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Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Second Quarter Fiscal Year 2010

Los Alamos
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EXECUTIVE SUMMARY

This periodic monitoring report summarizes vapor-monitoring activities conducted during the second quarter of fiscal year (FY) 2010 at Material Disposal Area (MDA) H, Solid Waste Management Unit 54-004, in Technical Area 54 at Los Alamos National Laboratory. The objective of the monitoring is to evaluate trends in volatile organic compound (VOC) concentrations and tritium activity levels over time in subsurface vapor at MDA H.

Monitoring conducted during the second quarter of FY2010 included field screening and collecting vapor samples from 28 sampling ports within 4 vapor-monitoring boreholes at MDA H. Vapor samples were submitted for laboratory analyses of VOCs and tritium.

The analytical results continue to confirm the presence of VOCs and tritium in pore-vapor samples collected at MDA H. VOC concentrations were consistent with previous sampling results. The maximum concentrations for all VOCs detected in pore gas during second quarter FY2010 and during the previous three quarters did not exceed groundwater-screening levels. No immediate potential threat to groundwater is posed by VOCs measured at MDA H monitoring locations.

Tritium activity decreased with distance from MDA H. The tritium activities for borehole 54-01023 were consistent with those detected during the third and fourth quarter FY2009 sampling. No tritium was detected in borehole 54-609985 during first quarter FY2010 sampling, but it was detected during second quarter sampling. Tritium activity levels at boreholes 54-15461 and 54-15462 were generally consistent with those in previous sampling quarters.

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1.0 INTRODUCTION

This periodic monitoring report presents the results of vapor-monitoring activities conducted during the second quarter of fiscal year (FY) 2010 at Material Disposal Area (MDA) H, Solid Waste Management Unit 54-004, in Technical Area 54 (TA-54) at Los Alamos National Laboratory (LANL or the Laboratory).

MDA H is located in the east-central portion of the Laboratory at TA-54 (Figure 1.0-1) on Mesita del Buey. MDA H is a 70 ft wide × 200 ft long (0.3-acre) fenced area consisting of nine inactive vertical disposal shafts arranged in a line approximately 15 ft within, and parallel to, its southern fence line (Figure 1.0-2). Each shaft is cylindrical, 6 ft in diameter, and 60 ft deep. The shafts are filled with solid-form waste to a depth of 6 ft below ground surface (bgs). The waste in Shafts 1 to 8 is covered by a 3-ft layer of concrete placed over 3 ft of crushed tuff; the waste in Shaft 9 is covered by 6 ft of concrete. The regional aquifer beneath MDA H is estimated to be at an average depth of approximately 1040 ft bgs, based on data from nearby wells and the predictions of the hydrogeologic conceptual model for the Pajarito Plateau (LANL 1998, 059599).

From May 1960 to August 1986, MDA H functioned as the Laboratory's primary disposal area for classified solid-form waste. Between periods of waste disposal, each shaft was covered with a padlocked steel plate to prevent unauthorized access to classified materials. Much of the classified waste was nonhazardous; however, various hazardous chemicals, radionuclide-contaminated materials, and materials contaminated by high explosives were also disposed of at MDA H. These materials included drummed radioactive waste, fuel elements, a tritium-contaminated unit, plutonium-contaminated shapes, scraps and shapes contaminated with depleted uranium, and decontamination and decommissioning scrap. According to waste disposal records, bulk solvent wastes were not disposed of at MDA H.

Vapor monitoring at MDA H consists of screening 28 sampling ports in four vapor-monitoring boreholes (Figure 1.0-2). Volatile organic compound (VOC) and tritium samples are collected from each of the 28 sampling ports completed within each stratigraphic unit. 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.

Vapor monitoring at MDA H has been conducted since the second quarter of FY2005. The NMED-approved vapor-monitoring boreholes and the corresponding sampling intervals that were field screened and sampled through fourth quarter of FY2009 are presented in Table 1.0-1. The NMED-approved vapor-monitoring boreholes and the corresponding sampling intervals that were field screened and sampled second quarter FY2010 are presented in Table 1.0-2. A summary of vapor-monitoring activities follows.

- On April 11, 2003, NMED sent a letter (NMED 2003, 075939) approving the Resource Conservation and Recovery Act facility investigation report for MDA H (LANL 2001, 070158) and subsequent addendum to the report (LANL 2002, 073270).
- In May 2003, the Laboratory submitted the corrective measures study for MDA H (LANL 2003, 076039) identifying a preferred remedy. Comments were received from NMED, and the report was reissued in June 2005 (LANL 2005, 089332).
- In December 2004, NMED sent a letter (NMED 2004, 092217) requesting the Laboratory collect quarterly subsurface vapor-monitoring samples from boreholes 54-15461, 54-15462, and 54-01023 to provide data to facilitate NMED's selection of an appropriate remedy for MDA H.

- In February 2005, the Laboratory began quarterly pore-gas monitoring using an inflatable packer sampling system. In March 2006, the Laboratory installed dedicated Flexible Liner Underground Technology (FLUTe) sampling membranes into each MDA H pore-gas monitoring borehole.
- In May 2005, NMED sent a letter (NMED 2005, 092219) requesting the Laboratory continue to collect quarterly subsurface vapor-monitoring samples from boreholes 54-15461, 54-15462, and 54-01023.
- NMED reviewed the 2007 pore-gas monitoring report and, based on packer sampling results for trichloroethene (TCE) in pore-gas samples collected before dedicated sampling equipment (FLUTe) was installed, suggested the FLUTe membrane was adsorbing VOCs (NMED 2007, 099277; NMED 2008, 100480). VOC concentrations in subsurface vapor samples were compared during the second and third quarters of FY2008 to evaluate the FLUTe system used at MDA H for those two quarters versus the packer system used from 2001 to 2006 to collect subsurface vapor samples. The results of this study are discussed in “Pilot Test Report for Comparing Packer and FLUTe Vapor-Sampling Systems at Material Disposal Area H” (LANL 2008, 103889). Pore gas was sampled using the FLUTe membrane system during the second quarter sampling event; however, the FLUTe membrane was damaged during the removal process to accommodate packer sampling for the comparison study. The membrane was sent to the manufacturer for repair before it was reinstalled for third quarter sampling activities, which were conducted as planned. During the membrane removal, the tubing was disconnected from the manifold and subsequently misaligned when it was reinstalled before third quarter FY2008 sampling activities were conducted.
- During the first quarter FY2009 (December 2008) sampling event, the field crew observed that one tube connecting the FLUTe membrane’s subsurface sampling port to the surface manifold in borehole 54-15462 did not correspond to the correct fitting for that depth interval on the manifold. The borehole was sampled in the observed tubing configuration (with the exception of the 60-ft port depth, which was not sampled), and the membrane was removed following sampling. After the membrane was removed, it was determined that five of the six tubes were not connected to the correct fittings for the depth intervals on the manifold. In addition, one sampling port (60-ft depth) was not reconnected to any sample tubing at that time.
- As a result of the tubing misalignment, the samples collected from the borehole during the third and fourth quarter FY2008 sampling events and the first quarter FY2009 sampling event were assigned to the wrong depth intervals. Although the misalignment of the tubing in borehole location 54-15462 was not discovered until the first quarter FY2009 sampling event, the ambient-air values measured in the port indicated the tubing may have been disconnected in the 60-ft port depth during the fourth quarter FY2008 sampling event. Therefore, the 60-ft port depth was not sampled during the fourth quarter FY2008 and first quarter FY2009 sampling events. The 60-ft port depth was sampled during the third quarter FY2008 sampling event; however, the results are not representative of formation air at this port depth.
- Because of the problems with the tubing configuration in borehole location 54-15462, the Laboratory corrected the field documentation (sample collection logs and field notebooks) for the third and fourth quarter FY2008 sampling events and for the first quarter FY2009 sampling event.
- The Sample Management Database records were updated to correlate the results to the correct port depths sampled in borehole location 54-15462 during the third and fourth quarters of FY2008 and the first quarter of FY2009.

- Analytical results and their associated port depths were reported correctly in "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Fiscal Year 2008" (LANL 2009, 105191).
- The third quarter FY2008 pore-gas results presented in "Pilot Test Report for Comparing Packer and FLUTe Vapor-Sampling Systems at Materials Disposal Area H" were incorrect (LANL 2008, 103889). The information presented in this report was revised, and the report was resubmitted to NMED in February 2009 as the "Pilot Test Report for Comparing Packer and FLUTe Vapor-Sampling Systems at Materials Disposal Area H, Revision 1" (LANL 2009, 105076).
- Although pore-gas screening and analytical data for borehole 54-15462 reported for the third and fourth quarters of FY2008 and the first quarter of FY2009 were corrected in all field and laboratory documentation to correlate the results to the actual depths monitored, NMED rejected all data for this borehole collected during these three events because the misalignment of the sampling ports to the manifold may have resulted in inadequate purge volumes (NMED 2009, 105599).
- On August 20, 2009, NMED sent a letter to the Laboratory discussing the presence of VOCs and tritium in the subsurface at MDA H, discrepancies between Tables 3.0-1 and 5.2-1 (LANL 2009, 106656), and the rejection of tritium in the third and fourth quarters of FY2008 and the first quarter of FY2009 because of inadequate purge times. The discrepancies were corrected, and the tables were resubmitted. The Laboratory rejected the VOC sampling results because the purge time for the three quarters was not adequate. The Laboratory includes the tritium data NMED rejected because tritium analysis is dependent on weight accumulation of water vapor, not on purge time (NMED 2009, 106786).
- On June 23, 2009, NMED sent a letter directing the Laboratory to extend the depth of existing monitoring well 54-15462 to its original intended depth of 300 ft bgs and to replace the FLUTe system with a stainless-steel tubing system. The letter also directed the Laboratory to drill a new borehole 54-609985 north of shafts 4 and 9 to a depth of 300 ft bgs and finish it with a stainless-steel tubing system. Additionally, the letter directed the Laboratory to replace the FLUTe system in borehole 54-01023 with a stainless-steel tubing system (NMED 2009, 106234).
- Drilling mobilization began on November 3, 2009. Drilling of borehole 54-609985 began on November 5, 2009 and was completed on November 13, 2009, when the stainless-steel sampling system was installed. Redrilling of borehole 54-01023 to its original intended depth of 260 ft began on November 14, 2009, and was completed on November 15, 2009, with a stainless-steel sampling system. Deepening of borehole 54-15462 to a depth of 300ft bgs began on November 16, 2009, and was completed with a stainless-steel sampling system on November 18, 2009. Installation of the stainless-steel sampling system at borehole 54-15461 began on November 18, 2009 and was completed on November 19, 2009 (LANL 2009, 108298).

Subsurface vapor-field screening and sampling are being performed to characterize VOC concentration and tritium-activity level trends in subsurface vapor over time. Field-screening data and analytical laboratory results for the second quarter of FY2010 and the previous three quarters are presented in this report.

2.0 SCOPE OF ACTIVITIES

The following sampling activities were completed at MDA H during the second quarter of FY2010, as directed by NMED in a June 23, 2009, letter to the Laboratory (NMED 2004, 092217). Second quarter vapor-monitoring activities were conducted from January 19 to February 12, 2010. Table 1.0-2 shows the vapor-monitoring borehole identification numbers and sampling port depths. The vapor-monitoring borehole locations are shown in Figure 1.0-2.

- Each sampling interval was purged to ensure that formation air was sampled in accordance with Standard Operating Procedure EP-ERSS-SOP-5074, Sampling of Sub-Atmospheric Air.
- Pore gas from each sampling interval was field screened for carbon dioxide (CO_2) and oxygen (O_2) using a Landtec GEM-500. A Brüel and Kjær (B&K) Type 1302 multigas photoacoustic analyzer was used to field screen for selected VOCs, CO_2, and water vapor. The pressure differential was also measured at each sampling interval using a manometer.
- Vapor samples were collected from each sampling interval in SUMMA canisters for laboratory analyses of VOCs using U.S. Environmental Protection Agency (EPA) Method TO-15.
- Tritium samples were collected from each sampling interval with silica-gel columns for laboratory analysis using EPA Method 906.0.
- A total of 28 VOC samples were collected from 28 ports in four boreholes.
- A total of 28 tritium samples were collected from 28 ports in four boreholes.

No investigation-derived waste was generated during quarterly monitoring.

3.0 REGULATORY CRITERIA

The Compliance Order on Consent (the Consent Order) does not identify any cleanup standards, risk-based screening levels (SLs), risk-based cleanup goals, or other regulatory criteria for pore gas at MDA H. Therefore, an analysis was conducted to evaluate the potential for contamination of groundwater by VOCs in pore gas using SLs based on groundwater cleanup levels in the Consent Order. The analysis evaluated the groundwater concentrations that would exist if pore gas were in equilibrium with ground water. The equilibrium relationship between air and water concentrations is described by the following equation.

$$C_{water} = C_{air}/H' \qquad \textbf{Equation 3.0-1}$$

Where C_{water} = the volumetric concentration of contaminant in water,

C_{air} = the volumetric concentration of contaminant in air, and

H' = dimensionless form of Henry's law constant.

If the predicted concentration of a particular VOC in groundwater is less than the SL, then no potential exists for exceedances of groundwater cleanup levels. The second quarter MDA H VOC pore-gas data are analyzed in section 5.0.

The screening evaluation was based on groundwater standards or tap water SLs and on Henry's law constants that describe the equilibrium relationship between vapor and water concentrations. The source of the Henry's law constants is the NMED technical background document (NMED 2009, 106420) or the EPA regional screening tables (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/params_sl_table_bwrun_DECEMBER2009.pdf) The following dimensionless form of Henry's law constant was used:

$$H' = \frac{C_{air}}{C_{water}}$$ **Equation 3.0-2**

Equation 3.0-2 can be used to calculate the following screening value (SV):

$$SV = \frac{C_{air}}{1000 \times H' \times SL}$$ **Equation 3.0-3**

where C_{air} is the concentration of a particular 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 the groundwater standards or tap water SLs. The groundwater standards are the EPA maximum contaminant level (MCL) or New Mexico Water Quality Control Commission (NMWQCC) groundwater standard, whichever is lower. If no MCL or NMWQCC standard is available, the EPA regional tap water SL (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_sl_table_bwrun_DECEMBER2009.pdf) is used and adjusted to 10^{-5} risk for carcinogens. The numerator in Equation 3.0-3 is the actual concentration of the VOC in pore gas, and the denominator represents the pore-gas concentration needed to exceed the SL. Therefore, if the screening value (SV) is less than 1, the concentration of the VOC in pore gas does not exceed the SL, even if the VOC plume were in direct contact with groundwater. Table 3.0-1 presents the calculated concentrations in pore gas corresponding to groundwater SLs for contaminants detected during the second quarter of FY2010 and the previous three quarters. Table 3.0-2 shows the SVs calculated for the maximum detected VOC concentrations during second quarter FY2010. Table 3.0-3 shows the SVs calculated for the maximum detected VOC concentrations during the second quarter of FY2010 and the previous three quarters.

4.0 FIELD-SCREENING RESULTS

Second quarter FY2010 vapor-monitoring field-screening activities were conducted at MDA H from January 19 to February 12, 2010. Before sampling, each sample interval was purged to ensure formation air was collected. The vapor from each port was field screened using a Landtec GEM-500 photoionization detector equipped with an 11.7-electron volt lamp to measure percent CO_2 and O_2. Each interval was monitored with the Landtec until CO_2 and O_2 readings stabilized. During second quarter screening with the Landtec GEM-500, the percent O_2 and CO_2 using the Landtec with the serial number 1139 were stable but elevated; they were reading near 24.0% O_2. The Landtec with serial number 1139 was sent back, and a replacement Landtec unit (serial number 560) was used to rescreen the ports. The stabilized percent CO_2 and O_2 values measured at each sampling location during the second quarter of FY2010 and the previous three quarters are provided in Table 4.0-1. After the tubing was purged and stabilized, VOC field-screening results were collected using a B&K Type 1302 multigas photoacoustic analyzer to estimate VOC concentrations. The B&K was calibrated for analysis of four VOCs, including trichlorofluoromethane (Freon-11); tetrachloroethene (PCE); 1,1,1-trichloroethane (TCA); and trichloroethene (TCE). It also measured CO_2 and water vapor. The stabilized B&K field-monitoring values measured at each sampling location for the second quarter of FY2010 and the previous three quarters at each sampling location are provided in Table 4.0-2. The field-screening quality assurance/quality control (QA/QC) program is summarized in Appendix B, section B-5.0.

