March 2011
EP2011-0067

Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, First Quarter Fiscal Year 2011

Prepared by the Environmental Programs Directorate

EP2011-0067

Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, First Quarter Fiscal Year 2011

March 2011

Responsible project manager:

Printed Name	Signature	Title	Organization	Date
Jarrett Rice		Project Manager	Environmental Programs	10 March 2011

Responsible LANS representative:

Printed Name	Signature	Title	Organization	Date
Michael J. Graham		Associate Director	Environmental Programs	3/11/11

Responsible DOE representative:

Printed Name	Signature	Title	Organization	Date
George J. Rael		Manager	DOE-LASO	3-14-2011

EXECUTIVE SUMMARY

This periodic monitoring report summarizes vapor-monitoring activities conducted during the first quarter of fiscal year (FY) 2011 at Material Disposal Area (MDA) H, Solid Waste Management Unit 54-004, in Technical Area 54, at Los Alamos National Laboratory. The objectives of vapor monitoring at MDA H are to (1) collect additional samples from vapor-monitoring wells at MDA H and (2) compare sampling results with previously detected volatile organic compound (VOC) concentrations and tritium activities in pore gas beneath MDA H.

Vapor monitoring included field screening and collecting vapor samples within four monitoring wells. Vapor samples were submitted for laboratory analysis of VOCs and tritium. The results of detected VOCs in MDA H pore gas during the first quarter of FY2011 sampling activities were generally consistent with previous sampling results. The VOC screening evaluation did not identify any VOCs in MDA H pore gas at concentrations that resulted in screening values greater than 1.

With the exception of one sample, all tritium activities in all four MDA H vapor-monitoring wells were consistent with activities reported in previous monitoring reports.

CONTENTS

1.0 INTRODUCTION 1
1.1 Site Location and Description 1
2.0 SCOPE OF ACTIVITIES 1
2.1 Deviations 2
3.0 REGULATORY CRITERIA 2
4.0 FIELD-SCREENING RESULTS 3
5.0 ANALYTICAL DATA RESULTS 4
5.1 VOC Pore-Gas Results 4
5.2 VOC Screening Evaluation 4
5.3 Pore-Vapor Tritium Results 4
6.0 SUMMARY 5
7.0 REFERENCES AND MAP DATA SOURCES 5
7.1 References 5
7.2 Map Data Sources 6

Figures

Figure 1.1-1 Location of MDA H in TA-54 with respect to Laboratory technical areas and surrounding landholdings 9
Figure 1.1-2 Locations of MDA H vapor-monitoring wells and associated structures and features 10
Figure 5.1-1 VOCs detected in vapor samples at MDA H 11
Figure 5.3-1 Tritium detected in vapor samples at MDA H 12
Figure 5.3-2 Tritium in vapor-monitoring wells 54-01023, 54-15462, 54-15461, and 54-609985 13

Tables

Table 2.0-1 NMED-Approved MDA H Subsurface Vapor-Monitoring Locations, Port Depths, and Corresponding Sampling Intervals 15
Table 3.0-1 Henry's Law Constants, Groundwater SLs, and Calculated Concentrations Corresponding to Groundwater SLs for Detected VOCs in Pore Gas 15
Table 5.2-1 Screening of VOCs in Pore Gas at MDA H, First Quarter FY2011 16

Appendixes

Appendix A Acronyms and Abbreviations, Metric Conversion Table, and Data Qualifier Definitions
Appendix B Field Methods
Appendix C Quality Assurance/Quality Control Program
Appendix D Field-Screening Results and Detected Volatile Organic Compounds and Tritium

1.0 INTRODUCTION

This periodic monitoring report (PMR) presents the results of vapor-monitoring activities conducted during the first quarter of fiscal year (FY) 2011 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). These activities are being conducted per the requirements outlined in a June 23, 2009, New Mexico Environment Department (NMED) letter to the Laboratory (NMED 2009, 106234) and the NMED-approved "Vapor-Monitoring Well Installation Work Plan for Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54" (LANL 2009, 106802).

The objectives of the MDA H vapor-monitoring activities are to (1) collect additional vapor samples from vapor-monitoring wells at MDA H and (2) compare sampling results with previously detected volatile organic compound (VOC) concentrations and tritium activities beneath and surrounding MDA H.

This report discusses the results obtained during the latest quarter monitoring activities; however, vapor data from the previous three quarterly PMRs, second, third, and fourth quarters of FY2010 (LANL 1998, 059599; LANL 2010, 111123; LANL 2010, 109524; LANL 2010, 111360), for MDA H are also included in the data evaluation section of this report for comparison. Vapor monitoring included field screening and collecting vapor samples from stainless-steel sampling ports in vapor-monitoring wells. All pore-gas samples were submitted for off-site analysis of VOCs and tritium.

No regulatory criteria exist for vapor-phase contaminants; therefore, this report presents the results of a screening evaluation of the pore-gas VOC data. This screening evaluation compares maximum concentrations of VOCs in pore gas with pore-gas screening levels (SLs) derived from groundwater SLs. This conservative screening process evaluates the potential for the detected VOC concentrations to result in contamination of groundwater above applicable regulatory criteria.

Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy policy.

1.1 Site Location and Description

MDA H is located in the east-central portion of the Laboratory at TA-54 (Figure 1.1-1) 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 fenceline (Figure 1.1-2). 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.

2.0 SCOPE OF ACTIVITIES

The following activities were completed at MDA H during the first quarter of FY2011. Vapor-monitoring activities were conducted from November 4 to November 15, 2010. Table 2.0-1 outlines the NMED-approved vapor-monitoring locations, port depths, and corresponding port intervals.

- Samples were field screened and collected in accordance with the current version of Standard Operating Procedure 5074, Sampling Subsurface Vapor.

- Field screening was conducted using a MultiRAE IR multi-gas monitor to measure percent carbon dioxide (%CO_2), percent oxygen (%O_2), and VOC concentrations in parts per million using a photoionization detector (PID).
- Vapor samples were submitted to off-site analytical laboratories in SUMMA canisters for VOC analysis using U.S. Environmental Protection Agency (EPA) Method TO-15 and in silica-gel columns for tritium analysis using EPA Method 906.
- A total of 34 pore-gas samples (28 characterization and 6 quality assurance/quality control [QA/QC]) was collected for VOC analysis from 28 ports in four vapor-monitoring wells.
- A total of 34 samples (28 characterization and 6 QA/QC) was collected for tritium analysis from 28 ports in four vapor-monitoring wells.
- All analytical data were subject to QA/QC and data validation reviews in accordance with Laboratory guidance and procedures. Field duplicate samples were collected at a minimum frequency of 1 for every 10 samples. The QA/QC and data validation review for MDA H pore-gas data are presented in Appendix C.

No investigation-derived waste was generated at the time vapor-monitoring activities were conducted at MDA H.

Further discussion of the field methods used for pore-gas field screening and sample collection are presented in Appendix B. Field chain-of-custody forms and sample collection logs are provided on a CD (Appendix D).

The pore-gas field-screening results are discussed in section 4.0, and the pore-gas analytical results are discussed in section 5.0. Any deviations from the scope of activities required in the June 23, 2009, letter to the Laboratory (NMED 2009, 106234) and the NMED-approved MDA H vapor-monitoring well installation work plan (LANL 2009, 106802) are presented in the following section.

2.1 Deviations

One field-screening sample in vapor-monitoring well 54-609985 at 202.5 ft bgs reported inaccurate purge values for CO_2 and O_2. Field-screening results are not reported for this port depth.

3.0 REGULATORY CRITERIA

The Compliance Order on Consent does not identify any cleanup standards, risk-based SLs, risk-based cleanup goals, or other regulatory criteria for pore gas at MDA H. Because the primary pathway of concern for subsurface VOC vapors is migration to groundwater, an analysis was conducted to evaluate the potential for contamination of groundwater by VOCs in pore gas using SLs based on groundwater cleanup levels. The analysis evaluated the groundwater concentration that would be in equilibrium with the maximum pore-gas concentrations of VOCs detected at MDA H.

The equilibrium relationship between air (pore gas) and water concentrations is described by the following equation

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

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 above applicable regulatory criteria at the vapor contaminant/groundwater interface.

The screening evaluation was based on groundwater standards or tap water SLs and 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_NOVEMBER2010.pdf). The following dimensionless form of Henry's law constant was used

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

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

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

where C_{air} is in units of µg/m^3,

SL is in units of µg/L, and

1000 = 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 NMED tap water SL should be used (NMED 2009, 106420). If no NMED tap water SL 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_NOVEMBER2010.pdf) is used. If EPA SLs for carcinogens are used, they should be adjusted to 10^{-5} risk. 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 groundwater SL. Therefore, if the SV is less than 1, the concentration of the VOC in groundwater would not exceed the SL even if the VOC plume was to come in contact with groundwater. Table 3.0-1 presents the calculated concentrations of contaminants in pore gas corresponding to groundwater SLs.

Results of the pore-gas screening evaluation are presented in section 5. No applicable standards for tritium in pore vapor are available, and the screening analysis described above does not apply to tritium.

4.0 FIELD-SCREENING RESULTS

First quarter FY2011 field screening was conducted using a MultiRAE IR multi-gas monitor to measure percent carbon dioxide, percent oxygen, and to estimate VOC concentrations in parts per million using a PID. Before each port was sampled, it was purged of stagnant air to ensure formation air was being collected. Each sampling port was then monitored until CO_2 and O_2 readings stabilized at levels representative of subsurface pore-gas conditions. A tabular summary of all field-screening results obtained during the second, third, and fourth quarter FY2010 and first quarter FY2011 sampling events at MDA H is provided in Appendix D by vapor-monitoring well identification and depth. The CO_2, O_2, and

PID field-screening methods and results are discussed further in Appendix B. The CO_2 and O_2 results for the first quarter of FY2011 were within calibration limits.

5.0 ANALYTICAL DATA RESULTS

All vapor analytical sampling data presented in this report are available at the Risk Analysis, Communication, Evaluation, and Reduction website (http://www.racernm.com/). The VOC pore-gas sampling results, VOC screening evaluation, and tritium sampling results are discussed below.

5.1 VOC Pore-Gas Results

VOC results from the first quarter of FY2011 and previous three vapor-monitoring quarters are summarized in tables and provided on CD in Appendix D. Figure 5.1-1 shows VOCs detected by borehole location during first quarter FY2011 sampling. Data associated with the previous three monitoring periods (second, third, and fourth quarter FY2010) are included for comparison purposes only.

A total of seven VOCs were detected in MDA H pore gas during the first quarter of FY2011 sampling activities, and the results are consistent with previous sampling results. Dichlorodifluoromethane, 1,1,1-trichloroethane and cyclohexane were detected in 6 of the 28 vapor samples collected. Other detected VOCs include chloroform, carbon disulfide, trichlorofluoromethane, and methylene chloride. There were no detected VOCs in vapor-monitoring well 54-15461 during first quarter FY2011 sampling.

5.2 VOC Screening Evaluation

The screening evaluation included the seven detected VOCs in MDA H samples for which there are MCLs, NMWQCC standards, NMED tap water SLs, or EPA regional tap water SLs (Table 3.0-1).

The results of the VOC screening evaluation for first quarter of FY2011 are presented in Table 5.2-1. The SVs were less than 1 for all detected VOCs during the first quarter FY2011. In addition, SVs were less than 1 for detected VOCs during the previous three vapor-monitoring quarters.

5.3 Pore-Vapor Tritium Results

Tritium results from the first quarter of FY2011 and previous three vapor-monitoring quarters are summarized in tables and provided on CD in Appendix D. Figure 5.3-1 shows tritium detected by borehole location during the latest sampling quarter. Tritium was detected in 16 of 28 vapor samples taken. The highest tritium activities detected were in vapor-monitoring well 54-01023. With the exception of one port in vapor-monitoring well 54-15462, all tritium activities detected during first quarter of FY2011 sampling are consistent with activities reported during previous sampling quarters. Concentration-with-depth profiles for tritium collected during the first quarter of FY2011 and previous three quarters are presented for all four vapor-monitoring wells in Figure 5.3-2.

The tritium sample collected in vapor-monitoring well 54-15462 at 202.5 ft bgs reported an activity of 630,000 pCi/L. The peak activity is inconsistent with previous data at this depth and location, which reported low and nondetect values for the last three quarters. Tritium activities below this port depth were detected at significantly lower activities or were not detected.

6.0 SUMMARY

The objectives of the MDA H vapor-monitoring activities are to (1) collect additional vapor samples from boreholes at MDA H and (2) compare the sampling results with previously detected VOC concentrations and tritium activities beneath MDA H. The results of the most recent monitoring activities compare well with those reported during previous monitoring activities.

- A total of seven VOCs were detected in the pore gas beneath MDA H. Concentrations for most VOCs detected in MDA H pore gas decreased with depth and were consistently detected at low concentrations or were detected infrequently. These results are consistent with data obtained during the three previous quarterly monitoring events.
- Tritium was detected in pore gas beneath MDA H. Detected tritium activities generally decreased with depth. With the exception of one sample, the results were consistent with data obtained during the three previous quarterly monitoring events. An inconsistent peak was reported in 54-609985 at 202.5 ft bgs. Tritium activities reported below this port were significantly lower or not detected.
- The VOC screening evaluation identified no VOCs with SVs greater than 1 during the latest quarterly monitoring event. In addition, no SVs have exceeded 1 during the previous three monitoring quarters. No regulatory criteria exist for pore gas; therefore, the screening evaluation is a conservative comparison with groundwater SLs to help evaluate any potential for groundwater contamination by VOCs.

Vapor-monitoring activities are scheduled to continue at MDA H as directed by the June 23, 2009, NMED letter to the Laboratory (NMED 2009, 106234) and the NMED-approved vapor-monitoring well installation work plan (LANL 2009, 106802). Data will be presented in subsequent quarterly monitoring reports.

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.

