Los Alamos
NATIONAL LABORATORY
EST.1943

Environmental Programs
P.O. Box 1663, MS M991
Los Alamos, New Mexico 87545
(505) 606-2337/FAX (505) 665-1812

National Nuclear Security Administration
Los Alamos Site Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
(505) 667-4255/FAX (505) 606-2132

Date: December 7, 2007
Refer To: EP2007-0757

James P. Bearzi, Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Submittal of Periodic Monitoring Report for Vapor Sampling Activities at Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54, for Fiscal Year 2007

Dear Mr. Bearzi:

Enclosed please find two hard copies with electronic files of the "Periodic Monitoring Report for Vapor Sampling Activities at Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54, for Fiscal Year 2007."

If you have any questions, please contact John Hopkins at (505) 699-1116 (johnhopkins@lanl.gov) or Ed Worth at (505) 606-0398 (eworth@doeal.gov).

Sincerely,

Susan G. Stiger, Associate Director
Environmental Programs
Los Alamos National Laboratory

Sincerely,

David R. Gregory, Project Director
Environmental Operations
Los Alamos Site Office

SS/DG/GD/JH:sm

Enclosures: 1) Two hard copies with electronic files - Periodic Monitoring Report for Vapor Sampling Activities at Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54, for Fiscal Year 2007 (EP2007-0757)

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Paul Mark, Apogen
Ed Worth, DOE-LASO, MS A316
John Hopkins, EP-CAP, MS M992
RPF, MS M707 (with two CDs)
Public Reading Room, MS M992

Cy: (Letter and CD only)
Laurie King, EPA Region 6, Dallas, TX
Steve Yanicak, NMED-OB, White Rock, NM
Peggy Reneau, EP-ERSS, MS M992
EP-CAP File, MS M992

Cy: (w/o enc.)
Tom Skibitski, NMED-OB, Santa Fe, NM
Bonita Eichorst, DOE-LASO (date-stamped letter emailed)
Susan G. Stiger, ADEP, MS M991
Carolyn A. Mangeng, ADEP, MS M991
Alison M. Dorries, ERSS-DO, MS M992
Gordon Dover, EP-CAP, MS M992
Dave McInroy, EP-CAP, MS M992
IRM-RMMSO, MS A150

LA-UR-07-8108
December 2007
EP2007-0757

Periodic Monitoring Report for Vapor Sampling Activities at Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54, for Fiscal Year 2007

Los Alamos
NATIONAL LABORATORY
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Prepared by the Environmental Programs Directorate

LA-UR-07-8108
EP2007-0757

Periodic Monitoring Report for Vapor Sampling Activities at Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54, for Fiscal Year 2007

December 2007

Responsible project leader:

Printed Name	Signature	Title	Organization	Date
John Hopkins		Project Leader	Environmental Programs	12/5/07

Responsible LANS representative:

Printed Name	Signature	Title	Organization	Date
Susan G. Stiger		Associate Director	Environmental Programs	12/7/07

Responsible DOE representative:

Printed Name	Signature	Title	Organization	Date
David R. Gregory		Project Director	DOE-LASO	12/10/07

EXECUTIVE SUMMARY

This periodic monitoring report summarizes field-screening and sampling activities conducted during fiscal year 2007 at Material Disposal Area (MDA) L, Solid Waste Management Unit 54-006, in Technical Area 54 at Los Alamos National Laboratory. The objective of the monitoring is to evaluate concentration trends in volatile organic compounds (VOCs) in subsurface vapor at MDA L over time and over their distances from known VOC source areas.

Validated analytical results and field monitoring confirm the presence of two VOC source areas. VOC concentrations in each source area decrease from the base of the shafts and pit (where organic chemicals had been disposed) to borehole total depth (TD). Field monitoring of pore gas from locations in angled boreholes drilled from the canyon into basalt under MDA L source areas also shows decreasing VOC analytical concentrations to angled borehole TD. The borehole TDs range from 39 ft in angled borehole 54-01128 to 701 ft in open borehole 54-25105. Pore-gas results show no immediate threat to groundwater from the VOC plume but do indicate the need for continued monitoring of pore gas, although at a reduced frequency.

The concentrations of VOCs in pore gas and soil from three boreholes drilled in the spring of 2007 were compared. Results of the comparison are similar to the results presented in the MDA L investigation report. Laboratory-reported concentrations of VOCs in soil are generally lower than the concentrations that were predicted, based on amounts of VOCs detected in pore gas. Concentrations of detected VOCs are not indicative of a free solvent phase release in the tuff.

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1.0 INTRODUCTION

Material Disposal Area (MDA) L (Solid Waste Management Unit [SWMU] 54-006) is located in the east-central portion of Los Alamos National Laboratory (LANL or the Laboratory) on Mesita del Buey (Figure 1.0-1), within an 1100-ft by 3000-ft (2.5-acre) fenced area known as Area L. It consists of 1 inactive subsurface disposal pit (Pit A), 3 inactive subsurface treatment and disposal impoundments (Impoundments B, C, and D), and 34 inactive disposal shafts (Shafts 1 through 34). Shafts 36 and 37 are the former lead-stringer shafts that are undergoing Resource Conservation and Recovery Act (RCRA) closure and are not part of SWMU 54-006. Area L is relatively flat, and most of the surface overlying MDA L is paved with asphalt to house ongoing waste-management activities, including the storage of chemical, hazardous, and mixed low-level wastes managed within container storage units.

During the late 1950s, the Laboratory, with the approval of the U.S. Atomic Energy Commission and upon recommendation of the U.S. Geological Survey, selected Mesita del Buey within Technical Area (TA) 54 for underground disposal of Laboratory-generated waste (Rogers 1977, 005707; Rogers 1977, 005708, p. G-1). Since then, the main waste storage and disposal facilities for the Laboratory have been located at TA-54. MDA L is one of four inactive disposal areas on Mesita del Buey, which is bounded by Pajarito Canyon to the south and Cañada del Buey to the north.

MDA L was used for disposal of nonradiological liquid chemical waste, including containerized and uncontainerized liquid wastes; bulk quantities of treated aqueous waste; batch-treated salt solutions; electroplating wastes (including precipitated heavy metals); and small-batch quantities of treated lithium hydride. MDA L operated from the early 1960s until it was decommissioned (i.e., removed from service) in 1985.

One pit, 3 impoundments, and 34 shafts were excavated into the overlying soil and unit 2 of the Tshirege Member of the Bandelier Tuff at MDA L. The site features are shown in Figure 1.0-2. The subsurface disposal units range in depth from 10 ft to 65 ft below the original ground surface. The regional aquifer is estimated to be at a depth of approximately 930 ft below ground surface (bgs), based on data from other wells at the Laboratory and the predictions of the hydrogeologic conceptual model for the Pajarito Plateau (LANL 1998, 059599). The pit, impoundments, and shafts were unlined. The bottoms of the pit and impoundments were level, so liquid could spread over the entire surface area to facilitate evaporation. After they were decommissioned, the pit and impoundments were filled and covered with clean crushed consolidated tuff. The bottom of each shaft was covered with 3 ft of crushed tuff to seal cracks and joints, and a steel cap was placed over the opening. When the shafts were filled to within approximately 3 ft of the surface, they were capped with a 3-ft concrete plug (LANL 1992, 007669, p. 5-108).

Because sampling methods and resulting data quality have changed substantially over the years, pore-gas data before 1996 were used only semiquantitatively in the MDA L investigation work plan (LANL 2004, 087624). Data collected from 1997 to the present have been subjected to rigorous quality assurance/quality control (QA/QC) procedures. The pore-gas monitoring data for MDA L indicate that 1,1,1-trichloroethane (TCA) is the predominant volatile organic compound (VOC) detected, followed by trichloroethene (TCE). The VOCs are the primary chemicals of potential concern (COPCs) in the subsurface at MDA L. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to the New Mexico Environment Department (NMED) in accordance with U.S. Department of Energy policy.

In 1994 and 1995, two deep-angled boreholes, designated as 54-01015 and 54-01016, were drilled from the adjacent canyon slope northeast of MDA L within Cañada del Buey to investigate the possible presence of vapor-phase contaminants at depth beneath MDA L (Figure 1.0-2). These boreholes were

drilled to depths of 530 ft and 600 ft bgs, respectively, beneath MDA L by air-rotary installation of 8-in.-diameter STRATEX casing to the bottom of each borehole. Borehole 54-01015 was drilled to intersect the region below the closed disposal shafts located in the western part of MDA L. Borehole 54-01016 was drilled to intersect the region below the closed pit, impoundments, and shafts located in the eastern part of MDA L. The boreholes were selectively cored for approximately 10 ft within every 40-ft interval below a depth of 260 ft bgs. From discontinuous core, 22 samples were collected and analyzed at an off-site contract laboratory for VOCs and tritium. Following the installation of Solinst multiport vapor- and lysimeter-coupled systems in each borehole, the STRATEX casing was withdrawn while annular well completion materials were emplaced to complete the borehole for vapor monitoring. Both boreholes are maintained as vapor-monitoring wells.

Results of geologic logging were recorded in the borehole logs. Saturation was not encountered in any of the Phase I RCRA facility investigation (RFI) boreholes at MDA L; however, moist cuttings and core were observed in RFI boreholes 54-01015 and 54-01016. Borehole logs document moist to wet cuttings and core at depths of 343 ft bgs (Puye Formation paleosol), 449 ft bgs (basalt), and 475 ft bgs (basalt) in borehole 54-01015. Similarly, the borehole log for borehole 54-01016 shows moist cuttings and core at a depth of 219 ft bgs (Cerro Toledo interval) and at multiple depths within the basalt (312, 370, 371, 397, 459, 479, 497, and 510 ft bgs) beneath MDA L. Lysimeters were installed to collect both pore vapor and water where moist to wet conditions were found at two depths (308.3 and 461.4 ft bgs) in borehole 54-01015 and at four depths (162.3, 274.7, 414.3, and 517.6 ft bgs) in borehole 54-01016. In April 1996, initial attempts to collect water samples during pore-gas monitoring yielded approximately 0.5 to 1 mL for the samples from borehole 54-01015 and no water for the samples from borehole 54-01016 (Lowry 1996, 081612). During quarterly pore-gas monitoring conducted from 1996 to 2005, the ports in target zones of potential perched water were sampled for pore gas and water; however, no water was recovered during this period.

Analyses of the pore-gas monitoring data indicate that a subsurface vapor-phase VOC plume is present. The plume has two unique sources, identified as shaft field 1 through 28, referred to as the western source area, and shaft field 29 through 34, referred to as the eastern source area. The dominant VOC in the plume is TCA.

Since 1985, pore-gas monitoring has been required at MDA L. A summary of monitoring at MDA L follows:

- In 1985, the Laboratory received a compliance order from NMED stipulating, among other requirements, characterization of pore gas at Areas G and L. The Laboratory installed seven vapor-monitoring wells to characterize pore gas.
- From 1986 to 1990, the Laboratory voluntarily installed 22 additional vapor-monitoring wells to characterize the VOC plumes at Areas G and L.
- In 1990, the U.S. Environmental Protection Agency (EPA) issued Module VIII of the Laboratory's Hazardous Waste Facility Permit. Module VIII included requirements for quarterly pore-gas sampling at MDAs G and L as input into the RFI.
- In 2005, the Compliance Order on Consent (the Consent Order) required pore-gas monitoring during the site investigations for all MDAs and required the submittal of a long-term pore-gas monitoring plan for each MDA.
- In September 2005, the Laboratory submitted a proposed long-term monitoring plan for pore gas in Appendix I of the MDA L investigation report (LANL 2005, 092591).

- During June and July 2006, a soil-vapor extraction pilot study was conducted at MDA L. An estimated 800 lb of VOCs was removed from the eastern and western source areas (LANL 2006, 094152).
- During February and March 2007, three boreholes were drilled into basalt at Area L, core from each borehole was analyzed, and the boreholes were constructed as vapor-monitoring wells to characterize the VOC plume.

Subsurface vapor field screening and sampling are being performed by personnel from the Laboratory's Environmental Programs–Waste and Environmental Services to characterize trends of VOCs in subsurface vapor. Field-screening data, analytical laboratory results, and monitoring data for fiscal year (FY) 2007 are presented in this report. The monitoring locations at SWMU 54-006 associated with MDA L are presented in Figures 1.0-2 and 1.0-3.

2.0 SCOPE OF ACTIVITIES

No field monitoring or sampling activities were conducted during the first quarter of FY2007.

During the second quarter of FY2007, from February 2 to March 2, 2007, the following activities were conducted at each instrumented port at MDA L:

- Each interval was purged to ensure that formation air was being sampled in accordance with Standard Operating Procedure (SOP) 06.31, Rev. 2, Sampling of Subatmospheric Air.
- Pore gas from each accessible instrumented interval was field screened for VOCs using a Brüel and Kjær (B&K) Type 1302 multigas photoacoustic analyzer, and field screened for carbon dioxide using a Landtec GEM-500.
- Vapor samples were collected from selected intervals in SUMMA canisters for laboratory analyses of VOCs using EPA Method TO-15.

During the third quarter of FY2007, from May 11 to May 17, 2007, the following activities were conducted at each instrumented port at MDA L:

- Each interval was purged to ensure that formation air was sampled in accordance with SOP-06.31, Rev. 2, Sampling of Subatmospheric Air.
- Pore gas from each accessible instrumented interval was field screened for VOCs using a B&K Type 1302 multigas photoacoustic analyzer, and field screened for carbon dioxide using a Landtec GEM-500.
- Vapor samples were collected from selected intervals in SUMMA canisters for laboratory analyses of VOCs using EPA Method TO-15.

During the fourth quarter of FY2007, from August 2 to September 26, 2007, the following activities were conducted at each instrumented port at MDA L:

- Each interval was purged to ensure that formation air was being sampled in accordance with SOP-06.31, Rev. 2, Sampling of Subatmospheric Air.
- Pore gas from each accessible instrumented interval was field screened for VOCs using a B&K Type 1302 multigas photoacoustic analyzer and for carbon dioxide using a Landtec GEM-500.

No investigation-derived waste was generated during quarterly monitoring activities.

3.0 REGULATORY CRITERIA

The Consent Order does not identify any cleanup standards, risk-based screening levels, risk-based cleanup goals, or other regulatory criteria for pore gas at MDA L. Therefore, an analysis was conducted to evaluate the potential for contamination of groundwater by VOCs in pore gas using groundwater cleanup levels provided in the Consent Order. The analysis evaluated the water concentration that would be in equilibrium with the maximum concentrations of VOCs detected at MDA L during the most recent round of monitoring.

If the predicted concentration of a particular VOC in water was less than the groundwater cleanup level, then the groundwater cleanup levels would not be exceeded. The screening-level analysis for MDA L is provided in section 5.0.

4.0 FIELD-SCREENING RESULTS

Field screening at each accessible instrumented port during each quarter of monitoring was conducted with a B&K Type 1302 multigas photoacoustic analyzer. The B&K is calibrated for analysis of four organic chemicals: trichlorofluoromethane (Freon 11), tetrachloroethene (PCE), TCA, and TCE. Second quarter FY2007 field screening was conducted from February 2 to March 2, 2007; third quarter FY2007 field screening was conducted from May 11 to May 17, 2007; and fourth quarter FY2007 field screening was conducted from August 2 to September 26, 2007. The locations, depth intervals, and results of field monitoring are reported in Table 4.0-1. The QA/QC program used when generating field results is presented in Appendix A.

The VOC concentrations at locations monitored generally peak between 65–120 ft bgs, near the depth of the base of the shafts and pit, then decrease to borehole total depth (TD). Concentrations observed at locations 54-01015, 54-01016, 54-02001, 54-02002, 54-02012, 54-02014, 54-02016, 54-02022, 54-02024, 54-02026, 54-02028, 54-02030, 54-02031, 54-02034, 54-02087, 54-02088, 54-02089, 54-24238, 54-24239, 54-24240, 54-24241, 54-24242, 54-24243, 54-24244, 54-27641, 54-27642, and 54-27643 reach maximums near the depth of the pit and shafts, then show trends of decreasing concentration to their TDs.

The deepest field monitoring of pore gas occurred at angled boreholes 54-01015 and 54-01016 (Figure 1.0-2), drilled from the canyon into basalt under eastern and western source areas at MDA L. VOCs at location 54-01015 reach maximum concentrations in tuff at 165.4 ft, or 308.3 ft bgs sampling intervals. Deeper sampling at this location in tuff at 333.3 ft, and in basalt from 377.7 ft, 426.5 ft, and 462.1 ft bgs, shows decreasing VOC analytical concentrations to TD. VOCs at location 54-01016 reach maximum concentrations in tuff at the 162.2-ft-bgs sampling interval. Deeper sampling in tuff at 274.7 ft, and in basalt at 336.3 ft, 414.3 ft, 459.5 ft, and 517.6 ft bgs, shows decreasing VOC analytical concentrations to TD.

Boreholes with low concentrations of organic chemicals and at large distances from source areas do not show consistently decreasing concentration trends with depth. The highest concentrations of Freon 11, PCE, TCA, and TCE at location 54-02023, which is situated approximately 330 ft south of the eastern source area, were observed at depths ranging from 100 to 200 ft bgs. The largest concentrations of Freon 11, PCE, TCA, and TCE at location 54-02020, which is located approximately 300 ft east of the eastern source area, were observed at 180 and 200 ft bgs.

Freon 11 concentrations are highest near the eastern source area. During the three quarters of field screening, the largest concentrations of Freon 11 were all observed at location 54-24238. The highest

concentration of the three quarters occurred during the fourth quarter (193 mg/m^3) at 44 ft bgs. The second quarter of FY2007, Freon 11 concentrations were highest at 44 ft bgs; and during the third quarter of FY2007, Freon 11 concentrations were highest at 54-24238 at 64 ft bgs.

PCE concentrations are highest near the eastern source area. During the four quarters of field screening in FY2007, the largest concentration of PCE (1360 mg/m^3) was observed during the second quarter at location 54-24238 at 44 ft bgs. During the third quarter, PCE concentrations were highest at 54-24238 at 64 ft bgs; and during the fourth quarter, PCE concentrations were highest at 54-24238 at 44 ft bgs.

Eastern and western source areas contain similar TCA concentrations. The highest concentrations were detected in the eastern area during screening this fiscal year, but the concentrations in the western area (54-02012) were very close to the highest concentrations seen in the eastern area. During the second to the fourth quarters of field screening in FY2007, the largest concentration of TCA (4720 mg/m^3) was observed at location 54-24240 at 28 ft bgs during the second quarter. During the third quarter, TCA concentrations were highest at 54-02088 at 86 ft bgs; and during the fourth quarter, TCA concentrations were highest at 54-24240 at 53 ft bgs.

Eastern and western source areas contain similar TCE concentrations. During the second to the fourth quarters of field screening in FY2007, the largest concentration of TCE (1190 mg/m^3) was observed at location 54-02012 at 28 ft bgs during the second quarter. During the third quarter, TCE concentrations were highest at 54-02088 at 86 ft bgs; and during the fourth quarter, TCE concentrations were highest at 54-02012 at 28 ft bgs.

5.0 ANALYTICAL DATA RESULTS

Validated analytical results for VOCs in pore gas are produced from laboratory analyses of vapor collected in SUMMA canisters and analyzed for tritium using EPA Method TO-15. During FY2007, second quarter subsurface vapor sampling was conducted at MDA L from February 2 to March 2, 2007; third quarter subsurface vapor sampling was conducted from May11 to May 17, 2007; and fourth quarter subsurface vapor sampling was conducted from August 2 to September 26, 2007.

VOC analytical data from these sampling events are presented in Table 5.0-1. Tritium analytical data from these sampling events are presented in Table 5.0-2. The QA/QC program used when the analytical were data reviewed is presented in Appendix A, and the data packages and chain-of-custody forms for the second, third, and fourth quarters of FY2007 are included in Appendix B (on CD included with this document).

5.1 Pore-Gas VOC Results Summary

Twenty-five different VOCs were detected at least once in vapor samples collected from MDA L. TCA was detected in each of the 42 samples analyzed and was the organic chemical detected with the greatest concentration, 4,900,000 µg/m^3, in borehole 54-24240 at 27 ft bgs during the second quarter of FY2007. The analytes 1,1-dichloroethene, trichloroethene, 1,1,1-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, tetrachloroethene, and 1,1-dichloroethane were also detected in 42 of 42 SUMMA samples analyzed. Tritium was detected in each sample analyzed at concentrations ranging from 18,200 pCi/L to 370 pCi/L.

5.2 Pore-Gas VOC Concentrations with Sampling Depth from Surface

Concentrations of VOCs detected in pore gas using EPA Method TO-15 reach maximum concentration between 65 and 120 ft bgs, near the depths of the base of the shafts and pit, then decrease to borehole TD. Boreholes with samples collected in SUMMA canisters at multiple depths in the last year include 54-24238, 54-24239, 54-24240, 54-24242, 54-24243, 54-24244, 54-27641, 54-27642, and 54-27643. Each of these samples show decreasing concentration trends beginning at 65–120 ft bgs to TD, which is consistent with B&K field-screening concentration measurements.

5.3 EPA Method TO-15 and B&K Result Comparison for Pore Gas

During the last four quarters, 21 collocated B&K and SUMMA pore-gas samples have been analyzed. When results of EPA Method TO-15 SUMMA analyses are compared to their corresponding B&K measurements, TCE and TCA results show good agreement. B&K and SUMMA TCE results both reach maximum concentration at about 800 mg/m^3. B&K and SUMMA TCA results both reach maximum concentration at about 4800 mg/m^3. However, agreement between Freon 11 and PCE SUMMA and B&K measurements are not good. B&K Freon 11 results reach maximum concentration at 120 mg/m^3, while the SUMMA Freon 11 results reach maximum concentration at 40 mg/m^3. B&K PCE results reach maximum concentration at 1200 mg/m^3, while the SUMMA PCE results reach maximum concentration at 480 mg/m^3. Figure 5.3-1 presents graphs showing the relationships between B&K and EPA Method TO-15 analytical results for each analyte in collocated SUMMA and B&K sample analyses.

B&K instrumentation uses an analytical technique that does not independently quantify each organic chemical. As a result, the signal produced by nontarget analytes can be interpreted as a target analyte signal. Interference from nontarget VOCs creates a positive bias in B&K analyses of target VOC concentrations. The concentration of PCE and Freon 11 from B&K field-screening analyses at MDA L is overestimated when compared with EPA Method TO-15 analyses of collocated samples. The B&K field-screening measurements closely match the concentrations of TCA and TCE reported from EPA Method TO-15 analyses of samples. A discussion of the B&K analytical bias and QA/QC program for B&K measurements is included in Appendix A.

5.4 TCA and TCE in the MDA L Subsurface Plume

Laboratory analyses of pore gas have been performed quarterly since 1997. However, only a few sampling intervals at MDA L have been analyzed for VOCs often enough to establish concentration trends. Instead of repeatedly collecting samples from a few locations, many sampling locations and intervals were collected to allow for more complete spatial characterization. The TCA and TCE results from two sampling intervals, 54-02002 at the 100-ft sampling interval near the eastern VOC source area and sampling location 54-02026 at the 160-ft sampling interval is east of the eastern VOC source area have been plotted in Figures 5.4-1 through 5.4-4. TCA and TCE concentrations have been decreasing over the last 8 yr at sampling locations nearest the source. The VOC concentrations at locations away from the source have been increasing or steady over the same time period.

To characterize the VOC plume movement, concentrations of TCA and TCE field measurements using photoacoustic analyzers over the last 8 yr at all monitored depths at these same two locations have been plotted. Figures 5.4-5 and 5.4-5 show results of B&K analyses for TCA and TCE, respectively, at 54-02002 near the eastern VOC source area conducted since 1997. Figures 5.4-6 and 5.4-7 show the results of B&K analyses for TCA and TCE, respectively, at 54-02026 at approximately 500 ft east of the eastern VOC source area conducted since 1997.

Trends of VOC concentrations are consistent with a diffusive plume behavior (Stauffer et al. 2000, 069794). At locations nearest VOC sources, and with the highest VOC concentrations, TCA and TCE concentrations are decreasing, and at locations farther from source areas, TCA concentrations are increasing. Concentrations of VOCs are stable or increasing at sampling intervals in tuff and basalt below both eastern and western source areas. Decreasing TCA concentrations near source areas indicate that no significant ongoing release of VOCs exists in either the eastern or western source areas. Decreasing or stable TCA concentrations at source areas at all depths moving into equilibrium, with increasing or stable TCA concentrations away from source areas at all depths, are consistent with a diffusive VOC vapor plume.

5.5 Contaminant Partitioning Overview

Under moist soil conditions and where no nonaqueous phase liquid (NAPL) is present, contaminant partitioning in the vadose zone can be described by the following equation (Suthersan 1997, 093755):

$$C_T = P_b C_{Soil} + w C_{water} + \alpha C_{air} \quad \textbf{Equation 5-1}$$

Where C_T = total quantity of contaminant per unit soil volume (µg/m^3)
C_{Soil} = adsorbed chemical concentration (µg/kg)
C_{water} = dissolved chemical concentration (µg/L)
C_{air} = vapor concentration (µg/m^3)
P_b = soil bulk density (kg/m^3)
w = volumetric water content (L/m^3)
α = volumetric air content – w (volumetric water content) (m$^3_{air}$/m$^3_{soil}$)

The equilibrium relationship between vapor concentration and the associated pore-water concentration is given by Henry's Law:

$$C_{air} = H' \cdot C_{water} \quad \textbf{Equation 5-2}$$

Where C_{air} is the volumetric concentration of contaminant in air, C_{water} is the volumetric concentration of contaminant in water, and H' is the dimensionless Henry's Law constant.

The relationship between equilibrium dissolved concentration and adsorbed concentration is given by

$$C_{Soil} = K_d \cdot C_{water} \quad \textbf{Equation 5-3}$$

Where C_{Soil} = adsorbed chemical concentration (µg/kg)
C_{water} = dissolved chemical concentration (µg/L)
K_d = adsorption coefficient (L/kg)

Where $K_d = f_{oc} \cdot K_{oc}$ and **Equation 5-4**
f_{oc} = percentage of fraction of organic carbon in soils (mg/mg)
K_{oc} = organic carbon partitioning coefficient (L/kg)

Environmental laboratory analyses of solids and soils are reported on a dry weight basis. As a result, calculated volumetric concentrations of C_T that include soils and tuff must be divided by the dry bulk density to match the "dry weight" reporting basis of laboratory results.

5.6 VOC Vapor-Phase Partitioning to Tuff

The VOC analytical results for collocated SVE core and pore-gas samples at 54-27641, 54-27642, and 54-27643 are presented in Table 5.6-1 and are described above. The frequency of organic chemicals detected in the 13 core samples collected is very low. Acetone was detected in seven samples, toluene was detected in three samples, and trichloroethene was detected in one sample. The results show a relationship consistent with vapor-phase partitioning to moisture and core reported in Appendix N of the MDA L investigation report (LANL 2005, 90513). Predicted concentrations in undisturbed tuff are the calculated value $C_{T,}$ given in equation 5-1 above, adjusted for dry weight basis. Table 5.6-2 presents the constants used in calculations and reports the fraction of each detected organic chemical that partitions to moisture, vapor, or tuff in equilibrium conditions. VOCs are generally detected in tuff at concentrations lower than predicted by contaminant partitioning, given the observed pore-gas concentrations.

Sample coring and collection are responsible for much of the VOC loss in samples collected from tuff. During borehole drilling, friction between the hollow-stem auger and tuff can cause temperatures to increase 40°–70° C, driving VOCs in moisture and rock quickly toward the gas phase. Compressed gases used to drill into basalt effectively purge the heated tuff core to further drive off VOCs. After drilling is completed, the core is exposed to the environment until the sample is collected. The losses of VOCs after sample collection in Encore samplers, during shipment, and at the analytical laboratory are smaller and more controlled.

5.7 VOC Vapor-Phase Partitioning to Water

VOC results from the four most recent rounds of pore-gas monitoring were screened to evaluate whether concentrations of VOCs in the plume would be of concern as a potential source of groundwater contamination. Because no screening levels exist for pore gas that address the potential for groundwater contamination, the screening evaluation was based on groundwater cleanup levels contained in the Consent Order and on Henry's Law constants that describe the equilibrium relationship between vapor and water concentrations. The source of the Henry's Law constants was the NMED soil-screening level technical background document (NMED 2006, 092513). The following dimensionless form of Henry's Law constant was used:

$$H' = \frac{C_{air}}{C_{water}} \qquad \textbf{Equation 5-5}$$

where C_{air} is the volumetric concentration of contaminant in air and C_{water} is the volumetric concentration of contaminant in water. Equation 5-1 can be used to calculate the following screening value:

$$SV = \frac{C_{air}}{1{,}000 \times H' \times SL} \qquad \textbf{Equation 5-6}$$

where C_{air} is the concentration of VOC in the pore-gas sample (µg/m^3), H' is the dimensionless Henry's Law constant, SL is the screening level (µg/L), and 1000 is a conversion factor from L to m^3. The SLs are groundwater cleanup levels specified in the Consent Order. These levels are the EPA maximum contaminant level (MCL) or the New Mexico Water Quality Control Commission (NMWQCC) groundwater standard, whichever is lower. As specified in the Consent Order, if no MCL or WQCC standard exists, the EPA Region 6 human health medium-specific SL for tap water is used. The numerator in Equation 5-6 is the actual concentration of VOC in pore gas, and the denominator represents the concentration in pore gas needed to exceed the SL. Therefore, if the screening value (SV) is less than 1, the concentration of

VOC in pore gas will not be sufficiently high to cause the water SL to be exceeded, even if the VOC plume were in contact with groundwater.