5.0 ANALYTICAL DATA RESULTS

Second quarter FY2010 vapor-sampling activities were conducted at MDA H from January 19 to February 12, 2010. Sampling locations and depths are provided in Table 1.0-2. Analytical vapor samples were collected in SUMMA canisters and submitted for laboratory analyses of VOCs according to EPA Method TO-15. Analytical vapor samples were collected in silica gel columns and submitted for laboratory analyses of tritium according to EPA Method 906.0. Table 5.0-1 presents analytical results for detected VOCs in samples collected during the second quarter of FY2010 and the three previous quarters. VOC levels in MDA H during second quarter of FY2010 are shown on Plate 1. Table 5.0-2 presents analytical results for detected activity levels of tritium in samples collected during the second quarter of FY2010 and the three previous quarters. Tritium levels in MDA H during second quarter of FY2010 are also displayed in Figure 5.0-1. Analytical data and reports for the second quarter FY2010 and the three previous quarters are included in Appendix C (on CD included with this report). Tritium and VOC analytical data were reviewed in accordance with the QA/QC program presented in Appendix B.

5.1 Data Summary

Boreholes 54-01023 and 54-15462 were redrilled in November and December of 2009 and the sampling interval increased from 2- to 5-ft intervals. These 5-ft intervals inhabit the same stratigraphic unit as the previous 2-ft sampling intervals; therefore, it is possible to compare the results from the first and second quarters of FY2010 with the previous two sampling events in FY2009.

During the second quarter of FY2010, laboratory analysis detected 24 VOC analytes in the 28 vapor samples collected from MDA H. TCA was detected in all 28 VOC samples; dichlorodifluoromethane and Freon-11 were detected in 26 of the 28 samples.

TCA was detected at concentrations ranging from 9.1 $\mu g/m^3$ to 100 $\mu g/m^3$ (1.7 ppbv to 18 ppbv). Dichlorodifluoromethane and Freon-11 were each detected at maximum concentrations of 47 $\mu g/m^3$ (9.6 ppbv) and 47 $\mu g/m^3$ (8.3 ppbv), respectively.

The VOC analyte with the highest concentration was butanol[1-] at 580 $\mu g/m^3$ (190 ppbv), detected in borehole 54-01023 at the 62.5 ft depth. The second highest VOC detect was ethanol at 380 $\mu g/m^3$ (200 ppbv), also detected in 54-01023 at 62.5 ft bgs.

VOC results were generally consistent between second quarter sampling and the previous three sampling events for boreholes 54-01023, 54-15461, and 54-15462 and were consistent between the first and second quarter for borehole 54-609985.

During the second quarter FY2010 sampling event, tritium was detected in 24 of the 28 vapor samples collected at MDA H with activity levels ranging from 385.205 pCi/L to 1,761,090 pCi/L. The highest tritium activity levels were detected in vapor samples collected from borehole 54-01023, the monitoring borehole nearest MDA H. The tritium activity levels detected at borehole 54-01023 in the second quarter FY2010 were similar to those detected in the third and fourth quarters of FY2009 but greater than those detected during first quarter FY2010 sampling. Tritium activity levels in boreholes 54-15461 and 54-15462 ranged from nondetect to 92,820.1 pCi/L and were generally consistent with the three previous sampling events, although activities significantly higher than the previous three quarters were detected in borehole 54-15462 at the 12.5-ft and 274.5-ft intervals. Tritium was detected 8 of the 9 ports of borehole 54-609985 during second quarter sampling, with a maximum activity of 165,743 pCi/L. This borehole was first sampled during first quarter FY2010; however, tritium was not detected during the first quarter sampling event.

5.2 Data Evaluation

During the second quarter of FY2010, SVs were calculated for the maximum concentrations of VOCs detected at MDA H using Equation 3.0-3. Twenty-four VOCs were detected during the second quarter of FY2010. The evaluation included the 20 VOCs detected in MDA H samples for which there are MCLs, NMWQCC standards, or EPA regional tap water SLs. Table 3.0-2 shows the SVs calculated for the relevant VOCs for second quarter FY2010. For all detected VOCs, SVs were less than 1.0, indicating VOC concentrations in the pore gas beneath MDA H are not an immediate potential threat to groundwater.

Table 3.0-3 shows the SVs calculated for VOCs for the second quarter FY2010 and the previous three sampling quarters. All SVs were below 1.0 for the last four quarters, indicating VOC concentrations in the pore gas beneath MDA H are not an immediate potential threat to groundwater.

6.0 SUMMARY

The purpose of the quarterly pore-gas monitoring activities at MDA H is to evaluate trends in VOC concentrations and tritium activities in subsurface vapor at MDA H over time. The results from the second quarter FY2010 monitoring event are summarized as follows.

- During FY2010, 24 VOC analytes were detected in vapor samples collected from the monitoring boreholes at MDA H. TCA was detected in all 28 samples collected, and dichlorodifluoromethane and Freon-11 were detected in 26 of the 28 VOC samples.
- VOCs were present at low concentrations in subsurface vapor and are generally consistent with concentrations detected during the three previous quarterly sampling events.
- Maximum concentrations of all VOCs detected in pore gas during second quarter FY2010 as well as the previous three sampling events were less than concentrations needed to exceed groundwater SLs. The VOCs measured at MDA H monitoring locations pose no immediate potential threat to groundwater.
- Tritium in pore vapor was detected in 24 of the 28 samples analyzed during the second quarter of FY2010; the activity levels in borehole locations 54-15461 and 54-15462 are generally consistent with those detected during the three previous quarterly sampling events. The tritium activity levels in borehole 54-01023 were generally consistent with those detected during the third and fourth quarters of FY2010.
- The highest two tritium activity levels measured in all four quarters of this report were in vapor samples collected from the top two port depths of borehole location 54-01023 in the third quarter of FY2009. The highest two tritium activity levels in the second quarter of FY2010 were detected in the second and fourth deepest depths at borehole 54-01023.
- No tritium activity was detected in the newly drilled borehole 54-609985 during the first quarter FY2010 but was detected in 7 of 8 ports during the second quarter FY2010, with a maximum activity of 165,743 pCi/L.

7.0 REFERENCES AND MAP 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. This information is also included in text citations. ER IDs 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 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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LANL (Los Alamos National Laboratory), September 2008. "Pilot Test Report for Comparing Packer and FLUTe Vapor-Sampling Systems at Material Disposal Area H," Los Alamos National Laboratory document LA-UR-08-5872, Los Alamos, New Mexico. (LANL 2008, 103889)

LANL (Los Alamos National Laboratory), January 2009. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Fiscal Year 2008," Los Alamos National Laboratory document LA-UR-09-0473, Los Alamos, New Mexico. (LANL 2009, 105191)

LANL (Los Alamos National Laboratory), July 2009. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Second Quarter Fiscal Year 2009," Los Alamos National Laboratory document LA-UR-09-4406, Los Alamos, New Mexico. (LANL 2009, 106656)

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LANL (Los Alamos National Laboratory), December 2009. "Completion Report for Pore-Gas Monitoring System Boreholes at Material Disposal Area H," Los Alamos National Laboratory document LA-UR-09-8169, Los Alamos, New Mexico. (LANL 2009, 108298)

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NMED (New Mexico Environment Department), December 21, 2004. "Notification to Collect Additional Vapor Monitoring Data at MDA H, SWMU 54-004, at TA-54," New Mexico Environment Department letter to D. Gregory (DOE LASO) and G.P. Nanos (LANL Director) from N. Dhawan (NMED-HWB), Santa Fe, New Mexico. (NMED 2004, 092217)

NMED (New Mexico Environment Department), May 17, 2005. "Notification for Additional Information for MDA H, SWMU 54-004, at TA-54," New Mexico Environment Department letter to D. Gregory (DOE LASO) and G.P. Nanos (LANL Director) from N. Dhawan (NMED-HWB), Santa Fe, New Mexico. (NMED 2005, 092219)

NMED (New Mexico Environment Department), December 21, 2007. "Review of Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Fiscal Year 2007," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2007, 099277)

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NMED (New Mexico Environment Department), August 2009. "Technical Background Document for Development of Soil Screening Levels, Revision 5.0," New Mexico Environment Department, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Santa Fe, New Mexico. (NMED 2009, 106420)

NMED (New Mexico Environment Department), August 20, 2009. "Review of the Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Second Quarter Fiscal Year 2009," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2009, 106786)

7.2 Map 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	Waste Storage Features; LANL, 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; LANL, 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; LANL, ENV Environmental Remediation and Surveillance Program; 1991.
Fence	Security and Industrial Fences and Gates; LANL, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
LANL boundary	LANL Areas Used and Occupied; LANL, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 October 2008.
MDA	Materials Disposal Areas; LANL, ENV Environmental Remediation and Surveillance Program; ER2004-0221; 1:2,500 Scale Data; 23 April 2004.
Paved road	Paved Road Arcs; LANL, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
Structure	Structures; LANL, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
TA boundary	Technical Area Boundaries; LANL, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007.
Unpaved road	Dirt Road Arcs; LANL, 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; LANL, Environment and Remediation Support Services Division, EP2007-0754; 30 November 2007.

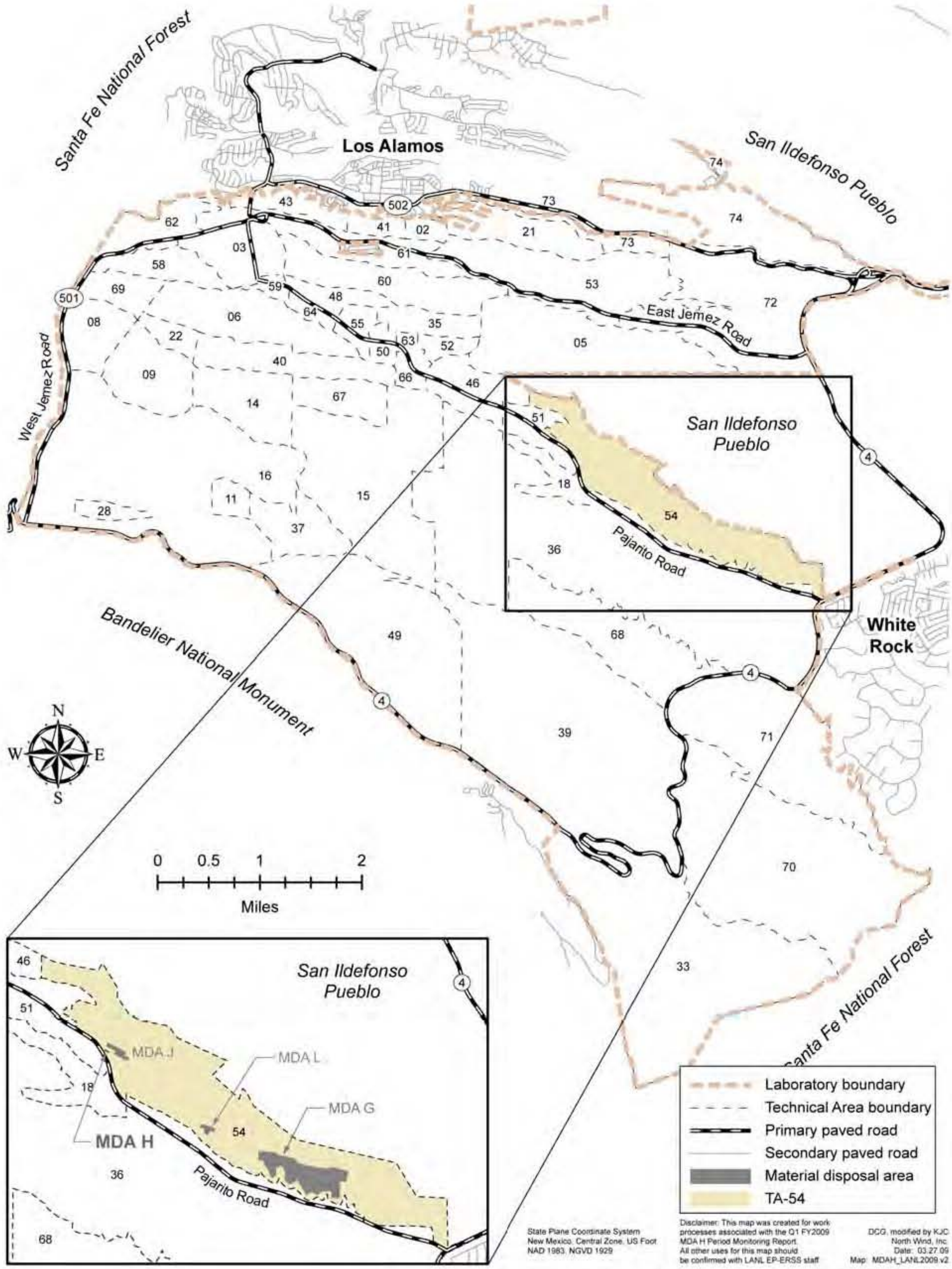

Figure 1.0-1 Location of MDA H in TA-54 with respect to Laboratory TAs and surrounding land holdings

