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**Data Evaluation Report
Simulated High-Level
Waste Slurry Treatment
and Storage Unit**

**Date Published
May 1995**



**United States
Department of Energy**
P.O. Box 550
Richland, Washington 99352



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Data Evaluation Report

Simulated High-Level Waste Slurry Treatment and Storage Unit

J. L. Julya

May 1995

Prepared for
the U.S. Department of Energy

Pacific Northwest Laboratory
Richland, Washington 99352



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Executive Summary

At the Simulated High-Level Waste Slurry Treatment and Storage (SHLWS T/S) Unit in the 3000 Area of the Hanford Site, sampling activities were undertaken and the analytical results obtained during soil sampling conducted as part of the Resource Conservation and Recovery Act closure activities. The sampling and analysis effort was performed to identify potential contamination, if it existed, at the SHLWS T/S Unit. The efforts were conducted in accordance with the approved SHLWS T/S Unit closure plan. Soil results were compared to the Hanford Site background thresholds, Model Toxics Control Act Method B limits, and crustal abundance as agreed upon during a data quality objectives process involving the U.S. Department of Energy, Washington State Department of Ecology, and Pacific Northwest Laboratory^(a).

No organic or inorganic constituents were found in sufficient concentrations to require the investigated soil to be remediated or to be regulated as dangerous waste. Concentrations were also below the Model Toxics Control Act Method B clean-up action levels established for this unit.

(a) Pacific Northwest Laboratory is operated for the U.S. Department of Energy by Battelle Memorial Institute under Contract DE-AC06-76RLO 1830.

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Acronyms and Abbreviations

| | |
|---------------------|--|
| alpha/beta | alpha/beta radionuclide |
| %D | percent difference |
| DI | deionized water |
| DOE | U.S. Department of Energy |
| Ecology | Washington State Department of Ecology |
| EP | Extraction Procedure |
| EPA | U.S. Environmental Protection Agency |
| Hg | mercury |
| ICP | inductively coupled plasma |
| ID | identification |
| MTCA | Model Toxics Control Act |
| PNL | Pacific Northwest Laboratory |
| QA | quality assurance |
| QC | quality control |
| RCRA | Resource Conservation and Recovery Act of 1976 |
| RPD | relative percent difference |
| SHLWS T/S Unit | Simulated High-Level Waste Slurry Treatment and Storage Unit |
| SVOA | semivolatile organic compounds analysis |
| Tri-Party Agreement | <i>Hanford Federal Facility Agreement and Consent Order</i> |
| TSD | treatment, storage, and/or disposal |
| VOA | volatile organic compounds analysis |
| WAC | Washington Administrative Code |
| WHC | Westinghouse Hanford Company |

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1.0 Introduction

This report summarizes the sampling activities undertaken and the analytical results obtained during soil sampling activities conducted as part of the Resource Conservation and Recovery Act of 1976 (RCRA) closure activities for the Simulated High-Level Waste Slurry Treatment and Storage (SHLWS T/S) Unit. This 86,600 ft² (8,000 m²) unit is located in an open area within a fenced-in yard in the 3000 Area of the Hanford Site. The sampling and analysis effort, referred to as the Phase 1 characterization study, was performed to determine if contamination occurred at the SHLWS T/S Unit and identify any contamination if it occurred. The efforts were conducted in accordance with the approved SHLWS T/S Unit closure plan. Results were compared to the Hanford Site background thresholds for soils (described in Section 1.4), Model Toxics Control Act (MTCA) Method B limits, and crustal abundance as agreed upon during a data quality objectives process involving the U.S. Department of Energy (DOE), Washington State Department of Ecology (Ecology), and Pacific Northwest Laboratory (PNL).

1.1 Regulatory Background

The U.S. Environmental Protection Agency (EPA) and Ecology jointly administer the RCRA in the State of Washington. The EPA retains oversight authority while delegating to Ecology enforcement of a state program that is consistent with or more stringent than the corresponding federal program. The implementing regulations can be found in the Washington Administrative Code (WAC) 173-303, "Dangerous Waste Regulations" (WAC 1993), and Title 40, *U.S. Code of Federal Regulations*, Parts 260 through 265 and 267 through 270. Ecology's authorization includes administering treatment, storage, and/or disposal (TSD) closures.

The DOE, EPA, and Ecology have entered into an agreement called the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989), commonly referred to as the Tri-Party Agreement. One purpose of this agreement is to ensure environmental impacts associated with past activities are investigated and appropriate response actions are taken as necessary to protect human health and the environment. The agreement seeks to promote this goal, in part, by identifying TSD units, identifying which units will undergo closure, and promoting compliance with relevant RCRA permitting requirements.

The SHLWS T/S Unit is identified as a RCRA TSD unit that will be closed in accordance with applicable laws and regulations. Clean closure is the planned option for the SHLWS T/S Unit.

1.2 Background

The SHLWS T/S Unit is located in the 3000 Area in Richland, Washington, within the ICF-Kaiser 1234 Laydown Yard. The simulated high-level waste slurry (SHLWS) was procured for a research demonstration program in 1977 that was later cancelled. The original slurry formulation was toxic, corrosive, ignitable, and slightly radioactive because of naturally occurring radioactive material

used to simulate the required waste material. Because the level of naturally occurring radioactive material in the SHLWS (<2000 pCi/g) was so low, the material was managed as dangerous waste rather than mixed waste.

Unused material (198 barrels) was declared surplus and thereby became a solid waste and thus a dangerous waste requiring management in compliance with the Washington State "Dangerous Waste Regulations" (WAC-173-303). Treatment of the unused material was performed in October and November 1988 and consisted of grouting the waste in 55-gal (208-L) barrels. Grouting was determined to be the best available technology for this particular waste and rendered the resulting slurry nonhazardous. This was confirmed by rat and fish toxicity studies (Majnarich and Ladiges 1989; Zabel 1989), corrosivity testing, and Extraction Procedure (EP) Toxicity analysis (the standard toxicity designation test when the analysis was conducted)(EPA 1992). After treatment and review by Ecology, the grouted material (306 barrels) was removed from the unit and shipped for disposal at facilities authorized to receive nondangerous solid waste.

The amount of contamination at the SHLWS T/S unit was expected to be minimal. All soil known to be contaminated by the slurry was immediately removed. Leaking containers were overpacked or double-contained to control contamination. A heavy plastic secondary containment berm was added to the primary storage area and the treatment area to eliminate the possibility of any material leaking to the environment during treatment and continued storage. Most legacy equipment, including berm material, pallets, and treatment equipment associated with treatment and storage and secondary waste have been handled and disposed of in accordance with the approved closure plan. One remaining barrel of solid waste awaits final designation and disposal, pending analysis of the results of field sampling. In addition, the drip pans have been decontaminated and remain at the site, pending approval that no soil remediation is required.

1.3 Setting

The SHLWS T/S Unit is in an open area, within a fenced-in yard located in the 3000 Area (Figure 1.1) of the Hanford Site at approximately 46°20'52" latitude and 119°16'54" longitude.

The SHLWS T/S Unit identified for closure is defined by roped boundaries and enclosed in a fenced area of approximately 86,600 ft² (8,000 m²) in the shape of an L. The trunk of the L is aligned north-south, with a length of 449.5 ft (137 m) and a width of 187.5 ft (57 m); the base of the L joins the trunk on the southeast corner and is aligned east-west with a length 114.0 ft (35 m) and a width of 77.5 ft (24 m). The unit is surrounded by a 6-ft (1.8-m) chain-link fence. On the western side, which is the only boundary with public access, the fence is topped with barbed wire. Access is controlled by a single 6-ft (1.8-m) locked gate, located on the eastern edge of the unit. A minimum number of keys to the locked gate are available to only those individuals who are cognizant of the special requirements for entry into the SHLWS T/S Unit.

The unit is divided among cordoned areas, including one area used for storage of SHLWS in drums, another used for SHLWS treatment, and one used for accumulation of containerized dangerous wastes for less than 90 days. The areas surrounding the unit were used for nonregulated activities,

including storage of raw materials and structural materials. Raw materials stored in the unit included the grout-forming chemicals used for treatment (fly ash, blast furnace slag, and Portland cement).

1.4 Hanford Site Background Approach

Hanford Site background is a Sitewide approach to determining constituent background concentrations and was developed as an alternative to local unit-based background determinations at the Hanford Site (DOE-RL 1993). Using local backgrounds for each unit can lead to different definitions of contamination and different assessments of remediation goals and risk for different units. The Hanford Site background approach is based on the premise that all of the waste management units are part of a common sequence of vadose zone sediments, and that the basic characteristics that control the chemical composition of these sediments are similar throughout the Hanford Site. The range of natural soil compositions is then used to establish a single set of soil background data. Use of the Hanford Site background for environmental restoration at the Site is technically preferable to the use of the unit-based background because this approach more accurately represents the range of natural variability in soil composition. Also, this approach provides a more consistent, credible, and efficient basis for evaluating contamination in soil.

The Hanford Site background threshold values are summarized in Section 2.0. The background threshold is the concentration level defining the upper limit that is attributable to the background population at a high probability. Background thresholds are based on a tolerance interval approach. The calculated threshold levels depend on the confidence interval and percentile used in the calculation. The WAC-173-340-708(11)(d) (WAC 1992) specifies a tolerance coefficient of 95% and a coverage of 95%. The Hanford Site background threshold values are based on a 95/95 confidence interval. Statistical calculations are described by the WAC (1992).

1.5 Report Organization

This report is organized into six main sections and nine appendixes, with the figures and tables located at the end of each chapter:

- 1.0 Introduction
 - 2.0 Sampling Activities
 - 3.0 Data Validation
 - 4.0 Analytical Results and Data Tabulation
 - 5.0 Conclusions
 - 6.0 References
-
- A. Volatile Organic Compounds Validated Data Summary Tables
 - B. Volatile Organic Compounds Field Duplicate Results
 - C. Semivolatile Organic Compounds Validated Data Summary Tables
 - D. Semivolatile Organic Compounds Field Duplicate Results
 - E. Metals Validated Data Summary Tables

- F. Metals Validated Field Duplicate Summary
- G. Radiochemistry Validated Data Summary Tables
- H. Radiochemistry Field Duplicate Results
- I. Method and Reporting Detection Limits for Volatile Organic and Semivolatile Organic Compounds Solid Samples

Appendices A through H are presented in their entirety as received in the data validation summary report and show analysis results for samples collected in the Phase 1 characterization study.

In this report, the following sections were taken from *Simulated High Level Waste Slurry Treatment and Storage (SHLWS T/S) Unit Closure Plan*, DOE/RL-88-08, Revision 6A (RL 1994):

- Section 1.3, Setting
- Figure 2.1, Location of SHLWS T/S Unit Within 3000 Area
- Figure 2.2, Locations of Soil Samples for SHLWS T/S
- Table 2.1, Compliance Constituents, Analytical Methods, Detection Limits, and Action Levels.

