6-5-2015

Mixed Waste Landfill Annual Long-Term Monitoring & Maintenance Report, April 2014 -- March 2015 for Sandia National Laboratories/ New Mexico, EPA ID Number NM5890110518

U.S. Department of Energy

Sandia Corporation

Department of Energy
National Nuclear Security Administration
Sandia Field Office
P. O. Box 5400
Albuquerque, NM 87185

JUN 05 2015

Mr. John E. Kieling
Chief
Hazardous Waste Bureau
New Mexico Environment Department
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Santa Fe, NM 87505

Subject: Submittal of Mixed Waste Landfill Long-Term Monitoring & Maintenance Report, April 2014-March 2015 for Sandia National Laboratories/New Mexico, Environmental Protection Agency Identification Number NM5890110518

Dear Mr. Kieling:

The Department of Energy/National Nuclear Security Administration and Sandia Corporation (Sandia) are submitting the *Mixed Waste Landfill Annual Long-Term Monitoring & Maintenance Report, April 2014-March 2015*, dated June 2015, to the New Mexico Environment Department. This submittal satisfies the requirements of Section 4.8.1 of the Mixed Waste Landfill (MWL) Long-Term Monitoring and Maintenance Plan and includes information for monitoring and inspection activities conducted at the MWL during the annual reporting period of April 2014 through March 2015.

If you have questions, please contact David Rast of my staff at (505) 845-5349.

Sincerely,

William P. Ortiz
Acting Assistant Manager for Engineering

Enclosure

cc: See Page 2

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Submittal of Mixed Waste Landfill Annual Long-Term Monitoring & Maintenance Report
April 2014-March 2015

Sandia National Laboratories
Albuquerque, New Mexico
EPA ID No. NM5890110518

CERTIFICATION STATEMENT

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

Michael W. Hazen, Vice-President
Sandia Corporation
Albuquerque, New Mexico
Operator

26 May 2015
Date signed

William P. Ortiz, Acting Assistant Manager
U.S. Department of Energy
National Nuclear Security Administration
Sandia Field Office
Owner

06-05-15
Date signed

Sandia National Laboratories

MIXED WASTE LANDFILL
ANNUAL LONG-TERM MONITORING & MAINTENANCE REPORT
APRIL 2014 – MARCH 2015

SANDIA NATIONAL LABORATORIES, NEW MEXICO
LONG-TERM STEWARDSHIP

JUNE 2015

National Nuclear Security Administration

U.S. DEPARTMENT OF ENERGY

United States Department of Energy
Sandia Field Office

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ANNUAL MIXED WASTE LANDFILL
LONG-TERM MONITORING AND MAINTENANCE REPORT
APRIL 2014–MARCH 2015

Facility: Mixed Waste Landfill

Location: Sandia National Laboratories
Albuquerque, New Mexico

EPA ID No.: NM5890110518

Permit Basis: Mixed Waste Landfill Long-Term Monitoring and Maintenance Plan, submitted March 2012, effective January 8, 2014.

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ACRONYMS AND ABBREVIATIONS

AOP	Administrative Operating procedure
AR/COC	Analysis Request/Chain-of-Custody
bgs	below ground surface
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
CY	Calendar Year
DI	deionized water
DO	dissolved oxygen
DOE	U.S. Department of Energy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ERFO	Environmental Resources Field Office
ET	evapotranspirative
Final Order	New Mexico Secretary of the Environment's Final Order in the Matter of Request for a Class 3 Permit Modification for Corrective Measures for the Mixed Waste Landfill No. HWB 04-11(M)
FLUTe™	Flexible Liner Underground Technology, Ltd.™
FOP	Field Operating Procedure
GEL	GEL Laboratories LLC
gpm	gallons per minute
HWB	Hazardous Waste Bureau
KAFB	Kirtland Air Force Base
LTMM	Long-Term Monitoring and Maintenance
LTMMP	Long-Term Monitoring and Maintenance Plan
MDA	minimum detectable activity
MDL	method detection limit
µg/L	micrograms per liter
mg/L	milligrams per liter
MWL	Mixed Waste Landfill
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NTU	nephelometric turbidity units
ORP	oxidation-reduction potential
PCE	tetrachloroethene
pCi/L	picocuries per liter
pH	potential of hydrogen
PID	photoionization detector
ppbv	parts per billion by volume
PPE	personal protective equipment
ppmv	parts per million by volume
PQL	practical quantitation limit
QC	quality control
RCRA	Resource Conservation and Recovery Act
RL	reporting limit
RPD	relative percent difference

ACRONYMS AND ABBREVIATIONS (Concluded)

SAP	Sampling and Analysis Plan
Sandia	Sandia Corporation
SC	specific conductance
SME	subject matter expert
SNL	Sandia National Laboratories
SNL/NM	Sandia National Laboratories, New Mexico
TA	Technical Area
TCE	trichloroethene
VOC	volatile organic compound

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1.0 INTRODUCTION

Sandia National Laboratories (SNL) is a multi-purpose engineering and science laboratory owned by the U.S. Department of Energy (DOE)/National Nuclear Security Administration. SNL is managed and operated by Sandia Corporation (Sandia), a wholly-owned subsidiary of Lockheed Martin Corporation. Sandia National Laboratories, New Mexico (SNL/NM) is located within the boundaries of Kirtland Air Force Base (KAFB), southeast of the City of Albuquerque in Bernalillo County, New Mexico (Figure 1-1). The Mixed Waste Landfill (MWL) is located 4 miles south of SNL/NM central facilities and 5 miles southeast of Albuquerque International Sunport, in the north-central portion of Technical Area (TA)-III (Figure 1-2).

The MWL is a Solid Waste Management Unit undergoing corrective action in accordance with the following regulatory criteria:

- New Mexico Secretary of the Environment's Final Order in the Matter of Request for a Class 3 Permit Modification for Corrective Measures for the Mixed Waste Landfill No. HWB 04-11(M) (Final Order) (Curry May 2005)
- Compliance Order on Consent (NMED April 2004)
- Facility Operating Permit for Sandia National Laboratories, EPA ID No. NM5890110518 (Permit) (NMED January 2015)

Between April 1, 2014 and February 26, 2015, the following regulatory criteria also applied to corrective action at the MWL:

- Module IV of Resource Conservation and Recovery Act (RCRA) Permit No. NM5890110518 (U.S. Environmental Protection Agency [EPA] August 1993), as revised and updated
- New Mexico Environment Department (NMED) Class 3 Permit Modification for the MWL (NMED August 2005)

On December 19, 2014, NMED signed the Final Order issuing a multiple unit Permit for Sandia National Laboratories. The Permit, which superseded Module IV of RCRA Permit NM58904110518, was formally issued January 27, 2015 (NMED January 2015) with an effective date of February 26, 2015 (Roberts January 2015). Corrective action at the MWL is not affected by issuance of the Permit.

The MWL disposal area comprises 2.6 acres. During operations, the MWL accepted containerized and other low-level radioactive waste and minor amounts of mixed waste from SNL/NM research facilities and off-site DOE and U.S. Department of Defense generators from March 1959 to December 1988. More specific information regarding the MWL inventory and past disposal practices is presented in the MWL Phase 2 RCRA Facility Investigation Report (Peace et al. September 2002) and in the MWL Long-Term Monitoring and Maintenance Plan (LTMMP) (SNL/NM March 2012).

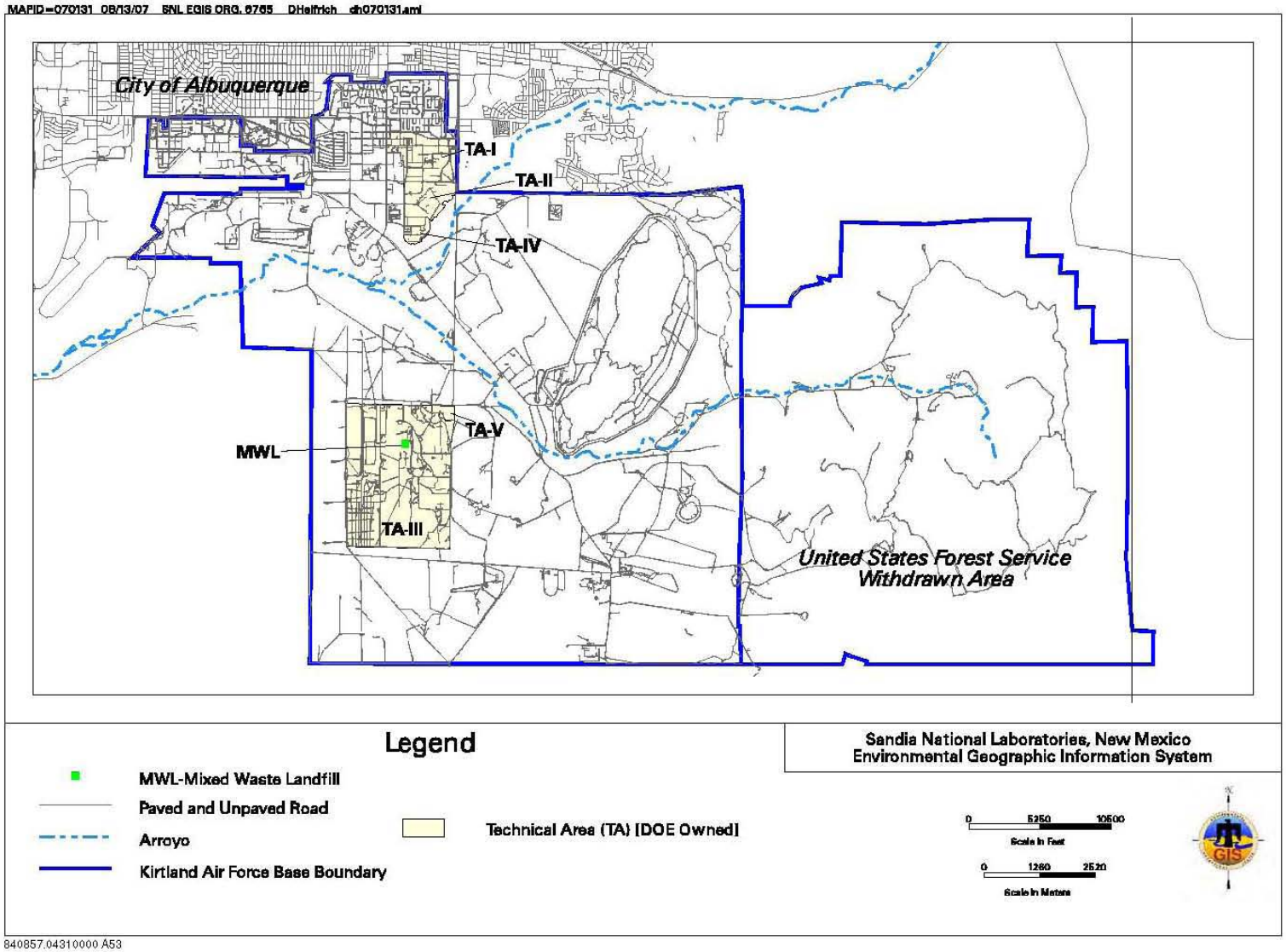

Figure 1-1
Location of the Mixed Waste Landfill with respect to Kirtland Air Force Base and the City of Albuquerque

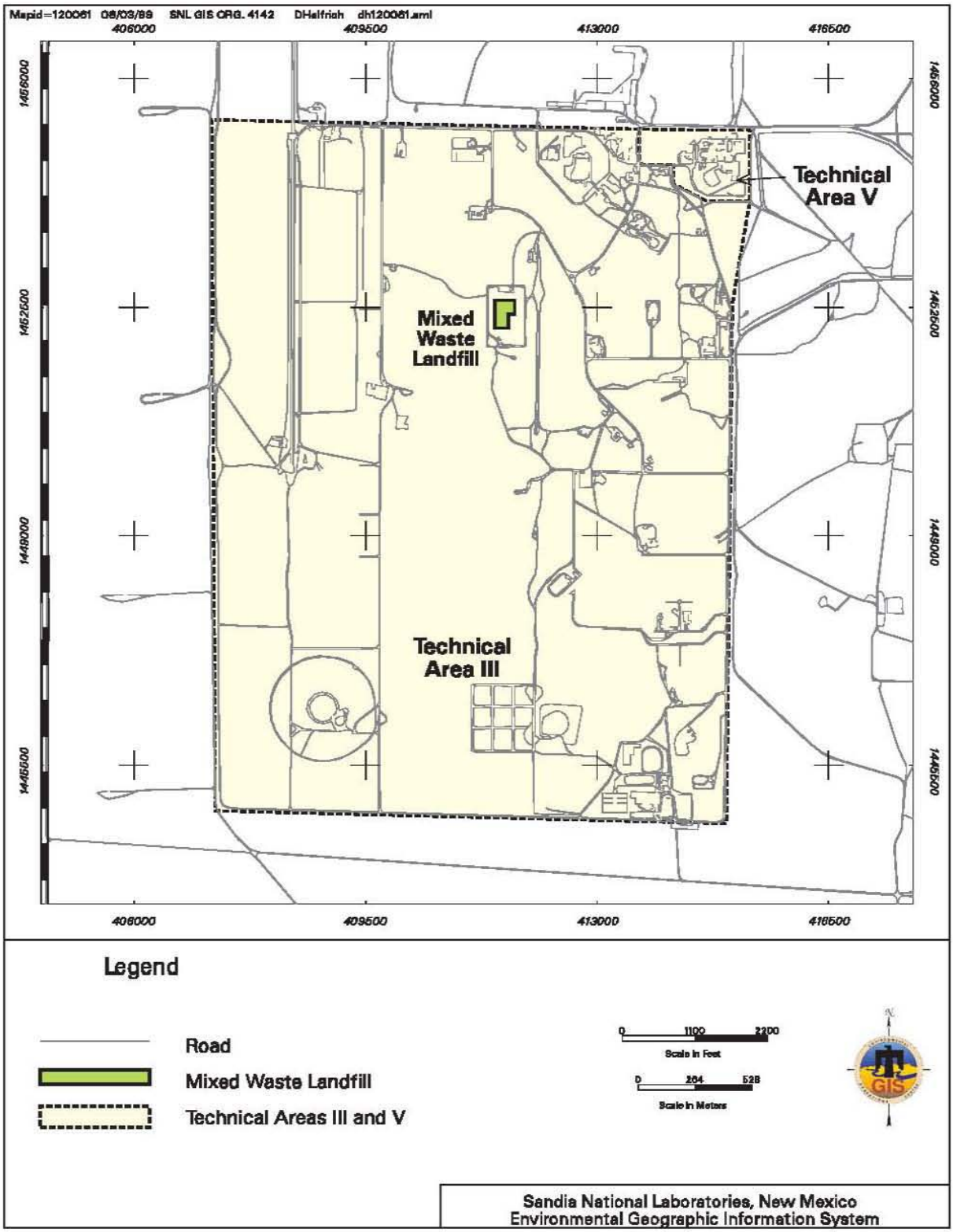

Figure 1-2
Location of the Mixed Waste Landfill within Technical Area III

On May 26, 2005, NMED issued the Final Order (Curry May 2005) selecting a vegetative soil cover with biointrusion barrier as the final remedy for the MWL, hereinafter referred to as the MWL evapotranspirative (ET) Cover. The NMED Final Order and Class 3 Permit Modification require an LTMMP to address physical controls, institutional controls, and reporting that are part of the final remedy. Deployment of the MWL ET Cover was completed in September 2009. The MWL Corrective Measures Implementation (CMI) Report (SNL/NM January 2010, Revision 1) documented ET Cover construction in accordance with the MWL CMI Plan (SNL/NM November 2005) and was approved by NMED on October 14, 2011 (Bearzi October 2011). The MWL LTMMP (SNL/NM March 2012) was submitted within 180 days of NMED approval of the CMI Report as stipulated in the NMED approval letter and as required by the Final Order (Curry May 2005).

NMED approved the MWL LTMMP on January 8, 2014 (Blaine January 2014) after a public meeting held on October 16, 2012 and a 150-day public comment period (September 2012 to February 2013). The NMED approval of the LTMMP included responses to public comments received during the 150-day public comment period (Blaine January 2014). The MWL LTMMP defines all long-term monitoring requirements. In addition to an annual report, DOE/Sandia are required to submit various documents as specified in the LTMMP. Table 1-1 summarizes MWL LTMMP-required submittals to NMED since approval of the LTMMP on January 8, 2014.

Table 1-1
Mixed Waste Landfill Long-Term Monitoring and Maintenance Plan Document Submittal History

Date of Submittal[a]	LTMMP Requirement	Description of Submittal
March 6, 2014	Appendices C through G	Procedures, plans, and documents cited in the LTMMP used by SNL/NM personnel for air, surface soil, soil vapor, soil moisture, biota, and groundwater monitoring.
July 9, 2014	Appendices C, D, F, and G	Updates to two documents used by SNL/NM personnel to validate analytical data from contract laboratories and conduct activities related to sampling MWL soil-vapor wells. Updates to the health and safety plan for groundwater monitoring at the MWL.
February 18, 2015	Appendix F	Updates to reference documents used by SNL/NM personnel to conduct groundwater monitoring activities at the MWL.

Notes:
[a]Date represents the date stamp on the DOE transmittal letter for the submittal.
DOE = U.S. Department of Energy.
LTMMP = Long-Term Monitoring and Maintenance Plan.
MWL = Mixed Waste Landfill.
SNL/NM = Sandia National Laboratories/New Mexico

1.1 Purpose and Scope

This is the second MWL Annual Long-Term Monitoring and Maintenance (LTMM) Report and the first to include a complete reporting period since approval of the MWL LTMMP on January 8, 2014. The LTMMP includes requirements for documentation of all monitoring, inspection, and maintenance/repair activities conducted during each reporting period. The purpose of this

Annual LTMM Report is to document monitoring, inspection, maintenance, and repair activities conducted during the April 1, 2014 through March 31, 2015 reporting period.

1.2 Report Organization

This report is organized as follows:

- Chapter 1 presents background information, purpose and scope, and report organization.
- Chapter 2 presents LTMMP monitoring and inspection requirements.
- Chapter 3 presents radon monitoring activities and results.
- Chapter 4 presents tritium surface soil monitoring activities and results.
- Chapter 5 presents vadose zone soil-vapor monitoring activities and results.
- Chapter 6 presents vadose zone soil-moisture monitoring activities and results.
- Chapter 7 presents groundwater monitoring activities and results.
- Chapter 8 presents biota monitoring activities and results.
- Chapter 9 presents inspection, maintenance, and repair activities and results.
- Chapter 10 summarizes regulatory activities.
- Chapter 11 presents a general summary and conclusions for the reporting period.
- Chapter 12 lists the references cited in this report.

Annexes are included that provide supporting information as follows:

- Annex A – Radon Monitoring Forms
- Annex B – Surface Soil Tritium and Biota Monitoring Forms and Reports
- Annex C – Soil-Vapor Monitoring Forms and Reports
- Annex D – Soil-Moisture Monitoring Forms
- Annex E – Groundwater Monitoring Forms and Reports
- Annex F – Inspection Forms
- Annex G – Biology Report

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2.0 MONITORING AND INSPECTION REQUIREMENTS

Monitoring, inspection, maintenance, and repair requirements are defined in Chapters 3 and 4 of the MWL LTMMP and are briefly summarized in this chapter. Monitoring requirements are described in Section 2.1 and generate empirical data that are evaluated to assess site conditions. Inspection requirements are described in Section 2.2 and include requirements to perform maintenance and/or repairs. As a whole, these activities ensure the physical controls at the MWL are maintained and perform as designed.

2.1 Monitoring Requirements

The primary objective of the monitoring activities at the MWL is to ensure that the ET Cover and site conditions are protective of groundwater, human health, and the environment. Monitoring activities include sampling and analysis of air, surface soil, vadose zone (volatile organic compounds [VOCs] in soil vapor and soil-moisture content), groundwater, and biota (surface soil and vegetation). The multi-media monitoring program is summarized in Table 2-1, which details information for each monitoring activity including the sampling media, monitoring parameters, frequency, number of samples, locations, and monitoring methods.

The data quality objective (DQO) of all monitoring activities is to produce representative, accurate, defensible, and comparable analytical results to support the monitoring objective. The DQO is accomplished through implementation of standard operating procedures and analytical procedures/methods through the use of quality assurance measures, quality control samples, and data evaluation protocols.

Sampling and Analysis Plans (SAPs) for each monitoring activity are included in MWL LTMMP, Appendices C through G. Results for monitoring activities conducted at the MWL in the subject reporting period are presented in Chapters 3 through 8.

2.2 Inspection, Maintenance, and Repair Requirements

The primary objective of inspection, maintenance, and repair activities at the MWL is to ensure that the ET Cover, other physical controls at the site (i.e., surface-water diversion features, perimeter security fence, and survey monuments), and the monitoring systems (groundwater and vadose zone networks) perform as designed.

Inspection parameters, specifications, frequency, and repair requirements are detailed in Chapter 4 of the MWL LTMMP and summarized in Table 2-2. Repair work is initiated, as needed, based upon the results of the inspections and tracked to completion on the respective inspection forms. Long-term monitoring inspection checklists/forms are contained in the MWL LTMMP, Annex I. Results of inspection activities conducted at the MWL in the subject reporting period are presented in Chapter 9.

The following sections provide additional background information on MWL inspections and associated maintenance/repairs.

Table 2-1
Mixed Waste Landfill Monitoring Parameters, Frequencies, and Methods

Sampling Media	Monitoring Parameters[a]/ Constituents of Concern	Monitoring Frequency[a]	Number of Samples Per Event	Monitoring Locations	Monitoring Method[b]	Comments
Air	Radon	Year 1 – Quarterly Year 2 – Quarterly Year 3 – Semiannual Year 4 – Semiannual Year 5 and subsequent years – Annual	17	10 detectors placed at corners and midpoints of perimeter fence 5 detectors placed on completed cover 2 detectors at background locations	Track-etch detectors (at breathing zone height); sampling and analysis per LTMMP Appendix C	Samples are time-weighted average and will be collected over a 3-month period. The first quarterly monitoring period begins in January of each year.
Surface Soil	Tritium	Annual	4	One sample collected from each corner of the MWL ET Cover.	Grab samples of soil collected; moisture extracted and analyzed for tritium using liquid scintillation per LTMMP Appendix G	Samples collected from the MWL ground surface at the four corners of the ET Cover.
Vadose Zone	VOCs in soil vapor	Year 1 – Semiannual Year 2 – Semiannual Year 3 – Semiannual Year 4 and subsequent years – Annual	17	Samples collected from 2 single-port soil-vapor monitoring points installed through the ET Cover (MWL-SV01 and MWL-SV02) and 3 perimeter multi-port FLUTe™ wells (MWL-SV03, MWL-SV04, and MWL-SV05)	Sampling and analysis of soil vapor per LTMMP Appendix D	MWL-SV01 and MWL-SV02 have a sampling port approximately 35 ft below the original ground surface. MWL-SV03, MWL-SV04, and MWL-SV05 have sampling ports at depths of approximately 50, 100, 200, 300, and 400 ft bgs.
Vadose Zone	Moisture content beneath the ET Cover	Year 1 – Semiannual Year 2 – Semiannual Year 3 and subsequent years – Annual	171	3 soil-moisture monitoring access tubes Measurements obtained at 1-ft increments from 4 ft to 25 feet bgs, then 5-ft increments to total depth of the access tube (200 linear ft)	Soil-moisture monitoring per LTMMP Appendix E	Moisture content in vadose zone beneath the cover is measured using a neutron probe to evaluate moisture infiltration through the ET Cover.