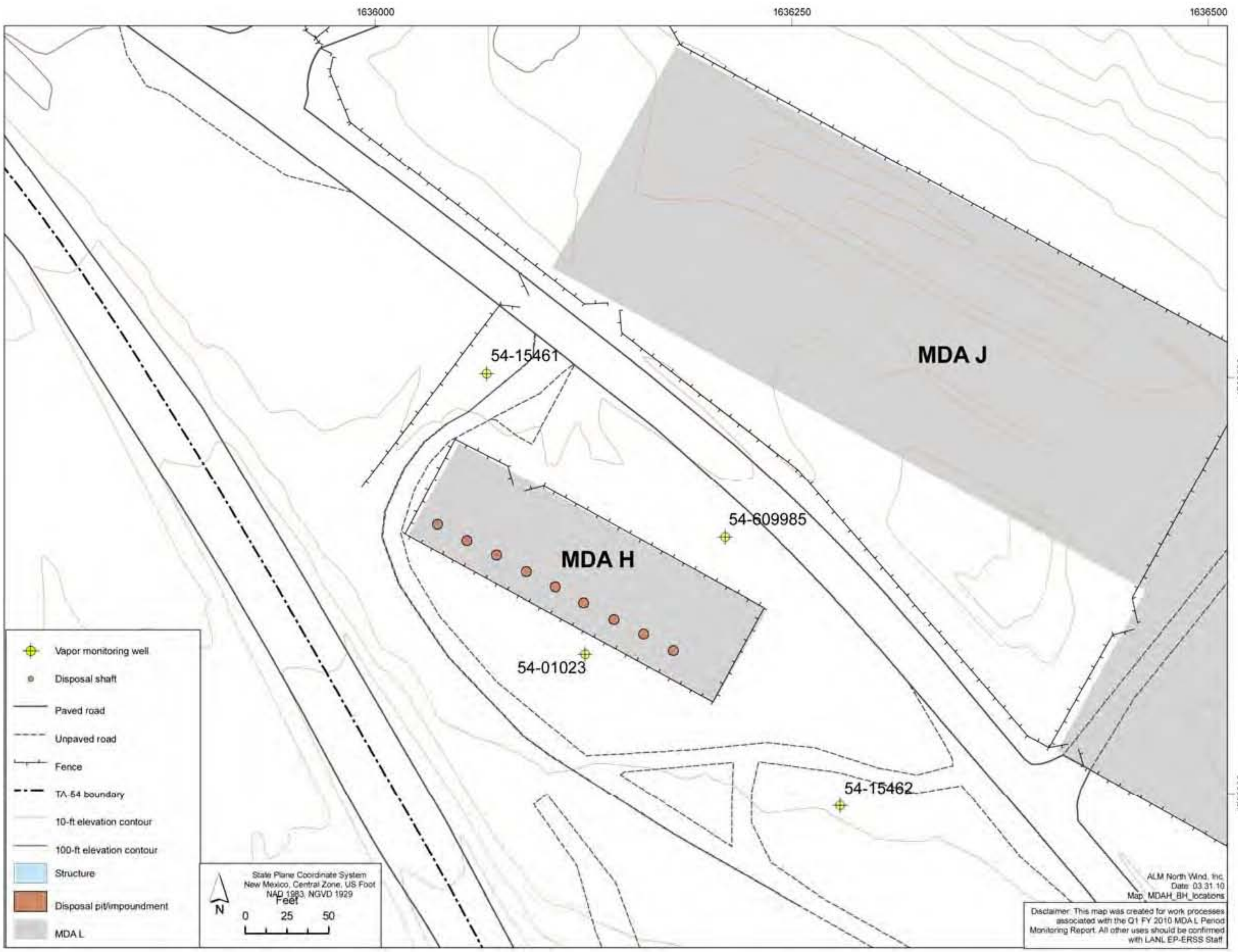

Figure 1.0-2 Locations of MDA H pore-gas monitoring boreholes

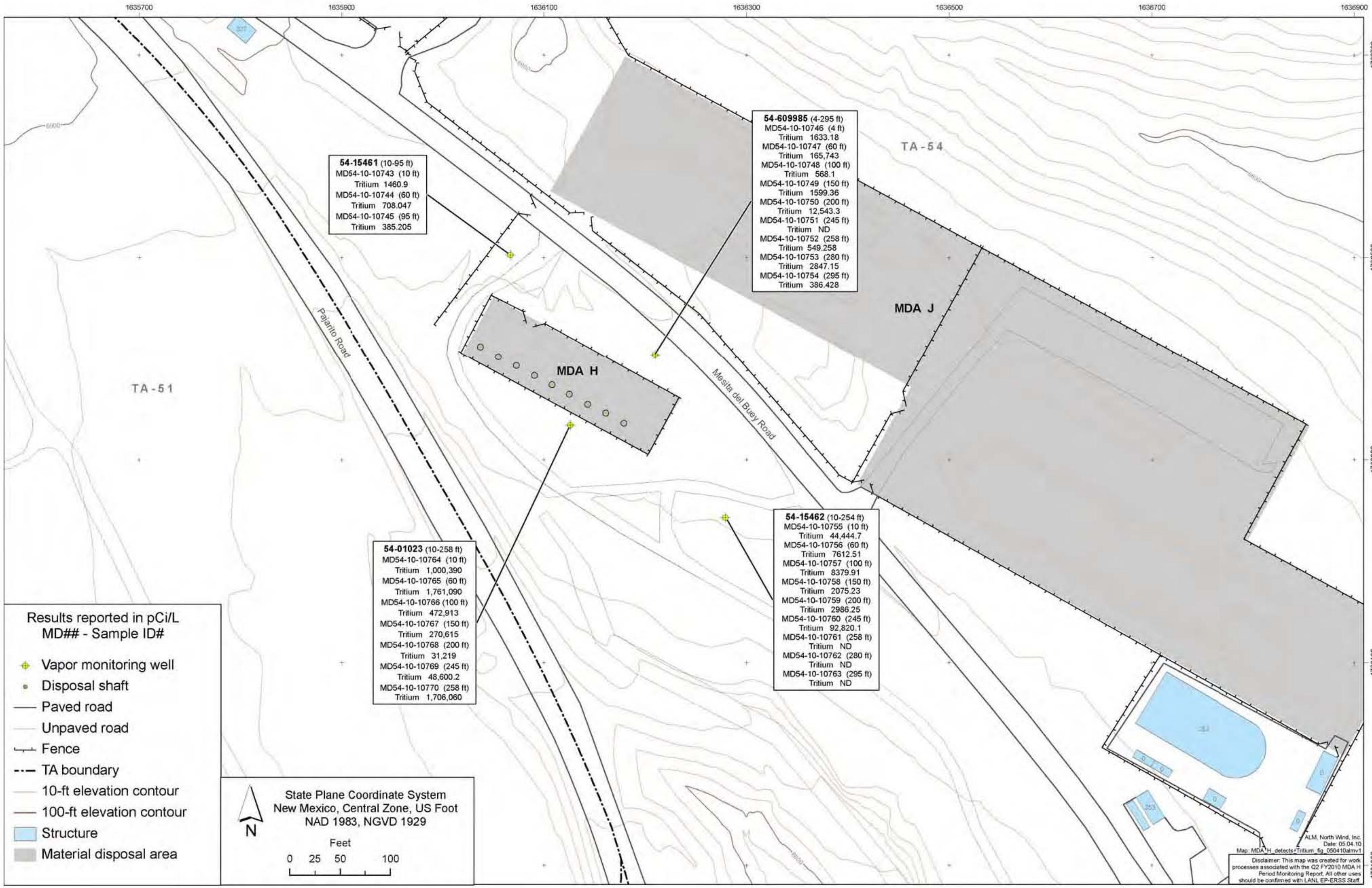

Figure 5.0-1 Tritium detected in vapor samples at MDA H

Table 1.0-1
NMED-Approved MDA H Subsurface Vapor-Monitoring Locations,
Port Depths, and Corresponding Sampling Intervals through Fourth Quarter FY2009

Borehole ID	VOC and Tritium Sampling Port Depth Intervals (ft bgs)
54–01023	10 (10–12), 60 (60-62), 100 (100–102), 150 (150–152), 200 (200–202), 247 (247–249)
54–15461	10 (10–12), 60 (60-62), 95 (95–97)
54–15462	10 (10–12), 60 (60–62), 100 (100–102), 150 (150–152), 200 (200–202), 254 (254–256)

Notes: Depths denote locations where VOC and tritium samples will be collected. Sampling intervals are given in parentheses.

Table 1.0-2
NMED-Approved MDA H Subsurface Vapor-Monitoring Locations,
Port Depths, and Corresponding Sampling Intervals Effective First Quarter FY2010

Borehole ID	VOC and Tritium Sampling Port Depth Intervals (ft bgs)
54–01023[a]	12.5 (10–15), 62.5 (60–65), 102.5 (100–105), 152.5 (150–155), 202.5 (200–205), 247.5 (245–250), 260.5 (258–263)
54–15461	11 (10–12), 61 (60–62), 96 (95–97)
54–15462[a]	12.5 (10–15), 62.5 (60–65), 102.5 (100–105), 152.5 (150–155), 202.5 (200–205), 247.5 (245–250), 260.5 (258–263), 282.5 (280–285), 297.5 (295–300)
54–609985[b]	6.5 (4–9), 62.5 (60–65), 102.5 (100–105), 152.5 (150–155), 202.5 (200–205), 247.5 (245–250), 260.5 (258–263), 282.5 (280–285), 297.5 (295–300)

Notes: Depths denote locations where VOC and tritium samples will be collected. Sampling intervals are given in parentheses.

[a] Borehole was redrilled November 2009, depths reflect new ports and intervals.

[b] New borehole was drilled in November 2009.

Table 3.0-1
Henry's Law Constants, Groundwater SLs, and
Calculated Pore Gas Concentrations Corresponding to Groundwater SLs
for VOCs Detected in Pore Gas at MDA H during Last Four Quarters

VOC	Henry's Law Constant[a] (dimensionless)	Groundwater SL (µg/L)	Source of Groundwater SL	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)
Acetone	0.0016	22,000	EPA Regional SL	35,200
Benzene	0.228	5	EPA MCL	1140
Bromodichloromethane	0.087	0.12	EPA Regional SL	10.44
Butanol[1-]	0.00036	3700	EPA Regional SL	1332
Butanone[2-]	0.0023	7100	EPA Regional SL	16,330
Carbon Disulfide	0.59	1000	EPA Regional SL	590,000
Carbon Tetrachloride	1.1	5	EPA MCL	5500
Chlorobenzene	0.13	100	EPA MCL	13,000
Chlorodifluoromethane	1.7	100,000	EPA Regional SL	170,000,000
Chloroform	0.15	100	NMWQCC	15,000
Cyclohexane	6.1	13,000	EPA Regional SL	79,300,000
Dichlorobenzene[1,4-]	0.0996	75	EPA MCL	7470
Dichlorodifluoromethane	14	390	EPA Regional SL	5,460,000
Dichloroethane[1,1-]	0.23	25	NMWQCC	5750
Dichloroethene[1,1-]	1.1	5	NMWQCC	5500
Dichloropropane[1,2-]	0.12	5	EPA MCL	600
Ethanol	na[b]	na	na	na
Ethylbenzene	0.323	700	EPA MCL	226,100
Ethyltoluene[4-]	na	na	na	na
Hexane	74	880	EPA Regional SL	65,120,000
Methanol	0.00019	18,000	EPA Regional SL	3420
Methylene Chloride	0.13	5	EPA MCL	650
n-Heptane	na	na	na	na
Propanol[2-]	0.00033	na	na	na
Propylene	na	na	na	na
Tetrachloroethene	0.72	5	EPA MCL	3600
Tetrahydrofuran	na	na	na	na
Toluene	0.272	750	NMWQCC	204,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	22	59,000	EPA Regional SL	1,298,000,000
Trichloroethane[1,1,1-]	0.705	60	NMWQCC	42,300
Trichloroethene	0.4	5	EPA MCL	2000

Table 3.0-1 (continued)

VOC	Henry's Law Constant[a] (dimensionless)	Groundwater SL (µg/L)	Source of Groundwater SL	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)
Trichlorofluoromethane	4	1300	EPA Regional SL	5,200,000
Xylene[1,2-]	0.213	1200	EPA Regional SL	255,600
Xylene[1,3-]+Xylene[1,4-]	0.27	10,000[c]	EPA MCL	2,700,000

Notes: Calculated concentrations in pore gas exceeding groundwater standard derived from the denominator of Equation 3.0-3. The SV is derived from Equation 3.0-3.

[a] NMED 2009, 106420, Appendix B.

[b] na = Not available.

[c] SL for xylene[1,3-]+xylene[1,4-] is for xylene mixture.

Table 3.0-2
Screening of VOC Detected in Pore Gas at MDA H during Second Quarter FY2010

VOCs	Maximum Pore-Gas Concentration (µg/m³)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)	SV (unitless)	Potential for Groundwater Impact[a]
Acetone	27	35,200	0.00077	No
Butanol[1-]	580	1332	0.44	No
Butanone[2-]	36	16,330	0.0022	No
Carbon Disulfide	3.2	590,000	0.0000054	No
Carbon Tetrachloride	16	5500	0.0029	No
Chlorodifluoromethane	19	170,000,000	0.00000011	No
Chloroform	280	15,000	0.019	No
Cyclohexane	120	79,300,000	0.0000015	No
Dichlorodifluoromethane	47	5,460,000	0.0000086	No
Dichloroethane[1,1-]	3.6	5750	0.00063	No
Dichloropropane[1,2-]	6.7	600	0.011	No
Ethanol	380	na[b]	na	No
Hexane	3.3	65,120,000	0.000000051	No
Methylene Chloride	13	650	0.02	No
Propanol[2-]	50	na	na	No
Propylene	17	na	na	No
Tetrachloroethene	7.3	3600	0.002	No
Tetrahydrofuran	4.8	na	na	No
Toluene	15	204,000	0.000074	No

Table 3.0-2 (continued)

VOC	Maximum Detected Pore-Gas Concentration (µg/m³)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)	SV (unitless)	Potential to Exceed Groundwater Standard[a]
Trichloro-1,2,2-trifluoroethane[1,1,2-]	25	1,298,000,000	0.000000019	No
Tricloroethane[1,1,1-]	100	42,300	0.0024	No
Trichloroethene	10	2000	0.005	No
Trichlorofluoromethane	47	5,200,000	0.000009	No
Xylene[1,3-]+Xylene[1,4-]	5.5	2,700,000	0.000002	No

Note: Calculated concentrations in pore gas corresponding to groundwater SLs derived from denominator of Equation 3.0-3.

[a] If the SV is less than 1, the concentration of the VOC in pore gas does not exceed the groundwater SL and the VOC is not a threat to groundwater.

[b] na = Not available.

Table 3.0-3
Screening of VOCs Detected in Pore Gas at MDA H during the Last Four Quarters

Analyte	Maximum Pore-Gas Concentration (µg/m³)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)	SV (unitless)	Potential for Groundwater Impact[a]
Acetone	37	35,200	0.0011	No
Benzene	14	1140	0.012	No
Bromodichloromethane	6.9	10.44	0.66	No
Butanol[1-]	600	1332	0.45	No
Butanone[2-]	36	16,330	0.0022	No
Carbon Disulfide	28	590,000	0.000047	No
Carbon Tetrachloride	19	5500	0.0035	No
Chlorobenzene	110	13,000	0.0085	No
Chlorodifluoromethane	20	170,000,000	0.00000012	No
Chloroform	1400	15,000	0.093	No
Cyclohexane	120	79,300,000	0.0000015	No
Dichlorobenzene[1,4-]	6.9	7470	0.00092	No
Dichlorodifluoromethane	47	5,460,000	0.0000086	No
Dichloroethane[1,1-]	3.6	5750	0.00063	No
Dichloroethene[1,1-]	16	5500	0.0029	No
Dichloropropane[1,2-]	6.7	600	0.011	No
Ethanol	380	na[b]	na	No

Table 3.0-3 (continued)

Analyte	Maximum Pore-Gas Concentration (µg/m³)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)	SV (unitless)	Potential for Groundwater Impact[a]
Ethylbenzene	4.2	226,100	0.000019	No
Ethyltoluene[4-]	4.5	na	na	No
Hexane	16	65,120,000	0.00000025	No
Methanol	250	3420	0.073	No
Methylene Chloride	13	650	0.02	No
n-Heptane	17	na	na	No
Propanol[2-]	410	na	na	No
Propylene	17	na	na	No
Tetrachloroethene	9	3600	0.0025	No
Tetrahydrofuran	17	na	na	No
Toluene	800	204,000	0.0039	No
Trichloro-1,2,2-trifluoroethane[1,1,2-]	25	1,298,000,000	0.000000019	No
Trichloroethane[1,1,1-]	100	42,300	0.0024	No
Trichloroethene	10	2000	0.005	No
Trichlorofluoromethane	75	5,200,000	0.000014	No
Xylene[1,2-]	10	255,600	0.000039	No
Xylene[1,3-]+Xylene[1,4-]	6.5	2,700,000	0.0000024	No

Note: Calculated concentrations in pore gas corresponding to groundwater SLs derived from denominator of Equation 3.0-3. The SV is derived from Equation 3.0-3.

[a] If the SV is less than 1, the concentration of the VOC in pore gas does not exceed the groundwater SL and the VOC is not a threat to groundwater.

[b] na = Not available.

Table 4.0-1
Field-Screening Results Using a Landtec GEM-500 at MDA H

Borehole ID	Port Depth (ft bgs)	Sampling-Port Interval (ft bgs)	Analyte	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result (%)	Date	Result (%)	Date	Result (%)	Date	Result (%)
54-01023	Ambient	Ambient	CO_2	4/30/09	0	8/5/09	0	12/2/09	0	2/12/10	0
			O_2	4/30/09	21.7	8/5/09	21.2	12/2/09	20.5	2/12/10	21.1
	10	10–12	CO_2	4/30/09	0.2	8/5/09	0.5	NS*	NS	NS	NS
			O_2	4/30/09	21.3	8/5/09	19.9	NS	NS	NS	NS
	12.5	10–15	CO_2	NS	NS	NS	NS	12/2/09	0.4	2/12/10	0
			O_2	NS	NS	NS	NS	12/2/09	20.2	2/12/10	21
	60	60–62	CO_2	4/30/09	0.4	8/5/09	0.3	NS	NS	NS	NS
			O_2	4/30/09	21.1	8/5/09	19.9	NS	NS	NS	NS
	62.5	60–65	CO_2	NS	NS	NS	NS	12/2/09	0.7	2/12/10	0.7
			O_2	NS	NS	NS	NS	12/2/09	19.6	2/12/10	20.4
	100	100–102	CO_2	4/30/09	0.2	8/5/09	0.3	NS	NS	NS	NS
			O_2	4/30/09	20.3	8/5/09	19.3	NS	NS	NS	NS
	102.5	100–105	CO_2	NS	NS	NS	NS	12/2/09	0.6	2/12/10	0.6
			O_2	NS	NS	NS	NS	12/2/09	19.3	2/12/10	20.5
	150	150–152	CO_2	4/30/09	0.1	8/5/09	0.1	NS	NS	NS	NS
			O_2	4/30/09	20.2	8/5/09	19.4	NS	NS	NS	NS
	152.5	150–155	CO_2	NS	NS	NS	NS	12/2/09	0	2/12/10	0.2
			O_2	NS	NS	NS	NS	12/2/09	19.6	2/12/10	20.9
	200	200–202	CO_2	4/30/09	0.2	8/5/09	0	NS	NS	NS	NS
			O_2	4/30/09	20	8/5/09	19.4	NS	NS	NS	NS
	202.5	200–205	CO_2	NS	NS	NS	NS	12/2/09	0.5	2/12/10	0
			O_2	NS	NS	NS	NS	12/2/09	19.3	2/12/10	21.3