Site Plan (3000 Area)

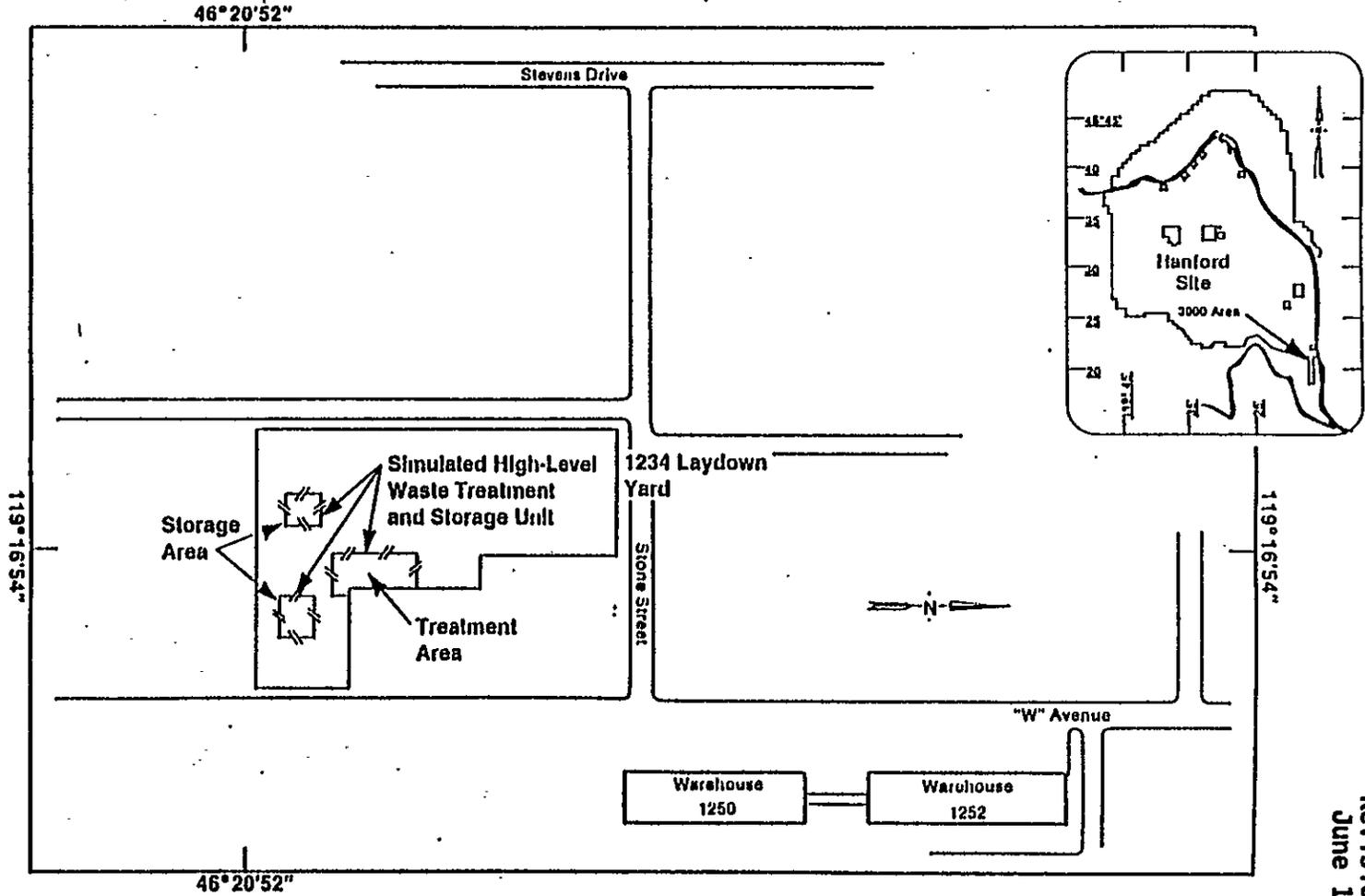


Figure I.1. Location of SHLWS T/S Unit Within the 3000 Area

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2.0 Sampling Activities

The sampling and analysis plan was developed based on a data quality objectives process. The primary objective of soil sampling was to determine whether contaminants were present in surface or subsurface soils at the SHLWS T/S Unit at levels exceeding the proposed action levels. Action level determination was agreed on during the data quality objectives meetings and will be used for clean closure on this specific unit only. Table 2.1 lists the compliance constituents, analytical methods, detection limits, and action levels. Potential contaminants of concern were determined based on the waste inventory for the SHLWS T/S Unit.

2.1 Sample Location

Soil samples were collected from 19 locations. More than one depth was collected from some of these locations. Table 2.2 gives the sample identification number, chain-of-custody number, and analysis requested. Figure 2.1 shows the location within the unit. The samples collected consist of the following:

T/S area:

- Five samples (from locations 4 through 8) were collected at the soil and gravel interface for inductively coupled plasma (ICP) metals and mercury (Hg), with one sample (location 5) including alpha/beta radionuclide analysis (alpha/beta), one sample (location 6) including cerium, and one quality control (QC) co-located field duplicate sample (location 5) for ICP metals, Hg, and alpha/beta.
- Three samples (from locations 1 through 3) were collected at the surface for lead.
- Two samples (from locations 4 and 6) were collected at the deep soil interface for ICP metals and Hg.

NE spill location:

- Two samples (from locations 9 and 10) were collected at the soil and gravel interface for ICP metals and Hg, with one sample (location 9) including cerium and one sample (location 10) including alpha/beta. Ecology collected co-located field duplicate samples at location 9 soil and gravel interface for ICP metals, Hg, and lead.
- One sample (from location 9) was collected at the surface for lead including one QC co-located sample for lead. Ecology collected co-located samples at location 9 surface for ICP metals, Hg, and lead.

Storage area:

- Four samples (from locations 11 through 14) were collected at the soil and gravel interface for ICP metals and Hg, with one sample (location 11) including cerium, one sample (location 14) including alpha/beta, and one QC co-located field duplicate sample (location 11) for ICP metals, Hg, and cerium.

- Two samples (from locations 11 and 13) were collected at the surface for lead.
- One sample (from location 11) was collected at the deep soil interface for ICP metals and Hg.

SW spill location:

- Two samples (from locations 15 and 16) were collected at the soil and gravel interface for ICP metals and Hg, with one sample (location 15) including cerium and one sample (location 16) including alpha/beta.
- One sample (from location 15) was collected at the surface for lead.

90-day-or-less accumulation area:

- Three samples (from locations 17 through 19) were collected at the soil and gravel interface for ICP metals and Hg, with one sample (location 18) including volatile organic compounds analysis (VOA) and semivolatile organic compounds analysis (SVOA) and one QC co-located field duplicate sample (location 18) for volatile organic and semivolatile organic compounds. Ecology collected co-located field duplicate samples at location 18 soil and gravel interface for ICP metals, Hg, lead (Pb), VOA, and SVOA.
- Two samples (from locations 18 and 19) were collected at the deep soil interface, with one sample (location 19) including VOA and SVOA.

2.2 Sample Collection

All samples were collected following the procedures in Appendix A, "Sampling and Analysis Plan" of *Simulated High Level Waste Slurry Treatment and Storage (SHLWS T/S) Closure Plan (RL 1994)*.

Sample kits containing all of the labeled certified clean bottles and paperwork were prepared for each individual sample location in the preparation laboratory at Pacific Northwest Laboratory's (PNL's) Sigma 5 building. Sample kits were matched to the sample location by the Sampling Field Team Leader. Paperwork was completed by the Sampling Field Team Leader while the Radiation Protection Technologists collected the samples.

All sample locations, samples, and equipment were surveyed during and after sampling for both alpha and beta/gamma radiation using portable instrumentation as required by PNL radiological control.

Pictures were taken of all sample locations as well as the general location within the specific areas. Sampling information was written in a log book.

Surface samples were taken at a depth of 1 in. (2.5 cm). Soil and gravel interface samples were taken at a depth of 14 in. to 17 in. (36 cm to 43 cm), and deep soil interface samples were collected at a depth of 23 in. to 24 in. (58 cm to 61 cm) depending on soil conditions. A shovel and pick were used to dig to a depth 1 in. (2.5 cm) above where the samples were collected. The remaining 1 in. (2.5 cm) of soil was removed with stainless steel tools to prevent any contamination of the sample material with the digging tools.

All samples were collected using stainless steel tools. The soil that was removed was placed on plastic sheets spread around the sampling area; this gave the samplers a clean work area. Surgeons gloves were worn and changed between each sample location to minimize the potential for cross-contamination between samples. Because of the concentration of gravel, all soil except that to be analyzed for volatile organic compounds, was sieved through a 4-mm stainless steel sieve. As many rocks as possible were removed, by hand, for soil collected for VOA, while still preserving the integrity of the VOCs samples. Security tape was applied to the sample bottles immediately after sampling, and sample bottles were surrounded with ice and water in an ice chest.

2.3 Field Quality Assurance/Quality Control

Field quality assurance (QA)/QC provide a basis by which field and laboratory accuracy and reproducibility could be measured. Co-located field duplicate samples and equipment blanks were used to assess precision and bias of sampling. The estimated precision and bias will contain components of the laboratory's precision and bias but must be evaluated in conjunction with laboratory duplicates and method blanks to assess those factors for the laboratory. Co-located field samples collected by Ecology are used to assess laboratory reproducibility. Co-located field duplicate samples were prepared to address issues related to laboratory QA/QC.

Co-located duplicate samples were collected in a 1:20 ratio for all constituents.

Between each use, the tools were washed in a container of deionized (DI) water and Alconox, rinsed in a container of DI water, rinsed again with clean DI water from a squirt bottle, and dried. Tools used for digging were washed in separate containers from those used to wash the sampling tools. All tools were stored on the dull side of aluminum foil until the next use.

After the sampling was completed, an ultra-pure water equipment blank was collected on the sampling tools to check the cleaning of the tools for any potential cross-contamination. Because the sampling was completed in 1 day, only one equipment blank was taken.

A PNL QA representative completed a post-sampling surveillance with no deficiencies noted. Supporting documentation (such as the chain of custody, field record form, shipping paperwork, laboratory notebooks, pictures) were reviewed for completeness and adherence to the SHLWS T/S Unit closure plan. A QA representative was not present during sampling.

2.4 Sample Analysis

Table 2.2 summarizes the analyses requested for soil and water samples, sample ID number, and chain-of-custody number.

All of the samples were analyzed by Lockheed Analytical Services in Las Vegas, Nevada. Ecology's co-located duplicate samples were analyzed by a different laboratory. Appendix I lists all analytes for each specific analytical method as well as the detection limits reported for each.

Table 2.1. Compliance Constituents, Analytical Methods, Detection Limits, and Action Levels

| Analyte or Parameter (Measurement Method) | Analytical Method ^(a) | Method Detection Limit ^(b,c) (ppm) | Action Levels | | |
|---|----------------------------------|---|-------------------|-------------------|--|
| | | | MTCA B Soil (ppm) | MTCA C Soil (ppm) | Sitewide Background ^(d) (ppm) |
| Aluminum | 6010 | 40.0 | 8.0E+4 | 3.2E+5 | 1.51E+4 |
| Antimony | 6010 | 12.0 | 3.2E+4 | 1.4E+3 | ND |
| Barium | 6010 | 40.0 | 5.6E+3 | 5.6E+3 | 1.75E+2 |
| Cadmium | 6010 | 1.0 | 4.0E+1 | 8.0E+1 | ND |
| Calcium | 6010 | 400.0 | NA | NA | 2.46E+4 |
| Chromium | 6010 | 2.0 | 4.0E+2 | 8.0E+4 | 28 |
| Cobalt | 6010 | 10.0 | 4.8E+3 | TBD | 19 |
| Copper | 6010 | 5.0 | 3.0E+3 | 1.4E+5 | ND |
| Iron | 6010 | 20.0 | TBD | TBD | ND |
| Magnesium | 6010 | 400.0 | NA | NA | 9.16E+3 |
| Molybdenum | 6010 | 40.0 | 4.0E+2 | 1.75E+4 | ND |
| Manganese | 6010 | 3.0 | 1.12E+4 | 1.6E+4 | 5.83E+2 |
| Nickel | 6010 | 8.0 | 1.6E+3 | 1.6E+3 | 25 |
| Potassium | 6010 | 400.0 | NA | NA | 3.09E+3 |
| Selenium | 6010 | 60.0 | 4.0E+2 | 1.75E+4 | ND |
| Silver | 6010 | 2.0 | 2.4E+2 | 1.75E+4 | ND |
| Sodium | 6010 | 400.0 | NA | NA | 1.38E+3 |
| Strontium | 6010 | 20.0 | 4.8E+4 | 1.9E+5 | ND |
| Lead | 7421 | 0.6 | 2.5E+2 | 1.0E+3 | 14.9 |
| Mercury | 7471 | 0.1 | 2.4E+1 | 2.4E+1 | 1.3 |
| Cerium | 200.8 | 1.0 | TBD | TBD | 60 CA ^(e) |
| SVOA | 8270 | ^(f) | R ^(g) | R | ND |
| VOA | 8240 | ^(f) | R | R | ND |
| Total alpha | LAL-91-SOP-0060 ^(h) | 5/10 pCi/g | TBD | TBD | ND |
| Total beta | LAL-91-SOP-0060 ^(h) | 5/10 pCi/g | TBD | TBD | ND |

^(a) U.S. Environmental Protection Agency. 1986. "USEPA Methods for Evaluating Solid Waste, Physical/Chemical Methods: SW-846, 3rd ed. Quality Control. In *Volume 1A: Laboratory Manual Physical/Chemical Methods Test*. U.S. Environmental Protection Agency, Washington, D.C.

^(b) Soil digestion procedure, SW-3050.

^(c) Accuracy and precision are discussed in Appendix B.

^(d) U.S. Department of Energy, Richland Field Office. 1993. *Hanford Site Background, Part 1. Soil Background for Nonradioactive Analytes*. Rev. 1, Vol. 1 & 2. U.S. Department of Energy, Richland Field Office, Richland, Washington.

^(e) Crustal abundance, which is defined in AGI Data Sheet 58 (Dutro et al. 1989)

^(f) Analyte dependent. Refer to Appendix I.