LANL (Los Alamos National Laboratory), May 22, 1998. "Hydrogeologic Workplan," Los Alamos National Laboratory document LA-UR-01-6511, Los Alamos, New Mexico. (LANL 1998, 059599)

LANL (Los Alamos National Laboratory), August 2009. "Vapor-Monitoring Well Installation Work Plan for Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54," Los Alamos National Laboratory document LA-UR-09-5023, Los Alamos, New Mexico. (LANL 2009, 106802)

LANL (Los Alamos National Laboratory), May 2010. "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 National Laboratory document LA-UR-10-3081, Los Alamos, New Mexico. (LANL 2010, 109524)

LANL (Los Alamos National Laboratory), October 2010. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Third Quarter Fiscal Year 2010," Los Alamos National Laboratory document LA-UR-10-6713, Los Alamos, New Mexico. (LANL 2010, 111123)

LANL (Los Alamos National Laboratory), November 2010. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Fourth Quarter Fiscal Year 2010," Los Alamos National Laboratory document LA-UR-10-7589, Los Alamos, New Mexico. (LANL 2010, 111360)

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), June 23, 2009. "Direction to Conduct Additional Investigations at Material Disposal Area H, SWMU 54-004, at Technical Area 54 to Define the Extent of Contamination," 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, 106234)

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)

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/Type	Data Source
LANL boundary	LANL Areas Used and Occupied; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 13 August 2010.
TA boundary	Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 13 August 2010.
ER projects	ER Project Locations; Los Alamos National Laboratory, ESH&Q Waste and Environmental Services Division, 2010-2E; 1:2,500 Scale Data; 04 October 2010.
MDAs	Materials Disposal Areas; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; ER2004-0221; 1:2,500 Scale Data; 23 April 2004.
Paved parking	Paved Parking; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.
Paved road	Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Legend Item/Type	Data Source
Dirt road	Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.
Road centerlines	Road Centerlines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 15 December 2005; as published 29 November 2010.
Structure	Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.
Contours	Hypsography, 10 and 100 Foot Contour Interval; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.
Fence	Security and Industrial Fences and Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.
Drainage	Modeled Surface Drainage, 1991; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, ER2002-0591; 1:24,000 Scale Data; Unknown publication date.

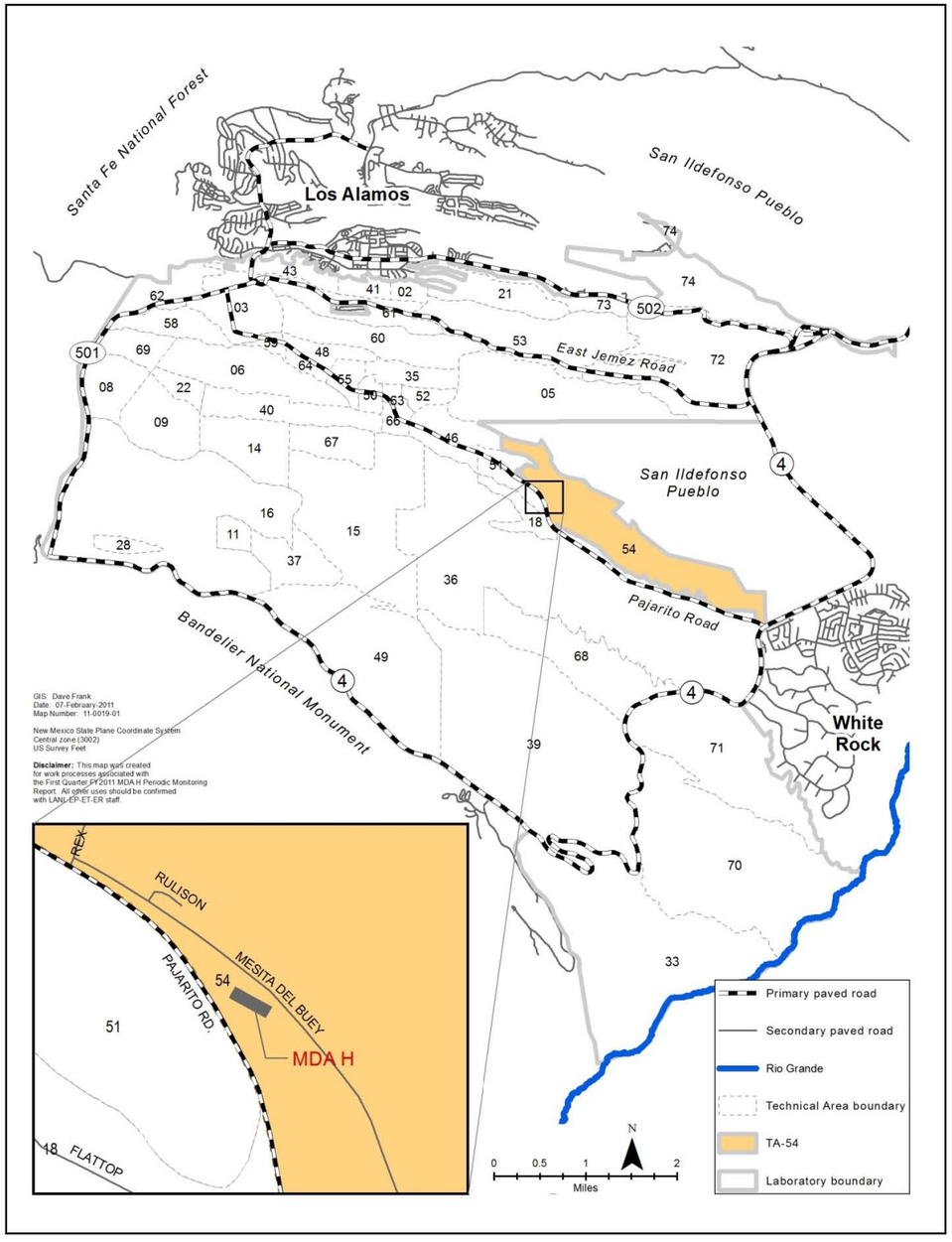

Figure 1.1-1 Location of MDA H in TA-54 with respect to Laboratory technical areas and surrounding landholdings

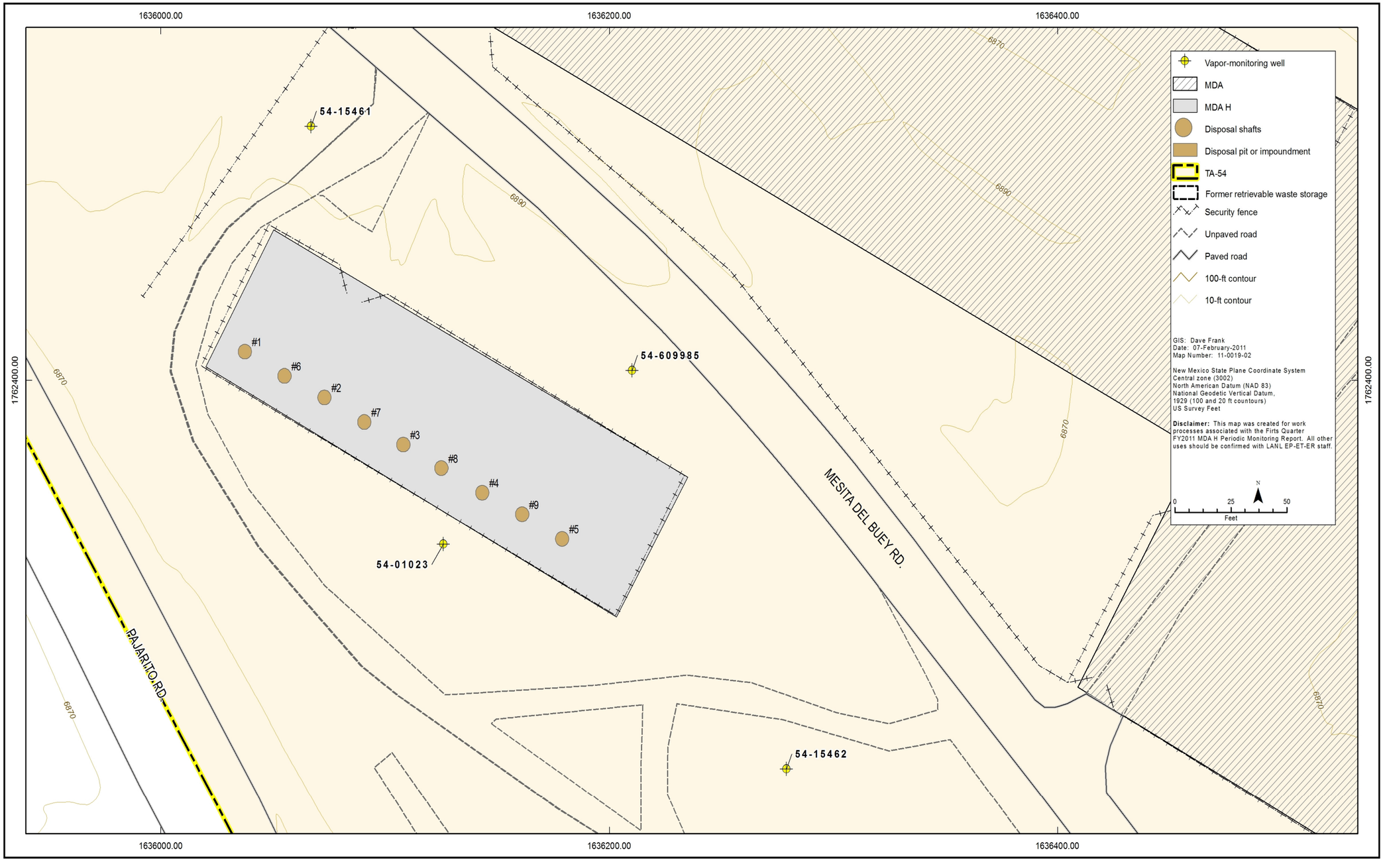

Figure 1.1-2 Locations of MDA H vapor-monitoring wells and associated structures and features