Equation 5-6 was used to screen the concentrations of VOCs detected in pore-gas samples from EPA Method TO-15 analyses at MDA L during FY2007. As shown in Table 5.7-1, 313 detected sample concentrations of 12 VOCs resulted in SVs greater than 1. The SVs of detected VOCs ranged from 1.01 to 1550.

Because SVs of detected compounds exceeded 1, screening was performed using the data from the deepest pore-gas samples (i.e., the samples collected closest to the regional aquifer). The deepest samples were collected from borehole location 54-24399 on March 26, 2007, from a depth interval of 550–608 ft. The results of this screening are presented in Table 5.7-2 and show all SVs below 1.

5.8 Summary of VOC Vapor-Phase Partitioning

Concentrations of VOCs detected in tuff appear to be attributed to the presence of VOCs in collocated pore gas and are not consistent with liquid release of VOCs. In these low-moisture and low-organic-content samples, VOC analyses of tuff are generally a poor predictor of the presence of fluorinated and chlorinated VOCs that are dominant in the vapor plume at MDA L. VOCs are detected in tuff and soil at MDA L at concentrations generally below those associated with equilibrium partitioning with the vapor concentrations determined by EPA Method TO-15 sample analyses or B&K field screening.

6.0 SUMMARY

The purpose of the quarterly field-screening and sampling activities at MDA L is to evaluate concentration trends in VOCs over time and over distance from known VOC source areas. The results from the second-, third-, and fourth-quarter events of FY2007 may be summarized as follows.

- The VOC concentration trends at MDA L are consistent with a diffusive plume.
- The VOC concentrations increase from ground surface to the base of the shafts and pit where VOCs were disposed of and then decrease to borehole TD.
- VOC measurements made over the last 9 yr show concentrations near the source areas have decreased, and VOC concentrations away from the source areas have increased.
- The VOC concentrations close to the source areas and the VOC concentrations removed from source areas are moving toward equilibrium.
- The VOC concentrations in the central portion of each source area are above screening concentrations based on groundwater cleanup standards.
- The VOC concentrations measured from the basalt below the central portion of each source area are below screening concentrations based on groundwater cleanup standards.
- Field screening using photoacoustic analysis is shown to be a reliable predictor of VOC concentration trends as determined from laboratory analysis of samples collected in SUMMA canisters.
- The results of analyses of pore gas are a better predictor of the presence of VOCs than sample analyses of drilled core.

Because multiple SVs for 13 VOCs from samples collected near potential VOC source areas exceed 1, monitoring at MDA L should continue. Based on the conservative nature of the screening evaluation, the

overall magnitude of SVs, and the temporal and spatial trends observed in past monitoring results at MDA L, semiannual gas monitoring for 1 yr and then annual monitoring thereafter are sufficient to detect changes that may present a potential threat to groundwater and that may require corrective action. This monitoring frequency will also be sufficient to proceed with the corrective measures evaluation and selecting a remedy for MDA L.

7.0 REFERENCES AND DATA SOURCES

7.1 References

The following list includes all documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy–Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

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Rogers, M.A., June 1977. "History and Environmental Setting of LASL Near-Surface Land Disposal Facilities for Radioactive Wastes (Areas A, B, C, D, E, F, G, and T)," Vol. II, Los Alamos Scientific Laboratory report LA-6848-MS, Los Alamos, New Mexico. (Rogers 1977, 005708)

Stauffer, P.H., K.H. Birdsell, M. Witkowski, T. Cherry, and J. Hopkins, March 2000. "Subsurface Vapor-Phase Transport of TCA and MDA L: Model Predictions," Los Alamos National Laboratory document LA-UR-00-2080, Los Alamos, New Mexico. (Stauffer et al. 2000, 069794)

Suthersan, S.S., 1997. Excerpted pages from *Remediation Engineering: Design Concepts*, CRC Press, Boca Raton, Florida. (Suthersan 1997, 093755)

7.2 Figure Data Sources

Data sources used in original figures created for this report are described below and identified by legend title.

Legend Item	Data Source
Disposal pit/impoundment	Waste Storage Features; Los Alamos National Laboratory, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group, EP2007-0032; 1:2,500 Scale Data; 13 April 2007.
Disposal shaft	Waste Storage Features; Los Alamos National Laboratory, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group, EP2007-0032; 1:2,500 Scale Data; 13 April 2007.
Elevation contour	Hypsography, 10, 20, & 100 Foot Contour Intervals; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
Fence	Security and Industrial Fences and Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
LANL boundary	LANL Areas Used and Occupied; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007.
Material disposal area	Materials Disposal Areas; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; ER2004-0221; 1:2,500 Scale Data; 23 April 2004.
Paved road	Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
Structure	Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
TA boundary	Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007.
Unpaved road	Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
Vapor monitoring well	Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Environment and Remediation Support Services Division, EP2007-0754; 30 November 2007.

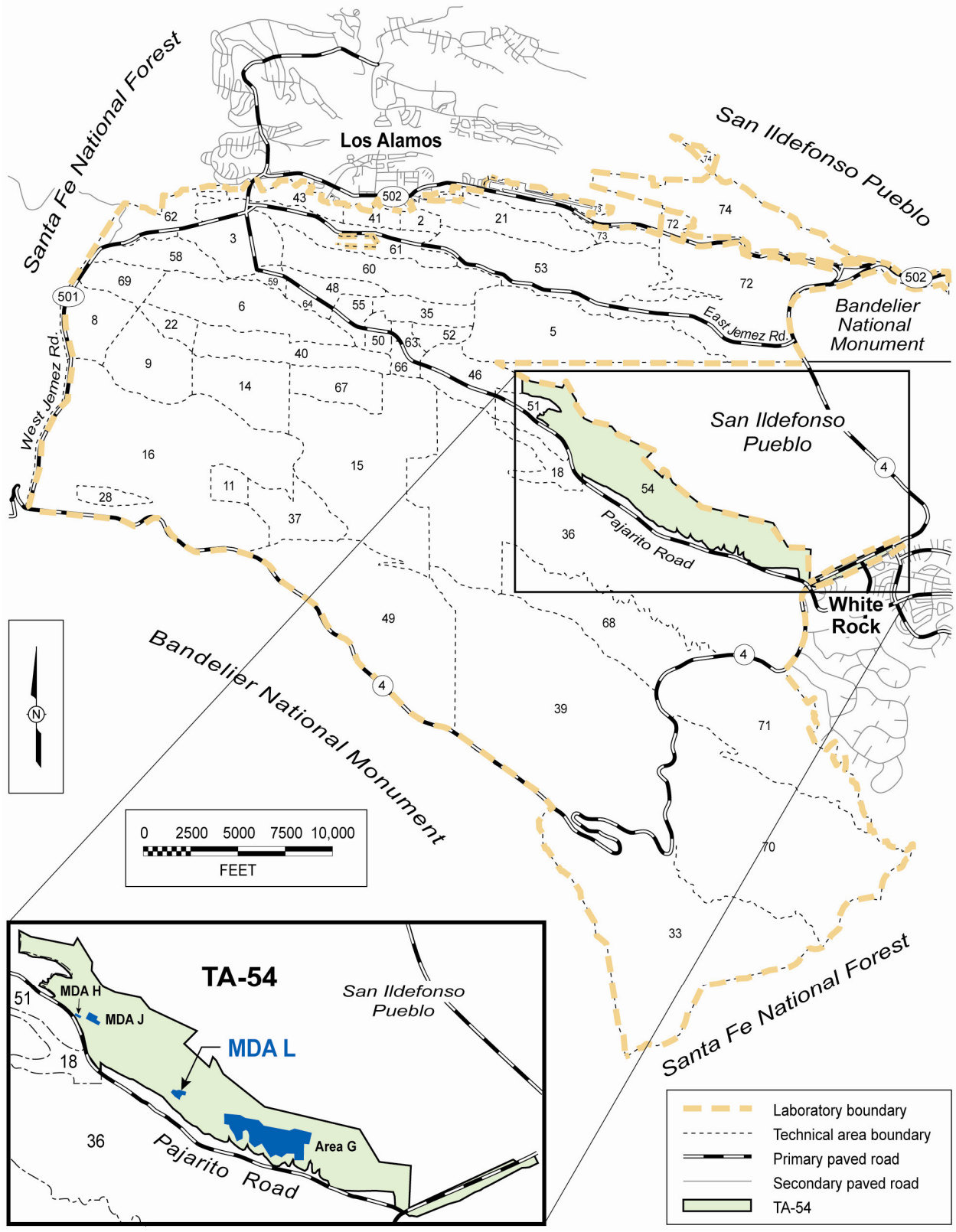

Figure 1.0-1 Location of MDA L in TA-54

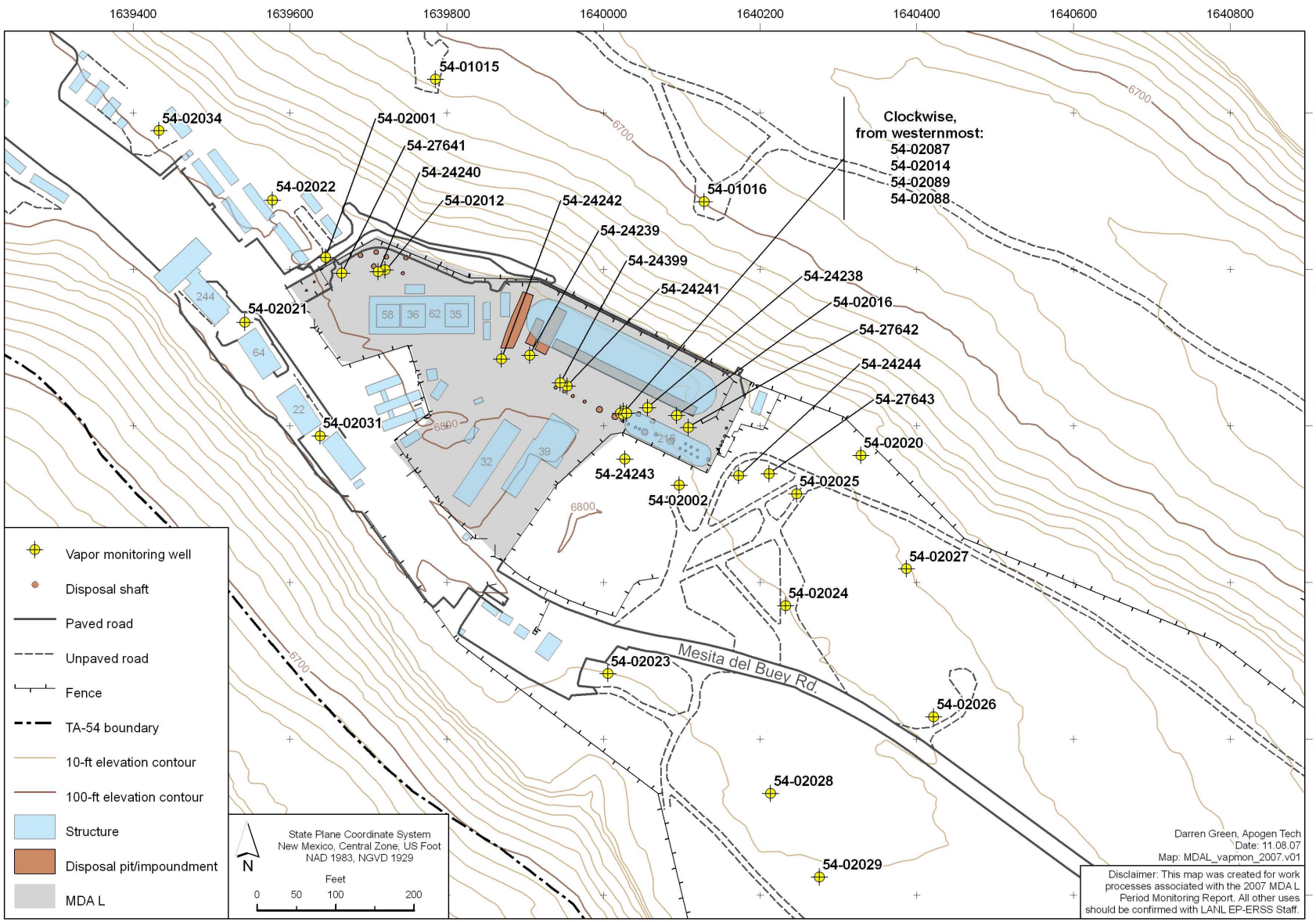

Figure 1.0-2 SWMU 54-006 pore-gas monitoring location

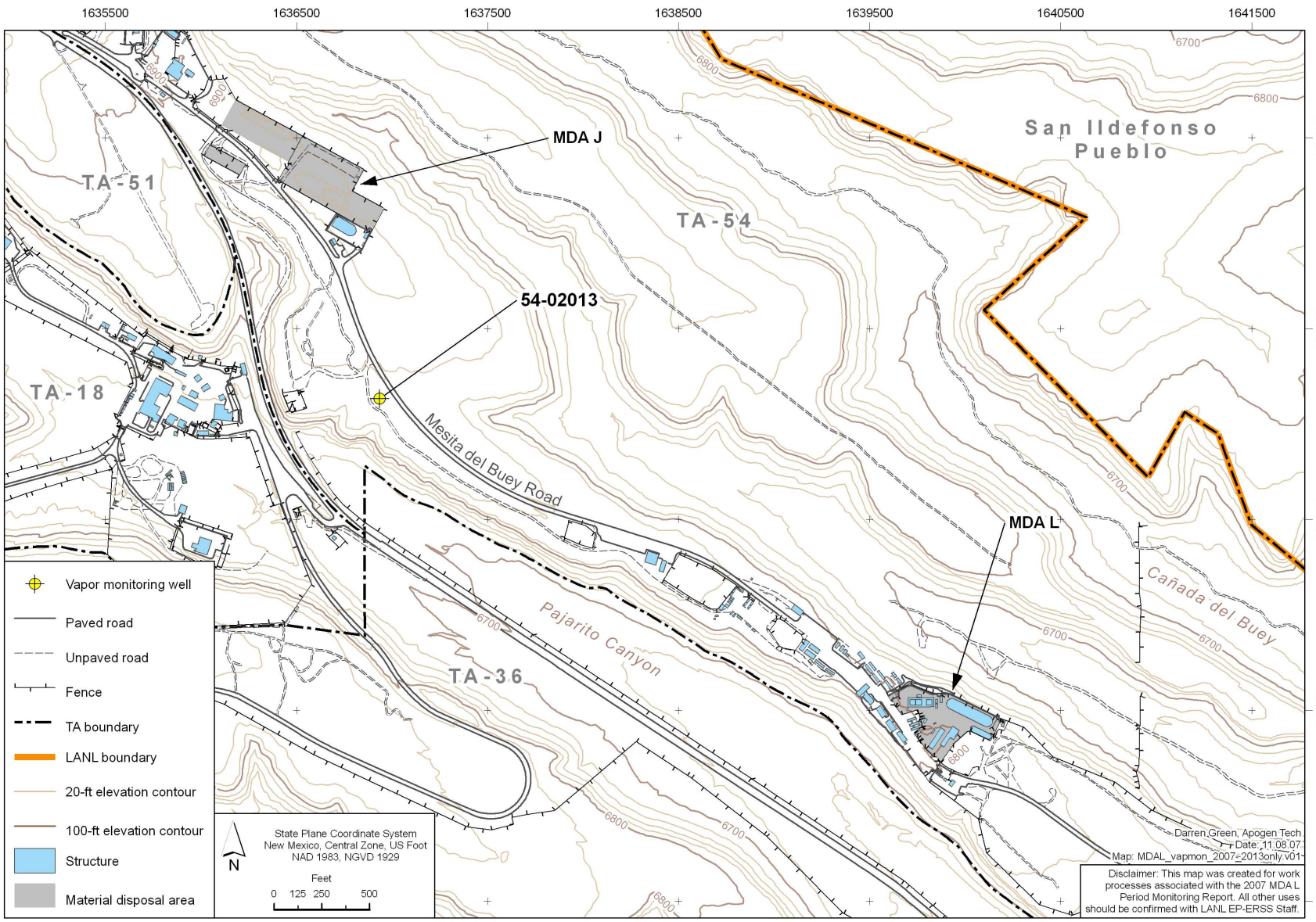

Figure 1.0-3 Location 54-02013 pore-gas monitoring location

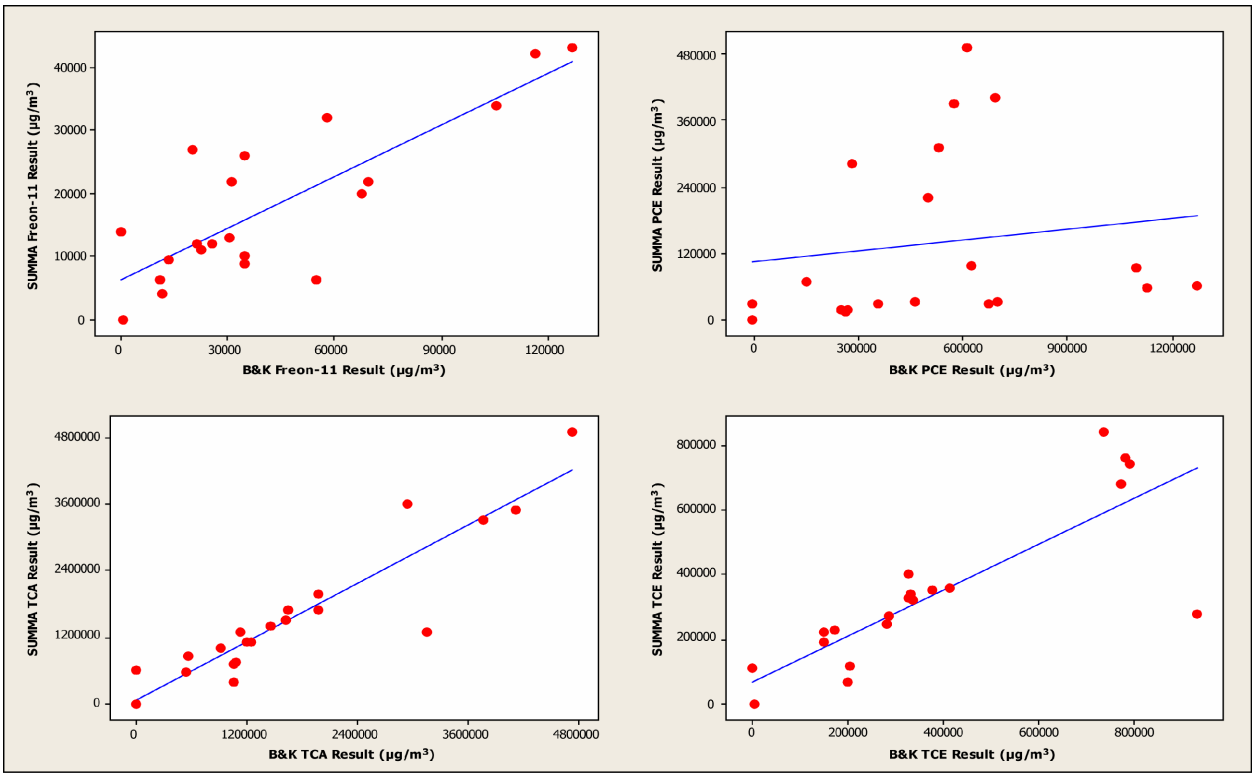

Figure 5.3-1 Collocated B&K and SUMMA results during FY2007

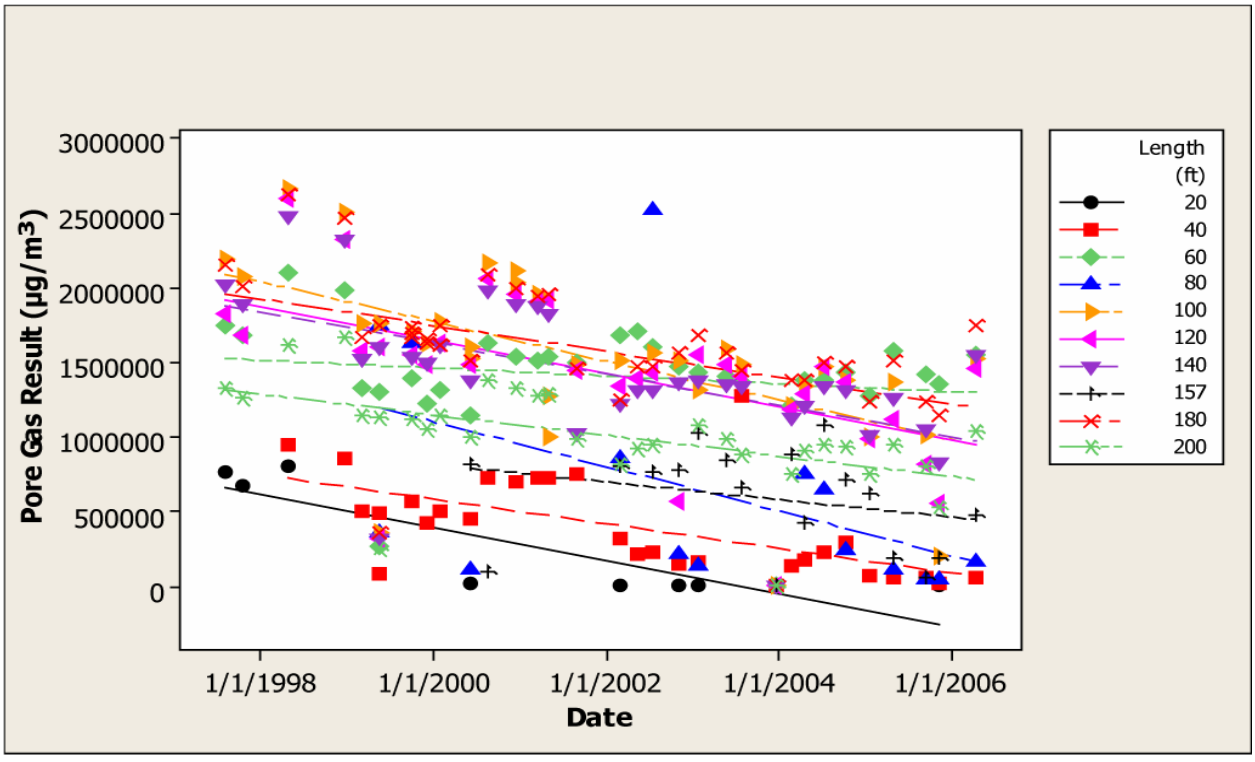

Figure 5.4-1 TCA concentrations in pore gas from B&K analyses since 1997 at 54-02002 near the eastern source area

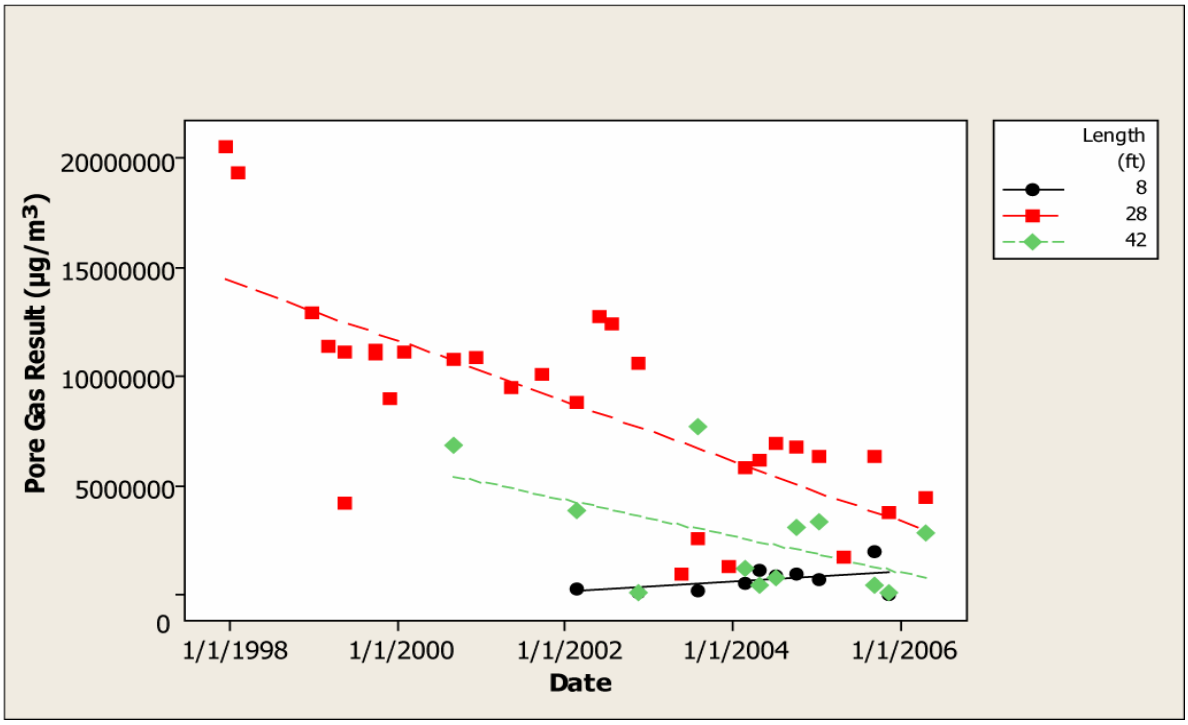

Figure 5.4-2 TCE concentrations in pore gas from B&K analyses since 1997 at 54-02002 near the eastern source area

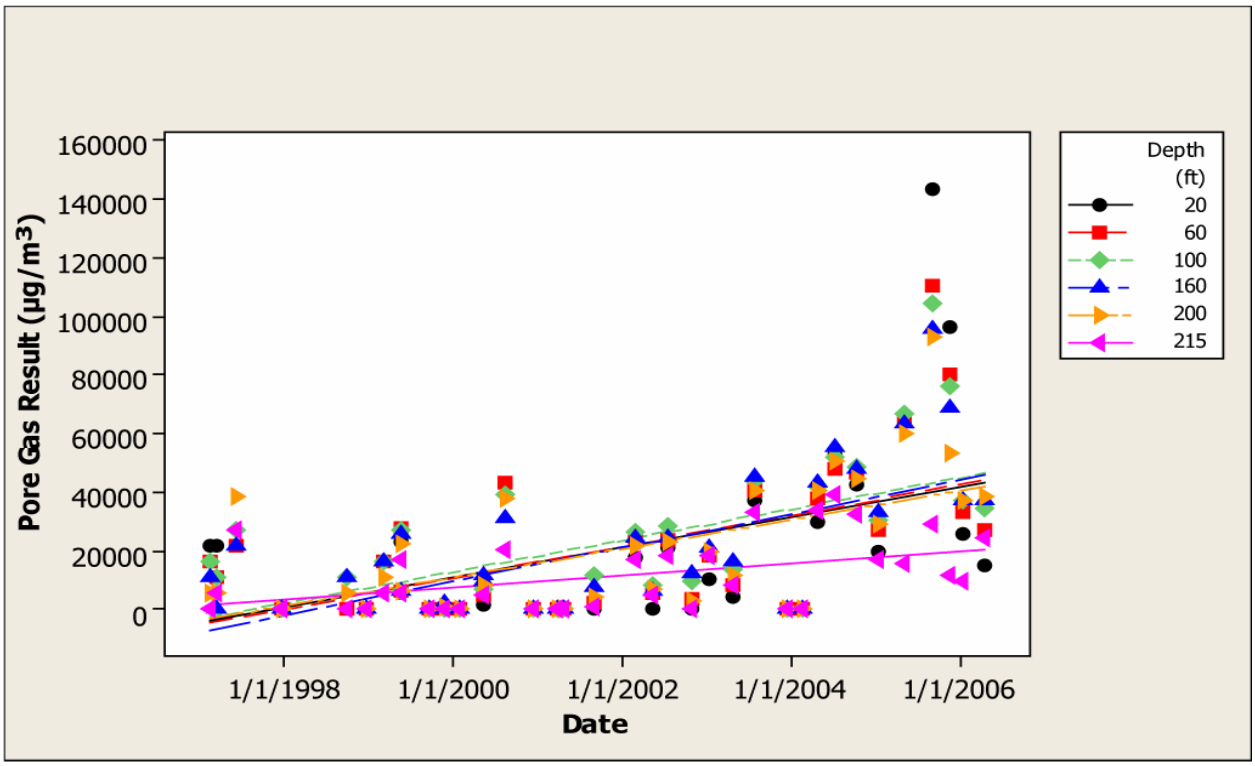

Figure 5.4-3 TCA concentrations in pore gas from B&K analyses since 1997 at 54-02026 approximately 500 ft from the eastern source area