^(g) R refers to Washington Administrative Code. 1992. "Model Toxics Control Act Cleanup Regulation". WAC-173-340, Olympia, Washington.

^(h) Westinghouse Hanford Company. 1991. *Lockheed Analytical Laboratory Standard Operating Procedure*. LAL-91-SOP-0060, Westinghouse Hanford Company, Richland, Washington.

NA = not applicable.

ND = no data.

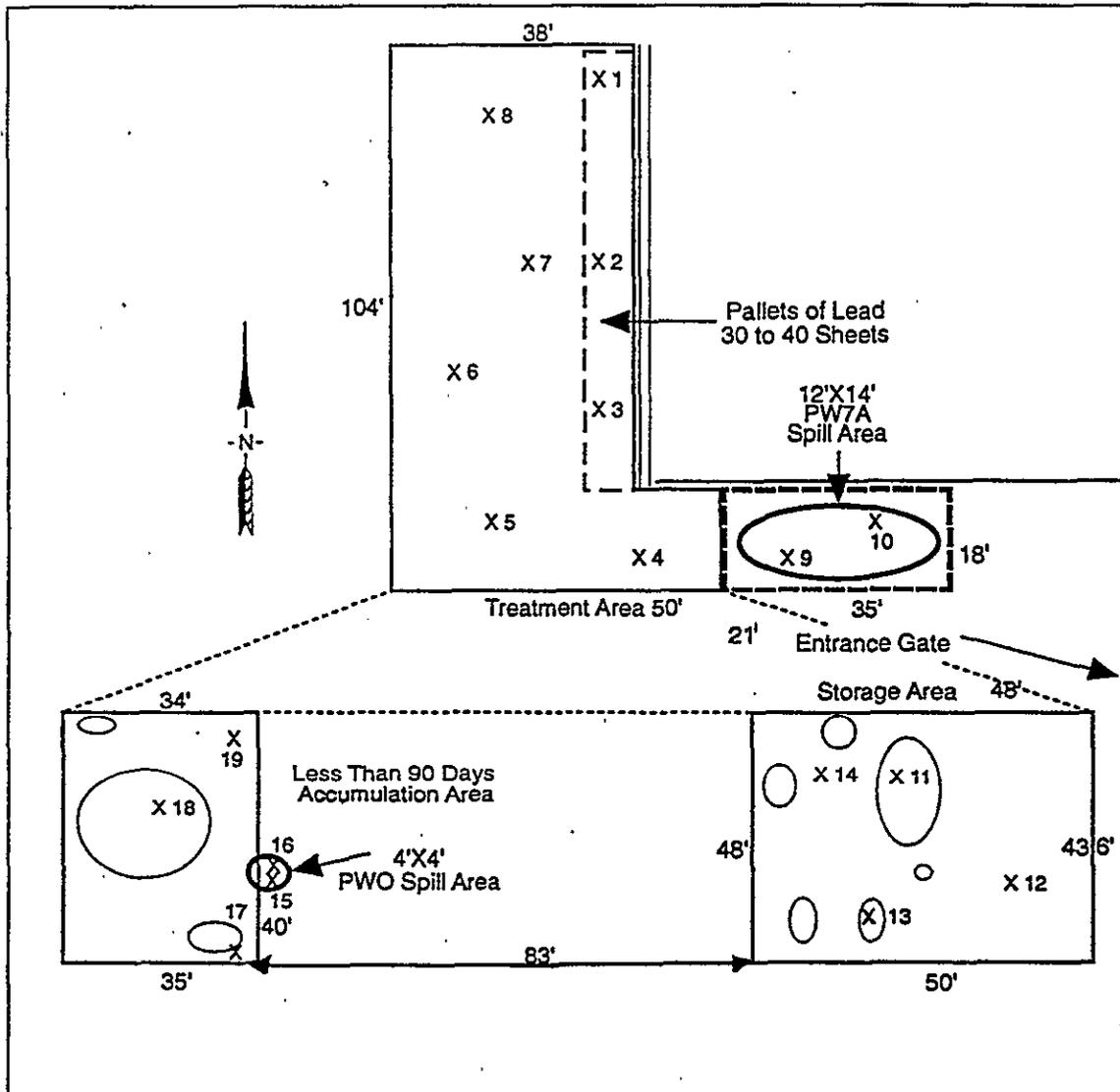
TBD = to be determined.

Table 2.2. SHLWS T/S Sampling Matrix 10/6/94

| Sample Site Soil | Sample Number ^(a) | Chain of Custody | Constituent List | Duplicate |
|------------------|------------------------------|------------------|----------------------------|----------------------|
| T/S 1 | TS1S | 12239, WHC | Pb, ACS* | |
| T/S 2 | TS2S | 12240, WHC | Pb, ACS* | |
| T/S 3 | TS3S | 12241, WHC | Pb, ACS* | |
| T/S 4 | TS4SG | 12242, WHC | ICP, Hg, ACS* | |
| T/S 4 | TS418 | 12243, WHC | ICP, Hg, ACS* | |
| T/S 5 | TS5SG | 12244, WHC | ICP, Hg, Alpha, Beta, ACS* | |
| T/S 5 | TS5SGD | 12307 | | ICP, Hg, Alpha, Beta |
| T/S 6 | TS6SG | 12245, WHC | ICP, Hg, Cerium, ACS* | |
| T/S 6 | TS618 | 12246, WHC | ICP, Hg, ACS* | |
| T/S 7 | TS7SG | 12247, WHC | ICP, Hg, ACS* | |
| T/S 8 | TS8SG | 12248, WHC | ICP, Hg, ACS* | |
| NE 9 | NE9S | 12249, WHC | Pb, ACS* | |
| NE 9 | NE9SD | 12308 | | Pb |
| NE 9 | NE9SG | 12250, WHC | ICP, Hg, Cerium, ACS* | |
| NE 10 | NE10SG | 12251, WHC | ICP, Hg, Alpha, Beta, ACS* | |
| SA 11 | SA11S | 12252, WHC | Pb, ACS* | |
| SA 11 | SA11SG | 12253, WHC | ICP, Hg, Cerium, ACS* | |
| SA 11 | SA11SGD | 12309 | | ICP, Hg, Cerium |
| SA 11 | SA1118 | 12254, WHC | ICP, Hg, ACS* | |
| SA 12 | SA12SG | 12255, WHC | ICP, Hg, ACS* | |
| SA 13 | SA13S | 12256, WHC | Pb, ACS* | |
| SA 13 | SA13SG | 12257, WHC | ICP, Hg, ACS* | |
| SA 14 | SA14SG | 12258, WHC | ICP, Hg, Alpha, Beta, ACS* | |
| SW 15 | SW15S | 12259, WHC | Pb, ACS* | |
| SW 15 | SW15SG | 12260, WHC | ICP, Hg, Cerium, ACS* | |
| SW 16 | SW16SG | 12261, WHC | ICP, Hg, Alpha, Beta, ACS* | |
| 90 17 | 9017SG | 12262, WHC | ICP, Hg, ACS* | |
| 90 18 | 9018SG | 12263, WHC | ICP, Hg, VOA, SVOA, ACS* | |
| 90 18 | 9018SGD | 12310 | | VOA, ABN |
| 90 18 | 901818 | 12264, WHC | ICP, Hg, ACS* | |
| 90 19 | 9019SG | 12265, WHC | ICP, Hg, ACS* | |

Table 2.2. (contd)

| Sample Site Soil | Sample Number ^(a) | Chain of Custody | Constituent List | Duplicate |
|--|------------------------------|------------------|---|-----------|
| 90 19 | 901918 | 12266, WHC | ICP, Hg, VOA, SVOA, ACS* | |
| Equipment blank | EQUI1 | 12267, WHC | ICP, Hg, Pb, Cerium, VOA, SVOA, Alpha, Beta, ACS* | |
| <p>(a) Explanation of sample numbering. First two letters or numbers = site location. TS = treatment and storage area. NE = NE spill area. SA = storage area. SW = SW spill area. 90 = 90-day-or-less accumulation area Middle numbers = location on map (see Figure 2.1) Last set of letters or numbers = sample depth S = surface (1-in. [2.5-cm] depth). SG = soil and gravel interface. 18 = deep soil interface. Note: All samples sent to 222S Laboratory for radioactive screen analysis. ICP constituents of concern are listed on Table 2.1. D at end of sample number represents a duplicate. Example TS5SGD is a duplicated of TS5SG. ABN = acid/base/neutral. ACS* = radioactive activity scan analyzed by Lockheed Analytical Services. Alpha = alpha radionuclide. Beta = beta radionuclide. Hg = mercury. ICP = inductively coupled plasma. Pb = lead. SVOA = semivolatile organic compounds analyses. VOA = volatile organic compounds analyses. WHC = Westinghouse Hanford Company.</p> | | | | |



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-  Discolored Areas
-  Waste Movement Area
-  Known Spill Areas
-  Lead Storage Area/ Moved before SHLWS T/S Start Up
-  Roped Area
-  Chain Link Fence
- X= Sampling Locations/Identification

Figure 2.1. Soil Sample Locations for SHLWS T/S Unit

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3.0 Data Validation

The data validation process included a review of the following QC elements performed by the laboratories and reported in the associated data deliverables:

- holding times
- blank analyses
- surrogates
- matrix spikes
- duplicates.

The validation process establishes organic, inorganic, and radiochemistry qualifiers and definitions to describe the associated data.

3.1 Data Qualifiers

Organic Data Reporting Qualifiers

U Indicates the constituent was analyzed for and not detected. The concentration reported is the sample quantitation limit corrected for aliquot size, dilution, and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for making decisions.

JN Indicates a tentatively identified compound whose concentration and identification have been determined to be valid as a result of data validation. The associated data should be considered usable for making decisions.

Inorganic Data Reporting Qualifiers

B Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required quantitation limit but greater than the instrument detection limit. The associated data should be considered usable for making decisions.

U Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution, and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for making decisions.

UJ Indicates the constituent was analyzed for and not detected. Because of a minor QC deficiency identified during data validation, the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for making decisions.

BJ Indicates the constituent was analyzed for and detected at a concentration less than the contract required quantitation limit but greater than the instrument detection limit. Because of a minor QC deficiency identified during data validation, the associated data have been qualified as estimated but should be considered usable for making decisions.

J Indicates the constituent was analyzed for and detected. Because of a minor QC deficiency identified during data validation, the associated data have been qualified as estimated but should be considered usable for making decisions.

Radiochemistry Data Reporting Qualifiers

U Indicates the constituent was analyzed for but was not detected at a concentration above the minimum detectable activity. The concentration reported is the minimum detectable activity corrected for sample aliquot size, dilution factors, and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for making decisions.

3.2 Golder Associates

Analytical results were validated by Golder Associates, Inc. Redmond, Washington. As required by the contract with Golder Associates, Inc. and the Westinghouse Hanford Company (WHC) statement of work (WHC 1994), data validation was conducted using the WHC data validation procedures for chemical and radiochemical analyses (WHC 1993a, 1993b). Analytical results were validated to level D as described in the data validation procedures.

3.3 Lockheed Analytical Services

No major deficiencies were identified during the validation of the volatile organic compounds, semivolatile organic compounds, inorganic, or radiochemical analyses. Thus, no data were qualified as unusable (R, UR).

All holding time criteria were met for both water and soil samples analyzed by Lockheed Analytical Services, except for mercury in the soil samples (exceeded by 1 day).

Lockheed Analytical Services prepared and analyzed laboratory blanks for both the soil and water sample matrices. Analyses of the blanks identified some potential laboratory contamination in the calibration and preparation blanks with the following compounds:

- calibration blanks
 - chromium
 - copper
 - manganese
 - vanadium
 - strontium

- preparation blanks
 - lead.

Analytes detected were at levels less than the method detection limit. When evidence of blank contamination was present, blank validation criteria were applied to determine appropriate qualification for associated sample results.

Lockheed Analytical Services prepared the sample matrix, analyzed matrix spike samples, and reported the results as percent recovery as an indication of accuracy. Matrix spike recovery is used as a general correlation for all samples in the analytical batch based on the fact that the samples are related to the same site and have relatively similar analyte concentrations except in the case of the soil VOC samples. The soil VOC matrix spike was analyzed on a sample not related to the SHLWS T/S Unit. The results of the nonrelated sample and the matrix spike done on the nonrelated sample were evaluated and found to be within control limits (50 to 150%) for percent recovery and, therefore, acceptable. Spiked sample results generally were within control limits for percent recovery. The percent recovery for sodium in the laboratory control sample was outside control limits. The ICP serial dilution percent differences (%D) exceeded 10%. Results that fell outside of the applicable control limits were qualified according to the validation procedure. Matrix spike samples were not analyzed and were not a requirement for gross alpha and gross beta analyses. No indication of significant matrix effects was observed in the sample results.