Refer to footnotes at end of table.

Table 2-1 (Concluded)
Mixed Waste Landfill Monitoring Parameters, Frequencies, and Methods

Sampling Media	Monitoring Parameters[a]/ Constituents of Concern	Monitoring Frequency[a]	Number of Samples Per Event	Monitoring Locations	Monitoring Method[b]	Comments
Groundwater	VOCs, metals[c], tritium, radon, gamma-emitting radionuclides[d], and gross alpha/beta activity	Semiannual	4	MWL compliance groundwater monitoring well network: MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9	Sampling and analysis of groundwater samples per LTMMP Appendix F	Monitoring wells MWL-MW4, MWL-MW5, and MWL-MW6 retained for monitoring groundwater elevation only.
Biota – Surface Soil	Metals[e] and gamma-emitting radionuclides[f]	Annual	Up to 4 (2 each, if they exist)	Variable - ant hills and animal burrows on the MWL ET Cover located during ET Cover inspections, if present	Grab sampling and analysis of surface soil at animal burrow and/or ant hill features per LTMMP Appendix G	If no features are identified, no samples will be collected.
Biota – Cover Vegetation	Gamma-emitting radionuclides (short list) in vegetation	Annual	Up to 2 if they exist	Variable - potentially deep-rooted vegetation overlying former disposal areas located during ET Cover inspections, if present	Grab sampling and analysis of vegetation, including the plant and root system per LTMMP Appendix G	If no potentially deep-rooted plants are present, no samples will be collected.

Notes:
[a]Monitoring parameters and frequency will be reevaluated every five years in the Five-Year Reevaluation Report.
[b]Sampling and Analysis Plans and sampling requirements in appendices of the MWL LTMMP (SNL/NM March 2012).
[c]Required metals analyses include cadmium, chromium, nickel, and uranium (SNL/NM March 2012).
[d]Radionuclide results reported for groundwater include americium-241, cesium-137, and cobalt-60.
[e]Required metals analyses include RCRA metals plus copper, nickel, vanadium, zinc, cobalt, and beryllium (SNL/NM March 2012).
[f]Radionuclide results reported for biota include cesium-137, cobalt-60, radium-226, thorium-232, uranium-235, and uranium-238.
bgs = Below ground surface.
ET = Evapotranspirative.
FLUTe™ = Flexible Liner Underground Technologies, Ltd.™
ft = Foot (feet).
LTMMP = Long-Term Monitoring and Maintenance Plan.
MWL = Mixed Waste Landfill.
RCRA = Resource Conservation and Recovery Act.
VOC = Volatile organic compound.

Table 2-2
Mixed Waste Landfill Inspection, Maintenance, and Repair Requirements

MWL System to be Inspected	Inspection Frequency/ Performed by	Inspection Parameters	Maintenance Implementation	Maintenance/Repair Frequency[a]
ET Cover Surface Biology Inspection (Cover vegetation and signs of animal activity)	Quarterly until vegetation is established, annually thereafter by a staff biologist[b]	Vegetation Inventory	Soil augmentations and/or reseeding	Within 60 days of discovery of needed repairs. Reseeding repairs may be delayed to await the appropriate growing season.
		Contiguous areas of no vegetation >200 ft^2	Revegetate barren areas that exceed prescribed limits	
		Animal intrusion burrows in excess of 4 inches in diameter	Repair cover system damage that exceeds prescribed limits	
ET Cover System (Surface)	Quarterly by a field technician	Settlement of cover surface in excess of 6 inches	Repair cover system damage that exceeds prescribed limits	Within 60 days of discovery of needed repairs. Reseeding repairs may be delayed to await the appropriate growing season.
		Erosion of cover soil in excess of 6 inches deep		
		Ponding of water on the ET Cover surface in excess of 100 ft^2		
		Animal intrusion burrows in excess of 4 inches in diameter		
		Contiguous areas of no vegetation >200 ft^2 [c]	Revegetate barren areas that exceed prescribed limits [c]	Within 60 days of discovery of needed repairs.
ET Cover Surface-Water (Storm water) Drainage Features	Quarterly by a field technician	Channel or sidewall erosion in excess of 6 inches deep	Repair erosion that exceeds prescribed limits	Within 60 days of discovery of needed repairs.
		Accumulations of sediment in excess of 6 inches deep or debris that blocks more than 1/3 of the channel width	Remove sediment and debris accumulations that exceed prescribed limits	
Soil-Vapor Monitoring Wells, Soil-Moisture Monitoring Access Tubes, and Groundwater Monitoring Wells	Groundwater and Vadose Zone Network Components: Field technician to inspect at same frequency/time that monitoring occurs	Concrete pads, stanchions, and protective casings	Maintain, clean, repair, replace, re-label, as appropriate	Within 60 days of discovery of needed repairs.
		Well cover caps and Swagelok® (or equivalent) dust caps		
		Monitoring wells and soil-vapor sampling port labels		
		Locks		
		Sampling pumps and tubing Neutron probe and cable system		

Refer to footnotes at end of table.

Table 2-2 (Concluded)
Mixed Waste Landfill Inspection, Maintenance, and Repair Requirements

MWL System to be Inspected	Inspection Frequency/ Performed by	Inspection Parameters	Maintenance Implementation	Maintenance/Repair Frequency[a]
ET Cover Physical Controls	Quarterly by a field technician	Presence of wind-blown plants and debris	Remove wind-blown plants and debris	Within 60 days of discovery of needed repairs.
		Condition of fence wires, posts, gates, gate locks, warning signs, and survey monuments in the local area	Repair broken wire sections and posts, repair/oil gates, clean/replace locks, repair/replace warning signs, clear dirt/debris from monuments	

Notes:
[a]Maintenance/repairs will be performed as necessary, based upon the results of inspections.
[b]The transition from quarterly to annual inspections by a staff biologist is based upon meeting successful revegetation criteria as determined by the staff biologist (SNL/NM March 2012).
[c]Barren areas exceeding >200 ft^2 will not require corrective action after ET Cover vegetation is determined to have met successful revegetation criteria if they are the result of relatively short-term climate stresses (e.g., severe short-term drought), and the staff biologist determines they will naturally fill in over time. However, these areas will be noted and tracked during inspections and reviewed annually by the staff biologist to determine whether action is required based upon comparison to surrounding vegetation.
ET = Evapotranspirative.
ft^2 = Square feet.
MWL = Mixed Waste Landfill.

2.2.1 ET Cover Biology Inspection

The ET Cover consists of four main layers: Compacted Subgrade, Biointrusion, Compacted Native Soil, and Topsoil Layers (Figure 2-1). A thin soil layer was placed on top of the Biointrusion Layer to fill void space and create an even surface upon which the Native Soil Layer was constructed. The Subgrade varies in thickness from 0 to 3.3 feet and the combined average thickness of the overlying ET Cover layers is 5.37 feet. The Topsoil layer was seeded with native grasses to mitigate surface erosion and promote evapotranspiration. The native grass species were selected based upon biological assessments of TA-III (Sullivan and Knight 1992; Peace et al. November 2004). A conceptual schematic profile of the ET Cover and how it works is provided in Figure 2-2.

The ET Cover slopes gently to the west (2 percent slope) and sheds surface-water runoff to the west and the cover perimeter down the side slopes. An engineered drainage swale located immediately east, north, and south of the ET Cover diverts surface run-on from the east (upgradient) side of the ET Cover and run-off from the side slopes around the northern and southern ends of ET Cover to the west (Figure 2-3).

Cover vegetation monitoring will be accomplished in two phases. During the first phase, a staff biologist conducts vegetation inspection and monitoring on a quarterly schedule. The first phase concentrates on establishing the vegetation on the ET Cover from seed to a mature plant community such that successful revegetation criteria are met. These criteria are defined in Section 4.1 of the MWL LTMMP and are presented below.

- Total percent foliar coverage equals 20 percent (i.e., 20 percent of the land surface is covered with living plants versus 80 percent bare surface area);
- Of the 20 percent total foliar coverage, 50 percent or greater comprises native perennial species, and 50 percent or less comprises annual species; and
- No contiguous bare spots greater than 200 square feet (approximately 14 by 14 feet).

In addition to inspecting and documenting the inventory of the primary flora populating the cover, the staff biologist documents signs of animal and insect activity. Once successful revegetation criteria are met, the second phase of cover vegetation inspection begins.

In phase two, the staff biologist inspection frequency changes to annual and occurs near the end of the growing season (August–September) to most accurately determine the coverage of living plants. The staff biologist continues to document the flora population and signs of animal and insect activity.

Damage to cover vegetation that exceeds the criteria listed in Section 4.2.2 of the LTMMP is noted on the Biology Inspection Checklist/Form and appropriate maintenance/repairs will be completed within 60 days of the notation. Reseeding repairs may be delayed until the appropriate time during the growing season (Table 2-2).

At the end of each reporting year, the staff biologist compiles the results of the quarterly inspections (or annual inspection), summarizes local climate trends, and presents

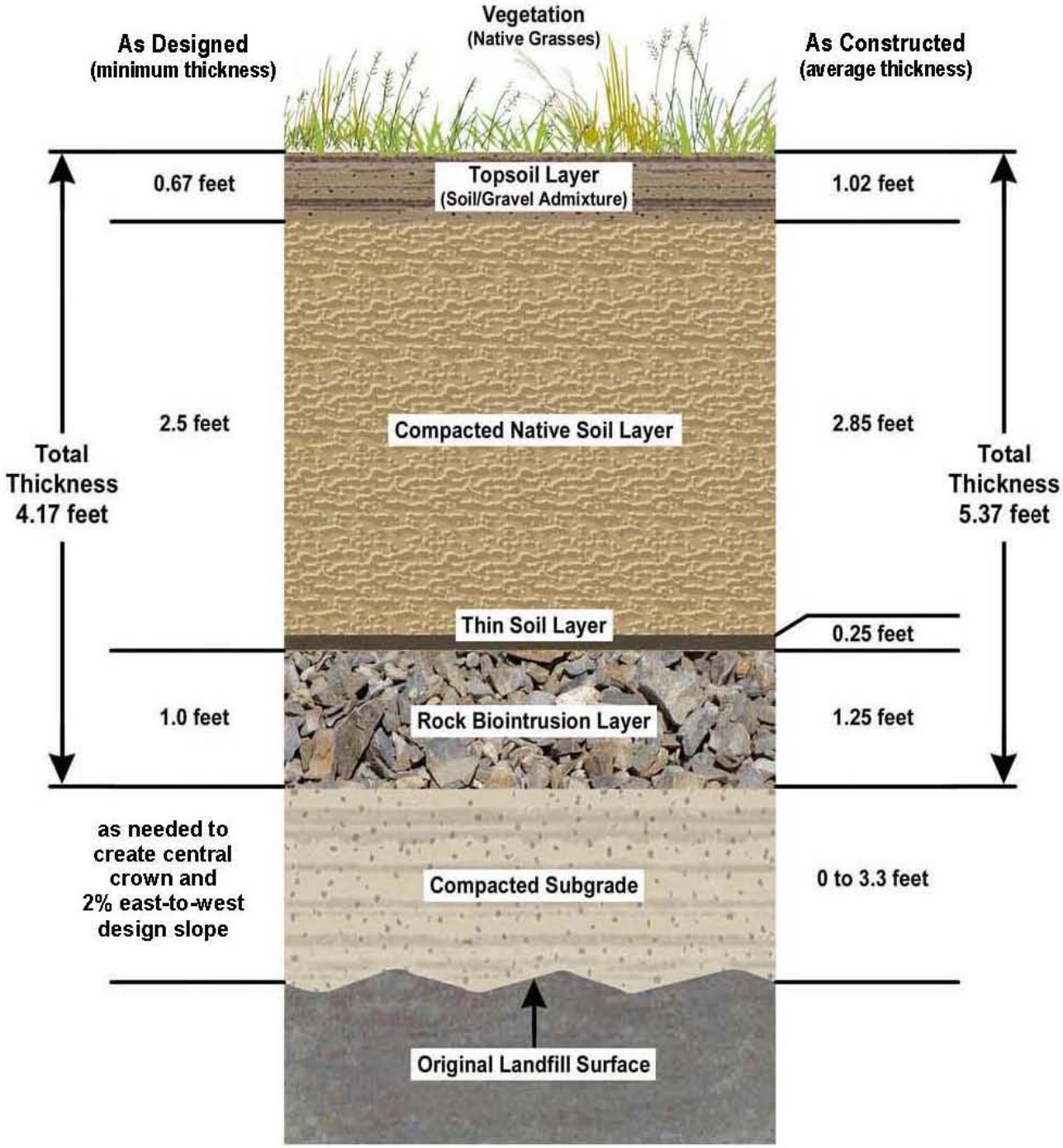

Figure 2-1
Schematic Profile of the Mixed Waste Landfill Evapotranspirative Cover Layers

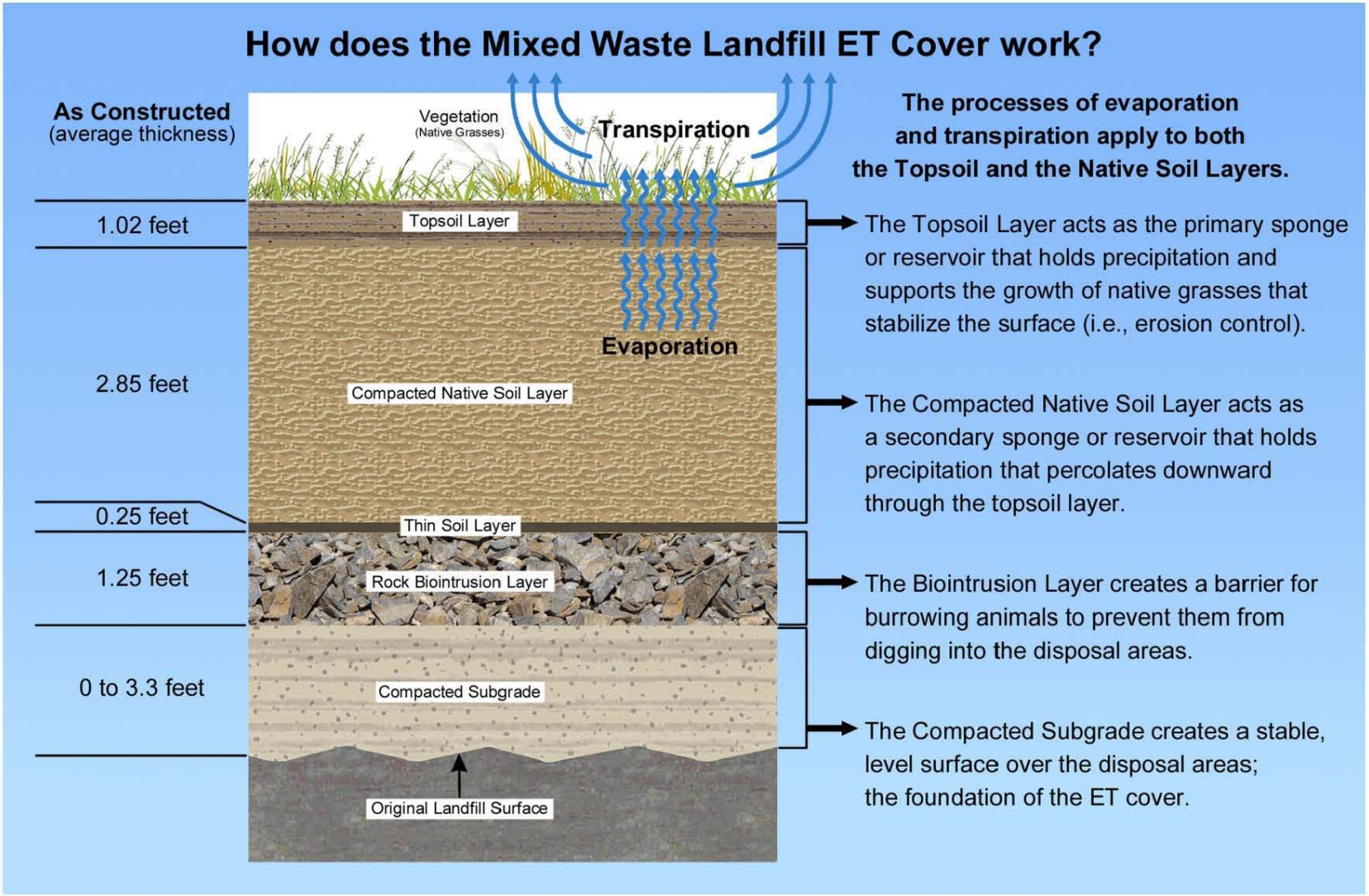

Figure 2-2
Schematic Profile of the Mixed Waste Landfill Evapotranspirative Cover and How it Works

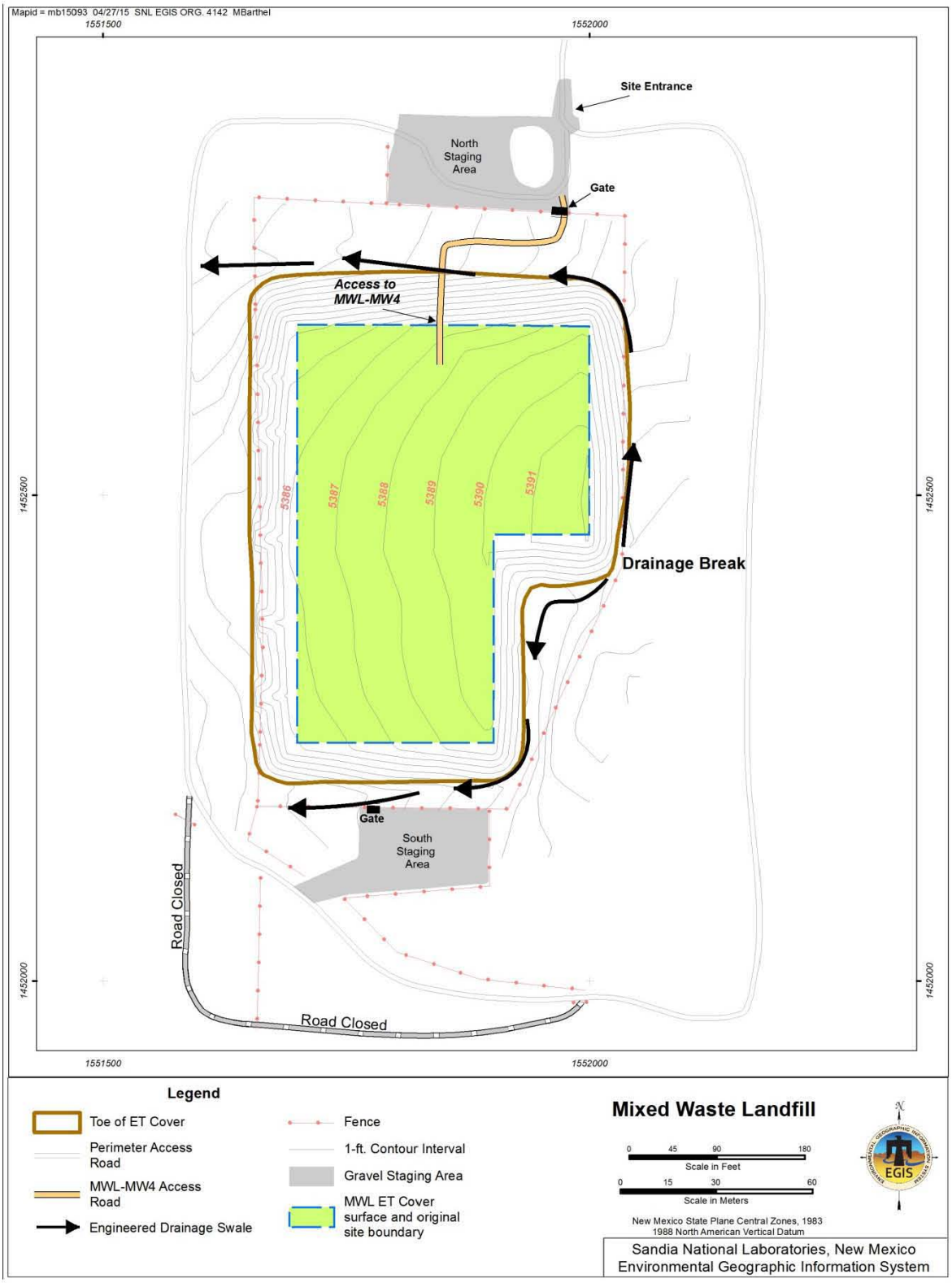

Figure 2-3
Mixed Waste Landfill Engineered Storm-Water Drainage Swale

recommendations in a summary report to be included in the Annual LTMM Report (Annex G) along with the inspection form(s).

2.2.2 ET Cover Surface and Physical Controls Inspection

The ET Cover surface, side slopes, and physical controls (i.e., storm-water drainage swale, security fence, locks, gates, signs, and survey monuments) are inspected by a field technician on a quarterly basis. Inspection parameters, specifications, frequency, and required maintenance/repair activities for the ET Cover are summarized in Table 2-2. Documentation of animal burrows in excess of 4 inches in diameter and contiguous areas lacking vegetation in excess of 200 square feet are noted on both the quarterly *Cover Inspection* and annual *Biology Inspection Checklists/Forms* once the Biology Inspection frequency changes to annual.

If parameter specifications are exceeded they will be noted on the *Cover Inspection Checklist/Form* and appropriate maintenance/repairs will be completed within 60 days of the notation. Reseeding repairs may be delayed until the appropriate time during the growing season (Table 2-2).

2.2.3 Monitoring Networks and Sampling Equipment

Groundwater monitoring wells, soil-vapor monitoring wells, soil-moisture monitoring access tubes, and associated sampling/monitoring equipment are inspected at the same frequency and during the associated monitoring events. All inspection parameters, specifications, and required maintenance/repair activities are detailed in Table 2-2. The inspections and any associated maintenance and repair activities will be documented on monitoring network-specific inspection checklists/forms. There is a separate inspection checklist/form for each of the three monitoring networks and associated sampling/monitoring equipment.

If conditions are observed that require maintenance, repair, or replacement they will be noted on the associated *Monitoring Network Inspection Checklist/Form* and appropriate actions will be completed within 60 days (Table 2-2).

3.0 RADON MONITORING RESULTS

This chapter presents radon monitoring activities (i.e., sampling and analysis), analytical results, and data evaluation in accordance with LTMMP Section 3.2.1 and Appendix C (SNL/NM March 2012). The monitoring objective is to collect data to evaluate radon gas flux (i.e., movement) to the atmosphere at the MWL. This monitoring provides an early warning detection system for changing conditions so that timely action can be taken, if necessary. Results from the monitoring stations located along the perimeter security fence (locations RN1 through RN 10) are compared to trigger levels defined in LTMMP Section 5.2.1.

Radon monitoring field activities are described in Section 3.1, analytical laboratory results and a discussion of data quality are presented in Section 3.2, and data evaluation requirements and a comparison of results to the trigger level are presented in Section 3.3. A summary of radon monitoring activities and results is provided in Section 11.1.