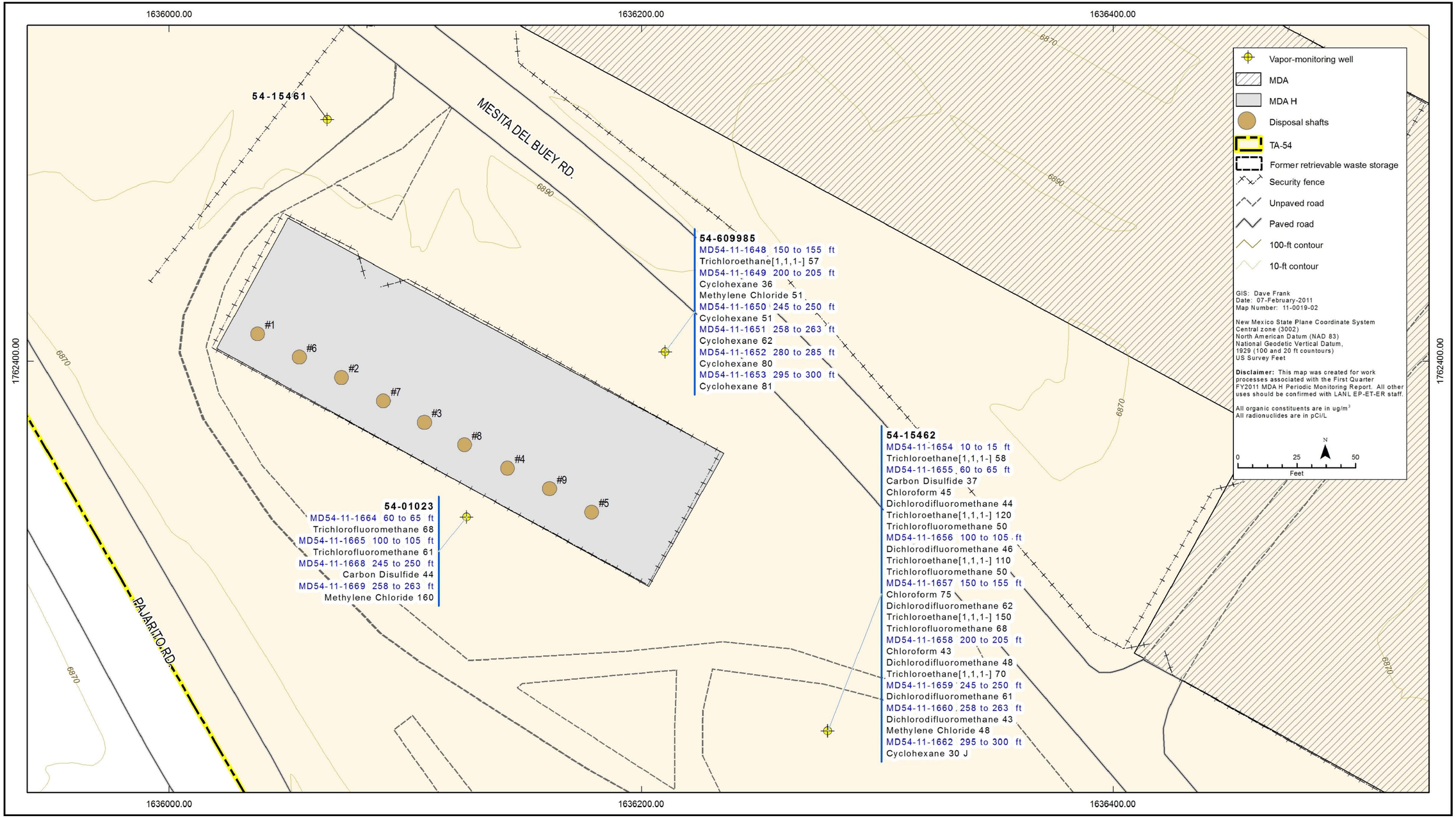

Figure 5.1-1 VOCs detected in vapor samples at MDA H

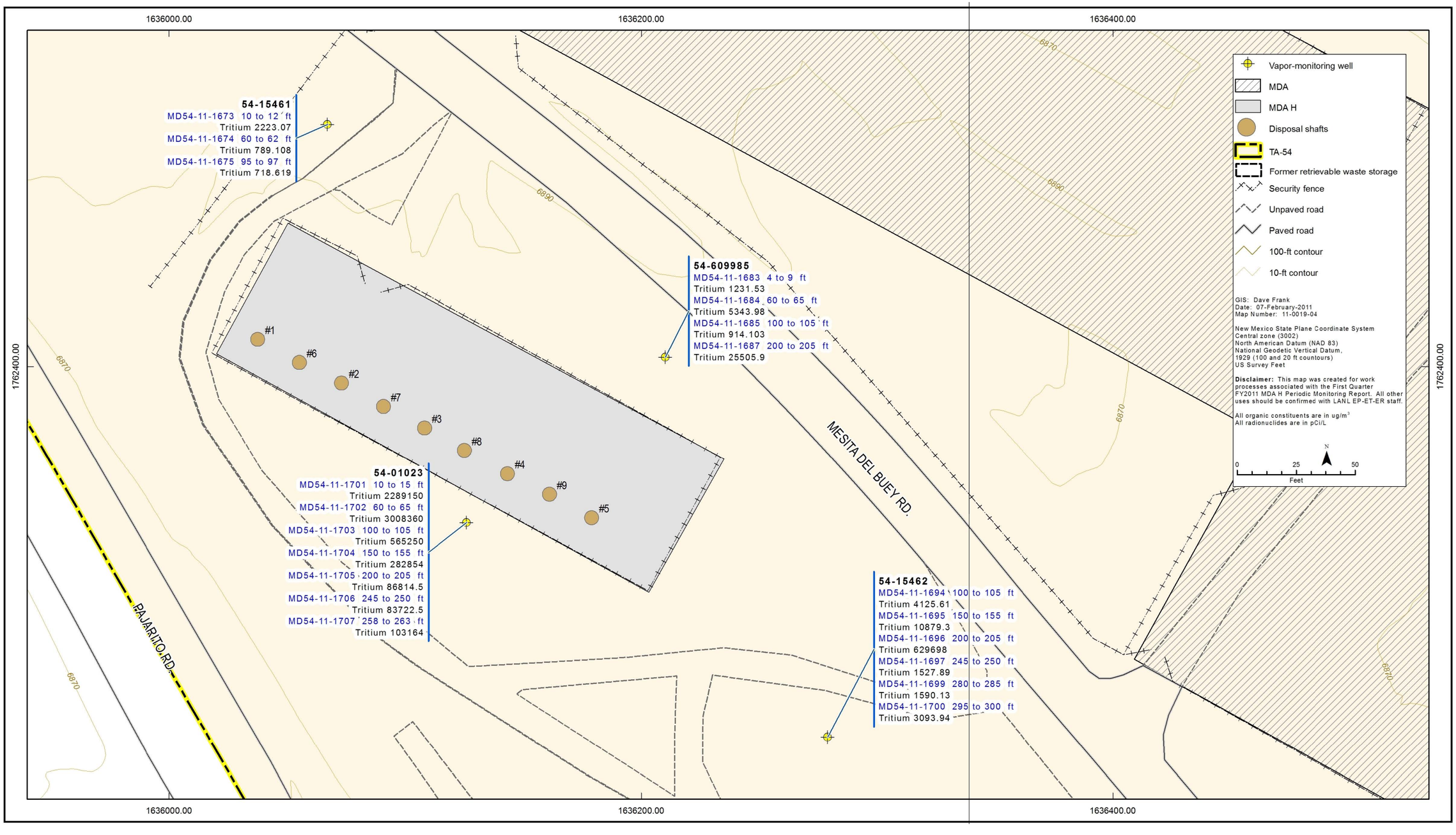

Figure 5.3-1 Tritium detected in vapor samples at MDA H

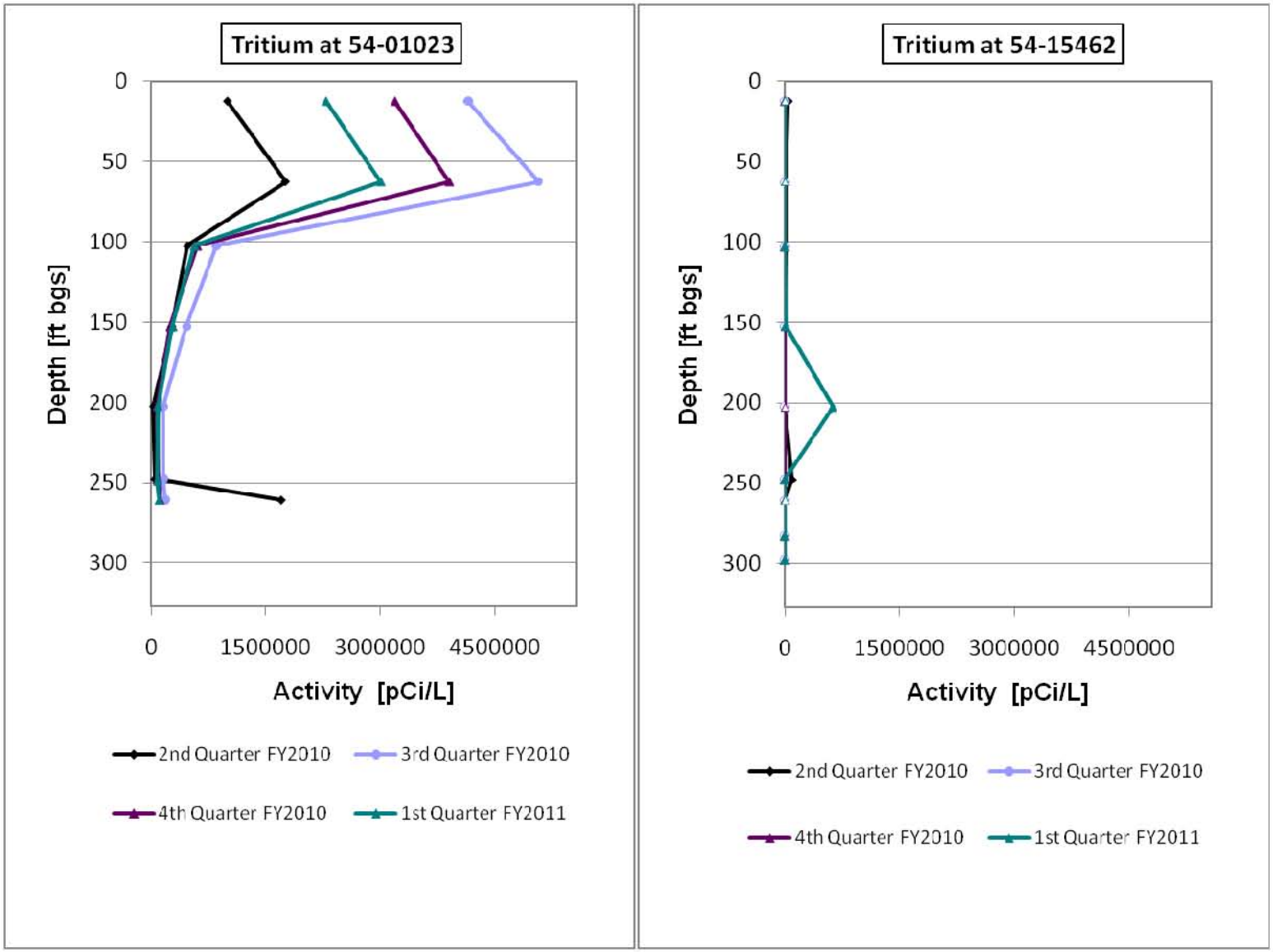

Figure 5.3-2 Tritium in vapor-monitoring wells 54-01023, 54-15462, 54-15461, and 54-609985

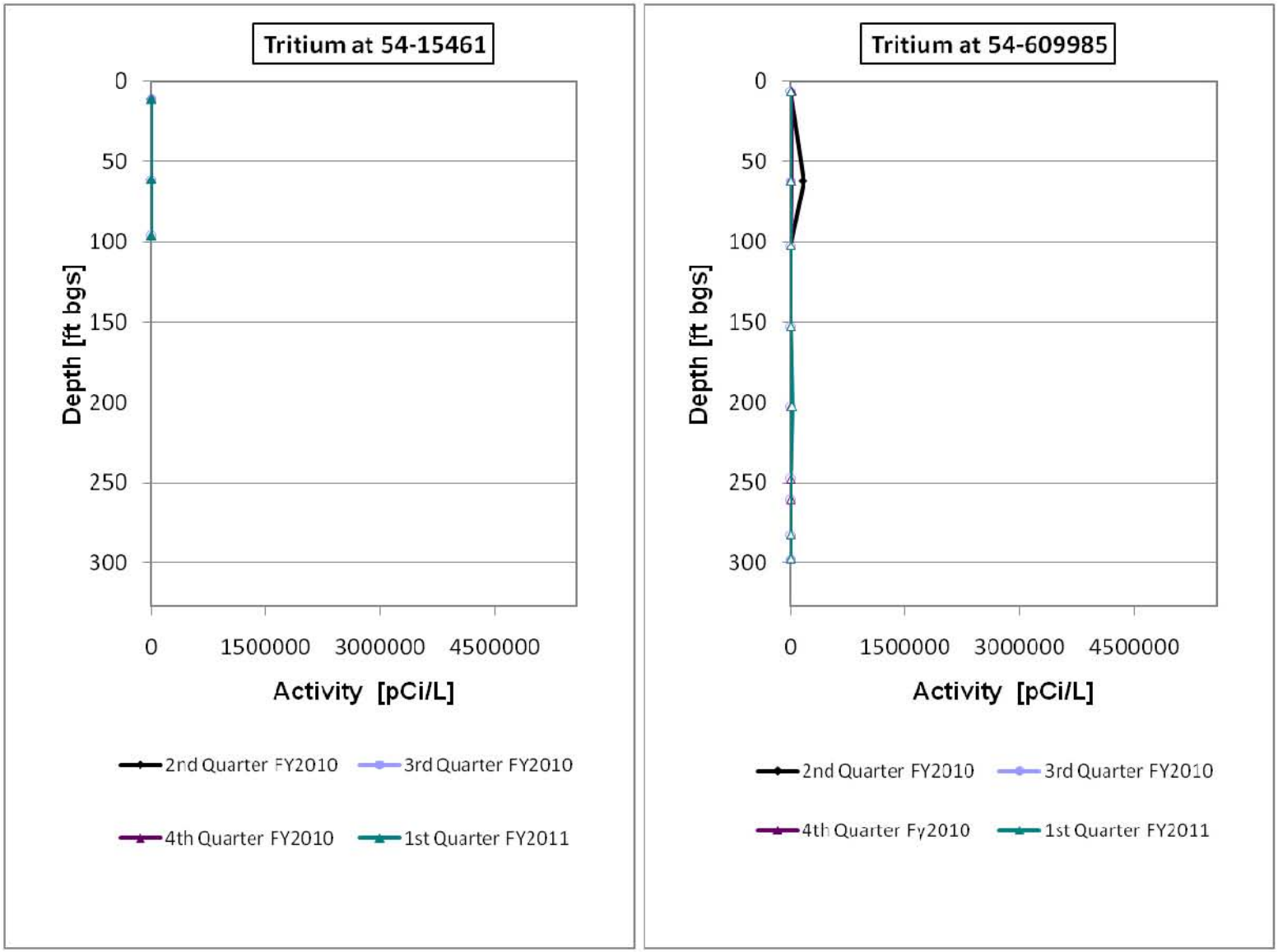

Figure 5.3-2 (continued) Tritium in vapor-monitoring wells 54-01023, 54-15462, 54-15461, and 54-609985

Table 2.0-1
NMED-Approved MDA H Subsurface Vapor-Monitoring Locations, Port Depths, and Corresponding Sampling Intervals

Borehole ID	VOC and Tritium Sampling Port Depths and Intervals (ft bgs)
54–01023*	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*	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	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)

Note: All ports require field screening as well as VOC and tritium sampling.

* Borehole was redrilled November 2009; depths reflect new ports and intervals.

Table 3.0-1
Henry's Law Constants, Groundwater SLs, and Calculated Concentrations Corresponding to Groundwater SLs for Detected VOCs in Pore Gas

VOC	Henry's Law Constant[a] (dimensionless)	Groundwater Screening Level (µg/L)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard[b] (µg/m^3)
Acetone	0.0016	21,800[a]	34,900
Benzene	0.228	5[c]	1140
Butanol[1-]	0.00036[d]	3700[d]	1330
Butanone[2-]	0.0023	7060[a]	16,200
Carbon disulfide	0.59	1040[a]	615,000
Carbon tetrachloride	1.1	5[c]	5500
Chlorodifluoromethane	1.7	104,000[a]	177,000,000
Chloroform	0.15	80[c]	15,000
Cyclohexane	6.1[d]	13,000[d]	79,300,000
Dichlorodifluoromethane	14	395[a]	5,520,000
Dichloroethane[1,1-]	0.23	25[e]	5750
Dichloroethane[1,2-]	0.048	5[c]	240
Dichloroethene[1,1-]	1.1	5[e]	5500
Dichloropropane[1,2-]	0.12	5[c]	600
Ethanol	na[f]	na	na
Ethylbenzene	0.323	700[c]	226,000
Hexane	74	876[a]	64,800,000
Methylene chloride	0.13	5[c]	650
Propanol[2-]	na	na	na
Propylene	8[d]	na	na
Tetrachloroethene	0.72	5[c]	3600
Tetrahydrofuran	na	na	na
Toluene	0.272	750[e]	204,000

Table 3.0-1 (continued)

VOC	Henry's Law Constant[a] (dimensionless)	Groundwater Screening Level (µg/L)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard[b] (µg/m³)
Trichloro-1,2,2-trifluoroethane[1,1,2-]	22	59,200[a]	1,300,000,000
Trichloroethane[1,1,1-]	0.705	60[e]	42,300
Trichloroethene	0.4	5[c]	2000
Trichlorofluoromethane	4	1290[a]	5,150,000
Xylene[1,2-]	0.213	620[e]	132,000
Xylene[1,3-] + xylene[1,4-]	0.28	620[e]	174,000

[a] Henry's law constants and SLs from NMED (2009, 106420) unless otherwise noted.

[b] Derived from denominator of Equation 3.0-3.

[c] EPA MCL (40 Code of Federal Regulations 141.61).

[d] Henry's law constants and SLs from EPA regional screening tables (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm). Adjusted to 10^{-5} risk for carcinogens

[e] NMWQCC groundwater standard (20.6.2.3103 New Mexico Administrative Code).

[f] na = Not available.

Table 5.2-1
Screening of VOCs in Pore Gas at MDA H, First Quarter FY2011

VOCs	Maximum Pore-Gas Concentration (µg/m³)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)[a]	SV (unitless)[b]
Carbon disulfide	44	615,286	0.0000715
Chloroform	75	15,000	0.005
Cyclohexane	81	79,300,000	0.00000102
Dichlorodifluoromethane	62	5,524,324	0.0000112
Methylene chloride	160	650	0.246
Trichloroethane[1,1,1-]	150	42,300	0.00355
Trichlorofluoromethane	68	5,152,941	0.0000132

[a] Derived from denominator of Equation 3.0-3.

[b] Calculated using Equation 3.0-3. If the SV is less than 1, the concentration of the VOC in pore gas does not have the potential to exceed the groundwater SL.

Appendix A

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

A-1.0 ACRONYMS AND ABBREVIATIONS

ADEP	Associate director for environmental programs
bgs	below ground surface
COC	chain of custody
DER	duplicate error ratio
EPA	Environmental Protection Agency (U.S.)
FY	fiscal year
ID	identification
LANL	Los Alamos National Laboratory
LCS	laboratory control sample
MCL	maximum contaminant level
MDA	material disposal area
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
PID	photoionization detector
PMR	periodic monitoring report
QA	quality assurance
QC	quality control
RPD	relative percent difference
RPF	Records Processing Facility
SCL	sample collection log
SL	screening level
SMO	Sample Management Office
SOP	standard operating procedure
SOW	statement of work
SV	screening value
SWMU	solid waste management unit
TA	technical area
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(°C) + 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

Field Methods

B-1.0 INTRODUCTION

This appendix summarizes the field methods used during the first quarter of fiscal year (FY) 2011 sampling activities at Material Disposal Area (MDA) H, Solid Waste Management Unit 54-004 in Technical Area 54 at Los Alamos National Laboratory (LANL or the Laboratory). All activities were conducted in accordance with the applicable standard operating procedures (SOPs), quality procedures, and Laboratory implementation and procedural requirements. Table B-1.0-1 summarizes the field methods used, and Table B-1.0-2 lists the applicable procedures.