Duplicate samples were prepared and analyzed, and data were reported as relative percent difference (RPD) by Lockheed Analytical Services as an indication of laboratory precision. For organic analyses, RPD calculations were made between results for matrix spike/matrix spike duplicate samples and co-located duplicate samples. For inorganic analyses, RPD calculations were made between co-located duplicate sample results. For radiochemistry analyses, RPD calculations were made between initial and co-located duplicate sample results. Reported RPDs (35%) for co-located duplicate samples and matrix spike duplicate samples were acceptable.

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4.0 Analytical Results and Data Tabulation

Analytical results are summarized and evaluated in this chapter. The analytical results do not indicate the presence of contamination. Constituent concentrations detected in the samples were compared to Hanford Site background threshold values (discussed in Section 1.4), health-based standards (WAC-173-340) described in Table 2.1, and crustal abundance averages. Specific results are discussed in the following sections.

4.1 Data Summary of Organic Analytes

Acetone and 2-butanone (methyl ethyl ketone) were detected at low levels in sample 9018SG (Appendix A). These constituents are common laboratory contaminants that often give false positive results. Neither constituent was detected in co-located sample 9018SGD (Appendix B). No other target volatile organic compounds were detected. Low levels (maximum of 90 $\mu\text{g}/\text{kg}$) of an unknown hydrocarbon were tentatively identified in three samples.

No target semivolatile organic compounds were detected in the samples. Tentatively identified compounds include an unknown ester in four samples (maximum of 23,000 $\mu\text{g}/\text{kg}$), unknown hydrocarbons in two samples (maximum of 370 $\mu\text{g}/\text{kg}$), and pentachlorobiphenyls in sample 9018SG (Appendix C) (total concentration detected was 1,210 $\mu\text{g}/\text{kg}$). The pentachlorobiphenyls were not detected in co-located sample 9018SGD (Appendix D).

4.2 Data Summary of Metal Analytes

Results for metal analytes were compared to MTCA B action levels, when available. When the MTCA B levels are unavailable, the Hanford Site background threshold levels or, in the case of cerium, the average crustal abundance were used. No metals were detected at concentrations above the MTCA B action levels.

Calcium was found at levels above the Hanford Site background threshold level. Calcium occurs naturally in high concentrations in limestone and caliche as well as other minerals. Calcium's presence in the samples is not indicative of contamination (Appendix E).

Lead was detected in sample number SW15S (97.4 ppm) and sample number TS3S (62.4 ppm). Documentation will be included in the administrative record for future reference.

There is no MTCA B action level or Hanford Site background threshold level for iron.

Cerium was detected in samples SA11SG (Appendix E) at 63.5 $\mu\text{g}/\text{kg}$ and co-located duplicate sample SA11SGD (Appendix F) at 57.3 $\mu\text{g}/\text{kg}$. No MTCA B action level or Hanford Site background threshold level has been determined for cerium; however, the cerium crustal abundance average was used for comparison. These samples were subsequently considered within accepted limits as listed in Table 2.1. Documentation will be included in the administrative record for future reference.

4.3 Data Summary of Radionuclide Analyses

The maximum alpha radioactivity measured in the samples was 15.9 pCi/g and the maximum beta measured was 22.2 pCi/g. Uranium and thorium are alpha and beta emitters and naturally occur in soils. The uranium and thorium account for the activities measured.

5.0 Conclusions

Thirty-two samples were collected from the SHLWS T/S Unit for chemical analysis. No analytical results were rejected during data validation. The analyses were performed with a specific set of constituents targeted. Most of the constituents were not detected. No constituents were detected at concentrations above MTCA B action levels or, where those levels have not been determined, above Hanford Site background threshold levels. Of the analytes that showed levels above detection limits, none are considered indicative of contamination and thus the SHLWS T/S Unit is considered clean.

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Appendix A

Volatile Organic Compounds Validated Data Summary Tables

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A.1

| Parameter | Swmp# | 9010SG | 9010SGD | 901910 | EQUI1 | | | | |
|---------------------------|----------|---------|------------|---------|-----------------|--------|---|--------|---|
| | Date | 11-0-94 | 11-0-94 | 11-0-94 | 11-0-94 | | | | |
| | Location | 90 10 | 90 10 | 90 19 | --- | | | | |
| | Depth | --- | --- | --- | --- | | | | |
| | Type | SOIL | SOIL | SOIL | WATER, UG/L | | | | |
| | Comments | | CO-LOCATED | | EQUIPMENT BLANK | | | | |
| | Units | Result | Q | Result | Q | | | | |
| | | Result | Q | Result | Q | | | | |
| CHLOROMETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| VINYL CHLORIDE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| BROMOMETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| CHLOROETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| TRICHLOROFLUOROMETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| ACETONE | UG/KG | 13.000 | U | 10.000 | U | 11.000 | U | 10.000 | U |
| 1,1-DICHLOROETHENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| CARBON DISULFIDE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| METHYLENE CHLORIDE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| TRANS-1,2-DICHLOROETHENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| VINYL ACETATE | UG/KG | 11.000 | U | 10.000 | U | 11.000 | U | 10.000 | U |
| 1,1-DICHLOROETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 2-BUTANONE | UG/KG | 17.000 | U | 10.000 | U | 11.000 | U | 10.000 | U |
| CIS-1,2-DICHLOROETHENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| CHLOROFORM | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 1,1,1-TRICHLOROETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| CARBON TETRACHLORIDE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 1,2-DICHLOROETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| BENZENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| TRICHLOROETHENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 1,2-DICHLOROPROPANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| BROMODICHLOROMETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 4-METHYL-2-PENTANONE | UG/KG | 11.000 | U | 10.000 | U | 11.000 | U | 10.000 | U |
| CIS-1,3-DICHLOROPROPENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| TOLUENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| TRANS-1,3-DICHLOROPROPENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 1,1,2-TRICHLOROETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| TETRACHLOROETHENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| DIBROMOCHLOROMETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| CHLOROBENZENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| ETHYLBENZENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| M,P-XYLENES | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| O-XYLENES | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| STYRENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| BROMOFORM | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 1,1,2,2-TETRACHLOROETHANE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 1,3-DICHLOROBENZENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 1,4-DICHLOROBENZENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 1,2-DICHLOROBENZENE | UG/KG | 5.300 | U | 5.200 | U | 5.300 | U | 5.000 | U |
| 2-CHLOROETHYL VINYL ETHER | UG/KG | --- | | --- | | --- | | 20.000 | U |
| 2-HEXANONE | UG/KG | --- | | --- | | --- | | 10.000 | U |

The decimal places shown do not reflect the precision reported by the laboratory

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Rev. 00

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VOLATILE ORGANIC ANALYSIS RESULTS
 FOR ANALYSES USING METHOD 8240
 TENTATIVELY IDENTIFIED COMPOUNDS

| | |
|----------------------------------|--------------------------|
| Client Sample ID: BLANK | LAL Sample ID: 15734MB |
| Date Received: N/A | Date Analyzed: 16-NOV-94 |
| Matrix: SOIL | Dilution Factor: 1 |
| Analytical Batch: 111694-8240-J2 | QC Batch ID: 111694-8240 |

| Tentatively Identified Compound | Estimated Concentration (µg/Kg) | Retention Time (minutes) | Data Qualifier(s) |
|---------------------------------|---------------------------------|--------------------------|-------------------|
| UNKNOWN | 30 | 8.00 | J |
| | | | |
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VOLATILE ORGANIC ANALYSIS RESULTS
FOR ANALYSES USING METHOD 8240
TENTATIVELY IDENTIFIED COMPOUNDS

| | |
|----------------------------------|--------------------------|
| Client Sample ID: 9018SG | LAL Sample ID: L3300-24 |
| Date Received: 10-NOV-94 | Date Analyzed: 17-NOV-94 |
| Matrix: SOIL | Dilution Factor: 1 |
| Analytical Batch: 111694-8240-J2 | QC Batch ID: 111694-8240 |

| Tentatively Identified Compound | Estimated Concentration (µg/Kg) | Retention Time (minutes) | Data Qualifier(s) |
|---------------------------------|---------------------------------|--------------------------|-------------------|
| UNKNOWN | 90 | 7.98 | JB |
| | | | |
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LJ

083
1/13/95

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VOLATILE ORGANIC ANALYSIS RESULTS
FOR ANALYSES USING METHOD 8240
TENTATIVELY IDENTIFIED COMPOUNDS

| | |
|----------------------------------|--------------------------|
| Client Sample ID: 901918 | LAL Sample ID: L3300-21 |
| Date Received: 10-NOV-94 | Date Analyzed: 17-NOV-94 |
| Matrix: SOIL | Dilution Factor: 1 |
| Analytical Batch: 111694-8240-J2 | QC Batch ID: 111694-8240 |

| Tentatively Identified Compound | Estimated Concentration (µg/Kg) | Retention Time (minutes) | Data Qualifier(s) |
|---------------------------------|---------------------------------|--------------------------|-------------------|
| UNKNOWN | 50 | 7.98 | 18 |
| | | | |
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Appendix B

Volatile Organic Compounds Field Duplicate Results

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|---------------------------|-----------------|---|-----------------|---|-----|
| SAMPLE NO.: | 9018SG | | 9018SGD | | |
| DATE: | 11/8/94 | | 11/8/94 | | |
| LOCATION: | 90 18 | | 90 18 | | |
| PARAMETER | RESULT µg/Kg | Q | RESULT µg/Kg | Q | RPD |
| CHLOROMETHANE | 5.3 | U | 5.2 | U | NC |
| VINYL CHLORIDE | 5.3 | U | 5.2 | U | NC |
| BROMOMETHANE | 5.3 | U | 5.2 | U | NC |
| CHLOROETHANE | 5.3 | U | 5.2 | U | NC |
| TRICHLOROFLUOROMETHANE | 5.3 | U | 5.2 | U | NC |
| ACETONE | 13 | | 10 | U | 200 |
| 1,1-DICHLOROETHENE | 5.3 | U | 5.2 | U | NC |
| CARBON DISULFIDE | 5.3 | U | 5.2 | U | NC |
| METHYLENE CHLORIDE | 5.3 | U | 5.2 | U | NC |
| TRANS-1,2-DICHLOROETHENE | 5.3 | U | 5.2 | U | NC |
| VINYL ACETATE | 11 | U | 10 | U | NC |
| 1,1-DICHLOROETHANE | 5.3 | U | 5.2 | U | NC |
| 2-BUTANONE | 17 | | 10 | U | 200 |
| CIS-1,2-DICHLOROETHENE | 5.3 | U | 5.2 | U | NC |
| CHLOROFORM | 5.3 | U | 5.2 | U | NC |
| 1,1,1-TRICHLOROETHANE | 5.3 | U | 5.2 | U | NC |
| CARBON TETRACHLORIDE | 5.3 | U | 5.2 | U | NC |
| 1,2-DICHLOROETHANE | 5.3 | U | 5.2 | U | NC |
| BENZENE | 5.3 | U | 5.2 | U | NC |
| TRICHLOROETHENE | 5.3 | U | 5.2 | U | NC |
| 1,2-DICHLOROPROPANE | 5.3 | U | 5.2 | U | NC |
| BROMODICHLOROMETHANE | 5.3 | U | 5.2 | U | NC |
| 4-METHYL-2-PENTANONE | 11 | U | 10 | U | NC |
| CIS-1,3-DICHLOROPROPENE | 5.3 | U | 5.2 | U | NC |
| TOLUENE | 5.3 | U | 5.2 | U | NC |
| TRANS-1,3-DICHLOROPROPENE | 5.3 | U | 5.2 | U | NC |
| 1,1,2-TRICHLOROETHANE | 5.3 | U | 5.2 | U | NC |
| TETRACHLOROETHENE | 5.3 | U | 5.2 | U | NC |
| DIBROMOCHLOROMETHANE | 5.3 | U | 5.2 | U | NC |
| CHLOROBENZENE | 5.3 | U | 5.2 | U | NC |
| ETHYLBENZENE | 5.3 | U | 5.2 | U | NC |
| M,P-XYLENES | 5.3 | U | 5.2 | U | NC |
| O-XYLENES | 5.3 | U | 5.2 | U | NC |
| STYRENE | 5.3 | U | 5.2 | U | NC |
| BROMOFORM | 5.3 | U | 5.2 | U | NC |
| 1,1,2,2-TETRACHLOROETHANE | 5.3 | U | 5.2 | U | NC |
| 1,3-DICHLOROBENZENE | 5.3 | U | 5.2 | U | NC |

| | | | | | |
|---------------------|-----------------|---|-----------------|---|-----|
| SAMPLE NO.: | 9018SG | | 9018SGD | | |
| DATE: | 11/8/94 | | 11/8/94 | | |
| LOCATION: | 90 18 | | 90 18 | | |
| PARAMETER | RESULT µg/Kg | Q | RESULT µg/Kg | Q | RPD |
| 1,4-DICHLOROBENZENE | 5.3 | U | 5.2 | U | NC |
| 1,2-DICHLOROBENZENE | 5.3 | U | 5.2 | U | NC |
| NC - Not calculated | | | | | |