3.1 Radon Sampling Field Activities

This section describes radon monitoring activities conducted at the MWL in conformance with LTMMP Appendix C that describes the procedures, methods, and analytical protocols for deploying, collecting, and analyzing radon monitoring samples.

Four monitoring events were conducted during CY 2014, fulfilling the LTMMP quarterly monitoring requirement. Radon monitoring presented for this April 1, 2014 through March 31, 2015 reporting period covers the CY 2014 period January 1, 2014 through December 31, 2014 due to the time required for laboratory analysis and data review after collection of the detectors in the field. The January through March 2015 monitoring quarter will be presented in the June 2016 MWL Annual LTMM Report.

Radon sampling locations are designated as RN1 through RN17 and are shown in Figure 3-1. Table 3-1 presents the dates of detector deployment and collection for each quarter, location number, quarterly average of radon air concentrations in picocuries per liter (pCi/L), and the CY 2014 annual average radon air concentrations (pCi/L). Locations RN1 through RN10 are located on the perimeter security fence and are the compliance locations to which the trigger level applies. Locations RN11 through RN15 are located on the ET Cover surface directly above pits and trenches with known radium-226 sources. Locations RN16 and RN17 are background locations established away from the MWL, but in the general vicinity.

Quarterly monitoring results are reviewed and evaluated by an SNL/NM radiological subject matter expert (SME). The data evaluation letter reports also include the corresponding laboratory data sheets, Analysis Request/Chain-of-Custody forms (AR/COCs), and pictures of the radon monitoring station equipment and configuration. They are provided in Annex A.

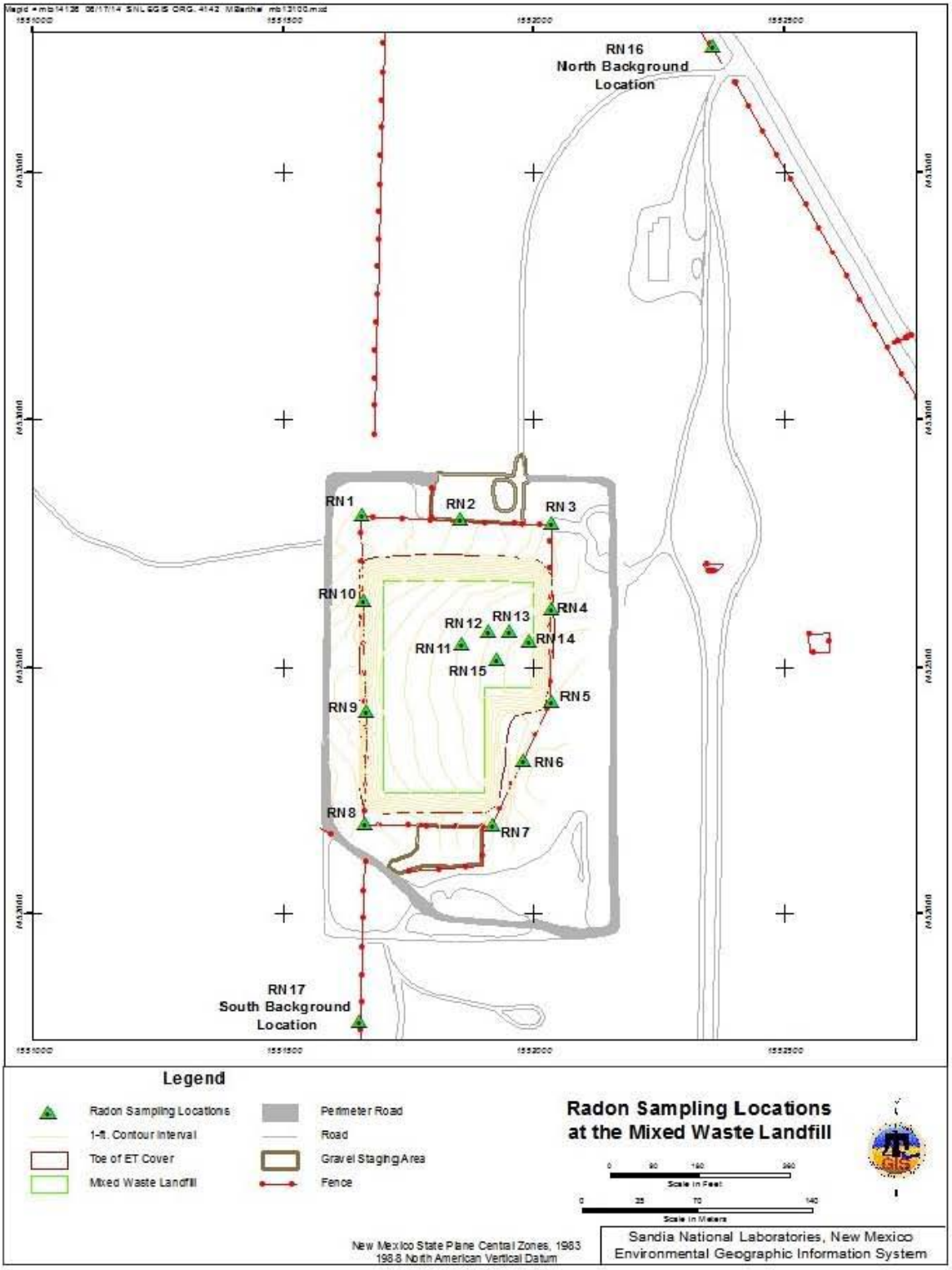

Figure 3-1
Mixed Waste Landfill Radon Detector Locations

Table 3-1
Summary of Radon Results
Mixed Waste Landfill Air Monitoring
Calendar Year 2014

Sample Location[a]	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		CY 2014 Average Radon Air Concentration (pCi/L)	Trigger Level (pCi/L)
	Detector Deployment Date	Detector Collection Date	Detector Deployment Date	Detector Collection Date	Detector Deployment Date	Detector Collection Date	Detector Deployment Date	Detector Collection Date		
	1/13/2014	4/2/2014	4/2/2014	7/3/2014	7/3/2014	10/2/2014	10/2/2014	1/7/2015		
	Quarterly Time-Weighted Average Radon Air Concentration (pCi/L)									
RN1	0.7		0.8		0.6		0.7		0.7	4
RN2	10.6 R[b]		1.4		0.6		0.6		0.9[c]	4
RN3	0.8		0.3		0.5		0.9		0.6	4
RN4	0.4		0.3		0.4		1.1		0.6	4
RN5	0.4		0.3		0.5		0.7		0.5	4
RN6	0.4		0.3		0.5		0.8		0.5	4
RN7	0.4		0.3		0.6		0.9		0.6	4
RN8	0.4		0.3		0.5		0.9		0.5	4
RN9	0.4		0.3		0.7		1.1		0.6	4
RN10	0.4		0.3		0.4		0.4		0.4	4
RN11	0.9		0.3		0.3		0.7		0.6	NA
RN12	0.7		0.3		0.4		0.8		0.6	NA
RN13	0.4		0.3		0.4		0.5		0.4	NA
RN14	0.4		0.3		0.3		0.7		0.4	NA
RN15	0.4		0.3		0.5		0.7		0.5	NA
Background Locations and Quality Control										
RN16	0.4		0.3		0.7		0.5		0.5	NA
RN17	0.4		0.3		0.6		0.9		0.6	NA
RNTB	--[d]		--[d]		0.4		1.0		0.7	NA

Notes:
[a]Bolded sample locations are the locations where the trigger level applies.
[b]The detector was found on the ground during collection on April 2, 2014. The reported result is not representative and was rejected during data review.
[c]The CY 2014 average radon concentration for location RN2 does not include the 1st quarter data.
[d]A trip blank was not used to monitor the environmental samples during storage and shipment to the analytical laboratory (Section 3.2.3).
CY = Calendar year.
NA = Not applicable.
pCi/L = Picocuries per liter.
R = Reported result was not representative and rejected during data review.
RNTB = Trip blank.

3.1.1 Radon Monitoring Detector Deployment and Collection

Radtrak® radon detectors were deployed and collected at the 17 sampling sites as shown in Table 3-1 and Figure 3-1. All detectors were found in good condition at the time of collection, except for the first quarterly monitoring period. On April 2, 2014 when the first quarter detectors were being collected, the RN2 location detector was found on the ground. A discussion of data quality impacts related to the condition of this detector are presented in Section 3.2.3 and corrective actions that have been implemented to prevent this situation in the future are discussed in Section 3.2.4.

3.1.2 Field Quality Control

Two types of field control measures are employed for quality control (QC) during each quarter monitoring event; a field control sample (trip blank) and two field background samples (representing natural environmental conditions in the vicinity of the MWL). The trip blank analysis is used to confirm detectors were not contaminated during storage and shipment to the analytical laboratory. The two field background samples (RN16 and RN17) were collected during each sampling event at areas outside of the MWL, but within TA-III (Figure 3-1). This allows the measurement of background radiation that is always present due to naturally-occurring radon. The two field background sample results are compared to the sample detectors (RN1 through RN15) that are located on top of the ET Cover and on the perimeter fence (Figure 3-1).

3.1.3 Waste Management

No waste is generated during radon monitoring field activities. Radon detectors are disposed of by the analytical laboratory.

3.2 Laboratory Results

This section summarizes radon air monitoring results for the CY 2014. The radon air measurements were obtained using Radtrak® radon detectors. Radtrak® is an alpha-track radon gas detector designed to monitor radon exposure for three months to one year to obtain a long-term average concentration over time. The detectors were submitted to Landauer® Incorporated for analysis. Analytical laboratory reports, including certificates of analyses, analytical methods, dates of analyses, results of QC analyses, and data validation findings are filed in the SNL/NM Record Center.

3.2.1 Environmental Sample Results

The compiled quarterly monitoring results are presented in Table 3-1. Figure 3-2 shows the tabulated data in graphical form along with the trigger level of 4 pCi/L. One sample location, RN2, exceeded the trigger level of 4 pCi/L with a value of 10.6 pCi/L during the first quarter (January through March 2014). The result from this detector is not representative and was rejected during data review because the detector was found on the ground in poor condition

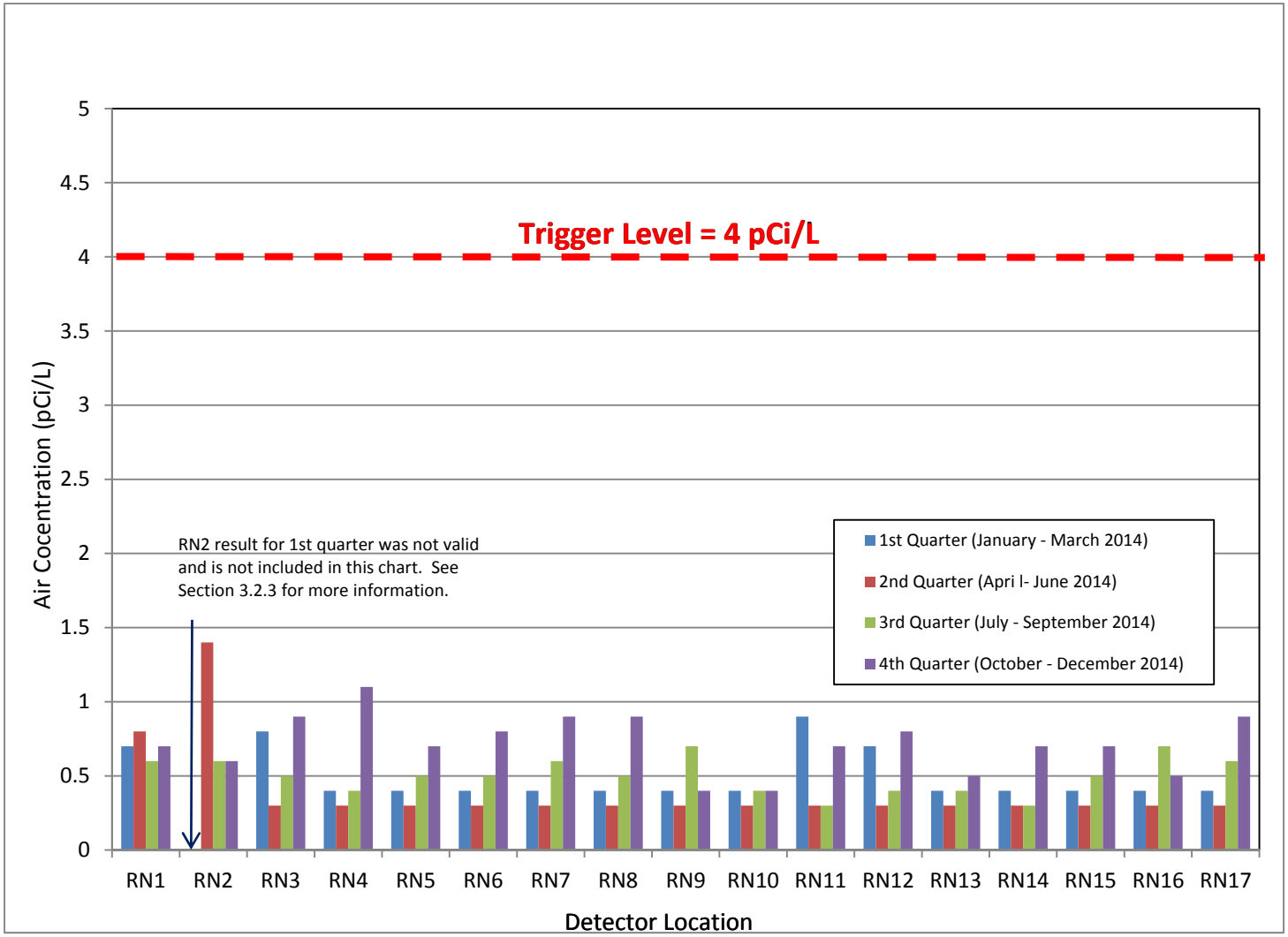

Figure 3-2
Mixed Waste Landfill
Calendar Year 2014 Quarterly Air Monitoring Results

when it was collected (see Section 3.2.3 for more information). As shown in Table 3-1, the RN2 location results for the second, third, and fourth quarters were well below the trigger level, with activities of 1.4, 0.6, and 0.6 pCi/L, respectively. The CY 2014 average radon concentration at locations RN1 through RN15 ranged from 0.4 to 0.9 pCi/L. The CY 2014 average radon concentrations at background locations RN16 and RN17 ranged from 0.5 to 0.6 pCi/L, respectively.

3.2.2 Field Quality Control Sample Results

Trip blanks (designated as RNTB in Table 3-1) were not submitted with the detectors collected during the first and second quarter sampling events. The results from analysis of the trip blanks submitted with the third and fourth quarter sampling events confirmed there was no contamination during storage and shipment of detectors RN1 through RN17 to the analyzing laboratory.

The two field background sample results (RN16 and RN17) for each quarter are compared to the quarterly sample results for detectors RN1 through RN15 and are shown in Figure 3-2. These background sample results show that conditions at the MWL are essentially equivalent to background conditions.

3.2.3 Data Quality

The detector at sampling location RN2 was found on the ground during the collection of first quarter detectors and the deployment of second quarter detectors on April 2, 2014. It had separated from its protective casing, which is secured to a perimeter fence at a height approximately 4 feet above ground surface. The detector was exposed on the ground surface for an undetermined period of time, was covered with dirt, and, based on its condition, was exposed to rain. The internal chip that is analyzed by the laboratory was warped and damaged. Due to the conditions noted for this detector, the analytical result was rejected as not representative during SNL/NM radiological SME review (Annex A). The results for the second, third, and fourth quarter monitoring events demonstrated the first quarter RN2 results were anomalous. To provide a valid, representative result, the detector must remain approximately 4 feet above the ground surface and be protected from the weather (i.e., precipitation and wind) and surface soil by the protective casing. Corrective actions to prevent this situation and data quality issue from occurring in the future are discussed in Section 3.2.4.

3.2.4 Variances and Non-Conformances

The first quarter RN2 detector detachment from the protective casing was a variance that resulted in rejected data. After further inspection, it was determined that a faulty Velcro™ attachment was the cause (Velcro™ tab on detector was the same as the tab on the inside of the protective casing, instead of opposite). High wind events common during this time of year likely caused the detector to fall out of the casing. Corrective action implemented after a review of the situation included the following.

- Prior to deployment, all detectors will be inspected to ensure that the Velcro™ tabs are installed appropriately. Extra detectors will be requested from the laboratory in case suspect detectors are found during inspections.

- During deployment, the integrity of the protective casing and the hardware that secures the protective casing to the fence post will also be inspected and repaired or replaced if appropriate.

- On a monthly basis, each monitoring station will be checked to make sure all detectors are in place and secure.

There was one non-conformance in both the first and second monitoring periods. A trip blank was not included when the detectors were sent to the laboratory to determine whether contamination of the detectors (RN1 through RN17) may have occurred during shipment and storage at the laboratory. There was no adverse impact on the results, as the trip blank samples were included with the third and fourth quarter detectors, and the monitoring results for the first and second quarter were comparable to the third and fourth quarter monitoring results. Comparison of the four data sets indicates contamination during shipment and storage at the laboratory of the first and second quarter detectors did not occur.

3.3 Data Evaluation and Monitoring Trigger Level

The trigger level for radon in air is 4 pCi/L, which applies to the detectors located on the perimeter fence (RN1 through RN10). The trigger level of 4 pCi/L is the same as the EPA-recommended action level for radon in households. There was no exceedance of the 4.0 pCi/L trigger level at sampling locations RN1 through RN10 during CY 2014.

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4.0 TRITIUM SURFACE SOIL MONITORING RESULTS

This chapter presents monitoring activities for tritium-in-surface soil (i.e., sampling and analysis), analytical results, and data evaluation in accordance with LTMMP Sections 3.3 and 5.2.2.1, and Appendix G (SNL/NM March 2012). The monitoring objective is to collect data to evaluate tritium flux (i.e., movement) to the atmosphere from soil moisture in surface soil at the MWL. This monitoring provides an early warning detection system for changing conditions so that action can be taken, if necessary, in a timely manner.

Tritium surface soil monitoring field activities are described in Section 4.1 and analytical laboratory results and a discussion of data quality are presented in Section 4.2. Data evaluation and a comparison of results to the trigger level are presented in Section 4.3 and Section 4.4 presents historic data evaluation. A summary of tritium surface soil monitoring activities and results is provided in Section 11.1.

4.1 Tritium Surface Soil Sampling Field Activities

This section describes activities conducted in conformance with LTMMP Appendix G, which describes the procedures, methods, and analytical protocols for collecting and analyzing tritium surface soil samples. Annex B contains the AR/COC forms and a data evaluation memo prepared by a Sandia radiological SME that includes an evaluation and summary of the data.

Surface soil samples were collected at four monitoring locations on August 21, 2014 (Figure 4-1). Although these locations matched previous SNL/NM Terrestrial Surveillance Program monitoring locations, they did not match the locations specified in Section 3.3, Figure 3.3-1 of the LTMMP. Therefore, sampling was conducted at the LTMMP locations on January 20, 2015 to fulfill the annual monitoring requirement and provide data for comparison between locations (Figure 4-1). Historically, tritium surface soil monitoring was performed at the MWL by the SNL/NM Terrestrial Surveillance Program, and these locations have been shifted over time to accommodate construction of the subgrade (2006) and ET Cover (2009). The August 2014 sampling locations were consistent with post-ET Cover installation Terrestrial Surveillance Program locations. Comparison of current tritium results with historical Terrestrial Surveillance Program results is presented in Section 4.4 and is still useful even though the sampling locations are not identical. The August 2014 results are presented in the following sections along with the January 2015 results.

4.1.1 Field Quality Control

A field QC sample (duplicate soil sample) was collected as part of the August 21, 2014 combined tritium and biota sampling event in accordance with the Tritium and Biota SAP (Appendix G, Table G-4.2-1), which requires one duplicate sample pair collected for every twenty environmental samples. The environmental and duplicate sample pairs for the August 2014 (combined tritium and biota sampling event) and January 2015 sampling events (tritium only) were collected at the tritium monitoring location MWL TS-2NE (Figure 4-1).

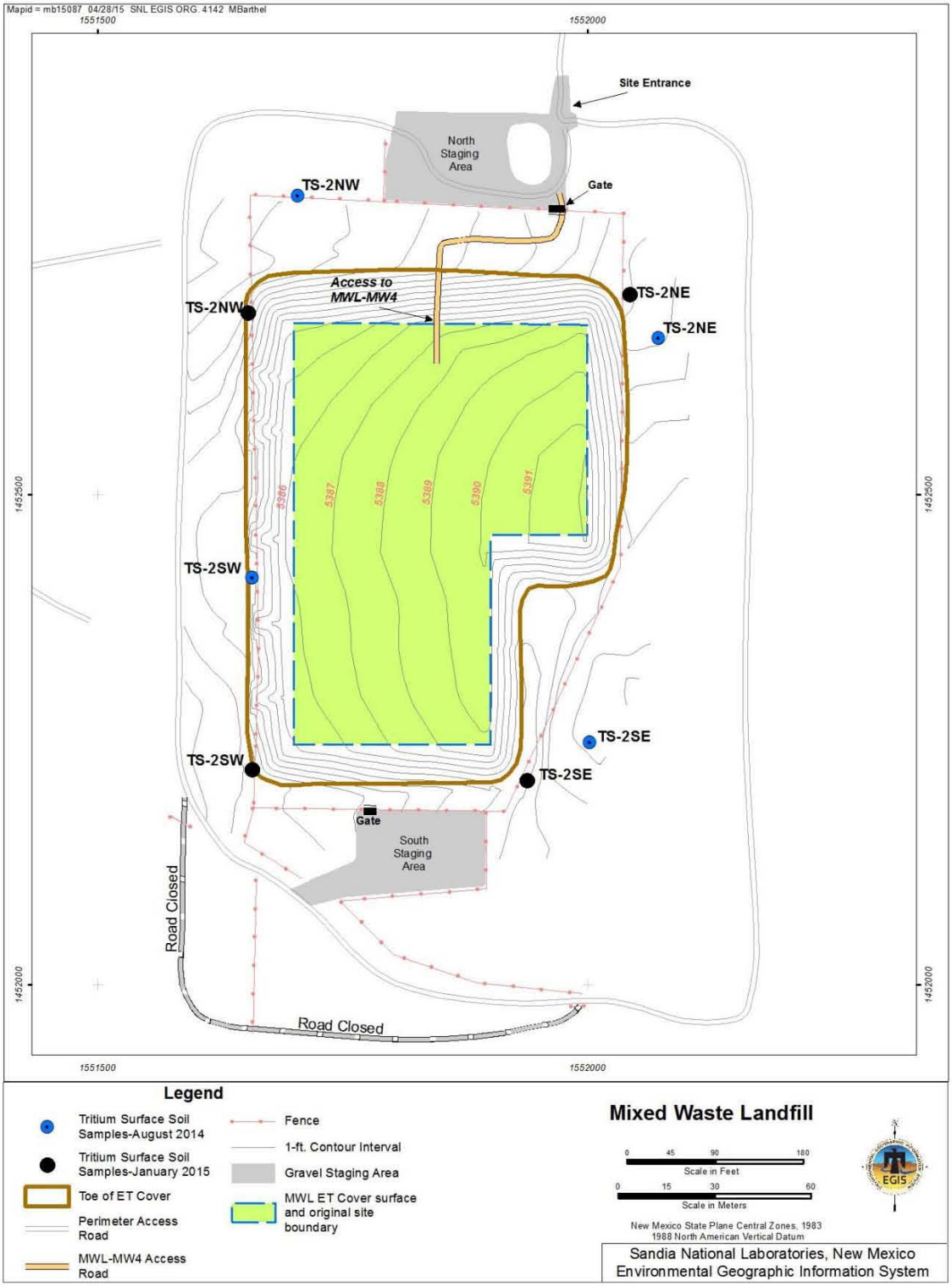

Figure 4-1
Mixed Waste Landfill Tritium Surface Soil Sampling Locations

4.1.2 Waste Management

Waste generated during sampling activities included personal protective equipment (PPE), such as gloves, and decontamination wipes. It was managed in accordance with federal, state, and city regulations, and applicable SNL/NM requirements. Analytical data collected from the sampling event was used to characterize the waste; it was determined to be non-hazardous and non-radioactive and was managed as solid waste.