Table 4.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Interval (ft bgs)	Analyte	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result (%)	Date	Result (%)	Date	Result (%)	Date	Result (%)
54-01023 (cont.)	247	247–249	CO_2	4/30/09	0.2	8/5/09	0	NS	NS	NS	NS
			O_2	4/30/09	20.1	8/5/09	19.7	NS	NS	NS	NS
	247.5	245–250	CO_2	NS	NS	NS	NS	12/2/09	0.3	2/12/10	0
			O_2	NS	NS	NS	NS	12/2/09	19.2	2/12/10	21.3
	260.5	258–263	CO_2	NS	NS	NS	NS	12/2/09	0.3	2/12/10	0
			O_2	NS	NS	NS	NS	12/2/09	19.3	2/12/10	21.2
54-15461	Ambient	Ambient	CO_2	4/29/09	0	8/6/09	0	12/1/09	0	2/12/10	0
			O_2	4/29/09	20.8	8/6/09	20.9	12/1/09	20.1	2/12/10	21.4
	10	10–12	CO_2	4/29/09	0.3	8/6/09	0	NS	NS	NS	NS
			O_2	4/29/09	20.7	8/6/09	20.4	NS	NS	NS	NS
	11	10–12	CO_2	NS	NS	NS	NS	12/1/09	0.4	2/12/10	0.4
			O_2	NS	NS	NS	NS	12/1/09	19.6	2/12/10	20.7
	60	60–62	CO_2	4/29/09	0.7	8/6/09	0	NS	NS	NS	NS
			O_2	4/29/09	20.6	8/6/09	20.2	NS	NS	NS	NS
	61	60–62	CO_2	NS	NS	NS	NS	12/1/09	0.4	2/12/10	0.6
			O_2	NS	NS	NS	NS	12/1/09	19.2	2/12/10	21
	95	95–97	CO_2	4/29/09	0.7	8/6/09	0	NS	NS	NS	NS
			O_2	4/29/09	20.5	8/6/09	20.1	NS	NS	NS	NS
	96	95–97	CO_2	NS	NS	NS	NS	12/1/09	0.5	2/12/10	0.5
			O_2	NS	NS	NS	NS	12/1/09	18.8	2/12/10	21.2
54-15462	Ambient	Ambient	CO_2	4/29/09	0	8/6/09	0	12/1/09	0	2/12/10	0
			O_2	4/29/09	20.8	8/6/09	21.4	12/1/09	20.6	2/12/10	21.1
	10	10–12	CO_2	4/29/09	0.5	8/6/09	0	NS	NS	NS	NS
			O_2	4/29/09	20.1	8/6/09	20.7	NS	NS	NS	NS

Table 4.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Interval (ft bgs)	Analyte	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result (%)	Date	Result (%)	Date	Result (%)	Date	Result (%)
54-15462 (cont.)	12.5	10–15	CO_2	NS	NS	NS	NS	12/1/09	0.8	2/12/10	0.7
			O_2	NS	NS	NS	NS	12/1/09	20.5	2/12/10	20.2
	60	60–62	CO_2	4/29/09	0.6	8/6/09	0	NS	NS	NS	NS
			O_2	4/29/09	19.4	8/6/09	20.2	NS	NS	NS	NS
	62.5	60–65	CO_2	NS	NS	NS	NS	12/1/09	0.7	2/12/10	0.8
			O_2	NS	NS	NS	NS	12/1/09	20.5	2/12/10	20.2
	100	100–102	CO_2	4/29/09	0.5	8/6/09	0	NS	NS	NS	NS
			O_2	4/29/09	19.3	8/6/09	20.1	NS	NS	NS	NS
	102.5	100–105	CO_2	NS	NS	NS	NS	12/1/09	0.6	2/12/10	0.7
			O_2	NS	NS	NS	NS	12/1/09	20.5	2/12/10	20.2
	150	150–152	CO_2	4/29/09	0.3	8/6/09	0	NS	NS	NS	NS
			O_2	4/29/09	19.6	8/6/09	19.8	NS	NS	NS	NS
	152.5	150–155	CO_2	NS	NS	NS	NS	12/1/09	0.5	2/12/10	0.4
			O_2	NS	NS	NS	NS	12/1/09	20.5	2/12/10	20.3
	200	200–202	CO_2	4/29/09	0.3	8/6/09	0	NS	NS	NS	NS
			O_2	4/29/09	19.8	8/6/09	19.4	NS	NS	NS	NS
	202.5	200–205	CO_2	NS	NS	NS	NS	12/1/09	0.4	2/12/10	0.3
			O_2	NS	NS	NS	NS	12/1/09	20.4	2/12/10	20.7
	247.5	245–250	CO_2	NS	NS	NS	NS	12/1/09	0	2/12/10	0
			O_2	NS	NS	NS	NS	12/1/09	20.6	2/12/10	21
	254	254–256	CO_2	4/29/09	0.2	8/6/09	0	NS	NS	NS	NS
			O_2	4/29/09	19.5	8/6/09	19.4	NS	NS	NS	NS
	260.5	258–263	CO_2	NS	NS	NS	NS	12/1/09	0.1	2/12/10	0
			O_2	NS	NS	NS	NS	12/1/09	20.5	2/12/10	21.3

Table 4.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Interval (ft bgs)	Analyte	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result (%)	Date	Result (%)	Date	Result (%)	Date	Result (%)
54-15462 (cont.)	282.5	280–285	CO_2	NS	NS	NS	NS	12/1/09	0.3	2/12/10	0.1
			O_2	NS	NS	NS	NS	12/1/09	20.2	2/12/10	20.8
	297.5	295–300	CO_2	NS	NS	NS	NS	12/1/09	0.2	2/12/10	0.2
			O_2	NS	NS	NS	NS	12/1/09	20.1	2/12/10	21
54-609985	Ambient	Ambient	CO_2	NS	NS	NS	NS	12/4/09	0	2/12/10	0
			O_2	NS	NS	NS	NS	12/4/09	20.2	2/12/10	21.5
	6.5	4–9	CO_2	NS	NS	NS	NS	12/4/09	0.2	2/12/10	0.6
			O_2	NS	NS	NS	NS	12/4/09	20.2	2/12/10	21
	62.5	60–65	CO_2	NS	NS	NS	NS	12/4/09	1	2/12/10	0.8
			O_2	NS	NS	NS	NS	12/4/09	19.5	2/12/10	20.7
	102.5	100–105	CO_2	NS	NS	NS	NS	12/4/09	0.7	2/12/10	0.7
			O_2	NS	NS	NS	NS	12/4/09	19.6	2/12/10	20.7
	152.5	150–155	CO_2	NS	NS	NS	NS	12/4/09	0.6	2/12/10	0.6
			O_2	NS	NS	NS	NS	12/4/09	19.8	2/12/10	20.7
	202.5	200–205	CO_2	NS	NS	NS	NS	12/4/09	0.6	2/12/10	0.4
			O_2	NS	NS	NS	NS	12/4/09	19.8	2/12/10	21
	247.5	245–250	CO_2	NS	NS	NS	NS	12/4/09	0.4	2/12/10	0.3
			O_2	NS	NS	NS	NS	12/4/09	20.2	2/12/10	21
	260.5	258–263	CO_2	NS	NS	NS	NS	12/4/09	0.4	2/12/10	0.3
			O_2	NS	NS	NS	NS	12/4/09	20.4	2/12/10	21.2
	282.5	280–285	CO_2	NS	NS	NS	NS	12/4/09	0.4	2/12/10	0.3
			O_2	NS	NS	NS	NS	12/4/09	20.8	2/12/10	21.3
	297.5	295–300	CO_2	NS	NS	NS	NS	12/4/09	0.3	2/12/10	0
			O_2	NS	NS	NS	NS	12/4/09	20.8	2/12/10	21.8

*NS = Not sampled.

Table 4.0-2
Field-Screening Results Using a B&K Multigas Analyzer at MDA H

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023	Ambient	Ambient	CO_2 (µg/m^3)	4/30/09	726,000	8/5/09	1,100,000	12/2/09	935,000	1/19/10	929,000
			Freon-11 (µg/m^3)	4/30/09	–1000	8/5/09	4	12/2/09	203	1/19/10	491
			H_2O (µg/m^3)	4/30/09	19.6[a]	8/5/09	11,000,000	12/2/09	5,140,000	1/19/10	6,220,000
			PCE (µg/m^3)	4/30/09	–4100	8/5/09	2150	12/2/09	5170	1/19/10	3040
			Pressure differential (kPa)	4/30/09	0	8/5/09	0	12/2/09	0	1/19/10	NS[b]
			TCA (µg/m^3)	4/30/09	–1100	8/5/09	1220	12/2/09	–2200	1/19/10	–2600
			TCE (µg/m^3)	4/30/09	2610	8/5/09	1530	12/2/09	3270	1/19/10	435
	10	10–12	CO_2 (µg/m^3)	4/30/09	5,060,000	8/5/09	16,500,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/30/09	253	8/5/09	–218	NS	NS	NS	NS
			H_2O (µg/m^3)	4/30/09	54.2[a]	8/5/09	15,100,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/30/09	–1400	8/5/09	2450	NS	NS	NS	NS
			Pressure differential (kPa)	4/30/09	0	8/5/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/30/09	–6900	8/5/09	5910	NS	NS	NS	NS
			TCE (µg/m^3)	4/30/09	–1500	8/5/09	137	NS	NS	NS	NS
	12.5	10–15	CO_2 (µg/m^3)	NS	NS	NS	NS	12/2/09	8,510,000	1/19/10	946,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/2/09	51	1/19/10	633
			H_2O (µg/m^3)	NS	NS	NS	NS	12/2/09	9,390,000	1/19/10	6,770,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/2/09	4290	1/19/10	3170
			Pressure differential (kPa)	NS	NS	NS	NS	12/2/09	0	1/19/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/2/09	–57,000	1/19/10	–3500
			TCE (µg/m^3)	NS	NS	NS	NS	12/2/09	5090	1/19/10	–446
	60	60–62	CO_2 (µg/m^3)	4/30/09	6,160,000	8/5/09	11,900,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/30/09	140	8/5/09	–173	NS	NS	NS	NS

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023 (cont.)	60	60–62	H_2O (µg/m^3)	4/30/09	59[a]	8/5/09	13,500,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/30/09	–4200	8/5/09	2020	NS	NS	NS	NS
			Pressure differential (kPa)	4/30/09	0	8/5/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/30/09	–8300	8/5/09	1390	NS	NS	NS	NS
			TCE (µg/m^3)	4/30/09	–248	8/5/09	2200	NS	NS	NS	NS
	62.5	60–65	CO_2 (µg/m^3)	NS	NS	NS	NS	12/2/09	13,700,000	1/19/10	11,000,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/2/09	122	1/19/10	62
			H_2O (µg/m^3)	NS	NS	NS	NS	12/2/09	9,780,000	1/19/10	6,870,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/2/09	3980	1/19/10	2390
			Pressure differential (kPa)	NS	NS	NS	NS	12/2/09	0	1/19/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/2/09	–80,000	1/19/10	–59,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/2/09	5790	1/19/10	1880
	100	100–102	CO_2 (µg/m^3)	4/30/09	3,370,000	8/5/09	10,300,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/30/09	–590	8/5/09	–259	NS	NS	NS	NS
			H_2O (µg/m^3)	4/30/09	59[a]	8/5/09	12,700,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/30/09	–1900	8/5/09	–1200	NS	NS	NS	NS
			Pressure differential (kPa)	4/30/09	0	8/5/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/30/09	–4000	8/5/09	6300	NS	NS	NS	NS
			TCE (µg/m^3)	4/30/09	1580	8/5/09	1600	NS	NS	NS	NS
	102.5	100–105	CO_2 (µg/m^3)	NS	NS	NS	NS	12/2/09	11,600,000	1/19/10	8,330,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/2/09	44	1/19/10	326
			H_2O (µg/m^3)	NS	NS	NS	NS	12/2/09	9,840,000	1/19/10	7,200,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/2/09	3920	1/19/10	4560
			Pressure differential (kPa)	NS	NS	NS	NS	12/2/09	0	1/19/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/2/09	–60,000	1/19/10	–44,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/2/09	5310	1/19/10	606

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023 (cont.)	150	150–152	CO_2 (µg/m^3)	4/30/09	3,230,000	8/5/09	7,450,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/30/09	–642	8/5/09	–47	NS	NS	NS	NS
			H_2O (µg/m^3)	4/30/09	58.8[a]	8/5/09	15,600,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/30/09	3140	8/5/09	–1600	NS	NS	NS	NS
			Pressure differential (kPa)	4/30/09	0	8/5/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/30/09	–4200	8/5/09	6200	NS	NS	NS	NS
			TCE (µg/m^3)	4/30/09	–767	8/5/09	-351	NS	NS	NS	NS
	152.5	150–155	CO_2 (µg/m^3)	NS	NS	NS	NS	12/2/09	9,000,000	1/19/10	5,270,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/2/09	69	1/19/10	414
			H_2O (µg/m^3)	NS	NS	NS	NS	12/2/09	9,900,000	1/19/10	8,010,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/2/09	3870	1/19/10	2790
			Pressure differential (kPa)	NS	NS	NS	NS	12/2/09	0	1/19/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/2/09	–42,000	1/19/10	–28,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/2/09	3570	1/19/10	226
	200	200–202	CO_2 (µg/m^3)	4/30/09	4,380,000	8/5/09	6,450,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/30/09	–483	8/5/09	–457	NS	NS	NS	NS
			H_2O (µg/m^3)	4/30/09	61[a]	8/5/09	15,100,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/30/09	–1800	8/5/09	686	NS	NS	NS	NS
			Pressure differential (kPa)	4/30/09	0	8/5/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/30/09	–2600	8/5/09	2980	NS	NS	NS	NS
			TCE (µg/m^3)	4/30/09	1890	8/5/09	1980	NS	NS	NS	NS
	202.5	200–205	CO_2 (µg/m^3)	NS	NS	NS	NS	12/2/09	7,150,000	1/19/10	8,410,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/2/09	–169	1/19/10	183
			H_2O (µg/m^3)	NS	NS	NS	NS	12/2/09	8,050,000	1/19/10	8,060,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/2/09	3920	1/19/10	2570

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023 (cont.)	202.5	200–205	Pressure differential (kPa)	NS	NS	NS	NS	12/2/09	0	1/19/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/2/09	–42,000	1/19/10	–44,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/2/09	5090	1/19/10	1350
	247	247–249	CO_2 (µg/m^3)	4/30/09	4,340,000	8/5/09	5,030,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/30/09	–1100	8/5/09	–498	NS	NS	NS	NS
			H_2O (µg/m^3)	4/30/09	58.2[a]	8/5/09	13,100,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/30/09	–3200	8/5/09	–302	NS	NS	NS	NS
			Pressure differential (kPa)	4/30/09	0	8/5/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/30/09	–1300	8/5/09	7210	NS	NS	NS	NS
			TCE (µg/m^3)	4/30/09	1730	8/5/09	3450	NS	NS	NS	NS
	247.5	245–250	CO_2 (µg/m^3)	NS	NS	NS	NS	12/2/09	5,950,000	1/19/10	5,770,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/2/09	–92	1/19/10	153
			H_2O (µg/m^3)	NS	NS	NS	NS	12/2/09	10,500,000	1/19/10	8,300,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/2/09	3840	1/19/10	3280
			Pressure differential (kPa)	NS	NS	NS	NS	12/2/09	1	1/19/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/2/09	–31,000	1/19/10	–29,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/2/09	4090	1/19/10	1580
	260.5	258–263	CO_2 (µg/m^3)	NS	NS	NS	NS	12/2/09	4,880,000	1/19/10	1,600,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/2/09	–126	1/19/10	–138
			H_2O (µg/m^3)	NS	NS	NS	NS	12/2/09	10,700,000	1/19/10	7,640,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/2/09	3430	1/19/10	1710
			Pressure differential (kPa)	NS	NS	NS	NS	12/2/09	0	1/19/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/2/09	–23,000	1/19/10	–6200
			TCE (µg/m^3)	NS	NS	NS	NS	12/2/09	3870	1/19/10	1870

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15461	Ambient	Ambient	CO_2 (µg/m^3)	4/29/09	774,000	8/6/09	811,000	12/1/09	985,000	1/19/10	949,000
			Freon-11 (µg/m^3)	4/29/09	–330	8/6/09	–40	12/1/09	–344	1/19/10	–3
			H_2O (µg/m^3)	4/29/09	30.3[a]	8/6/09	9,070,000	12/1/09	7,090,000	1/19/10	7,950,000
			PCE (µg/m^3)	4/29/09	–1100	8/6/09	1310	12/1/09	3030	1/19/10	2740
			Pressure differential (kPa)	4/29/09	0	8/6/09	0	12/1/09	0	1/19/10	NS
			TCA (µg/m^3)	4/29/09	–2700	8/6/09	–114	12/1/09	–4000	1/19/10	–4300
			TCE (µg/m^3)	4/29/09	1110	8/6/09	2440	12/1/09	3380	1/19/10	2230
	10	10–12	CO_2 (µg/m^3)	4/29/09	6,840,000	8/6/09	6,790,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/29/09	–466	8/6/09	-136	NS	NS	NS	NS
			H_2O (µg/m^3)	4/29/09	61.3[a]	8/6/09	20,900,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/29/09	–533	8/6/09	1060	NS	NS	NS	NS
			Pressure differential (kPa)	4/29/09	0	8/6/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/29/09	-11,000	8/6/09	1230	NS	NS	NS	NS
			TCE (µg/m^3)	4/29/09	-1600	8/6/09	952,000	NS	NS	NS	NS
	11	10–12	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	9,000,000	1/19/10	8,730,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–43	1/19/10	389
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	15,500,000	1/19/10	7,610,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	3330	1/19/10	3530
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	0	1/19/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–41,000	1/19/10	–54,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	4420	1/19/10	1160
	60	60–62	CO_2 (µg/m^3)	4/29/09	11,700,000	8/6/09	5,350,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/29/09	–774	8/6/09	1100	NS	NS	NS	NS
			H_2O (µg/m^3)	4/29/09	61.8[a]	8/6/09	22,600,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/29/09	–3100	8/6/09	488	NS	NS	NS	NS