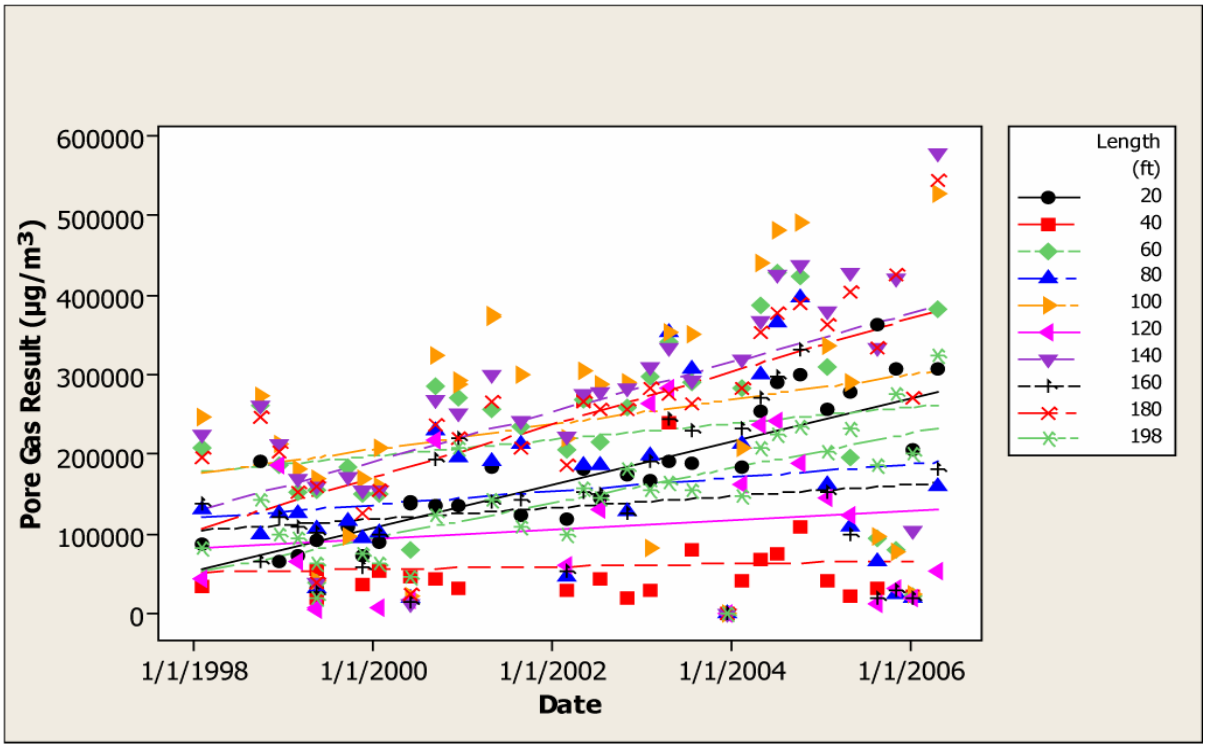

Figure 5.4-4 TCE concentrations in pore gas from B&K analyses since 1997 at 54-02026 approximately 500 ft from the eastern source area

Table 4.0-1
Pore-Gas VOC Field-Screening Results at MDA L

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-01015	37.6	42.8	Freon 11	-129	-275	246
54-01015	37.6	42.8	PCE	1170	3120	2130
54-01015	37.6	42.8	TCA	11000	5050	-18000[a]
54-01015	37.6	42.8	TCE	3830	4610	2920
54-01015	165.4	188.2	Freon 11	663	736	303
54-01015	165.4	188.2	PCE	6120	3970	3730
54-01015	165.4	188.2	TCA	25000	1000	-10900[a]
54-01015	165.4	188.2	TCE	7200	-236	3200
54-01015	308.3	350.8	Freon 11	-303	-253	-780
54-01015	308.3	350.8	PCE	5660	2710	3360
54-01015	308.3	350.8	TCA	6820	3200	-21300[a]
54-01015	308.3	350.8	TCE	9080	1320	7840
54-01015	333.3	379.3	Freon 11	-286	458	-107
54-01015	333.3	379.3	PCE	-136	1370	1970
54-01015	333.3	379.3	TCA	5510	1530	-13100[a]
54-01015	333.3	379.3	TCE	2770	-2420	1830
54-01015	377.7	429.8	Freon 11	-185	-281	8.37
54-01015	377.7	429.8	PCE	-366	3320	1950
54-01015	377.7	429.8	TCA	5250	7690	-13600[a]
54-01015	377.7	429.8	TCE	2350	1760	2520
54-01015	426.5	485.3	Freon 11	-213	-320	43.9
54-01015	426.5	485.3	PCE	-603	1670	1820
54-01015	426.5	485.3	TCA	4120	2860	-10400[a]
54-01015	426.5	485.3	TCE	2670	2420	1840
54-01015	462.1	525.8	Freon 11	-152	809	-84.2
54-01015	462.1	525.8	PCE	-929	-1780	1570
54-01015	462.1	525.8	TCA	1320	10400	-6540[a]
54-01015	462.1	525.8	TCE	1470	-2840	1340
54-01016	30.8	35.8	Freon 11	332	143	1110
54-01016	30.8	35.8	PCE	4910	4090	6050
54-01016	30.8	35.8	TCA	4910	16500	-12500[a]
54-01016	30.8	35.8	TCE	5530	17	5480
54-01016	162.2	188.3	Freon 11	10100	515	14900
54-01016	162.2	188.3	PCE	80000	1190	74600
54-01016	162.2	188.3	TCA	112000	1720	80700
54-01016	162.2	188.3	TCE	34400	272	38900

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-01016	274.7	318.8	Freon 11	3030	1430	2600
54-01016	274.7	318.8	PCE	26400	14200	15200
54-01016	274.7	318.8	TCA	14700	15200	-12000[a]
54-01016	274.7	318.8	TCE	8060	4880	6010
54-01016	336.3	390.3	Freon 11	-55.6	130	333
54-01016	336.3	390.3	PCE	759	1740	1260
54-01016	336.3	390.3	TCA	1150	7310	-6540[a]
54-01016	336.3	390.3	TCE	2600	2090	618
54-01016	414.3	480.8	Freon 11	—[b]	62300[a]	—
54-01016	414.3	480.8	PCE	—	422000[a]	—
54-01016	414.3	480.8	TCA	—	134000[a]	—
54-01016	414.3	480.8	TCE	—	0[a]	—
54-01016	459.5	533.3	Freon 11	—	261	—
54-01016	459.5	533.3	PCE	—	1580	—
54-01016	459.5	533.3	TCA	—	8830	—
54-01016	459.5	533.3	TCE	—	2090	—
54-01016	517.6	600.7	Freon 11	-298	248	177
54-01016	517.6	600.7	PCE	2020	12300	3240
54-01016	517.6	600.7	TCA	2420	12600	-3420[a]
54-01016	517.6	600.7	TCE	3740	10300	677
54-02001	20	20	Freon 11	4920	7410	691000
54-02001	20	20	PCE	99000	177000	121000
54-02001	20	20	TCA	1150000	1560000	1100000
54-02001	20	20	TCE	276000	423000	287000
54-02001	40	40	Freon 11	5590	10300	11500
54-02001	40	40	PCE	133000	238000	203000
54-02001	40	40	TCA	1500000	2040000	1550000
54-02001	40	40	TCE	227000	352000	271000
54-02001	60	60	Freon 11	—	—	176
54-02001	60	60	PCE	—	—	2830
54-02001	60	60	TCA	—	—	3000
54-02001	60	60	TCE	—	—	2780
54-02001	80	80	Freon 11	5530	7580	10100
54-02001	80	80	PCE	114000	169000	168000
54-02001	80	80	TCA	1440000	1830000	1500000
54-02001	80	80	TCE	189000	255000	210000
54-02001	100	100	Freon 11	3740	5780	8820

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02001	100	100	PCE	58300	91500	95600
54-02001	100	100	TCA	1000000	1360000	1050000
54-02001	100	100	TCE	138000	195000	136000
54-02001	120	120	Freon 11	3890	3630	4550
54-02001	120	120	PCE	47800	41200	37600
54-02001	120	120	TCA	982000	813000	519000
54-02001	120	120	TCE	149000	127000	77300
54-02001	140	140	Freon 11	5730	7240	6010
54-02001	140	140	PCE	65500	80000	48500
54-02001	140	140	TCA	1410000	1700000	753000
54-02001	140	140	TCE	202000	250000	103000
54-02001	160	160	Freon 11	—	1930	—
54-02001	160	160	PCE	—	22200	—
54-02001	160	160	TCA	—	388000	—
54-02001	160	160	TCE	—	73600	—
54-02001	180	180	Freon 11	—	—	—
54-02001	180	180	PCE	—	—	—
54-02001	180	180	TCA	—	—	—
54-02001	180	180	TCE	—	—	—
54-02001	200	200	Freon 11	2000	1290	1290
54-02001	200	200	PCE	21700	16700	9010
54-02001	200	200	TCA	271000	184000	81800
54-02001	200	200	TCE	60700	47700	20300
54-02002	20	20	Freon 11	—	—	—
54-02002	20	20	PCE	—	—	—
54-02002	20	20	TCA	—	—	—
54-02002	20	20	TCE	—	—	—
54-02002	40	40	Freon 11	—	—	—
54-02002	40	40	PCE	—	—	—
54-02002	40	40	TCA	—	—	—
54-02002	40	40	TCE	—	—	—
54-02002	60	60	Freon 11	41000	35700	65100
54-02002	60	60	PCE	373000	319000	366000
54-02002	60	60	TCA	1320000	1130000	1270000
54-02002	60	60	TCE	222000	162000	189000
54-02002	80	80	Freon 11	—	—	—
54-02002	80	80	PCE	—	—	—

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02002	80	80	TCA	—	—	—
54-02002	80	80	TCE	—	—	—
54-02002	100	100	Freon 11	47100	22700	72400
54-02002	100	100	PCE	394000	181000	384000
54-02002	100	100	TCA	1540000	698000	1360000
54-02002	100	100	TCE	270000	105000	230000
54-02002	120	120	Freon 11	48600	29400	75800
54-02002	120	120	PCE	365000	218000	359000
54-02002	120	120	TCA	1430000	851000	1280000
54-02002	120	120	TCE	258000	136000	225000
54-02002	140	140	Freon 11	52700	39000	80900
54-02002	140	140	PCE	357000	258000	348000
54-02002	140	140	TCA	1370000	965000	1210000
54-02002	140	140	TCE	248000	142000	219000
54-02002	157	157	Freon 11	24900	910000	—
54-02002	157	157	PCE	174000	61500	—
54-02002	157	157	TCA	643000	240000	—
54-02002	157	157	TCE	134000	53100	—
54-02002	180	180	Freon 11	49500	37200	77500
54-02002	180	180	PCE	361000	262000	365000
54-02002	180	180	TCA	1430000	1070000	1310000
54-02002	180	180	TCE	250000	170000	233000
54-02002	200	200	Freon 11	56700	29900	82500
54-02002	200	200	PCE	371000	185000	333000
54-02002	200	200	TCA	1110000	556000	938000
54-02002	200	200	TCE	222000	94000	192000
54-02012	8	8	Freon 11	—	—	—
54-02012	8	8	PCE	—	—	—
54-02012	8	8	TCA	—	—	—
54-02012	8	8	TCE	—	—	—
54-02012	28	28	Freon 11	17600	21300	55700
54-02012	28	28	PCE	636000	474000	698000
54-02012	28	28	TCA	4220000	2870000	3620000
54-02012	28	28	TCE	1190000	827000	1170000
54-02012	42	42	Freon 11	8590	—	—
54-02012	42	42	PCE	251000	—	—
54-02012	42	42	TCA	1960000	—	—

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02012	42	42	TCE	324000	—	—
54-02013	20	20	Freon 11	—	—	-561
54-02013	20	20	PCE	—	—	400
54-02013	20	20	TCA	—	—	18900
54-02013	20	20	TCE	—	—	6440
54-02013	43	43	Freon 11	—	—	—
54-02013	43	43	PCE	—	—	—
54-02013	43	43	TCA	—	—	—
54-02013	43	43	TCE	—	—	—
54-02013	63	63	Freon 11	-61.8	22.2	—
54-02013	63	63	PCE	4490	2230	—
54-02013	63	63	TCA	7200	24500	—
54-02013	63	63	TCE	1900	1050	—
54-02014	13	13	Freon 11	75800	92600	167000
54-02014	13	13	PCE	752000	929000	1020000
54-02014	13	13	TCA	2800000	3270000	3380000
54-02014	13	13	TCE	693000	832000	806000
54-02014	31	31	Freon 11	—	—	—
54-02014	31	31	PCE	—	—	—
54-02014	31	31	TCA	—	—	—
54-02014	31	31	TCE	—	—	—
54-02014	46	46	Freon 11	—	—	—
54-02014	46	46	PCE	—	—	—
54-02014	46	46	TCA	—	—	—
54-02014	46	46	TCE	—	—	—
54-02014	86	86	Freon 11	—	—	—
54-02014	86	86	PCE	—	—	—
54-02014	86	86	TCA	—	—	—
54-02014	86	86	TCE	—	—	—
54-02016	18	18	Freon 11	—	—	—
54-02016	18	18	PCE	—	—	—
54-02016	18	18	TCA	—	—	—
54-02016	18	18	TCE	—	—	—
54-02016	31	31	Freon 11	52700	53100	—
54-02016	31	31	PCE	533000	530000	—
54-02016	31	31	TCA	1590000	1630000	—
54-02016	31	31	TCE	289000	280000	—

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02016	82	82	Freon 11	—	—	—
54-02016	82	82	PCE	—	—	—
54-02016	82	82	TCA	—	—	—
54-02016	82	82	TCE	—	—	—
54-02020	20	20	Freon 11	4710	4800	8250
54-02020	20	20	PCE	32500	37600	35200
54-02020	20	20	TCA	115000	131000	80200
54-02020	20	20	TCE	19400	27500	19500
54-02020	40	40	Freon 11	6910	8030	12900
54-02020	40	40	PCE	48900	59300	54100
54-02020	40	40	TCA	174000	194000	143000
54-02020	40	40	TCE	31000	33400	29000
54-02020	60	60	Freon 11	8590	10400	15300
54-02020	60	60	PCE	58800	65600	64300
54-02020	60	60	TCA	202000	234000	178000
54-02020	60	60	TCE	35700	46500	34500
54-02020	80	80	Freon 11	9940	11700	18000
54-02020	80	80	PCE	69100	81300	75200
54-02020	80	80	TCA	234000	263000	211000
54-02020	80	80	TCE	40000	44600	39100
54-02020	95	95	Freon 11	10800	12100	18200
54-02020	95	95	PCE	77900	86100	75900
54-02020	95	95	TCA	228000	264000	215000
54-02020	95	95	TCE	39600	53400	39600
54-02020	120	120	Freon 11	11700	13600	18200
54-02020	120	120	PCE	84000	88100	80000
54-02020	120	120	TCA	234000	283000	214000
54-02020	120	120	TCE	41300	44900	39600
54-02020	140	140	Freon 11	12700	12200	16600
54-02020	140	140	PCE	92200	86800	73200
54-02020	140	140	TCA	245000	266000	183000
54-02020	140	140	TCE	41900	46800	35400
54-02020	160	160	Freon 11	12100	6340	9430
54-02020	160	160	PCE	88100	50000	42400
54-02020	160	160	TCA	224000	137000	96500
54-02020	160	160	TCE	40000	27200	20800
54-02020	180	180	Freon 11	14900	18000	26600

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02020	180	180	PCE	108000	127000	117000
54-02020	180	180	TCA	258000	324000	260000
54-02020	180	180	TCE	47700	55900	48600
54-02020	200	200	Freon 11	14600	17200	26400
54-02020	200	200	PCE	108000	121000	117000
54-02020	200	200	TCA	233000	299000	232000
54-02020	200	200	TCE	42000	52100	43100
54-02021	20	20	Freon 11	578	573	-39.3
54-02021	20	20	PCE	4330	2910	-1220
54-02021	20	20	TCA	109000	117000	-9270[a]
54-02021	20	20	TCE	18900	20600	1600
54-02021	40	40	Freon 11	—	-270	-186
54-02021	40	40	PCE	—	861	1800
54-02021	40	40	TCA	—	-2500	24600
54-02021	40	40	TCE	—	4090	6230
54-02021	60	60	Freon 11	724	194	2480
54-02021	60	60	PCE	8610	528	15500
54-02021	60	60	TCA	207000	45900	280000
54-02021	60	60	TCE	36800	7300	48600
54-02021	80	80	Freon 11	—	488	-157
54-02021	80	80	PCE	—	4570	-88.1
54-02021	80	80	TCA	—	24100	-1350
54-02021	80	80	TCE	—	6500	2090
54-02021	100	100	Freon 11	1390	260	541
54-02021	100	100	PCE	12900	2000	-3700[a]
54-02021	100	100	TCA	294000	60000	71400
54-02021	100	100	TCE	49300	9880	14100
54-02021	120	120	Freon 11	—	769	-118
54-02021	120	120	PCE	—	5440	305
54-02021	120	120	TCA	—	87200	2590
54-02021	120	120	TCE	—	14300	1860
54-02021	140	140	Freon 11	2290	2050	2860
54-02021	140	140	PCE	19500	15900	16900
54-02021	140	140	TCA	336000	254000	263000
54-02021	140	140	TCE	58500	41800	44900
54-02021	160	160	Freon 11	—	-78.6	-31.4
54-02021	160	160	PCE	—	834	401

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m^3)	B&K Result Q3 FY2007 (µg/m^3)	B&K Result Q4 FY2007 (µg/m^3)
54-02021	160	160	TCA	—	51400	5940
54-02021	160	160	TCE	—	14700	2950
54-02021	180	180	Freon 11	2240	2670	3260
54-02021	180	180	PCE	19700	20900	19800
54-02021	180	180	TCA	330000	307000	284000
54-02021	180	180	TCE	60100	50200	50200
54-02021	198	198	Freon 11	2480	1720	2870
54-02021	198	198	PCE	19700	16700	15300
54-02021	198	198	TCA	237000	205000	151000
54-02021	198	198	TCE	48500	43700	31600
54-02022	20	20	Freon 11	—	—	—
54-02022	20	20	PCE	—	—	—
54-02022	20	20	TCA	—	—	—
54-02022	20	20	TCE	—	—	—
54-02022	40	40	Freon 11	2000	1570	3290
54-02022	40	40	PCE	21600	19300	19900
54-02022	40	40	TCA	578000	556000	410000
54-02022	40	40	TCE	81100	77900	57500
54-02022	60	60	Freon 11	2580	2370	3940
54-02022	60	60	PCE	27200	24500	24600
54-02022	60	60	TCA	731000	709000	545000
54-02022	60	60	TCE	103000	99900	77900
54-02022	80	80	Freon 11	3080	3230	4400
54-02022	80	80	PCE	31900	25800	26700
54-02022	80	80	TCA	845000	796000	638000
54-02022	80	80	TCE	119000	111000	89100
54-02022	100	100	Freon 11	—	385	249
54-02022	100	100	PCE	—	8130	1210
54-02022	100	100	TCA	—	189000	35400
54-02022	100	100	TCE	—	35800	8750
54-02022	120	120	Freon 11	4230	3620	4720
54-02022	120	120	PCE	37600	31200	30900
54-02022	120	120	TCA	878000	834000	676000
54-02022	120	120	TCE	133000	127000	99400
54-02022	140	140	Freon 11	4160	3940	5270
54-02022	140	140	PCE	36200	30000	30600
54-02022	140	140	TCA	682000	682000	594000

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02022	140	140	TCE	114000	112000	95600
54-02022	160	160	Freon 11	4070	4560	5090
54-02022	160	160	PCE	33300	27500	27400
54-02022	160	160	TCA	544000	545000	486000
54-02022	160	160	TCE	98300	91800	85400
54-02022	180	180	Freon 11	3580	2300	1270
54-02022	180	180	PCE	27700	14000	8540
54-02022	180	180	TCA	370000	256000	113000
54-02022	180	180	TCE	70900	49100	23300
54-02022	200	200	Freon 11	3710	3470	3950
54-02022	200	200	PCE	26800	22400	21100
54-02022	200	200	TCA	292000	298000	231000
54-02022	200	200	TCE	59100	58000	43600
54-02023	20	20	Freon 11	2260	2110	3550
54-02023	20	20	PCE	19800	11700	18200
54-02023	20	20	TCA	60000	119000	21500
54-02023	20	20	TCE	17300	14500	14300
54-02023	40	40	Freon 11	3320	3270	4620
54-02023	40	40	PCE	24300	20100	20700
54-02023	40	40	TCA	73100	127000	41000
54-02023	40	40	TCE	16800	14900	15300
54-02023	60	60	Freon 11	—	—	—
54-02023	60	60	PCE	—	—	—
54-02023	60	60	TCA	—	—	—
54-02023	60	60	TCE	—	—	—
54-02023	80	80	Freon 11	2980	1830	3670
54-02023	80	80	PCE	21600	16200	17400
54-02023	80	80	TCA	62700	75300	31300
54-02023	80	80	TCE	16200	12100	11100
54-02023	100	100	Freon 11	5560	4650	7860
54-02023	100	100	PCE	38800	35400	34000
54-02023	100	100	TCA	107000	147000	78500
54-02023	100	100	TCE	25100	23000	22000
54-02023	120	120	Freon 11	5840	5500	8930
54-02023	120	120	PCE	42400	38400	38200
54-02023	120	120	TCA	105000	145000	85600
54-02023	120	120	TCE	25700	22200	23100

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m^3)	B&K Result Q3 FY2007 (µg/m^3)	B&K Result Q4 FY2007 (µg/m^3)
54-02023	140	140	Freon 11	—	—	—
54-02023	140	140	PCE	—	—	—
54-02023	140	140	TCA	—	—	—
54-02023	140	140	TCE	—	—	—
54-02023	159	159	Freon 11	7750	7240	10300
54-02023	159	159	PCE	55800	44300	44200
54-02023	159	159	TCA	121000	141000	86700
54-02023	159	159	TCE	29800	30500	23000
54-02023	180	180	Freon 11	—	—	—
54-02023	180	180	PCE	—	—	—
54-02023	180	180	TCA	—	—	—
54-02023	180	180	TCE	—	—	—
54-02023	200	200	Freon 11	7750	6010	10300
54-02023	200	200	PCE	56700	41000	46200
54-02023	200	200	TCA	101000	106000	80200
54-02023	200	200	TCE	25600	19000	20700
54-02024	20	20	Freon 11	3110	2760	4200
54-02024	20	20	PCE	19100	14800	18400
54-02024	20	20	TCA	111000	111000	30500
54-02024	20	20	TCE	17300	16400	13200
54-02024	40	40	Freon 11	3480	3450	5900
54-02024	40	40	PCE	23700	27000	24900
54-02024	40	40	TCA	129000	98700	50100
54-02024	40	40	TCE	21600	15200	16000
54-02024	60	60	Freon 11	4960	4270	7520
54-02024	60	60	PCE	31600	29800	32300
54-02024	60	60	TCA	152000	115000	72500
54-02024	60	60	TCE	24900	17400	21000
54-02024	80	80	Freon 11	10600	5070	9710
54-02024	80	80	PCE	71200	25000	40200
54-02024	80	80	TCA	232000	124000	92700
54-02024	80	80	TCE	46300	25600	24000
54-02024	100	100	Freon 11	7470	7190	10700
54-02024	100	100	PCE	47700	41300	43500
54-02024	100	100	TCA	192000	147000	98700
54-02024	100	100	TCE	32700	27300	25300
54-02024	120	120	Freon 11	—	—	—

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02024	120	120	PCE	—	—	—
54-02024	120	120	TCA	—	—	—
54-02024	120	120	TCE	—	—	—
54-02024	140	140	Freon 11	—	—	—
54-02024	140	140	PCE	—	—	—
54-02024	140	140	TCA	—	—	—
54-02024	140	140	TCE	—	—	—
54-02024	160	160	Freon 11	10600	10600	16200
54-02024	160	160	PCE	69800	62800	67200
54-02024	160	160	TCA	230000	188000	110000
54-02024	160	160	TCE	44400	29300	33100
54-02024	180	180	Freon 11	11700	7860	16500
54-02024	180	180	PCE	77900	58400	67800
54-02024	180	180	TCA	235000	146000	142000
54-02024	180	180	TCE	43100	29700	33400
54-02024	200	200	Freon 11	10400	5500	14100
54-02024	200	200	PCE	69800	36800	59900
54-02024	200	200	TCA	204000	100000	117000
54-02024	200	200	TCE	42300	16500	28000
54-02025	20	20	Freon 11	8030	8760	13100
54-02025	20	20	PCE	63700	66500	61400
54-02025	20	20	TCA	249000	229000	179000
54-02025	20	20	TCE	49000	40200	38700
54-02025	60	60	Freon 11	—	—	287
54-02025	60	60	PCE	—	—	2890
54-02025	60	60	TCA	—	—	-11500[a]
54-02025	60	60	TCE	—	—	2960
54-02025	100	100	Freon 11	22700	21000	30800
54-02025	100	100	PCE	157000	150000	129000
54-02025	100	100	TCA	562000	516000	404000
54-02025	100	100	TCE	104000	95600	76800
54-02025	160	160	Freon 11	29300	28200	31700
54-02025	160	160	PCE	200000	195000	130000
54-02025	160	160	TCA	611000	578000	366000
54-02025	160	160	TCE	112000	97200	70400
54-02025	190	190	Freon 11	22600	27800	23600
54-02025	190	190	PCE	154000	190000	96300

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02025	190	190	TCA	396000	489000	232000
54-02025	190	190	TCE	77900	92400	50100
54-02026	20	20	Freon 11	313	5.78	374
54-02026	20	20	PCE	1360	5100	2830
54-02026	20	20	TCA	49600	56700	-24500[a]
54-02026	20	20	TCE	3500	3920	3340
54-02026	60	60	Freon 11	584	453	1110
54-02026	60	60	PCE	4990	15900	6170
54-02026	60	60	TCA	63300	60500	-21800[a]
54-02026	60	60	TCE	4880	4050	2910
54-02026	100	100	Freon 11	837	-185	999
54-02026	100	100	PCE	6070	4580	5330
54-02026	100	100	TCA	59400	60500	-12000[a]
54-02026	100	100	TCE	5010	10300	3130
54-02026	160	160	Freon 11	1470	1410	2000
54-02026	160	160	PCE	11100	4680	9560
54-02026	160	160	TCA	54400	55600	-5450[a]
54-02026	160	160	TCE	6710	7730	3650
54-02026	200	200	Freon 11	1160	1800	1760
54-02026	200	200	PCE	11500	7860	9290
54-02026	200	200	TCA	51100	47900	-4120[a]
54-02026	200	200	TCE	7730	4630	3240
54-02026	215	215	Freon 11	1070	195	1320
54-02026	215	215	PCE	7050	3940	6780
54-02026	215	215	TCA	36400	41300	-3380[a]
54-02026	215	215	TCE	5370	9450	3100
54-02027	20	20	Freon 11	1530	1440	2800
54-02027	20	20	PCE	13300	14900	13500
54-02027	20	20	TCA	27500	65400	-38200[a]
54-02027	20	20	TCE	6980	752	6390
54-02027	60	60	Freon 11	3540	3180	6060
54-02027	60	60	PCE	24100	29400	26900
54-02027	60	60	TCA	65400	90500	-1670[a]
54-02027	60	60	TCE	13600	12800	12000
54-02027	100	100	Freon 11	4510	4750	7410
54-02027	100	100	PCE	35200	36100	34000
54-02027	100	100	TCA	82900	115000	32900

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02027	100	100	TCE	17200	19200	14600
54-02027	160	160	Freon 11	5900	6460	8370
54-02027	160	160	PCE	46400	47600	38800
54-02027	160	160	TCA	93800	132000	36000
54-02027	160	160	TCE	18900	22100	13800
54-02027	200	200	Freon 11	5230	5730	8930
54-02027	200	200	PCE	41300	44700	41600
54-02027	200	200	TCA	75300	119000	34800
54-02027	200	200	TCE	17200	23400	13800
54-02027	220	220	Freon 11	4960	5840	7920
54-02027	220	220	PCE	40500	44300	38600
54-02027	220	220	TCA	65400	100000	24300
54-02027	220	220	TCE	13700	16900	10900
54-02027	250	250	Freon 11	3870	5130	5080
54-02027	250	250	PCE	31000	35400	24300
54-02027	250	250	TCA	44000	78500	5340
54-02027	250	250	TCE	11800	13300	7040
54-02028	20	20	Freon 11	578	366	323
54-02028	20	20	PCE	2660	1530	3540
54-02028	20	20	TCA	40600	26000	-10900[a]
54-02028	20	20	TCE	3720	1930	2680
54-02028	60	60	Freon 11	859	558	904
54-02028	60	60	PCE	5820	3800	6590
54-02028	60	60	TCA	49800	37800	-2900[a]
54-02028	60	60	TCE	4950	5960	4180
54-02028	100	100	Freon 11	1040	780	2410
54-02028	100	100	PCE	7520	6560	7320
54-02028	100	100	TCA	53900	44800	-436
54-02028	100	100	TCE	6710	6120	2910
54-02028	160	160	Freon 11	752	1230	1870
54-02028	160	160	PCE	6110	10700	7250
54-02028	160	160	TCA	32300	34100	4610
54-02028	160	160	TCE	5590	1920	3610
54-02028	200	200	Freon 11	1460	1810	2160
54-02028	200	200	PCE	10500	8680	8270
54-02028	200	200	TCA	45300	32000	1150
54-02028	200	200	TCE	6770	4270	2070