4.2 Laboratory Results

Soil samples and field QC samples were submitted to GEL Laboratories LLC (GEL) for analyses. Samples were analyzed by liquid scintillation analysis, in accordance with EPA Method 906.0 (liquid scintillation analysis). Tritium activity is determined in the moisture extracted from the soil sample, so results are sensitive to in-situ moisture content of the soil collected. Analytical results that are below the minimum detectable activity (MDA) are qualified with a "U" and are designated as not detected. Analytical laboratory reports, including certificates of analyses, analytical methods, sample results, dates of analyses, results of QC analyses, and data validation reports are filed in the SNL/NM Record Center.

4.2.1 Environmental Sample Results

Table 4-1 summarizes the tritium surface soil results for the August 2014 and January 2015 sampling events. Tritium was not detected above the MDA in any of the August 2014 surface soil samples. This was due in part to the soil being very dry, despite scheduling the sampling during the summer monsoon season. Tritium assay in soil depends on the presence of measurable soil moisture, and the August 2014 samples were very dry (i.e., soil-moisture content of the samples was less than 2 percent). There was more soil moisture present during the January 2015 sampling event due to winter precipitation events and cooler temperatures (i.e., soil-moisture content of the samples ranged from 4.3 to 9.2 percent), and tritium activity was detected above the MDA in all samples. The January 2015 tritium samples exhibited very low activities, ranging from 1,010 to 1,830 pCi/L.

The variation in the two data sets is primarily related to soil-moisture content, and is not related to the minor changes in sampling locations (see the Sandia radiological SME's data evaluation memo in Annex B).

4.2.2 Field Quality Control Sample Results

Relative percent difference (RPD) values between the environmental sample and corresponding duplicate is calculated using the following formula.

$$RPD = \frac{\left|R_1 - R_2\right|}{[(R_1 + R_2)/2]} \times 100$$

where: R_1 = Analysis result.
R_2 = Duplicate analysis result.

Table 4-1
Summary of Tritium Results (EPA Method 906.0[a])
Mixed Waste Landfill Surface Soil Monitoring
August 2014 and January 2015

Sample Location	Result (pCi/L)	Laboratory Qualifier[b]	Validation Qualifier[b]	Result (pCi/L)	Laboratory Qualifier[b]	Validation Qualifier[b]	Trigger Level (pCi/L)
	August 2014			January 2015			
MWL TS-2NW	151 ± 136	U	BD	1210 ± 216	--	--	20,000
MWL TS-2SW	-39.4 ± 118	U	BD	1660 ± 271	--	--	
MWL TS-2SE	-45.9 ± 115	U	BD	1830 ± 294	--	--	
MWL TS-2NE	147 ± 136	U	BD	1010 ± 191	--	--	
MWL TS-2NE (duplicate)	60.4 ± 125	U	BD	1370 ± 235	--	--	

Notes:
[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.
[b]Blank (--) cell means all quality control samples met acceptance criteria.
BD = Result is below the MDA.
EPA = U.S. Environmental Protection Agency.
MDA = Minimum detectable activity.
MWL = Mixed Waste Landfill.
pCi/L = Picocuries per liter.
U = Analyte was not detected; the result is less than the MDA.

For the environmental-duplicate sample pair collected at MWL TS-2NE in August 2014, tritium was not detected; therefore, an RPD value was not calculated. The RPD value between the environmental-duplicate sample pair collected at MWL TS-2NE in January 2015 shows good agreement (RPD values <35) with a calculated value of 30.

4.2.3 Data Quality

Field QC sample results validated the adequacy of the field sampling procedures and protocol. Internal laboratory QC samples were analyzed concurrently with all environmental samples in accordance with laboratory procedures and EPA methods. These included laboratory control samples, method blanks, and matrix spike samples. The results were used to evaluate potential contamination associated with the laboratory analytical process and to determine the accuracy and precision of the analytical methods. All radiochemical data were reviewed and qualified in accordance with SNL/NM Administrative Operating Procedure (AOP) AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data" (SNL/NM June 2014a). Data Validation Reports and Contract Verification Review forms are provided in Annex B.

4.2.4 Variances and Non-Conformances

There were no variances or non-conformances for tritium surface soil sampling.

4.3 Data Evaluation and Monitoring Trigger Level

The trigger level for tritium as measured in soil moisture from surface soil samples is 20,000 pCi/L as specified in LTMMP Section 5.2.2.1 (SNL/NM March 2012). No sample results from August 2014 or January 2015 exceeded the trigger level.

4.4 Historic Data Evaluation

Tritium surface soil sampling has been conducted at the MWL by the Terrestrial Surveillance Program since August 1985 at various locations around the MWL perimeter. The tritium sampling being performed under the LTMMP is a continuation of this monitoring effort. Historic tritium data from 1985 through1999 did not go through same rigorous data quality review process as data collected since June 2000, but does provide useful information regarding tritium levels over time.

Trend plots are not presented in this Annual LTMM Report because the factors that affect tritium results in surface soil samples at these very low activities (e.g., soil-moisture content and barometric conditions) overwhelm the subtle changes in actual, measurable tritium flux. The data collected in August 2014 and January 2015 are consistent with the historical data and demonstrate consistent, tritium activity at very low levels that are close to the laboratory minimum detectable activity.

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5.0 SOIL-VAPOR MONITORING RESULTS

This chapter presents soil-vapor monitoring activities (i.e., sampling and analysis), analytical results, and data evaluation in accordance with LTMMP Sections 3.4.1 and 5.2.3.1, and Appendix D (SNL/NM March 2012). The soil-vapor monitoring objective is to provide spatial and temporal concentration data for hazardous constituents in the soil vapor at various depths in the approximately 500-foot-thick vadose zone beneath the MWL (i.e., unsaturated soil and sediments above the regional groundwater aquifer). These monitoring data serve as an early warning detection system for the protection of groundwater. Results from the deepest sampling ports of the deepest soil-vapor wells are compared to trigger levels defined in LTMMP Section 5.2.3.

Soil-vapor monitoring field activities are described in Section 5.1, analytical laboratory results and a discussion of data quality are presented in Section 5.2, and data evaluation and comparison of results to monitoring trigger levels are presented in Section 5.3. A summary of soil-vapor monitoring activities and results is provided in Section 11.1.

5.1 Soil-Vapor Sampling Field Activities

This section describes soil-vapor monitoring activities conducted at the MWL in conformance with the MWL Soil-Vapor SAP, LTMMP Appendix D, which describes the procedures, methods, and analytical protocols for collecting and analyzing soil-vapor samples. Field forms and documentation that address calibration of equipment, well evacuation, purge volumes, and vacuum pressure readings for each sample container are provided in Annex C.

Wells MWL-SV01 and MWL-SV02 are single-sampling-port wells installed through the ET Cover; each well has one sampling port at depths 42.5 and 41.5 feet below ground surface (bgs), respectively. Wells MWL-SV03, MWL-SV04, and MWL-SV05 are multi-sampling-port wells (i.e., each has 5 sampling ports at depths of approximately 50, 100, 200, 300, 400 feet bgs), and are installed around the ET Cover perimeter. These wells were constructed in May through July 2014 using the Flexible Liner Underground Technology, Ltd.™ (FLUTe™) technology after NMED approved the LTMMP (Blaine January 2014). Wells MWL-SV01 and MWL-SV02 were installed during ET Cover construction in August 2009 to minimize impact on the ET Cover. The well locations are shown in Figure 5-1.

Two soil-vapor monitoring events were conducted during the April 1, 2014 through March 31, 2015 reporting period fulfilling the LTMMP semiannual monitoring requirement. The three FLUTe™ wells were not ready for sampling until September 2014, two months after completion of drilling and installation, to allow for vadose zone equilibration. The two monitoring events were conducted in September and October 2014, to allow time for laboratory analysis and data validation so the results of two soil-vapor monitoring events could be presented in this Annual LTMM Report. Future MWL semiannual soil-vapor monitoring will be performed at the same time as the semiannual groundwater monitoring, in April and October of each annual reporting period.

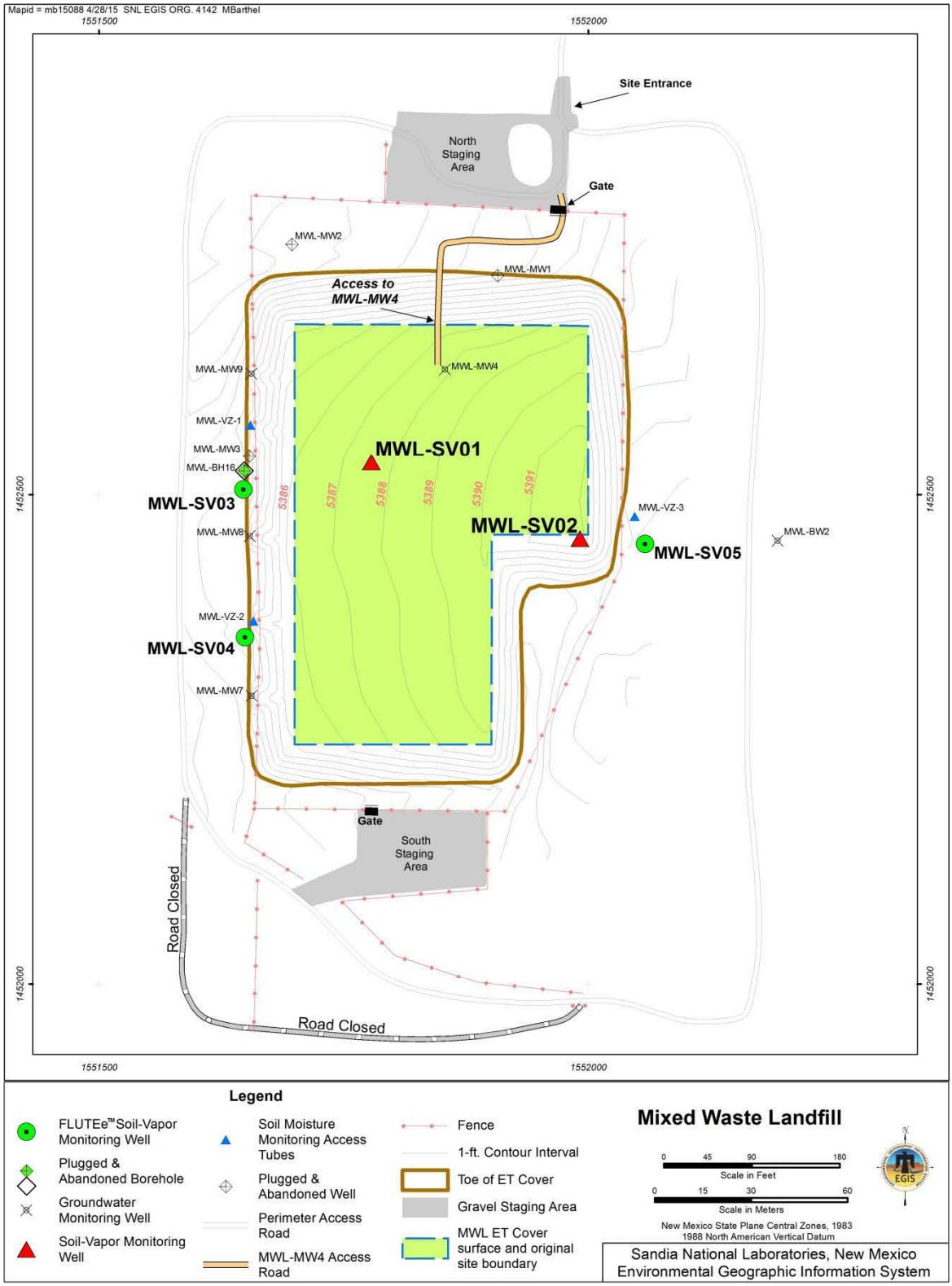

Figure 5-1
Mixed Waste Landfill Soil-Vapor Monitoring Well Locations

The two soil-vapor monitoring events are described as follows.

- The first sampling event was conducted on September 11, 2014. Soil vapor samples were collected from all monitoring wells (MWL-SV01, MWL-SV02, MWL-SV03, MWL-SV04, and MWL-SV05). Duplicate samples were collected from MWL-SV04 at the 100 and 300-foot depth sampling ports.

- The second sampling event was conducted on October 22, 2014. Soil vapor samples were collected from all monitoring wells and duplicate samples were collected from MWL-SV05 at the 200 and 400-foot depth sampling ports.

5.1.1 Well Purging

Purging removes stagnant air from each monitoring port and associated sample tubing, and draws representative soil vapor from the soil pore space surrounding the sampling port in the subsurface. All wells were purged to remove a minimum of three tubing volumes of air, and until VOC levels stabilized (3 measurements after purging 3 tubing volumes within plus or minus 10 percent), in accordance with procedures described in field operating procedure (FOP) FOP 08-22, “Soil-Vapor Sampling,” (SNL/NM June 2014b), and LTMMP Appendix D. All wells were purged using a dedicated (to the MWL) vacuum pump. Real time VOC screening was performed with a photoionization detector (PID) to determine VOC stabilization during the purging process. After achieving stabilization, PID VOC concentrations ranged from 0.0 to 0.2 parts per million by volume (ppmv) for all wells and sampling ports.

5.1.2 Field Quality Control

Field QC samples include duplicate samples (minimum of two per annual monitoring event) and field blank samples. Field QC samples were submitted for analysis with the soil-gas samples and analytical results are presented in Section 5.2.2 and Annex C. Duplicate samples were collected immediately after the original environmental sample in order to reduce variability caused by time and/or sampling mechanics. These sample results were used to evaluate the reproducibility of the sampling and analytical processes.

Field blank samples were prepared in the field during sampling activities by collecting an ultra-pure grade nitrogen gas sample at each monitoring well. Results were used to assess whether contamination of the samples may have resulted from ambient field conditions.

A brief explanation of the field QC sampling protocol for the September and October 2014 sampling events is provided below.

Duplicate samples were collected from the sample ports located at 100 feet bgs and 300 feet bgs at monitoring well MWL-SV04 in September, and from the sample ports located at 200 feet bgs and 400 feet bgs at monitoring well MWL-SV05 in October. A total of five QC field blank samples were submitted for analysis for each of the events.

5.1.3 Waste Management

A small volume of solid waste (e.g., PPE) was generated during the two soil-vapor monitoring events. This waste was combined with the solid waste generated during groundwater monitoring activities and managed in accordance with federal, state, and city regulations, and applicable SNL/NM requirements.

5.2 Laboratory Results

Environmental and field QC soil-vapor samples were submitted to Test America Laboratories, Inc. for analyses. Samples were analyzed in accordance with EPA Method TO-15. Analytical results that are equal to or above the analytical laboratory method detection limit (MDL) but below the reporting limit (RL) are qualified as estimated values by the laboratory and designated with a "J" qualifier. Analytical laboratory reports, including certificates of analyses, analytical methods, MDLs, RLs, dates of analyses, and data validation reports are filed in the SNL/NM Record Center.

5.2.1 Environmental Sample Results

This section summarizes soil-vapor monitoring results for the April 1, 2014 through March 31, 2015 reporting period. A summary of compounds detected in each event is provided below, along with a discussion of soil-vapor trigger levels defined in LTMMP Section 5.2.3.1.

First Semiannual Sampling Event – September 11, 2014

A total of 26 compounds were detected above laboratory MDLs in September 2014 samples. 22 of the VOCs were also detected in the October samples; the 4 highlighted VOCs were not detected in the October samples.

Acetone
Benzene
Bromodichloromethane
2-Butanone
Carbon Disulfide
Carbon Tetrachloride
Chloroform
Chloromethane
Dibromochloromethane
Dichlorodifluoromethane
1,1-Dichloroethane
1,1-Dichloroethene
cis-1,2-Dichloroethene
Ethyl Benzene
2-Hexanone
Methylene Chloride
Tetrachloroethene (PCE)
Toluene
Trichloroethene (TCE)
Trichlorofluoromethane
1,1,1-Trichloroethane
1,1,2-Trichloro-1,2,2-trifluoroethane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
m, p-Xylene
o-Xylene

Tetrachloroethene (PCE) and trichloroethene (TCE) are the primary VOCs of concern, exhibited the highest concentrations, and were reported in all environmental samples. PCE was detected at concentrations ranging from 0.052 to 0.560 ppmv, and TCE concentrations ranged from 0.044 to 0.300 ppmv. Other VOCs detected in all samples, generally at lower concentrations, include 2-butanone, chloroform, dichlorodifluoromethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1,1-trichloroethane, and trichlorofluoromethane. The maximum VOC concentration was 0.560 ppmv PCE from MWL-SV01-42.5.

Second Semiannual Sampling Event – October 22, 2014

A total of 27 compounds were detected above laboratory MDLs in October 2014 samples. VOCs that are not highlighted were also detected in the September samples; the 5 highlighted VOCs were not detected in the September samples.

Acetone
Benzene
2-Butanone
Carbon Disulfide
Carbon Tetrachloride
Chloroform
Chloromethane
Dibromochloromethane
Dichlorodifluoromethane
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,1-Dichloroethane
1,1-Dichloroethene
cis-1,2-Dichloroethene
1,2-Dichloropropane
2-Hexanone
Methylene Chloride
Tetrachloroethene (PCE)
Toluene
Trichloroethene (TCE)
Trichlorofluoromethane
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2-Trichloro-1,2,2-trifluoroethane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl Acetate

PCE and TCE exhibited the highest in soil vapor, and were reported in all environmental samples. PCE was detected at concentrations ranging from 0.048 ppmv to 0.400 ppmv. TCE concentrations ranged from 0.058 ppmv to 0.300 ppmv. Other VOCs detected in all samples, generally at lower concentrations, included dichlorodifluoromethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1,1-trichloroethane, and trichlorofluoromethane. The maximum VOC concentration was 0.400 ppmv PCE from samples MWL-SV01-42.5 and MWL-SV03-400.

Table 5-1 and Table 5-2 summarize detected VOCs results for the September 2014 and October 2014 sampling events, respectively. Table 5-3 provides results for PCE, TCE, and Total VOCs for both events. For the combined September-October data sets, PCE concentrations ranged from 0.048 ppmv (October MWL-SV05-50) to 0.560 ppmv (September MWL-SV01-42.5), and TCE concentrations ranged from 0.044 ppmv (September MWL-SV04-300) to 0.300 ppmv (September and October MWL-SV03-200). Total VOCs, as the sum of validated detected VOCs, were reported in all environmental samples at concentrations ranging from 0.20438 ppmv (September MWL-SV04-300) to 1.14010 ppmv (September MWL-SV01-42.5).