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15461 (cont.)	60	60–62	Pressure differential (kPa)	4/29/09	0	8/6/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/29/09	–14,000	8/6/09	–1700	NS	NS	NS	NS
			TCE (µg/m^3)	4/29/09	–618	8/6/09	–3100	NS	NS	NS	NS
	61	60–62	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	7,540,000	1/19/10	10,700,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–85	1/19/10	364
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	16,000,000	1/19/10	8,000,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	3850	1/19/10	3570
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	0	1/19/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–32,000	1/19/10	–64,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	3110	1/19/10	1230
	95	95–97	CO_2 (µg/m^3)	4/29/09	11,500,000	8/6/09	7,640,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/29/09	–1600	8/6/09	–370	NS	NS	NS	NS
			H_2O (µg/m^3)	4/29/09	61.7[a]	8/6/09	19,700,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/29/09	–5600	8/6/09	–2000	NS	NS	NS	NS
			Pressure differential (kPa)	4/29/09	0	8/6/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/29/09	–11,000	8/6/09	2270	NS	NS	NS	NS
			TCE (µg/m^3)	4/29/09	3450	8/6/09	13,800	NS	NS	NS	NS
	96	95–97	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	7,620,000	1/19/10	10,200,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–506	1/19/10	470
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	16,400,000	1/19/10	7,850,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	2370	1/19/10	3710
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	0	1/19/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–30,000	1/19/10	–60,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	4340	1/19/10	718

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462	Ambient	Ambient	CO_2 (µg/m^3)	4/29/09	871,000	8/6/09	771,000	12/1/09	885,000	1/20/10	1,100,000
			Freon-11 (µg/m^3)	4/29/09	–1500	8/6/09	553	12/1/09	97	1/20/10	573
			H_2O (µg/m^3)	4/29/09	35.3[a]	8/6/09	11,400,000	12/1/09	5,030,000	1/20/10	5,790,000
			PCE (µg/m^3)	4/29/09	731	8/6/09	1370	12/1/09	4650	1/20/10	2730
			Pressure differential (kPa)	4/29/09	0	8/6/09	0	12/1/09	0	1/20/10	NS
			TCA (µg/m^3)	4/29/09	–6100	8/6/09	3380	12/1/09	–2500	1/20/10	–7100
			TCE (µg/m^3)	4/29/09	1960	8/6/09	–507	12/1/09	4380	1/20/10	623
	10	10–12	CO_2 (µg/m^3)	4/29/09	8,560,000	8/6/09	3,460,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/29/09	153	8/6/09	39	NS	NS	NS	NS
			H_2O (µg/m^3)	4/29/09	59.8	8/6/09	15,600,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/29/09	227	8/6/09	233	NS	NS	NS	NS
			Pressure differential (kPa)	4/29/09	0	8/6/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/29/09	–13,000	8/6/09	-5100	NS	NS	NS	NS
			TCE (µg/m^3)	4/29/09	–1200	8/6/09	428	NS	NS	NS	NS
	12.5	10–15	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	13,400,000	1/20/10	14,000,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–303	1/20/10	832
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	10,900,000	1/20/10	7,870,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	2990	1/20/10	4130
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	0	1/20/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–86,000	1/20/10	–87,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	8070	1/20/10	590
	60	60–62	CO_2 (µg/m^3)	4/29/09	9,750,000	8/6/09	4,970,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/29/09	–2400	8/6/09	–72	NS	NS	NS	NS
			H_2O (µg/m^3)	4/29/09	60.6	8/6/09	21,300,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/29/09	1990	8/6/09	3340	NS	NS	NS	NS

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	60	60–62	Pressure differential (kPa)	4/29/09	0	8/6/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/29/09	–16,000	8/6/09	–5900	NS	NS	NS	NS
			TCE (µg/m^3)	4/29/09	2030	8/6/09	–699	NS	NS	NS	NS
	62.5	60–65	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	12,600,000	1/20/10	15,200,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–530	1/20/10	792
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	11,800,000	1/20/10	8,340,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	5510	1/20/10	5600
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	0	1/20/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–73,000	1/20/10	–95,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	3740	1/20/10	902
	100	100–102	CO_2 (µg/m^3)	4/29/09	9,230,000	8/6/09	6,320,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/29/09	–1200	8/6/09	1250	NS	NS	NS	NS
			H_2O (µg/m^3)	4/29/09	60.7	8/6/09	29,500,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/29/09	–1800	8/6/09	581	NS	NS	NS	NS
			Pressure differential (kPa)	4/29/09	0	8/6/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/29/09	–13,000	8/6/09	-3700	NS	NS	NS	NS
			TCE (µg/m^3)	4/29/09	1780	8/6/09	-2000	NS	NS	NS	NS
	102.5	100–105	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	10,400,000	1/20/10	12,000,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–5	1/20/10	580
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	11,600,000	1/20/10	8,310,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	4560	1/20/10	4700
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	0	1/20/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–60,000	1/20/10	–75,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	3280	1/20/10	1730

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	150	150–152	CO_2 (µg/m^3)	4/29/09	5,990,000	8/6/09	4,560,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/29/09	–1500	8/6/09	55	NS	NS	NS	NS
			H_2O (µg/m^3)	4/29/09	60.2[a]	8/6/09	22,900,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/29/09	–941	8/6/09	519	NS	NS	NS	NS
			Pressure differential (kPa)	4/29/09	0	8/6/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/29/09	–14,000	8/6/09	–3900	NS	NS	NS	NS
			TCE (µg/m^3)	4/29/09	2640	8/6/09	799	NS	NS	NS	NS
	152.5	150–155	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	9,400,000	1/20/10	10,900,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–1000	1/20/10	751
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	13,500,000	1/20/10	8,570,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	4690	1/20/10	4340
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	1	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–48,000	1/20/10	–67,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	6420	1/20/10	43
	200	200–202	CO_2 (µg/m^3)	4/29/09	5,960,000	8/6/09	3,990,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/29/09	–1400	8/6/09	-1200	NS	NS	NS	NS
			H_2O (µg/m^3)	4/29/09	59.7	8/6/09	21,200,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/29/09	–2200	8/6/09	–391	NS	NS	NS	NS
			Pressure differential (kPa)	4/29/09	0	8/6/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/29/09	–7100	8/6/09	–5100	NS	NS	NS	NS
			TCE (µg/m^3)	4/29/09	4070	8/6/09	4210	NS	NS	NS	NS
	202.5	200–205	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	8,850,000	1/20/10	9,990,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	1630	1/20/10	483
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	16,600,000	1/20/10	8,680,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	7470	1/20/10	3830

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	202.5	200–205	Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	1	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–46,000	1/20/10	–61,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	–531	1/20/10	1250
	247.5	245–250	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	2,990,000	1/20/10	5,870,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–713	1/20/10	411
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	13,200,000	1/20/10	8,620,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	4550	1/20/10	4070
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	1	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–19,000	1/20/10	–36,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	–68	1/20/10	1400
	254	254–256	CO_2 (µg/m^3)	4/29/09	4,980,000	8/6/09	3,330,000	NS	NS	NS	NS
			Freon-11 (µg/m^3)	4/29/09	–1600	8/6/09	–46	NS	NS	NS	NS
			H_2O (µg/m^3)	4/29/09	59.1[a]	8/6/09	20,600,000	NS	NS	NS	NS
			PCE (µg/m^3)	4/29/09	–510	8/6/09	–291	NS	NS	NS	NS
			Pressure differential (kPa)	4/29/09	0	8/6/09	0	NS	NS	NS	NS
			TCA (µg/m^3)	4/29/09	7700	8/6/09	–133	NS	NS	NS	NS
			TCE (µg/m^3)	4/29/09	3930	8/6/09	512	NS	NS	NS	NS
	260.5	258–263	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	4,240,000	1/20/10	6,300,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	440	1/20/10	310
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	13,600,000	1/20/10	8,530,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	2230	1/20/10	3370
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	1	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–24,000	1/20/10	–36,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	2120	1/20/10	1630

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	282.5	280–285	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	7,110,000	1/20/10	7,910,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–473	1/20/10	345
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	13,600,000	1/20/10	8,520,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	1540	1/20/10	3160
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	1	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–32,000	1/20/10	–46,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	5680	1/20/10	1670
	297.5	295–300	CO_2 (µg/m^3)	NS	NS	NS	NS	12/1/09	6,080,000	1/20/10	8,020,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/1/09	–256	1/20/10	260
			H_2O (µg/m^3)	NS	NS	NS	NS	12/1/09	15,300,000	1/20/10	8,650,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/1/09	3310	1/20/10	3720
			Pressure differential (kPa)	NS	NS	NS	NS	12/1/09	1	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/1/09	–26,000	1/20/10	–46,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/1/09	6770	1/20/10	1370
54-609985	Ambient	Ambient	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	1,460,000	1/20/10	945,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	218	1/20/10	95
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	3,060,000	1/20/10	6,100,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	1660	1/20/10	4520
			Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	NS	1/20/10	NS
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	1410	1/20/10	–4300
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	2280	1/20/10	2110
	6.5	4–9	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	6,170,000	1/20/10	9,080,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	–10	1/20/10	274
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	4,130,000	1/20/10	7,280,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	2640	1/20/10	4470

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-609985 (cont.)	6.5	4–9	Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	0	1/20/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	–14,000	1/20/10	–69,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3420	1/20/10	2410
	62.5	60–65	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	16,900,000	1/20/10	17,100,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	–178	1/20/10	880
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	46,100,000	1/20/10	8,150,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3970	1/20/10	4000
			Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	0	1/20/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	–50,000	1/20/10	–113,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	4940	1/20/10	1260
	102.5	100–105	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	13,500,000	1/20/10	15,600,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	–598	1/20/10	614
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	4,520,000	1/20/10	8,450,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	2890	1/20/10	4850
			Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	0	1/20/10	0
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	–45,000	1/20/10	–101,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	6530	1/20/10	1140
	152.5	150–155	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	10,700,000	1/20/10	13,700,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	–468	1/20/10	698
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	4,580,000	1/20/10	9,080,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3290	1/20/10	4330
			Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	0	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	–39,000	1/20/10	–86,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	5090	1/20/10	1050

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-609985 (cont.)	202.5	200–205	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	9,300,000	1/20/10	12,600,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	–82	1/20/10	695
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	4,550,000	1/20/10	9,220,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3170	1/20/10	4280
			Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	0	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	–31,000	1/20/10	–77,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3920	1/20/10	628
	247.5	245–250	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	7,460,000	1/20/10	10,900,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	-263	1/20/10	623
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	4,230,000	1/20/10	9,540,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	4940	1/20/10	4220
			Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	0	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	–27,000	1/20/10	–65,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	4530	1/20/10	591
	260.5	258–263	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	6,370,000	1/20/10	10,000,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	220	1/20/10	556
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	4,620,000	1/20/10	10,300,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3580	1/20/10	3780
			Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	0	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	–20,000	1/20/10	-58,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3800	1/20/10	764
	282.5	280–285	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	6,240,000	1/20/10	9,610,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	–177	1/20/10	501
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	4,860,000	1/20/10	9,160,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3540	1/20/10	3880

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling–Port Depth or Interval (ft bgs)	Analyte (Unit)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-609985 (cont.)	282.5	280–285	Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	0	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	–23,000	1/20/10	–54,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3740	1/20/10	1040
	297.5	295–300	CO_2 (µg/m^3)	NS	NS	NS	NS	12/4/09	5,800,000	1/20/10	8,880,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	12/4/09	–96	1/20/10	218
			H_2O (µg/m^3)	NS	NS	NS	NS	12/4/09	4,950,000	1/20/10	8,810,000
			PCE (µg/m^3)	NS	NS	NS	NS	12/4/09	2170	1/20/10	2760
			Pressure differential (kPa)	NS	NS	NS	NS	12/4/09	0	1/20/10	1
			TCA (µg/m^3)	NS	NS	NS	NS	12/4/09	–20,000	1/20/10	–48,000
			TCE (µg/m^3)	NS	NS	NS	NS	12/4/09	3380	1/20/10	1880

Note: All results reported in µg/m^3 were converted from mg/m^3. B&K detection threshold is gas dependent, reliable values are typically above 1 ppm (1000 to 7000 µg/m^3 depending on the analyte).

[a] NS = Not sampled.

[b] Results presented in TDew (dew point).

Table 5.0-1
Pore-Gas VOCs Detected at MDA H, Second Quarter FY2010 and Three Previous Quarters

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-01023	10	10–12	Butanone[2-]	4/30/09	4.1	12	8/5/09	ND[a]	ND	NS[b]	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/30/09	1.7	8.3	8/5/09	3.8	19	NS	NS	NS	NS	NS	NS
			Tetrachloroethene	4/30/09	ND	ND	8/5/09	1.1	7.2	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/30/09	ND	ND	8/5/09	1.4	11	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/30/09	ND	ND	8/5/09	3.7	20	NS	NS	NS	NS	NS	NS
			Trichloroethene	4/30/09	ND	ND	8/5/09	1.2	6.3	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/30/09	2.9	16	8/5/09	10	58	NS	NS	NS	NS	NS	NS
	12.5	10–15	Chloroform	NS	NS	NS	NS	NS	NS	12/2/09	41	200	1/19/10	ND	ND
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	2.4	12	1/19/10	ND	ND
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/2/09	0.9	4.9	1/19/10	2.7	15
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	5.2	29	1/19/10	ND	ND
	60	60–62	Butanol[1-]	4/30/09	4.9 (J)	15 (J)	8/5/09	ND	ND	NS	NS	NS	NS	NS	NS
			Butanone[2-]	4/30/09	3.4	10	8/5/09	ND	ND	NS	NS	NS	NS	NS	NS
			Chlorobenzene	4/30/09	1.1	5	8/5/09	1.2	5.8	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/30/09	2.1	10	8/5/09	4.8	24	NS	NS	NS	NS	NS	NS
			Tetrachloroethene	4/30/09	ND	ND	8/5/09	1.3	9	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/30/09	ND	ND	8/5/09	1.7	13	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/30/09	ND	ND	8/5/09	4.5	25	NS	NS	NS	NS	NS	NS
			Trichloroethene	4/30/09	ND	ND	8/5/09	1.9	10	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/30/09	3.9	22	8/5/09	13	75	NS	NS	NS	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)
54-01023 (cont.)	62.5	60–65	Acetone	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	7.6	18
			Butanol[1-]	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	190	580
			Butanone[2-]	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	12	36
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	12/2/09	2	6.4	1/19/10	1	3.2
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	5.2	26	1/19/10	3.5	17
			Ethanol	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	200 (J)	380 (J)
			Propanol[2-]	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	14	36
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	0.88	6
			Tetrahydrofuran	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	1.6	4.8
			Toluene	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	1.5	5.6
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/2/09	1.3 (J-)	9.8 (J-)	1/19/10	1.3	9.7
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/2/09	3	16	1/19/10	3.5	19
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/2/09	1.1	6.1	1/19/10	1.2	6.5
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	12	65	1/19/10	7.8	44
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	0.88	3.8
	100	100–102	Acetone	4/30/09	ND	ND	8/5/09	16	37	NS	NS	NS	NS	NS	NS
			Butanol[1-]	4/30/09	9.2 (J)	28 (J)	8/5/09	5.2 (J)	16 (J)	NS	NS	NS	NS	NS	NS
			Butanone[2-]	4/30/09	2.8	8.3	8/5/09	2.7	7.8	NS	NS	NS	NS	NS	NS
			Chlorobenzene	4/30/09	2	9.2	8/5/09	2	9.1	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/30/09	1.2	6.2	8/5/09	3.9	19	NS	NS	NS	NS	NS	NS
			Tetrahydrofuran	4/30/09	5.9	17	8/5/09	ND	ND	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/30/09	ND	ND	8/5/09	1.4	10	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/30/09	ND	ND	8/5/09	3.5	19	NS	NS	NS	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-01023 (cont.)	100	100–102	Trichloroethene	4/30/09	ND	ND	8/5/09	1.2	6.3	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/30/09	1.8	10	8/5/09	10	56	NS	NS	NS	NS	NS	NS
	102.5	100–105	Acetone	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	3.3	7.8
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	4.3	21	1/19/10	3.1	16
			Ethanol	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	8.7 (J)	16 (J)
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/2/09	1.2 (J-)	9.5 (J-)	1/19/10	1.3	9.9
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/2/09	3.7	20	1/19/10	4.1	22
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/2/09	0.88	4.7	1/19/10	ND	ND
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	7.6	42	1/19/10	5.2	29
	150	150–152	Butanol[1-]	4/30/09	19 (J)	57 (J)	8/5/09	9.3 (J)	28 (J)	NS	NS	NS	NS	NS	NS
			Chlorobenzene	4/30/09	2.5	11	8/5/09	1.5	7.1	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/30/09	1.3	6.4	8/5/09	3.7	18	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/30/09	ND	ND	8/5/09	1.3	9.7	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/30/09	ND	ND	8/5/09	4	22	NS	NS	NS	NS	NS	NS
			Trichloroethene	4/30/09	ND	ND	8/5/09	1	5.6	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/30/09	1.6	9	8/5/09	7	39	NS	NS	NS	NS	NS	NS
	152.5	150–155	Carbon Disulfide	NS	NS	NS	NS	NS	NS	12/2/09	1.4	4.2	1/19/10	ND	ND
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	3.2	16	1/19/10	4.4	22
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/2/09	1.1 (J-)	8.4 (J-)	1/19/10	1.8	14
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/2/09	3.2	18	1/19/10	5.7	31
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	3.8	21	1/19/10	4.9	28