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02028	220	220	Freon 11	1340	1080	1540
54-02028	220	220	PCE	10800	6480	7250
54-02028	220	220	TCA	44500	36700	1070
54-02028	220	220	TCE	7040	6070	3130
54-02028	250	250	Freon 11	926	983	267
54-02028	250	250	PCE	8880	7790	3080
54-02028	250	250	TCA	32500	26300	932
54-02028	250	250	TCE	5370	2380	3250
54-02029	20	20	Freon 11	-56.1	-14	458
54-02029	20	20	PCE	1360	1100	2660
54-02029	20	20	TCA	14800	20200	-37600[a]
54-02029	20	20	TCE	2760	559	607
54-02029	60	60	Freon 11	115	483	702
54-02029	60	60	PCE	1560	1370	2110
54-02029	60	60	TCA	20700	20400	-33800[a]
54-02029	60	60	TCE	2460	-548	591
54-02029	100	100	Freon 11	159	-67.4	853
54-02029	100	100	PCE	2260	1230	1930
54-02029	100	100	TCA	23500	19800	-31600[a]
54-02029	100	100	TCE	2990	3150	360
54-02029	160	160	Freon 11	228	561	960
54-02029	160	160	PCE	3240	3710	2770
54-02029	160	160	TCA	22600	22100	-26700[a]
54-02029	160	160	TCE	3460	112	364
54-02029	200	200	Freon 11	524	601	430
54-02029	200	200	PCE	3380	2470	1380
54-02029	200	200	TCA	22200	24400	-22400[a]
54-02029	200	200	TCE	2950	1850	441
54-02029	220	220	Freon 11	190	578	207
54-02029	220	220	PCE	2870	4180	1930
54-02029	220	220	TCA	23100	20900	-18000[a]
54-02029	220	220	TCE	3120	129	1290
54-02029	260	260	Freon 11	122	423	282
54-02029	260	260	PCE	3120	-434	2050
54-02029	260	260	TCA	20900	18500	-15300[a]
54-02029	260	260	TCE	2750	859	886
54-02029	288	288	Freon 11	144	118	146

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02029	288	288	PCE	1230	8810	1690
54-02029	288	288	TCA	19700	14700	-12500[a]
54-02029	288	288	TCE	2180	2700	591
54-02030	20	20	Freon 11	127	[c]	[c]
54-02030	20	20	PCE	1480	[c]	[c]
54-02030	20	20	TCA	36900	[c]	[c]
54-02030	20	20	TCE	3580	[c]	[c]
54-02030	60	60	Freon 11	231	[c]	[c]
54-02030	60	60	PCE	4630	[c]	[c]
54-02030	60	60	TCA	55100	[c]	[c]
54-02030	60	60	TCE	5850	[c]	[c]
54-02030	100	100	Freon 11	797	[c]	[c]
54-02030	100	100	PCE	6850	[c]	[c]
54-02030	100	100	TCA	55600	[c]	[c]
54-02030	100	100	TCE	5300	[c]	[c]
54-02030	160	160	Freon 11	960	[c]	[c]
54-02030	160	160	PCE	7590	[c]	[c]
54-02030	160	160	TCA	50900	[c]	[c]
54-02030	160	160	TCE	6070	[c]	[c]
54-02030	200	200	Freon 11	1190	[c]	[c]
54-02030	200	200	PCE	8200	[c]	[c]
54-02030	200	200	TCA	44200	[c]	[c]
54-02030	200	200	TCE	3510	[c]	[c]
54-02030	220	220	Freon 11	831	[c]	[c]
54-02030	220	220	PCE	6850	[c]	[c]
54-02030	220	220	TCA	38000	[c]	[c]
54-02030	220	220	TCE	3880	[c]	[c]
54-02030	243	243	Freon 11	—	[c]	[c]
54-02030	243	243	PCE	—	[c]	[c]
54-02030	243	243	TCA	—	[c]	[c]
54-02030	243	243	TCE	—	[c]	[c]
54-02031	20	20	Freon 11	1200	2430	1830
54-02031	20	20	PCE	12500	10400	10200
54-02031	20	20	TCA	80700	126000	58900
54-02031	20	20	TCE	20100	9720	17700
54-02031	60	60	Freon 11	2710	2730	3650
54-02031	60	60	PCE	25400	19800	21100

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02031	60	60	TCA	167000	171000	130000
54-02031	60	60	TCE	39500	27600	32400
54-02031	100	100	Freon 11	2200	2610	5090
54-02031	100	100	PCE	26200	35900	29400
54-02031	100	100	TCA	161000	213000	173000
54-02031	100	100	TCE	39800	46200	39000
54-02031	160	160	Freon 11	3780	4360	6060
54-02031	160	160	PCE	35800	25500	33900
54-02031	160	160	TCA	178000	161000	149000
54-02031	160	160	TCE	44400	34800	35900
54-02031	200	200	Freon 11	3120	2800	4400
54-02031	200	200	PCE	28300	20900	24500
54-02031	200	200	TCA	104000	120000	101000
54-02031	200	200	TCE	25400	20400	24700
54-02031	220	220	Freon 11	1200	1480	—
54-02031	220	220	PCE	11500	7390	—
54-02031	220	220	TCA	48600	38100	—
54-02031	220	220	TCE	13700	5530	—
54-02031	260	260	Freon 11	1120	109	225
54-02031	260	260	PCE	9350	305	466
54-02031	260	260	TCA	37500	12200	3710
54-02031	260	260	TCE	13300	4990	4730
54-02034	20	20	Freon 11	34.9	-702	257
54-02034	20	20	PCE	490	-2380	3180
54-02034	20	20	TCA	50200	92200	-19100[a]
54-02034	20	20	TCE	6230	14000	8160
54-02034	60	60	Freon 11	198	1320	159
54-02034	60	60	PCE	1590	-963	4650
54-02034	60	60	TCA	63300	104000	13700
54-02034	60	60	TCE	9770	8430	12300
54-02034	100	100	Freon 11	2.74	-84.2	606
54-02034	100	100	PCE	2960	-63.7	5090
54-02034	100	100	TCA	62200	88300	31700
54-02034	100	100	TCE	11300	16300	13200
54-02034	160	160	Freon 11	244	236	842
54-02034	160	160	PCE	1460	6050	5000
54-02034	160	160	TCA	39900	60500	12500

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02034	160	160	TCE	7360	8650	8220
54-02034	200	200	Freon 11	238	274	399
54-02034	200	200	PCE	2680	254	4240
54-02034	200	200	TCA	27600	45700	1800
54-02034	200	200	TCE	4370	6930	5150
54-02034	220	220	Freon 11	105	403	312
54-02034	220	220	PCE	1950	2680	5160
54-02034	220	220	TCA	17300	11000	-1570[a]
54-02034	220	220	TCE	3200	-1080	4850
54-02034	260	260	Freon 11	-107	427	-309
54-02034	260	260	PCE	114	3400	352
54-02034	260	260	TCA	10100	18500	-6000[a]
54-02034	260	260	TCE	2490	-12.4	314
54-02034	300	300	Freon 11	-393	-208	-331
54-02034	300	300	PCE	-447	-4170	-522
54-02034	300	300	TCA	4160	8670	-7630[a]
54-02034	300	300	TCE	3040	4500	3470
54-02087	13	13	Freon 11	46900	—	[d]
54-02087	13	13	PCE	467000	—	[d]
54-02087	13	13	TCA	1340000	—	[d]
54-02087	13	13	TCE	453000	—	[d]
54-02087	31	31	Freon 11	71300	44000	[d]
54-02087	31	31	PCE	718000	431000	[d]
54-02087	31	31	TCA	2030000	1210000	[d]
54-02087	31	31	TCE	682000	364000	[d]
54-02087	46	46	Freon 11	109000	111000	[d]
54-02087	46	46	PCE	1100000	1100000	[d]
54-02087	46	46	TCA	3270000	3100000	[d]
54-02087	46	46	TCE	1030000	854000	[d]
54-02087	86	86	Freon 11	104000	112000	[d]
54-02087	86	86	PCE	1030000	1080000	[d]
54-02087	86	86	TCA	3720000	3810000	[d]
54-02087	86	86	TCE	977000	977000	[d]
54-02088	13	13	Freon 11	74700	62900	[d]
54-02088	13	13	PCE	759000	648000	[d]
54-02088	13	13	TCA	2280000	2160000	[d]
54-02088	13	13	TCE	811000	816000	[d]

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-02088	31	31	Freon 11	97700	41600	[d]
54-02088	31	31	PCE	990000	413000	[d]
54-02088	31	31	TCA	2860000	1400000	[d]
54-02088	31	31	TCE	902000	472000	[d]
54-02088	46	46	Freon 11	107000	91500	[d]
54-02088	46	46	PCE	1080000	935000	[d]
54-02088	46	46	TCA	3260000	2930000	[d]
54-02088	46	46	TCE	983000	1020000	[d]
54-02088	86	86	Freon 11	106000	117000	[d]
54-02088	86	86	PCE	1040000	1150000	[d]
54-02088	86	86	TCA	3680000	3920000	[d]
54-02088	86	86	TCE	1020000	1100000	[d]
54-02089	13	13	Freon 11	69100	67900	122000
54-02089	13	13	PCE	705000	698000	725000
54-02089	13	13	TCA	2120000	2340000	2150000
54-02089	13	13	TCE	757000	816000	709000
54-02089	31	31	Freon 11	110000	40500	89300
54-02089	31	31	PCE	1130000	390000	538000
54-02089	31	31	TCA	3160000	1350000	1520000
54-02089	31	31	TCE	988000	411000	449000
54-02089	46	46	Freon 11	118000	101000	165000
54-02089	46	46	PCE	1230000	1020000	1010000
54-02089	46	46	TCA	3300000	2980000	2910000
54-02089	46	46	TCE	929000	849000	768000
54-02089	86	86	Freon 11	102000	85900	149000
54-02089	86	86	PCE	1010000	854000	901000
54-02089	86	86	TCA	3180000	2830000	2880000
54-02089	86	86	TCE	806000	720000	693000
54-24238	44	44	Freon 11	131000	106000	193000
54-24238	44	44	PCE	1360000	1100000	1200000
54-24238	44	44	TCA	3410000	2930000	3180000
54-24238	44	44	TCE	779000	736000	601000
54-24238	64	64	Freon 11	126000	124000	180000
54-24238	64	64	PCE	1270000	1270000	1100000
54-24238	64	64	TCA	4120000	3810000	3330000
54-24238	64	64	TCE	779000	752000	596000
54-24238	84	84	Freon 11	116000	112000	171000

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-24238	84	84	PCE	1130000	1140000	1020000
54-24238	84	84	TCA	3760000	3600000	3060000
54-24238	84	84	TCE	773000	746000	607000
54-24239	25	25	Freon 11	17600	10700	25700
54-24239	25	25	PCE	401000	283000	410000
54-24239	25	25	TCA	911000	573000	703000
54-24239	25	25	TCE	215000	148000	177000
54-24239	50	50	Freon 11	21800	18200	32100
54-24239	50	50	PCE	489000	451000	462000
54-24239	50	50	TCA	1150000	982000	900000
54-24239	50	50	TCE	267000	238000	219000
54-24239	75	75	Freon 11	22700	21100	35400
54-24239	75	75	PCE	502000	481000	477000
54-24239	75	75	TCA	1190000	1100000	998000
54-24239	75	75	TCE	280000	260000	237000
54-24239	99.5	99.5	Freon 11	25200	23200	37300
54-24239	99.5	99.5	PCE	498000	476000	462000
54-24239	99.5	99.5	TCA	1240000	1170000	1030000
54-24239	99.5	99.5	TCE	287000	273000	243000
54-24240	28	28	Freon 11	19900	15000	59000
54-24240	28	28	PCE	529000	390000	586000
54-24240	28	28	TCA	4720000	2580000	3620000
54-24240	28	28	TCE	789000	518000	897000
54-24240	53	53	Freon 11	25700	54900	75800
54-24240	53	53	PCE	512000	624000	554000
54-24240	53	53	TCA	4240000	3160000	3880000
54-24240	53	53	TCE	891000	929000	789000
54-24240	78	78	Freon 11	14500	26600	32500
54-24240	78	78	PCE	266000	387000	342000
54-24240	78	78	TCA	2590000	2740000	2230000
54-24240	78	78	TCE	564000	601000	461000
54-24240	103	103	Freon 11	12600	14900	19700
54-24240	103	103	PCE	201000	238000	216000
54-24240	103	103	TCA	2300000	2170000	1710000
54-24240	103	103	TCE	469000	443000	338000
54-24240	128	128	Freon 11	13000	13300	20000
54-24240	128	128	PCE	161000	174000	180000

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-24240	128	128	TCA	2120000	2000000	1760000
54-24240	128	128	TCE	402000	393000	343000
54-24240	153	153	Freon 11	13100	13500	19700
54-24240	153	153	PCE	153000	155000	160000
54-24240	153	153	TCA	1970000	1860000	1630000
54-24240	153	153	TCE	375000	354000	314000
54-24241	73	73	Freon 11	33000	[e]	56000
54-24241	73	73	PCE	424000	[e]	388000
54-24241	73	73	TCA	1520000	[e]	1230000
54-24241	73	73	TCE	308000	[e]	239000
54-24241	93	93	Freon 11	21300	[e]	62900
54-24241	93	93	PCE	280000	[e]	451000
54-24241	93	93	TCA	1010000	[e]	1520000
54-24241	93	93	TCE	231000	[e]	291000
54-24241	113	113	Freon 11	22100	[e]	63400
54-24241	113	113	PCE	262000	[e]	473000
54-24241	113	113	TCA	927000	[e]	1700000
54-24241	113	113	TCE	208000	[e]	308000
54-24241	133	133	Freon 11	—	[e]	79200
54-24241	133	133	PCE	—	[e]	618000
54-24241	133	133	TCA	—	[e]	2500000
54-24241	133	133	TCE	—	[e]	406000
54-24241	153	153	Freon 11	19700	[e]	53300
54-24241	153	153	PCE	226000	[e]	165000
54-24241	153	153	TCA	807000	[e]	521000
54-24241	153	153	TCE	190000	[e]	107000
54-24241	173	173	Freon 11	20200	[e]	51500
54-24241	173	173	PCE	231000	[e]	349000
54-24241	173	173	TCA	823000	[e]	1090000
54-24241	173	173	TCE	193000	[e]	227000
54-24241	193	193	Freon 11	—	[e]	52600
54-24241	193	193	PCE	—	[e]	338000
54-24241	193	193	TCA	—	[e]	1030000
54-24241	193	193	TCE	—	[e]	222000
54-24242	25	25	Freon 11	10300	11300	24700
54-24242	25	25	PCE	497000	609000	1100000
54-24242	25	25	TCA	556000	551000	491000

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-24242	25	25	TCE	155000	150000	138000
54-24242	50	50	Freon 11	30300	27800	45700
54-24242	50	50	PCE	691000	605000	643000
54-24242	50	50	TCA	1450000	1290000	1190000
54-24242	50	50	TCE	334000	277000	271000
54-24242	75	75	Freon 11	27500	24900	40400
54-24242	75	75	PCE	752000	712000	698000
54-24242	75	75	TCA	1310000	1190000	1010000
54-24242	75	75	TCE	308000	286000	242000
54-24242	100	100	Freon 11	20900	19700	34400
54-24242	100	100	PCE	766000	746000	827000
54-24242	100	100	TCA	1030000	949000	818000
54-24242	100	100	TCE	266000	249000	212000
54-24242	110.5	110.5	Freon 11	21200	13500	23100
54-24242	110.5	110.5	PCE	575000	489000	465000
54-24242	110.5	110.5	TCA	1120000	1060000	1070000
54-24242	110.5	110.5	TCE	331000	309000	271000
54-24243	25	25	Freon 11	32200	34900	55200
54-24243	25	25	PCE	338000	357000	334000
54-24243	25	25	TCA	987000	922000	878000
54-24243	25	25	TCE	197000	173000	173000
54-24243	50	50	Freon 11	67400	60600	106000
54-24243	50	50	PCE	698000	632000	641000
54-24243	50	50	TCA	1640000	1490000	1490000
54-24243	50	50	TCE	329000	294000	279000
54-24243	75	75	Freon 11	69100	67400	101000
54-24243	75	75	PCE	672000	660000	588000
54-24243	75	75	TCA	1980000	1770000	1640000
54-24243	75	75	TCE	412000	342000	328000
54-24243	100	100	Freon 11	62300	53700	79200
54-24243	100	100	PCE	556000	487000	430000
54-24243	100	100	TCA	1950000	1610000	1430000
54-24243	100	100	TCE	395000	306000	287000
54-24243	125	125	Freon 11	57800	50600	66800
54-24243	125	125	PCE	464000	406000	333000
54-24243	125	125	TCA	1620000	1470000	1180000
54-24243	125	125	TCE	328000	275000	238000

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-24243	134.5	134.5	Freon 11	—	—	—
54-24243	134.5	134.5	PCE	—	—	—
54-24243	134.5	134.5	TCA	—	—	—
54-24243	134.5	134.5	TCE	—	—	—
54-24244	25	25	Freon 11	41.8	171[f]	[f]
54-24244	25	25	PCE	333	976[f]	[f]
54-24244	25	25	TCA	-622	204[f]	[f]
54-24244	25	25	TCE	1140	1080[f]	[f]
54-24244	50	50	Freon 11	-303	82[f]	[f]
54-24244	50	50	PCE	516	990[f]	[f]
54-24244	50	50	TCA	1360	-1600[f]	[f]
54-24244	50	50	TCE	2050	3950[f]	[f]
54-24244	75	75	Freon 11	31100	-107[f]	[f]
54-24244	75	75	PCE	272000	470[f]	[f]
54-24244	75	75	TCA	1070000	-3430[f]	[f]
54-24244	75	75	TCE	204000	5850[f]	[f]
54-24244	100	100	Freon 11	34900	[f]	[f]
54-24244	100	100	PCE	265000	[f]	[f]
54-24244	100	100	TCA	1060000	[f]	[f]
54-24244	100	100	TCE	203000	[f]	[f]
54-24244	118.5	118.5	Freon 11	34600	[f]	[f]
54-24244	118.5	118.5	PCE	254000	[f]	[f]
54-24244	118.5	118.5	TCA	1050000	[f]	[f]
54-24244	118.5	118.5	TCE	201000	[f]	[f]
54-24399	550	608	Freon 11	267	—	—
54-24399	550	608	PCE	—203	—	—
54-24399	550	608	TCA	3080	—	—
54-24399	550	608	TCE	2300	—	—
54-27641	32	32	Freon 11	[g]	13100	25300
54-27641	32	32	PCE	[g]	304000	325000
54-27641	32	32	TCA	[g]	2460000	2330000
54-27641	32	32	TCE	[g]	495000	495000
54-27641	82	82	Freon 11	[g]	9100	19400
54-27641	82	82	PCE	[g]	232000	297000
54-27641	82	82	TCA	[g]	1810000	1830000
54-27641	82	82	TCE	[g]	263000	260000
54-27641	115	115	Freon 11	[g]	8820	14800

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-27641	115	115	PCE	g	127000	159000
54-27641	115	115	TCA	g	1800000	1640000
54-27641	115	115	TCE	g	285000	250000
54-27641	182	182	Freon 11	g	9380	14100
54-27641	182	182	PCE	g	78600	86800
54-27641	182	182	TCA	g	1150000	1060000
54-27641	182	182	TCE	g	215000	192000
54-27641	232	232	Freon 11	g	7190	11500
54-27641	232	232	PCE	g	57800	63400
54-27641	232	232	TCA	g	485000	441000
54-27641	232	232	TCE	g	107000	99900
54-27641	272	272	Freon 11	g	4230	7690
54-27641	272	272	PCE	g	36500	39800
54-27641	272	272	TCA	g	163000	121000
54-27641	272	272	TCE	g	44800	38100
54-27641	332	332	Freon 11	g	567	1150
54-27641	332	332	PCE	g	7250	8610
54-27641	332	332	TCA	g	20600	-21300
54-27641	332	332	TCE	g	11900	6710
54-27642	30	30	Freon 11	g	53600	89800
54-27642	30	30	PCE	g	525000	532000
54-27642	30	30	TCA	g	2720000	2740000
54-27642	30	30	TCE	g	293000	195000
54-27642	75	75	Freon 11	g	76400	98300
54-27642	75	75	PCE	g	594000	479000
54-27642	75	75	TCA	g	2480000	1780000
54-27642	75	75	TCE	g	479000	330000
54-27642	116	116	Freon 11	g	85300	117000
54-27642	116	116	PCE	g	807000	668000
54-27642	116	116	TCA	g	3140000	2430000
54-27642	116	116	TCE	g	537000	372000
54-27642	175	175	Freon 11	g	66300	94300
54-27642	175	175	PCE	g	440000	387000
54-27642	175	175	TCA	g	1550000	1230000
54-27642	175	175	TCE	g	316000	245000
54-27642	235	235	Freon 11	g	56700	77500
54-27642	235	235	PCE	g	382000	320000

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m³)	B&K Result Q3 FY2007 (µg/m³)	B&K Result Q4 FY2007 (µg/m³)
54-27642	235	235	TCA	[g]	976000	736000
54-27642	235	235	TCE	[g]	223000	163000
54-27642	275	275	Freon 11	[g]	35700	50400
54-27642	275	275	PCE	[g]	242000	210000
54-27642	275	275	TCA	[g]	496000	369000
54-27642	275	275	TCE	[g]	132000	92400
54-27642	338	338	Freon 11	[g]	9210	12700
54-27642	338	338	PCE	[g]	65100	55200
54-27642	338	338	TCA	[g]	87800	53600
54-27642	338	338	TCE	[g]	29600	21100
54-27643	30	30	Freon 11	[g]	14100	22100
54-27643	30	30	PCE	[g]	109000	110000
54-27643	30	30	TCA	[g]	527000	443000
54-27643	30	30	TCE	[g]	82200	74600
54-27643	74	74	Freon 11	[g]	21600	28800
54-27643	74	74	PCE	[g]	162000	141000
54-27643	74	74	TCA	[g]	709000	538000
54-27643	74	74	TCE	[g]	132000	100000
54-27643	117	117	Freon 11	[g]	26900	43700
54-27643	117	117	PCE	[g]	178000	184000
54-27643	117	117	TCA	[g]	753000	687000
54-27643	117	117	TCE	[g]	132000	124000
54-27643	167	167	Freon 11	[g]	25800	46000
54-27643	167	167	PCE	[g]	157000	185000
54-27643	167	167	TCA	[g]	578000	573000
54-27643	167	167	TCE	[g]	102000	108000
54-27643	235	235	Freon 11	[g]	15700	41000
54-27643	235	235	PCE	[g]	102000	171000
54-27643	235	235	TCA	[g]	303000	384000
54-27643	235	235	TCE	[g]	65000	81600
54-27643	275	275	Freon 11	[g]	11900	31300
54-27643	275	275	PCE	[g]	78600	133000
54-27643	275	275	TCA	[g]	196000	230000
54-27643	275	275	TCE	[g]	46300	53700
54-27643	354	354	Freon 11	[g]	5900	8930
54-27643	354	354	PCE	[g]	45200	39000

Table 4.0-1 (continued)

Borehole	Sampling Port Depth (ft bgs)	Borehole Length at Sampling Port (ft)	Analyte	B&K Result Q2 FY2007 (µg/m^3)	B&K Result Q3 FY2007 (µg/m^3)	B&K Result Q4 FY2007 (µg/m^3)
54-27643	354	354	TCA	[g]	64900	37600
54-27643	354	354	TCE	[g]	21100	11500

[a] Interferences present.

[b] — = Port blocked or partially blocked (B&K readings are low and/or unstable).

[c] Borehole abandoned during FY2007.

[d] Monitoring not conducted this quarter; borehole is not constructed with isolated intervals.

[e] Monitoring not conducted this quarter; borehole surface casing was filled with water.

[f] Sample ports were disconnected from sampling tubes; ambient air was monitored.

[g] Monitoring not conducted this quarter; borehole was not constructed.