B-2.0 FIELD METHODS

All work was conducted according to site-specific health and safety documents and an integrated work document. The field activities conducted according to SOPs are discussed below.

B-2.1 Volatile Organic Compound Pore-Gas Field Screening

All volatile organic compound (VOC) samples were field screened in accordance with the current version of SOP-5074, Sampling Subsurface Vapor. This procedure covers the use of the MultiRAE IR multi-gas monitor.

B-2.1.1 MultiRAE IR Multi-Gas Monitor

Before each sampling event, each sample port was purged of stagnant air and then monitored with a MultiRAE IR multi-gas monitor (or equivalent) until the percent carbon dioxide (%CO_2) and percent oxygen (%O_2) levels stabilized at values representative of subsurface pore-gas conditions. In addition, VOC concentrations were estimated in parts per million using the MultiRAE IR monitor equipped with an 11.7 eV lamp photoionization detector (PID). Each rented instrument was shipped factory-calibrated to the subcontractor and the calibration was checked daily.

The MultiRAE IR monitor can be calibrated using a two-point process using “fresh air” and a standard gas. The first point calibration is the fresh air calibration that determines the zero point of the calibration curve for lower explosive limit, VOC, and toxic gas sensors. The fresh air calibration uses air containing 20.9% oxygen concentration that is void of toxic gases and other impurities. The standard gas calibration sets the second point of the sensor calibration curve. The CO, CO_2, and O_2 sensors are zeroed during this two-point calibration process.

Calibration information is reported below for the MultiRAE IR monitor used to generate the results presented in this periodic monitoring report.

- Unit 2603 was calibrated on October 22, 2010, at Geotech Environmental Equipment, Inc., in Denver, Colorado. The zero points were set for CO_2 and O_2. Percent oxygen was set to read ambient air at 20.9%.

Oxygen values should be near the zero point. An alarm sounds if percent oxygen exceeds a range from 19.5% to 23.5%, thereby identifying the need for calibration. The CO_2 reading should be near zero.

The vapor-sample tubing was purged of stagnant air by drawing sufficient air from the sampling interval through the line. To ensure that the sample collected was representative of the subsurface air at depth, every sampling activity included a purge cycle.

The percent carbon dioxide and percent oxygen screening levels are presented in Appendix D. The percent carbon dioxide and percent oxygen levels ranged from 0.034% to 0.84% and from 19.9% to 20.9%, respectively, during the first quarter FY2011 sampling event. These values are within acceptable limits and are representative of subsurface pore-gas conditions.

VOC screening data using a PID are presented in Appendix D. The VOC concentrations using the PID ranged from 0 to 0.4 ppm during the first quarter of FY2011.

All field-screening results were recorded on the appropriate sample collection logs (SCLs) and/or in the field logbook and are provided in Appendix D.

B-2.2 VOC Pore-Gas Sample Collection

All VOC samples were collected in accordance with the current version of SOP-5074.

Upon completion of purging and field screening, VOC samples were taken using a sample train setup along with a SUMMA canister. Information was recorded on the appropriate SCLs. Field chain-of-custody (COC) forms and SCLs are provided in Appendix D.

All samples were submitted to the Sample Management Office (SMO) for processing and transport to off-site contract analytical laboratories.

B-2.3 Tritium Pore-Gas Sample Collection

All tritium samples were collected in accordance with the current version of SOP-5074. Water vapor intended for tritium analysis was collected from pore gas by pulling a pore-gas sample through a canister of silica gel (silica-gel column) and the sample information was recorded on the appropriate SCL (Appendix D). Silica gel was the medium used at the Laboratory to collect moisture from pore-gas samples. The moisture was analyzed for tritium using liquid scintillation counting. 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 SOP-5059, Field Quality Control Samples.

Silica gel was prepared for sampling by drying it at a temperature above 100°C. Drying removes moisture from the silica gel but does not remove bound water, which is accounted for by measuring the bound water percentage in each batch of silica gel. Before sample collection, the amount of silica gel used in each sample was weighed (typically approximately 135 g). The sample canister with silica gel was also weighed before sampling. SOP-5074 requires that at least 5 g of moisture be collected. After sampling, the sample canister with silica gel was weighed again to verify that 5 g of water vapor had been collected.

The sample (canister plus silica gel) was shipped to the analytical laboratory where it 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 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.

Table B-1.0-1
Summary of Field Methods

Method	Summary
General Instructions for Field Investigations	This procedure provides an overview of instructions regarding activities performed before, during, and after field investigations. It is assumed field investigations involve standard sampling equipment, personal protective equipment, waste management, and site-control equipment/materials. The procedure covers premobilization activities, mobilization to the site, documentation and sample collection activities, sample media evaluation, surveillance, and completion of lessons learned.
Sample Containers and Preservation	Specific requirements/processes for sample containers, preservation techniques, and holding times are based on the U.S. Environmental Protection Agency guidance for environmental sampling, preservation, and quality assurance. Specific requirements were met for each sample and were printed in the SCLs provided by the Laboratory's SMO (size and type of container, preservatives, etc.). All samples were preserved by placing them in insulated containers with ice to maintain a temperature of 4°C.
Handling, Packaging, and Transporting Field Samples	Field team members sealed and labeled samples before packing to ensure sample and transport containers were free of external contamination. All environmental samples were collected, preserved, packaged, and transported to the SMO under COC. The SMO arranged for shipping of the samples to analytical laboratories. Any levels of radioactivity (i.e., action-level or limited-quantity ranges) were documented in SCLs submitted to the SMO.
Sample Control and Field Documentation	The collection, screening, and transport of samples were documented in standard forms generated by the SMO. These forms include SCLs, COC forms, sample container labels, and custody seals. Collection logs were completed at the time of sample collection and were signed by the sampler and a reviewer who verified the logs for completeness and accuracy. Corresponding labels were initialed and applied to each sample container, and custody seals were placed around container lids or openings. COC forms were completed and signed to verify that the samples were not left unattended.
Field Quality Control (QC) Samples	Field QC samples were collected as follows: Field duplicates were collected at a frequency of 10% at the same time as a regular sample and submitted for the same analyses. Field blanks required for all field events that include collecting samples for VOC analyses were collected. Field blanks were kept with the other sample containers during the sampling process and were submitted for laboratory analyses.
Sampling Subsurface Vapor	Vapor sampling was performed at four monitoring wells in accordance with the current version of SOP-5074 and analyzed for VOCs and tritium. This SOP describes the process of sampling subsurface air from vapor ports in monitoring wells and boreholes. The procedure covers presampling activities, sampling to detect and quantify gaseous organic concentration in air, SUMMA sampling (a passive collection and containment system of laboratory-quality air samples), adsorbent column sampling, and sampling through the packer system (a sampling system that uses inflatable bladders to seal off a desired interval in an open borehole or at the end of a drill casing to obtain a sample from a discrete section), and postsampling activities.

Table B-1.0-2
List of Applicable General Procedures for MDA H Pore-Gas Monitoring Activities

Document Number	LANL Procedure Title
SOP-5055	General Instructions for Field Investigations
SOP-5056	Sample Containers and Preservation
SOP-5057	Handling, Packaging, and Transporting Field Samples
SOP-5058	Sample Control and Field Documentation
SOP-5059	Field Quality Control Samples
SOP-5061	Field Decontamination of Equipment
SOP-5074	Sampling Subsurface Vapor
P101-6	Personal Protective Equipment
SOP-01.12	Field Site Closeout Checklist
SOP-01.13	Initiating and Managing Data Set Requests
SOP-5181	Notebook and Logbook Documentation for Environmental Directorate Technical and Field Activities
SOP-5228	ADEP* Reporting Requirements for Abnormal Events

*ADEP = Associate director for environmental programs.

Appendix C

Quality Assurance/Quality Control Program

C-1.0 INTRODUCTION

This appendix presents the analytical methods and summarizes the data quality review for the first quarter of fiscal year FY2011 pore-gas samples collected at Material Disposal Area (MDA) H, Solid Waste Management Unit (SWMU) 54-004, in Technical Area 54, at Los Alamos National Laboratory (LANL or the Laboratory).

Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the Los Alamos National 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 (LCSs), 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 SOW (LANL 2000, 071233). Other QC factors, such as sample preservation and holding times, were also assessed. The requirements for sample preservation and holding times are presented in the Standard Operating Procedure (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. The SOPs used for data validation are presented in Table C-1.0-1. Copies of the analytical data, laboratory logbooks, and instrument printouts are provided in Appendix D (on CD).

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

C-1.1 Maintenance of Chain of Custody

To maintain chain of custody (COC) is to document or demonstrate the possession of an item by only authorized individuals. The COC process, described in SOP-5269, 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 COC forms are provided in Appendix D (on CD).

C-1.2 Sample Documentation

Establishing sample documentation acceptability, as described in SOP-5058, is the first step toward verifying that 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.

C-1.3 Sample Preservation

Sample preservation is the use of specific types of sample containers and preservation techniques as described in SOP-5056. Sample preservation is mandatory for hazardous site investigations because the integrity of any sample decreases over time. Physical factors (e.g., light, pressure, or temperature), chemical factors (e.g., changes in pH or volatilization), 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.

C-1.4 Holding Time

Holding time, the maximum amount of time a sample can be stored without potential unacceptable changes in analyte concentrations, is described in 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.

C-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.

C-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.

C-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, internal standards, and carrier recoveries 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.

Tritium results reported at less than the minimum detectable concentration are not detected. Each tritium result is also compared with the corresponding 1-sigma total propagated uncertainty (TPU). If the result is not greater than 3 times the TPU, it is also qualified as not detected (U).

C-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 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).

C-1.9 Matrix Spike Recoveries

A matrix spike is an aliquot of a 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).

C-1.10 Surrogate

Surrogates (an organic chemical compound) are similar in composition and behavior to target analytes but are 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).

C-1.11 Internal Standard Responses and Carrier Recoveries

Internal standards are chemical compounds 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 from $\geq$50% to $\leq$200% (LANL 2000, 071233).

C-1.12 LCS Recoveries

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

C-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) that are used to assess or demonstrate acceptable laboratory-method precision at the time of analysis. For radionuclide laboratory duplicates, the duplicate error ratio (DER) is also used to quantify precision. The DER is defined by the equation $DER = |S - D|/\text{sqrt}\,[(2\sigma_S)^2 + (2\sigma_D)^2]$, where S represents the original sample value, D represents the duplicate value, and $2\sigma_s$ and $2\sigma_D$ represent the 2-sigma uncertainties surrounding the original and duplicate samples, respectively. A DER below 3 indicates sample-to-field duplicate precision that is in control.

Field duplicates are samples taken from the same location and as close as possible to the same time. They are analyzed as two separate samples at the laboratory. Each duplicate sample is equally representative of the original material. All relative percent differences (RPDs) between samples and field duplicates should be ±35% (LANL 2000, 071233). The RPD is defined by the equation $RPD = [|D1 - D2|/(D1 + D2)/2] \times 100\%$,

where D1 and D2 represent analytical measurements on duplicate samples. Field duplicates are collected for both volatile organic compound (VOC) and radionuclide analytes.

The field duplicate samples were collected at a frequency greater than or equal to 10% per sampling event in accordance with the current version of SOP-5059, Field Quality Control Samples.

C-1.14 Field Blanks, Equipment Blanks, and Performance Evaluations

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. The field blank samples were collected at a frequency greater than or equal to 10% per sampling event in accordance with the current version of SOP-5059.

An equipment blank is a sample used to verify cleanliness of the sampling equipment. It is collected after completion of decontamination and before sampling.

C-2.0 LABORATORY ANALYSIS SUMMARY

During the first quarter of FY2011, 28 VOC pore-gas samples, 3 field blank samples, and 3 field duplicate samples were collected at SWMU 54-004, also known as MDA H. Additionally, 28 tritium samples, 3 field blank samples, and 3 field duplicate samples were collected. Analysis of pore gas was conducted for VOCs using EPA Method TO-15, and analysis for tritium was conducted using EPA Method 906.0. Table C-2.0-1 lists the analytical methods used for VOC and tritium analyses. All QC procedures were followed as required by the analytical services SOW (LANL 2000, 071233).

Sampling locations, sampling ports, and validated analytical results are presented in Appendix D of this periodic monitoring report. All VOC results are provided on CD in Appendix D. The entire data set meets the standards for use in this report.

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

C-3.0 ORGANIC CHEMICAL ANALYSES

No VOC data were rejected during the first quarter of FY2011. COC, field documentation, and holding times were properly maintained for all samples. No sample preservation is required for VOCs.

Analyte identification criteria were met for all VOC results. Method blanks, surrogate recoveries, and internal standards responses were all within acceptable limits.

One detected VOC was qualified as (J) because the detected result was less than the practical quantitation limit but greater than the method detection limit.

Twenty-four results were qualified as not detected (UJ) because the initial calibration verification and/or continuing calibration verification were recovered outside the method-specific limits.

Laboratory duplicates indicated acceptable precision. All field duplicates and their associated sample results had RPDs less than 35%.

There were no VOC analyte detects in any of the three field blanks.

C-4.0 RADIONUCLIDE ANALYSES

No tritium results were rejected during the first quarter of FY2011. COC, field documentation, and holding times were properly maintained for all samples. No sample preservation is required for tritium. The LCS recoveries were within acceptable limits for all tritium analyses.

Eight tritium results were qualified as not detected (U) because the associated sample concentration was less than or equal to the minimum detectable concentration.

Four tritium results were qualified as not detected (U) because the sample result was less than or equal to five times the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.

One field duplicate and its associated analytical sample had an RPD of 38%. Table C-4.0-1 summarizes samples containing RPD >35%.

One field blank had a detectable level of tritium. The field blank collected from vapor monitoring well 54-609985 at 280 to 285 ft bgs reported an activity of 33,652.6 pCi/L.

C-5.0 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 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.

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

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

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

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

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

Table C-1.0-1
Data Validation Procedures

Procedure	Title	Effective Date
SOP-5161, Rev. 0	Routine Validation of Volatile Organic Compound (VOC) Analytical Data	06/10/08
SOP-5166, Rev. 0	Routine Validation of Gamma Spectroscopy, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data	06/30/08

Table C-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 C-4.0-1
Tritium Sample Record with Field Duplicate RPD above 35%

Borehole ID	Depth (ft bgs)	Analyte	Sample Standard Result (µg/m^3)	Field Duplicate Result (µg/m^3)	RPD
54-15462	282.5	Tritium	1590.13	1082.48	38%

Appendix D

Field-Screening Results and
Detected Volatile Organic Compounds and Tritium

D-1.0 INTRODUCTION

This appendix summarizes the field-screening results, detected volatile organic compound (VOC) concentrations, and tritium activities for the first quarter of fiscal year 2011 at Material Disposal Area (MDA) H Solid Waste Management Unit 54-004. The tables listed below are included in this appendix and are organized by vapor-monitoring well identifications (IDs) and depths.