Table 5-1
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV01-42.5	Acetone	0.013	0.89	25	B, J	25U
11-Sep-14	Bromodichloromethane	0.00040	0.33	1.5	J	--
	2-Butanone	0.0027	0.99	4.0	J	--
	Carbon Disulfide	0.0031	0.39	4.0	J	4U
	Carbon Tetrachloride	0.00035	0.32	4.0	J	--
	Chloroform	0.013	0.47	1.5	--	--
	Chloromethane	0.0012	0.98	4.0	J	--
	Dichlorodifluoromethane	0.100	0.72	2.0	--	--
	1,1-Dichloroethane	0.0028	0.36	1.5	--	--
	1,1-Dichloroethene	0.0080	0.64	4.0	--	--
	cis-1,2-Dichloroethene	0.0015	0.44	2.0	J	--
	Tetrachloroethene	0.560	0.77	6.0	--	--
	Toluene	0.0011	0.25	2.0	J	--
	Trichloroethene	0.110	0.52	2.0	--	--
	Trichlorofluoromethane	0.190	0.98	2.0	--	--
	1,1,1-Trichloroethane	0.055	0.32	1.5	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.094	0.81	2.0	--	--
	Total Organics[d]	1.14010	NA	NA	NA	NA
MWL-SV02-41.5	Acetone	0.0083	0.38	11	B, J	11U
11-Sep-14	Benzene	0.00017	0.17	0.84	J	0.84U
	2-Butanone	0.0041	0.42	1.7	--	--
	Carbon Disulfide	0.0019	0.16	1.7	--	--
	Chloroform	0.0031	0.20	0.63	--	--
	Chloromethane	0.00052	0.42	1.7	J	--
	Dichlorodifluoromethane	0.094	0.31	0.84	--	--
	1,1-Dichloroethane	0.0026	0.15	0.63	--	--
	1,1-Dichloroethene	0.011	0.27	1.7	--	--
	cis-1,2-Dichloroethene	0.00096	0.19	0.84	--	--
	2-Hexanone	0.00043	0.18	0.84	J	--
	Methylene Chloride	0.00061	0.15	0.84	J	--
	Tetrachloroethene	0.086	0.11	0.84	--	--
	Trichloroethene	0.075	0.22	0.84	--	--
	Trichlorofluoromethane	0.300	1.7	3.4	--	--
	1,1,1-Trichloroethane	0.082	0.14	0.63	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.056	0.34	0.84	--	--
	Total Organics[d]	0.71822	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV03-50	Acetone	0.0072	0.24	6.8	B	--
11-Sep-14	Benzene	0.0060	0.11	0.54	--	--
	2-Butanone	0.0021	0.27	1.1	--	--
	Carbon Disulfide	0.00020	0.11	1.1	J	1.1U
	Carbon Tetrachloride	0.00022	0.086	1.1	J	--
	Chloroform	0.0018	0.13	0.41	--	--
	Dichlorodifluoromethane	0.022	0.20	0.54	--	--
	1,1-Dichloroethane	0.0024	0.097	0.41	--	--
	1,1-Dichloroethene	0.0085	0.17	1.1	--	--
	cis-1,2-Dichloroethene	0.0016	0.12	0.54	--	--
	2-Hexanone	0.00019	0.12	0.54	J	--
	Methylene Chloride	0.00046	0.097	0.54	J	--
	Tetrachloroethene	0.140	0.15	1.2	--	--
	Toluene	0.0028	0.069	0.54	--	2.8U
	Trichloroethene	0.100	0.31	1.2	--	--
	Trichlorofluoromethane	0.022	0.26	0.54	--	--
	1,1,1-Trichloroethane	0.0061	0.088	0.41	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.049	0.22	0.54	--	--
	Total Organics[d]	0.36957	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV03-100	Acetone	0.011	0.38	11	B	11U
11-Sep-14	Benzene	0.00081	0.17	0.85	J	0.85U
	2-Butanone	0.0021	0.42	1.7	--	--
	Carbon Disulfide	0.00086	0.17	1.7	J	1.7U
	Carbon Tetrachloride	0.00037	0.14	1.7	J	--
	Chloroform	0.0023	0.20	0.64	--	--
	Chloromethane	0.00052	0.42	1.7	J	--
	Dichlorodifluoromethane	0.040	0.31	0.85	--	--
	1,1-Dichloroethane	0.0051	0.15	0.64	--	--
	1,1-Dichloroethene	0.019	0.27	1.7	--	--
	cis-1,2-Dichloroethene	0.0034	0.19	0.85	--	--
	Methylene Chloride	0.0019	0.15	0.85	--	--
	Tetrachloroethene	0.210	0.22	1.7	--	--
	Toluene	0.0030	0.11	0.85	--	3.0U
	Trichloroethene	0.190	0.45	1.7	--	--
	Trichlorofluoromethane	0.030	0.42	0.85	--	--
	1,1,1-Trichloroethane	0.0066	0.14	0.64	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.100	0.35	0.85	--	--
	m,p-Xylene	0.00022	0.21	1.7	J	--
	Total Organics[d]	0.61151	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV03-200	Acetone	0.0047	0.53	15	B, J	15U
11-Sep-14	Benzene	0.00068	0.23	1.2	J	1.2U
	2-Butanone	0.0013	0.59	2.4	J	--
	Carbon Disulfide	0.00061	0.23	2.4	J	2.4U
	Carbon Tetrachloride	0.00056	0.19	2.4	J	--
	Chloroform	0.0020	0.28	0.89	--	--
	Dichlorodifluoromethane	0.057	0.43	1.2	--	--
	1,1-Dichloroethane	0.0076	0.21	0.89	--	--
	1,1-Dichloroethene	0.034	0.38	2.4	--	--
	cis-1,2-Dichloroethene	0.0050	0.26	1.2	--	--
	Methylene Chloride	0.0032	0.21	1.2	--	--
	Tetrachloroethene	0.300	0.30	2.4	--	--
	Toluene	0.0036	0.15	1.2	--	3.6U
	Trichloroethene	0.300	0.62	2.4	--	--
	Trichlorofluoromethane	0.026	0.58	1.2	--	--
	1,1,1-Trichloroethane	0.0024	0.19	0.89	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.180	0.96	2.4	--	--
	Total Organics[d]	0.91906	NA	NA	NA	NA
MWL-SV03-300	Acetone	0.014	0.90	25	B, J	25U
11-Sep-14	Benzene	0.0012	0.40	2.0	J	2.0U
	2-Butanone	0.0035	1.0	4.0	J	--
	Carbon Disulfide	0.023	0.39	4.0	--	--
	Chloroform	0.00081	0.48	1.5	J	--
	Dichlorodifluoromethane	0.027	0.73	2.0	--	--
	1,1-Dichloroethane	0.0020	0.36	1.5	--	--
	1,1-Dichloroethene	0.015	0.65	4.0	--	--
	cis-1,2-Dichloroethene	0.0020	0.45	2.0	--	--
	Methylene Chloride	0.0011	0.38	2.0	J	--
	Tetrachloroethene	0.290	0.26	2.0	--	--
	Toluene	0.0060	0.26	2.0	--	--
	Trichloroethene	0.190	0.53	2.0	--	--
	Trichlorofluoromethane	0.0091	0.99	2.0	--	--
	1,1,1-Trichloroethane	0.00066	0.33	1.5	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.079	0.82	2.0	--	--
	Total Organics[d]	0.64917	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV03-400	Acetone	0.013	0.90	25	B, J	25U
11-Sep-14	Benzene	0.0015	0.40	2.0	J	2.0U
	2-Butanone	0.0044	1.0	4.0	--	--
	Carbon Disulfide	0.026	0.39	4.0	--	--
	Carbon Tetrachloride	0.00033	0.32	4.0	J	--
	Chloroform	0.0012	0.48	1.5	J	--
	Chloromethane	0.0019	0.99	4.0	J	--
	Dichlorodifluoromethane	0.026	0.73	2.0	--	--
	1,1-Dichloroethane	0.0029	0.36	1.5	--	--
	1,1-Dichloroethene	0.019	0.65	4.0	--	--
	cis-1,2-Dichloroethene	0.0028	0.45	2.0	--	--
	Tetrachloroethene	0.390	0.51	4.0	--	--
	Toluene	0.022	0.26	2.0	--	--
	Trichloroethene	0.290	0.53	2.0	--	--
	Trichlorofluoromethane	0.0096	0.99	2.0	--	--
	1,1,1-Trichloroethane	0.0013	0.33	1.5	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.075	0.82	2.0	--	--
	o-Xylene	0.00027	0.27	2.0	J	--
	Total Organics[d]	0.87270	NA	NA	NA	NA
MWL-SV04-50	Acetone	0.0069	0.44	12	B, J	12U
11-Sep-14	Benzene	0.0017	0.20	1.0	--	1.7U
	2-Butanone	0.00064	0.50	2.0	J	--
	Carbon Disulfide	0.00024	0.19	2.0	J	--
	Chloroform	0.0018	0.24	0.75	--	--
	Dichlorodifluoromethane	0.021	0.36	1.0	--	--
	1,1-Dichloroethane	0.0013	0.18	0.75	--	--
	1,1-Dichloroethene	0.0064	0.32	2.0	--	--
	cis-1,2-Dichloroethene	0.00051	0.22	1.0	J	--
	Tetrachloroethene	0.072	0.13	1.0	--	--
	Toluene	0.0013	0.13	1.0	--	--
	Trichloroethene	0.061	0.26	1.0	--	--
	Trichlorofluoromethane	0.023	0.49	1.0	--	--
	1,1,1-Trichloroethane	0.0063	0.16	0.75	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.064	0.41	1.0	--	--
	Total Organics[d]	0.25949	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV04-100	Acetone	0.0033	0.24	6.8	B, J	6.8U
11-Sep-14	Benzene	0.00094	0.11	0.54	--	0.94U
	2-Butanone	0.00050	0.27	1.1	J	--
	Carbon Disulfide	0.00014	0.11	1.1	J	--
	Carbon Tetrachloride	0.00038	0.086	1.1	J	--
	Chloroform	0.0018	0.13	0.41	--	--
	Chloromethane	0.00029	0.27	1.1	J	--
	Dichlorodifluoromethane	0.035	0.20	0.54	--	--
	1,1-Dichloroethane	0.0029	0.097	0.41	--	--
	1,1-Dichloroethene	0.016	0.17	1.1	--	--
	cis-1,2-Dichloroethene	0.0017	0.12	0.54	--	--
	Methylene Chloride	0.00045	0.097	0.54	J	--
	Tetrachloroethene	0.130	0.21	1.6	--	--
	Toluene	0.0019	0.069	0.54	--	--
	Trichloroethene	0.130	0.42	1.6	--	--
	Trichlorofluoromethane	0.029	0.26	0.54	--	--
	1,1,1-Trichloroethane	0.0050	0.088	0.41	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.100	0.66	1.6	--	--
	Total Organics[d]	0.45506	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV04-100 (Duplicate)	Acetone	0.011	0.44	12	B, J	12U
11-Sep-14	Benzene	0.00085	0.20	0.99	J	0.99U
	2-Butanone	0.0024	0.49	2.0	--	--
	Carbon Disulfide	0.00045	0.19	2.0	J	--
	Carbon Tetrachloride	0.00039	0.16	2.0	J	--
	Chloroform	0.0018	0.24	0.74	--	--
	Dichlorodifluoromethane	0.035	0.36	0.99	--	--
	1,1-Dichloroethane	0.0029	0.18	0.74	--	--
	1,1-Dichloroethene	0.016	0.32	2.0	--	--
	cis-1,2-Dichloroethene	0.0018	0.22	0.99	--	--
	Methylene Chloride	0.00047	0.18	0.99	J	--
	Tetrachloroethene	0.130	0.13	0.99	--	--
	Toluene	0.0021	0.13	0.99	--	--
	Trichloroethene	0.130	0.26	0.99	--	--
	Trichlorofluoromethane	0.031	0.49	0.99	--	--
	1,1,1-Trichloroethane	0.0050	0.16	0.74	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.097	0.40	0.99	--	--
	Total Organics[d]	0.45631	NA	NA	NA	NA
MWL-SV04-200	Acetone	0.0072	0.52	15	B, J	15U
11-Sep-14	Benzene	0.00060	0.23	1.2	J	1.2U
	2-Butanone	0.00081	0.58	2.3	J	--
	Carbon Disulfide	0.00058	0.23	2.3	J	--
	Carbon Tetrachloride	0.00062	0.19	2.3	J	--
	Chloroform	0.0014	0.28	0.87	--	--
	Dichlorodifluoromethane	0.051	0.42	1.2	--	--
	1,1-Dichloroethane	0.0049	0.21	0.87	--	--
	1,1-Dichloroethene	0.034	0.37	2.3	--	--
	cis-1,2-Dichloroethene	0.0031	0.26	1.2	--	--
	Methylene Chloride	0.0012	0.21	1.2	--	--
	Tetrachloroethene	0.180	0.30	2.3	--	--
	Toluene	0.0030	0.15	1.2	--	--
	Trichloroethene	0.210	0.61	2.3	--	--
	Trichlorofluoromethane	0.031	0.57	1.2	--	--
	1,1,1-Trichloroethane	0.0020	0.19	0.87	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.160	0.47	1.2	--	--
	Total Organics[d]	0.68361	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV04-300	Acetone	0.0045	0.25	7.2	B, J	7.2U
11-Sep-14	Benzene	0.00064	0.11	0.57	--	0.64U
	2-Butanone	0.00084	0.28	1.1	J	--
	Carbon Disulfide	0.00044	0.11	1.1	J	--
	Chloroform	0.00044	0.14	0.43	--	--
	Dichlorodifluoromethane	0.016	0.21	0.57	--	--
	1,1-Dichloroethane	0.00071	0.10	0.43	--	--
	1,1-Dichloroethene	0.0095	0.18	1.1	--	--
	cis-1,2-Dichloroethene	0.00071	0.13	0.57	--	--
	Methylene Chloride	0.00026	0.10	0.57	J	--
	Tetrachloroethene	0.110	0.15	1.1	--	--
	Toluene	0.0033	0.073	0.57	--	--
	Trichloroethene	0.076	0.15	0.57	--	--
	Trichlorofluoromethane	0.0079	0.28	0.57	--	--
	1,1,1-Trichloroethane	0.00046	0.093	0.43	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.039	0.23	0.57	--	--
	1,2,4-Trimethylbenzene	0.00038	0.23	1.1	J	--
	m,p-Xylene	0.00020	0.14	1.1	J	--
	o-Xylene	0.00010	0.077	0.57	J	--
	Total Organics[d]	0.26624	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV04-300 (Duplicate)	Acetone	0.0089	0.25	7.1	B	--
11-Sep-14	Benzene	0.00055	0.11	0.57	J	0.57U
	2-Butanone	0.0019	0.28	1.1	--	--
	Carbon Disulfide	0.00071	0.11	1.1	J	--
	Carbon Tetrachloride	0.00019	0.091	1.1	J	--
	Chloroform	0.00019	0.13	0.43	J	--
	Dibromochloromethane	0.00017	0.11	0.57	J	--
	Dichlorodifluoromethane	0.015	0.21	0.57	--	--
	1,1-Dichloroethane	0.00016	0.10	0.43	J	--
	1,1-Dichloroethene	0.0052	0.18	1.1	--	--
	2-Hexanone	0.00019	0.12	0.57	J	--
	Tetrachloroethene	0.082	0.072	0.57	--	--
	Toluene	0.0034	0.072	0.57	--	--
	Trichloroethene	0.044	0.15	0.57	--	--
	Trichlorofluoromethane	0.0053	0.28	0.57	--	--
	1,1,1-Trichloroethane	0.00013	0.092	0.43	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.036	0.23	0.57	--	--
	1,2,4-Trimethylbenzene	0.00047	0.23	1.1	J	--
	1,3,5-Trimethylbenzene	0.00018	0.18	0.57	J	--
	m,p-Xylene	0.00018	0.14	1.1	J	--
	o-Xylene	0.00011	0.077	0.57	J	--
	Total Organics[d]	0.20438	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV04-400	Acetone	0.0087	0.29	8.2	B	8.7U
11-Sep-14	Benzene	0.0012	0.13	0.65	--	1.2U
	2-Butanone	0.0016	0.32	1.3	--	--
	Carbon Disulfide	0.0023	0.13	1.3	--	--
	Carbon Tetrachloride	0.00016	0.10	1.3	J	--
	Chloroform	0.00040	0.15	0.49	J	--
	Chloromethane	0.0012	0.32	1.3	J	--
	Dichlorodifluoromethane	0.011	0.24	0.65	--	--
	1,1-Dichloroethane	0.00068	0.12	0.49	--	--
	1,1-Dichloroethene	0.0073	0.21	1.3	--	--
	cis-1,2-Dichloroethene	0.00075	0.15	0.65	--	--
	Ethylbenzene	0.00012	0.10	0.65	J	--
	Methylene Chloride	0.00026	0.12	0.65	J	--
	Tetrachloroethene	0.110	0.17	1.3	--	--
	Toluene	0.0023	0.083	0.65	--	--
	Trichloroethene	0.075	0.17	0.65	--	--
	Trichlorofluoromethane	0.0060	0.32	0.65	--	--
	1,1,1-Trichloroethane	0.00039	0.11	0.49	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.030	0.27	0.65	--	--
	1,2,4-Trimethylbenzene	0.00042	0.26	1.3	J	--
	m,p-Xylene	0.00029	0.16	1.3	J	--
	o-Xylene	0.00014	0.088	0.65	J	--
	Total Organics[d]	0.25031	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-50	Acetone	0.012	0.24	6.8	B	--
11-Sep-14	Benzene	0.00068	0.11	0.54	--	0.68U
	2-Butanone	0.0019	0.27	1.1	--	--
	Carbon Disulfide	0.00021	0.11	1.1	J	--
	Carbon Tetrachloride	0.00039	0.086	1.1	J	--
	Chloroform	0.0015	0.13	0.41	--	--
	Dichlorodifluoromethane	0.045	0.20	0.54	--	--
	1,1-Dichloroethane	0.0018	0.097	0.41	--	--
	1,1-Dichloroethene	0.011	0.17	1.1	--	--
	cis-1,2-Dichloroethene	0.00071	0.12	0.54	--	--
	2-Hexanone	0.00015	0.12	0.54	J	--
	Methylene Chloride	0.00031	0.097	0.54	J	--
	Tetrachloroethene	0.052	0.069	0.54	--	--
	Toluene	0.0015	0.069	0.54	--	--
	Trichloroethene	0.067	0.14	0.54	--	--
	Trichlorofluoromethane	0.110	0.53	1.1	--	--
	1,1,1-Trichloroethane	0.013	0.088	0.41	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.047	0.22	0.54	--	--
	Total Organics[d]	0.36547	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-100	Acetone	0.0052	0.38	11	B, J	11U
11-Sep-14	Benzene	0.00056	0.17	0.86	J	0.86U
	2-Butanone	0.0010	0.43	1.7	J	--
	Carbon Disulfide	0.00026	0.17	1.7	J	--
	Carbon Tetrachloride	0.00070	0.14	1.7	J	--
	Chloroform	0.0021	0.20	0.65	--	--
	Dichlorodifluoromethane	0.066	0.31	0.86	--	--
	1,1-Dichloroethane	0.0034	0.15	0.65	--	--
	1,1-Dichloroethene	0.023	0.28	1.7	--	--
	cis-1,2-Dichloroethene	0.0016	0.19	0.86	--	--
	Methylene Chloride	0.00092	0.15	0.86	--	--
	Tetrachloroethene	0.092	0.11	0.86	--	--
	Toluene	0.0018	0.11	0.86	--	--
	Trichloroethene	0.140	0.45	1.7	--	--
	Trichlorofluoromethane	0.130	0.42	0.86	--	--
	1,1,1-Trichloroethane	0.012	0.14	0.65	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.091	0.35	0.86	--	--
	Total Organics[d]	0.56578	NA	NA	NA	NA
MWL-SV05-200	Acetone	0.0083	0.45	13	B, J	13U
11-Sep-14	Benzene	0.00034	0.20	1.0	J	1.0U
	2-Butanone	0.0018	0.50	2.0	J	--
	Carbon Disulfide	0.00027	0.20	2.0	J	--
	Carbon Tetrachloride	0.0012	0.16	2.0	J	--
	Chloroform	0.0019	0.24	0.75	--	--
	Dichlorodifluoromethane	0.066	0.36	1.0	--	--
	1,1-Dichloroethane	0.0049	0.18	0.75	--	--
	1,1-Dichloroethene	0.042	0.32	2.0	--	--
	cis-1,2-Dichloroethene	0.0023	0.22	1.0	--	--
	Methylene Chloride	0.0025	0.18	1.0	--	--
	Tetrachloroethene	0.140	0.13	1.0	--	--
	Toluene	0.0042	0.13	1.0	--	--
	Trichloroethene	0.200	0.53	2.0	--	--
	Trichlorofluoromethane	0.072	0.49	1.0	--	--
	1,1,1-Trichloroethane	0.0033	0.16	0.75	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.160	0.82	2.0	--	--
	Total Organics[d]	0.70237	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-300	Acetone	0.013	0.27	7.5	B	--
11-Sep-14	Benzene	0.00053	0.12	0.60	J	0.6U
	2-Butanone	0.0020	0.30	1.2	--	--
	Carbon Disulfide	0.0031	0.12	1.2	--	--
	Carbon Tetrachloride	0.00087	0.096	1.2	J	--
	Chloroform	0.00061	0.14	0.45	--	--
	Chloromethane	0.00051	0.30	1.2	J	--
	Dichlorodifluoromethane	0.024	0.22	0.60	--	--
	1,1-Dichloroethane	0.0012	0.11	0.45	--	--
	1,1-Dichloroethene	0.020	0.19	1.2	--	--
	cis-1,2-Dichloroethene	0.00089	0.13	0.60	--	--
	2-Hexanone	0.00013	0.13	0.60	J	--
	Methylene Chloride	0.00072	0.11	0.60	--	--
	Tetrachloroethene	0.090	0.077	0.60	--	--
	Toluene	0.0061	0.077	0.60	--	--
	Trichloroethene	0.100	0.32	1.2	--	--
	Trichlorofluoromethane	0.019	0.29	0.60	--	--
	1,1,1-Trichloroethane	0.00090	0.098	0.45	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.073	0.24	0.60	--	--
	m,p-Xylene	0.00016	0.15	1.2	J	--
	o-Xylene	0.000085	0.081	0.60	J	--
	Total Organics[d]	0.35628	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Concluded)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
September 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-400	Acetone	0.014	0.52	15	B, J	15U
11-Sep-14	Benzene	0.00099	0.23	1.2	J	1.2U
	2-Butanone	0.0022	0.59	2.4	J	--
	Carbon Disulfide	0.0012	0.23	2.4	J	--
	Carbon Tetrachloride	0.00049	0.19	2.4	J	--
	Chloroform	0.00054	0.28	0.88	J	--
	Chloromethane	0.0017	0.58	2.4	J	--
	Dichlorodifluoromethane	0.015	0.43	1.2	--	--
	1,1-Dichloroethane	0.0012	0.21	0.88	--	--
	1,1-Dichloroethene	0.014	0.38	2.4	--	--
	cis-1,2-Dichloroethene	0.00082	0.26	1.2	J	--
	Methylene Chloride	0.00071	0.21	1.2	J	--
	Tetrachloroethene	0.100	0.15	1.2	--	--
	Toluene	0.250	0.30	2.4	--	--
	Trichloroethene	0.094	0.31	1.2	--	--
	Trichlorofluoromethane	0.018	0.58	1.2	--	--
	1,1,1-Trichloroethane	0.0011	0.19	0.88	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.040	0.48	1.2	--	--
	Total Organics[d]	0.54096	NA	NA	NA	NA

Notes:
[a]U.S. Environmental Protection Agency, 1999, "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-15" Center for Environmental Research Information, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.
[b]Results are reported in ppmv. MDL and RL are reported in ppbv.
[c]Laboratory/Validation Qualifier - Blank (--) cell = all quality control samples met acceptance criteria. Qualifiers "B," "J," and "U" see below.
[d]Total Organics -- Sum of validated detected organic analytes (i.e., results for analytes reported as detections by the laboratory but qualified during data validation as not detected are not included in the Total Organics value).
B = Compound was detected in the blank and sample.
EPA = U.S. Environmental Protection Agency.
ID = Identifier.
J = Result detected at a level below the RL but greater than or equal to the MDL and is an approximate value.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is present (i.e., greater than zero).
MWL = Mixed Waste Landfill.
NA = Not applicable.
ppbv = parts per billion, by volume basis.
ppmv = parts per million, by volume basis.
RL = Reporting limit. Minimum concentration that can be reported with a statistically established degree of confidence.
SV = Soil vapor.
U = The analyte was reported as a detection by the laboratory but was qualified during data validation review as not detected. The associated numerical value is the revised sample quantitation limit, in accordance with the data validation process.