Table 5.0-1
Pore-Gas VOC EPA Method TO-15 Results at MDA L

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-24238	43–45	Carbon Disulfide	4/24/2007	5500
54-24238	43–45	Chloroform	4/24/2007	57000
54-24238	43–45	Cyclohexane	4/24/2007	66000
54-24238	43–45	Dichloroethane[1,1-]	4/24/2007	72000
54-24238	43–45	Dichloroethane[1,2-]	4/24/2007	64000
54-24238	43–45	Dichloroethene[1,1-]	4/24/2007	160000
54-24238	43–45	Dichloropropane[1,2-]	4/24/2007	430000
54-24238	43–45	Methylene Chloride	4/24/2007	25000
54-24238	43–45	Tetrachloroethene	4/24/2007	92000
54-24238	43–45	Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/24/2007	1000000
54-24238	43–45	Trichloroethane[1,1,1-]	4/24/2007	3600000
54-24238	43–45	Trichloroethene	4/24/2007	840000
54-24238	43–45	Trichlorofluoromethane	4/24/2007	34000
54-24238	63–65	Chloroform	2/22/2007	58000
54-24238	63–65	Cyclohexane	2/22/2007	69000
54-24238	63–65	Dichloroethane[1,1-]	2/22/2007	68000
54-24238	63–65	Dichloroethane[1,2-]	2/22/2007	72000
54-24238	63–65	Dichloroethene[1,1-]	2/22/2007	130000
54-24238	63–65	Dichloropropane[1,2-]	2/22/2007	510000
54-24238	63–65	Methylene Chloride	2/22/2007	300000
54-24238	63–65	Tetrachloroethene	2/22/2007	60000
54-24238	63–65	Tetrahydrofuran	2/22/2007	14000
54-24238	63–65	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/22/2007	820000
54-24238	63–65	Trichloroethane[1,1,1-]	2/22/2007	3500000
54-24238	63–65	Trichloroethene	2/22/2007	760000
54-24238	63–65	Trichlorofluoromethane	2/22/2007	43000
54-24238	83–85	Chloroform	2/22/2007	55000
54-24238	83–85	Cyclohexane	2/22/2007	60000
54-24238	83–85	Dichloroethane[1,1-]	2/22/2007	58000
54-24238	83–85	Dichloroethane[1,2-]	2/22/2007	68000
54-24238	83–85	Dichloroethene[1,1-]	2/22/2007	130000
54-24238	83–85	Dichloropropane[1,2-]	2/22/2007	430000
54-24238	83–85	Methylene Chloride	2/22/2007	120000
54-24238	83–85	Tetrachloroethene	2/22/2007	56000
54-24238	83–85	Tetrahydrofuran	2/22/2007	14000
54-24238	83–85	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/22/2007	700000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-24238	83–85	Trichloroethane[1,1,1-]	2/22/2007	3300000
54-24238	83–85	Trichloroethene	2/22/2007	680000
54-24238	83–85	Trichlorofluoromethane	2/22/2007	42000
54-24239	24–26	Carbon Tetrachloride	4/24/2007	4800
54-24239	24–26	Chloroform	4/24/2007	20000
54-24239	24–26	Cyclohexane	4/24/2007	12000
54-24239	24–26	Dichloroethane[1,1-]	4/24/2007	16000
54-24239	24–26	Dichloroethane[1,2-]	4/24/2007	7800
54-24239	24–26	Dichloroethene[1,1-]	4/24/2007	38000
54-24239	24–26	Dichloropropane[1,2-]	4/24/2007	9400
54-24239	24–26	Tetrachloroethene	4/24/2007	280000
54-24239	24–26	Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/24/2007	94000
54-24239	24–26	Trichloroethane[1,1,1-]	4/24/2007	860000
54-24239	24–26	Trichloroethene	4/24/2007	220000
54-24239	24–26	Trichlorofluoromethane	4/24/2007	6500
54-24239	74–76	Acetone	2/22/2007	8800
54-24239	74–76	Carbon Disulfide	2/22/2007	4400
54-24239	74–76	Carbon Tetrachloride	2/22/2007	5300
54-24239	74–76	Chloroform	2/22/2007	22000
54-24239	74–76	Cyclohexane	2/22/2007	19000
54-24239	74–76	Dichloroethane[1,1-]	2/22/2007	20000
54-24239	74–76	Dichloroethane[1,2-]	2/22/2007	14000
54-24239	74–76	Dichloroethene[1,1-]	2/22/2007	54000
54-24239	74–76	Dichloropropane[1,2-]	2/22/2007	12000
54-24239	74–76	Methylene Chloride	2/22/2007	3400
54-24239	74–76	Tetrachloroethene	2/22/2007	220000
54-24239	74–76	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/22/2007	110000
54-24239	74–76	Trichloroethane[1,1,1-]	2/22/2007	1100000
54-24239	74–76	Trichloroethene	2/22/2007	250000
54-24239	74–76	Trichlorofluoromethane	2/22/2007	11000
54-24239	98.5–100.5	Acetone	2/22/2007	10000
54-24239	98.5–100.5	Carbon Disulfide	2/22/2007	4300
54-24239	98.5–100.5	Chloroform	2/22/2007	23000
54-24239	98.5–100.5	Cyclohexane	2/22/2007	20000
54-24239	98.5–100.5	Dichloroethane[1,1-]	2/22/2007	22000
54-24239	98.5–100.5	Dichloroethane[1,2-]	2/22/2007	15000
54-24239	98.5–100.5	Dichloroethene[1,1-]	2/22/2007	58000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-24239	98.5–100.5	Dichloropropane[1,2-]	2/22/2007	9800
54-24239	98.5–100.5	Methylene Chloride	2/22/2007	4200
54-24239	98.5–100.5	Propanol[2-]	2/22/2007	19000
54-24239	98.5–100.5	Tetrachloroethene	2/22/2007	220000
54-24239	98.5–100.5	Toluene	2/22/2007	4500
54-24239	98.5–100.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/22/2007	120000
54-24239	98.5–100.5	Trichloroethane[1,1,1-]	2/22/2007	1100000
54-24239	98.5–100.5	Trichloroethene	2/22/2007	270000
54-24239	98.5–100.5	Trichlorofluoromethane	2/22/2007	12000
54-24240	27–29	Cyclohexane	2/22/2007	79000
54-24240	27–29	Dichlorodifluoromethane	2/22/2007	65000
54-24240	27–29	Dichloroethane[1,1-]	2/22/2007	110000
54-24240	27–29	Dichloroethane[1,2-]	2/22/2007	310000
54-24240	27–29	Dichloroethene[1,1-]	2/22/2007	77000
54-24240	27–29	Methylene Chloride	2/22/2007	79000
54-24240	27–29	Tetrachloroethene	2/22/2007	310000
54-24240	27–29	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/22/2007	66000
54-24240	27–29	Trichloroethane[1,1,1-]	2/22/2007	4900000
54-24240	27–29	Trichloroethene	2/22/2007	740000
54-24240	52–54	Acetone	4/24/2007	18000
54-24240	52–54	Carbon Disulfide	4/24/2007	9900
54-24240	52–54	Chloroform	4/24/2007	11000
54-24240	52–54	Cyclohexane	4/24/2007	19000
54-24240	52–54	Dichlorodifluoromethane	4/24/2007	7000
54-24240	52–54	Dichloroethane[1,1-]	4/24/2007	31000
54-24240	52–54	Dichloroethane[1,2-]	4/24/2007	84000
54-24240	52–54	Dichloroethene[1,1-]	4/24/2007	54000
54-24240	52–54	Methylene Chloride	4/24/2007	42000
54-24240	52–54	Tetrachloroethene	4/24/2007	99000
54-24240	52–54	Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/24/2007	36000
54-24240	52–54	Trichloroethane[1,1,1-]	4/24/2007	1300000
54-24240	52–54	Trichloroethene	4/24/2007	280000
54-24240	152–154	Acetone	2/22/2007	22000
54-24240	152–154	Butanone[2-]	2/22/2007	6000
54-24240	152–154	Carbon Disulfide	2/22/2007	6200
54-24240	152–154	Chloroform	2/22/2007	11000
54-24240	152–154	Cyclohexane	2/22/2007	35000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-24240	152–154	Dichloroethane[1,1-]	2/22/2007	40000
54-24240	152–154	Dichloroethane[1,2-]	2/22/2007	59000
54-24240	152–154	Dichloroethene[1,1-]	2/22/2007	51000
54-24240	152–154	Methylene Chloride	2/22/2007	24000
54-24240	152–154	Tetrachloroethene	2/22/2007	68000
54-24240	152–154	Toluene	2/22/2007	18000
54-24240	152–154	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/22/2007	44000
54-24240	152–154	Trichloroethane[1,1,1-]	2/22/2007	2000000
54-24240	152–154	Trichloroethene	2/22/2007	350000
54-24242	24–26	Carbon Tetrachloride	4/24/2007	3800
54-24242	24–26	Chloroform	4/24/2007	14000
54-24242	24–26	Cyclohexane	4/24/2007	8000
54-24242	24–26	Dichloroethane[1,1-]	4/24/2007	11000
54-24242	24–26	Dichloroethane[1,2-]	4/24/2007	5000
54-24242	24–26	Dichloroethene[1,1-]	4/24/2007	22000
54-24242	24–26	Dichloropropane[1,2-]	4/24/2007	8100
54-24242	24–26	Tetrachloroethene	4/24/2007	490000
54-24242	24–26	Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/24/2007	61000
54-24242	24–26	Trichloroethane[1,1,1-]	4/24/2007	560000
54-24242	24–26	Trichloroethene	4/24/2007	190000
54-24242	24–26	Trichlorofluoromethane	4/24/2007	4100
54-24242	49–51	Chloroform	2/22/2007	28000
54-24242	49–51	Cyclohexane	2/22/2007	24000
54-24242	49–51	Dichloroethane[1,1-]	2/22/2007	22000
54-24242	49–51	Dichloroethane[1,2-]	2/22/2007	20000
54-24242	49–51	Dichloroethene[1,1-]	2/22/2007	54000
54-24242	49–51	Dichloropropane[1,2-]	2/22/2007	14000
54-24242	49–51	Methylene Chloride	2/22/2007	14000
54-24242	49–51	Tetrachloroethene	2/22/2007	400000
54-24242	49–51	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/22/2007	140000
54-24242	49–51	Trichloroethane[1,1,1-]	2/22/2007	1400000
54-24242	49–51	Trichloroethene	2/22/2007	320000
54-24242	49–51	Trichlorofluoromethane	2/22/2007	13000
54-24242	109.5–111.5	Chloroform	2/22/2007	28000
54-24242	109.5–111.5	Cyclohexane	2/22/2007	24000
54-24242	109.5–111.5	Dichloroethane[1,1-]	2/22/2007	23000
54-24242	109.5–111.5	Dichloroethane[1,2-]	2/22/2007	23000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-24242	109.5–111.5	Dichloroethene[1,1-]	2/22/2007	54000
54-24242	109.5–111.5	Dichloropropane[1,2-]	2/22/2007	14000
54-24242	109.5–111.5	Methylene Chloride	2/22/2007	11000
54-24242	109.5–111.5	Tetrachloroethene	2/22/2007	390000
54-24242	109.5–111.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/22/2007	130000
54-24242	109.5–111.5	Trichloroethane[1,1,1-]	2/22/2007	1300000
54-24242	109.5–111.5	Trichloroethene	2/22/2007	340000
54-24242	109.5–111.5	Trichlorofluoromethane	2/22/2007	12000
54-24243	24–26	Carbon Tetrachloride	4/24/2007	5100
54-24243	24–26	Chloroform	4/24/2007	19000
54-24243	24–26	Cyclohexane	4/24/2007	14000
54-24243	24–26	Dichloroethane[1,1-]	4/24/2007	19000
54-24243	24–26	Dichloroethane[1,2-]	4/24/2007	4400
54-24243	24–26	Dichloroethene[1,1-]	4/24/2007	29000
54-24243	24–26	Dichloropropane[1,2-]	4/24/2007	38000
54-24243	24–26	Tetrachloroethene	4/24/2007	30000
54-24243	24–26	Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/24/2007	280000
54-24243	24–26	Trichloroethane[1,1,1-]	4/24/2007	1000000
54-24243	24–26	Trichloroethene	4/24/2007	230000
54-24243	24–26	Trichlorofluoromethane	4/24/2007	10000
54-24243	49–51	Chloroform	2/27/2007	33000
54-24243	49–51	Cyclohexane	2/27/2007	30000
54-24243	49–51	Dichloroethane[1,1-]	2/27/2007	32000
54-24243	49–51	Dichloroethane[1,2-]	2/27/2007	8700
54-24243	49–51	Dichloroethene[1,1-]	2/27/2007	67000
54-24243	49–51	Dichloropropane[1,2-]	2/27/2007	110000
54-24243	49–51	Tetrachloroethene	2/27/2007	31000
54-24243	49–51	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/27/2007	440000
54-24243	49–51	Trichloroethane[1,1,1-]	2/27/2007	1700000
54-24243	49–51	Trichloroethene	2/27/2007	400000
54-24243	49–51	Trichlorofluoromethane	2/27/2007	20000
54-24243	74–76	Acetone	2/27/2007	22000
54-24243	74–76	Carbon Disulfide	2/27/2007	21000
54-24243	74–76	Chloroform	2/27/2007	32000
54-24243	74–76	Cyclohexane	2/27/2007	32000
54-24243	74–76	Dichloroethane[1,1-]	2/27/2007	28000
54-24243	74–76	Dichloroethane[1,2-]	2/27/2007	18000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-24243	74–76	Dichloroethene[1,1-]	2/27/2007	55000
54-24243	74–76	Dichloropropane[1,2-]	2/27/2007	120000
54-24243	74–76	Hexane	2/27/2007	12000
54-24243	74–76	Methylene Chloride	2/27/2007	29000
54-24243	74–76	Propanol[2-]	2/27/2007	19000
54-24243	74–76	Tetrachloroethene	2/27/2007	28000
54-24243	74–76	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/27/2007	360000
54-24243	74–76	Trichloroethane[1,1,1-]	2/27/2007	1700000
54-24243	74–76	Trichloroethene	2/27/2007	360000
54-24243	74–76	Trichlorofluoromethane	2/27/2007	22000
54-24243	124–126	Acetone	2/27/2007	14000
54-24243	124–126	Benzene	2/27/2007	3400
54-24243	124–126	Chloroform	2/27/2007	34000
54-24243	124–126	Cyclohexane	2/27/2007	26000
54-24243	124–126	Dichloroethane[1,1-]	2/27/2007	20000
54-24243	124–126	Dichloroethane[1,2-]	2/27/2007	34000
54-24243	124–126	Dichloroethene[1,1-]	2/27/2007	70000
54-24243	124–126	Dichloropropane[1,2-]	2/27/2007	60000
54-24243	124–126	Methylene Chloride	2/27/2007	66000
54-24243	124–126	Propanol[2-]	2/27/2007	68000
54-24243	124–126	Tetrachloroethene	2/27/2007	32000
54-24243	124–126	Toluene	2/27/2007	4800
54-24243	124–126	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2/27/2007	270000
54-24243	124–126	Trichloroethane[1,1,1-]	2/27/2007	1500000
54-24243	124–126	Trichloroethene	2/27/2007	330000
54-24243	124–126	Trichlorofluoromethane	2/27/2007	32000
54-24244	24–26	Carbon Tetrachloride	4/24/2007	3800
54-24244	24–26	Chloroform	4/24/2007	15000
54-24244	24–26	Cyclohexane	4/24/2007	8500
54-24244	24–26	Dichloroethane[1,1-]	4/24/2007	7100
54-24244	24–26	Dichloroethane[1,2-]	4/24/2007	9000
54-24244	24–26	Dichloroethene[1,1-]	4/24/2007	20000
54-24244	24–26	Dichloropropane[1,2-]	4/24/2007	29000
54-24244	24–26	Methylene Chloride	4/24/2007	9000
54-24244	24–26	Tetrachloroethene	4/24/2007	28000
54-24244	24–26	Tetrahydrofuran	4/24/2007	8200
54-24244	24–26	Toluene	4/24/2007	2900

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-24244	24–26	Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/24/2007	98000
54-24244	24–26	Trichloroethane[1,1,1-]	4/24/2007	620000
54-24244	24–26	Trichloroethene	4/24/2007	110000
54-24244	24–26	Trichlorofluoromethane	4/24/2007	14000
54-24244	74–76	Carbon Disulfide	3/1/2007	2300
54-24244	74–76	Chloroform	3/1/2007	21000
54-24244	74–76	Cyclohexane	3/1/2007	13000
54-24244	74–76	Dichloroethane[1,1-]	3/1/2007	10000
54-24244	74–76	Dichloroethane[1,2-]	3/1/2007	14000
54-24244	74–76	Dichloroethene[1,1-]	3/1/2007	26000
54-24244	74–76	Dichloropropane[1,2-]	3/1/2007	37000
54-24244	74–76	Methylene Chloride	3/1/2007	24000
54-24244	74–76	Tetrachloroethene	3/1/2007	18000
54-24244	74–76	Tetrahydrofuran	3/1/2007	33000
54-24244	74–76	Toluene	3/1/2007	3900
54-24244	74–76	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/1/2007	120000
54-24244	74–76	Trichloroethane[1,1,1-]	3/1/2007	760000
54-24244	74–76	Trichloroethene	3/1/2007	120000
54-24244	74–76	Trichlorofluoromethane	3/1/2007	22000
54-24244	99–101	Acetone	3/1/2007	7400
54-24244	99–101	Carbon Disulfide	3/1/2007	2200
54-24244	99–101	Chloroform	3/1/2007	19000
54-24244	99–101	Cyclohexane	3/1/2007	13000
54-24244	99–101	Dichloroethane[1,1-]	3/1/2007	10000
54-24244	99–101	Dichloroethane[1,2-]	3/1/2007	14000
54-24244	99–101	Dichloroethene[1,1-]	3/1/2007	28000
54-24244	99–101	Dichloropropane[1,2-]	3/1/2007	31000
54-24244	99–101	Methylene Chloride	3/1/2007	22000
54-24244	99–101	Tetrachloroethene	3/1/2007	16000
54-24244	99–101	Tetrahydrofuran	3/1/2007	18000
54-24244	99–101	Toluene	3/1/2007	4500
54-24244	99–101	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/1/2007	130000
54-24244	99–101	Trichloroethane[1,1,1-]	3/1/2007	730000
54-24244	99–101	Trichloroethene	3/1/2007	120000
54-24244	99–101	Trichlorofluoromethane	3/1/2007	26000
54-24244	117.5–119.5	Chloroform	4/24/2007	9500
54-24244	117.5–119.5	Cyclohexane	4/24/2007	5300

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-24244	117.5–119.5	Dichloroethane[1,1-]	4/24/2007	4500
54-24244	117.5–119.5	Dichloroethane[1,2-]	4/24/2007	5900
54-24244	117.5–119.5	Dichloroethene[1,1-]	4/24/2007	13000
54-24244	117.5–119.5	Dichloropropane[1,2-]	4/24/2007	19000
54-24244	117.5–119.5	Methylene Chloride	4/24/2007	6000
54-24244	117.5–119.5	Tetrachloroethene	4/24/2007	18000
54-24244	117.5–119.5	Tetrahydrofuran	4/24/2007	6800
54-24244	117.5–119.5	Toluene	4/24/2007	2200
54-24244	117.5–119.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/24/2007	62000
54-24244	117.5–119.5	Trichloroethane[1,1,1-]	4/24/2007	390000
54-24244	117.5–119.5	Trichloroethene	4/24/2007	71000
54-24244	117.5–119.5	Trichlorofluoromethane	4/24/2007	8800
54-24399	550–608	Carbon Tetrachloride	3/26/2007	32
54-24399	550–608	Chloroform	3/26/2007	86
54-24399	550–608	Cyclohexane	3/26/2007	93
54-24399	550–608	Dichlorodifluoromethane	3/26/2007	30
54-24399	550–608	Dichloroethane[1,1-]	3/26/2007	110
54-24399	550–608	Dichloroethane[1,2-]	3/26/2007	37
54-24399	550–608	Dichloroethene[1,1-]	3/26/2007	290
54-24399	550–608	Dichloropropane[1,2-]	3/26/2007	44
54-24399	550–608	Methylene Chloride	3/26/2007	43
54-24399	550–608	Tetrachloroethene	3/26/2007	500
54-24399	550–608	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/26/2007	730
54-24399	550–608	Trichloroethane[1,1,1-]	3/26/2007	4400
54-24399	550–608	Trichloroethene	3/26/2007	1100
54-24399	550–608	Trichlorofluoromethane	3/26/2007	62
54-27641	30–34	Acetone	3/1/2007	47000
54-27641	30–34	Butanone[2-]	3/1/2007	7900
54-27641	30–34	Carbon Disulfide	3/1/2007	14000
54-27641	30–34	Cyclohexane	3/1/2007	38000
54-27641	30–34	Dichlorodifluoromethane	3/1/2007	9600
54-27641	30–34	Dichloroethane[1,1-]	3/1/2007	81000
54-27641	30–34	Dichloroethane[1,2-]	3/1/2007	84000
54-27641	30–34	Dichloroethene[1,1-]	3/1/2007	34000
54-27641	30–34	Ethanol	3/1/2007	15000
54-27641	30–34	Hexane	3/1/2007	6300
54-27641	30–34	Methylene Chloride	3/1/2007	120000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-27641	30–34	Propanol[2-]	3/1/2007	190000
54-27641	30–34	Tetrachloroethene	3/1/2007	66000
54-27641	30–34	Toluene	3/1/2007	11000
54-27641	30–34	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/1/2007	35000
54-27641	30–34	Trichloroethane[1,1,1-]	3/1/2007	2100000
54-27641	30–34	Trichloroethene	3/1/2007	290000
54-27641	80–84	Carbon Disulfide	3/1/2007	8500
54-27641	80–84	Cyclohexane	3/1/2007	27000
54-27641	80–84	Dichloroethane[1,1-]	3/1/2007	32000
54-27641	80–84	Dichloroethane[1,2-]	3/1/2007	65000
54-27641	80–84	Dichloroethene[1,1-]	3/1/2007	36000
54-27641	80–84	Methylene Chloride	3/1/2007	94000
54-27641	80–84	Tetrachloroethene	3/1/2007	67000
54-27641	80–84	Toluene	3/1/2007	5300
54-27641	80–84	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/1/2007	24000
54-27641	80–84	Trichloroethane[1,1,1-]	3/1/2007	1300000
54-27641	80–84	Trichloroethene	3/1/2007	170000
54-27641	110–114	Carbon Disulfide	3/1/2007	7300
54-27641	110–114	Chloroform	3/1/2007	7000
54-27641	110–114	Cyclohexane	3/1/2007	30000
54-27641	110–114	Dichloroethane[1,1-]	3/1/2007	34000
54-27641	110–114	Dichloroethane[1,2-]	3/1/2007	65000
54-27641	110–114	Dichloroethene[1,1-]	3/1/2007	46000
54-27641	110–114	Hexane	3/1/2007	4600
54-27641	110–114	Methylene Chloride	3/1/2007	81000
54-27641	110–114	Tetrachloroethene	3/1/2007	42000
54-27641	110–114	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/1/2007	30000
54-27641	110–114	Trichloroethane[1,1,1-]	3/1/2007	1600000
54-27641	110–114	Trichloroethene	3/1/2007	220000
54-27641	180–185	Acetone	3/1/2007	17000
54-27641	180–185	Carbon Disulfide	3/1/2007	9100
54-27641	180–185	Cyclohexane	3/1/2007	19000
54-27641	180–185	Dichlorodifluoromethane	3/1/2007	5800
54-27641	180–185	Dichloroethane[1,1-]	3/1/2007	17000
54-27641	180–185	Dichloroethane[1,2-]	3/1/2007	11000
54-27641	180–185	Dichloroethene[1,1-]	3/1/2007	40000
54-27641	180–185	Ethanol	3/1/2007	8000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-27641	180–185	Hexane	3/1/2007	4300
54-27641	180–185	Methylene Chloride	3/1/2007	43000
54-27641	180–185	Tetrachloroethene	3/1/2007	87000
54-27641	180–185	Toluene	3/1/2007	3700
54-27641	180–185	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/1/2007	28000
54-27641	180–185	Trichloroethane[1,1,1-]	3/1/2007	990000
54-27641	180–185	Trichloroethene	3/1/2007	160000
54-27641	180–185	Trichlorofluoromethane	3/1/2007	6200
54-27641	230–235	Carbon Disulfide	3/1/2007	990
54-27641	230–235	Chloroform	3/1/2007	1900
54-27641	230–235	Cyclohexane	3/1/2007	8100
54-27641	230–235	Dichlorodifluoromethane	3/1/2007	4000
54-27641	230–235	Dichloroethane[1,1-]	3/1/2007	6400
54-27641	230–235	Dichloroethane[1,2-]	3/1/2007	1100
54-27641	230–235	Dichloroethene[1,1-]	3/1/2007	26000
54-27641	230–235	Methylene Chloride	3/1/2007	10000
54-27641	230–235	Propanol[2-]	3/1/2007	3500
54-27641	230–235	Tetrachloroethene	3/1/2007	7100
54-27641	230–235	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/1/2007	23000
54-27641	230–235	Trichloroethane[1,1,1-]	3/1/2007	420000
54-27641	230–235	Trichloroethene	3/1/2007	79000
54-27641	230–235	Trichlorofluoromethane	3/1/2007	4500
54-27641	269–273	Carbon Tetrachloride	3/1/2007	620
54-27641	269–273	Chloroform	3/1/2007	560
54-27641	269–273	Cyclohexane	3/1/2007	2500
54-27641	269–273	Dichlorodifluoromethane	3/1/2007	1900
54-27641	269–273	Dichloroethane[1,1-]	3/1/2007	1600
54-27641	269–273	Dichloroethene[1,1-]	3/1/2007	13000
54-27641	269–273	Methylene Chloride	3/1/2007	1700
54-27641	269–273	Tetrachloroethene	3/1/2007	5000
54-27641	269–273	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/1/2007	14000
54-27641	269–273	Trichloroethane[1,1,1-]	3/1/2007	120000
54-27641	269–273	Trichloroethene	3/1/2007	31000
54-27641	269–273	Trichlorofluoromethane	3/1/2007	2400
54-27641	330–335	Carbon Tetrachloride	3/1/2007	170
54-27641	330–335	Chloroform	3/1/2007	59
54-27641	330–335	Cyclohexane	3/1/2007	330

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-27641	330–335	Dichlorodifluoromethane	3/1/2007	460
54-27641	330–335	Dichloroethane[1,1-]	3/1/2007	120
54-27641	330–335	Dichloroethane[1,2-]	3/1/2007	34
54-27641	330–335	Dichloroethene[1,1-]	3/1/2007	3000
54-27641	330–335	Hexane	3/1/2007	56
54-27641	330–335	Methylene Chloride	3/1/2007	110
54-27641	330–335	Tetrachloroethene	3/1/2007	800
54-27641	330–335	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/1/2007	5000
54-27641	330–335	Trichloroethane[1,1,1-]	3/1/2007	14000
54-27641	330–335	Trichloroethene	3/1/2007	4500
54-27641	330–335	Trichlorofluoromethane	3/1/2007	940
54-27642	27.5–32.5	Chloroform	3/6/2007	31000
54-27642	27.5–32.5	Dichloroethane[1,1-]	3/6/2007	33000
54-27642	27.5–32.5	Dichloroethane[1,2-]	3/6/2007	12000 (J+)*
54-27642	27.5–32.5	Dichloroethene[1,1-]	3/6/2007	81000
54-27642	27.5–32.5	Dichloropropane[1,2-]	3/6/2007	89000
54-27642	27.5–32.5	Tetrachloroethene	3/6/2007	46000
54-27642	27.5–32.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/6/2007	270000
54-27642	27.5–32.5	Trichloroethane[1,1,1-]	3/6/2007	2300000
54-27642	27.5–32.5	Trichloroethene	3/6/2007	280000
54-27642	27.5–32.5	Trichlorofluoromethane	3/6/2007	18000
54-27642	72.5–77.5	Acetone	3/6/2007	17000
54-27642	72.5–77.5	Carbon Disulfide	3/6/2007	11000
54-27642	72.5–77.5	Chloroform	3/6/2007	43000
54-27642	72.5–77.5	Dichloroethane[1,1-]	3/6/2007	26000
54-27642	72.5–77.5	Dichloroethane[1,2-]	3/6/2007	39000 (J+)
54-27642	72.5–77.5	Dichloroethene[1,1-]	3/6/2007	96000
54-27642	72.5–77.5	Dichloropropane[1,2-]	3/6/2007	78000
54-27642	72.5–77.5	Methylene Chloride	3/6/2007	140000
54-27642	72.5–77.5	Tetrachloroethene	3/6/2007	36000
54-27642	72.5–77.5	Tetrahydrofuran	3/6/2007	15000
54-27642	72.5–77.5	Toluene	3/6/2007	21000
54-27642	72.5–77.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/6/2007	340000
54-27642	72.5–77.5	Trichloroethane[1,1,1-]	3/6/2007	2000000
54-27642	72.5–77.5	Trichloroethene	3/6/2007	350000
54-27642	72.5–77.5	Trichlorofluoromethane	3/6/2007	52000
54-27642	113.5–118.5	Carbon Disulfide	3/6/2007	16000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-27642	113.5–118.5	Chloroform	3/6/2007	44000
54-27642	113.5–118.5	Dichloroethane[1,1-]	3/6/2007	36000
54-27642	113.5–118.5	Dichloroethane[1,2-]	3/6/2007	37000 (J+)
54-27642	113.5–118.5	Dichloroethene[1,1-]	3/6/2007	96000
54-27642	113.5–118.5	Dichloropropane[1,2-]	3/6/2007	130000
54-27642	113.5–118.5	Methylene Chloride	3/6/2007	140000
54-27642	113.5–118.5	Tetrachloroethene	3/6/2007	39000
54-27642	113.5–118.5	Tetrahydrofuran	3/6/2007	24000
54-27642	113.5–118.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/6/2007	440000
54-27642	113.5–118.5	Trichloroethane[1,1,1-]	3/6/2007	2600000
54-27642	113.5–118.5	Trichloroethene	3/6/2007	370000
54-27642	113.5–118.5	Trichlorofluoromethane	3/6/2007	40000
54-27642	172.5–177.5	Acetone	3/6/2007	18000
54-27642	172.5–177.5	Benzene	3/6/2007	4900
54-27642	172.5–177.5	Butanone[2-]	3/6/2007	3800
54-27642	172.5–177.5	Carbon Disulfide	3/6/2007	12000
54-27642	172.5–177.5	Carbon Tetrachloride	3/6/2007	7900
54-27642	172.5–177.5	Chloroform	3/6/2007	35000
54-27642	172.5–177.5	Dichloroethane[1,1-]	3/6/2007	12000
54-27642	172.5–177.5	Dichloroethane[1,2-]	3/6/2007	19000 (J+)
54-27642	172.5–177.5	Dichloroethene[1,1-]	3/6/2007	88000
54-27642	172.5–177.5	Dichloropropane[1,2-]	3/6/2007	33000
54-27642	172.5–177.5	Hexane	3/6/2007	5500
54-27642	172.5–177.5	Methylene Chloride	3/6/2007	120000
54-27642	172.5–177.5	Tetrachloroethene	3/6/2007	25000
54-27642	172.5–177.5	Toluene	3/6/2007	30000
54-27642	172.5–177.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/6/2007	270000
54-27642	172.5–177.5	Trichloroethane[1,1,1-]	3/6/2007	1200000
54-27642	172.5–177.5	Trichloroethene	3/6/2007	280000
54-27642	172.5–177.5	Trichlorofluoromethane	3/6/2007	49000
54-27642	172.5–177.5	Xylene[1,3-]+Xylene[1,4-]	3/6/2007	5600
54-27642	232–237.5	Benzene	3/6/2007	2700
54-27642	232–237.5	Carbon Tetrachloride	3/6/2007	4700
54-27642	232–237.5	Chloroform	3/6/2007	17000
54-27642	232–237.5	Dichlorodifluoromethane	3/6/2007	3600
54-27642	232–237.5	Dichloroethane[1,1-]	3/6/2007	5000
54-27642	232–237.5	Dichloroethane[1,2-]	3/6/2007	2200