- Table D-1.0-1 Summary of Pore-Gas Field-Screening Results Using a MultiRAE IR Multi-Gas Monitor at MDA H
- Table D-1.0-2 Summary of VOCs Detected in Pore-Gas Samples at MDA H
- Table D-1.0-3 Summary of VOCs Detected in Pore-Gas Samples at MDA H
- Table D-1.0-4 Summary of Tritium Results in Pore Gas at MDA H

Data qualifiers used in these tables are defined in Appendix A of this periodic monitoring report.

Attachment D-1 (on CD included with this report) presents the analytical suites and results and analytical reports for the current and previous three monitoring periods.

Table D-1.0-1
Summary of Pore-Gas Field-Screening Results Using a MultiRAE IR Multi-Gas Monitor at MDA H

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010[a]		3rd Quarter FY2010[a]		4th Quarter FY2010[a]		1st Quarter FY2011	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023	Ambient	Ambient	CO_2 (%)	02/12/10	0	06/08/10	0	07/23/10	0	11/04/10	0.038
			O_2 (%)	02/12/10	21.1	06/08/10	19.9	07/23/10	19.5	11/04/10	20.9
			PID (ppm)	NS[b]	NS	NS	NS	NS	NS	11/10/10	NS
	10	15	CO_2 (%)	02/12/10	0	06/08/10	0.7	07/23/10	0.6	11/04/10	0.65
			O_2 (%)	02/12/10	21	06/08/10	19.1	07/23/10	19.1	11/04/10	20.3
			PID(ppm)	NS	NS	NS	NS	NS	NS	11/10/10	0.3
	60	65	CO_2 (%)	02/12/10	0.7	06/08/10	0.5	07/23/10	0.7	11/04/10	0.73
			O_2 (%)	02/12/10	20.4	06/08/10	19	07/23/10	18.7	11/04/10	20.1
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/10/10	0.2
	100	105	CO_2 (%)	02/12/10	0.6	06/08/10	0.4	07/23/10	0.6	11/04/10	0.65
			O_2 (%)	02/12/10	20.5	06/08/10	19	07/23/10	18.7	11/04/10	20.1
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/10/10	0.1
	150	155	CO_2 (%)	02/12/10	0.2	06/08/10	0	07/23/10	0.5	11/04/10	0.45
			O_2 (%)	02/12/10	20.9	06/08/10	19.3	07/23/10	18.8	11/04/10	20.3
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/10/10	0.1
	200	205	CO_2 (%)	02/12/10	0	06/08/10	0.3	07/23/10	0.4	11/04/10	0.42
			O_2 (%)	02/12/10	21.3	06/08/10	19	07/23/10	18.8	11/04/10	20.4
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/10/10	0.1
	245	250	CO_2 (%)	02/12/10	0	06/08/10	0.2	07/23/10	0.4	11/04/10	0.38
			O_2 (%)	02/12/10	21.3	06/08/10	19.1	07/23/10	19	11/04/10	20.4
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/10/10	0.2
	258	263	CO_2 (%)	02/12/10	0	06/08/10	0.2	07/23/10	0.3	11/04/10	0.35
			O_2 (%)	02/12/10	21.2	06/08/10	19	07/23/10	19	11/04/10	20.4
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/10/10	0.1

Table D-1.0-1 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010[a]		3rd Quarter FY2010[a]		4th Quarter FY2010[a]		1st Quarter FY2011	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15461	Ambient	Ambient	CO_2 (%)	02/12/10	0	06/07/10	0	07/23/10	0	11/04/10	0.034
			O_2 (%)	02/12/10	21.4	06/07/10	19.4	07/23/10	19.7	11/04/10	20.9
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.0
	10	12	CO_2 (%)	02/12/10	0.4	06/07/10	0.4	07/23/10	0.7	11/04/10	0.50
			O_2 (%)	02/12/10	20.7	06/07/10	19	07/23/10	18.8	11/04/10	20.2
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.2
	60	62	CO_2 (%)	02/12/10	0.6	06/07/10	0.3	07/23/10	0.6	11/04/10	0.62
			O_2 (%)	02/12/10	21	06/07/10	19	07/23/10	18.8	11/04/10	20.1
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.3
	96	97	CO_2 (%)	02/12/10	0.5	06/07/10	0.3	07/23/10	0.6	11/04/10	0.52
			O_2 (%)	02/12/10	21.2	06/07/10	18.9	07/23/10	19	11/04/10	20.3
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.1
54-15462	Ambient	Ambient	CO_2 (%)	02/12/10	0	06/07/10	0	07/22/10	0	11/05/10	0.036
			O_2 (%)	02/12/10	21.1	06/07/10	20.1	07/22/10	20	11/05/10	20.7
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.0
	10	15	CO_2 (%)	02/12/10	0.7	06/07/10	0.3	07/22/10	0.7	11/05/10	0.84
			O_2 (%)	02/12/10	20.2	06/07/10	19.6	07/22/10	19.2	11/05/10	19.9
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.4
	60	65	CO_2 (%)	02/12/10	0.8	06/07/10	0.5	07/22/10	0.7	11/05/10	0.65
			O_2 (%)	02/12/10	20.2	06/07/10	19	07/22/10	18.8	11/05/10	20.0
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.2
	100	105	CO_2 (%)	02/12/10	0.7	06/07/10	0.4	07/22/10	0.6	11/05/10	0.49
			O_2 (%)	02/12/10	20.2	06/07/10	19	07/22/10	18.7	11/05/10	20.0
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.2

Table D-1.0-1 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010[a]		3rd Quarter FY2010[a]		4th Quarter FY2010[a]		1st Quarter FY2011	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	150	155	CO_2 (%)	02/12/10	0.4	06/07/10	0.4	07/22/10	0.5	11/05/10	0.48
			O_2 (%)	02/12/10	20.3	06/07/10	19	07/22/10	18.4	11/05/10	20.0
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.1
	200	205	CO_2 (%)	02/12/10	0.3	06/07/10	0.3	07/22/10	0.4	11/05/10	0.32
			O_2 (%)	02/12/10	20.7	06/07/10	19.1	07/22/10	18.3	11/05/10	20.2
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.1
	245	250	CO_2 (%)	02/12/10	0	06/07/10	0.2	07/22/10	0.3	11/05/10	0.28
			O_2 (%)	02/12/10	21	06/07/10	19.1	07/22/10	18.3	11/05/10	20.2
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.1
	258	263	CO_2 (%)	02/12/10	0	06/07/10	0.2	07/22/10	0.2	11/05/10	0.28
			O_2 (%)	02/12/10	21.3	06/07/10	19.1	07/22/10	18.3	11/05/10	20.3
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.1
	280	285	CO_2 (%)	02/12/10	0.1	06/07/10	0.2	07/22/10	0.2	11/05/10	0.29
			O_2 (%)	02/12/10	20.8	06/07/10	19.1	07/22/10	18.3	11/05/10	20.4
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.1
	295	300	CO_2 (%)	02/12/10	0.2	06/07/10	0.2	07/22/10	0.2	11/05/10	0.26
			O_2 (%)	02/12/10	21	06/07/10	19.2	07/22/10	18.7	11/05/10	20.4
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/12/10	0.1
54-609985	Ambient	Ambient	CO_2 (%)	02/12/10	0	06/08/10	0	07/22/10	0	11/08/10	0.045
			O_2 (%)	02/12/10	21.5	06/08/10	19.8	07/22/10	19.6	11/08/10	20.9
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.0
	4	9	CO_2 (%)	02/12/10	0.6	06/08/10	0.3	07/22/10	0.5	11/08/10	0.44
			O_2 (%)	02/12/10	21	06/08/10	19.3	07/22/10	19	11/08/10	20.2
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.2

Table D-1.0-1 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010[a]		3rd Quarter FY2010[a]		4th Quarter FY2010[a]		1st Quarter FY2011	
				Date	Result	Date	Result	Date	Result	Date	Result
54-609985 (cont.)	60	65	CO_2 (%)	02/12/10	0.8	06/08/10	0.5	07/22/10	0.6	11/08/10	0.76
			O_2 (%)	02/12/10	20.7	06/08/10	18.9	07/22/10	18.8	11/08/10	19.9
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.1
	100	105	CO_2 (%)	02/12/10	0.7	06/08/10	0.5	07/22/10	0.6	11/08/10	0.66
			O_2 (%)	02/12/10	20.7	06/08/10	18.9	07/22/10	18.8	11/08/10	20.0
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.2
	105	155	CO_2 (%)	02/12/10	0.6	06/08/10	0.4	07/22/10	0.5	11/08/10	0.61
			O_2 (%)	02/12/10	20.7	06/08/10	18.9	07/22/10	18.9	11/08/10	20.0
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.1
	200	205	CO_2 (%)	02/12/10	0.4	06/08/10	0.3	07/22/10	0.4	11/09/10	NR[c]
			O_2 (%)	02/12/10	21	06/08/10	19	07/22/10	19	11/09/10	NR
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.1
	245	250	CO_2 (%)	02/12/10	0.3	06/08/10	0.3	07/22/10	0.4	11/08/10	0.35
			O_2 (%)	02/12/10	21	06/08/10	19	07/22/10	19.1	11/08/10	20.2
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.2
	258	263	CO_2 (%)	02/12/10	0.3	06/08/10	0.3	07/22/10	0.4	11/08/10	0.24
			O_2 (%)	02/12/10	21.2	06/08/10	19.1	07/22/10	18.9	11/08/10	20.4
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.1
	280	285	CO_2 (%)	02/12/10	0.3	06/08/10	0.2	07/22/10	0.3	11/08/10	0.41
			O_2 (%)	02/12/10	21.3	06/08/10	19	07/22/10	18.9	11/08/10	20.2
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.1
	295	300	CO_2 (%)	02/12/10	0	06/08/10	0.2	07/22/10	0.3	11/08/10	0.33
			O_2 (%)	02/12/10	21.8	06/08/10	18.9	07/22/10	19.1	11/08/10	20.3
			PID (ppm)	NS	NS	NS	NS	NS	NS	11/09/10	0.1

[a] Samples taken with a LANDTEC GEM-2000 gas monitor.

[b] NS = Not sampled.

[c] NR = Not reported.

Table D-1.0-2
Summary of VOCs Detected in Pore-Gas Samples at MDA H

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)
54-01023	10	15	Acetone	01/19/10	ND[a]	06/08/10	12	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	ND	06/08/10	2.7	07/23/10	ND	11/04/10	ND
			Chloroform	01/19/10	ND	06/08/10	13	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	ND	06/08/10	29 (J+)	07/23/10	ND	11/04/10	ND
			Tetrachloroethene	01/19/10	ND	06/08/10	6.2	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	15	06/08/10	7.9	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	ND	06/08/10	36 (J+)	07/23/10	ND	11/04/10	ND
	60	65	Acetone	01/19/10	18	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Butanol[1-]	01/19/10	580	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	36	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Carbon disulfide	01/19/10	3.2	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	17	06/08/10	39 (J+)	07/23/10	50	11/04/10	ND
			Ethanol	01/19/10	380 (J)	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Propanol[2-]	01/19/10	36	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Tetrachloroethene	01/19/10	6	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Tetrahydrofuran	01/19/10	4.8	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Toluene	01/19/10	5.6	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	9.7	06/08/10	10	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	19	06/08/10	17	07/23/10	ND	11/04/10	ND
			Trichloroethene	01/19/10	6.5	06/08/10	4.9	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	44	06/08/10	77 (J+)	07/23/10	81	11/04/10	68
			Xylene[1,3-] + xylene[1,4-]	01/19/10	3.8	06/08/10	ND	07/23/10	ND	11/04/10	ND
	100	105	Acetone	01/19/10	7.8	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	16	06/08/10	30 (J+)	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	16 (J)	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	9.9	06/08/10	12	07/23/10	ND	11/04/10	ND

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result ($\mu g/m^3$)	Collection Date	Result ($\mu g/m^3$)	Collection Date	Result ($\mu g/m^3$)	Collection Date	Result ($\mu g/m^3$)
54-01023 (cont.)	100	105	Trichloroethane[1,1,1-]	01/19/10	22	06/08/10	29	07/23/10	ND	11/04/10	ND
			Trichloroethene	01/19/10	ND	06/08/10	6.1	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	29	06/08/10	61 (J+)	07/23/10	52	11/04/10	61
	150	155	Acetone	01/19/10	ND	06/08/10	19	07/23/10	ND	11/04/10	ND
			Benzene	01/19/10	ND	06/08/10	3.1	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	ND	06/08/10	9.6	07/23/10	ND	11/04/10	ND
			Cyclohexane	01/19/10	ND	06/08/10	4.3	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	22	06/08/10	28 (J+)	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	ND	06/08/10	12	07/23/10	ND	11/04/10	ND
			Hexane	01/19/10	ND	06/08/10	3.6	07/23/10	ND	11/04/10	ND
			Toluene	01/19/10	ND	06/08/10	9.9	07/23/10	ND	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	14	06/08/10	13	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	31	06/08/10	35	07/23/10	ND	11/04/10	ND
			Trichloroethene	01/19/10	ND	06/08/10	4.9	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	28	06/08/10	35 (J+)	07/23/10	ND	11/04/10	ND
			Xylene[1,3-] + xylene[1,4-]	01/19/10	ND	06/08/10	3.8 (J)	07/23/10	ND	11/04/10	ND
	200	205	Carbon tetrachloride	01/19/10	6.1	06/08/10	7	07/23/10	ND	11/04/10	ND
			Cyclohexane	01/19/10	23	06/08/10	10	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	21	06/08/10	30 (J+)	07/23/10	ND	11/04/10	ND
			Dichloropropane[1,2-]	01/19/10	6.2	06/08/10	5.2	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	6.8 (J)	06/08/10	ND	07/23/10	210	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	13	06/08/10	15	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	26	06/08/10	30	07/23/10	ND	11/04/10	ND
			Trichloroethene	01/19/10	ND	06/08/10	5	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	24	06/08/10	34 (J+)	07/23/10	ND	11/04/10	ND