Table 5-2
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV01-42.5	Chloroform	0.012	2.3	7.2	--	--
22-Oct-14	Dichlorodifluoromethane	0.110	3.5	9.6	--	--
	1,1-Dichloroethane	0.0027	1.7	7.2	J	--
	1,1-Dichloroethene	0.010	3.1	19	J	--
	Tetrachloroethene	0.400	1.2	9.6	--	--
	Trichloroethene	0.090	2.5	9.6	--	--
	Trichlorofluoromethane	0.230	4.7	9.6	--	--
	1,1,1-Trichloroethane	0.054	1.6	7.2	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.100	3.9	9.6	--	--
	Total Organics[d]	1.0087	NA	NA	NA	NA
MWL-SV02-41.5	Acetone	0.0028	1.6	45	J	45U
22-Oct-14	Chloroform	0.0026	0.86	2.7	J	--
	Dichlorodifluoromethane	0.089	1.3	3.6	--	--
	1,1-Dichloroethane	0.0022	0.65	2.7	J	--
	1,1-Dichloroethene	0.011	1.2	7.3	--	--
	Tetrachloroethene	0.067	0.46	3.6	--	--
	Trichloroethene	0.058	0.95	3.6	--	--
	Trichlorofluoromethane	0.320	1.8	3.6	--	--
	1,1,1-Trichloroethane	0.076	0.59	2.7	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.053	1.5	3.6	--	--
	Total Organics[d]	0.6788	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV03-50	Acetone	0.0055	1.3	37	J	--
22-Oct-14	Benzene	0.005	0.59	3.0	--	--
	Chloroform	0.0016	0.71	2.2	J	--
	Dichlorodifluoromethane	0.020	1.1	3.0	--	--
	1,1-Dichloroethane	0.0021	0.54	2.2	J	--
	1,1-Dichloroethene	0.0071	0.96	6.0	--	--
	cis-1,2-Dichloroethene	0.0013	0.66	3.0	J	--
	Styrene	0.00045	0.44	3.0	B, J	3.0U
	Tetrachloroethene	0.120	0.38	3.0	--	--
	Toluene	0.0022	0.38	3.0	J	--
	Trichloroethene	0.082	0.78	3.0	--	--
	Trichlorofluoromethane	0.019	1.5	3.0	--	--
	1,1,1-Trichloroethane	0.0057	0.48	2.2	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.046	1.2	3.0	--	--
	m,p-Xylene	0.00085	0.74	6.0	B, J	6.0U
	o-Xylene	0.00046	0.40	3.0	B, J	3.0U
	Total Organics[d]	0.3175	NA	NA	NA	NA
MWL-SV03-100	Chloroform	0.0023	1.4	4.5	J	--
22-Oct-14	Dichlorodifluoromethane	0.039	2.2	6.0	--	--
	1,1-Dichloroethane	0.0053	1.1	4.5	--	--
	1,1-Dichloroethene	0.019	1.9	12	--	--
	cis-1,2-Dichloroethene	0.0037	1.3	6.0	J	--
	Methylene Chloride	0.0017	1.1	6.0	J	--
	Tetrachloroethene	0.230	0.76	6.0	--	--
	Toluene	0.0016	0.76	6.0	J	--
	Trichloroethene	0.190	1.6	6.0	--	--
	Trichlorofluoromethane	0.029	2.9	6.0	--	--
	1,1,1-Trichloroethane	0.0066	0.97	4.5	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.110	2.4	6.0	--	--
	Total Organics[d]	0.6382	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV03-200	Acetone	0.0033	1.3	37	J	--
22-Oct-14	Benzene	0.00092	0.59	3.0	J	--
	Carbon Disulfide	0.00059	0.58	6.0	J	--
	Chlorobenzene	0.00056	0.48	2.2	B, J	2.2U
	Chloroform	0.0023	0.71	2.2	--	--
	1,2-Dichlorobenzene	0.0011	0.97	3.0	J	--
	1,3-Dichlorobenzene	0.0011	0.82	3.0	B, J	3.0U
	1,4-Dichlorobenzene	0.0012	1.1	3.0	J	--
	Dichlorodifluoromethane	0.054	1.1	3.0	--	--
	1,1-Dichloroethane	0.0081	0.54	2.2	--	--
	1,1-Dichloroethene	0.035	0.96	6.0	--	--
	cis-1,2-Dichloroethene	0.0057	0.66	3.0	--	--
	Ethylbenzene	0.00061	0.47	3.0	B, J	3.0U
	Methylene Chloride	0.0034	0.54	3.0	--	--
	Styrene	0.00085	0.44	3.0	B, J	3.0U
	1,1,2,2-Tetrachloroethane	0.00053	0.51	3.0	J	--
	Tetrachloroethene	0.320	0.38	3.0	--	--
	Toluene	0.0025	0.38	3.0	J	--
	Trichloroethene	0.300	0.78	3.0	--	--
	Trichlorofluoromethane	0.025	1.5	3.0	--	--
	1,1,1-Trichloroethane	0.0028	0.48	2.2	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.180	1.2	3.0	--	--
	1,3,5-Trimethylbenzene	0.0011	0.93	3.0	J	--
	m,p-Xylene	0.0016	0.74	6.0	B, J	6.0U
	o-Xylene	0.00079	0.40	3.0	B, J	3.0U
	Total Organics[d]	0.94754	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV03-300	Acetone	0.0065	1.3	37	J	--
22-Oct-14	Benzene	0.00088	0.59	3.0	J	--
	Carbon Disulfide	0.0023	0.58	6.0	J	--
	Chloroform	0.001	0.71	2.2	J	--
	Dichlorodifluoromethane	0.024	1.1	3.0	--	--
	1,1-Dichloroethane	0.0025	0.54	2.2	--	--
	1,1-Dichloroethene	0.017	0.96	6.0	--	--
	cis-1,2-Dichloroethene	0.0024	0.66	3.0	J	--
	Methylene Chloride	0.00097	0.54	3.0	J	--
	Tetrachloroethene	0.320	0.38	3.0	--	--
	Toluene	0.0031	0.38	3.0	--	--
	Trichloroethene	0.210	0.78	3.0	--	--
	Trichlorofluoromethane	0.0085	1.5	3.0	--	--
	1,1,1-Trichloroethane	0.0012	0.48	2.2	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.078	1.2	3.0	--	--
	Total Organics[d]	0.67835	NA	NA	NA	NA
MWL-SV03-400	Dichlorodifluoromethane	0.023	2.7	7.4	--	--
22-Oct-14	1,1-Dichloroethane	0.0028	1.3	5.6	J	--
	1,1-Dichloroethene	0.017	2.4	15	--	--
	cis-1,2-Dichloroethene	0.0024	1.7	7.4	J	--
	Tetrachloroethene	0.400	0.95	7.4	--	--
	Toluene	0.0062	0.95	7.4	J	--
	Trichloroethene	0.280	2.0	7.4	--	--
	Trichlorofluoromethane	0.0092	3.6	7.4	--	--
	1,1,1-Trichloroethane	0.0015	1.2	5.6	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.072	3.0	7.4	--	--
	Total Organics[d]	0.8141	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV04-50	Acetone	0.0058	0.52	15	J	--
22-Oct-14	Benzene	0.0013	0.23	1.2	--	--
	2-Butanone	0.00069	0.58	2.3	J	--
	Carbon Disulfide	0.0016	0.23	2.3	J	--
	Chloroform	0.0018	0.28	0.87	--	--
	Dichlorodifluoromethane	0.019	0.42	1.2	--	--
	1,1-Dichloroethane	0.0012	0.21	0.87	--	--
	1,1-Dichloroethene	0.0059	0.37	2.3	--	--
	Tetrachloroethene	0.076	0.15	1.2	--	--
	Toluene	0.00062	0.15	1.2	J	1.2U
	Trichloroethene	0.059	0.30	1.2	--	--
	Trichlorofluoromethane	0.021	0.57	1.2	--	--
	1,1,1-Trichloroethane	0.0063	0.19	0.87	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.064	0.47	1.2	--	--
	Total Organics[d]	0.26359	NA	NA	NA	NA
MWL-SV04-100	Acetone	0.005	0.89	25	J	--
22-Oct-14	Benzene	0.00084	0.39	2.0	J	2.0U
	Chloroform	0.0018	0.47	1.5	--	--
	Dichlorodifluoromethane	0.032	0.72	2.0	--	--
	1,1-Dichloroethane	0.0028	0.36	1.5	--	--
	1,1-Dichloroethene	0.015	0.64	4.0	--	--
	cis-1,2-Dichloroethene	0.0017	0.44	2.0	J	--
	Methylene Chloride	0.00049	0.36	2.0	J	--
	Tetrachloroethene	0.120	0.25	2.0		--
	Toluene	0.00099	0.25	2.0	J	2.0U
	Trichloroethene	0.120	0.52	2.0	--	--
	Trichlorofluoromethane	0.029	0.98	2.0	--	--
	1,1,1-Trichloroethane	0.005	0.32	1.5	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.096	0.81	2.0	--	--
	Total Organics[d]	0.42879	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV04-200	Carbon Tetrachloride	0.00055	0.48	6.0	J	--
22-Oct-14	Chloroform	0.0012	0.71	2.2	J	--
	Dichlorodifluoromethane	0.048	1.1	3.0	--	--
	1,1-Dichloroethane	0.0044	0.54	2.2	--	--
	1,1-Dichloroethene	0.030	0.96	6.0	--	--
	cis-1,2-Dichloroethene	0.003	0.66	3.0	--	--
	Methylene Chloride	0.0011	0.54	3.0	J	--
	Tetrachloroethene	0.180	0.38	3.0	--	--
	Toluene	0.0019	0.38	3.0	J	3.0U
	Trichloroethene	0.210	0.78	3.0	--	--
	Trichlorofluoromethane	0.029	1.5	3.0	--	--
	1,1,1-Trichloroethane	0.0021	0.48	2.2	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.160	1.2	3.0	--	--
	Total Organics[d]	0.66935	NA	NA	NA	NA
MWL-SV04-300	Acetone	0.010	0.88	25	J	--
22-Oct-14	Benzene	0.00058	0.39	2.0	J	2.0U
	2-Butanone	0.0018	0.99	4.0	J	--
	Carbon Disulfide	0.00052	0.39	4.0	J	--
	Chloroform	0.00051	0.47	1.5	J	--
	Dichlorodifluoromethane	0.018	0.72	2.0	--	--
	1,1-Dichloroethane	0.00096	0.36	1.5	J	--
	1,1-Dichloroethene	0.0099	0.64	4.0	--	--
	cis-1,2-Dichloroethene	0.00067	0.44	2.0	J	--
	Tetrachloroethene	0.130	0.25	2.0	--	--
	Toluene	0.0018	0.25	2.0	J	2.0U
	Trichloroethene	0.091	0.52	2.0	--	--
	Trichlorofluoromethane	0.0094	0.97	2.0	--	--
	1,1,1-Trichloroethane	0.00079	0.32	1.5	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.050	0.81	2.0	--	--
	Total Organics[d]	0.32355	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV04-400	Acetone	0.0052	0.90	25	J	--
22-Oct-14	Benzene	0.0015	0.40	2.0	J	2.0U
	Carbon Disulfide	0.001	0.40	4.1	J	--
	Chloroform	0.00061	0.48	1.5	J	--
	Chloromethane	0.0012	1.0	4.1	J	--
	Dibromochloromethane	0.00045	0.40	2.0	J	--
	Dichlorodifluoromethane	0.015	0.74	2.0	--	--
	1,1-Dichloroethane	0.0011	0.37	1.5	J	--
	1,1-Dichloroethene	0.0089	0.65	4.1	--	--
	cis-1,2-Dichloroethene	0.00095	0.45	2.0	J	--
	Ethylbenzene	0.00037	0.32	2.0	B, J	2.0U
	Styrene	0.00052	0.30	2.0	B, J	2.0U
	Tetrachloroethene	0.140	0.26	2.0	--	--
	Toluene	0.0015	0.26	2.0	B, J	2.0U
	Trichloroethene	0.096	0.53	2.0	--	--
	Trichlorofluoromethane	0.0092	0.99	2.0	--	--
	1,1,1-Trichloroethane	0.00099	0.33	1.5	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.044	0.83	2.0	--	--
	m,p-Xylene	0.00098	0.51	4.1	B, J	4.1U
	o-Xylene	0.00051	0.27	2.0	B, J	2.0U
	Total Organics[d]	0.3246	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-50	Acetone	0.0083	0.52	15	J	--
22-Oct-14	Benzene	0.00079	0.23	1.2	J	--
	2-Butanone	0.0012	0.58	2.3	J	--
	Carbon Disulfide	0.0014	0.23	2.3	J	--
	Carbon Tetrachloride	0.00038	0.19	2.3	J	--
	Chlorobenzene	0.00022	0.19	0.88	B, J	0.88U
	Chloroform	0.0013	0.28	0.88	--	--
	Dichlorodifluoromethane	0.039	0.42	1.2	--	--
	1,1-Dichloroethane	0.0015	0.21	0.88	--	--
	1,1-Dichloroethene	0.0094	0.38	2.3	--	--
	cis-1,2-Dichloroethene	0.00068	0.26	1.2	J	--
	Ethylbenzene	0.00025	0.18	1.2	B, J	1.2U
	Methylene Chloride	0.00028	0.21	1.2	J	--
	Styrene	0.00027	0.17	1.2	B, J	1.2U
	Tetrachloroethene	0.048	0.15	1.2	--	--
	Toluene	0.0011	0.15	1.2	J	--
	Trichloroethene	0.061	0.31	1.2	--	--
	Trichlorofluoromethane	0.089	0.57	1.2	--	--
	1,1,1-Trichloroethane	0.012	0.19	0.88	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.043	0.48	1.2	--	--
	m,p-Xylene	0.0006	0.29	2.3	B, J	2.3U
	o-Xylene	0.00027	0.16	1.2	B, J	1.2U
	Total Organics[d]	0.31833	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-100	Acetone	0.0072	0.56	16	J	--
22-Oct-14	Benzene	0.00053	0.25	1.3	J	--
	2-Butanone	0.0012	0.63	2.5	J	--
	Carbon Tetrachloride	0.00067	0.20	2.5	J	--
	Chloroform	0.0021	0.30	0.95	--	--
	Dichlorodifluoromethane	0.060	0.46	1.3	--	--
	1,1-Dichloroethane	0.0033	0.23	0.95	--	--
	1,1-Dichloroethene	0.022	0.41	2.5	--	--
	cis-1,2-Dichloroethene	0.0017	0.28	1.3	--	--
	Methylene Chloride	0.00086	0.23	1.3	J	--
	Styrene	0.00025	0.19	1.3	B, J	1.3U
	Tetrachloroethene	0.096	0.16	1.3	--	--
	Toluene	0.00097	0.16	1.3	B, J	1.3U
	Trichloroethene	0.130	0.33	1.3	--	--
	Trichlorofluoromethane	0.120	0.62	1.3	--	--
	1,1,1-Trichloroethane	0.012	0.21	0.95	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.088	0.52	1.3	--	--
	m,p-Xylene	0.00048	0.32	2.5	B, J	2.5U
	o-Xylene	0.00025	0.17	1.3	B, J	1.3U
	Total Organics[d]	0.54556	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-200	Acetone	0.0064	1.1	31	J	--
22-Oct-14	2-Butanone	0.0016	1.3	5.0	J	--
	Carbon Tetrachloride	0.0012	0.40	5.0	J	--
	Chloroform	0.0021	0.60	1.9	--	--
	Dichlorodifluoromethane	0.062	0.91	2.5	--	--
	1,1-Dichloroethane	0.0051	0.45	1.9	--	--
	1,1-Dichloroethene	0.042	0.81	5.0	--	--
	cis-1,2-Dichloroethene	0.0025	0.56	2.5	--	--
	Methylene Chloride	0.0024	0.45	2.5	J	--
	Tetrachloroethene	0.140	0.32	2.5	--	--
	Toluene	0.0022	0.32	2.5	B, J	2.5U
	Trichloroethene	0.210	0.66	2.5	--	--
	Trichlorofluoromethane	0.070	1.2	2.5	--	--
	1,1,1-Trichloroethane	0.0036	0.41	1.9	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.160	1.0	2.5	--	--
	m,p-Xylene	0.00077	0.63	5.0	B, J	5.0U
	o-Xylene	0.00043	0.34	2.5	B, J	2.5U
	Total Organics[d]	0.7089	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-200 (Duplicate) 22-Oct-14	Acetone	0.0043	0.18	5.0	J	--
	Benzene	0.00033	0.079	0.40	J	--
	2-Butanone	0.00081	0.20	0.80	--	--
	Carbon Disulfide	0.00053	0.078	0.80	J	--
	Carbon Tetrachloride	0.0012	0.064	0.80	--	--
	Chlorobenzene	0.000076	0.064	0.30	B, J	0.30U
	Chloroform	0.0019	0.095	0.30	--	--
	Chloromethane	0.00023	0.20	0.80	J	--
	Dichlorodifluoromethane	0.071	0.93	2.6	--	--
	1,1-Dichloroethane	0.0053	0.072	0.30	--	--
	1,1-Dichloroethene	0.045	0.13	0.80	--	--
	cis-1,2-Dichloroethene	0.0027	0.089	0.40	--	--
	1,2-Dichloropropane	0.0003	0.24	0.40	J	--
	Ethylbenzene	0.000071	0.063	0.40	B, J	0.40U
	2-Hexanone	0.00012	0.087	0.40	J	--
	Methylene Chloride	0.0026	0.072	0.40	--	--
	Styrene	0.000063	0.059	0.40	B, J	0.40U
	Tetrachloroethene	0.170	0.33	2.6	--	--
	Toluene	0.0024	0.051	0.40	B	--
	Trichloroethene	0.240	0.67	2.6	--	--
	Trichlorofluoromethane	0.078	1.3	2.6	--	--
	1,1,1-Trichloroethane	0.0033	0.065	0.30	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.190	1.0	2.6	--	--
	1,2,4-Trimethylbenzene	0.00018	0.16	0.80	J	--
	Vinyl Acetate	0.00095	0.15	0.80	--	--
	m,p-Xylene	0.00017	0.10	0.80	B, J	0.80U
	o-Xylene	0.000093	0.054	0.40	B, J	0.40U
	Total Organics[d]	0.82115	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-300	Acetone	0.010	0.63	18	J	--
22-Oct-14	Benzene	0.00033	0.28	1.4	J	--
	2-Butanone	0.0019	0.71	2.8	J	--
	Carbon Tetrachloride	0.00096	0.23	2.8	J	--
	Chloroform	0.00079	0.34	1.1	J	--
	Dichlorodifluoromethane	0.026	0.51	1.4	--	--
	1,1-Dichloroethane	0.0017	0.26	1.1	--	--
	1,1-Dichloroethene	0.023	0.46	2.8	--	--
	cis-1,2-Dichloroethene	0.00098	0.32	1.4	J	--
	Methylene Chloride	0.00085	0.26	1.4	J	--
	Tetrachloroethene	0.120	0.18	1.4	--	--
	Toluene	0.0027	0.18	1.4	B	--
	Trichloroethene	0.130	0.37	1.4	--	--
	Trichlorofluoromethane	0.022	0.70	1.4	--	--
	1,1,1-Trichloroethane	0.0015	0.23	1.1	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.081	0.58	1.4	--	--
	m,p-Xylene	0.00042	0.36	2.8	B, J	2.8U
	o-Xylene	0.00023	0.19	1.4	B, J	1.4U
	Total Organics[d]	0.42371	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Well ID/Sample Port	Analyte	Result[b] (ppmv)	MDL[b] (ppbv)	RL[b] (ppbv)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL-SV05-400 22-Oct-14	Acetone	0.0051	0.62	18	J	--
	Benzene	0.00083	0.28	1.4	J	--
	Carbon Disulfide	0.00063	0.27	2.8	J	--
	Carbon Tetrachloride	0.00051	0.22	2.8	J	--
	Chloroform	0.00067	0.33	1.1	J	--
	Chloromethane	0.0022	0.69	2.8	J	--
	Dichlorodifluoromethane	0.014	0.51	1.4	--	--
	1,1-Dichloroethane	0.0014	0.25	1.1	--	--
	1,1-Dichloroethene	0.014	0.45	2.8	--	--
	cis-1,2-Dichloroethene	0.00077	0.31	1.4	J	--
	Methylene Chloride	0.00058	0.25	1.4	J	--
	Tetrachloroethene	0.110	0.18	1.4	--	--
	Toluene	0.074	0.18	1.4	B	--
	Trichloroethene	0.100	0.37	1.4	--	--
	Trichlorofluoromethane	0.018	0.69	1.4	--	--
	1,1,1-Trichloroethane	0.0015	0.23	1.1	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.040	0.57	1.4	--	--
	Total Organics[d]	0.38419	NA	NA	NA	NA
MWL-SV05-400 (Duplicate) 22-Oct-14	Acetone	0.0063	0.70	20	J	--
	Benzene	0.0012	0.31	1.6	J	--
	2-Butanone	0.00088	0.78	3.1	J	--
	Carbon Disulfide	0.00039	0.31	3.1	J	--
	Chloromethane	0.0033	0.77	3.1	--	--
	Dichlorodifluoromethane	0.011	0.57	1.6	--	--
	1,1-Dichloroethane	0.00056	0.28	1.2	J	--
	1,1-Dichloroethene	0.0076	0.51	3.1	--	--
	Methylene Chloride	0.00035	0.28	1.6	J	--
	Tetrachloroethene	0.089	0.20	1.6	--	--
	Toluene	0.170	0.20	1.6	B	--
	Trichloroethene	0.060	0.41	1.6	--	--
	Trichlorofluoromethane	0.012	0.77	1.6	--	--
	1,1,1-Trichloroethane	0.00063	0.26	1.2	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.032	0.64	1.6	--	--
	o-Xylene	0.00021	0.21	1.6	B, J	1.6U
	Total Organics[d]	0.39521	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Concluded)
Summary of Detected Volatile Organic Compounds (EPA Method TO-15[a])
Mixed Waste Landfill Soil-Vapor Monitoring
October 2014

Notes:
[a]U.S. Environmental Protection Agency, 1999, "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-15," Center for Environmental Research Information, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.
[b]Results are reported in ppmv. MDL and RL are reported in ppbv.
[c]Laboratory/Validation Qualifier - Blank (--) cell = all quality control samples met acceptance criteria. Qualifiers "B," "J," and "U" see below.
[d]Total Organics -- Sum of validated detected organic analytes (i.e., results for analytes reported as detections by the laboratory but qualified during data validation as not detected are not included in the Total Organics value).
B = Compound was detected in the blank and sample.
EPA = U.S. Environmental Protection Agency.
ID = Identifier.
J = Result detected at a level below the RL but greater than or equal to the MDL and is an approximate value.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is present (i.e., greater than zero).
MWL = Mixed Waste Landfill.
NA = Not applicable.
ppbv = Parts per billion, by volume basis.
ppmv = Parts per million, by volume basis.
RL = Reporting limit. Minimum concentration that can be reported with a statistically established degree of confidence.
SV = Soil vapor
U = The analyte was reported as a detection by the laboratory but was qualified during data validation review as not detected. The associated numerical value is the revised sample quantitation limit, in accordance with the data validation process.

Table 5-3
Summary of Historic PCE, TCE, and Total VOCs Concentrations
Mixed Waste Landfill Soil-Vapor Monitoring

Well ID & Sample Port Depth[b]	PCE[a]		TCE[a]		Total VOCs[a]	
	September 2014 (ppmv)	October 2014 (ppmv)	September 2014 (ppmv)	October 2014 (ppmv)	September 2014 (ppmv)	October 2014 (ppmv)
MWL-SV01-42.5	0.560	0.400	0.110	0.090	1.14010	1.0087
MWL-SV02-41.5	0.086	0.067	0.075	0.058	0.71822	0.6788
MWL-SV03-50	0.140	0.120	0.100	0.082	0.36957	0.3175
MWL-SV03-100	0.210	0.230	0.190	0.190	0.61151	0.6382
MWL-SV03-200	0.300	0.320	0.300	0.300	0.91906	0.94754
MWL-SV03-300	0.290	0.320	0.190	0.210	0.64917	0.67835
MWL-SV03-400	0.390	0.400	0.290	0.280	0.87270	0.8141
MWL-SV04-50	0.072	0.076	0.061	0.059	0.25949	0.26359
MWL-SV04-100	0.130	0.120	0.130	0.120	0.45631	0.42879
MWL-SV04-200	0.180	0.180	0.210	0.210	0.68361	0.66935
MWL-SV04-300	0.110	0.130	0.076	0.091	0.26624	0.32355
MWL-SV04-400	0.110	0.140	0.075	0.096	0.25031	0.3246
MWL-SV05-50	0.052	0.048	0.067	0.061	0.36547	0.31833
MWL-SV05-100	0.092	0.096	0.140	0.130	0.56578	0.54556
MWL-SV05-200	0.140	0.170	0.200	0.240	0.70237	0.82115
MWL-SV05-300	0.090	0.120	0.100	0.130	0.35628	0.42371
MWL-SV05-400	0.100	0.110	0.094	0.100	0.54096	0.39521

Notes:
September and October 2014 concentrations are not rounded so they exactly match the reported concentrations in corresponding data tables.
[a]If a duplicate sample was collected, the maximum concentration of the environmental-duplicate sample pair is shown.
[b]Port depth is the last number in the Well ID, and is in feet below ground surface.
ID = Identification.
PCE = Tetrachloroethene.
ppmv = Parts per million by volume.
TCE = Trichloroethene.
VOCs = Volatile organic compounds.