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Appendix C

Semivolatile Organic Compounds Validated Data Summary Tables

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| Parameter | Sample# Date Location Depth Type Comments | 9018SG 11-8-94 90 18 --- | | 9018GD 11-8-94 90 18 --- | | 901910 11-8-94 90 19 --- | | EQUI 1 11-8-94 --- | |
|------------------------------|--|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|--------------------------|---|
| | | Result | Q | Result | Q | Result | Q | Result | Q |
| PHENOL | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| BIS(2-CHLOROETHYL)ETHER | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2-CHLOROPHENOL | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 1,3-DICHLOROBENZENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 1,4-DICHLOROBENZENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| BENZYL ALCOHOL | UG/KG | 1400.000 | U | 1300.000 | U | 1400.000 | U | 20.000 | U |
| 1,2-DICHLOROBENZENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2-METHYLPHENOL | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2,2'-OXYBIS(1-CHLOROPROPANE) | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 4-METHYLPHENOL | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| N-NITROSO-DI-N-PROPYLAMINE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| HEXACHLOROETHANE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| NITROBENZENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| ISOPHORONE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2-NITROPHENOL | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2,4-DIMETHYLPHENOL | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| BENZOIC ACID | UG/KG | 3500.000 | U | 3300.000 | U | 3500.000 | U | 50.000 | U |
| BIS(2-CHLOROETHOXY)METHANE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2,4-DICHLOROPHENOL | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 1,2,4-TRICHLOROBENZENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| NAPHTHALENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 4-CHLOROANILINE | UG/KG | 1400.000 | U | 1300.000 | U | 1400.000 | U | 20.000 | U |
| HEXACHLOROCYCLOPENTADIENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 4-CHLORO-3-METHYLPHENOL | UG/KG | 1400.000 | U | 1300.000 | U | 1400.000 | U | 20.000 | U |
| 2-METHYLNAPHTHALENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| HEXACHLOROCYCLOPENTADIENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2,4,6-TRICHLOROPHENOL | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2,4,5-TRICHLOROPHENOL | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2-CHLORONAPHTHALENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2-NITROANILINE | UG/KG | 3500.000 | U | 3300.000 | U | 3500.000 | U | 50.000 | U |
| DIMETHYLNAPHTHALENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| ACENAPHTHYLENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2,6-DINITROTOLUENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 3-NITROANILINE | UG/KG | 3500.000 | U | 3300.000 | U | 3500.000 | U | 50.000 | U |
| ACENAPHTHENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 2,4-DINITROPHENOL | UG/KG | 3500.000 | U | 3300.000 | U | 3500.000 | U | 50.000 | U |
| 4-NITROPHENOL | UG/KG | 3500.000 | U | 3300.000 | U | 3500.000 | U | 50.000 | U |
| DIBENZOFURAN | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |

The decimal places shown do not reflect the precision reported by the laboratory

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C.1

C.2

| Parameter | Samp# | 9018SG | | 9018GD | | 901918 | | EQU11 | |
|----------------------------|----------|----------|---|------------|---|----------|---|-----------------|---|
| | Date | 11-8-94 | | 11-8-94 | | 11-8-94 | | 11-8-94 | |
| | Location | 90 18 | | 90 18 | | 90 19 | | --- | |
| | Depth | --- | | --- | | --- | | --- | |
| | Type | SOIL | | SOIL | | SOIL | | WATER, UG/L | |
| | Comments | | | CO-LOCATED | | | | EQUIPMENT BLANK | |
| | Units | Result | Q | Result | Q | Result | Q | Result | Q |
| 2,4-DINITROTOLUENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| DIETHYLPHTHALATE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 4-CHLOROPHENYL-PHENYLETHYR | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| FLUORENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 4-NITROANILINE | UG/KG | 3500.000 | U | 3300.000 | U | 3500.000 | U | 20.000 | U |
| 4,6-DINITRO-2-METHYLPHENOL | UG/KG | 3500.000 | U | 3300.000 | U | 3500.000 | U | 50.000 | U |
| N-NITROSODIPHENYLAMINE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 4-BROMOPHENYL-PHENYLETHYR | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| HEXACHLORODERZENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| PENTACHLOROPHENOL | UG/KG | 3500.000 | U | 3300.000 | U | 3500.000 | U | 50.000 | U |
| PHENANTHRENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| ANTHRACENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| DI-N-BUTYLPHTHALATE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| FLUORANTHENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| PYRENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| BUTYLBENZYLPHTHALATE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| 3,3'-DICHLOROBENZIDINE | UG/KG | 1400.000 | U | 1300.000 | U | 1400.000 | U | 20.000 | U |
| BENZO(A)ANTHRACENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| CHRYSENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| BIS(2-ETHYLHEXYL)PHTHALATE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| DI-N-OCTYLPHTHALATE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| BENZO(B)FLUORANTHENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| BENZO(K)FLUORANTHENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| BENZO(A)PYRENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| INDENO(1,2,3-CD)PYRENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| DIBENZ(A,H)ANTHRACENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |
| BENZO(G,H,I)PERYLENE | UG/KG | 700.000 | U | 660.000 | U | 690.000 | U | 10.000 | U |

The decimal places shown do not reflect the precision reported by the laboratory

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Appendix D

Semivolatile Organic Compounds Field Duplicate Results

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| SAMPLE NO.: | 9018SG | | 9018SGD | | |
|-----------------------------|-----------------|---|-----------------|---|-----|
| DATE: | 11/8/94 | | 11/8/94 | | |
| LOCATION: | 90 18 | | 90 18 | | |
| PARAMETER | RESULT µg/Kg | Q | RESULT µg/Kg | Q | RPD |
| PHENOL | 700 | U | 660 | U | NC |
| BIS(2-CHLOROETHYL)ETHER | 700 | U | 660 | U | NC |
| 1,3-DICHLOROBENZENE | 700 | U | 660 | U | NC |
| 1,4-DICHLOROBENZENE | 700 | U | 660 | U | NC |
| BENZYL ALCOHOL | 1400 | U | 1300 | U | NC |
| BIS(2-CHLOROISOPROPYL)ETHER | 700 | U | 660 | U | NC |
| 4-METHYLPHENOL | 700 | U | 660 | U | NC |
| 2,4-DIMETHYLPHENOL | 700 | U | 660 | U | NC |
| BIS(2-CHLOROETHOXY)METHANE | 700 | U | 660 | U | NC |
| 2,4-DICHLOROPHENOL | 700 | U | 660 | U | NC |
| 1,2,4-TRICHLOROBENZENE | 700 | U | 660 | U | NC |
| 4-CHLOROANILINE | 1400 | U | 1300 | U | NC |
| DIMETHYLPHthalate | 700 | U | 660 | U | NC |
| ACENAPHTHYLENE | 700 | U | 660 | U | NC |
| 2,4-DINITROPHENOL | 3500 | U | 3300 | U | NC |
| 4-NITROPHENOL | 3500 | U | 3300 | U | NC |
| DIBENZOFURAN | 700 | U | 660 | U | NC |
| 2,4-DINITROTOLUENE | 700 | U | 660 | U | NC |
| 4-NITROANILINE | 3500 | U | 3300 | U | NC |
| 4,6-DINITRO-2-METHYLPHENOL | 3500 | U | 3300 | U | NC |
| 4-BROMOPHENYL-PHENYLETHER | 700 | U | 660 | U | NC |
| HEXACHLOROBENZENE | 700 | U | 660 | U | NC |
| ANTHRACENE | 700 | U | 660 | U | NC |
| FLUORANTHENE | 700 | U | 660 | U | NC |
| PYRENE | 700 | U | 660 | U | NC |
| BENZO(A)ANTHRACENE | 700 | U | 660 | U | NC |
| CHRYSENE | 700 | U | 660 | U | NC |
| BIS(2-ETHYLHEXYL)PHTHALATE | 700 | U | 660 | U | NC |
| DI-N-OCTYLPHthalate | 700 | U | 660 | U | NC |
| BENZO(B)FLUORANTHENE | 700 | U | 660 | U | NC |
| BENZO(K)FLUORANTHENE | 700 | U | 660 | U | NC |
| BENZO(A)PYRENE | 700 | U | 660 | U | NC |
| INDENO(1,2,3-CD)PYRENE | 700 | U | 660 | U | NC |
| DIBENZ(A,H)ANTHRACENE | 700 | U | 660 | U | NC |

| | | | | | |
|----------------------------|-----------------|---|-----------------|---|-----|
| SAMPLE NO.: | 9018SG | | 9018SGD | | |
| DATE: | 11/8/94 | | 11/8/94 | | |
| LOCATION: | 90 18 | | 90 18 | | |
| PARAMETER | RESULT µg/Kg | Q | RESULT µg/Kg | Q | RPD |
| BENZO(G,H,I)PERYLENE | 700 | U | 660 | U | NC |
| 2-CHLOROPHENOL | 700 | U | 660 | U | NC |
| 1,2-DICHLOROBENZENE | 700 | U | 660 | U | NC |
| 2-METHYLPHENOL | 700 | U | 660 | U | NC |
| N-NITROSO-DI-N-PROPYLAMINE | 700 | U | 660 | U | NC |
| HEXACHLOROETHANE | 700 | U | 660 | U | NC |
| NITROBENZENE | 700 | U | 660 | U | NC |
| ISOPHORONE | 700 | U | 660 | U | NC |
| 2-NITROPHENOL | 700 | U | 660 | U | NC |
| BENZOIC ACID | 3500 | U | 3300 | U | NC |
| NAPHTHALENE | 700 | U | 660 | U | NC |
| HEXACHLOROBUTADIENE | 700 | U | 660 | U | NC |
| 4-CHLORO-3-METHYLPHENOL | 1400 | U | 1300 | U | NC |
| 2-METHYLNAPHTHALENE | 700 | U | 660 | U | NC |
| HEXACHLOROCYCLOPENTADIENE | 700 | U | 660 | U | NC |
| 2,4,6-TRICHLOROPHENOL | 700 | U | 660 | U | NC |
| 2,4,5-TRICHLOROPHENOL | 700 | U | 660 | U | NC |
| 2-CHLORONAPHTHALENE | 700 | U | 660 | U | NC |
| 2-NITROANILINE | 3500 | U | 3300 | U | NC |
| 2,6-DINITROTOLUENE | 700 | U | 660 | U | NC |
| 3-NITROANILINE | 3500 | U | 3300 | U | NC |
| ACENAPHTHENE | 700 | U | 660 | U | NC |
| DIETHYLPHTHALATE | 700 | U | 660 | U | NC |
| 4-CHLOROPHENYL-PHENYLETHER | 700 | U | 660 | U | NC |
| FLUORENE | 700 | U | 660 | U | NC |
| N-NITROSODIPHENYLAMINE | 700 | U | 660 | U | NC |
| PENTACHLOROPHENOL | 3500 | U | 3300 | U | NC |
| PHENANTHRENE | 700 | U | 660 | U | NC |
| CARBAZOLE | 700 | U | 660 | U | NC |
| DI-N-BUTYLPHTHALATE | 700 | U | 660 | U | NC |
| BUTYLBENZYLPHTHALATE | 700 | U | 660 | U | NC |
| 3,3'-DICHLOROBENZIDINE | 1400 | U | 1300 | U | NC |
| NC - Not calculated | | | | | |