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Collection Date
54-01023 (cont.)	245	250	Acetone	01/19/10	ND	06/08/10	15	07/23/10	ND	NS[b]	NS
			Carbon disulfide	01/19/10	ND	06/08/10	ND	07/23/10	ND	11/04/10	44
			Carbon tetrachloride	01/19/10	ND	06/08/10	6.4 (J+)	07/23/10	ND	NS	NS
			Cyclohexane	01/19/10	26	06/08/10	14	07/23/10	ND	NS	NS
			Dichlorodifluoromethane	01/19/10	14	06/08/10	21 (J)	07/23/10	ND	NS	NS
			Dichloropropane[1,2-]	01/19/10	4.3	06/08/10	ND	07/23/10	ND	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	9.3	06/08/10	8.9	07/23/10	ND	NS	NS
			Trichloroethane[1,1,1-]	01/19/10	13	06/08/10	11	07/23/10	ND	NS	NS
			Trichlorofluoromethane	01/19/10	14	06/08/10	21	07/23/10	ND	NS	NS
	258	263	Acetone	01/19/10	27	06/08/10	17	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	ND	06/08/10	2.6	07/23/10	ND	11/04/10	ND
			Carbon tetrachloride	01/19/10	ND	06/08/10	7.9 (J+)	07/23/10	ND	11/04/10	ND
			Cyclohexane	01/19/10	ND	06/08/10	5.2	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	ND	06/08/10	24 (J)	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	310 (J)	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Methylene chloride	01/19/10	13	06/08/10	ND	07/23/10	ND	11/04/10	160
			Propanol[2-]	01/19/10	50	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Toluene	01/19/10	15	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	ND	06/08/10	11	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	14	06/08/10	11	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	ND	06/08/10	24	07/23/10	ND	11/04/10	ND
54-15461	10	12	Acetone	01/19/10	ND	06/07/10	25	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	ND	06/07/10	3.4	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	14	06/07/10	14	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	9.1	06/07/10	12	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	9.3	06/07/10	11	07/23/10	ND	11/04/10	ND

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Collection Date
54-15461 (cont.)	60	62	Dichlorodifluoromethane	01/19/10	15	06/07/10	19	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	6.4 (J)	06/07/10	ND	07/23/10	ND	11/04/10	ND
			Tetrachloroethene	01/19/10	ND	06/07/10	6.8	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	9.9	06/07/10	12	07/23/10	ND	11/04/10	ND
			Trichloroethene	01/19/10	ND	06/07/10	5.2	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	12	06/07/10	16	07/23/10	ND	11/04/10	ND
	95	97	Dichlorodifluoromethane	01/19/10	16	06/07/10	20	07/23/10	ND	11/04/10	ND
			Toluene	01/19/10	ND	06/07/10	6.2	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	10	06/07/10	12	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	13	06/07/10	18	07/23/10	ND	11/04/10	ND
54-15462	10	15	Chloroform	01/20/10	71	06/07/10	22	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	28	06/07/10	32	07/22/10	ND	11/05/10	ND
			Tetrachloroethene	01/20/10	ND	06/07/10	7.7	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	14 (J-)	06/07/10	20	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	55	06/07/10	93	07/22/10	68	11/05/10	58
			Trichloroethene	01/20/10	ND	06/07/10	5.7	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	30	06/07/10	36	07/22/10	ND	11/05/10	ND
	60	65	Acetone	01/20/10	ND	06/07/10	18	07/22/10	ND	11/05/10	ND
			Butanol[1-]	01/20/10	ND	06/07/10	13	07/22/10	ND	11/05/10	ND
			Butanone[2-]	01/20/10	ND	06/07/10	3	07/22/10	ND	11/05/10	ND
			Carbon disulfide	01/20/10	ND	06/07/10	ND	07/22/10	ND	11/05/10	37
			Chloroform	01/20/10	130	06/07/10	49	07/22/10	ND	11/05/10	45
			Dichlorodifluoromethane	01/20/10	43	06/07/10	48	07/22/10	55	11/05/10	44
			Dichloroethane[1,1-]	01/20/10	3.5	06/07/10	3.8	07/22/10	ND	11/05/10	ND
			Tetrachloroethene	01/20/10	ND	06/07/10	7.2	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	24 (J-)	06/07/10	29	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	100	06/07/10	140	07/22/10	99	11/05/10	120

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Collection Date
54-15462 (cont.)	60	65	Trichloroethene	01/20/10	5.8	06/07/10	9.2	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	47	06/07/10	54	07/22/10	ND	11/05/10	50
	100	105	Acetone	01/20/10	ND	06/07/10	20	07/22/10	ND	11/05/10	ND
			Butanone[2-]	01/20/10	ND	06/07/10	4.9	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	84	06/07/10	36	07/22/10	ND	11/05/10	ND
			Cyclohexane	01/20/10	ND	06/07/10	6.7	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	29	06/07/10	41	07/22/10	58	11/05/10	46
			Dichloroethane[1,1-]	01/20/10	ND	06/07/10	3.5	07/22/10	ND	11/05/10	ND
			Ethanol	01/20/10	ND	06/07/10	22	07/22/10	ND	11/05/10	ND
			Hexane	01/20/10	ND	06/07/10	23	07/22/10	ND	11/05/10	ND
			Propanol[2-]	01/20/10	ND	06/07/10	25	07/22/10	ND	11/05/10	ND
			Tetrachloroethene	01/20/10	ND	06/07/10	5.2	07/22/10	ND	11/05/10	ND
			Toluene	01/20/10	8.1	06/07/10	15	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	15 (J-)	06/07/10	21	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	65	06/07/10	110	07/22/10	120	11/05/10	110
			Trichloroethene	01/20/10	ND	06/07/10	8	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	29	06/07/10	42	07/22/10	50	11/05/10	50
			Xylene[1,3-] + xylene[1,4-]	01/20/10	5.2	06/07/10	3.6	07/22/10	ND	11/05/10	ND
	150	155	Chloroform	01/20/10	280	06/07/10	100	07/22/10	80	11/05/10	75
			Cyclohexane	01/20/10	6.1	06/07/10	7.9	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	47	06/07/10	71	07/22/10	79	11/05/10	62
			Dichloroethane[1,1-]	01/20/10	3.6	06/07/10	4.8	07/22/10	ND	11/05/10	ND
			Dichloroethene[1,1-]	01/20/10	ND	06/07/10	3.6	07/22/10	ND	11/05/10	ND
			Tetrachloroethene	01/20/10	ND	06/07/10	6.2	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	25 (J-)	06/07/10	41	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	83	06/07/10	170	07/22/10	120	11/05/10	150
			Trichloroethene	01/20/10	6.2	06/07/10	9.5	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	45	06/07/10	73	07/22/10	56	11/05/10	68

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Collection Date
54-15462 (cont.)	200	205	Carbon disulfide	01/20/10	ND	06/07/10	7.7	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	190	06/07/10	77	07/22/10	66	11/05/10	43
			Cyclohexane	01/20/10	10	06/07/10	11	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	45	06/07/10	58	07/22/10	68	11/05/10	48
			Dichloroethane[1,2-]	01/20/10	ND	06/07/10	5.9	07/22/10	ND	11/05/10	ND
			Dichloroethene[1,1-]	01/20/10	ND	06/07/10	4.4	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	21 (J-)	06/07/10	30	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	64	06/07/10	100	07/22/10	74	11/05/10	70
			Trichloroethene	01/20/10	5.4	06/07/10	13	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	37	06/07/10	46	07/22/10	ND	11/05/10	ND
	245	250	Acetone	01/20/10	ND	06/07/10	11	07/22/10	ND	11/05/10	ND
			Benzene	01/20/10	ND	06/07/10	10	07/22/10	ND	11/05/10	ND
			Butanone[2-]	01/20/10	ND	06/07/10	6.2	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	96	06/07/10	28	07/22/10	ND	11/05/10	ND
			Cyclohexane	01/20/10	5.3	06/07/10	11	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	28	06/07/10	39	07/22/10	46	11/05/10	61
			Ethanol	01/20/10	ND	06/07/10	32	07/22/10	ND	11/05/10	ND
			Ethylbenzene	01/20/10	ND	06/07/10	6.7	07/22/10	ND	11/05/10	ND
			Hexane	01/20/10	ND	06/07/10	29	07/22/10	ND	11/05/10	ND
			Propanol[2-]	01/20/10	ND	06/07/10	14	07/22/10	ND	11/05/10	ND
			Toluene	01/20/10	ND	06/07/10	33	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	12 (J-)	06/07/10	17	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	20	06/07/10	36	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	19	06/07/10	27	07/22/10	ND	11/05/10	ND
			Xylene[1,2-]	01/20/10	ND	06/07/10	4.1	07/22/10	ND	11/05/10	ND
			Xylene[1,3-] + xylene[1,4-]	01/20/10	ND	06/07/10	15	07/22/10	ND	11/05/10	ND

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Collection Date
54-15462 (cont.)	258	263	Acetone	01/20/10	ND	06/07/10	15	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	100	06/07/10	43	07/22/10	ND	11/05/10	ND
			Cyclohexane	01/20/10	7	06/07/10	5.5	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	28	06/07/10	56	07/22/10	63	11/05/10	43
			Hexane	01/20/10	ND	06/07/10	6.6	07/22/10	ND	11/05/10	ND
			Methylene chloride	01/20/10	ND	06/07/10	ND	07/22/10	ND	11/05/10	48
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	12 (J-)	06/07/10	26	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	19	06/07/10	47	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	20	06/07/10	38	07/22/10	ND	11/05/10	ND
	280	285	Acetone	01/20/10	ND	06/07/10	17	07/22/10	ND	11/05/10	ND
			Carbon disulfide	01/20/10	ND	06/07/10	6.4	07/22/10	ND	11/05/10	ND
			Carbon tetrachloride	01/20/10	5.3	06/07/10	6	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	120	06/07/10	58	07/22/10	49	11/05/10	ND
			Cyclohexane	01/20/10	26	06/07/10	19	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	34	06/07/10	48	07/22/10	55	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	16 (J-)	06/07/10	22	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	25	06/07/10	33	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	26	06/07/10	34	07/22/10	ND	11/05/10	ND
	295	300	Acetone	01/20/10	ND	06/07/10	14	07/22/10	ND	11/05/10	ND
			Carbon tetrachloride	01/20/10	6.6	06/07/10	6 (J)	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	110	06/07/10	47	07/22/10	ND	11/05/10	ND
			Cyclohexane	01/20/10	36	06/07/10	33	07/22/10	ND	11/05/10	30 (J)
			Dichlorodifluoromethane	01/20/10	36	06/07/10	42 (J)	07/22/10	49	11/05/10	ND
			Ethanol	01/20/10	8.6	06/07/10	ND	07/22/10	ND	11/05/10	ND
			Toluene	01/20/10	5.2	06/07/10	ND	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	19 (J-)	06/07/10	19	07/22/10	ND	11/05/10	ND

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Collection Date
54-15462 (cont.)	295	300	Trichloroethane[1,1,1-]	01/20/10	21	06/07/10	26	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	25	06/07/10	27	07/22/10	ND	11/05/10	ND
54-609985	4	9	Dichlorodifluoromethane	01/20/10	15	06/08/10	15 (J)	07/22/10	ND	11/08/10	ND
			Tetrachloroethene	01/20/10	7.3	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	9.2	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	31	06/08/10	23	07/22/10	ND	11/08/10	ND
			Trichloroethene	01/20/10	6	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	18	06/08/10	14	07/22/10	ND	11/08/10	ND
	60	65	Chloroform	01/20/10	40	06/08/10	21	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	3.1	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Dichlorodifluoromethane	01/20/10	30	06/08/10	49 (J)	07/22/10	ND	11/08/10	ND
			Ethanol	01/20/10	9.7	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Hexane	01/20/10	3.3	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Methylene chloride	01/20/10	6.5	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Tetrachloroethene	01/20/10	6.2	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Toluene	01/20/10	8.4	06/08/10	15	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	15	06/08/10	15	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	43	06/08/10	58	07/22/10	52	11/08/10	ND
			Trichloroethene	01/20/10	7.2	06/08/10	5.5	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	38	06/08/10	56	07/22/10	ND	11/08/10	ND
			Xylene[1,3-] + xylene[1,4-]	01/20/10	5.5	06/08/10	ND	07/22/10	ND	11/08/10	ND
	100	105	Carbon tetrachloride	01/20/10	5.6	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	45	06/08/10	20	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	4.6	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Dichlorodifluoromethane	01/20/10	37	06/08/10	60 (J)	07/22/10	50	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	18	06/08/10	18	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	51	06/08/10	66	07/22/10	63	11/08/10	ND

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result ($\mu g/m^3$)	Collection Date	Result ($\mu g/m^3$)	Collection Date	Result ($\mu g/m^3$)	Collection Date	Collection Date
54-609985 (cont.)	100	105	Trichloroethene	01/20/10	7.8	06/08/10	6.3	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	40	06/08/10	60	07/22/10	52	11/08/10	ND
	150	155	Carbon tetrachloride	01/20/10	6.4	06/08/10	7.5 (J+)	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	4.5	06/08/10	5.3	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	16	06/08/10	8.3	07/22/10	ND	11/08/10	ND
			Dichlorodifluoromethane	01/20/10	33	06/08/10	63 (J)	07/22/10	51	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	17	06/08/10	20	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	49	06/08/10	76	07/22/10	67	11/08/10	57
			Trichloroethene	01/20/10	7.9	06/08/10	7.4	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	35	06/08/10	60	07/22/10	ND	11/08/10	ND
	200	205	Acetone	01/20/10	8.5	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Carbon tetrachloride	01/20/10	14	06/08/10	14 (J+)	07/22/10	ND	11/08/10	ND
			Chlorodifluoromethane	01/20/10	19	06/08/10	18	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	120	06/08/10	56	07/22/10	53	11/08/10	ND
			Cyclohexane	01/20/10	52	06/08/10	37	07/22/10	46	11/08/10	36
			Dichlorodifluoromethane	01/20/10	40	06/08/10	58 (J)	07/22/10	53	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	6.7	06/08/10	4.9	07/22/10	ND	11/08/10	ND
			Methylene chloride	01/20/10	ND	06/08/10	ND	07/22/10	ND	11/08/10	51
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	23	06/08/10	22	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	42	06/08/10	53	07/22/10	50	11/08/10	ND
			Trichloroethene	01/20/10	7.1	06/08/10	5.8	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	36	06/08/10	48	07/22/10	ND	11/08/10	ND
	245	250	Acetone	01/20/10	ND	06/08/10	22	07/22/10	ND	11/08/10	ND
			Butanone[2-]	01/20/10	ND	06/08/10	2.5	07/22/10	ND	11/08/10	ND
			Carbon disulfide	01/20/10	3.2	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Carbon tetrachloride	01/20/10	14	06/08/10	17 (J+)	07/22/10	ND	11/08/10	ND
			Chlorodifluoromethane	01/20/10	15	06/08/10	20	07/22/10	ND	11/08/10	ND