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-01023 (cont.)	200	200–202	Acetone	4/30/09	ND	ND	8/5/09	5	12	NS	NS	NS	NS	NS	NS
			Butanone[2-]	4/30/09	ND	ND	8/5/09	0.95	2.8	NS	NS	NS	NS	NS	NS
			Carbon Disulfide	4/30/09	2.8	8.6	8/5/09	2.2	7	NS	NS	NS	NS	NS	NS
			Carbon Tetrachloride	4/30/09	ND	ND	8/5/09	1	6.6	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/30/09	1.8	8.8	8/5/09	4.2	21	NS	NS	NS	NS	NS	NS
			Dichloropropane[1,2-]	4/30/09	ND	ND	8/5/09	0.93 (J)	4.3 (J)	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/30/09	ND	ND	8/5/09	2	15	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/30/09	ND	ND	8/5/09	5.2	28	NS	NS	NS	NS	NS	NS
			Trichloroethene	4/30/09	ND	ND	8/5/09	0.97	5.2	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/30/09	1.9	11	8/5/09	5.5	31	NS	NS	NS	NS	NS	NS
	202.5	200–205	Acetone	NS	NS	NS	NS	NS	NS	12/2/09	4.3	10	1/19/10	ND	ND
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	12/2/09	3.6	11	1/19/10	ND	ND
			Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	0.97	6.1
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/2/09	5.5	19	1/19/10	6.8	23
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	3.8	19	1/19/10	4.3	21
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	12/2/09	1.2	5.6	1/19/10	1.3	6.2
			Ethanol	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	3.6 (J)	6.8 (J)
			Toluene	NS	NS	NS	NS	NS	NS	12/2/09	1.9	7.2	1/19/10	ND	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	1.7	13
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/2/09	3.2	17	1/19/10	4.7	26
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	3.9	22	1/19/10	4.3	24

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009 Date	3rd Quarter FY2009 Result (ppbv)	3rd Quarter FY2009 Result (µg/m³)	4th Quarter FY2009 Date	4th Quarter FY2009 Result (ppbv)	4th Quarter FY2009 Result (µg/m³)	1st Quarter FY2010 Date	1st Quarter FY2010 Result (ppbv)	1st Quarter FY2010 Result (µg/m³)	2nd Quarter FY2010 Date	2nd Quarter FY2010 Result (ppbv)	2nd Quarter FY2010 Result (µg/m³)
54-01023 (cont.)	247	247–249	Butanol[1-]	4/30/09	37 (J)	110 (J)	8/5/09	19 (J)	59 (J)	NS	NS	NS	NS	NS	NS
			Carbon Tetrachloride	4/30/09	ND	ND	8/5/09	1.3	8.2	NS	NS	NS	NS	NS	NS
			Chlorobenzene	4/30/09	7	32	8/5/09	8.4	39	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/30/09	1.6	7.8	8/5/09	3.5	17	NS	NS	NS	NS	NS	NS
			Methylene Chloride	4/30/09	1.8	6.1	8/5/09	ND	ND	NS	NS	NS	NS	NS	NS
			Toluene	4/30/09	ND	ND	8/5/09	3	11	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/30/09	ND	ND	8/5/09	1.5	12	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/30/09	ND	ND	8/5/09	2.3	12	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/30/09	1.7	9.8	8/5/09	4.1	23	NS	NS	NS	NS	NS	NS
	247.5	245–250	Cyclohexane	NS	NS	NS	NS	NS	NS	12/2/09	6.6	23	1/19/10	7.5	26
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	2.4	12	1/19/10	2.9	14
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	12/2/09	0.92	4.2	1/19/10	0.94	4.3
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	1.2	9.3
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/2/09	1.3	6.9	1/19/10	2.4	13
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	2.4	13	1/19/10	2.5	14
	260.5	258–263	Acetone	NS	NS	NS	NS	NS	NS	12/2/09	5.8	14	1/19/10	12	27
			Butanone[2-]	NS	NS	NS	NS	NS	NS	12/2/09	0.9	2.6	1/19/10	ND	ND
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/2/09	4	14	1/19/10	ND	ND
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	2.1	10	1/19/10	ND	ND
			Ethanol	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	160 (J)	310 (J)
			Methylene Chloride	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	3.8	13
			Propanol[2-]	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	20	50
			Propylene	NS	NS	NS	NS	NS	NS	12/2/09	3.5	6	1/19/10	ND	ND

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-01023 (cont.)	260.5	258–263	Toluene	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	3.9	15
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/2/09	ND	ND	1/19/10	2.5	14
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/2/09	1.8	10	1/19/10	ND	ND
54-15461	10	10–12	Dichlorodifluoromethane	4/29/09	1.2	5.8	8/6/09	1.5	7.3	NS	NS	NS	NS	NS	NS
			Toluene	4/29/09	2.1	8	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/29/09	ND	ND	8/6/09	1.1	5.9	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/29/09	ND	ND	8/6/09	1.1	6	NS	NS	NS	NS	NS	NS
	11	10–12	Carbon Disulfide	NS	NS	NS	NS	NS	NS	12/1/09	0.9	2.8	1/19/10	ND	ND
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	2.4	12	1/19/10	2.8	14
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	1.7	9.3	1/19/10	1.7	9.1
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	1.4	7.8	1/19/10	1.6	9.3
	60	60–62	Carbon Disulfide	4/29/09	2	6.2	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/29/09	3.3	16	8/6/09	1.8	9.1	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/29/09	1.4	7.7	8/6/09	1.1	6.1	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/29/09	2.6	14	8/6/09	1.2	7	NS	NS	NS	NS	NS	NS
	61	60–62	Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	2.2	11	1/19/10	3.1	15
			Ethanol	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/19/10	3.4 (J)	6.4 (J)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	1.3	7.1	1/19/10	1.8	9.9
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	1.5	8.7	1/19/10	2.2	12
	95	95–97	Carbon Disulfide	4/29/09	ND	ND	8/6/09	2.9	9	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/29/09	3.4	16	8/6/09	1.9	9.3	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/29/09	1.4	7.4	8/6/09	1.1	5.9	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/29/09	2.7	15	8/6/09	1.6	8.8	NS	NS	NS	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)
54-15461 (cont.)	96	95–97	Acetone	NS	NS	NS	NS	NS	NS	12/1/09	3.6	8.5	1/19/10	ND	ND
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	12/1/09	2.7	8.3	1/19/10	ND	ND
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	2.7	13	1/19/10	3.1	16
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	1.5	8.2	1/19/10	1.8	10
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	2	12	1/19/10	2.4	13
54-15462	10	10–12	Dichlorodifluoromethane	4/29/09	3.4	17	8/6/09	1	4.9	NS	NS	NS	NS	NS	NS
			Dichloroethene[1,1-]	4/29/09	1.6	6.6	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Tetrahydrofuran	4/29/09	ND	ND	8/6/09	1.1	3.4	NS	NS	NS	NS	NS	NS
			Toluene	4/29/09	5.4	20	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/29/09	1.4	11	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/29/09	4.6	25	8/6/09	2.3	12	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/29/09	3	17	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
	12.5	10–15	Butanone[2-]	NS	NS	NS	NS	NS	NS	12/1/09	1.5	4.4	1/20/10	ND	ND
			Chloroform	NS	NS	NS	NS	NS	NS	12/1/09	90	440	1/20/10	14	71
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	4.6	22	1/20/10	5.6	28
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/1/09	2 (J-)	15 (J-)	1/20/10	1.8 (J-)	14 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	9.9	54	1/20/10	10	55
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	4.1	23	1/20/10	5.3	30
	60	60–62	Butanol[1-]	4/29/09	7 (J)	21 (J)	8/6/09	4.9 (J)	15 (J)	NS	NS	NS	NS	NS	NS
			Chlorobenzene	4/29/09	1.8	8.4	8/6/09	2.2	10	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/29/09	6.6	32	8/6/09	2.8	14	NS	NS	NS	NS	NS	NS
			Dichloroethene[1,1-]	4/29/09	3.9	15	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	60	60–62	Methanol	4/29/09	ND	ND	8/6/09	190 (J)	250 (J)	NS	NS	NS	NS	NS	NS
			Toluene	4/29/09	1.4	5.3	8/6/09	1	3.9	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/29/09	2.8	22	8/6/09	1.1	8.7	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/29/09	10	56	8/6/09	5.5	30	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/29/09	5.7	32	8/6/09	2.4	13	NS	NS	NS	NS	NS	NS
	62.5	60–65	Bromodichloromethane	NS	NS	NS	NS	NS	NS	12/1/09	0.88	5.9	1/20/10	ND	ND
			Chloroform	NS	NS	NS	NS	NS	NS	12/1/09	170	820	1/20/10	26	130
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	7.4	36	1/20/10	8.7	43
			Dichloroethane[1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	0.86	3.5
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	12/1/09	1.1	7.6	1/20/10	ND	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/1/09	2.9 (J-)	22 (J-)	1/20/10	3.1 (J-)	24 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	17	91	1/20/10	18	100
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/1/09	1.1	5.7	1/20/10	1.1	5.8
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	7.1	40	1/20/10	8.3	47
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	12/1/09	1.4	6.2	1/20/10	ND	ND
	100	100–102	Acetone	4/29/09	10	24	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Butanol[1-]	4/29/09	14 (J)	41 (J)	8/6/09	47 (J)	140 (J)	NS	NS	NS	NS	NS	NS
			Butanone[2-]	4/29/09	1.7	5.1	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Chlorobenzene	4/29/09	2.8	13	8/6/09	4.4	20	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/29/09	7	35	8/6/09	3.6	18	NS	NS	NS	NS	NS	NS
			Dichloroethene[1,1-]	4/29/09	4.1	16	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Propanol[2-]	4/29/09	20	50	8/6/09	26	63	NS	NS	NS	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)
54-15462 (cont.)	100	100–102	Toluene	4/29/09	1.7	6.5	8/6/09	2.2	8.4	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/29/09	3.1	24	8/6/09	1.6	12	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/29/09	14	74	8/6/09	7.8	43	NS	NS	NS	NS	NS	NS
			Trichloroethene	4/29/09	1	5.4	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/29/09	6.4	36	8/6/09	3.4	19	NS	NS	NS	NS	NS	NS
	102.5	100–105	Chloroform	NS	NS	NS	NS	NS	NS	12/1/09	100	490	1/20/10	17	84
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/1/09	0.85 (J)	2.9 (J)	1/20/10	ND	ND
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	6.6	32	1/20/10	5.9	29
			Dichloroethane[1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	0.87	3.5	1/20/10	ND	ND
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	12/1/09	0.85 (J)	5.8 (J)	1/20/10	ND	ND
			Toluene	NS	NS	NS	NS	NS	NS	12/1/09	1	3.8	1/20/10	2.2	8.1
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/1/09	2.5 (J-)	19 (J-)	1/20/10	1.9 (J-)	15 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	14	80	1/20/10	12	65
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/1/09	1.2	6.5	1/20/10	ND	ND
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	6.2	35	1/20/10	5.2	29
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	1.2	5.2
	150	150–152	Acetone	4/29/09	11	27	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Butanol[1-]	4/29/09	29 (J)	88 (J)	8/6/09	67 (J)	200 (J)	NS	NS	NS	NS	NS	NS
			Butanone[2-]	4/29/09	2	5.9	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Carbon Disulfide	4/29/09	ND	ND	8/6/09	8.8	28	NS	NS	NS	NS	NS	NS
			Chlorobenzene	4/29/09	6.6	30	8/6/09	6.8	31	NS	NS	NS	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	150	150–152	Dichlorodifluoromethane	4/29/09	7.4	37	8/6/09	2.8	14	NS	NS	NS	NS	NS	NS
			Dichloroethene[1,1-]	4/29/09	3.5	14	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Propanol[2-]	4/29/09	ND	ND	8/6/09	4	10	NS	NS	NS	NS	NS	NS
			Toluene	4/29/09	3.1	12	8/6/09	2.6	9.7	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/29/09	3.3	25	8/6/09	1.1	8.7	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/29/09	9.8	54	8/6/09	5.3	29	NS	NS	NS	NS	NS	NS
			Trichloroethene	4/29/09	0.89 (J)	4.8 (J)	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/29/09	5.8	32	8/6/09	2.4	13	NS	NS	NS	NS	NS	NS
	152.5	150–155	Bromodichloromethane	NS	NS	NS	NS	NS	NS	12/1/09	1	6.9	1/20/10	ND	ND
			Chloroform	NS	NS	NS	NS	NS	NS	12/1/09	290	1400	1/20/10	57	280
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/1/09	1.3	4.5	1/20/10	1.8	6.1
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	6.3	31	1/20/10	9.6	47
			Dichloroethane[1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	0.88	3.6
			Ethylbenzene	NS	NS	NS	NS	NS	NS	12/1/09	0.97	4.2	1/20/10	ND	ND
			Propylene	NS	NS	NS	NS	NS	NS	12/1/09	4.8	8.3	1/20/10	ND	ND
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	12/1/09	0.98	6.6	1/20/10	ND	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/1/09	2.3 (J-)	18 (J-)	1/20/10	3.3 (J-)	25 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	10	57	1/20/10	15	83
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/1/09	0.9	4.8	1/20/10	1.2	6.2
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	5	28	1/20/10	8.1	45
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	12/1/09	1.3	5.8	1/20/10	ND	ND

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	200	200–202	Acetone	4/29/09	9	21	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Benzene	4/29/09	1.3	4.3	8/6/09	1.3	4.2	NS	NS	NS	NS	NS	NS
			Butanol[1-]	4/29/09	53 (J)	160 (J)	8/6/09	120 (J)	370 (J)	NS	NS	NS	NS	NS	NS
			Carbon Disulfide	4/29/09	ND	ND	8/6/09	2.7	8.4	NS	NS	NS	NS	NS	NS
			Chlorobenzene	4/29/09	13	60	8/6/09	14	66	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/29/09	7.1	35	8/6/09	2.4	12	NS	NS	NS	NS	NS	NS
			Dichloroethene[1,1-]	4/29/09	2.8	11	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Propanol[2-]	4/29/09	110	280	8/6/09	78	190	NS	NS	NS	NS	NS	NS
			Toluene	4/29/09	5.6	21	8/6/09	6.2	23	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/29/09	3.1	24	8/6/09	0.95	7.2	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/29/09	9.7	53	8/6/09	3.7	20	NS	NS	NS	NS	NS	NS
			Trichloroethene	4/29/09	0.96	5.1	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Trichlorofluoromethane	4/29/09	5.3	30	8/6/09	1.9	11	NS	NS	NS	NS	NS	NS
	202.5	200–205	Benzene	NS	NS	NS	NS	NS	NS	12/1/09	1.4	4.5	1/20/10	ND	ND
			Chloroform	NS	NS	NS	NS	NS	NS	12/1/09	160	760	1/20/10	39	190
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/1/09	2.3	7.9	1/20/10	3	10
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	6	30	1/20/10	9.1	45
			Ethylbenzene	NS	NS	NS	NS	NS	NS	12/1/09	0.86	3.7	1/20/10	ND	ND
			Propylene	NS	NS	NS	NS	NS	NS	12/1/09	5	8.6	1/20/10	ND	ND
			Toluene	NS	NS	NS	NS	NS	NS	12/1/09	0.97	3.7	1/20/10	ND	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/1/09	2.1 (J-)	16 (J-)	1/20/10	2.8 (J-)	21 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	7.8	42	1/20/10	12	64