9513386.0252

Appendix E

Metals Validated Data Summary Tables

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E.1

| Parameter | Sampl Date | 9017SG | | 901810 | | 9010SG | | 901910 | | 9019SG | | EQUI1 | |
|------------|---------------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------------|-----|
| | Location | 11-8-94 | 90 17 | 11-8-94 | 90 10 | 11-8-94 | 90 10 | 11-8-94 | 90 19 | 11-8-94 | 90 19 | 11-8-94 | --- |
| | Depth | --- | | --- | | --- | | --- | | --- | | --- | |
| | Type | SOIL | | WATER, UG/L | |
| | Comments | | | | | | | | | | | EQUIPMENT BLANK | |
| | Units | Result | Q | Result | Q |
| ALUMINUM | HG/KG | 5110.000 | | 5500.000 | | 6320.000 | | 6400.000 | | 5900.000 | | 16.000 | U |
| ANTIMONY | HG/KG | 10.600 | U | 10.600 | U | 10.600 | UJ | 10.600 | UJ | 10.700 | U | 50.000 | U |
| BARIUM | HG/KG | 62.400 | | 71.900 | | 87.800 | | 72.600 | | 71.400 | | 9.000 | U |
| BERYLLIUM | HG/KG | --- | | --- | | --- | | --- | | --- | | 1.000 | U |
| CADMIUM | HG/KG | 0.850 | U | 0.850 | U | 3.500 | | 0.850 | U | 0.860 | U | 4.000 | U |
| CALCIUM | HG/KG | 5050.000 | | 4920.000 | | 5430.000 | | 5000.000 | | 6370.000 | | 232.000 | BJ |
| CHROMIUM | HG/KG | 9.600 | J | 7.700 | J | 11.000 | | 9.500 | | 8.700 | J | 3.000 | UJ |
| COBALT | HG/KG | 8.200 | B | 9.700 | B | 22.800 | | 7.100 | B | 7.200 | B | 6.000 | U |
| COPPER | HG/KG | 16.500 | | 13.900 | | 18.400 | | 12.500 | | 17.100 | | 3.000 | UJ |
| IRON | HG/KG | 19600.000 | | 19700.000 | | 24000.000 | | 23800.000 | | 21400.000 | | 28.200 | B |
| LEAD | HG/KG | --- | | --- | | --- | | --- | | --- | | 2.300 | U |
| MAGNESIUM | HG/KG | 3700.000 | | 4120.000 | | 4170.000 | | 4650.000 | | 4220.000 | | 74.900 | B |
| MANGANESE | HG/KG | 253.000 | | 294.000 | | 310.000 | | 319.000 | | 301.000 | | 1.000 | UJ |
| MERCURY | HG/KG | 0.110 | UJ | 0.100 | UJ | 0.110 | UJ | 0.100 | UJ | 0.100 | UJ | 0.200 | U |
| MOLYBDENUM | HG/KG | 15.800 | B | 3.200 | U | 3.200 | U | 3.200 | U | 3.200 | U | --- | |
| NICKEL | HG/KG | 14.600 | | 20.000 | | 70.500 | | 12.100 | | 10.900 | | 10.000 | U |
| POTASSIUM | HG/KG | 792.000 | B | 1010.000 | B | 995.000 | B | 1080.000 | | 953.000 | B | 620.000 | U |
| SELENIUM | HG/KG | 19.100 | U | 19.200 | U | 19.100 | U | 19.100 | U | 19.300 | U | --- | |
| SILVER | HG/KG | 0.850 | U | 0.850 | U | 0.850 | U | 0.850 | U | 0.860 | U | 4.000 | U |
| SODIUM | HG/KG | 476.000 | BJ | 472.000 | BJ | 511.000 | BJ | 477.000 | BJ | 460.000 | BJ | 500.000 | BJ |
| STRONTIUM | HG/KG | 22.800 | B | 35.100 | B | 79.300 | | 24.200 | B | 22.500 | B | 1.000 | UJ |
| TANTALUM | HG/KG | --- | | --- | | --- | | --- | | --- | | 3.000 | UJ |
| ZINC | HG/KG | --- | | --- | | --- | | --- | | --- | | 84.000 | U |
| CERIUM | HG/KG | --- | | --- | | --- | | --- | | --- | | 1.000 | U |

The decimal places shown do not reflect the precision reported by the laboratory

9513386.0253

| Parameter | Sample Date | NE10SG 11-8-94 | | NE9S 11-8-94 | | NE9SD 11-8-94 | | NE9SG 11-8-94 | | SA1110 11-8-94 | | SA11S 11-8-94 | |
|------------|----------------|-------------------|----|-----------------|---|------------------|---|------------------|----|-------------------|----|------------------|---|
| | Location | NE 10 | | NE 9 | | NE 9 | | NE 9 | | SA 11 | | SA 11 | |
| | Depth | --- | | --- | | --- | | --- | | --- | | --- | |
| | Type | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | Comments | | | | | CO-LOCATED | | | | | | | |
| | Units | Result | Q | Result | Q | Result | Q | Result | Q | Result | Q | Result | Q |
| ALUMINUM | MG/KG | 5250.000 | | --- | | --- | | 7250.000 | | 6350.000 | | --- | |
| ANTIMONY | MG/KG | 10.700 | U | --- | | --- | | 10.800 | UJ | 10.800 | U | --- | |
| BARIUM | MG/KG | 74.800 | | --- | | --- | | 75.000 | | 85.900 | | --- | |
| BERYLLIUM | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| CADMIUM | MG/KG | 0.860 | U | --- | | --- | | 0.860 | U | 0.860 | U | --- | |
| CALCIUM | MG/KG | 4430.000 | | --- | | --- | | 5700.000 | | 3600.000 | | --- | |
| CHROMIUM | MG/KG | 6.700 | J | --- | | --- | | 8.600 | | 8.100 | J | --- | |
| CODALT | MG/KG | 7.000 | B | --- | | --- | | 9.100 | B | 7.200 | B | --- | |
| COPPER | MG/KG | 12.100 | | --- | | --- | | 16.100 | | 11.600 | | --- | |
| IRON | MG/KG | 17000.000 | | --- | | --- | | 25700.000 | | 22400.000 | | --- | |
| LEAD | MG/KG | --- | | 34.800 | J | 43.300 | | --- | | --- | | 29.100 | J |
| MAGNESIUM | MG/KG | 3880.000 | | --- | | --- | | 4520.000 | | 4550.000 | | --- | |
| MANAGANESE | MG/KG | 269.000 | | --- | | --- | | 358.000 | | 349.000 | | --- | |
| MERCURY | MG/KG | 0.090 | UJ | --- | | --- | | 0.100 | UJ | 0.100 | UJ | --- | |
| MOLYBDENUM | MG/KG | 3.200 | U | --- | | --- | | 3.200 | U | 3.200 | U | --- | |
| NICKEL | MG/KG | 9.600 | | --- | | --- | | 10.000 | | 10.000 | | --- | |
| POTASSIUM | MG/KG | 867.000 | B | --- | | --- | | 1010.000 | B | 1280.000 | | --- | |
| SELENIUM | MG/KG | 19.300 | U | --- | | --- | | 19.400 | U | 19.400 | U | --- | |
| SILVER | MG/KG | 0.860 | U | --- | | --- | | 0.860 | U | 0.860 | U | --- | |
| SODIUM | MG/KG | 472.000 | BJ | --- | | --- | | 533.000 | UJ | 430.000 | BJ | --- | |
| STRONTIUM | MG/KG | 24.500 | B | --- | | --- | | 24.400 | B | 19.800 | B | --- | |
| Vanadium | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| ZINC | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| CERIUM | MG/KG | --- | | --- | | --- | | 27.100 | | --- | | --- | |

The decimal places shown do not reflect the precision reported by the laboratory

E.2

E.3

| Parameter | Sample | SA11SG | | SA11SG | | SA12SG | | SA13S | | SA13SG | | SA14SG | |
|------------|----------|-----------|----|------------|----|-----------|----|---------|---|-----------|----|-----------|----|
| | Date | 11-8-94 | | 11-8-94 | | 11-8-94 | | 11-8-94 | | 11-8-94 | | 11-8-94 | |
| | Location | SA 11 | | SA 11 | | SA 12 | | SA 13 | | SA 13 | | SA 14 | |
| | Depth | --- | | --- | | --- | | --- | | --- | | --- | |
| | Type | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | Comments | | | CO-LOCATED | | | | | | | | | |
| | Units | Result | Q | Result | Q | Result | Q | Result | Q | Result | Q | Result | Q |
| ALUMINUM | MG/KG | 6020.000 | | 6020.000 | | 5780.000 | | --- | | 5020.000 | | 5520.000 | |
| ANTIMONY | MG/KG | 10.700 | UJ | 10.700 | UJ | 10.700 | U | --- | | 10.000 | U | 10.500 | U |
| BARIUM | MG/KG | 76.300 | | 79.000 | | 72.100 | | --- | | 73.600 | | 68.200 | |
| BERYLLIUM | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| CADMIUM | MG/KG | 0.060 | U | 0.050 | U | 0.060 | U | --- | | 0.070 | U | 0.040 | U |
| CALCIUM | MG/KG | 5590.000 | | 5030.000 | | 4530.000 | | --- | | 4450.000 | | 4680.000 | |
| CHROMIUM | MG/KG | 0.600 | | 9.900 | | 0.100 | J | --- | | 7.300 | J | 6.100 | J |
| CODALT | MG/KG | 7.100 | B | 7.700 | B | 6.900 | B | --- | | 7.000 | B | 7.400 | B |
| COPPER | MG/KG | 13.000 | | 13.500 | | 11.900 | | --- | | 11.000 | | 12.900 | |
| IRON | MG/KG | 23600.000 | | 24400.000 | | 20200.000 | | --- | | 20200.000 | | 20300.000 | |
| LEAD | MG/KG | --- | | --- | | --- | | 26.500 | | --- | | --- | |
| MAGNESIUM | MG/KG | 4510.000 | | 4500.000 | | 4170.000 | | --- | | 4390.000 | | 4230.000 | |
| MANGANESE | MG/KG | 325.000 | | 330.000 | | 290.000 | | --- | | 305.000 | | 307.000 | |
| MERCURY | MG/KG | 0.100 | UJ | 0.100 | UJ | 0.100 | UJ | --- | | 0.110 | UJ | 0.110 | UJ |
| MOLYBDENUM | MG/KG | 3.200 | U | 3.200 | U | 3.200 | U | --- | | 3.200 | U | 3.200 | U |
| NICKEL | MG/KG | 10.100 | | 10.000 | | 11.000 | | --- | | 9.700 | | 9.900 | |
| POTASSIUM | MG/KG | 1060.000 | B | 1060.000 | B | 1020.000 | B | --- | | 1020.000 | B | 905.000 | B |
| SELENIUM | MG/KG | 19.300 | U | 19.200 | U | 19.300 | U | --- | | 19.500 | U | 19.000 | U |
| SILVER | MG/KG | 0.060 | U | 0.050 | U | 0.060 | U | --- | | 0.070 | U | 0.040 | U |
| SODIUM | MG/KG | 403.000 | BJ | 545.000 | BJ | 426.000 | BJ | --- | | 459.000 | BJ | 433.000 | BJ |
| STRONTIUM | MG/KG | 23.000 | D | 23.100 | B | 20.300 | B | --- | | 20.900 | D | 19.800 | B |
| THORIUM | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| ZINC | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| CERIUM | MG/KG | 63.500 | | 57.300 | | --- | | --- | | --- | | --- | |