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Collection Date
54-609985 (cont.)	245	250	Chloroform	01/20/10	52	06/08/10	27	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	85	06/08/10	56	07/22/10	74	11/08/10	51
			Dichlorodifluoromethane	01/20/10	32	06/08/10	49 (J)	07/22/10	ND	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	5.9	06/08/10	4.4	07/22/10	ND	11/08/10	ND
			Methylene chloride	01/20/10	ND	06/08/10	3.2	07/22/10	ND	11/08/10	ND
			Toluene	01/20/10	ND	06/08/10	9.3	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	17	06/08/10	17	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	21	06/08/10	27	07/22/10	ND	11/08/10	ND
			Trichloroethene	01/20/10	4.8	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	17	06/08/10	37	07/22/10	ND	11/08/10	ND
	258	263	Carbon tetrachloride	01/20/10	14	06/08/10	14 (J+)	07/22/10	ND	11/08/10	ND
			Chlorodifluoromethane	01/20/10	16	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	51	06/08/10	20	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	89	06/08/10	55	07/22/10	83	11/08/10	62
			Dichlorodifluoromethane	01/20/10	30	06/08/10	41 (J)	07/22/10	47	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	5.1	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	17	06/08/10	15	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	17	06/08/10	20 (J+)	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	15	06/08/10	30 (J+)	07/22/10	ND	11/08/10	ND
	280	285	Acetone	01/20/10	27	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Butanone[2-]	01/20/10	13	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Carbon tetrachloride	01/20/10	12	06/08/10	16 (J+)	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	55	06/08/10	25	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	76	06/08/10	80	07/22/10	76	11/08/10	80
			Dichlorodifluoromethane	01/20/10	28	06/08/10	44 (J)	07/22/10	47	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	5.3	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Propylene	01/20/10	17	06/08/10	ND	07/22/10	ND	11/08/10	ND

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Result (µg/m³)	Collection Date	Collection Date
54-609985 (cont.)	280	285	Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	8	06/08/10	14	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	9.6	06/08/10	16 (J+)	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	14	06/08/10	31 (J+)	07/22/10	ND	11/08/10	ND
	295	300	Carbon tetrachloride	01/20/10	16	06/08/10	16 (J+)	07/22/10	ND	11/08/10	ND
			Chlorodifluoromethane	01/20/10	14	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	30	06/08/10	20	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	120	06/08/10	85	07/22/10	110	11/08/10	81
			Dichlorodifluoromethane	01/20/10	28	06/08/10	40 (J)	07/22/10	ND	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	4.3	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	14	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	11	06/08/10	14 (J+)	07/22/10	ND	11/08/10	ND
			Trichloroethene	01/20/10	10	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	22	06/08/10	29 (J+)	07/22/10	ND	11/08/10	ND

[a] ND = Not detected.

[b] NS = Not sampled.

Table D-1.0-3
Summary of VOCs Detected in Pore-Gas Samples at MDA H

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-01023	10	15	Acetone	01/19/10	ND[a]	06/08/10	5.3	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	ND	06/08/10	0.92	07/23/10	ND	11/04/10	ND
			Chloroform	01/19/10	ND	06/08/10	2.6	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	ND	06/08/10	5.9 (J+)	07/23/10	ND	11/04/10	ND
			Tetrachloroethene	01/19/10	ND	06/08/10	0.92	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	2.7	06/08/10	1.4	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	ND	06/08/10	6.4 (J+)	07/23/10	ND	11/04/10	ND
	60	65	Acetone	01/19/10	7.6	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Butanol[1-]	01/19/10	190	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	12	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Carbon disulfide	01/19/10	1	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	3.5	06/08/10	7.9 (J+)	07/23/10	10	11/04/10	ND
			Ethanol	01/19/10	200 (J)	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Propanol[2-]	01/19/10	14	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Tetrachloroethene	01/19/10	0.88	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Tetrahydrofuran	01/19/10	1.6	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Toluene	01/19/10	1.5	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	1.3	06/08/10	1.3	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	3.5	06/08/10	3.2	07/23/10	ND	11/04/10	ND
			Trichloroethene	01/19/10	1.2	06/08/10	0.92	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	7.8	06/08/10	14 (J+)	07/23/10	14	11/04/10	12
			Xylene[1,3-] + xylene[1,4-]	01/19/10	0.88	06/08/10	ND	07/23/10	ND	11/04/10	ND
	100	105	Acetone	01/19/10	3.3	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	3.1	06/08/10	6 (J+)	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	8.7 (J)	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	1.3	06/08/10	1.5	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	4.1	06/08/10	5.3	07/23/10	ND	11/04/10	ND

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-01023 (cont.)	100	105	Trichloroethene	01/19/10	ND	06/08/10	1.1	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	5.2	06/08/10	11 (J+)	07/23/10	9.4	11/04/10	11
	150	155	Acetone	01/19/10	ND	06/08/10	7.9	07/23/10	ND	11/04/10	ND
			Benzene	01/19/10	ND	06/08/10	0.97	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	ND	06/08/10	3.2	07/23/10	ND	11/04/10	ND
			Cyclohexane	01/19/10	ND	06/08/10	1.2	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	4.4	06/08/10	5.6 (J+)	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	ND	06/08/10	6.1	07/23/10	ND	11/04/10	ND
			Hexane	01/19/10	ND	06/08/10	1	07/23/10	ND	11/04/10	ND
			Toluene	01/19/10	ND	06/08/10	2.6	07/23/10	ND	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	1.8	06/08/10	1.7	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	5.7	06/08/10	6.5	07/23/10	ND	11/04/10	ND
			Trichloroethene	01/19/10	ND	06/08/10	0.91	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	4.9	06/08/10	6.2 (J+)	07/23/10	ND	11/04/10	ND
			Xylene[1,3-] + xylene[1,4-]	01/19/10	ND	06/08/10	0.88 (J)	07/23/10	ND	11/04/10	ND
	200	205	Carbon tetrachloride	01/19/10	0.97	06/08/10	1.1	07/23/10	ND	11/04/10	ND
			Cyclohexane	01/19/10	6.8	06/08/10	3	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	4.3	06/08/10	6.2 (J+)	07/23/10	ND	11/04/10	ND
			Dichloropropane[1,2-]	01/19/10	1.3	06/08/10	1.1	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	3.6 (J)	06/08/10	ND	07/23/10	110	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	1.7	06/08/10	1.9	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	4.7	06/08/10	5.4	07/23/10	ND	11/04/10	ND
			Trichloroethene	01/19/10	ND	06/08/10	0.93	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	4.3	06/08/10	6.1 (J+)	07/23/10	ND	11/04/10	ND
	245	250	Acetone	01/19/10	ND	06/08/10	6.2	07/23/10	ND	NS[b]	NS
			Carbon disulfide	01/19/10	ND	06/08/10	ND	07/23/10	ND	11/04/10	14
			Carbon tetrachloride	01/19/10	ND	06/08/10	1 (J+)	07/23/10	ND	NS	NS

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-01023 (cont.)	245	250	Cyclohexane	01/19/10	7.5	06/08/10	4	07/23/10	ND	NS	NS
			Dichlorodifluoromethane	01/19/10	2.9	06/08/10	4.3 (J)	07/23/10	ND	NS	NS
	245	250	Dichloropropane[1,2-]	01/19/10	0.94	06/08/10	ND	07/23/10	ND	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	1.2	06/08/10	1.2	07/23/10	ND	NS	NS
			Trichloroethane[1,1,1-]	01/19/10	2.4	06/08/10	2.1	07/23/10	ND	NS	NS
			Trichlorofluoromethane	01/19/10	2.5	06/08/10	3.8	07/23/10	ND	NS	NS
	258	263	Acetone	01/19/10	12	06/08/10	7.2	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	ND	06/08/10	0.9	07/23/10	ND	11/04/10	ND
			Carbon tetrachloride	01/19/10	ND	06/08/10	1.2 (J+)	07/23/10	ND	11/04/10	ND
			Cyclohexane	01/19/10	ND	06/08/10	1.5	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	ND	06/08/10	4.8 (J)	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	160 (J)	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Methylene chloride	01/19/10	3.8	06/08/10	ND	07/23/10	ND	11/04/10	45
			Propanol[2-]	01/19/10	20	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Toluene	01/19/10	3.9	06/08/10	ND	07/23/10	ND	11/04/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/19/10	ND	06/08/10	1.4	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	2.5	06/08/10	2.1	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	ND	06/08/10	4.2	07/23/10	ND	11/04/10	ND
54-15461	10	12	Acetone	01/19/10	ND	06/07/10	11	07/23/10	ND	11/04/10	ND
			Butanone[2-]	01/19/10	ND	06/07/10	1.1	07/23/10	ND	11/04/10	ND
			Dichlorodifluoromethane	01/19/10	2.8	06/07/10	2.8	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	1.7	06/07/10	2.2	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	1.6	06/07/10	2	07/23/10	ND	11/04/10	ND
	60	62	Dichlorodifluoromethane	01/19/10	3.1	06/07/10	3.8	07/23/10	ND	11/04/10	ND
			Ethanol	01/19/10	3.4 (J)	06/07/10	ND	07/23/10	ND	11/04/10	ND
			Tetrachloroethene	01/19/10	ND	06/07/10	1	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	1.8	06/07/10	2.2	07/23/10	ND	11/04/10	ND

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-15461 (cont.)	60	62	Trichloroethene	01/19/10	ND	06/07/10	0.96	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	2.2	06/07/10	2.9	07/23/10	ND	11/04/10	ND
	95	97	Dichlorodifluoromethane	01/19/10	3.1	06/07/10	4	07/23/10	ND	11/04/10	ND
			Toluene	01/19/10	ND	06/07/10	1.6	07/23/10	ND	11/04/10	ND
			Trichloroethane[1,1,1-]	01/19/10	1.8	06/07/10	2.2	07/23/10	ND	11/04/10	ND
			Trichlorofluoromethane	01/19/10	2.4	06/07/10	3.2	07/23/10	ND	11/04/10	ND
54-15462	10	15	Chloroform	01/20/10	14	06/07/10	4.4	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	5.6	06/07/10	6.4	07/22/10	ND	11/05/10	ND
			Tetrachloroethene	01/20/10	ND	06/07/10	1.1	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	1.8 (J-)	06/07/10	2.6	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	10	06/07/10	17	07/22/10	12	11/05/10	11
			Trichloroethene	01/20/10	ND	06/07/10	1.1	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	5.3	06/07/10	6.3	07/22/10	ND	11/05/10	ND
	60	65	Acetone	01/20/10	ND	06/07/10	7.5	07/22/10	ND	11/05/10	ND
			Butanol[1-]	01/20/10	ND	06/07/10	4.3	07/22/10	ND	11/05/10	ND
			Butanone[2-]	01/20/10	ND	06/07/10	1	07/22/10	ND	11/05/10	ND
			Carbon disulfide	01/20/10	ND	06/07/10	ND	07/22/10	ND	11/05/10	12
			Chloroform	01/20/10	26	06/07/10	10	07/22/10	ND	11/05/10	9.2
			Dichlorodifluoromethane	01/20/10	8.7	06/07/10	9.8	07/22/10	11	11/05/10	8.9
			Dichloroethane[1,1-]	01/20/10	0.86	06/07/10	0.93	07/22/10	ND	11/05/10	ND
			Tetrachloroethene	01/20/10	ND	06/07/10	1.1	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	3.1 (J-)	06/07/10	3.8	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	18	06/07/10	26	07/22/10	18	11/05/10	21
			Trichloroethene	01/20/10	1.1	06/07/10	1.7	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	8.3	06/07/10	9.7	07/22/10	ND	11/05/10	9

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-15462 (cont.)	100	105	Acetone	01/20/10	ND	06/07/10	8.6	07/22/10	ND	11/05/10	ND
			Butanone[2-]	01/20/10	ND	06/07/10	1.7	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	17	06/07/10	7.4	07/22/10	ND	11/05/10	ND
			Cyclohexane	01/20/10	ND	06/07/10	2	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	5.9	06/07/10	8.3	07/22/10	12	11/05/10	9.4
	100	105	Dichloroethane[1,1-]	01/20/10	ND	06/07/10	0.86	07/22/10	ND	11/05/10	ND
			Ethanol	01/20/10	ND	06/07/10	12	07/22/10	ND	11/05/10	ND
			Hexane	01/20/10	ND	06/07/10	6.5	07/22/10	ND	11/05/10	ND
			Propanol[2-]	01/20/10	ND	06/07/10	10	07/22/10	ND	11/05/10	ND
			Tetrachloroethene	01/20/10	ND	06/07/10	0.76	07/22/10	ND	11/05/10	ND
			Toluene	01/20/10	2.2	06/07/10	4.1	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	1.9 (J-)	06/07/10	2.8	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	12	06/07/10	20	07/22/10	21	11/05/10	21
			Trichloroethene	01/20/10	ND	06/07/10	1.5	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	5.2	06/07/10	7.5	07/22/10	9	11/05/10	8.8
			Xylene[1,3-] + xylene[1,4-]	01/20/10	1.2	06/07/10	0.82	07/22/10	ND	11/05/10	ND
	150	155	Chloroform	01/20/10	57	06/07/10	22	07/22/10	16	11/05/10	15
			Cyclohexane	01/20/10	1.8	06/07/10	2.3	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	9.6	06/07/10	14	07/22/10	16	11/05/10	12
			Dichloroethane[1,1-]	01/20/10	0.88	06/07/10	1.2	07/22/10	ND	11/05/10	ND
			Dichloroethene[1,1-]	01/20/10	ND	06/07/10	0.9	07/22/10	ND	11/05/10	ND
			Tetrachloroethene	01/20/10	ND	06/07/10	0.91	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	3.3 (J-)	06/07/10	5.4	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	15	06/07/10	31	07/22/10	22	11/05/10	27
			Trichloroethene	01/20/10	1.2	06/07/10	1.8	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	8.1	06/07/10	13	07/22/10	10	11/05/10	12