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	202.5	200–205	Trichloroethene	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	1	5.4
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	4.3	24	1/20/10	6.6	37
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	12/1/09	1.5	6.5	1/20/10	ND	ND
	247.5	245–250	Chloroform	NS	NS	NS	NS	NS	NS	12/1/09	77	380	1/20/10	20	96
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	1.5	5.3
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	1.8	9.1	1/20/10	5.7	28
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	1.5 (J-)	12 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	1	5.6	1/20/10	3.7	20
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	1	5.9	1/20/10	3.4	19
	254	254–256	Benzene	4/29/09	1.9	6.2	8/6/09	3.5	11	NS	NS	NS	NS	NS	NS
			Butanol[1-]	4/29/09	67 (J)	200 (J)	8/6/09	200 (J)	600 (J)	NS	NS	NS	NS	NS	NS
			Butanone[2-]	4/29/09	3.9	11	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Carbon Disulfide	4/29/09	ND	ND	8/6/09	1	3.1	NS	NS	NS	NS	NS	NS
			Chlorobenzene	4/29/09	17	79	8/6/09	25	110	NS	NS	NS	NS	NS	NS
			Dichlorobenzene[1,4-]	4/29/09	0.95	5.7	8/6/09	1.1	6.9	NS	NS	NS	NS	NS	NS
			Dichlorodifluoromethane	4/29/09	6.6	33	8/6/09	1.8	9	NS	NS	NS	NS	NS	NS
			Ethanol	4/29/09	ND	ND	8/6/09	3.8 (J)	7.1 (J)	NS	NS	NS	NS	NS	NS
			Propanol[2-]	4/29/09	ND	ND	8/6/09	170	410	NS	NS	NS	NS	NS	NS
			Propylene	4/29/09	6.1	10	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Toluene	4/29/09	210	800	8/6/09	28	110	NS	NS	NS	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/29/09	2.7	21	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
			Trichloroethane[1,1,1-]	4/29/09	6.9	38	8/6/09	2.8	15	NS	NS	NS	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	254	254–256	Trichlorofluoromethane	4/29/09	4.4	25	8/6/09	1.5	8.2	NS	NS	NS	NS	NS	NS
			Xylene[1,2-]	4/29/09	2.3	10	8/6/09	1.9	8.4	NS	NS	NS	NS	NS	NS
			Xylene[1,3-]+Xylene[1,4-]	4/29/09	1.3	5.7	8/6/09	ND	ND	NS	NS	NS	NS	NS	NS
	260.5	258–263	Chloroform	NS	NS	NS	NS	NS	NS	12/1/09	74	360	1/20/10	21	100
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/1/09	1.7	5.8	1/20/10	2	7
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	2.4	12	1/20/10	5.7	28
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	1.6 (J-)	12 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	1.6	8.5	1/20/10	3.5	19
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	1.5	8.4	1/20/10	3.6	20
	282.5	280–285	Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	0.84	5.3
			Chloroform	NS	NS	NS	NS	NS	NS	12/1/09	77	370	1/20/10	24	120
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/1/09	8.4	29	1/20/10	7.4	26
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	6.2	30	1/20/10	7	34
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/1/09	2 (J-)	15 (J-)	1/20/10	2.2 (J-)	16 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	4.3	23	1/20/10	4.6	25
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	3.9	22	1/20/10	4.7	26
	297.5	295–300	Butanone[2-]	NS	NS	NS	NS	NS	NS	12/1/09	3.4	10	1/20/10	ND	ND
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	12/1/09	4.4	14	1/20/10	ND	ND
			Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	1	6.6
			Chloroform	NS	NS	NS	NS	NS	NS	12/1/09	92	450	1/20/10	24	110
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/1/09	8.8	30	1/20/10	10	36
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	5.3	26	1/20/10	7.2	36
			Ethanol	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	4.5	8.6

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	297.5	295–300	Toluene	NS	NS	NS	NS	NS	NS	12/1/09	ND	ND	1/20/10	1.4	5.2
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/1/09	1.8 (J-)	13 (J-)	1/20/10	2.5 (J-)	19 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/1/09	3	16	1/20/10	3.8	21
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/1/09	3.3	19	1/20/10	4.4	25
54-609985	6.5	4–9	Acetone	NS	NS	NS	NS	NS	NS	12/4/09	4.6	11	1/20/10	ND	ND
			Benzene	NS	NS	NS	NS	NS	NS	12/4/09	2.3	7.3	1/20/10	ND	ND
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/4/09	0.94	3.2	1/20/10	ND	ND
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	1.2	6.1	1/20/10	3.1	15
			Hexane	NS	NS	NS	NS	NS	NS	12/4/09	1.6	5.6	1/20/10	ND	ND
			n-Heptane	NS	NS	NS	NS	NS	NS	12/4/09	1.2	5	1/20/10	ND	ND
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	1.1	7.3
			Toluene	NS	NS	NS	NS	NS	NS	12/4/09	2.1	8	1/20/10	ND	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	1.2	9.2
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/4/09	1.7	9.1	1/20/10	5.7	31
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	1.1	6
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	0.86	4.8	1/20/10	3.2	18
	62.5	60–65	Chloroform	NS	NS	NS	NS	NS	NS	12/4/09	34	160	1/20/10	8.2	40
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	0.89	3.1
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	8.3	41	1/20/10	6.1	30
			Ethanol	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	5.1	9.7
			Hexane	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	0.93	3.3
			Methylene Chloride	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	1.9	6.5
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	0.92	6.2

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-609985 (cont.)	62.5	60–65	Toluene	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	2.2	8.4
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1.7	13	1/20/10	1.9	15
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/4/09	8.1	44	1/20/10	7.8	43
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/4/09	0.86	4.6	1/20/10	1.3	7.2
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	8	45	1/20/10	6.7	38
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	1.3	5.5
	102.5	100–105	Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/4/09	0.94	5.9	1/20/10	0.88	5.6
			Chloroform	NS	NS	NS	NS	NS	NS	12/4/09	21	100	1/20/10	9.2	45
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	1.3	4.6
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	8	39	1/20/10	7.6	37
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1.7	13	1/20/10	2.4	18
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/4/09	8	44	1/20/10	9.3	51
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/4/09	0.95	5.1	1/20/10	1.4	7.8
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	6.7	38	1/20/10	7.2	40
	152.5	150–155	Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/4/09	0.97	6.1	1/20/10	1	6.4
			Chloroform	NS	NS	NS	NS	NS	NS	12/4/09	0.98	4.8	1/20/10	0.92	4.5
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/4/09	2.5	8.6	1/20/10	4.6	16
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	7.9	39	1/20/10	6.8	33
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1.9	15	1/20/10	2.3	17
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/4/09	8.6	47	1/20/10	9	49
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/4/09	1.1	6	1/20/10	1.5	7.9
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	6.4	36	1/20/10	6.2	35

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)
54-609985 (cont.)	202.5	200–205	Acetone	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	3.6	8.5
			Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/4/09	3	19	1/20/10	2.2	14
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	5	18	1/20/10	5.2	19
			Chloroform	NS	NS	NS	NS	NS	NS	12/4/09	55	270	1/20/10	24	120
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/4/09	10	34	1/20/10	15	52
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	9.2	45	1/20/10	8	40
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1.2	5.7	1/20/10	1.5	6.7
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	12/4/09	0.84	5.7	1/20/10	ND	ND
			Toluene	NS	NS	NS	NS	NS	NS	12/4/09	1.8	6.6	1/20/10	ND	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	2.5	19	1/20/10	3	23
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/4/09	7.3	40	1/20/10	7.8	42
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/4/09	0.88	4.7	1/20/10	1.3	7.1
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	6.6	37	1/20/10	6.4	36
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	12/4/09	1.4	5.9	1/20/10	ND	ND
	247.5	245–250	Benzene	NS	NS	NS	NS	NS	NS	12/4/09	4.4	14	1/20/10	ND	ND
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	1	3.2
			Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/4/09	3	19	1/20/10	2.3	14
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	5.7	20	1/20/10	4.3	15
			Chloroform	NS	NS	NS	NS	NS	NS	12/4/09	27	130	1/20/10	11	52
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/4/09	19	64	1/20/10	25	85
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	8	39	1/20/10	6.4	32
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1.2	5.5	1/20/10	1.3	5.9
			Ethylbenzene	NS	NS	NS	NS	NS	NS	12/4/09	0.8 (J)	3.5 (J)	1/20/10	ND	ND

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009			4th Quarter FY2009			1st Quarter FY2010			2nd Quarter FY2010		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-609985 (cont.)	247.5	245–250	Ethyltoluene[4-]	NS	NS	NS	NS	NS	NS	12/4/09	0.92	4.5	1/20/10	ND	ND
			Hexane	NS	NS	NS	NS	NS	NS	12/4/09	4.6	16	1/20/10	ND	ND
			n-Heptane	NS	NS	NS	NS	NS	NS	12/4/09	4.2	17	1/20/10	ND	ND
			Toluene	NS	NS	NS	NS	NS	NS	12/4/09	1.5	5.8	1/20/10	ND	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1.9	15	1/20/10	2.2	17
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/4/09	3.7	20	1/20/10	3.9	21
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	0.89	4.8
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	5.1	29	1/20/10	3	17
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	12/4/09	1.2	5.3	1/20/10	ND	ND
	260.5	258–263	Acetone	NS	NS	NS	NS	NS	NS	12/4/09	3.7	8.8	1/20/10	ND	ND
			Butanone[2-]	NS	NS	NS	NS	NS	NS	12/4/09	0.91	2.7	1/20/10	ND	ND
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	12/4/09	0.86	2.7	1/20/10	ND	ND
			Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/4/09	2.7	17	1/20/10	2.3	14
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	5.2	18	1/20/10	4.4	16
			Chloroform	NS	NS	NS	NS	NS	NS	12/4/09	24	120	1/20/10	10	51
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/4/09	17	59	1/20/10	26	89
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	6.8	34	1/20/10	6	30
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1	4.7	1/20/10	1.1	5.1
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1.6	12	1/20/10	2.2	17
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/4/09	2.9	16	1/20/10	3.2	17
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	4.4	25	1/20/10	2.6	15

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	3rd Quarter FY2009 Date	3rd Quarter FY2009 Result (ppbv)	3rd Quarter FY2009 Result (µg/m³)	4th Quarter FY2009 Date	4th Quarter FY2009 Result (ppbv)	4th Quarter FY2009 Result (µg/m³)	1st Quarter FY2010 Date	1st Quarter FY2010 Result (ppbv)	1st Quarter FY2010 Result (µg/m³)	2nd Quarter FY2010 Date	2nd Quarter FY2010 Result (ppbv)	2nd Quarter FY2010 Result (µg/m³)
54-609985 (cont.)	282.5	280–285	Acetone	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	11	27
			Butanone[2-]	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	4.3	13
			Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/4/09	3.1	19	1/20/10	1.8	12
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	5.2	18	1/20/10	ND	ND
			Chloroform	NS	NS	NS	NS	NS	NS	12/4/09	24	120	1/20/10	11	55
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/4/09	22	78	1/20/10	22	76
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	6.3	31	1/20/10	5.6	28
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	0.96	4.4	1/20/10	1.1	5.3
			Propylene	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	9.8	17
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1.6	12	1/20/10	1	8
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/4/09	2.3	13	1/20/10	1.8	9.6
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	4	22	1/20/10	2.5	14
	297.5	295–300	Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	12/4/09	2.8	18	1/20/10	2.6	16
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	4.8	17	1/20/10	4.1	14
			Chloroform	NS	NS	NS	NS	NS	NS	12/4/09	11	54	1/20/10	6.1	30
			Cyclohexane	NS	NS	NS	NS	NS	NS	12/4/09	24	81	1/20/10	35	120
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	5.7	28	1/20/10	5.6	28
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	0.93	4.3
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	12/4/09	1.4	10	1/20/10	1.8	14
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	12/4/09	1.7	9.3	1/20/10	2	11
			Trichloroethene	NS	NS	NS	NS	NS	NS	12/4/09	ND	ND	1/20/10	1.9	10
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	12/4/09	3.5	20	1/20/10	3.9	22

Note: See Appendix A for data qualifier definitions.

[a] ND = Not detected.

[b] NS = Not sampled.

Table 5.0-2
Tritium Pore-Vapor Results at MDA H, Second Quarter FY2010 and Three Previous Quarters

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
			Date	Result (pCi/L)	Date	Result (pCi/L)	Date	Result (pCi/L)	Date	Result (pCi/L)
54-01023	10	10–12	5/4/09	16,424,700	8/6/09	6,836,460	NS[a]	NS	NS	NS
	12.5	10–15	NS	NS	NS	NS	12/15/09	271,780 (J)	1/20/10	1,000,390
	60	60–62	5/4/09	9,284,720	8/6/09	2,963,040	NS	NS	NS	NS
	62.5	60–65	NS	NS	NS	NS	12/15/09	398,879 (J)	1/20/10	1,761,090
	100	100–102	5/4/09	5,507,850	8/6/09	2,057,790	NS	NS	NS	NS
	102.5	100–105	NS	NS	NS	NS	12/15/09	284,857 (J)	1/20/10	472,913
	150	150–152	5/4/09	2,382,130	8/6/09	1,320,480	NS	NS	NS	NS
	152.5	150–155	NS	NS	NS	NS	12/15/09	132,499 (J)	1/20/10	270,615
	200	200–202	5/4/09	2,149,850	8/6/09	699,163	NS	NS	NS	NS
	202.5	200–205	NS	NS	NS	NS	12/15/09	7090.85 (J)	1/20/10	31,219
	247	247–249	5/11/09	ND[b]	8/6/09	860,847	NS	NS	NS	NS
	247.5	245–250	NS	NS	NS	NS	12/16/09	86,977 (J)	1/20/10	48,600.2
	260.5	258–263	NS	NS	NS	NS	12/16/09	104,258 (J)	1/20/10	1,706,060
54-15461	10	10–12	4/30/09	4937.48	8/7/09	3112.83	NS	NS	NS	NS
	11	10–12	NS	NS	NS	NS	12/14/09	2928.45	1/20/10	1460.9
	60	60–62	4/30/09	937.567	8/10/09	1183.58	NS	NS	NS	NS
	61	60–62	NS	NS	NS	NS	12/14/09	ND	1/20/10	708.047
	95	95–97	4/30/09	621.228	8/7/09	1558.41	NS	NS	NS	NS
	96	95–97	NS	NS	NS	NS	12/14/09	ND	1/20/10	385.205
54-15462	10	10–12	5/1/09	1161.33	8/7/09	864.929	NS	NS	NS	NS
	12.5	10–15	NS	NS	NS	NS	12/10/09	2304.88	1/21/10	44,444.7
	60	60–62	5/1/09	NS	8/7/09	1068.52	NS	NS	NS	NS
	62.5	60–65	NS	NS	NS	NS	12/11/09	ND	1/21/10	7612.51

Table 5.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010		2nd Quarter FY2010	
			Date	Result (pCi/L)	Date	Result (pCi/L)	Date	Result (pCi/L)	Date	Result (pCi/L)
54-15462 (cont.)	100	100–102	5/1/09	904.313	8/10/09	668.452	NS	NS	NS	NS
	102.5	100–105	NS	NS	NS	NS	12/14/09	ND	1/21/10	8379.91
	150	150–152	5/4/09	701.119	8/7/09	475.882	NS	NS	NS	NS
	152.5	150–155	NS	NS	NS	NS	12/15/09	3037.27	1/21/10	2075.23
	200	200–202	5/4/09	797.65	8/7/09	566.728	NS	NS	NS	NS
	202.5	200–205	NS	NS	NS	NS	12/15/09	1043.86 (J)	1/21/10	2986.25
	247.5	245–250	NS	NS	NS	NS	12/14/09	ND	1/21/10	92,820.1
	254	254–256	5/1/09	1026.2	8/10/09	1492.27	NS	NS	NS	NS
	260.5	258–263	NS	NS	NS	NS	12/15/09	–46.98 (R)	1/25/10	ND
	282.5	280–285	NS	NS	NS	NS	12/14/09	ND	1/25/10	ND
	297.5	295–300	NS	NS	NS	NS	12/14/09	ND	1/25/10	ND
54-609985	6.5	4–9	NS	NS	NS	NS	12/15/09	ND	1/21/10	1633.18
	62.5	60–65	NS	NS	NS	NS	12/16/09	ND	1/21/10	165,743
	102.5	100–105	NS	NS	NS	NS	12/16/09	ND	1/21/10	568.1
	152.5	150–155	NS	NS	NS	NS	12/16/09	ND	1/21/10	1599.36
	202.5	200–205	NS	NS	NS	NS	12/16/09	ND	1/21/10	12,543.3
	247.5	245–250	NS	NS	NS	NS	12/16/09	ND	1/21/10	ND
	260.5	258–263	NS	NS	NS	NS	12/16/09	ND	1/25/10	549.258
	282.5	280–285	NS	NS	NS	NS	12/16/09	ND	1/25/10	2847.15
	297.5	295–300	NS	NS	NS	NS	12/16/09	ND	1/25/10	386.428

Note: See Appendix A for data qualifier definitions.