5.2.2 Field Quality Control Sample Results

Table 5-4 summarizes results of duplicate sample analyses and the relative percent difference (RPD) values between the environmental-duplicate sample pair results for the September and October 2014 data sets.

Table 5-4
Summary of Duplicate Samples
Mixed Waste Landfill Soil-Vapor Monitoring
September and October 2014

Well ID/Parameter	Environmental Sample (R_1) (ppmv)	Duplicate Sample (R_2) (ppmv)	RPD[a] (%)
MWL-SV04-100 September 2014			
Dichlorodifluoromethane	0.035	0.035	< 1
1,1-Dichloroethene	0.016	0.016	< 1
Tetrachloroethene	0.13	0.13	< 1
Trichloroethene	0.13	0.13	< 1
Trichlorofluoromethane	0.029	0.031	7
1,1,1-Trichloroethane	0.005	0.005	< 1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.1	0.097	3
MWL-SV04-300 September 2014			
Dichlorodifluoromethane	0.016	0.015	6
Tetrachloroethene	0.11	0.082	**29**
Toluene	0.0033	0.0034	3
Trichloroethene	0.076	0.044	**53**
Trichlorofluoromethane	0.0079	0.0053	**39**
1,1,2-Trichloro-1,2,2-trifluoroethane	0.039	0.036	8
MWL-SV05-200 October 2014			
Dichlorodifluoromethane	0.062	0.071	14
1,1-Dichloroethene	0.042	0.045	7
Tetrachloroethene	0.140	0.170	19
Trichloroethene	0.210	0.240	13
Trichlorofluoromethane	0.070	0.078	11
1,1,2-Trichloro-1,2,2-trifluoroethane	0.160	0.190	17
MWL-SV05-400 October 2014			
Dichlorodifluoromethane	0.014	0.011	**24**
Tetrachloroethene	0.110	0.089	**21**
Toluene	0.074	0.170	**79**
Trichloroethene	0.100	0.060	**50**
Trichlorofluoromethane	0.018	0.012	**40**
1,1,2-Trichloro-1,2,2-trifluoroethane	0.040	0.032	**22**

Notes:
[a]RPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number. Bolded values exceed 20%.

$$RPD = \frac{\left|R_1 - R_2\right|}{[(R_1 + R_2)/2]} \; x\; 100$$

where: R_1 = Analysis result.
R_2 = Duplicate analysis result.

ppmv = Parts per million by volume basis.

First Semi-Annual Sampling Event – September 11, 2014

An environmental-duplicate sample pair was collected from the sample ports located at 100 feet bgs and 300 feet bgs at monitoring well MWL-SV04. Each duplicate sample was collected immediately after the original environmental sample in order to reduce variability caused by time and/or sampling mechanics. Duplicate samples were analyzed for all analytical parameters. The RPD was calculated when compounds were reported in both environmental and duplicate samples at concentrations greater than or equal to five times the reporting limit.

Table 5-4 summarizes results of duplicate sample analysis and calculated RPD values. In general the duplicate sample result RPDs show good agreement. Of the 13 RPDs calculated, only 3 exceeded 20, and only one slightly exceeded 50. Ten of the 13 RPD values were below 10. The three high RPD values were for PCE (RPD of 29), trichlorofluoromethane (RPD of 39), and TCE (RPD of 53) in the 300 foot bgs sample. Based on experience from soil-vapor monitoring at the Chemical Waste Landfill, an RPD of 50 or less demonstrates acceptable reproducibility of the sampling and analytical processes (NMED October 2009 and subsequent revisions). Resampling for RPD results exceeding 20 is not stipulated in LTMMP, Appendix D, and was not conducted based on an overall evaluation of the September RPDs.

A total of five QC blank samples were submitted for analysis with the September 2014 samples. VOCs detected above laboratory MDLs in QC blank samples included acetone (all 5 field QC samples), benzene (all 5 field QC samples), carbon disulfide (2 field QC samples), methylene chloride (1 field QC sample), and toluene (4 field QC samples). Associated environmental sample results that were qualified during data validation as not detected include benzene (17 of 18 detections), carbon disulfide (4 of 19 detections), and toluene (3 of 18 detections) since the reported VOC concentrations were less than five times the associated field QC sample concentration (benzene and carbon disulfide), or less than ten times the associated field QC sample concentration for common laboratory contaminants (toluene). No results were qualified for methylene chloride as the associated environmental sample result was a non-detect. Qualification of acetone results, including environmental and field QC sample results, was related to laboratory contamination detected in laboratory control samples, which is described below. All results that were qualified based on field QC sample results were very low concentrations (<4 parts per billion by volume [ppbv]).

Second Semi-Annual Sampling Event – October 22, 2014

An environmental-duplicate sample pair was collected from the from the sample ports located at 200 feet bgs and 400 feet bgs at monitoring well MWL-SV05. Each duplicate sample was collected immediately after the original environmental sample in order to reduce variability caused by time and/or sampling mechanics. Duplicate samples were analyzed for all analytical parameters. The RPD was calculated when compounds are reported in both environmental and duplicate samples at concentrations greater than or equal to five times the reporting limit.

Table 5-4 summarizes results of duplicate sample analysis and calculated RPD values. The duplicate sample result RPDs for the MWL-SV05-200 sample show excellent agreement, with all RPD values less than 20. The duplicate sample result RPDs for the MWL-SV05-400 sample show good agreement, with all RPD values less than 50 except for the RPD for toluene (79). However, toluene was detected in the associated laboratory method blank sample indicating

laboratory contamination, and the results were qualified during data validation ("B" qualifier). Resampling for RPD results exceeding 20 is not stipulated in the LTMMP, Appendix D, and was not conducted based on an overall evaluation of the October RPDs.

A total of five QC blank samples were submitted for analysis with the October 2014 samples. VOCs detected above laboratory MDLs in QC blank samples included acetone (2 field QC samples), benzene (1 field QC sample), 2-butanone (1 field QC sample), styrene (1 field QC sample), toluene (2 field QC samples), TCE (1 field QC sample), m- & p-xylene (1 field QC sample), and o-xylene (1 field QC sample). Associated environmental sample results that were qualified during data validation as not detected include acetone (1 of 15 detections), benzene (3 of 13 detections), and toluene (4 of 17 detections) since the reported VOC concentrations were less than five times the associated field QC sample concentration (benzene), or less than ten times the associated field QC sample concentrations for common laboratory contaminants (acetone and toluene). No corrective action was required for 2-butanone (the associated environmental sample result was non-detect) and TCE (all associated environmental sample results were >5 times the field QC sample concentration). Styrene, m,p-xylene, and o-xylene were detected once each in the same field QC sample; these field QC results were qualified as not detected due to laboratory contamination detected in associated laboratory control samples, described in Section 5.2.3. These field QC results were not applied to environmental sample results. All results that were qualified based on field QC sample results were very low concentrations (<3 ppbv).

5.2.3 Data Quality

Field QC sample results met the sampling DQOs and validated the adequacy of the field sampling procedures and protocol. Internal laboratory QC samples were analyzed concurrently with all environmental samples in accordance with laboratory procedures and EPA methods. These samples included laboratory control samples, method blanks, matrix spike and matrix spike duplicate samples, surrogate spike samples, and replicate samples. The results were used to evaluate potential contamination associated with the laboratory analytical process and to determine the accuracy and precision of the analytical methods. All chemical data were reviewed and qualified in accordance with SNL/NM AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data" (SNL/NM June 2014a). Minor issues documented during the data validation process are summarized below.

First Semi-Annual Sampling Event – September 11, 2014

Acetone was detected in laboratory QC samples as well as all 5 field QC samples. As a result of laboratory contamination (i.e., laboratory QC sample results), the field QC sample acetone results were all qualified as non-detects, and 15 of 19 environmental sample detections were qualified as non-detects. All qualified results were very low concentrations (<15 ppbv).

Second Semi-Annual Sampling Event – October 22, 2014

Chlorobenzene, 1,3-dichlorobenzene, ethylbenzene, styrene, toluene, m,p-xylene, and o-xylene were detected in laboratory QC samples indicating very low concentration laboratory

contamination. As a result, associate field QC and environmental sample results were qualified as non-detects during data validation. Styrene, m- and p-xylene, and o-xylene field QC blank sample detections (1 detection each in the same field QC sample) were qualified as non-detects. Associated environmental sample results that were qualified as non-detects include chlorobenzene (3 detections), 1,3-dichlorobenzene (1 detection), ethylbenzene (4 detections), styrene (6 detections), m,p-xylene (8 detections), and o-xylene (9 detections). In addition to the four environmental sample results qualified as non-detects based on field QC blank sample toluene results, three additional environmental sample toluene results were qualified as non-detects based on laboratory QC sample results (total of 7 environmental sample toluene results qualified as non-detects). All results that were qualified were very low concentrations (<3 ppbv), with most results <0.1 ppbv.

Based upon the data validation and review criteria, all analytical data were determined acceptable. Reported QC samples results were in compliance with analytical method and laboratory procedure requirements, producing defensible data. Data Validation Reports and Contract Verification Review forms are provided in Annex C.

5.2.4 Variances and Non-Conformances

There were no variances or non-conformances for soil-vapor sampling. Very low VOC concentrations detected in the field and laboratory QC samples indicate the presence of very low levels of VOCs in ambient air and in the analytical laboratory environment. The resulting qualification of environmental sample results through data validation appropriately accounts for these conditions.

Overall, RPDs for environmental and duplicate sample results show good agreement. Of the 25 calculated RPDs, only 9 exceeded 20, only 2 exceeded 50, and one of these 2 exceedances (79 for toluene from the October MWL-SV05-400 sample pair) was qualified due to laboratory contamination. The SNL/NM field team is developing a specially-designed manifold for the dedicated soil-vapor vacuum sampling pump that will allow simultaneous collection of environmental and duplicate samples. This new equipment will be tested and used during the next soil-vapor monitoring event scheduled for April 2015. Results will be used to evaluate the soil-vapor sampling process, impacts on environmental and duplicate sample RPD calculations, and to continue process improvements.

5.3 Data Evaluation and Monitoring Trigger Level

Trigger levels for VOCs in soil vapor at the MWL are 20 ppmv for PCE and TCE (i.e., the trigger level of 20 ppmv applies to both PCE and TCE) and 25 ppmv for Total VOCs as defined in the LTMMP Section 5.2.3.1 (SNL/NM March 2012). All trigger levels apply only to samples collected from the deepest sampling port (i.e., 400 feet bgs) in each of the three FLUTe^{TM} multi-port soil-vapor monitoring wells (MWL-SV03, MWL-SV04, and MWL-SV05). The results for the 400-foot bgs sampling ports for wells MWL-SV03, MWL-SV04, and MWL-SV05 are summarized below.

For the September 2014 results, the maximum PCE concentration was 0.390 ppmv and the maximum TCE concentration was 0.290 ppmv (both from MWL-SV03-400). Total VOCs

concentrations, as the sum of validated detected VOCs, ranged from 0.25031 ppmv (MWL-SV04-400) to 0.87270 ppmv (MWL-SV03-400).

For the October 2014 results, the maximum PCE concentration was 0.400 ppmv and the maximum TCE concentration was 0.280 ppmv (both from sample MWL-SV03-400). Total VOCs concentrations, as the sum of validated detected VOCs, ranged from 0.32460 ppmv (MWL-SV04-400) to 0.81410 ppmv (MWL-SV03-400).

No VOC results were reported above applicable trigger levels. In summary, soil-vapor monitoring results indicate a relatively uniform distribution of VOCs at low concentrations throughout the 500-foot thick vadose zone. This distribution is consistent with an old source which has dissipated throughout the vadose zone, and indicates the VOC soil-vapor plume is stable with no new releases from the disposal area.

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6.0 SOIL-MOISTURE MONITORING RESULTS

This chapter presents soil-moisture monitoring activities (i.e., data collection and analysis) in accordance with LTMMP Sections 3.4.2 and 5.2.3, and Appendix E (SNL/NM March 2012). The monitoring objective is to establish soil-moisture trends in the vadose zone beneath the MWL to evaluate ET Cover performance. The soil-moisture monitoring system functions as an early detection system for water percolation and infiltration through the ET Cover.

Soil-moisture monitoring field activities are described in Section 6.1 and data evaluation and comparison of results to the monitoring trigger level are presented in Section 6.2. A summary of soil-moisture monitoring activities and results is provided in Section 11.1.

6.1 Soil-Moisture Monitoring Field Activities

Two semiannual soil-moisture monitoring events were conducted during the April 1, 2014 through March 31, 2015 reporting period fulfilling the LTMMP semiannual monitoring requirement. The first monitoring event was conducted on April 15, 2014. The second monitoring event was conducted on October 16, 2014. Figure 6-1 shows the soil-moisture monitoring locations MWL-VZ-1, MWL-VZ-2, and MWL-VZ-3. Soil-moisture monitoring field forms and tables that compare soil-moisture content values to baseline values for the three access tubes are provided in Annex D.

Neutron count data collected in the field were correlated to percent soil-moisture content by volume as described in LTMMP Section 3.4.2 and Appendix E (SNL/NM March 2012). A baseline for soil-moisture content was determined for each access tube prior to deployment of the ET Cover subgrade work on September 27, 2006. The baseline was determined by averaging data collected during ten monitoring events between May 27, 2004 and August 8, 2006.

6.1.1 Field Quality Control

The CPN 503DR neutron probe was operated in accordance with the field operating procedure and the manufacturer's operating manual. A standard count was taken once daily during each monitoring event prior to the moisture logging to ensure the instrument was functioning properly and to confirm measurement accuracy. The results of the standard counts are provided on the MWL neutron logging data field form provided in Annex D.

6.1.2 Waste Management

No wastes were generated from soil-moisture monitoring activities.

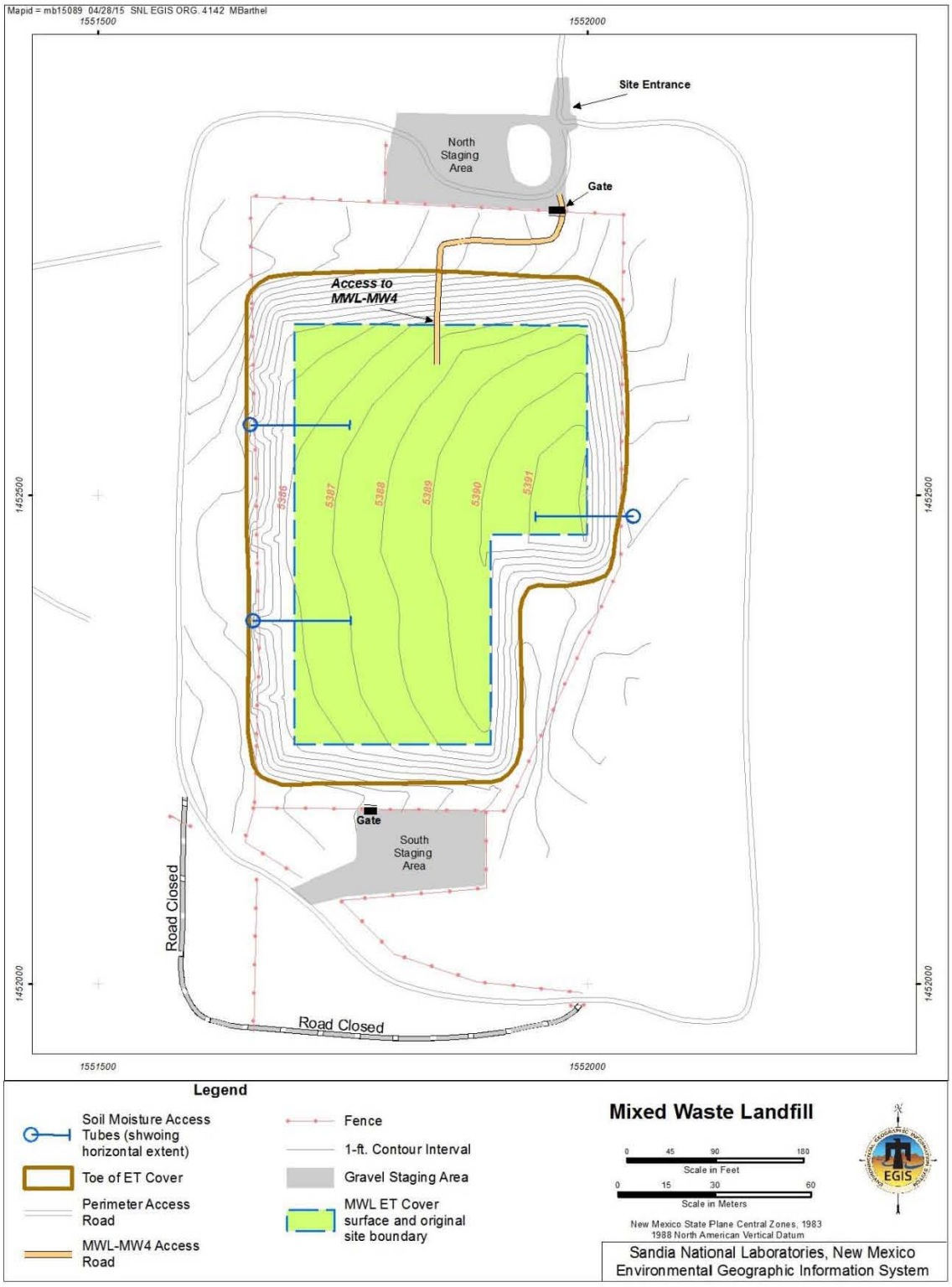

Figure 6-1
Mixed Waste Landfill Soil-Moisture Monitoring Locations

6.2 Monitoring Results

Soil-moisture monitoring data for this reporting period are presented in Figures 6-2, 6-3, and 6-4 for MW-VZ-1, MWLVZ-2, and MWL-VZ-3 respectively. The results for April and October are plotted on these figures along with the baseline soil-moisture content for comparison. Results track very closely with the established soil-moisture baseline for the three access tubes.

6.3 Data Evaluation and Monitoring Trigger Level

Soil-moisture data collected during the reporting period were compared to the trigger level, which is 23 percent by volume and applies to the shallow depth range beneath the ET Cover of 8.7 to 86.6 feet bgs for each monitoring location as specified in LTMMP Section 5.2.3.2 (SNL/NM March 2012). This comparison is shown graphically in Figures 6-2, 6-3, and 6-4.

During this reporting period, the soil-moisture content measurements for the shallow trigger level depth interval at MWL-VZ-1 ranged from 2.0 to 4.6 percent, compared to 1.7 to 5.4 percent baseline. At MWL-VZ-2 the soil-moisture content ranged from 2.1 to 4.8 percent, compared to 2.1 to 5.5 percent baseline. At MWL-VZ-3 the soil-moisture content ranged from 1.5 to 4.2 percent, compared to 1.8 to 4.5 percent baseline.

In summary, all values are below the 23 percent soil-moisture content trigger level and track closely to baseline soil-moisture values, indicating the ET Cover is performing as designed.