The decimal places shown do not reflect the precision reported by the laboratory

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| Sample | Date | Location | Depth | Type | Comments | Parameter | Units | Result | Q |
|-----------|---------|----------|-------|------|----------|------------|-------|-----------|-----|
| 1S3S | 11-8-94 | 1/S 3 | --- | SOIL | --- | ALUMINUM | HG/KG | 6920.000 | U |
| | | | | | | ANTIMONY | HG/KG | 10.600 | U |
| | | | | | | BARIUM | HG/KG | 72.000 | U |
| | | | | | | BERYLLIUM | HG/KG | --- | --- |
| | | | | | | CADMIUM | HG/KG | 0.050 | U |
| | | | | | | CALCIUM | HG/KG | 6120.000 | U |
| | | | | | | CHROMIUM | HG/KG | 9.300 | J |
| | | | | | | COBALT | HG/KG | 9.400 | B |
| | | | | | | COPPER | HG/KG | 17.000 | B |
| | | | | | | IRON | HG/KG | 26900.000 | B |
| | | | | | | LEAD | HG/KG | 4620.000 | --- |
| | | | | | | MANGANESE | HG/KG | 337.000 | U |
| | | | | | | MERCURY | HG/KG | 0.110 | U |
| | | | | | | MOLYBDENUM | HG/KG | 3.200 | U |
| NICKEL | HG/KG | 15.100 | B | | | | | | |
| POTASSIUM | HG/KG | 1000.000 | --- | | | | | | |
| SELENIUM | HG/KG | 19.300 | U | | | | | | |
| SILVER | HG/KG | 0.050 | U | | | | | | |
| SODIUM | HG/KG | 495.000 | B | | | | | | |
| STRONTIUM | HG/KG | 25.200 | B | | | | | | |
| TUNGSTEN | HG/KG | --- | --- | | | | | | |
| ZINC | HG/KG | --- | --- | | | | | | |
| ZENK | HG/KG | 20.900 | --- | | | | | | |
| 1S2S | 11-8-94 | 1/S 2 | --- | SOIL | --- | ALUMINUM | HG/KG | 6100.000 | U |
| | | | | | | ANTIMONY | HG/KG | 10.700 | U |
| | | | | | | BARIUM | HG/KG | 73.000 | U |
| | | | | | | BERYLLIUM | HG/KG | --- | --- |
| | | | | | | CADMIUM | HG/KG | 0.060 | U |
| | | | | | | CALCIUM | HG/KG | 5340.000 | U |
| | | | | | | CHROMIUM | HG/KG | 7.300 | J |
| | | | | | | COBALT | HG/KG | 6.900 | B |
| | | | | | | COPPER | HG/KG | 16.200 | B |
| | | | | | | IRON | HG/KG | 20600.000 | B |
| | | | | | | LEAD | HG/KG | 4030.000 | --- |
| | | | | | | MANGANESE | HG/KG | 310.000 | U |
| | | | | | | MERCURY | HG/KG | 0.110 | U |
| | | | | | | MOLYBDENUM | HG/KG | 3.200 | U |
| NICKEL | HG/KG | 0.600 | B | | | | | | |
| POTASSIUM | HG/KG | 1100.000 | --- | | | | | | |
| SELENIUM | HG/KG | 19.300 | U | | | | | | |
| SILVER | HG/KG | 0.060 | U | | | | | | |
| SODIUM | HG/KG | 495.000 | B | | | | | | |
| STRONTIUM | HG/KG | 22.500 | B | | | | | | |
| TUNGSTEN | HG/KG | --- | --- | | | | | | |
| ZINC | HG/KG | --- | --- | | | | | | |
| ZENK | HG/KG | --- | --- | | | | | | |
| 1S1S | 11-8-94 | 1/S 1 | --- | SOIL | --- | ALUMINUM | HG/KG | 6100.000 | U |
| | | | | | | ANTIMONY | HG/KG | 10.700 | U |
| | | | | | | BARIUM | HG/KG | 73.000 | U |
| | | | | | | BERYLLIUM | HG/KG | --- | --- |
| | | | | | | CADMIUM | HG/KG | 0.060 | U |
| | | | | | | CALCIUM | HG/KG | 5340.000 | U |
| | | | | | | CHROMIUM | HG/KG | 7.300 | J |
| | | | | | | COBALT | HG/KG | 6.900 | B |
| | | | | | | COPPER | HG/KG | 16.200 | B |
| | | | | | | IRON | HG/KG | 20600.000 | B |
| | | | | | | LEAD | HG/KG | 4030.000 | --- |
| | | | | | | MANGANESE | HG/KG | 310.000 | U |
| | | | | | | MERCURY | HG/KG | 0.110 | U |
| | | | | | | MOLYBDENUM | HG/KG | 3.200 | U |
| NICKEL | HG/KG | 0.600 | B | | | | | | |
| POTASSIUM | HG/KG | 1100.000 | --- | | | | | | |
| SELENIUM | HG/KG | 19.300 | U | | | | | | |
| SILVER | HG/KG | 0.060 | U | | | | | | |
| SODIUM | HG/KG | 495.000 | B | | | | | | |
| STRONTIUM | HG/KG | 22.500 | B | | | | | | |
| TUNGSTEN | HG/KG | --- | --- | | | | | | |
| ZINC | HG/KG | --- | --- | | | | | | |
| ZENK | HG/KG | --- | --- | | | | | | |

The decimal places shown do not reflect the precision reported by the laboratory.

E.S

| Parameter | Samp# | 1S410 | | 1S450 | | 1S550 | | 1S550 | | 1S610 | | 1S650 | |
|------------|----------|-----------|----|-----------|----|-----------|----|------------|----|-----------|----|-----------|----|
| | Date | 11-0-94 | | 11-0-94 | | 11-0-94 | | 11-0-94 | | 11-0-94 | | 11-0-94 | |
| | Location | 1/S 4 | | 1/S 4 | | 1/S 5 | | 1/S 5 | | 1/S 6 | | 1/S 6 | |
| | Depth | --- | | --- | | --- | | --- | | --- | | --- | |
| | Type | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | Comments | | | | | | | CO-LOCATED | | | | | |
| | Units | Result | Q | Result | Q | Result | Q | Result | Q | Result | Q | Result | Q |
| ALUMINUM | MG/KG | 5410.000 | | 5370.000 | | 4940.000 | | 4930.000 | | 6310.000 | | 7200.000 | |
| ANTIMONY | MG/KG | 10.700 | U | 10.600 | U | 10.600 | U | 10.500 | U | 10.000 | U | 10.700 | UJ |
| BARIUM | MG/KG | 69.500 | | 69.300 | | 64.000 | | 66.600 | | 77.200 | | 72.700 | |
| BERYLLIUM | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| CADMIUM | MG/KG | 0.060 | U | 0.050 | U | 0.040 | U | 0.040 | U | 0.060 | U | 0.060 | U |
| CALCIUM | MG/KG | 3050.000 | | 4240.000 | | 4290.000 | | 4370.000 | | 3090.000 | | 4170.000 | |
| CHROMIUM | MG/KG | 7.400 | J | 7.200 | J | 6.900 | J | 6.200 | J | 9.100 | J | 10.300 | |
| COBALT | MG/KG | 6.100 | B | 6.200 | B | 6.300 | B | 5.600 | B | 7.200 | B | 7.600 | B |
| COPPER | MG/KG | 9.800 | | 10.400 | | 12.400 | | 11.000 | | 13.200 | | 12.900 | |
| IRON | MG/KG | 16900.000 | | 16000.000 | | 10000.000 | | 16300.000 | | 21400.000 | | 23000.000 | |
| LEAD | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| MAGNESIUM | MG/KG | 4060.000 | | 4170.000 | | 3960.000 | | 3900.000 | | 4430.000 | | 4620.000 | |
| MANGANESE | MG/KG | 205.000 | | 207.000 | | 280.000 | | 263.000 | | 326.000 | | 324.000 | |
| MERCURY | MG/KG | 0.090 | UJ | 0.110 | UJ | 0.110 | UJ | 0.110 | UJ | 0.110 | UJ | 0.100 | UJ |
| MOLYBDENUM | MG/KG | 3.200 | U | 3.200 | U | 3.200 | U | 3.200 | U | 3.200 | U | 3.200 | U |
| NICKEL | MG/KG | 10.000 | | 8.400 | B | 9.600 | | 8.100 | B | 11.600 | | 11.200 | |
| POTASSIUM | MG/KG | 1100.000 | | 1120.000 | | 925.000 | B | 853.000 | B | 1250.000 | | 1250.000 | |
| SELENIUM | MG/KG | 19.300 | U | 19.100 | U | 19.000 | U | 10.900 | U | 19.400 | U | 19.300 | U |
| SILVER | MG/KG | 0.060 | U | 0.050 | U | 0.040 | U | 0.040 | U | 0.060 | U | 0.060 | U |
| SODIUM | MG/KG | 374.000 | BJ | 399.000 | DJ | 424.000 | BJ | 444.000 | DJ | 449.000 | DJ | 447.000 | BJ |
| STRONTIUM | MG/KG | 17.800 | B | 19.500 | B | 10.600 | B | 23.000 | B | 21.000 | B | 23.100 | B |
| Vanadium | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| ZINC | MG/KG | --- | | --- | | --- | | --- | | --- | | --- | |
| CERIUM | MG/KG | --- | | --- | | --- | | --- | | --- | | 20.400 | |

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| Parameter | Units | TS7SG | | TS0SG | |
|------------|-------|------------------|----|------------------|----|
| | | Result | Q | Result | Q |
| | | 11-0-94 I/S 7 | | 11-0-94 I/S 0 | |
| | | --- | | --- | |
| | | SOIL | | SOIL | |
| | | Comments | | | |
| ALUMINIUM | HG/KG | 5590.000 | | 5970.000 | |
| ANTIMONY | HG/KG | 10.700 | U | 11.000 | U |
| BARIUM | HG/KG | 01.300 | | 69.600 | |
| BERYLLIUM | HG/KG | --- | | --- | |
| CADMIUM | HG/KG | 0.860 | U | 0.880 | U |
| CALCIUM | HG/KG | 5170.000 | | 4270.000 | |
| CHROMIUM | HG/KG | 0.400 | J | 0.200 | J |
| COBALT | HG/KG | 6.900 | B | 6.800 | B |
| COPPER | HG/KG | 11.900 | | 10.400 | |
| IRON | HG/KG | 19600.000 | | 17400.000 | |
| LEAD | HG/KG | --- | | --- | |
| MAGNESIUM | HG/KG | 4520.000 | | 4360.000 | |
| MANGANESE | HG/KG | 305.000 | | 303.000 | |
| MERCURY | HG/KG | 0.110 | UJ | 0.110 | UJ |
| MOLYBDENUM | HG/KG | 3.200 | U | 3.300 | U |
| NICKEL | HG/KG | 9.500 | | 11.200 | |
| POTASSIUM | HG/KG | 973.000 | B | 1060.000 | B |
| SELENIUM | HG/KG | 19.300 | U | 19.800 | U |
| SILVER | HG/KG | 0.860 | U | 0.880 | U |
| SODIUM | HG/KG | 446.000 | BJ | 483.000 | BJ |
| STRONTIUM | HG/KG | 23.200 | B | 21.000 | B |
| VANADIUM | HG/KG | --- | | --- | |
| ZINC | HG/KG | --- | | --- | |
| CERIUM | HG/KG | --- | | --- | |

The decimal places shown do not reflect the precision reported by the laboratory

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Appendix F

Metals Validated Field Duplicate Summary

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| SAMPLE NO.: | TS5SG | | TS5SGD | | |
|---------------------|-----------------|----|-----------------|----|------|
| DATE: | 11/8/94 | | 11/8/94 | | |
| LOCATION: | T/S 5 | | T/S 5 | | |
| PARAMETER | RESULT MG/KG | Q | RESULT MG/KG | Q | RPD |
| ALUMINUM | 4940 | | 4930 | | .2 |
| ANTIMONY | 10.6 | U | 10.5 | U | NC |
| BARIUM | 64 | | 66.6 | | 4 |
| CADMIUM | 0.84 | U | 0.84 | U | NC |
| CALCIUM | 4290 | | 4370 | | 2 |
| CHROMIUM | 6.9 | J | 6.2 | J | 10.7 |
| COBALT | 6.3 | B | 5.6 | B | 11.8 |
| COPPER | 12.4 | | 11.8 | | 5.0 |
| IRON | 18000 | | 16300 | | 10 |
| MAGNESIUM | 3960 | | 3900 | | 2 |
| MANGANESE | 288 | | 263 | | 9 |
| MERCURY | 0.11 | UJ | 0.11 | UJ | NC |
| MOLYBDENUM | 3.2 | U | 3.2 | U | NC |
| NICKEL | 9.6 | | 8.1 | B | 16.9 |
| POTASSIUM | 925 | B | 853 | B | 8 |
| SELENIUM | 19 | U | 18.9 | U | NC |
| SILVER | 0.84 | U | 0.84 | U | NC |
| SODIUM | 424 | BJ | 444 | BJ | 5 |
| STRONTIUM | 18.6 | B | 23 | B | 21 |
| NC - Not calculated | | | | | |

| SAMPLE NO.: | SA11SG | | SA11SGD | | |
|---------------------|-----------------|----|-----------------|----|-----|
| DATE: | 11/8/94 | | 11/8/94 | | |
| LOCATION | SA 11 | | SA 11 | | |
| PARAMETER | RESULT MG/KG | Q | RESULT MG/KG | Q | RPD |
| ALUMINUM | 6820 | | 6820 | | 0 |
| ANTIMONY | 10.7 | UJ | 10.7 | UJ | NC |
| BARIUM | 76.3 | | 79 | | 3 |
| CADMIUM | 0.86 | U | 0.85 | U | NC |
| CALCIUM | 5590 | | 5030 | | 11 |
| CERIUM | 63.5 | | 57.3 | | 10 |
| CHROMIUM | 8.6 | | 9.9 | | 14 |
| COBALT | 7.1 | B | 7.7 | B | 8.1 |
| COPPER | 13 | | 13.5 | | 4 |
| IRON | 23600 | | 24400 | | 3 |
| MAGNESIUM | 4510 | | 4580 | | 2 |
| MANGANESE | 325 | | 338 | | 4 |
| MERCURY | 0.1 | UJ | 0.1 | UJ | NC |
| MOLYBDENUM | 3.2 | U | 3.2 | U | NC |
| NICKEL | 10.1 | | 10.8 | | 6.7 |
| POTASSIUM | 1060 | B | 1060 | B | 0 |
| SELENIUM | 19.3 | U | 19.2 | U | NC |
| SILVER | 0.86 | U | 0.85 | U | NC |
| SODIUM | 483 | BJ | 545 | BJ | 12 |
| STRONTIUM | 23 | B | 23.1 | B | 0.4 |
| NC - Not calculated | | | | | |