[a] NS = Not sampled.

[b] ND = Not detected.

Appendix A

Acronyms and Abbreviations,
Metric Conversion Table, and Data Qualifier Definitions

A-1.0 ACRONYMS AND ABBREVIATIONS

B&K	Brüel and Kjær
bgs	below ground surface
CAS	Chemical Abstract Service
DCE	dichloroethylene
DER	duplicate error ratio
EPA	Environmental Protection Agency (U.S.)
FLUTe	Flexible Liner Underground Technology
FY	fiscal year
kPa	kilopascal
LANL	Los Alamos National Laboratory
LCS	laboratory control sample
MCL	maximum contaminant level
MDA	material disposal area
MDC	minimum detectable concentration
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
PCE	tetrachloroethene
PID	photoionization detector
QA	quality assurance
QC	quality control
RPD	relative percent difference
SL	screening level
SV	screening value
SOP	standard operating procedure
SOW	statement of work
TA	technical area
TCA	1,1,1-trichloroethane
TCE	trichloroethene
TPU	total propagated uncertainty
VOC	volatile organic compound

A-2.0 METRIC CONVERSION TABLE

Multiply SI (Metric) Unit	by	To Obtain U.S. Customary Unit
kilometers (km)	0.622	miles (mi)
kilometers (km)	3281	feet (ft)
meters (m)	3.281	feet (ft)
meters (m)	39.37	inches (in.)
centimeters (cm)	0.03281	feet (ft)
centimeters (cm)	0.394	inches (in.)
millimeters (mm)	0.0394	inches (in.)
micrometers or microns (µm)	0.0000394	inches (in.)
square kilometers (km^2)	0.3861	square miles (mi^2)
hectares (ha)	2.5	acres
square meters (m^2)	10.764	square feet (ft^2)
cubic meters (m^3)	35.31	cubic feet (ft^3)
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter (g/cm^3)	62.422	pounds per cubic foot (lb/ft^3)
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram (µg/g)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius (°C)	9/5 + 32	degrees Fahrenheit (°F)

A-3.0 DATA QUALIFIER DEFINITIONS

Data Qualifier	Definition
U	The analyte was analyzed for but not detected.
J	The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.
J+	The analyte was positively identified, and the result is likely to be biased high.
J-	The analyte was positively identified, and the result is likely to be biased low.
UJ	The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.
R	The data are rejected as a result of major problems with quality assurance/quality control parameters.

Appendix B

Quality Assurance/Quality Control Program

B-1.0 INTRODUCTION

This appendix discusses analytical methods and data quality review and summarizes the effects of data quality exceptions on the acceptability of the analytical laboratory data.

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 (SOW) 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 (LCS), internal standards, initial and continuing calibrations, and surrogates, 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 standard operating procedure (SOP) ER-ERSS-SOP-5056, 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) that included a more detailed review of the raw data results. The procedures used for data validation are listed in Table B-1.0-1. Copies of the raw analytical data, laboratory logbooks, and instrument printouts are provided in data packages as part of Appendix C (on CD included with this document).

Analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines, where applicable (EPA 1994, 048639; EPA 1999, 066649). Data have also been assessed using guidelines established in EPA Method SW-846 (EPA 1997, 057589). As a result of the data validation and assessment efforts, qualifiers have been assigned to some of the analytical records.

B-1.1 Maintenance of Chain of Custody

To maintain chain of custody is to document or demonstrate the possession of an item by only authorized individuals. The chain-of-custody process, described in EP-ERSS-SOP-5058, Chain of Custody for Analytical Data Record Packages, 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. The chain-of-custody forms are provided in Appendix C (on CD).

B-1.2 Sample Documentation

Establishing sample documentation acceptability, described in EP-ERSS-SOP-5058, is the first step toward verifying an analytical system has produced data of known quality. Documentation depends on 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.

B-1.3 Sample Preservation

Sample preservation is the use of specific types of sample containers and preservation techniques, as described in EP-ERSS-SOP-5056, Sample Containers and Preservation. 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.

B-1.4 Holding Time

Holding time, the maximum amount of time a sample can be stored without unacceptable changes in analyte concentrations, is described in EP-ERSS-SOP-5056. Extraction holding time refers to the time that elapses between sample collection and sample preparation; analytical holding time refers to the time that elapses between sample preparation and analysis.

B-1.5 Initial and Continuing Calibration Verification (Including Interference-Check Standards)

Calibration verification establishes 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 and 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.

B-1.6 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.

B-1.7 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, and internal standards are tools for making analyte quantitation evaluations.

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

Radionuclide results reported at less than the minimum detectable activity are 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 U.

B-1.8 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).

B-1.9 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).

B-1.10 Surrogate Recoveries

A surrogate (an organic chemical compound) is similar in composition and behavior to target analytes but is not typically found in environmental samples. Surrogates 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 vary by method but should generally be greater than 10% for an analytical result to be usable (LANL 2000, 071233).

B-1.11 Internal Standard Responses

Internal standards 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 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 ≥50% to ≤200% (LANL 2000, 071233).

B-1.12 LCS Recoveries

An LCS is a known matrix that has been spiked with compound(s) that 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).

B-1.13 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) 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 (RPD) for laboratory duplicates should be within 20% (LANL, 2000 071233). Field duplicates are independent samples collected as closely as possible at the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently and should have RPDs less than 20% as described in EP-ERSS-SOP-5059. The RPD is defined by the equation RPD[|D1-D2|]/[(D1+D2)/2) × 100, where D1 and D2 represent the analytical measurements on duplicate samples.

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.

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

B-1.14 Field Blanks

A field blank is a sample of analyte-free medium 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.

B-2.0 LABORATORY ANALYSIS SUMMARY

During the second quarter fiscal year (FY) 2010, 28 pore-gas volatile organic compound (VOC) samples, 3 VOC field duplicates, 3 VOC field blanks, 3 VOC performance evaluation (PE) samples, 28 tritium samples, 3 tritium field duplicates, and 3 tritium field blanks were collected at Solid Waste Management Unit 54-004, also known as Material Disposal Area (MDA) H. Analyses for VOCs were performed using EPA Method TO-15 and for tritium using EPA Method 906.0. All QC procedures were followed as required by the analytical services SOW (LANL 2000, 071233). Table B-2.0-1 lists the analytical methods used for VOC and tritium analyses.

Sampling locations, sampling ports, and validated analytical results are presented in Tables 5.0-1 and 5.0-2 of the periodic monitoring report. The data, including the qualified data, are usable for evaluation purposes.

The tritium and VOCs analyses are summarized in the following sections. The required minimum detectable activity or estimated quantitation limit is prescribed in the analytical services SOW (LANL 2000, 071233).

B-3.0 ORGANIC CHEMICAL ANALYSES

No VOC data were rejected.

B-3.1 Maintenance of Chain of Custody

Chain of custody was properly maintained for all samples.

B-3.2 Sample Documentation

All samples were properly documented in the field.

B-3.3 Sample Preservation

No sample preservation is required for VOCs.

B-3.4 Holding Time

The holding times were met for all samples.

B-3.5 Initial and Continuing Calibration Verification

Five VOC results were qualified as estimated (J), and 22 VOC results were qualified as estimated not detected (UJ) because the initial calibration verification and/or continuing calibration verification was recovered outside method specific limits.

Nine VOC results were qualified as estimated not detected (UJ) because the affected analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient was less than 0.995.

B-3.6 Analyte Identification (Including Internal Standards, and Spectra Review)

One VOC result was qualified as not detected (U) because the mass spectrum did not meet specifications.

B-3.7 Method Blank

Method blank results for VOC analyses were within acceptable limits for all results.

B-3.8 Surrogate Recoveries

All surrogate recoveries for VOC analyses were within acceptable limits.

B-3.9 Internal Standard Responses

All internal standard responses for VOC analyses were within acceptable limits.

B-3.10 LCS Recoveries

Laboratory control spike percent recoveries were less than the allowable limit but greater than 10% recovery for 18 results. Nine affected analytes were qualified as not detected (UJ), and nine analyte results were qualified as estimated biased low (J-).

B-3.11 Laboratory and Field Duplicates

Laboratory duplicates indicate acceptable precision. Two field sample results and their associated field duplicate results RPDs greater than 20%. Both results were below ground surface (bgs) from a field duplicate and associated field sample collected 54-609985 at 297.5 ft bgs. The RPD for the cyclohexane results was 38.8%, and the RPD for the trichlorofluoromethane analyte was 20.4%. The data are not qualified based on RPD between the field duplicate and its associated field sample.

B-3.12 Field Blanks and Equipment Blanks

One field blank, collected on January 20, 2010, from borehole 54-609985 had detects of tetrachloroethene (PCE) and trichloroethene (TCE). These detects did not affect the quality of the associated field sample results.

B-4.0 RADIOCHEMICAL ANALYSES

No tritium results were rejected.

B-4.1 Maintenance of Chain of Custody

Chain of custody was properly maintained for all samples.

B-4.2 Sample Documentation

Samples were properly documented in the field.

B-4.3 Sample Preservation

No sample preservation is required for tritium.

B-4.4 Holding Times

The holding times were met for all tritium analyses.

B-4.5 Method Blanks

Method blank results were within acceptable limits for all tritium analyses.

B-4.3 Analyte Identification

Two tritium results were qualified as not detected (U) because the sampling result was ≤ 5 times the concentration in the associated field blank. Two tritium results were qualified as not detected (U) because the sample concentration was less than the minimum detectable concentration (MDC).

B-4.6 LCS Recoveries

The LCS recoveries were within acceptable limits for all tritium analyses.

B-4.7 Laboratory Duplicates and Field Duplicates

Field duplicates indicate acceptable precision accept for one field duplicate and its associated field sample. The tritium sample collected from borehole 54-609985 at 6.5 ft bgs, and its associated field duplicate sample had an RPD of 53.7%. The results are not qualified based on the RPD of the field sample and field duplicate.

B-4.8 Field Blanks and Equipment Blanks

One field blank collected on January 25, 2010, from borehole 54-15462 had detectable levels of tritium.

B-5.0 FIELD-MONITORING SUMMARY

B-5.1 Volatile Organic Compounds

Field-monitoring data are less costly to generate than analytical 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 H is conducted using guidance provided in ER-ERSS-SOP-5074, Sampling of Sub-Atmospheric Air. This procedure covers the use of the Brüel and Kjær (B&K) Type 1302 multigas analyzer and the Landtec GEM 500 photoionization detector (PID).

The B&K is maintained through calibration and changing or cleaning of filters as needed. The B&K is calibrated before use each quarter by a certified calibration laboratory. The B&K is adjusted before each day’s use to compensate for ambient pressure and temperature. A daily operational check is conducted through the analysis of ambient air readings and triplicate readings of known quantities of organic analytes in nitrogen. These verification check analyses confirm analytical stability, the instrument zero point for each analyte is correctly set, and the stored calibration curve remains applicable to current instrument response to the presence of organic chemicals. Concentrations of gas standards analyzed before each day’s use are expected to be within ±20% of their known values. Additionally, during each sample analysis, a low-sample flow condition will trigger an alarm on the B&K and the VOC measurement is not completed.

The presence of nontarget VOCs bias B&K target analytes may skew results if they have an acoustic response to infrared light similar to the target analyte. Trichlorofluoromethane (Freon-11) generates a measurable acoustic signal in response to light with a wavelength of 11.6 µm proportional to its concentration. Other VOCs generating an acoustic signal to light at this wavelength include (Freon-114) (Chemical Abstract Service [CAS] 76-14-2; 1,2-dichloro-1,1,2,2-tetrafluoroethane) and Freon-21 (CAS 75-43-4; dichlorofluoromethane), neither of which is reported by EPA Method TO-15. 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) and (Freon-113) (CAS 76-13-1, 1,1,2-trichloro-1,2,2-trifluoroethane), neither of which is reported by EPA Method TO-15; Freon-12 (CAS 75-71-8, dichlorodifluoromethane); ethanol (CAS 64-17-5); and 1,1-dichloroethylene (DCE) (CAS 75-35-4). Results indicate that DCE and Freon-113 are detected in most samples at MDA H at concentrations that generate a measurable acoustic signal in response to light with a wavelength included in the acoustic signal interpreted as PCE, which may make the PCE readings appear higher on the B&K. Table B-5.1-1 presents VOCs that interfere with each of the four B&K target analytes.

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

- On January 15, 2010 the B&K with serial number 1692083 was calibrated before the second quarter monitoring event. The zero points were set for 1,1,1-trichloroethane (TCA), TCE, Freon-11, PCE, carbon dioxide (CO_2), and water vapor. Span concentrations of TCA at 10.68 ppm, TCE at 19.86 ppm, Freon-11 at 20 ppm, PCE at 21.4 ppm, and CO_2 at 2000 ppm were used to generate calibration response curves.
- After the second quarter FY2010 monitoring event, the B&K with serial number 1692083 was sent for calibration.

The Landtec GEM 500 PID is calibrated 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 curve 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 no other hydrocarbon gases present are present within the sample (e.g., ethane, propane, butane). If other hydrocarbons are 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 is not influenced by CO_2, hydrogen sulfide, nitrate, sulfide, or hydrogen.

Calibration of the Landtec GEM-500 PID is confirmed before each day's use through multiple readings of ambient air. Zero readings of CH_4 and CO_2 are expected. O_2 is expected to read 20.9%. The Landtec reads with an accuracy of +/-1% over an O_2% concentration range of 0% to 25%.

Data generated using the Landtec GEM-500 PID is supported by calibration records that arrive with the rented instrument previous to the period of analyses. Calibration is performed by Geotech's Colorado Service Center in Denver, CO. Calibration information is reported below for the Landtec PID used to generate results presented in this periodic monitoring report.

- Unit 1139 was calibrated on December 31, 2009. The zero points were 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/min.
- Unit 560 was calibrated on February 1, 2010. The zero points were 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 475 cc/min.

B-5.2 Tritium

All tritium samples were collected in accordance with the current version of EP-ERSS-SOP-5074. Water vapor intended for tritium analysis was collected from pore gas by means of pulling a pore-gas sample through a canister of silica gel and the sample information recorded on the appropriate sample collection log (Appendix C [on CD]). Silica gel column field duplicate samples were also collected at a frequency greater than or equal to 10% per sampling event in accordance with the current version of EP-ERSS-SOP-5059.

Following delivery of the canister and silica gel sample to the analytical laboratory, the silica gel was heated, and the moisture driven off was collected for liquid scintillation counting. Silica gel was prepared for sampling by drying at a temperature above 100^{o}C. Before sample collection, the amount of silica gel used in each sample was weighed (typically about 135 g), as well as the sample canister with silica gel. EP-ERSS-SOP-5074 requires that at least 5 g of moisture be collected. After sampling, sample canister with silica gel was weighed again.

The sample (canister plus silica gel) was shipped to the analytical laboratory, where the canister with silica gel was weighed again. The silica gel was emptied into a distillation apparatus and heated to 110°C, driving moisture off the silica gel. This moisture was collected and analyzed for tritium by liquid scintillation. The analytical laboratory also weighed the empty canister and calculated the percent moisture of the sample, as the amount of moisture collected divided by the calculated weight of the wet silica gel. The value of the tritium concentration and the calculated percent moisture were reported to the Laboratory in the analytical data package and the electronic data deliverable.

B-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. This information is also included in text citations. ER IDs 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 New Mexico Environment Department Hazardous Waste Bureau 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)

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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 B-1.0-1
Data Validation Procedures

Procedure	Title	Effective Date
SOP-1561, Rev. 0	Routine Validation of Volatile Organic Compound (VOC) Analytical Data	6/10/2008
SOP-1566, Rev. 0	Routine Validation of Gamma Spectroscopy, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data	6/30/2008

Table B-2.0-1
Analytical Methods Used for Sample Analyses

Analytical Method	Analytical Description	Target Compound List
EPA Method TO-15	VOCs in pore gas	See analytical services SOW (LANL 2000, 071233)
EPA Method 906.0	Tritium in pore gas	Tritium

Table B-3.0-1
B&K Target Analytes
and Potential Interfering Analytes

Target	Potential Interfering Analyte
PCE	Styrene
PCE	Freon-113
PCE	Freon-12
PCE	DCE
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

Table B-3.0-1 (continued)

Target	Potential Interfering Analyte
Freon-11	Phosgene
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	1,2-Difluoroethane
TCE	Diethyl ketone
TCE	Dinitrogendifluoride
TCE	2-Pentanone
TCE	2-Propanol
TCE	Sulfur hexafluoride
TCE	Vinyl chloride

Appendix C

Analytical Suites and Results and Analytical Reports
(on CD included with this document)