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-27642	232–237.5	Dichloroethene[1,1-]	3/6/2007	71000
54-27642	232–237.5	Dichloropropane[1,2-]	3/6/2007	6800
54-27642	232–237.5	Hexane	3/6/2007	3400
54-27642	232–237.5	Methylene Chloride	3/6/2007	53000
54-27642	232–237.5	Tetrachloroethene	3/6/2007	10000
54-27642	232–237.5	Toluene	3/6/2007	16000
54-27642	232–237.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/6/2007	230000
54-27642	232–237.5	Trichloroethane[1,1,1-]	3/6/2007	580000
54-27642	232–237.5	Trichloroethene	3/6/2007	140000
54-27642	232–237.5	Trichlorofluoromethane	3/6/2007	31000
54-27642	272–277.5	Benzene	3/6/2007	1800
54-27642	272–277.5	Carbon Tetrachloride	3/6/2007	3400
54-27642	272–277.5	Chloroform	3/6/2007	7700
54-27642	272–277.5	Dichlorodifluoromethane	3/6/2007	2500
54-27642	272–277.5	Dichloroethane[1,1-]	3/6/2007	2000
54-27642	272–277.5	Dichloroethene[1,1-]	3/6/2007	48000
54-27642	272–277.5	Dichloropropane[1,2-]	3/6/2007	2100
54-27642	272–277.5	Hexane	3/6/2007	2400
54-27642	272–277.5	Methylene Chloride	3/6/2007	22000
54-27642	272–277.5	Tetrachloroethene	3/6/2007	7900
54-27642	272–277.5	Toluene	3/6/2007	11000
54-27642	272–277.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/6/2007	97000
54-27642	272–277.5	Trichloroethane[1,1,1-]	3/6/2007	260000
54-27642	272–277.5	Trichloroethene	3/6/2007	95000
54-27642	272–277.5	Trichlorofluoromethane	3/6/2007	14000
54-27642	335–341	Benzene	3/6/2007	540
54-27642	335–341	Carbon Tetrachloride	3/6/2007	1600
54-27642	335–341	Chloroform	3/6/2007	1800
54-27642	335–341	Dichlorodifluoromethane	3/6/2007	1500
54-27642	335–341	Dichloroethane[1,1-]	3/6/2007	480
54-27642	335–341	Dichloroethene[1,1-]	3/6/2007	21000
54-27642	335–341	Hexane	3/6/2007	1400
54-27642	335–341	Methylene Chloride	3/6/2007	4000
54-27642	335–341	Tetrachloroethene	3/6/2007	2400
54-27642	335–341	Toluene	3/6/2007	2400
54-27642	335–341	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/6/2007	43000
54-27642	335–341	Trichloroethane[1,1,1-]	3/6/2007	82000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-27642	335–341	Trichloroethene	3/6/2007	31000
54-27642	335–341	Trichlorofluoromethane	3/6/2007	5600
54-27643	27.5–32.5	Carbon Disulfide	3/13/2007	2000
54-27643	27.5–32.5	Carbon Tetrachloride	3/13/2007	1700
54-27643	27.5–32.5	Chloroform	3/13/2007	8600
54-27643	27.5–32.5	Cyclohexane	3/13/2007	5800
54-27643	27.5–32.5	Dichloroethane[1,1-]	3/13/2007	4200
54-27643	27.5–32.5	Dichloroethane[1,2-]	3/13/2007	2900
54-27643	27.5–32.5	Dichloroethene[1,1-]	3/13/2007	9900
54-27643	27.5–32.5	Dichloropropane[1,2-]	3/13/2007	15000
54-27643	27.5–32.5	Methylene Chloride	3/13/2007	1900
54-27643	27.5–32.5	Propanol[2-]	3/13/2007	2800
54-27643	27.5–32.5	Tetrachloroethene	3/13/2007	11000
54-27643	27.5–32.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/13/2007	53000
54-27643	27.5–32.5	Trichloroethane[1,1,1-]	3/13/2007	320000
54-27643	27.5–32.5	Trichloroethene	3/13/2007	55000
54-27643	27.5–32.5	Trichlorofluoromethane	3/13/2007	8500
54-27643	71.5–76.5	Carbon Disulfide	3/13/2007	1700
54-27643	71.5–76.5	Chloroform	3/13/2007	14000
54-27643	71.5–76.5	Dichloroethane[1,1-]	3/13/2007	6800
54-27643	71.5–76.5	Dichloroethane[1,2-]	3/13/2007	7800
54-27643	71.5–76.5	Dichloroethene[1,1-]	3/13/2007	21000
54-27643	71.5–76.5	Dichloropropane[1,2-]	3/13/2007	23000
54-27643	71.5–76.5	Methylene Chloride	3/13/2007	16000
54-27643	71.5–76.5	Tetrachloroethene	3/13/2007	14000
54-27643	71.5–76.5	Tetrahydrofuran	3/13/2007	12000
54-27643	71.5–76.5	Toluene	3/13/2007	2000
54-27643	71.5–76.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/13/2007	93000
54-27643	71.5–76.5	Trichloroethane[1,1,1-]	3/13/2007	500000
54-27643	71.5–76.5	Trichloroethene	3/13/2007	87000
54-27643	71.5–76.5	Trichlorofluoromethane	3/13/2007	15000
54-27643	114.5–119.5	Benzene	3/13/2007	1500
54-27643	114.5–119.5	Carbon Disulfide	3/13/2007	1200
54-27643	114.5–119.5	Carbon Tetrachloride	3/13/2007	2700
54-27643	114.5–119.5	Chloroform	3/13/2007	17000
54-27643	114.5–119.5	Dichloroethane[1,1-]	3/13/2007	6900
54-27643	114.5–119.5	Dichloroethane[1,2-]	3/13/2007	11000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-27643	114.5–119.5	Dichloroethene[1,1-]	3/13/2007	26000
54-27643	114.5–119.5	Dichloropropane[1,2-]	3/13/2007	22000
54-27643	114.5–119.5	Methylene Chloride	3/13/2007	34000
54-27643	114.5–119.5	Tetrachloroethene	3/13/2007	13000
54-27643	114.5–119.5	Tetrahydrofuran	3/13/2007	2800
54-27643	114.5–119.5	Toluene	3/13/2007	6100
54-27643	114.5–119.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/13/2007	120000
54-27643	114.5–119.5	Trichloroethane[1,1,1-]	3/13/2007	570000
54-27643	114.5–119.5	Trichloroethene	3/13/2007	100000
54-27643	114.5–119.5	Trichlorofluoromethane	3/13/2007	21000
54-27643	164–170	Benzene	3/13/2007	1900
54-27643	164–170	Carbon Disulfide	3/13/2007	1300
54-27643	164–170	Carbon Tetrachloride	3/13/2007	2400
54-27643	164–170	Chloroform	3/13/2007	16000
54-27643	164–170	Dichlorodifluoromethane	3/13/2007	2000
54-27643	164–170	Dichloroethane[1,1-]	3/13/2007	5000
54-27643	164–170	Dichloroethane[1,2-]	3/13/2007	6800
54-27643	164–170	Dichloroethene[1,1-]	3/13/2007	35000
54-27643	164–170	Dichloropropane[1,2-]	3/13/2007	13000
54-27643	164–170	Hexane	3/13/2007	1200
54-27643	164–170	Methylene Chloride	3/13/2007	46000
54-27643	164–170	Tetrachloroethene	3/13/2007	8200
54-27643	164–170	Toluene	3/13/2007	9700
54-27643	164–170	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/13/2007	140000
54-27643	164–170	Trichloroethane[1,1,1-]	3/13/2007	450000
54-27643	164–170	Trichloroethene	3/13/2007	91000
54-27643	164–170	Trichlorofluoromethane	3/13/2007	22000
54-27643	232.5–237.5	Benzene	3/13/2007	1900
54-27643	232.5–237.5	Carbon Disulfide	3/13/2007	1300
54-27643	232.5–237.5	Carbon Tetrachloride	3/13/2007	3200
54-27643	232.5–237.5	Chloroform	3/13/2007	13000
54-27643	232.5–237.5	Dichlorodifluoromethane	3/13/2007	2200
54-27643	232.5–237.5	Dichloroethane[1,1-]	3/13/2007	3200
54-27643	232.5–237.5	Dichloroethane[1,2-]	3/13/2007	1700
54-27643	232.5–237.5	Dichloroethene[1,1-]	3/13/2007	41000
54-27643	232.5–237.5	Dichloropropane[1,2-]	3/13/2007	5000
54-27643	232.5–237.5	Hexane	3/13/2007	1900

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-27643	232.5–237.5	Methylene Chloride	3/13/2007	39000
54-27643	232.5–237.5	Tetrachloroethene	3/13/2007	6200
54-27643	232.5–237.5	Toluene	3/13/2007	10000
54-27643	232.5–237.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/13/2007	150000
54-27643	232.5–237.5	Trichloroethane[1,1,1-]	3/13/2007	340000
54-27643	232.5–237.5	Trichloroethene	3/13/2007	84000
54-27643	232.5–237.5	Trichlorofluoromethane	3/13/2007	19000
54-27643	272.5–278.5	Benzene	3/13/2007	1800
54-27643	272.5–278.5	Carbon Tetrachloride	3/13/2007	2700
54-27643	272.5–278.5	Chloroform	3/13/2007	8000
54-27643	272.5–278.5	Cyclohexane	3/13/2007	4200
54-27643	272.5–278.5	Dichlorodifluoromethane	3/13/2007	1800
54-27643	272.5–278.5	Dichloroethane[1,1-]	3/13/2007	1800
54-27643	272.5–278.5	Dichloroethene[1,1-]	3/13/2007	34000
54-27643	272.5–278.5	Dichloropropane[1,2-]	3/13/2007	2100
54-27643	272.5–278.5	Hexane	3/13/2007	1600
54-27643	272.5–278.5	Methylene Chloride	3/13/2007	19000
54-27643	272.5–278.5	Tetrachloroethene	3/13/2007	9400
54-27643	272.5–278.5	Toluene	3/13/2007	13000
54-27643	272.5–278.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/13/2007	100000
54-27643	272.5–278.5	Trichloroethane[1,1,1-]	3/13/2007	230000
54-27643	272.5–278.5	Trichloroethene	3/13/2007	81000
54-27643	272.5–278.5	Trichlorofluoromethane	3/13/2007	12000
54-27643	272.5–278.5	Xylene[1,3-]+Xylene[1,4-]	3/13/2007	1100
54-27643	351–356.5	Benzene	3/13/2007	390
54-27643	351–356.5	Carbon Tetrachloride	3/13/2007	1100
54-27643	351–356.5	Chloroform	3/13/2007	820
54-27643	351–356.5	Dichlorodifluoromethane	3/13/2007	1000
54-27643	351–356.5	Dichloroethane[1,1-]	3/13/2007	200
54-27643	351–356.5	Dichloroethene[1,1-]	3/13/2007	14000
54-27643	351–356.5	Hexane	3/13/2007	1000
54-27643	351–356.5	Methylene Chloride	3/13/2007	1400
54-27643	351–356.5	n-Heptane	3/13/2007	150
54-27643	351–356.5	Tetrachloroethene	3/13/2007	1400
54-27643	351–356.5	Toluene	3/13/2007	1200
54-27643	351–356.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/13/2007	35000
54-27643	351–356.5	Trichloroethane[1,1,1-]	3/13/2007	45000

Table 5.0-1 (continued)

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	SUMMA TO-15 Result (µg/m^3)
54-27643	351–356.5	Trichloroethene	3/13/2007	16000
54-27643	351–356.5	Trichlorofluoromethane	3/13/2007	3700

*J+ and other data qualifiers are defined in Table A-1.0-2.

Table 5.0-2
Pore-Gas Tritium Results at MDA L

Borehole	Sampling-Interval Depth (ft bgs)	Analyte	Collection Date	Results (pCi/L)
54-27641	30–34	Tritium	4/23/2007	18200
54-27641	80–84	Tritium	4/23/2007	10980
54-27641	330–335	Tritium	4/23/2007	4170
54-27642	27.5–32.5	Tritium	4/24/2007	1320
54-27642	72.5–77.5	Tritium	4/24/2007	4960
54-27642	113.5–118.5	Tritium	4/24/2007	8420
54-27642	172.5–177	Tritium	4/24/2007	570
54-27642	232–237.5	Tritium	4/24/2007	1340
54-27642	272–277.5	Tritium	4/24/2007	370
54-27643	71.5–76.5	Tritium	4/24/2007	470
54-27643	114.5–119.5	Tritium	4/24/2007	510
54-27643	164–170	Tritium	4/25/2007	540
54-27643	232.5–237.5	Tritium	4/24/2007	440
54-27643	272.5–278.5	Tritium	4/24/2007	510
54-27643	351–356.5	Tritium	4/24/2007	630

Table 5.6-1
Comparison of Tuff to Pore-Gas VOC Results

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27641	MD54-07-76205	180–185	Acetone	17000	—[b]	MD54-07-76043	154–155	6.22	—
54-27641	MD54-07-76206	230–235	Acetone	2400	U[a]	MD54-07-76044	229–230	9.09	—
54-27641	MD54-07-76207	269–273	Acetone	760	U	MD54-07-76022	284–285	16.2	—
54-27641	MD54-07-76208	330–335	Acetone	76	U	MD54-07-76023	334–335	11.0	J
54-27642	MD54-07-76212	172.5–177.5	Acetone	18000	—	MD54-07-76026	179–180	2.87	J
54-27642	MD54-07-76213	232–237.5	Acetone	4100	U	MD54-07-76027	229–230	2.82	J
54-27642	MD54-07-76214	272–277.5	Acetone	1600	U	MD54-07-76045	279–280	3.53	J
54-27642	MD54-07-76215	335–341	Acetone	800	U	MD54-07-76028	376–377	7.02	U
54-27643	MD54-07-76218	114.5–119.5	Acetone	3400	U	MD54-07-76031	154–155	5.18	U
54-27643	MD54-07-76219	164–170	Acetone	3200	U	MD54-07-76032	179–180	5.40	U
54-27643	MD54-07-76220	232.5–237.5	Acetone	3200	U	MD54-07-76033	229–230	5.43	U
54-27643	MD54-07-76221	272.5–278.5	Acetone	1600	U	MD54-07-76047	279–280	5.59	U
54-27643	MD54-07-76236	351–356.5	Acetone	320	U	MD54-07-76025	369–370	5.79	U
54-27641	MD54-07-76205	180–185	Benzene	3000	U	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Benzene	800	U	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Benzene	260	U	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Benzene	26	U	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Benzene	4900	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Benzene	2700	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Benzene	1800	—	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Benzene	540	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Benzene	1500	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Benzene	1900	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Benzene	1900	—	MD54-07-76033	229–230	1.09	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27643	MD54-07-76221	272.5–278.5	Benzene	1800	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Benzene	390	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Butanone[2-]	2800	U	MD54-07-76043	154–155	5.25	U
54-27641	MD54-07-76206	230–235	Butanone[2-]	740	U	MD54-07-76044	229–230	5.45	U
54-27641	MD54-07-76207	269–273	Butanone[2-]	240	U	MD54-07-76022	284–285	5.53	U
54-27641	MD54-07-76208	330–335	Butanone[2-]	24	U	MD54-07-76023	334–335	22.0	U
54-27642	MD54-07-76212	172.5–177.5	Butanone[2-]	3800	—	MD54-07-76026	179–180	5.38	U
54-27642	MD54-07-76213	232–237.5	Butanone[2-]	1300	U	MD54-07-76027	229–230	5.35	U
54-27642	MD54-07-76214	272–277.5	Butanone[2-]	500	U	MD54-07-76045	279–280	5.45	U
54-27642	MD54-07-76215	335–341	Butanone[2-]	250	U	MD54-07-76028	376–377	7.02	U
54-27643	MD54-07-76218	114.5–119.5	Butanone[2-]	1000	U	MD54-07-76031	154–155	5.18	U
54-27643	MD54-07-76219	164–170	Butanone[2-]	990	U	MD54-07-76032	179–180	5.40	U
54-27643	MD54-07-76220	232.5–237.5	Butanone[2-]	990	U	MD54-07-76033	229–230	5.43	U
54-27643	MD54-07-76221	272.5–278.5	Butanone[2-]	500	U	MD54-07-76047	279–280	5.59	U
54-27643	MD54-07-76236	351–356.5	Butanone[2-]	100	U	MD54-07-76025	369–370	5.79	U
54-27641	MD54-07-76205	180–185	Carbon Disulfide	9100	—	MD54-07-76043	154–155	5.25	U
54-27641	MD54-07-76206	230–235	Carbon Disulfide	990	—	MD54-07-76044	229–230	5.45	U
54-27641	MD54-07-76207	269–273	Carbon Disulfide	250	U	MD54-07-76022	284–285	5.53	U
54-27641	MD54-07-76208	330–335	Carbon Disulfide	25	U	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Carbon Disulfide	12000	—	MD54-07-76026	179–180	5.38	U
54-27642	MD54-07-76213	232–237.5	Carbon Disulfide	1300	U	MD54-07-76027	229–230	5.35	U
54-27642	MD54-07-76214	272–277.5	Carbon Disulfide	530	U	MD54-07-76045	279–280	5.45	U
54-27642	MD54-07-76215	335–341	Carbon Disulfide	260	U	MD54-07-76028	376–377	7.02	U
54-27643	MD54-07-76218	114.5–119.5	Carbon Disulfide	1200	—	MD54-07-76031	154–155	5.18	U
54-27643	MD54-07-76219	164–170	Carbon Disulfide	1300	—	MD54-07-76032	179–180	5.40	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27643	MD54-07-76220	232.5–237.5	Carbon Disulfide	1300	—	MD54-07-76033	229–230	5.43	U
54-27643	MD54-07-76221	272.5–278.5	Carbon Disulfide	520	U	MD54-07-76047	279–280	5.59	U
54-27643	MD54-07-76236	351–356.5	Carbon Disulfide	110	U	MD54-07-76025	369–370	5.79	U
54-27641	MD54-07-76205	180–185	Carbon Tetrachloride	5900	U	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Carbon Tetrachloride	1600	U	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Carbon Tetrachloride	620	—	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Carbon Tetrachloride	170	—	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Carbon Tetrachloride	7900	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Carbon Tetrachloride	4700	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Carbon Tetrachloride	3400	—	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Carbon Tetrachloride	1600	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Carbon Tetrachloride	2700	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Carbon Tetrachloride	2400	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Carbon Tetrachloride	3200	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Carbon Tetrachloride	2700	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Carbon Tetrachloride	1100	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Chloroform	4600	U	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Chloroform	1900	—	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Chloroform	560	—	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Chloroform	59	—	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Chloroform	35000	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Chloroform	17000	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Chloroform	7700	—	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Chloroform	1800	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Chloroform	17000	—	MD54-07-76031	154–155	1.04	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27643	MD54-07-76219	164–170	Chloroform	16000	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Chloroform	13000	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Chloroform	8000	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Chloroform	820	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Dichlorodifluoromethane	5800	—	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Dichlorodifluoromethane	4000	—	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Dichlorodifluoromethane	1900	—	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Dichlorodifluoromethane	460	—	MD54-07-76023	334–335	11.1	UJ
54-27642	MD54-07-76212	172.5–177.5	Dichlorodifluoromethane	4900	U	MD54-07-76026	179–180	1.08	UJ
54-27642	MD54-07-76213	232–237.5	Dichlorodifluoromethane	3600	—	MD54-07-76027	229–230	1.07	UJ
54-27642	MD54-07-76214	272–277.5	Dichlorodifluoromethane	2500	—	MD54-07-76045	279–280	1.09	UJ
54-27642	MD54-07-76215	335–341	Dichlorodifluoromethane	1500	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Dichlorodifluoromethane	1800	U	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Dichlorodifluoromethane	2000	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Dichlorodifluoromethane	2200	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Dichlorodifluoromethane	1800	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Dichlorodifluoromethane	1000	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Dichloroethane[1,1-]	17000	—	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Dichloroethane[1,1-]	6400	—	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Dichloroethane[1,1-]	1600	—	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Dichloroethane[1,1-]	120	—	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Dichloroethane[1,1-]	12000	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Dichloroethane[1,1-]	5000	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Dichloroethane[1,1-]	2000	—	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Dichloroethane[1,1-]	480	—	MD54-07-76028	376–377	1.40	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27643	MD54-07-76218	114.5–119.5	Dichloroethane[1,1-]	6900	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Dichloroethane[1,1-]	5000	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Dichloroethane[1,1-]	3200	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Dichloroethane[1,1-]	1800	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Dichloroethane[1,1-]	200	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Dichloroethane[1,2-]	11000	—	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Dichloroethane[1,2-]	1100	—	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Dichloroethane[1,2-]	320	U	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Dichloroethane[1,2-]	34	—	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Dichloroethane[1,2-]	19000	J+	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Dichloroethane[1,2-]	2200	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Dichloroethane[1,2-]	690	U	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Dichloroethane[1,2-]	340	U	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Dichloroethane[1,2-]	11000	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Dichloroethane[1,2-]	6800	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Dichloroethane[1,2-]	1700	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Dichloroethane[1,2-]	680	U	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Dichloroethane[1,2-]	140	U	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Dichloroethene[1,1-]	40000	—	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Dichloroethene[1,1-]	26000	—	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Dichloroethene[1,1-]	13000	—	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Dichloroethene[1,1-]	3000	—	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Dichloroethene[1,1-]	88000	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Dichloroethene[1,1-]	71000	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-7-76214	272–77.5	Dichloroethene[1,1-]	48000	—	MD54-07-76045	279–280	1.09	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27642	MD54-07-76215	335–341	Dichloroethene[1,1-]	21000	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Dichloroethene[1,1-]	26000	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Dichloroethene[1,1-]	35000	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Dichloroethene[1,1-]	41000	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Dichloroethene[1,1-]	34000	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Dichloroethene[1,1-]	14000	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Dichloropropane[1,2-]	4300	U	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Dichloropropane[1,2-]	1200	U	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Dichloropropane[1,2-]	370	U	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Dichloropropane[1,2-]	37	U	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Dichloropropane[1,2-]	33000	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Dichloropropane[1,2-]	6800	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Dichloropropane[1,2-]	2100	—	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Dichloropropane[1,2-]	390	U	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Dichloropropane[1,2-]	22000	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Dichloropropane[1,2-]	13000	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Dichloropropane[1,2-]	5000	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Dichloropropane[1,2-]	2100	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Dichloropropane[1,2-]	160	U	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Methylene Chloride	43000	—	MD54-07-76043	154–155	5.25	U
54-27641	MD54-07-76206	230–235	Methylene Chloride	10000	—	MD54-07-76044	229–230	5.45	U
54-27641	MD54-07-76207	269–273	Methylene Chloride	1700	—	MD54-07-76022	284–285	5.53	U
54-27641	MD54-07-76208	330–335	Methylene Chloride	110	—	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Methylene Chloride	120000	—	MD54-07-76026	179–180	5.38	U
54-27642	MD54-07-76213	232–237.5	Methylene Chloride	53000	—	MD54-07-76027	229–230	5.35	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m^3)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27642	MD54-07-76214	272–277.5	Methylene Chloride	22000	—	MD54-07-76045	279–280	5.45	U
54-27642	MD54-07-76215	335–341	Methylene Chloride	4000	—	MD54-07-76028	376–377	7.02	U
54-27643	MD54-07-76218	114.5–119.5	Methylene Chloride	34000	—	MD54-07-76031	154–155	5.18	U
54-27643	MD54-07-76219	164–170	Methylene Chloride	46000	—	MD54-07-76032	179–180	5.40	U
54-27643	MD54-07-76220	232.5–237.5	Methylene Chloride	39000	—	MD54-07-76033	229–230	5.43	U
54-27643	MD54-07-76221	272.5–278.5	Methylene Chloride	19000	—	MD54-07-76047	279–280	5.59	U
54-27643	MD54-07-76236	351–356.5	Methylene Chloride	1400	—	MD54-07-76025	369–370	5.79	U
54-27641	MD54-07-76205	180–185	Tetrachloroethene	87000	—	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Tetrachloroethene	7100	—	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Tetrachloroethene	5000	—	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Tetrachloroethene	800	—	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Tetrachloroethene	25000	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Tetrachloroethene	10000	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Tetrachloroethene	7900	—	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Tetrachloroethene	2400	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Tetrachloroethene	13000	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Tetrachloroethene	8200	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Tetrachloroethene	6200	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Tetrachloroethene	9400	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Tetrachloroethene	1400	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Toluene	3700	—	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Toluene	940	U	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Toluene	300	U	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Toluene	30	U	MD54-07-76023	334–335	16.0	—
54-27642	MD54-07-76212	172.5–177.5	Toluene	30000	—	MD54-07-76026	179–180	1.08	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27642	MD54-07-76213	232–237.5	Toluene	16000	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Toluene	11000	—	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Toluene	2400	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Toluene	6100	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Toluene	9700	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Toluene	10000	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Toluene	13000	—	MD54-07-76047	279–280	0.63	J
54-27643	MD54-07-76236	351–356.5	Toluene	1200	—	MD54-07-76025	369–370	0.380	J
54-27641	MD54-07-76205	180–185	Trichloro-1,2,2-trifluoroethane[1,1,2-]	28000	—	MD54-07-76043	154–155	5.25	U
54-27641	MD54-07-76206	230–235	Trichloro-1,2,2-trifluoroethane[1,1,2-]	23000	—	MD54-07-76044	229–230	5.45	U
54-27641	MD54-07-76207	269–273	Trichloro-1,2,2-trifluoroethane[1,1,2-]	14000	—	MD54-07-76022	284–285	5.53	U
54-27641	MD54-07-76208	330–335	Trichloro-1,2,2-trifluoroethane[1,1,2-]	5000	—	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	270000	—	MD54-07-76026	179–180	5.38	U
54-27642	MD54-07-76213	232–237.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	230000	—	MD54-07-76027	229–230	5.35	U
54-27642	MD54-07-76214	272–277.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	97000	—	MD54-07-76045	279–280	5.45	U
54-27642	MD54-07-76215	335–341	Trichloro-1,2,2-trifluoroethane[1,1,2-]	43000	—	MD54-07-76028	376–377	7.02	U
54-27643	MD54-07-76218	114.5–119.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	120000	—	MD54-07-76031	154–155	5.18	U
54-27643	MD54-07-76219	164–170	Trichloro-1,2,2-trifluoroethane[1,1,2-]	140000	—	MD54-07-76032	179–180	5.40	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27643	MD54-07-76220	232.5–237.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	150000	—	MD54-07-76033	229–230	5.43	U
54-27643	MD54-07-76221	272.5–278.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	100000	—	MD54-07-76047	279–280	5.59	U
54-27643	MD54-07-76236	351–356.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	35000	—	MD54-07-76025	369–370	5.79	U
54-27641	MD54-07-76205	180–185	Trichloroethane[1,1,1-]	990000	—	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Trichloroethane[1,1,1-]	420000	—	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Trichloroethane[1,1,1-]	120000	—	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Trichloroethane[1,1,1-]	14000	—	MD54-07-76023	334–335	5.40	U
54-27642	MD54-07-76212	172.5–177.5	Trichloroethane[1,1,1-]	1200000	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Trichloroethane[1,1,1-]	580000	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Trichloroethane[1,1,1-]	260000	—	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Trichloroethane[1,1,1-]	82000	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Trichloroethane[1,1,1-]	570000	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Trichloroethane[1,1,1-]	450000	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Trichloroethane[1,1,1-]	340000	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Trichloroethane[1,1,1-]	230000	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Trichloroethane[1,1,1-]	45000	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Trichloroethene	160000	—	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Trichloroethene	79000	—	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Trichloroethene	31000	—	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Trichloroethene	4500	—	MD54-07-76023	334–335	0.590	J
54-27642	MD54-07-76212	172.5–177.5	Trichloroethene	280000	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Trichloroethene	140000	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Trichloroethene	95000	—	MD54-07-76045	279–280	1.09	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27642	MD54-07-76215	335–341	Trichloroethene	31000	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Trichloroethene	100000	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Trichloroethene	91000	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Trichloroethene	84000	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Trichloroethene	81000	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Trichloroethene	16000	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76205	180–185	Trichlorofluoromethane	6200	—	MD54-07-76043	154–155	1.05	U
54-27641	MD54-07-76206	230–235	Trichlorofluoromethane	4500	—	MD54-07-76044	229–230	1.09	U
54-27641	MD54-07-76207	269–273	Trichlorofluoromethane	2400	—	MD54-07-76022	284–285	1.11	U
54-27641	MD54-07-76208	330–335	Trichlorofluoromethane	940	—	MD54-07-76023	334–335	11.1	U
54-27642	MD54-07-76212	172.5–177.5	Trichlorofluoromethane	49000	—	MD54-07-76026	179–180	1.08	U
54-27642	MD54-07-76213	232–237.5	Trichlorofluoromethane	31000	—	MD54-07-76027	229–230	1.07	U
54-27642	MD54-07-76214	272–277.5	Trichlorofluoromethane	14000	—	MD54-07-76045	279–280	1.09	U
54-27642	MD54-07-76215	335–341	Trichlorofluoromethane	5600	—	MD54-07-76028	376–377	1.40	U
54-27643	MD54-07-76218	114.5–119.5	Trichlorofluoromethane	21000	—	MD54-07-76031	154–155	1.04	U
54-27643	MD54-07-76219	164–170	Trichlorofluoromethane	22000	—	MD54-07-76032	179–180	1.08	U
54-27643	MD54-07-76220	232.5–237.5	Trichlorofluoromethane	19000	—	MD54-07-76033	229–230	1.09	U
54-27643	MD54-07-76221	272.5–278.5	Trichlorofluoromethane	12000	—	MD54-07-76047	279–280	1.12	U
54-27643	MD54-07-76236	351–356.5	Trichlorofluoromethane	3700	—	MD54-07-76025	369–370	1.16	U
54-27641	MD54-07-76206	230–235	Xylene[1,3-]+Xylene[1,4-]	1100	U	MD54-07-76044	229–230	2.18	U
54-27641	MD54-07-76207	269–273	Xylene[1,3-]+Xylene[1,4-]	350	U	MD54-07-76022	284–285	2.21	U
54-27642	MD54-07-76212	172.5–177.5	Xylene[1,3-]+Xylene[1,4-]	5600	—	MD54-07-76026	179–180	2.15	U
54-27642	MD54-07-76213	232–237.5	Xylene[1,3-]+Xylene[1,4-]	1800	U	MD54-07-76027	229–230	2.14	U
54-27642	MD54-07-76214	272–277.5	Xylene[1,3-]+Xylene[1,4-]	740	U	MD54-07-76045	279–280	2.18	U
54-27642	MD54-07-76215	335–341	Xylene[1,3-]+Xylene[1,4-]	360	U	MD54-07-76028	376–377	2.81	U

Table 5.6-1 (continued)

Location	Pore-Gas Sample ID	Pore-Gas Sampling Interval (ft bgs)	Analyte Name	Pore-Gas Sampling Result (µg/m³)	Pore-Gas Sample Qualifier[a]	Tuff Sample ID	Tuff Sampling Interval (ft bgs)	Soil Sampling Result (µg/kg)	Tuff Sample Qualifier[a]
54-27643	MD54-07-76218	114.5–119.5	Xylene[1,3-]+Xylene[1,4-]	1600	U	MD54-07-76031	154–155	2.07	U
54-27643	MD54-07-76219	164–170	Xylene[1,3-]+Xylene[1,4-]	1400	U	MD54-07-76032	179–180	2.16	U
54-27643	MD54-07-76220	232.5–237.5	Xylene[1,3-]+Xylene[1,4-]	1400	U	MD54-07-76033	229–230	2.17	U
54-27643	MD54-07-76221	272.5–278.5	Xylene[1,3-]+Xylene[1,4-]	1100	—	MD54-07-76047	279–280	2.23	U
54-27643	MD54-07-76236	351–356.5	Xylene[1,3-]+Xylene[1,4-]	150	U	MD54-07-76025	369–370	2.32	U

[a] U and other data qualifiers are defined in Table A-1.0-2.