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| | | | | | |
|---------------------|-----------------|---|-----------------|---|------|
| SAMPLE NO.: | NE9S | | NE9SD | | |
| DATE: | 11/8/94 | | 11/8/94 | | |
| LOCATION: | NE 9 | | NE 9 | | |
| PARAMETER | RESULT MG/KG | Q | RESULT MG/KG | Q | RPD |
| LEAD | 34.8 | J | 43.3 | | 21.8 |
| NC - Not calculated | | | | | |

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Appendix G

Radiochemistry Validated Data Summary Tables

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G.1

| Parameter | Samp# Date Location Depth Type Comments | EQ11 11-8-94 --- WATER (in pCi/l) EQUIPMENT BLANK | | NE10SG 11-8-94 HE 10 --- SOIL | | SA14SG 11-8-94 SA 14 --- SOIL | | SW16SG 11-8-94 SW 16 --- SOIL | | TS55SG 11-8-94 T/S 5 --- SOIL | | TS55GD 11-8-94 T/S 5 --- SOIL CO-LOCATED | |
|-------------|--|---|---|---|---|---|---|---|---|---|---|---|---|
| | Units | Result | Q | Result | Q | Result | Q | Result | Q | Result | Q | Result | Q |
| GROSS ALPHA | pCi/g | 0.110 | U | 9.300 | | 9.000 | | 15.400 | | 9.500 | | 15.900 | |
| GROSS BETA | pCi/g | -0.200 | U | 16.700 | | 19.000 | | 10.000 | | 14.300 | | 22.200 | |

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Appendix H

Radiochemistry Field Duplicate Results

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| | | | | | |
|-------------|-----------------|---|-----------------|---|------|
| SAMPLE NO.: | TS5SG | | TS5SGD | | |
| DATE: | 11/8/94 | | 11/8/94 | | |
| LOCATION: | T/S 5 | | T/S 5 | | |
| PARAMETER | RESULT pCi/L | Q | RESULT pCi/L | Q | RPD |
| GROSS ALPHA | 9.5 | | 15.9 | | 50.4 |
| GROSS BETA | 14.3 | | 22.2 | | 43.3 |

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Appendix I

Method and Reporting Detection Limits for Volatile Organic and Semivolatile Organic Compounds Solid Samples

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Lockheed Analytical Services

METHOD AND REPORTING DETECTION LIMITS FOR SOLID SAMPLES
 USING
 EPA METHOD 3550/8270 - SEMIVOLATILE ANALYSES BY GC/MS

| Method 3550/8270 - Solid Samples | | |
|----------------------------------|----------------------------------|----------------------------------|
| CONSTITUENT | MDL* ($\mu\text{g}/\text{kg}$) | RDL* ($\mu\text{g}/\text{kg}$) |
| Phenol | 460 | 660 |
| bis(2-Chloroethyl)ether | 280 | 660 |
| 2-Chlorophenol | 400 | 660 |
| 1,3-Dichlorobenzene | 240 | 660 |
| 1,4-Dichlorobenzene | 250 | 660 |
| Benzyl alcohol | 560 | 1300 |
| 1,2-Dichlorobenzene | 260 | 660 |
| 2-Methylphenol | 480 | 660 |
| bis(2-Chloroisopropyl)ether | 240 | 660 |
| 4-Methylphenol | 540 | 660 |
| N-Nitroso-di-n-propylamine | 350 | 660 |
| Hexachloroethane | 250 | 660 |
| Nitrobenzene | 220 | 660 |
| Isophorone | 250 | 660 |
| 2-Nitrophenol | 410 | 660 |
| 2,4-Dimethylphenol | 390 | 660 |
| bis(2-Chloroethoxy)methane | 280 | 660 |
| Benzoic acid | 410 | 3300 |
| 2,4-Dichlorophenol | 410 | 660 |
| 1,2,4-Trichlorobenzene | 210 | 660 |
| Naphthalene | 250 | 660 |

Issued on 7/05/94

| Method 3550/8270 - Solid Samples | | |
|----------------------------------|--------------------------|--------------------------|
| CONSTITUENT | MDL ^a (µg/kg) | RDL ^b (µg/kg) |
| 4-Chloroaniline | 390 | 1300 |
| Hexachlorobutadiene | 220 | 660 |
| 4-Chloro-3-methylphenol | 520 | 1300 |
| 2-Methylnaphthalene | 280 | 660 |
| Hexachlorocyclopentadiene | 160 | 660 |
| 2,4,6-Trichlorophenol | 310 | 660 |
| 2,4,5-Trichlorophenol | 370 | 660 |
| 2-Chloronaphthalene | 230 | 660 |
| 2-Nitroaniline | 310 | 3300 |
| Dimethyl phthalate | 190 | 660 |
| Acenaphthylene | 190 | 660 |
| 2,6-Dinitrotoluene | 250 | 660 |
| 3-Nitroaniline | 420 | 3300 |
| Acenaphthene | 190 | 660 |
| 2,4-Dinitrophenol | 410 | 3300 |
| 4-Nitrophenol | 570 | 3300 |
| Dibenzofuran | 200 | 660 |
| 2,4-Dinitrotoluene | 260 | 660 |
| Diethylphthalate | 240 | 660 |
| 4-Chlorophenyl phenyl ether | 180 | 660 |
| Fluorene | 200 | 660 |
| 4-Nitroaniline | 450 | 3300 |
| 4,6-Dinitro-2-methylphenol | 260 | 3300 |
| N-Nitrosodiphenylamine | 130 | 660 |
| 4-Bromophenyl phenyl ether | 160 | 660 |

Issued on 7/05/94

| Method 3550/8270 - Solid Samples | | |
|----------------------------------|--------------------------|--------------------------|
| CONSTITUENT | MDL ^a (µg/kg) | RDL ^b (µg/kg) |
| Hexachlorobenzene | 140 | 660 |
| Pentachlorophenol | 380 | 3300 |
| Phenanthrene | 120 | 660 |
| Anthracene | 140 | 660 |
| Carbazole | 200 | 660 ^c |
| Di-n-butyl phthalate | 150 | 660 |
| Fluoranthene | 200 | 660 |
| Pyrene | 260 | 660 |
| Butyl benzyl phthalate | 150 | 660 |
| 3,3'-Dichlorobenzidine | 360 | 1300 |
| Benzo(a)anthracene | 130 | 660 |
| bis(2-Ethylhexyl)phthalate | 150 | 660 |
| Chrysene | 120 | 660 |
| Di-n-octyl phthalate | 170 | 660 |
| Benzo(b)fluoranthene | 190 | 660 |
| Benzo(k)fluoranthene | 260 | 660 |
| Benzo(a)pyrene | 140 | 660 |
| Indeno(1,2,3-cd)pyrene | 120 | 660 |
| Dibenz(a,h)anthracene | 130 | 660 |
| Benzo(g,h,i)perylene | 140 | 660 |

- a - Determined on 5/12/94 using a 30-g sample, with GPC cleanup, and a 1 µL injection.
- b - Adopted from the POLs specified by Method 8270, Revision A, July 1992, and Revision 1, July 1992.
- c - Adopted from the CRQL specified by CLP OLM01.1.

Lockheed Analytical Services

METHOD AND REPORTING DETECTION LIMITS FOR SOLID SAMPLES
 USING EPA METHODS 8240/8260 - VOLATILE
 ORGANIC ANALYSES BY GC/MS

| METHODS 8240/8260 - SOLID SAMPLES | | |
|-----------------------------------|----------------------------|----------------------------|
| Routine Analytes | MDL ^(a) (µg/kg) | RDL ^(b) (µg/kg) |
| Chloromethane | 2 | 5 |
| Vinyl Chloride | 2 | 5 |
| Bromomethane | 2 | 5 |
| Chloroethane | 1 | 5 |
| Trichlorofluoromethane | 2 | 5 |
| Acetone | 4 ^(c) | 10 |
| 2-Chloroethyl vinyl ether | 5 | 20 |
| 1,1-Dichloroethene | 2 | 5 |
| Methylene Chloride | 1 | 5 |
| Carbon Disulfide | 1 | 5 |
| Vinyl Acetate | 2 ^(c) | 10 |
| 1,1-Dichloroethane | 1 | 5 |
| 2-Butanone | 1 | 10 |
| trans-1,2-Dichloroethene | 1 | 5 |
| cis-1,2-Dichloroethene | 1 | 5 |
| Chloroform | 2 | 5 |
| 1,1,1-Trichloroethane | 2 | 5 |
| Carbon Tetrachloride | 2 | 5 |
| 1,2-Dichloroethane | 2 | 5 |
| Benzene | 2 | 5 |
| Trichloroethene (TCE) | 2 | 5 |
| 1,2-Dichloropropane | 1 | 5 |
| Bromodichloromethane | 1 | 5 |
| 4-Methyl-2-pentanone | 1 | 10 |
| 2-Hexanone | 2 | 10 |
| cis-1,3-Dichloropropene | 1 | 5 |
| trans-1,3-Dichloropropene | 1 | 5 |
| 1,1,2-Trichloroethane | 1 | 5 |
| Toluene | 1 | 5 |
| Dibromochloromethane | 2 | 5 |
| Tetrachloroethene (PCE) | 2 | 5 |
| Chlorobenzene | 2 | 5 |
| Ethylbenzene | 2 | 5 |
| m,p-Xylenes | 3 | 5 |
| o-Xylene | 2 | 5 |
| Styrene | 1 | 5 |

| METHODS 8240/8260 - SOLID SAMPLES | | |
|-----------------------------------|--|--|
| Routine Analytes | MDL ^(a) ($\mu\text{g}/\text{kg}$) | RDL ^(b) ($\mu\text{g}/\text{kg}$) |
| Bromoform | 2 | 5 |
| 1,1,2,2-Tetrachloroethane | 2 | 5 |
| 1,3-Dichlorobenzene | 2 | 5 |
| 1,4-Dichlorobenzene | 2 | 5 |
| 1,2-Dichlorobenzene | 2 | 5 |

a - Calculated based on the aqueous MDLs determined on 4/22/93.
b - The LAS RDLs met the estimated quantitation limits (PQLs) specified in Method 8260 of 5 $\mu\text{g}/\text{kg}$ for all the target compounds listed in Table 1 in Method 8260. For the analytes that are not listed in Method 8260, such as ketones, the LAS RDLs are generated based on the MDL study.
c - Calculated based on the aqueous MDLs determined on 2/19/93.

| METHOD 8240/8260 - SOLID SAMPLES | | |
|----------------------------------|----------------------------|-----|
| Additional Analytes | MDL ^(a) (µg/kg) | RDL |
| Dichlorodifluoromethane | 2 | 5 |
| Freon 113 | 2 | 10 |
| 2,2-Dichloropropane | 1 | 5 |
| Bromochloromethane | 1 | 5 |
| 1,1-Dichloropropene | 2 | 5 |
| Dibromomethane | 2 | 5 |
| 1,2-Dibromoethane | 1 | 5 |
| 1,3-Dichloropropane | 1 | 5 |
| 1,1,1,2-Tetrachloroethane | 2 | 5 |
| Isopropylbenzene | 2 | 5 |
| 1,2,3-Trichloropropane | 2 | 5 |
| n-Propylbenzene | 2 | 5 |
| Bromobenzene | 2 | 5 |
| 1,3,5-Trimethylbenzene | 2 | 5 |
| 2-Chlorotoluene | 2 | 5 |
| 4-Chlorotoluene | 2 | 5 |
| tert-Butylbenzene | 2 | 5 |
| 1,2,4-Trimethylbenzene | 2 | 5 |
| sec-Butylbenzene | 2 | 5 |
| p-Isopropyltoluene | 2 | 5 |
| n-Butylbenzene | 2 | 5 |
| 1,2-Dibromo-3-chloropropane | 2 | 5 |
| 1,2,4-Trichlorobenzene | 2 | 5 |
| Hexachlorobutadiene | 2 | 5 |
| Naphthalene | 1 | 5 |
| 1,2,3-Trichlorobenzene | 2 | 5 |

a - Calculated based on the aqueous MDLs determined on 4/22/93.

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