____ No X Date _____ Time _____

Weather Conditions: N/A

*24 Hr. Notification:

EPA	Person: N/A		NMED	Person: N. Wells	
	Time:			Time: 1520 hr.	
	Date:			Date: 5/10/95	
ESH-7	Person: N/A		DOE	Person: B. Koch	
	Time:			Time: 0730 hr.	
	Date:			Date: 5/11/95	

Written follow-up within 7 days: Date: 5/17/95
Corrective action report within 15 days: Date: 5/17/95
NMED/EPA Approval on file: Date: Pending

Comments: Soil / substrate samples from seep area in DP Canyon indicate the presence of diesel. Further sampling will be performed on the watercourse.

Release Notification Form Completed By: Alex Puglisi / James Alarid, Water Quality & Hydrology Group (ESH-18)

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State of New Mexico
ENVIRONMENT DEPARTMENT
DOE OVERSIGHT BUREAU
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GOVERNOR

MARK E. WEIDLER
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EDGAR T. THORNTON, III
DEPUTY SECRETARY

June 28, 1995

Beverly Martin
LANL ER Program MS/E525
Los Alamos, NM 87545

Re: Response to TA-21 site visit concerning TPH/DIESEL contamination of the stream course in DP Canyon.

Ms. Martin:

On May 31, 1995, per your request, AIP personnel accompanied LANL staff on a site visit to TA-21, former underground storage tank farm. The purpose of this visit was to help answer any questions that LANL staff may have concerning the possibility that hydrocarbons may be discharging along the tuff/channel stream course in DP canyon. After viewing the area of concern, and reviewing existing data a discussion was held concerning this project with NMED Surface Water Quality Bureau staff. SWQB concurred with AIP suggestions that ER staff take several water and soil/rock samples. Sample locations agreed upon were upstream of the seep, at the seep and downstream in order to assess the possible contamination impact on the stream below the release area. Other interested bureaus within the NMED may respond to this separately.

If you have any questions please call me at 672-0459.

Sincerely,

Harvey L. Decker

Harvey L. Decker
Environmental Specialist C
NMED\SWQB\AIP

cc: Steve Rae, ES&H 18
Alex Puglisi, ES&H 18
Neil Weber, NMED/DOE
Steve Yanicak, NMED/DOE

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Ivan Trujillo, DOE