[b] — = The analyte was detected without data qualification.

Table 5.6-2
Calculated Partitioning between Gas, Moisture, and Tuff Fractions at MDA L

Analyte	H'	F_{oc}	K_{oc} (cm^3/g)	Soil Moisture	Porosity	Bulk Density	VOC in Gas Fraction	VOC in Moisture Fraction	VOC in Soil Fraction
Acetone	0.0016	0.0005	0.58	0.05	0.45	1.46	1%	98%	1%
Benzene	0.228	0.0005	58.9	0.05	0.45	1.46	52%	26%	22%
Butanone[2-]	0.0011	0.0005	4.5	0.05	0.45	1.46	1%	93%	6%
Carbon disulfide	1.2	0.0005	46.0	0.05	0.45	1.46	85%	9%	6%
Carbon tetrachloride	1.25	0.0005	174	0.05	0.45	1.46	74%	7%	19%
Chloroform	0.15	0.0005	39.8	0.05	0.45	1.46	43%	36%	21%
Dichlorodifluoromethane	4.1	0.0005	58	0.05	0.45	1.46	95%	3%	2%
Dichloroethane[1,1-]	0.23	0.0005	53	0.05	0.45	1.46	51%	28%	21%
Dichloroethane[1,2-]	0.0401	0.0005	38	0.05	0.45	1.46	17%	53%	30%
Dichloroethene[1,1-]	1.1	0.0005	65	0.05	0.45	1.46	82%	9%	9%
Dichloropropane[1,2-]	0.11	0.0005	44	0.05	0.45	1.46	35%	40%	25%
Methylene chloride	0.09	0.0005	12	0.05	0.45	1.46	38%	53%	9%
Tetrachloroethene	0.754	0.0005	270	0.05	0.45	1.46	55%	9%	36%
Tetrahydrofuran	0.002895	0.0005	31.6	0.05	0.45	1.46	2%	67%	31%
Toluene	0.272	0.0005	182	0.05	0.45	1.46	37%	17%	46%
Trichloro-1,2,2-trifluoroethane[1,1,2-]	21.4	0.0005	160	0.05	0.45	1.46	98%	1%	1%
Trichloroethane[1,1,1-]	0.705	0.0005	110	0.05	0.45	1.46	68%	12%	19%
Trichloroethene	0.422	0.0005	94	0.05	0.45	1.46	59%	17%	24%
Trichlorofluoromethane	4	0.0005	160	0.05	0.45	1.46	91%	3%	7%
Xylene[1,3-]+Xylene[1,4-]	0.3	0.0005	200	0.05	0.45	1.46	38%	16%	46%

Table 5.7-1
Detected Pore-Gas Concentrations above Screening Concentrations at MDA L

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/m^3)	Screening Value
54-24238	43–45	Chloroform	57000	15000	3.8
54-24238	43–45	Dichloroethane[1,2-]	64000	200.5	319
54-24238	43–45	Dichloroethene[1,1-]	160000	5500	29.1
54-24238	43–45	Dichloropropane[1,2-]	430000	550	782
54-24238	43–45	Methylene chloride	25000	450	55.6
54-24238	43–45	Tetrachloroethene	92000	3770	24.4
54-24238	43–45	Trichloroethane[1,1,1-]	3600000	42300	85.1
54-24238	43–45	Trichloroethene	840000	2110	398
54-24238	63–65	Chloroform	58000	15000	3.9
54-24238	63–65	Dichloroethane[1,2-]	72000	200.5	359
54-24238	63–65	Dichloroethene[1,1-]	130000	5500	23.6
54-24238	63–65	Dichloropropane[1,2-]	510000	550	927
54-24238	63–65	Methylene chloride	300000	450	667
54-24238	63–65	Tetrachloroethene	60000	3770	15.9
54-24238	63–65	Tetrahydrofuran	14000	255	54.9
54-24238	63–65	Trichloroethane[1,1,1-]	3500000	42300	82.7
54-24238	63–65	Trichloroethene	760000	2110	360
54-24238	83–85	Chloroform	55000	15000	3.7
54-24238	83–85	Dichloroethane[1,2-]	68000	200.5	339
54-24238	83–85	Dichloroethene[1,1-]	130000	5500	23.6
54-24238	83–85	Dichloropropane[1,2-]	430000	550	782
54-24238	83–85	Methylene chloride	120000	450	267
54-24238	83–85	Tetrachloroethene	56000	3770	14.9
54-24238	83–85	Tetrahydrofuran	14000	255	54.9
54-24238	83–85	Trichloroethane[1,1,1-]	3300000	42300	78
54-24238	83–85	Trichloroethene	680000	2110	322
54-24239	24–26	Chloroform	20000	15000	1.3
54-24239	24–26	Dichloroethane[1,2-]	7800	200.5	38.9
54-24239	24–26	Dichloroethene[1,1-]	38000	5500	6.91
54-24239	24–26	Dichloropropane[1,2-]	9400	550	17.1
54-24239	24–26	Tetrachloroethene	280000	3770	74.3
54-24239	24–26	Trichloroethane[1,1,1-]	860000	42300	20.3
54-24239	24–26	Trichloroethene	220000	2110	104
54-24239	74–76	Acetone	8800	8800	1
54-24239	74–76	Chloroform	22000	15000	1.5
54-24239	74–76	Dichloroethane[1,2-]	14000	200.5	69.8

Table 5.7-1 (continued)

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/m^3)	Screening Value
54-24239	74–76	Dichloroethene[1,1-]	54000	5500	9.82
54-24239	74–76	Dichloropropane[1,2-]	12000	550	21.8
54-24239	74–76	Methylene chloride	3400	450	7.56
54-24239	74–76	Tetrachloroethene	220000	3770	58.4
54-24239	74–76	Trichloroethane[1,1,1-]	1100000	42300	26
54-24239	74–76	Trichloroethene	250000	2110	118
54-24239	98.5–100.5	Acetone	10000	8800	1.14
54-24239	98.5–100.5	Chloroform	23000	15000	1.5
54-24239	98.5–100.5	Dichloroethane[1,2-]	15000	200.5	74.8
54-24239	98.5–100.5	Dichloroethene[1,1-]	58000	5500	10.5
54-24239	98.5–100.5	Dichloropropane[1,2-]	9800	550	17.8
54-24239	98.5–100.5	Methylene chloride	4200	450	9.33
54-24239	98.5–100.5	Tetrachloroethene	220000	3770	58.4
54-24239	98.5–100.5	Trichloroethane[1,1,1-]	1100000	42300	26
54-24239	98.5–100.5	Trichloroethene	270000	2110	128
54-24240	27–29	Dichloroethane[1,2-]	310000	200.5	1550
54-24240	27–29	Dichloroethene[1,1-]	77000	5500	14
54-24240	27–29	Methylene chloride	79000	450	176
54-24240	27–29	Tetrachloroethene	310000	3770	82.2
54-24240	27–29	Trichloroethane[1,1,1-]	4900000	42300	116
54-24240	27–29	Trichloroethene	740000	2110	351
54-24240	52–54	Acetone	18000	8800	2.05
54-24240	52–54	Chloroform	11000	15000	0.73
54-24240	52–54	Dichloroethane[1,2-]	84000	200.5	419
54-24240	52–54	Dichloroethene[1,1-]	54000	5500	9.82
54-24240	52–54	Methylene chloride	42000	450	93.3
54-24240	52–54	Tetrachloroethene	99000	3770	26.3
54-24240	52–54	Trichloroethane[1,1,1-]	1300000	42300	30.7
54-24240	52–54	Trichloroethene	280000	2110	133
54-24240	152–154	Acetone	22000	8800	2.5
54-24240	152–154	Chloroform	11000	15000	0.73
54-24240	152–154	Dichloroethane[1,2-]	59000	200.5	294
54-24240	152–154	Dichloroethene[1,1-]	51000	5500	9.27
54-24240	152–154	Methylene chloride	24000	450	53.3
54-24240	152–154	Tetrachloroethene	68000	3770	18
54-24240	152–154	Trichloroethane[1,1,1-]	2000000	42300	47.3
54-24240	152–154	Trichloroethene	350000	2110	166

Table 5.7-1 (continued)

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/m^3)	Screening Value
54-24242	24–26	Chloroform	14000	15000	0.93
54-24242	24–26	Dichloroethane[1,2-]	5000	200.5	24.9
54-24242	24–26	Dichloroethene[1,1-]	22000	5500	4
54-24242	24–26	Dichloropropane[1,2-]	8100	550	14.7
54-24242	24–26	Tetrachloroethene	490000	3770	130
54-24242	24–26	Trichloroethane[1,1,1-]	560000	42300	13.2
54-24242	24–26	Trichloroethene	190000	2110	90
54-24242	49–51	Chloroform	28000	15000	1.9
54-24242	49–51	Dichloroethane[1,2-]	20000	200.5	99.8
54-24242	49–51	Dichloroethene[1,1-]	54000	5500	9.82
54-24242	49–51	Dichloropropane[1,2-]	14000	550	25.5
54-24242	49–51	Methylene chloride	14000	450	31.1
54-24242	49–51	Tetrachloroethene	400000	3770	106
54-24242	49–51	Trichloroethane[1,1,1-]	1400000	42300	33.1
54-24242	49–51	Trichloroethene	320000	2110	152
54-24242	109.5–111.5	Chloroform	28000	15000	1.9
54-24242	109.5–111.5	Dichloroethane[1,2-]	23000	200.5	115
54-24242	109.5–111.5	Dichloroethene[1,1-]	54000	5500	9.82
54-24242	109.5–111.5	Dichloropropane[1,2-]	14000	550	25.5
54-24242	109.5–111.5	Methylene chloride	11000	450	24.4
54-24242	109.5–111.5	Tetrachloroethene	390000	3770	103
54-24242	109.5–111.5	Trichloroethane[1,1,1-]	1300000	42300	30.7
54-24242	109.5–111.5	Trichloroethene	340000	2110	161
54-24243	24–26	Chloroform	19000	15000	1.3
54-24243	24–26	Dichloroethane[1,2-]	4400	200.5	21.9
54-24243	24–26	Dichloroethene[1,1-]	29000	5500	5.27
54-24243	24–26	Dichloropropane[1,2-]	38000	550	69.1
54-24243	24–26	Tetrachloroethene	30000	3770	7.96
54-24243	24–26	Trichloroethane[1,1,1-]	1000000	42300	23.6
54-24243	24–26	Trichloroethene	230000	2110	109
54-24243	49–51	Chloroform	33000	15000	2.2
54-24243	49–51	Dichloroethane[1,2-]	8700	200.5	43.4
54-24243	49–51	Dichloroethene[1,1-]	67000	5500	12.2
54-24243	49–51	Dichloropropane[1,2-]	110000	550	200
54-24243	49–51	Tetrachloroethene	31000	3770	8.22
54-24243	49–51	Trichloroethane[1,1,1-]	1700000	42300	40.2
54-24243	49–51	Trichloroethene	400000	2110	190

Table 5.7-1 (continued)

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/m^3)	Screening Value
54-24243	74–76	Acetone	22000	8800	2.5
54-24243	74–76	Chloroform	32000	15000	129
54-24243	74–76	Dichloroethane[1,2-]	18000	200.5	89.8
54-24243	74–76	Dichloroethene[1,1-]	55000	5500	10
54-24243	74–76	Dichloropropane[1,2-]	120000	550	218
54-24243	74–76	Methylene chloride	29000	450	64.4
54-24243	74–76	Tetrachloroethene	28000	3770	7.43
54-24243	74–76	Trichloroethane[1,1,1-]	1700000	42300	40.2
54-24243	74–76	Trichloroethene	360000	2110	171
54-24243	124–126	Acetone	14000	8800	1.59
54-24243	124–126	Benzene	3400	1140	2.98
54-24243	124–126	Chloroform	34000	15000	2.3
54-24243	124–126	Dichloroethane[1,2-]	34000	200.5	170
54-24243	124–126	Dichloroethene[1,1-]	70000	5500	12.7
54-24243	124–126	Dichloropropane[1,2-]	60000	550	109
54-24243	124–126	Methylene chloride	66000	450	147
54-24243	124–126	Tetrachloroethene	32000	3770	8.49
54-24243	124–126	Trichloroethane[1,1,1-]	1500000	42300	35.5
54-24243	124–126	Trichloroethene	330000	2110	156
54-24244	24–26	Chloroform	15000	15000	1.0
54-24244	24–26	Dichloroethane[1,2-]	9000	200.5	44.9
54-24244	24–26	Dichloroethene[1,1-]	20000	5500	3.64
54-24244	24–26	Dichloropropane[1,2-]	29000	550	52.7
54-24244	24–26	Methylene chloride	9000	450	20
54-24244	24–26	Tetrachloroethene	28000	3770	7.43
54-24244	24–26	Tetrahydrofuran	8200	255	32.2
54-24244	24–26	Trichloroethane[1,1,1-]	620000	42300	14.7
54-24244	24–26	Trichloroethene	110000	2110	52.1
54-24244	74–76	Chloroform	21000	15000	1.4
54-24244	74–76	Dichloroethane[1,2-]	14000	200.5	69.8
54-24244	74–76	Dichloroethene[1,1-]	26000	5500	4.73
54-24244	74–76	Dichloropropane[1,2-]	37000	550	67.3
54-24244	74–76	Methylene chloride	24000	450	53.3
54-24244	74–76	Tetrachloroethene	18000	3770	4.77
54-24244	74–76	Tetrahydrofuran	33000	255	129
54-24244	74–76	Trichloroethane[1,1,1-]	760000	42300	18
54-24244	74–76	Trichloroethene	120000	2110	56.9

Table 5.7-1 (continued)

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/m^3)	Screening Value
54-24244	99–101	Chloroform	19000	15000	1.3
54-24244	99–101	Dichloroethane[1,2-]	14000	200.5	69.8
54-24244	99–101	Dichloroethene[1,1-]	28000	5500	5.09
54-24244	99–101	Dichloropropane[1,2-]	31000	550	56.4
54-24244	99–101	Methylene Chloride	22000	450	48.9
54-24244	99–101	Tetrachloroethene	16000	3770	4.24
54-24244	99–101	Tetrahydrofuran	18000	255	70.6
54-24244	99–101	Trichloroethane[1,1,1-]	730000	42300	17.3
54-24244	99–101	Trichloroethene	120000	2110	56.9
54-24244	117.5–119.5	Chloroform	9500	15000	0.63
54-24244	117.5–119.5	Dichloroethane[1,2-]	5900	200.5	29.4
54-24244	117.5–119.5	Dichloroethene[1,1-]	13000	5500	2.36
54-24244	117.5–119.5	Dichloropropane[1,2-]	19000	550	34.5
54-24244	117.5–119.5	Methylene chloride	6000	450	13.3
54-24244	117.5–119.5	Tetrachloroethene	18000	3770	4.77
54-24244	117.5–119.5	Tetrahydrofuran	6800	255	267
54-24244	117.5–119.5	Trichloroethane[1,1,1-]	390000	42300	9.22
54-24244	117.5–119.5	Trichloroethene	71000	2110	33.6
54-27641	30–34	Acetone	47000	8800	5.34
54-27641	30–34	Butanone[2-]	7900	7810	1.01
54-27641	30–34	Dichloroethane[1,2-]	84000	200.5	419
54-27641	30–34	Dichloroethene[1,1-]	34000	5500	6.18
54-27641	30–34	Methylene chloride	120000	450	267
54-27641	30–34	Tetrachloroethene	66000	3770	17.5
54-27641	30–34	Trichloroethane[1,1,1-]	2100000	42300	49.6
54-27641	30–34	Trichloroethene	290000	2110	137
54-27641	80–84	Dichloroethane[1,2-]	65000	200.5	324
54-27641	80–84	Dichloroethene[1,1-]	36000	5500	6.55
54-27641	80–84	Methylene chloride	94000	450	209
54-27641	80–84	Tetrachloroethene	67000	3770	17.8
54-27641	80–84	Trichloroethane[1,1,1-]	1300000	42300	30.7
54-27641	80–84	Trichloroethene	170000	2110	80.6
54-27641	110–114	Chloroform	7000	15000	4.67
54-27641	110–114	Dichloroethane[1,2-]	65000	200.5	324
54-27641	110–114	Dichloroethene[1,1-]	46000	5500	8.36
54-27641	110–114	Methylene chloride	81000	450	180
54-27641	110–114	Tetrachloroethene	42000	3770	11.1

Table 5.7-1 (continued)

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/m^3)	Screening Value
54-27641	110–114	Trichloroethane[1,1,1-]	1600000	42300	37.8
54-27641	110–114	Trichloroethene	220000	2110	104
54-27641	180–185	Acetone	17000	8800	1.93
54-27641	180–185	Dichloroethane[1,2-]	11000	200.5	54.9
54-27641	180–185	Dichloroethene[1,1-]	40000	5500	7.27
54-27641	180–185	Methylene chloride	43000	450	95.6
54-27641	180–185	Tetrachloroethene	87000	3770	23.1
54-27641	180–185	Trichloroethane[1,1,1-]	990000	42300	23.4
54-27641	180–185	Trichloroethene	160000	2110	75.8
54-27641	230–235	Chloroform	1900	15000	0.127
54-27641	230–235	Dichloroethane[1,2-]	1100	200.5	5.49
54-27641	230–235	Dichloroethene[1,1-]	26000	5500	4.73
54-27641	230–235	Methylene chloride	10000	450	22.2
54-27641	230–235	Tetrachloroethene	7100	3770	1.88
54-27641	230–235	Trichloroethane[1,1,1-]	420000	42300	9.93
54-27641	230–235	Trichloroethene	79000	2110	37.4
54-27641	269–273	Chloroform	560	15000	0.0373
54-27641	269–273	Dichloroethene[1,1-]	13000	5500	2.36
54-27641	269–273	Methylene chloride	1700	450	3.78
54-27641	269–273	Tetrachloroethene	5000	3770	1.33
54-27641	269–273	Trichloroethane[1,1,1-]	120000	42300	2.84
54-27641	269–273	Trichloroethene	31000	2110	14.7
54-27641	330–335	Trichloroethene	4500	2110	2.13
54-27642	27.5–32.5	Chloroform	31000	15000	2.07
54-27642	27.5–32.5	Dichloroethane[1,2-]	12000	200.5	59.9
54-27642	27.5–32.5	Dichloroethene[1,1-]	81000	5500	14.7
54-27642	27.5–32.5	Dichloropropane[1,2-]	89000	550	162
54-27642	27.5–32.5	Tetrachloroethene	46000	3770	12.2
54-27642	27.5–32.5	Trichloroethane[1,1,1-]	2300000	42300	54.4
54-27642	27.5–32.5	Trichloroethene	280000	2110	133
54-27642	72.5–77.5	Acetone	17000	8800	1.93
54-27642	72.5–77.5	Chloroform	43000	15000	2.87
54-27642	72.5–77.5	Dichloroethane[1,2-]	39000	200.5	195
54-27642	72.5–77.5	Dichloroethene[1,1-]	96000	5500	17.5
54-27642	72.5–77.5	Dichloropropane[1,2-]	78000	550	142
54-27642	72.5–77.5	Methylene chloride	140000	450	311
54-27642	72.5–77.5	Tetrachloroethene	36000	3770	9.55

Table 5.7-1 (continued)

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/m^3)	Screening Value
54-27642	72.5–77.5	Tetrahydrofuran	15000	25.5	589
54-27642	72.5–77.5	Trichloroethane[1,1,1-]	2000000	42300	47.3
54-27642	72.5–77.5	Trichloroethene	350000	2110	166
54-27642	113.5–118.5	Chloroform	44000	15000	2.93
54-27642	113.5–118.5	Dichloroethane[1,2-]	37000	200.5	185
54-27642	113.5–118.5	Dichloroethene[1,1-]	96000	5500	17.5
54-27642	113.5–118.5	Dichloropropane[1,2-]	130000	550	236
54-27642	113.5–118.5	Methylene chloride	140000	450	311
54-27642	113.5–118.5	Tetrachloroethene	39000	3770	10.3
54-27642	113.5–118.5	Tetrahydrofuran	24000	25.5	942
54-27642	113.5–118.5	Trichloroethane[1,1,1-]	2600000	42300	61.5
54-27642	113.5–118.5	Trichloroethene	370000	2110	175
54-27642	172.5–177.5	Acetone	18000	8800	2.05
54-27642	172.5–177.5	Benzene	4900	1140	4.3
54-27642	172.5–177.5	Carbon tetrachloride	7900	6250	1.26
54-27642	172.5–177.5	Chloroform	35000	15000	2.33
54-27642	172.5–177.5	Dichloroethane[1,2-]	19000	200.5	94.8
54-27642	172.5–177.5	Dichloroethene[1,1-]	88000	5500	16
54-27642	172.5–177.5	Dichloropropane[1,2-]	33000	550	60
54-27642	172.5–177.5	Methylene chloride	120000	450	267
54-27642	172.5–177.5	Tetrachloroethene	25000	3770	6.63
54-27642	172.5–177.5	Trichloroethane[1,1,1-]	1200000	42300	28.4
54-27642	172.5–177.5	Trichloroethene	280000	2110	133
54-27642	232–237.5	Benzene	2700	1140	2.37
54-27642	232–237.5	Chloroform	17000	15000	1.13
54-27642	232–237.5	Dichloroethane[1,2-]	2200	200.5	11
54-27642	232–237.5	Dichloroethene[1,1-]	71000	5500	12.9
54-27642	232–237.5	Dichloropropane[1,2-]	6800	550	12.4
54-27642	232–237.5	Methylene chloride	53000	450	118
54-27642	232–237.5	Tetrachloroethene	10000	3770	2.65
54-27642	232–237.5	Trichloroethane[1,1,1-]	580000	42300	13.7
54-27642	232–237.5	Trichloroethene	140000	2110	66.4
54-27642	272–277.5	Benzene	1800	1140	1.58
54-27642	272–277.5	Chloroform	7700	15000	0.513
54-27642	272–277.5	Dichloroethene[1,1-]	48000	5500	8.73
54-27642	272–277.5	Dichloropropane[1,2-]	2100	550	3.82
54-27642	272–277.5	Methylene chloride	22000	450	48.9

Table 5.7-1 (continued)

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/m^3)	Screening Value
54-27642	272–277.5	Tetrachloroethene	7900	3770	2.1
54-27642	272–277.5	Trichloroethane[1,1,1-]	260000	42300	6.15
54-27642	272–277.5	Trichloroethene	95000	2110	45
54-27642	335–341	Chloroform	1800	15000	0.120
54-27642	335–341	Dichloroethene[1,1-]	21000	5500	3.82
54-27642	335–341	Methylene chloride	4000	450	8.89
54-27642	335–341	Trichloroethane[1,1,1-]	82000	42300	1.94
54-27642	335–341	Trichloroethene	31000	2110	14.7
54-27643	27.5–32.5	Chloroform	8600	15000	0.573
54-27643	27.5–32.5	Dichloroethane[1,2-]	2900	200.5	14.5
54-27643	27.5–32.5	Dichloroethene[1,1-]	9900	5500	1.8
54-27643	27.5–32.5	Dichloropropane[1,2-]	15000	550	27.3
54-27643	27.5–32.5	Methylene chloride	1900	450	4.22
54-27643	27.5–32.5	Tetrachloroethene	11000	3770	2.92
54-27643	27.5–32.5	Trichloroethane[1,1,1-]	320000	42300	7.57
54-27643	27.5–32.5	Trichloroethene	55000	2110	26.1
54-27643	71.5–76.5	Chloroform	14000	15000	0.933
54-27643	71.5–76.5	Dichloroethane[1,2-]	7800	200.5	38.9
54-27643	71.5–76.5	Dichloroethene[1,1-]	21000	5500	3.82
54-27643	71.5–76.5	Dichloropropane[1,2-]	23000	550	41.8
54-27643	71.5–76.5	Methylene chloride	16000	450	35.6
54-27643	71.5–76.5	Tetrachloroethene	14000	3770	3.71
54-27643	71.5–76.5	Tetrahydrofuran	12000	25.5	471
54-27643	71.5–76.5	Trichloroethane[1,1,1-]	500000	42300	11.8
54-27643	71.5–76.5	Trichloroethene	87000	2110	41.2
54-27643	114.5–119.5	Benzene	1500	1140	1.32
54-27643	114.5–119.5	Chloroform	17000	15000	1.13
54-27643	114.5–119.5	Dichloroethane[1,2-]	11000	200.5	54.9
54-27643	114.5–119.5	Dichloroethene[1,1-]	26000	5500	4.73
54-27643	114.5–119.5	Dichloropropane[1,2-]	22000	550	40
54-27643	114.5–119.5	Methylene chloride	34000	450	75.6
54-27643	114.5–119.5	Tetrachloroethene	13000	3770	3.45
54-27643	114.5–119.5	Tetrahydrofuran	2800	25.5	110
54-27643	114.5–119.5	Trichloroethane[1,1,1-]	570000	42300	13.5
54-27643	114.5–119.5	Trichloroethene	100000	2110	47.4
54-27643	164–170	Benzene	1900	1140	1.67
54-27643	164–170	Chloroform	16000	15000	1.07

Table 5.7-1 (continued)

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/m^3)	Screening Value
54-27643	164–170	Dichloroethane[1,2-]	6800	200.5	33.9
54-27643	164–170	Dichloroethene[1,1-]	35000	5500	6.36
54-27643	164–170	Dichloropropane[1,2-]	13000	550	23.6
54-27643	164–170	Methylene chloride	46000	450	102
54-27643	164–170	Tetrachloroethene	8200	3770	2.18
54-27643	164–170	Trichloroethane[1,1,1-]	450000	42300	10.6
54-27643	164–170	Trichloroethene	91000	2110	43.1
54-27643	232.5–237.5	Benzene	1900	1140	1.67
54-27643	232.5–237.5	Chloroform	13000	15000	0.867
54-27643	232.5–237.5	Dichloroethane[1,2-]	1700	200.5	8.48
54-27643	232.5–237.5	Dichloroethene[1,1-]	41000	5500	7.45
54-27643	232.5–237.5	Dichloropropane[1,2-]	5000	550	9.09
54-27643	232.5–237.5	Methylene chloride	39000	450	86.7
54-27643	232.5–237.5	Tetrachloroethene	6200	3770	1.64
54-27643	232.5–237.5	Trichloroethane[1,1,1-]	340000	42300	8.04
54-27643	232.5–237.5	Trichloroethene	84000	2110	39.8
54-27643	272.5–278.5	Benzene	1800	1140	1.58
54-27643	272.5–278.5	Chloroform	8000	15000	0.533
54-27643	272.5–278.5	Dichloroethene[1,1-]	34000	5500	6.18
54-27643	272.5–278.5	Dichloropropane[1,2-]	2100	550	3.82
54-27643	272.5–278.5	Methylene chloride	19000	450	42.2
54-27643	272.5–278.5	Tetrachloroethene	9400	3770	2.49
54-27643	272.5–278.5	Trichloroethane[1,1,1-]	230000	42300	5.44
54-27643	272.5–278.5	Trichloroethene	81000	2110	38.4
54-27643	351–356.5	Chloroform	820	15000	0.0547
54-27643	351–356.5	Dichloroethene[1,1-]	14000	5500	2.55
54-27643	351–356.5	Methylene chloride	1400	450	3.11
54-27643	351–356.5	Trichloroethane[1,1,1-]	45000	42300	1.06
54-27643	351–356.5	Trichloroethene	16000	2110	7.58

Table 5.7-2
Detected Pore-Gas Concentrations and SVs in the Deep Sample Collected at MDA L

Location	Sampling-Interval Depth (ft bgs)	Analyte Name	Concentration (µg/m^3)	Screening Concentration (µg/L)	Screening Value
54-24399	550–608	Carbon tetrachloride	32	6250	0.00512
54-24399	550–608	Chloroform	86	15000	0.00573
54-24399	550–608	Cyclohexane	93	106600000	0.000000872
54-24399	550–608	Dichlorodifluoromethane	30	1599000	0.0000188
54-24399	550–608	Dichloroethane[1,1-]	110	5750	0.0191
54-24399	550–608	Dichloroethane[1,2-]	37	200.5	0.185
54-24399	550–608	Dichloroethene[1,1-]	290	5500	0.0527
54-24399	550–608	Dichloropropane[1,2-]	44	550	0.08
54-24399	550–608	Methylene chloride	43	450	0.0956
54-24399	550–608	Tetrachloroethene	500	3770	0.133
54-24399	550–608	Trichloro-1,2,2-trifluoroethane[1,1,2-]	730	1262600000	0.000000578
54-24399	550–608	Trichloroethane[1,1,1-]	4400	42300	0.104
54-24399	550–608	Trichloroethene	1100	2110	0.521
54-24399	550–608	Trichlorofluoromethane	62	5200000	0.0000119

Appendix A

Quality Assurance/Quality Control Program

A-1.0 INTRODUCTION

In accordance with Section XI.D.13.b of the Compliance Order on Consent, this appendix discusses analytical methods, data quality objectives, and data quality review. Additionally, this appendix summarizes the effects of data quality exceptions on the acceptability of the field and laboratory analytical data as they impact the investigation and site status.

Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the Los Alamos National Laboratory (LANL or the Laboratory) "Quality Assurance Project Plan Requirements for Sampling and Analysis" (LANL 1996, 054609) and the Laboratory's statement of work for analytical services (LANL 2000, 071233). The results of the QA/QC activities were used to estimate the accuracy, bias, and precision of the analytical measurements. QC samples, including method blanks, blank spikes, matrix spikes, laboratory control samples (LCSs), internal standards, initial and continuing calibrations, surrogates, and tracers, were used to assess laboratory accuracy and bias.

The type and frequency of QC analyses are described in the analytical services contract. Other QC factors, such as sample preservation and holding times, were also assessed. The requirements for sample preservation and holding times are given in the Environmental Programs Directorate Standard Operating Procedure (SOP) 01.02, Sample Containers and Preservation. Evaluating these QC indicators allows estimates to be made of the accuracy, bias, and precision of the analytical suites. A focused data validation was also performed for all the data packages (identified by request number). The procedures used for data validation are given in Table A-1.0-1. The focused validation followed the same procedure discussed above and included a more detailed review of the raw data results generated by the analytical laboratory. Copies of the raw analytical data, laboratory logbooks, and instrument printouts used during focused validation are provided in data packages as part of Appendix B (on CD included with this document).

Analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines for inorganic and organic chemical data review where applicable (EPA 1994, 048639; EPA 1999, 066649). Data have also been assessed using guidelines established in SW-846 (EPA 1997, 057589). As a result of the data validation and assessment efforts, qualifiers have been assigned to each analytical record. Definitions for the data qualifiers used in data validation are given in Table A-1.0-2. Data validators and reviewers made judgments about the following industry-accepted QA/QC analytical quality functions.

Maintenance of Chain of Custody (COC)

To maintain COC is to document or demonstrate the possession of an item by only authorized individuals. The COC process provides confidence in, and documentation of, analytical data integrity by establishing the traceability of the sample from the time of collection through processing to final maintenance as a record.

Sample Documentation

Establishing sample documentation acceptability is the first step toward verifying that an analytical system has produced data of known quality. Documentation is dependent upon the accessibility of review items that accurately and completely describe the work performed. In the absence of adequate sample documentation, data quality cannot be independently verified.

Sample Preservation

Sample preservation is the use of specific types of sample containers and preservation techniques. Sample preservation is mandatory for hazardous site investigations because the integrity of any sample decreases over time. Physical factors (light, pressure, temperature, etc.), chemical factors (changes in pH, volatilization, etc.), and biological factors may alter the original quality of a sample. Because the various target parameters are uniquely altered at varying rates, distinct sample containers, preservation techniques, and holding times have been established to maintain sample integrity for a reasonable and acceptable period of time.

Holding Time

Holding time is the maximum amount of time a sample can be stored without unacceptable changes in analyte concentrations. Holding times apply under prescribed conditions; deviations from these conditions may affect the holding time. Extraction holding time refers to the time that lapses between sample collection and sample preparation; analytical holding time refers to the time that lapses between sample preparation and analysis.

Initial and Continuing Calibration Verification (including interference-check standards)

Calibration verification is the establishment of a quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. There are two aspects of calibration verification: initial and continuing. The initial calibration verifies the accuracy of the calibration curve as well as the individual calibration standards being used to perform the calibration. The continuing calibration ensures that the initial calibration is still holding and correct as the instrument is used to process samples. Interference-check samples are used to determine if a high concentration of a single analyte in a sample interferes with the accurate quantitation of other analytes.

Analyte Identification (including spectra review and thermal ionization cavity review)

Analyte identification is the process of associating an instrument signal with a compound or analyte of interest. Evaluation of signal retention times, spectral overlap, multipeak pattern matching, and mass spectral library searches are tools for making analyte identification determinations.

Analyte Quantitation

Analyte quantitation is the association of an instrument signal with a concentration, and the determination that a recorded signal is detected or not detected. Detection limits, instrument calibration linear ranges, internal standards, and carrier recoveries are tools for making analyte quantitation evaluations.

Organic and inorganic chemical results are considered to be not detected if reported results are less than or equal to the method detection limit adjusted by sample-specific dilution or concentration factors.

Radiochemical results reported with values less than the minimum detectable activity are considered to be not detected (U). Each radiochemical result is also compared to the corresponding 1-sigma total propagated uncertainty (TPU). If the result is not greater than 3 times the TPU, it is also qualified as not detected.

Method Blank

A method blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing and which is extracted and analyzed in the same manner as the corresponding environmental samples. Method blanks are used to assess the potential for sample contamination during extraction and analysis. All target analytes should be below the contract-required detection limit in the method blank (LANL 2000, 071233).

Matrix Spike Recoveries

A matrix spike is an aliquot of sample spiked with a known concentration of the target analyte(s). Matrix spike samples are used to measure the ability to recover prescribed analytes from a native sample matrix. Spiking typically occurs before sample preparation and analysis. Acceptable percentage recoveries for matrix spikes vary by method but should generally be greater than 10% for an analytical result to be usable (LANL 2000, 071233).

Surrogate and Tracer Recoveries

A surrogate (an organic chemical compound) and a tracer (a radiochemical isotope) are similar in composition and behavior to target analytes but are not typically found in environmental samples. Surrogates and tracers are added to every blank, sample, and spike to evaluate the efficiency with which target analytes are recovered during extraction and analysis. The recovery percentages of the surrogates and tracers vary by method but should generally be greater than 10% for an analytical result to be usable (LANL 2000, 071233).

Internal Standard Responses and Carrier Recoveries

Internal standards and carriers are chemical compounds that are added to blank, sample, and standard extracts at known concentrations. They are used to compensate for (1) analyte concentration changes that might occur during storage of the extract, and (2) quantitation variations that can occur during analysis. Internal standard responses and carrier recoveries are used to adjust the reported concentrations for the quantitation of target analytes. The response factors for internal standards vary by method but should generally be within the range of $\geq$50% to $\leq$200%. The recoveries for carriers vary by method but should generally be greater than 10% for an analytical result to be usable (LANL 2000, 071233).

LCS Recoveries

An LCS is a known matrix that has been spiked with compound(s) which are representative of the target analytes. The LCS is used to document laboratory performance. The acceptance criteria for LCSs are method-specific but should generally be greater than 10% for an analytical result to be usable (LANL 2000, 071233).

Laboratory and Field Duplicates (including serial dilutions)

Laboratory duplicates are two portions of a sample taken from the same sample container (prepared for analysis and analyzed independently but under identical conditions) which are used to assess or demonstrate acceptable laboratory-method precision at the time of analysis. Each duplicate sample is equally representative of the original material. Duplicate analyses are also performed to generate data and to determine the long-term precision of an analytical method on various matrices. All relative percent

differences (RPDs) between samples and field duplicates should be ±35% (LANL 2000, 071233). RPD is defined by the equation RPD = [|D1 – D2| / (D1 + D2)] × 100%, where *D1* and *D2* represent analytical measurements on duplicate samples.

For radionuclides, the duplicate error ratio (DER) may also be used to quantify precision. DER is defined by the equation DER = |S–D| / sqrt($2\sigma S^2 + 2\sigma D^2$), where *S* represents the original sample value, *D* represents the duplicate value, and $2\sigma S$ and $2\sigma D$ represent the 2-sigma uncertainties surrounding the original and duplicate samples, respectively. A DER below 3 indicates sample-to-field-duplicate precision that is in control.

Field duplicates are independent samples that are collected as closely as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently.

Serial dilution checks are performed for certain inorganic analyses to determine if dilutions have been prepared correctly, and to identify any effects that may arise from characteristics of the sample matrix.

Trip Blanks, Field Blanks, and Rinsate Blanks

Trip blanks, field blanks, and rinsate blanks are all collected and analyzed to establish whether concentration values assigned to an analyte or compound are attributable to contamination of the analytical system or to the presence of the analyte in the samples collected.

Trip blank—a sample of analyte-free medium that is taken to the sampling site and returned unopened to an analytical laboratory. Trip blanks are used to identify contamination attributable to shipping or field handling procedures. Trip blanks are required for all field events that include the collection of volatile samples.

Field blank—a sample of analyte-free medium that is taken to the sampling site and exposed to the atmosphere during sample-collection activities. Field blanks are used to measure contamination introduced during sample collection.

Equipment rinsate blank—a sample of analyte-free medium that has been used to rinse the sampling equipment. It is collected after completion of decontamination and before sampling. Equipment rinsate blanks are used to assess the cleanliness of sampling equipment.

A-2.0 LABORATORY ANALYSIS SUMMARY

During the fiscal year (FY) 2007, 42 pore gas samples, 4 field blank samples, 6 field duplicate samples, and 2 field blank samples were collected at Solid Waste Management Unit (SWMU) 54-006. Additionally, during FY2007, 16 tuff samples and 4 field duplicate samples were collected from core collocated with SUMMA samples at locations 54-27641, 54-27642, and 54-27643. Analysis of pore gas was conducted for volatile organic compounds (VOCs) using EPA Method TO-15 and for tritium using EPA Method 906.0. Analysis of tuff was conducted for VOCs using EPA Method 8260B and for inorganic chemicals using EPA Methods 6010B, 6020, and 7471A. All QC procedures were followed as required by the analytical services contract. Table A-2.0-1 lists the analytical method used for inorganic and organic chemical analyses.

Sampling locations, sampling ports, and validated analytical results are given in Appendix B of this monitoring report. The data, including the qualified data, are usable for evaluation and interpretive purposes. The entire data set meets the standards set for use in this report.

The analytical methods used for radionuclides, inorganic chemicals, and organic chemicals are summarized in the following sections. The required estimated detection limit (EDL) or estimated quantitation limit (EQL) for each analyte is defined in the analytical services contract.

A-3.0 ORGANIC CHEMICAL ANALYSES

The summaries for these analyses are presented in the sections below. All QC procedures were followed as required by the analytical services contract.

Maintenance of COC

COC was properly maintained for all samples.

Sample Documentation and Dilutions

Samples were properly documented in the field.

Sample Preservation

Preservation criteria were met for all samples.

Holding Time

Holding times were met for all samples.

Initial and Continuing Calibration Verification

Initial acceptance criteria were met for all sample analyses. Continuing calibration percent differences (%D) were greater than 25% affecting EPA Method TO-15 analyses of 61 organic chemical analytical records and EPA Method 8260B analyses of 15 organic chemical analytical records. Affected records were qualified as being an estimate of their sample-specific quantitation limit or detection limit.

Analyte Identification (including internal standards, spectra review, and thermal ionization cavity review)

Analyte identification criteria were met for all sample analyses.

Analyte Quantitation

Analyte quantitation criteria were met for all sample analyses.

Method Blank

Method blank results for organic chemical analyses were within acceptable limits for all but one EPA Method 8260B analytical record. The analyte was detected in the method blank and the sampling result for the analyte was less than 5 times the amount detected in the blank.

Matrix Spike Recoveries

All matrix spike recoveries for organic chemical analyses were within acceptable limits.

Surrogate Recoveries

All surrogate recoveries for organic chemical analyses were within acceptable limits.

Internal Standard Responses

All internal standard responses for organic chemical analyses were within acceptable limits.

LCS Recoveries

LCS recoveries were within acceptable limits for all but four EPA Method TO-15 analytical records and eight EPA Method 8260B analytical records. LCS recoveries were greater than the upper acceptance limit, affecting four detected analytical records. Affected records were qualified as estimated and biased high. LCS recoveries were less than the lower acceptance limit but greater than 10%, affecting eight detected analytical records. Each of the affected detected records was qualified being an estimate of their sample-specific quantitation limit or detection limit.

Laboratory and Field Duplicates

Most laboratory and field duplicates collected for organic chemical analyses indicate acceptable precision. All laboratory and field duplicate RPDs were better than 35% for pore gas collected during FY2007. During FY2007, field duplicate precision was greater than 35% for one analyte collected from pore gas at location 54-27642 at 335 ft. The sample record potentially affected by larger-than-expected field duplicate RPDs are listed in Table A-3.0-1. Sample results are not qualified based on field duplicate precision.

Trip Blanks, Field Blanks, and Rinsate Blanks

Trip blank and rinsate blank samples are not collected during VOC SUMMA sampling.

The equipment blank collected on April 25, 2007, for EPA Method TO-15 analysis contained detectable amounts of tetrachloroethene; 1,1,1-trichloroethane; and trichloroethene. The equipment blank collected on March 2, 2007, did not contain detected organic chemicals. The field trip blanks collected on February 7 and 26, 2007, for EPA Method 8260B analysis contained detectable amounts of acetone. Two field blanks collected on April 29, 2007, did not contain detectable amounts of tritium.

Field blank concentrations within five times the concentration samples analyzed indicate that the analyte detected in these samples could be the result of contamination. Detected field blank results do not impact the investigation or site status. No sample records were affected by field blank contamination.

A-4.0 RADIONUCLIDE ANALYSES

Maintenance of COC

COC was properly maintained for all samples.

Sample Documentation and Dilutions

Samples were properly documented in the field.

Sample Preservation

Preservation criteria were met for all samples.

Holding Times

Holding times were met for all radionuclide analyses.

Initial and Continuing Calibration Verification

Initial and continuing calibrations are acceptable for all radionuclide analyses.

Analyte Identification

Analyte identification criteria were met for all radionuclide analyses.

Analyte Quantitation

Analyte quantitation criteria were met for all radionuclide analyses.

Method Blanks

The method blank results for radionuclide analyses were within acceptable limits all sample results.

Matrix spike Recoveries

The matrix spike recoveries for radionuclide analyses were within acceptable limits for all the analyses.

Carrier and Tracer Recoveries

Tracer and carrier recoveries for radionuclide analyses were within acceptable limits for all core and air analyses.

LCS Recoveries

The LCS recoveries for radionuclide analyses were within acceptable limits for all core and air analyses.

Laboratory and Field Duplicates

Laboratory duplicates collected for all radionuclide analyses indicate acceptable precision.

Field duplicates collected for radionuclide analyses indicate acceptable precision for all but one sampling result. One detected tritium and associated field duplicate result had an RPD greater than 35%. The sample record potentially affected by larger-than-expected field duplicate RPD is listed in Table A-3.0-1. Sampling results are not qualified based on field duplicate precision.

Trip, Field, and Rinsate Blanks

Field blank samples were not collected for radionuclide analyses.

A-5.0 FIELD-MONITORING SUMMARY

Field-monitoring data are less costly to generate than laboratory data and are immediately available to guide field decisions. Field-monitoring results are generated by rapid methods of analysis that provide less precision than laboratory analyses. Field-monitoring data provide analyte (or at least chemical class) identification and quantification, although the quantification may be relatively imprecise.

Field monitoring of subsurface vapor monitoring at MDA L is conducted using guidance provided in SOP-06.31, Rev. 2, Sampling of Subatmospheric Air. This procedure covers the use of the Brüel and Kjær (B&K) Type 1302 multigas analyzer and Landtec GEM 500 photoionization detector (PID).

The B&K is calibrated annually by a certified calibration laboratory. The B&K is adjusted before each day's use to compensate for ambient pressure and temperature. Calibration is confirmed before each day's use by analyzing triplicate readings of ambient air and duplicate readings of known quantities of mixed organic analytes in nitrogen. These calibration verification check analyses confirm analytical stability, confirm that the instrument zero point for each analyte is correctly set, and confirm that the stored calibration curve remains applicable to current instrument response to the presence of organic analytes. Concentrations of calibration standards analyzed before each day's use are expected be within ±20% of their known values. Additionally, during each sample analyses a low sample flow condition triggers an alarm on the B&K and VOC measurement is then not completed.

The presence of nontarget organic chemicals bias B&K target analyte results if they have an acoustic response to infrared light that is similar to the target analyte. Trichlorofluoromethane (Freon 11) generates a measurable acoustic signal in response to light with a wavelength of 11.6 µm that is proportional to its concentration. Other VOCs generating an accoustic signal to light at this wavelength include Freon 114 (CAS 76-14-2; 1,2-dichloro-1,1,2,2-tetrafluoroethane) and Freon 21 (CAS 75-43-4), which is not reported by EPA Method TO-15. Tetrachloroethene (PCE) generates an acoustic signal in response to light with a wavelength of 11.1 µm. Other VOCs responding to light at this wavelength include styrene (CAS 100-42-5); Freon 113 (CAS 76-13-1), which is not reported by EPA Method TO-15; Freon 12 (CAS 75-71-8, dichlorodifluoromethane); ethanol (CAS 64-17-5); and 1,1-dichloroethene (CAS 75-35-4). EPA Method TO-15 analytical results indicate that 1,1-dichloroethene and Freon 113 are present in most samples at MDA L at detectable concentrations that would be included in the signal interpreted as PCE. Table A-4.0-1 presents VOCs that interfere with each of the four B&K target analytes.

Analytical data generated using the B&K Type 1302 are supported by annual calibration records that bracket the periods of analyses. Calibration information is reported below for each of the two B&K photoacoustic analyzers used to generate results presented in this periodic monitoring report.

- The B&K with serial number 1692083 was calibrated on July 3, 2007. The zero point was set for 1,1,1-trichloroethane (TCA), trichloroethene (TCE), Freon 11, PCE, carbon dioxide (CO_2), and water (H_2O). Span concentrations of TCA at 61.4 ppm, TCE at 8.1 parts per million (ppm), Freon 11 at 53 ppm, PCE at 19.24 ppm, and CO_2 at 1265 ppm were used to generate calibration response curves.
- The B&K with serial number 1692083 was calibrated on May 17, 2006. The zero point was set for TCA, TCE, Freon 11, PCE, CO_2, and H_2O. Span concentrations of TCA at 61.4 ppm, TCE at

61.6 ppm, Freon 11 at 110 ppm, PCE at 63 ppm, and CO_2 at 4.99% were used to generate calibration response curves.

- The B&K with serial number 1732805 was calibrated on May 17, 2006. The zero point was set for TCA, TCE, Freon 11, PCE, CO_2, and H_2O. Span concentrations of TCA at 61.4 ppm, TCE at 61.6 ppm, Freon 11 at 110 ppm, PCE at 63 ppm, and CO_2 at 4.99% were used to generate calibration response curves.

The Landtec GEM 500 PID is calibrated annually by a certified calibration laboratory. During calibration, methane (CH_4), oxygen (O_2), and CO_2 zero points are set, and each analyte's calibration response curves is developed. The CH_4 reading is filtered to an infrared absorption frequency of 3.41 mm (nominal), the frequency specific to hydrocarbon bonds. Landtec instruments are calibrated using certified CH_4 mixtures and will give correct readings provided there are no other hydrocarbon gasses present within the sample (e.g., ethane, propane, butane, etc.). If there are other hydrocarbons present, the CH_4 reading will be higher (never lower) than the actual CH_4 concentration being monitored. The extent to which the CH_4 reading is affected depends upon the concentration of the CH_4 in the sample and the concentration of the other hydrocarbons. The effect of other hydrocarbons is nonlinear and difficult to predict. The CO_2 reading is filtered to an infrared absorption frequency of 4.29 µm (nominal), the frequency specific to CO_2. Therefore, any other gases usually found on landfill sites will not affect the CO_2 reading. The O_2 sensor is a galvanic cell type and suffers no influence from CO_2, CO_2, hydrogen sulfide, nitrate, sulfide, or hydrogen.

Calibration is confirmed before each day's use by analyzing multiple readings of ambient air. Zero readings of CH_4 and CO_2 are expected. Oxygen is expected to read 20.9%. Oxygen readings within ± 25% of 20.9% are considered acceptable.

Analytical data generated using the Landtec GEM-500 PID is supported by annual calibration records that bracket the periods of analyses. Calibration is performed by Geotech's Colorado Service Center, in Denver, Colorado. Calibration information is reported below for the four Landtec PIDs used to generate results presented in this periodic monitoring report.

- Unit 1503 was calibrated on December 4, 2006 The zero point was set for CH_4, CO_2, and O_2. Calibration was performed so that CH_4 and CO_2 reached ±15% of a known concentration, and O_2 was set to read ambient air at 20.9%. Pump flow was confirmed to be 525 cc per min.
- Unit 279 was calibrated on January 26, 2007. The zero point was set for CH_4, CO_2, and O_2. Calibration was performed so that CH_4 and CO_2 reached ±15% of a known concentration, and O_2 was set to read ambient air at 20.9%. Pump flow was confirmed to be 500 cc per min.
- Unit 916 was calibrated on March 2, 2007. The zero point was set for CH_4, CO_2, and O_2. Calibration was performed so that CH_4 and $CO2_2$ reached ±15% of a known concentration, and O_2 was set to read ambient air at 20.9%. Pump flow was confirmed to be 550 cc per min.
- Unit 916 was calibrated on May 1, 2007. The zero point was set for CH_4, CO_2, and O_2. Calibration was performed so that CH_4 and CO_2 reached ±15% of a known concentration, and O_2 was set to read ambient air at 20.9%. Pump flow was confirmed to be 525 cc per min.
- Unit 913 was calibrated on May 23, 2007. The zero point was set for CH_4, CO_2, and O_2. Calibration was performed so that CH_4 and CO_2 reached ±15% of a known concentration, and O_2 was set to read ambient air at 20.9%. Pump flow was confirmed to be 350 cc per min.
- Unit 913 was calibrated on July 19, 2007. The zero point was set for CH_4, CO_2, and O_2. Calibration was performed so that CH_4 and CO_2 reached ±15% of a known concentration, and O_2 was set to read ambient air at 20.9%. Pump flow was confirmed to be 375 cc per min.

A-6.0 REFERENCES

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the U.S. Department of Energy–Los Alamos Site Office; the U.S. Environmental Protection Agency, Region 6; and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

EPA (U.S. Environmental Protection Agency), February 1994. "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," EPA-540/R-94/013, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1994, 048639)

EPA (U.S. Environmental Protection Agency), 1997. "Test Methods for Evaluating Solid Waste, Laboratory Manual, Physical/Chemical Methods," SW-846, 3rd ed., Update III, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1997, 057589)

EPA (U.S. Environmental Protection Agency), October 1999. "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," EPA540/R-99/008, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1999, 066649)

LANL (Los Alamos National Laboratory), March 1996. "Quality Assurance Project Plan Requirements for Sampling and Analysis," Los Alamos National Laboratory document LA-UR-96-441, Los Alamos, New Mexico. (LANL 1996, 054609)

LANL (Los Alamos National Laboratory), December 2000. "University of California, Los Alamos National Laboratory (LANL), I8980SOW0-8S, Statement of Work for Analytical Laboratories," Rev. 1, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2000, 071233)

Table A-1.0-1
Data Analysis and Assessment Procedures

Procedure	Title	Effective Date
SOP-15.01, Rev. 1	Routine Validation of Volatile Organic Data	4/20/2004
SOP-15.07, Rev. 1	Routine Validation of Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Data	4/20/2004

Table A-1.0-2
Definition of Data Qualifiers Used in Data Validation

Qualifier	Explanation
U	The analyte was analyzed for but not detected. Reported value is the sample-specific EQL or detection limit.
J	The reported value should be regarded as estimated.
J+	The reported value should be regarded as estimated and biased high.
J-	The reported value should be regarded as estimated and biased low.
UJ	The analyte was analyzed for but not detected. Reported value is an estimate of the sample-specific quantitation limit or detection limit.
R	The sample results were rejected because of serious deficiencies in the ability to analyze the sample and meet quality-control criteria; presence or absence cannot be verified.

Table A-2.0-1
Analytical Method Used for Organic Chemical Analyses

Analytical Method	Analytical Description	Target Compound List
EPA Method TO-15—Sampling and Analysis	VOCs in air	See analytical services statement of work (LANL 2000, 071233)
EPA Method 8260B	VOCs in solids	See analytical services statement of work (LANL 2000, 071233)
EPA Method 906.0	Tritium analysis	See analytical services statement of work (LANL 2000, 071233)

Table A-3.0-1
Sample Records with Large Duplicate RPDs

Location ID	Depth (ft)	Analyte Name	Units	FD[a] Quantitation Limit	FD Result	FD Qualifier[b]	Sample Quantitation Limit	Sample Result	Sample Qualifier	RPD (%)
54-27642	113	Tritium	pCi/L	230	3350	—[c]	500	8420	—	43.1
54-27642	335	Chlorodifluoromethane	µg/m^3	950	5400	—	1200	1200	U	63.6

[a] FD = Field duplicate.

[b] See Table A-1.0-2 for definitions of data qualifiers.

[c] — = Analyte was detected without qualification.

Table A-4.0-1
B&K Target Analytes
and Potential Interfering Analytes

Target	Potential Interfering Analyte
PCE	Styrene
PCE	Freon 113
PCE	Freon 12
PCE	1,1-Dichloroethene
PCE	Ethylene oxide
PCE	Ethanol
PCE	Dipropylnitrosamine
PCE	1,1-Dimethylhydrazine
PCE	1,4-Diethylene dioxide
PCE	Cyclohexene
PCE	tert-Butyl alcohol
PCE	m-Vinyltoluene
PCE	Vinyl chloride
PCE	Tetrahydrofurane
PCE	Silicium tetrafluoride
PCE	Nitromethane
PCE	Nitrogen trifluoride
PCE	α-Methylstyrene
PCE	Monomethyl hydrazine
PCE	Methyl iodide
PCE	n-Hexane
PCE	Acetic anhydride
PCE	1,3-Butadiene
Freon 11	Freon 114
Freon 11	Freon 21
Freon 11	Carbonyl sulphide
Freon 11	Methyl acetate
Freon 11	Chloropicrine
Freon 11	Cyclohexane
Freon 11	Dimethylnitrosamine
Freon 11	Epichlorohydrine
Freon 11	Ethane
Freon 11	Ethylene oxide
Freon 11	Ethyl formate
Freon 11	2-Nitropropane
Freon 11	Phosgene

Table A-4.0-1 (continued)

Target	Potential Interfering Analyte
Freon 11	Vinyl acetate
TCA	Fluorobenzene
TCA	Ethyl benzene
TCA	Dimethyl formamide
TCA	Dichloromethane
TCA	1,2-Dichloroethane
TCA	o-Dichlorobenzene
TCA	Dibutyl phthalate
TCA	Chloromethane
TCA	m-Xylene
TCA	1,1,2-Trichloroethane
TCA	o-Toluidine
TCA	Toluene
TCA	Phenol
TCA	Chlorobenzene
TCA	Carbon dioxide
TCA	Boron trifluoride
TCA	Aniline
TCA	Acetophenone
TCA	Hydrogen cyanide
TCA	n-Heptane
TCE	Arsine
TCE	Butanone
TCE	Freon 152
TCE	Diethyl ketone
TCE	Dinitrogendifluoride
TCE	2-Pentanone
TCE	2-Propanol
TCE	Sulfur hexafluoride
TCE	Vinyl chloride

Appendix B

Data Packages and Chain-of-Custody Forms
(on CD included with this document)