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-15462 (cont.)	200	205	Carbon disulfide	01/20/10	ND	06/07/10	2.5	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	39	06/07/10	16	07/22/10	13	11/05/10	8.8
			Cyclohexane	01/20/10	3	06/07/10	3.2	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	9.1	06/07/10	12	07/22/10	14	11/05/10	9.8
			Dichloroethane[1,2-]	01/20/10	ND	06/07/10	1.4	07/22/10	ND	11/05/10	ND
			Dichloroethene[1,1-]	01/20/10	ND	06/07/10	1.1	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	2.8 (J-)	06/07/10	3.9	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	12	06/07/10	18	07/22/10	14	11/05/10	13
			Trichloroethene	01/20/10	1	06/07/10	2.4	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	6.6	06/07/10	8.2	07/22/10	ND	11/05/10	ND
	245	250	Acetone	01/20/10	ND	06/07/10	4.6	07/22/10	ND	11/05/10	ND
			Benzene	01/20/10	ND	06/07/10	3.2	07/22/10	ND	11/05/10	ND
			Butanone[2-]	01/20/10	ND	06/07/10	2.1	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	20	06/07/10	5.8	07/22/10	ND	11/05/10	ND
			Cyclohexane	01/20/10	1.5	06/07/10	3.3	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	5.7	06/07/10	7.9	07/22/10	9.3	11/05/10	12
			Ethanol	01/20/10	ND	06/07/10	17	07/22/10	ND	11/05/10	ND
			Ethylbenzene	01/20/10	ND	06/07/10	1.6	07/22/10	ND	11/05/10	ND
			Hexane	01/20/10	ND	06/07/10	8.2	07/22/10	ND	11/05/10	ND
			Propanol[2-]	01/20/10	ND	06/07/10	5.6	07/22/10	ND	11/05/10	ND
			Toluene	01/20/10	ND	06/07/10	8.8	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	1.5 (J-)	06/07/10	2.2	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	3.7	06/07/10	6.6	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	3.4	06/07/10	4.8	07/22/10	ND	11/05/10	ND
			Xylene[1,2-]	01/20/10	ND	06/07/10	0.95	07/22/10	ND	11/05/10	ND
			Xylene[1,3-] + xylene[1,4-]	01/20/10	ND	06/07/10	3.5	07/22/10	ND	11/05/10	ND

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-15462 (cont.)	258	263	Acetone	01/20/10	ND	06/07/10	6.4	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	21	06/07/10	8.8	07/22/10	ND	11/05/10	ND
			Cyclohexane	01/20/10	2	06/07/10	1.6	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	5.7	06/07/10	11	07/22/10	13	11/05/10	8.7
			Hexane	01/20/10	ND	06/07/10	1.9	07/22/10	ND	11/05/10	ND
			Methylene chloride	01/20/10	ND	06/07/10	ND	07/22/10	ND	11/05/10	14
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	1.6 (J-)	06/07/10	3.4	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	3.5	06/07/10	8.6	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	3.6	06/07/10	6.8	07/22/10	ND	11/05/10	ND
	280	285	Acetone	01/20/10	ND	06/07/10	7.3	07/22/10	ND	11/05/10	ND
			Carbon disulfide	01/20/10	ND	06/07/10	2.1	07/22/10	ND	11/05/10	ND
			Carbon tetrachloride	01/20/10	0.84	06/07/10	0.96	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	24	06/07/10	12	07/22/10	10	11/05/10	ND
			Cyclohexane	01/20/10	7.4	06/07/10	5.6	07/22/10	ND	11/05/10	ND
			Dichlorodifluoromethane	01/20/10	7	06/07/10	9.6	07/22/10	11	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	2.2 (J-)	06/07/10	2.8	07/22/10	ND	11/05/10	ND
			Trichloroethane[1,1,1-]	01/20/10	4.6	06/07/10	6.1	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	4.7	06/07/10	6	07/22/10	ND	11/05/10	ND
	295	300	Acetone	01/20/10	ND	06/07/10	5.8	07/22/10	ND	11/05/10	ND
			Carbon tetrachloride	01/20/10	1	06/07/10	0.96 (J)	07/22/10	ND	11/05/10	ND
			Chloroform	01/20/10	24	06/07/10	9.6	07/22/10	ND	11/05/10	ND
			Cyclohexane	01/20/10	10	06/07/10	9.6	07/22/10	ND	11/05/10	8.7 (J)
			Dichlorodifluoromethane	01/20/10	7.2	06/07/10	8.4 (J)	07/22/10	9.9	11/05/10	ND
			Ethanol	01/20/10	4.5	06/07/10	ND	07/22/10	ND	11/05/10	ND
			Toluene	01/20/10	1.4	06/07/10	ND	07/22/10	ND	11/05/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	2.5 (J-)	06/07/10	2.5	07/22/10	ND	11/05/10	ND

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-15462 (cont.)	295	300	Trichloroethane[1,1,1-]	01/20/10	3.8	06/07/10	4.7	07/22/10	ND	11/05/10	ND
			Trichlorofluoromethane	01/20/10	4.4	06/07/10	4.8	07/22/10	ND	11/05/10	ND
54-609985	4	9	Dichlorodifluoromethane	01/20/10	3.1	06/08/10	3 (J)	07/22/10	ND	11/08/10	ND
			Tetrachloroethene	01/20/10	1.1	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	1.2	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	5.7	06/08/10	4.2	07/22/10	ND	11/08/10	ND
			Trichloroethene	01/20/10	1.1	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	3.2	06/08/10	2.5	07/22/10	ND	11/08/10	ND
	60	65	Chloroform	01/20/10	8.2	06/08/10	4.2	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	0.89	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Dichlorodifluoromethane	01/20/10	6.1	06/08/10	9.9 (J)	07/22/10	ND	11/08/10	ND
			Ethanol	01/20/10	5.1	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Hexane	01/20/10	0.93	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Methylene chloride	01/20/10	1.9	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Tetrachloroethene	01/20/10	0.92	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Toluene	01/20/10	2.2	06/08/10	4	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	1.9	06/08/10	1.9	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	7.8	06/08/10	11	07/22/10	9.6	11/08/10	ND
			Trichloroethene	01/20/10	1.3	06/08/10	1	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	6.7	06/08/10	9.9	07/22/10	ND	11/08/10	ND
			Xylene[1,3-] + xylene[1,4-]	01/20/10	1.3	06/08/10	ND	07/22/10	ND	11/08/10	ND
	100	105	Carbon tetrachloride	01/20/10	0.88	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	9.2	06/08/10	4.1	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	1.3	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Dichlorodifluoromethane	01/20/10	7.6	06/08/10	12 (J)	07/22/10	10	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	2.4	06/08/10	2.4	07/22/10	ND	11/08/10	ND

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-609985 (cont.)	100	105	Trichloroethane[1,1,1-]	01/20/10	9.3	06/08/10	12	07/22/10	12	11/08/10	ND
			Trichloroethene	01/20/10	1.4	06/08/10	1.2	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	7.2	06/08/10	10	07/22/10	9.3	11/08/10	ND
	150	155	Carbon tetrachloride	01/20/10	1	06/08/10	1.2 (J+)	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	0.92	06/08/10	1.1	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	4.6	06/08/10	2.4	07/22/10	ND	11/08/10	ND
			Dichlorodifluoromethane	01/20/10	6.8	06/08/10	13 (J)	07/22/10	10	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	2.3	06/08/10	2.7	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	9	06/08/10	14	07/22/10	12	11/08/10	10
			Trichloroethene	01/20/10	1.5	06/08/10	1.4	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	6.2	06/08/10	11	07/22/10	ND	11/08/10	ND
	200	205	Acetone	01/20/10	3.6	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Carbon tetrachloride	01/20/10	2.2	06/08/10	2.2 (J+)	07/22/10	ND	11/08/10	ND
			Chlorodifluoromethane	01/20/10	5.2	06/08/10	5.1	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	24	06/08/10	12	07/22/10	11	11/08/10	ND
			Cyclohexane	01/20/10	15	06/08/10	11	07/22/10	13	11/08/10	11
			Dichlorodifluoromethane	01/20/10	8	06/08/10	12 (J)	07/22/10	11	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	1.5	06/08/10	1	07/22/10	ND	11/08/10	ND
			Methylene chloride	01/20/10	ND	06/08/10	ND	07/22/10	ND	11/08/10	14
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	3	06/08/10	2.9	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	7.8	06/08/10	9.7	07/22/10	9.1	11/08/10	ND
			Trichloroethene	01/20/10	1.3	06/08/10	1.1	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	6.4	06/08/10	8.5	07/22/10	ND	11/08/10	ND
	245	250	Acetone	01/20/10	ND	06/08/10	9.1	07/22/10	ND	11/08/10	ND
			Butanone[2-]	01/20/10	ND	06/08/10	0.86	07/22/10	ND	11/08/10	ND
			Carbon disulfide	01/20/10	1	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Carbon tetrachloride	01/20/10	2.3	06/08/10	2.8 (J+)	07/22/10	ND	11/08/10	ND

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-609985 (cont.)	245	250	Chlorodifluoromethane	01/20/10	4.3	06/08/10	5.8	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	11	06/08/10	5.6	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	25	06/08/10	16	07/22/10	21	11/08/10	15
			Dichlorodifluoromethane	01/20/10	6.4	06/08/10	10 (J)	07/22/10	ND	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	1.3	06/08/10	0.96	07/22/10	ND	11/08/10	ND
			Methylene chloride	01/20/10	ND	06/08/10	0.92	07/22/10	ND	11/08/10	ND
			Toluene	01/20/10	ND	06/08/10	2.5	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	2.2	06/08/10	2.2	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	3.9	06/08/10	4.9	07/22/10	ND	11/08/10	ND
			Trichloroethene	01/20/10	0.89	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	3	06/08/10	6.6	07/22/10	ND	11/08/10	ND
	258	263	Carbon tetrachloride	01/20/10	2.3	06/08/10	2.3 (J+)	07/22/10	ND	11/08/10	ND
			Chlorodifluoromethane	01/20/10	4.4	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	10	06/08/10	4.1	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	26	06/08/10	16	07/22/10	24	11/08/10	18
			Dichlorodifluoromethane	01/20/10	6	06/08/10	8.3 (J)	07/22/10	9.5	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	1.1	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	2.2	06/08/10	2	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	3.2	06/08/10	3.6 (J+)	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	2.6	06/08/10	5.4 (J+)	07/22/10	ND	11/08/10	ND
	280	285	Acetone	01/20/10	11	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Butanone[2-]	01/20/10	4.3	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Carbon tetrachloride	01/20/10	1.8	06/08/10	2.6 (J+)	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	11	06/08/10	5.2	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	22	06/08/10	23	07/22/10	22	11/08/10	23
			Dichlorodifluoromethane	01/20/10	5.6	06/08/10	8.9 (J)	07/22/10	9.5	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	1.1	06/08/10	ND	07/22/10	ND	11/08/10	ND

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	Analyte	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-609985 (cont.)	280	285	Propylene	01/20/10	9.8	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	1	06/08/10	1.8	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	1.8	06/08/10	3 (J+)	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	2.5	06/08/10	5.5 (J+)	07/22/10	ND	11/08/10	ND
	295	300	Carbon tetrachloride	01/20/10	2.6	06/08/10	2.5 (J+)	07/22/10	ND	11/08/10	ND
			Chlorodifluoromethane	01/20/10	4.1	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Chloroform	01/20/10	6.1	06/08/10	4.1	07/22/10	ND	11/08/10	ND
			Cyclohexane	01/20/10	35	06/08/10	25	07/22/10	31	11/08/10	24
			Dichlorodifluoromethane	01/20/10	5.6	06/08/10	8 (J)	07/22/10	ND	11/08/10	ND
			Dichloropropane[1,2-]	01/20/10	0.93	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	01/20/10	1.8	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichloroethane[1,1,1-]	01/20/10	2	06/08/10	2.6 (J+)	07/22/10	ND	11/08/10	ND
			Trichloroethene	01/20/10	1.9	06/08/10	ND	07/22/10	ND	11/08/10	ND
			Trichlorofluoromethane	01/20/10	3.9	06/08/10	5.1 (J+)	07/22/10	ND	11/08/10	ND

[a] ND = Not detected.

[b] NS = Not sampled.

Table D-1.0-4
Summary of Tritium Results in Pore Gas at MDA H

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	2nd Quarter FY2010		3rd Quarter FY2010		4th Quarter FY2010		1st Quarter FY2011	
			Collection Date	Result (pCi/L)	Collection Date	Result (pCi/L)	Collection Date	Result (pCi/L)	Collection Date	Result (pCi/L)
54-01023	10	15	01/20/10	1,000,000	06/23/10	4,150,000	07/27/10	3,190,000	11/08/10	2,290,000
	60	65	01/20/10	1,760,000	06/23/10	5,070,000	07/27/10	3,910,000	11/09/10	3,010,000
	100	105	01/20/10	473,000	06/23/10	856,000	07/27/10	608,000	11/09/10	565,000
	150	155	01/20/10	271,000	06/23/10	463,000	07/27/10	255,000	11/09/10	283,000
	200	205	01/20/10	31,200	06/23/10	163,000	07/27/10	77,300	11/08/10	86,800
	245	250	01/20/10	48,600	06/23/10	163,000	07/27/10	86,300	11/09/10	83,700
	258	263	01/20/10	1,710,000	06/23/10	187,000	07/27/10	121,000	11/08/10	103,000
54-15461	10	12	01/20/10	1460	06/09/10	2680	07/30/10	ND	11/05/10	2220
	60	62	01/20/10	708	06/09/10	ND*	07/30/10	ND	11/05/10	789
	95	97	01/20/10	385	06/09/10	ND	07/30/10	ND	11/05/10	719
54-15462	10	15	01/21/10	44,400	06/15/10	ND	07/26/10	542	11/10/10	ND
	60	65	01/21/10	7610	06/15/10	ND	07/26/10	ND	11/12/10	ND
	100	105	01/21/10	8380	06/16/10	ND	07/26/10	807	11/12/10	4130
	150	155	01/21/10	2080	06/15/10	ND	07/26/10	ND	11/12/10	10,900
	200	205	01/21/10	2990	06/15/10	ND	07/26/10	ND	11/10/10	630,000
	245	250	01/21/10	92,800	06/16/10	ND	07/26/10	438	11/10/10	1530
	258	263	01/25/10	ND	06/16/10	ND	07/26/10	539	11/12/10	ND
	280	285	01/25/10	ND	06/17/10	ND	07/26/10	503	11/10/10	1590
	295	300	01/25/10	ND	06/17/10	ND	07/26/10	596	11/10/10	3090
54-609985	4	9	01/21/10	1630	06/10/10	ND	07/28/10	12,900	11/15/10	ND
	60	65	01/21/10	166,000	06/14/10	8350	07/28/10	6680	11/15/10	ND
	100	105	01/21/10	568	06/10/10	ND	07/28/10	ND	11/15/10	ND
	150	155	01/21/10	1600	06/10/10	ND	07/28/10	ND	11/15/10	ND
	200	205	01/21/10	12,500	06/10/10	ND	07/29/10	ND	11/15/10	ND
	258	263	01/25/10	549	06/14/10	ND	07/29/10	ND	11/15/10	ND
	280	285	01/25/10	2850	06/14/10	ND	07/29/10	ND	11/15/10	ND
	295	300	01/25/10	386	06/14/10	4470	07/29/10	ND	11/15/10	ND

* ND = Not detected.

Attachment D-1

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