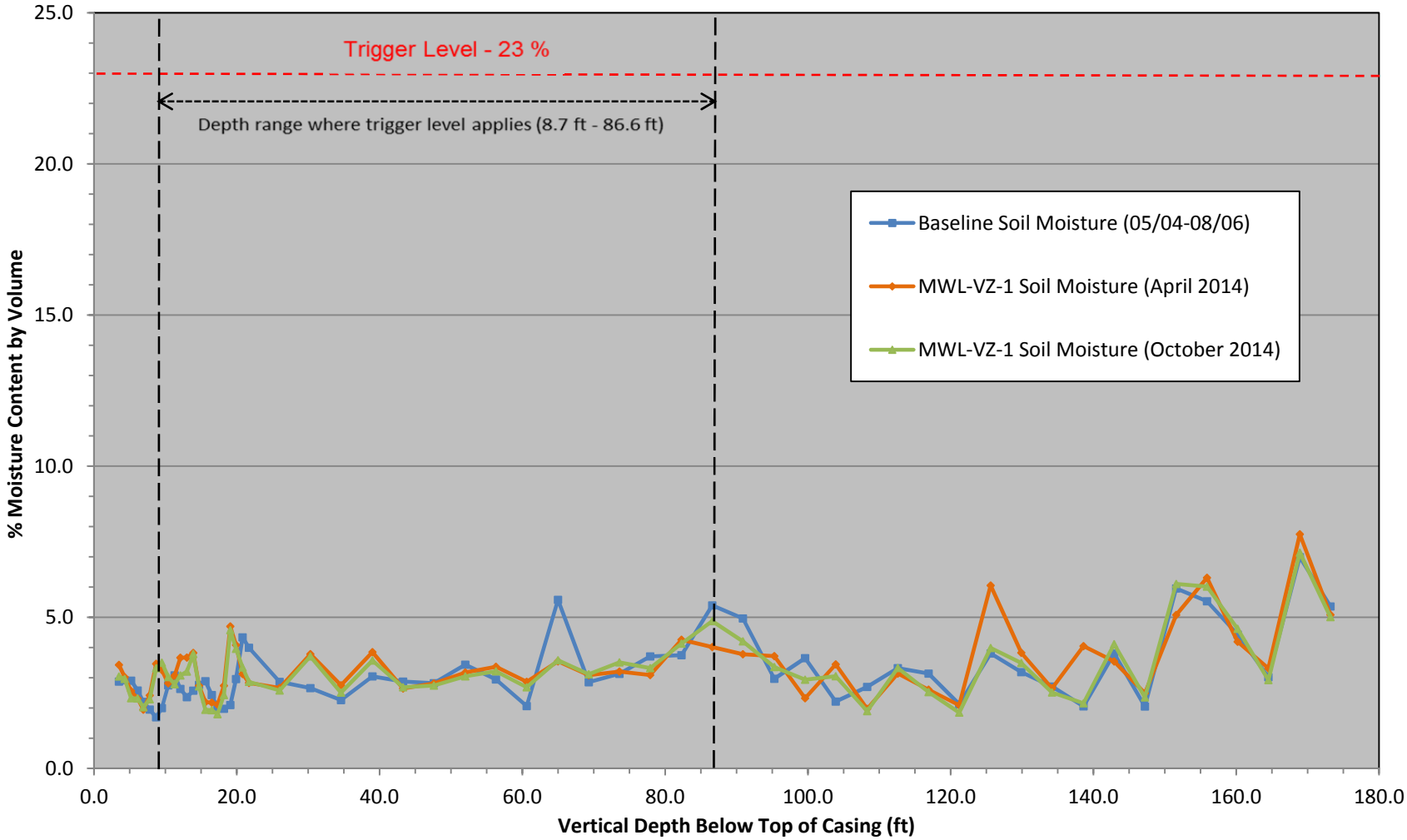

Figure 6-2
Mixed Waste Landfill MWL-VZ-1 Soil-Moisture Monitoring Results

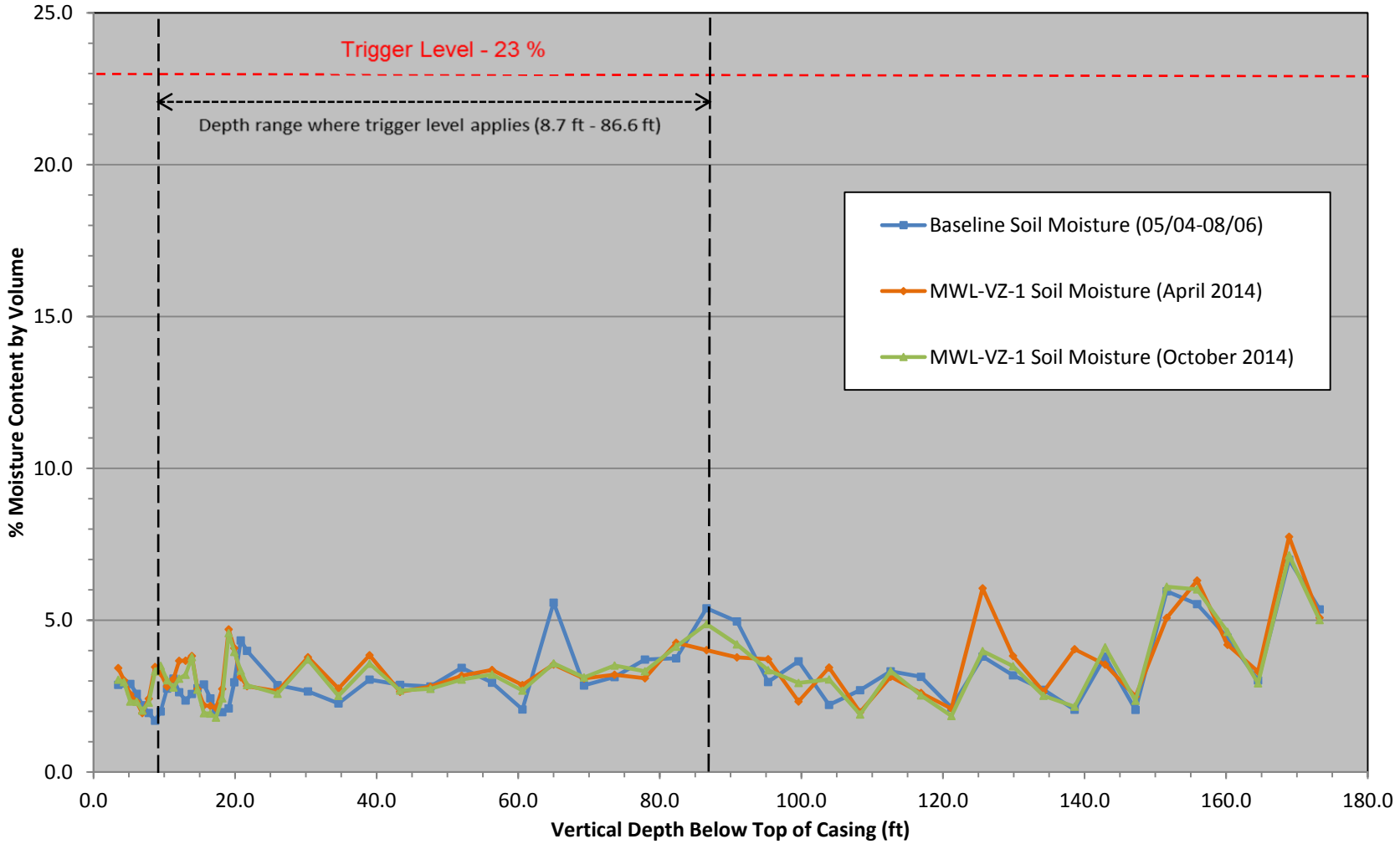

Figure 6-3
Mixed Waste Landfill MWL-VZ-2 Soil-Moisture Monitoring Results

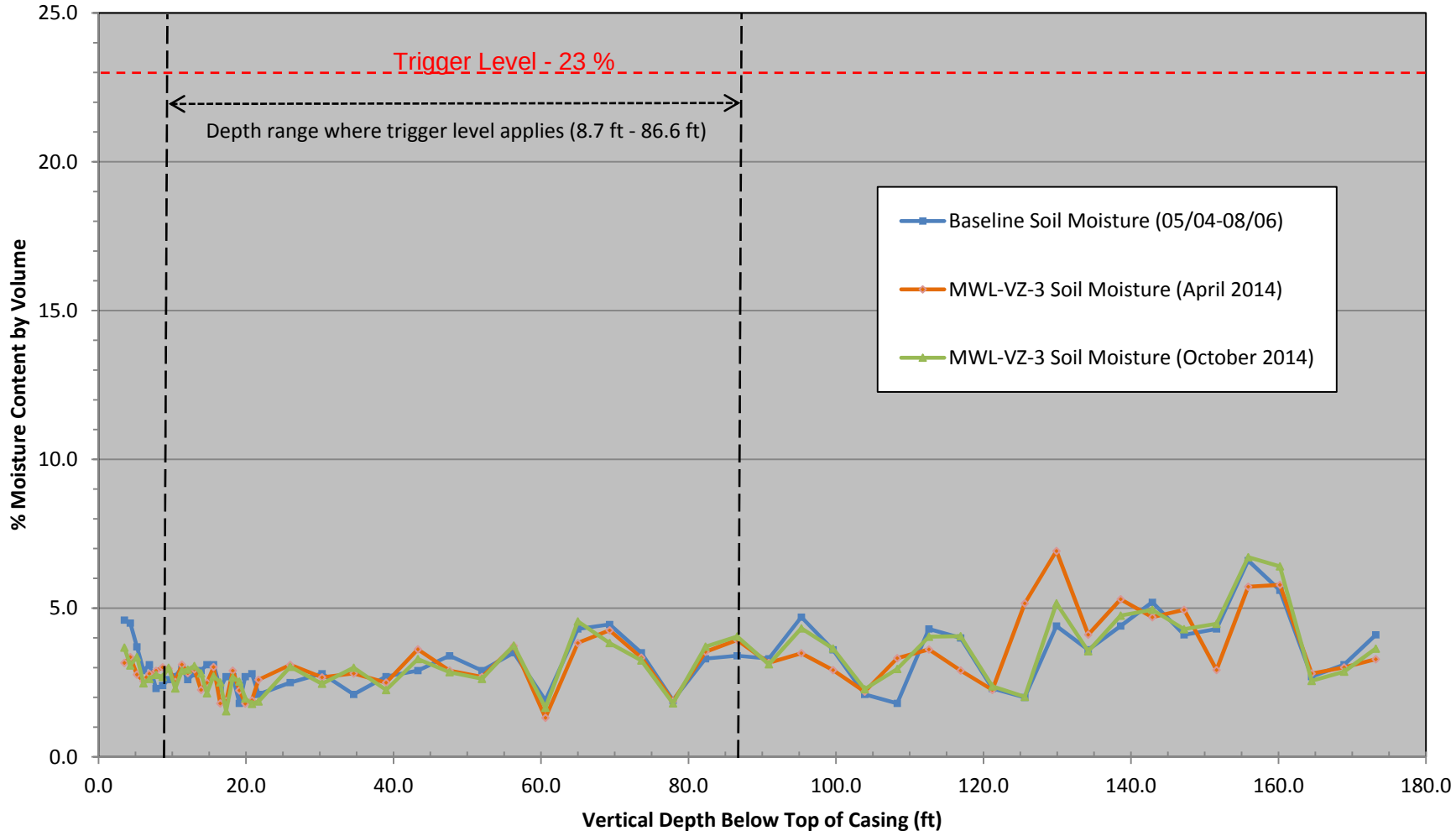

Figure 6-4
Mixed Waste Landfill MWL-VZ-3 Soil-Moisture Monitoring Results

7.0 GROUNDWATER MONITORING RESULTS

This chapter presents groundwater monitoring activities (i.e., sampling and analysis), analytical results, and data evaluation in accordance with LTMMP Sections 3.5 and 5.2.4, and Appendix F (SNL/NM March 2012). The monitoring objective is to assess concentrations of hazardous constituents in the groundwater in the uppermost aquifer beneath the MWL and compare them to the trigger levels defined in Table 5.2.4-1 of the MWL LTMMP.

Groundwater sampling field activities are described in Section 7.1, analytical laboratory results are presented and compared to trigger levels in Section 7.2, followed by a discussion of data quality. Hydrogeologic information on the regional aquifer is presented in Section 7.3.
A summary of groundwater monitoring activities and results is provided in Section 11.1.

7.1 Environmental Sampling Field Activities

Two semiannual environmental sampling events were conducted during the April 1, 2014 through March 31, 2015 reporting period fulfilling the LTMMP semiannual monitoring requirement. Groundwater samples were collected from monitoring wells MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9. Well locations are shown in Figure 7-1. The samples were analyzed for VOCs, metals (cadmium, chromium, nickel, and uranium), specific radionuclides, gross alpha and beta, tritium, and radon-222. Field forms and documentation that address calibration of equipment, well purging and water quality measurements and equipment decontamination activities are provided in Annex E.

The first sampling event was conducted between April 17 and 28, 2014. MWL-MW8 was resampled on June 30, 2014 to confirm detections of VOCs. A duplicate sample was taken at the same time of the resample.

The second sampling event was conducted between October 16 and 29, 2014. A duplicate sample was collected from MWL-MW7. MWL-MW7 was originally sampled on October 17, 2014, but was resampled for radon-222 only on October 29, 2014 due to a holding time issue with the associated equipment blank.

7.1.1 Well Purging

Purging removes stagnant water from the well so that a representative environmental sample can be obtained. In accordance with LTMMP Appendix F, the minimum purge requirement for a portable piston pump is one saturated screen volume. Purging continued until four stable field measurements for temperature, specific conductance (SC), potential of hydrogen (pH), and turbidity were obtained. Field measurements for water quality parameters were collected using an YSI™ Model EXO1 Water Quality Meter, and a HACH™ Model 2100Q portable turbidity meter. Additional water quality measurements included oxidation-reduction potential (ORP) and dissolved oxygen (DO).

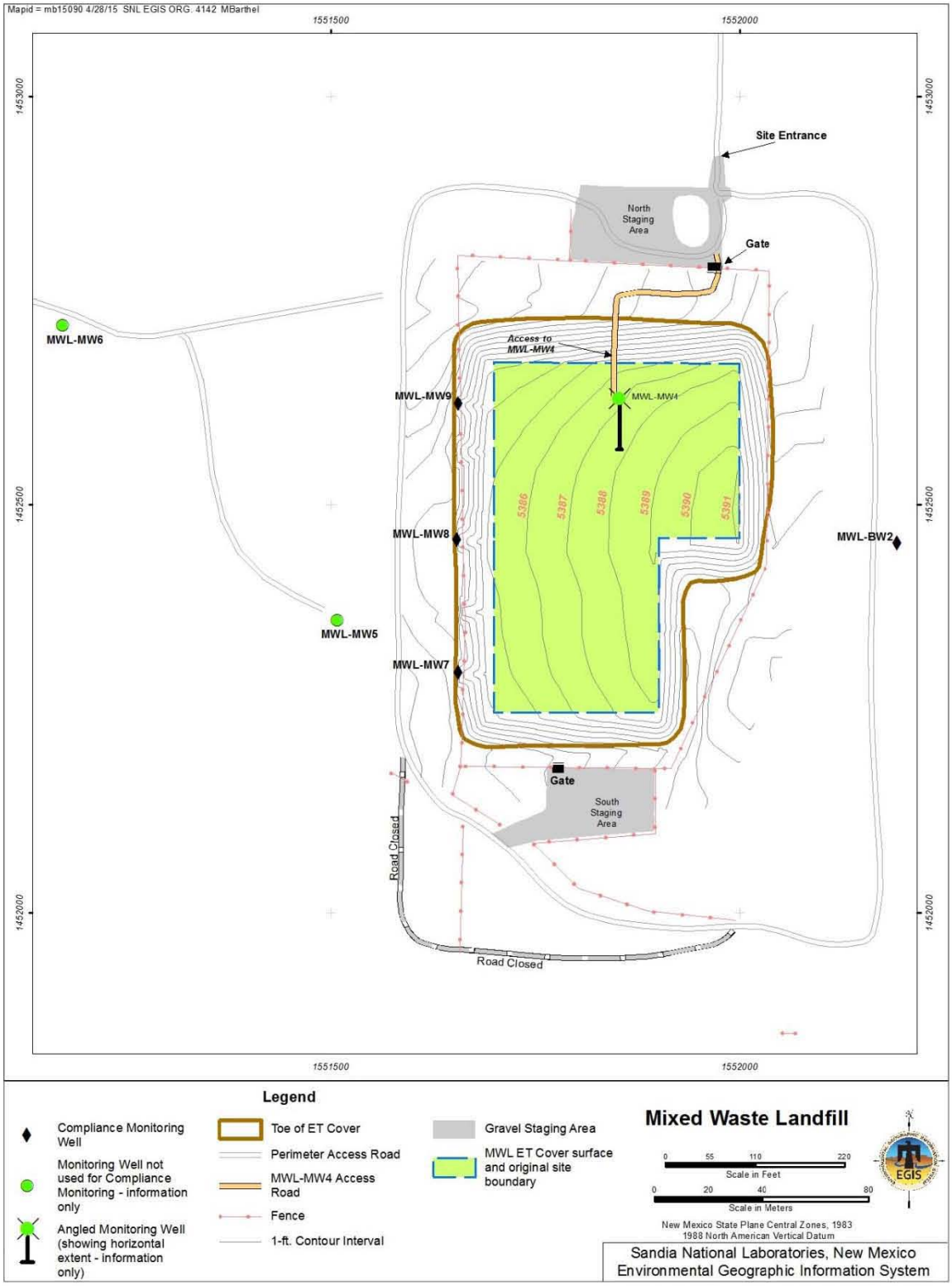

Figure 7-1
Mixed Waste Landfill Groundwater Monitoring Well Locations

A portable Bennett™ groundwater sampling system was used to collect environmental samples from all wells. Purge requirements were satisfied at all monitoring wells. In accordance with LTMMP Appendix F requirements designed to decrease the purging flow rate as low as possible, the portable Bennett™ groundwater sampling system was equipped with a flow meter valve located along the discharge line and with small diameter tubing (3/8-inch outer diameter and ¼-inch inner diameter). The average flow rates ranged from 0.10 gallons per minute (gpm) at MWL-MW9 to 0.24 gpm at MWL-BW2 for the April/June 2014 sampling event. The average flow rates ranged from 0.073 gpm at MWL-MW8 to 0.27 gpm at MWL-BW2 for the October 2014 sampling event.

7.1.2 Field Quality Control

Field QC samples were collected as part of each sampling event and included a duplicate, equipment blank, field blank, and trip blank samples. The sampling pump and tubing bundle used to collect environmental samples were decontaminated prior to sampling each monitoring well.

Duplicate samples were collected and analyzed to evaluate the overall reproducibility of the sampling and analysis process. The duplicate samples were collected immediately after the original groundwater sample to reduce variability caused by time and/or sampling mechanics. Duplicate samples were analyzed for the same constituents as the groundwater samples.

Equipment blank (also referred to as a rinsate blank) samples were collected after equipment decontamination to verify the equipment decontamination process. Equipment blank samples consisted of deionized (DI) water that was pumped through the sampling system and collected in sample containers. The equipment blank samples were analyzed for the same constituents as the groundwater samples.

Field blank samples were collected and analyzed for VOCs to detect any potential sample contamination resulting from ambient field conditions. The field blanks were prepared by pouring DI water into sample containers at the sample point (i.e., inside the sampling truck at each monitoring well) to simulate the transfer of environmental samples from the sampling system to the sample container. Additional field blank samples were collected at the Environmental Resources Field Office (ERFO) during the decontamination process to assess the DI water and ERFO ambient conditions. The DI water is provided by Culligan® in 5-gallon sealed plastic containers that are stored at ERFO.

Trip blank samples consist of laboratory reagent-grade water with hydrochloric acid preservative. They are prepared by the analytical laboratory and accompany the empty sample containers supplied by the laboratory. Trip blank samples were submitted with groundwater samples collected for VOC analysis to assess whether contamination of the samples had occurred during sampling, transportation, analysis, and/or storage.

The field QC samples were submitted for analysis with the environmental samples. A brief explanation of the field QC sampling protocol for the April/June and October sampling events is provided below. Analytical results are presented in Section 7.2.

First Semi-Annual Sampling Event – April 17-28, 2014

One equipment blank sample was collected prior to sampling monitoring well MWL-BW2. One duplicate sample was collected at MWL-BW2. One field blank sample was collected at ERFO, and four field blank samples were collected at the site (one at each monitoring well). A total of five trip blank samples were submitted for analysis with VOC groundwater samples during the sampling event.

Follow-up VOC Sampling at MWL-MW8 – June 30, 2014

One equipment blank sample was collected prior to sampling MWL-MW8. The equipment blank sample was analyzed for VOCs only. One duplicate sample was collected from MWL-MW8 and one field blank sample was collected at the MWL-MW8 location. One trip blank sample was submitted for analysis with the equipment blank sample and one with the environmental-duplicate sample pair.

Second Semi-Annual Sampling Event – October 16-29, 2014

One equipment blank sample was collected prior to sampling MWL-MW7. An additional equipment blank sample was collected prior to resampling MWL-MW7 for radon-222 on October 29, 2014 (as described in Section 7.1). One duplicate sample was collected each time MWL-MW7 was sampled (a total of two). One field blank sample was collected at ERFO, and four field blank samples were collected at the site (one at each monitoring well). A total of five trip blank samples were submitted for analysis with VOC groundwater samples during the sampling event.

7.1.3 Waste Management

Purge and decontamination wastewater generated from sampling activities was collected in 55-gallon containers and stored at the ERFO waste accumulation area. All wastewater was managed as “non-hazardous” waste based upon historical sample results and process knowledge of monitoring well locations. All wastewater was discharged to the sanitary sewer in accordance with Albuquerque Bernalillo County Water Utility Authority requirements after characterization data were compared to discharge limits. Approximately 275 gallons of wastewater were generated during the April and June 2014 groundwater sampling events and approximately 278 gallons were generated during the October 2014 sampling event.

PPE and other solid waste generated during April, June, and October 2014 monitoring activities was managed in accordance with federal, state, and city regulations, and applicable SNL/NM requirements. Analytical data collected from the sampling event was used to supplement the waste management process. All solid waste was managed as solid waste.

7.2 Laboratory Results

Environmental and field QC samples were submitted to GEL for analyses. Samples were analyzed in accordance with applicable EPA analytical methods. For comparison, trigger levels are included in the analytical results tables in this report. Analytical results that are above the analytical laboratory MDL but below the practical quantitation limit (PQL) were qualified by the laboratory as estimated values and designated with a "J" qualifier. Both analytical laboratory and data validation qualifiers are included in the groundwater data tables presented in this section. Analytical laboratory reports, including certificates of analyses, analytical methods, MDLs, PQLs, dates of analyses, results of QC analyses, and data validation reports are filed in the SNL/NM Record Center.

7.2.1 Environmental Sample Results

This section summarizes groundwater monitoring results for the reporting period. Groundwater monitoring results were compared to historical MWL groundwater monitoring results and LTMMP trigger levels. All results were below applicable LTMMP trigger levels defined in the LTMMP Section 5.2.4 (SNL/NM March 2012) and were comparable to historic MWL groundwater monitoring results.

Table 7-1 summarizes detected VOCs for the April and June sampling events; no VOCs were detected during the October sampling event. Table 7-2 summarizes MDLs for all VOCs. Table 7-3 summarizes the cadmium, chromium, nickel, and uranium results for the April and October 2014 groundwater sampling events. Table 7-4 summarizes radionuclide, gross alpha, gross beta, tritium, and radon results for the April and October 2014 sampling events.

Radionuclide activity in groundwater samples is determined through specific radiological analyses as presented in Table 7-4. In addition, gross alpha and beta activities are measured to screen for indications of other radionuclides (i.e., radiological anomalies). Gross alpha activity values are corrected to subtract naturally occurring uranium in accordance to 40 CFR Parts 9, 141, and 142, Table I-4. Uranium is measured independently and results are presented in Table 7-3. Table 7-5 summarizes field water quality measurements collected prior to sampling for all events.

Trigger levels provide early detection of potentially changing conditions that require additional testing and further investigation (SNL/NM March 2012). Groundwater radiological trigger levels for tritium (4 millirem per year), radon (1,000 pCi/L), gross alpha activity (15 pCi/L), and gross beta activity (4 millirem per year) are shown in Table 7-4. The units for the tritium and gross beta triggers relate to a dose rate and not a specific "pCi/L activity." For tritium, the approximate equivalent activity is 20,000 pCi/L, assuming an onsite resident using the groundwater as their primary drinking water source. Gross alpha and beta results are used as a broad radiological screening tool to look for other potential radionuclides besides tritium, radon, and the radionuclides already addressed by gamma spectroscopy analysis (i.e., the radionuclides of concern). These screening analyses do not provide radionuclide-specific identification necessary to calculate a dose. If the gross alpha trigger is exceeded, additional radiological analysis may be required to identify the specific radionuclide(s) that are contributing to the "gross alpha result." Gross beta results are compared to the extensive SNL/NM groundwater monitoring data set to determine if there are indications of radiological anomalies (i.e., if the

Table 7-1
Summary of Detected Volatile Organic Compounds (EPA Method 8260B[a])
Mixed Waste Landfill Groundwater Monitoring
April and June 2014

Well ID	Analyte	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Trigger Levels (µg/L)	Laboratory Qualifier[b]	Validation Qualifier[b]
April 2014 Sampling Event							
MWL-MW8	Tetrachloroethene	0.450	0.300	1.00	2.50	J	--
28-Apr-14	Trichloroethene	0.380	0.300	1.00	2.50	J	--
June 2014 Resampling Event							
MWL-MW8 30-Jun-14	Tetrachloroethene	0.370	0.300	1.00	2.50	J	--
MWL-MW8 30-Jun-14 (Duplicate)	Tetrachloroethene	0.390	0.300	1.00	2.50	J	--

Notes:
[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.
[b]Laboratory/Validation Qualifier - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
J = Estimated value, the analyte concentration is below the practical quantitation limit (PQL).
MDL = Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix-specific.
µg/L = Micrograms per liter.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by the applicable method under routine laboratory operating conditions.

Table 7-2
Summary of Method Detection Limits for Volatile Organic Compounds (EPA Method 8260B[a])
Mixed Waste Landfill Groundwater Monitoring
April/June and October 2014

Analyte	MDL (µg/L)
1,1,1-Trichloroethane	0.300
1,1,2,2-Tetrachloroethane	0.300
1,1,2-Trichloroethane	0.300
1,1-Dichloroethane	0.300
1,1-Dichloroethene	0.300
1,2-Dichloroethane	0.300
1,2-Dichloropropane	0.300
2-Butanone	2.00
2-Hexanone	2.20
4-methyl-, 2-Pentanone	1.50
Acetone	2.50 – 3.00
Benzene	0.300
Bromodichloromethane	0.300
Bromoform	0.300
Bromomethane	0.300
Carbon disulfide	1.50
Carbon tetrachloride	0.300
Chlorobenzene	0.300
Chloroethane	0.300
Chloroform	0.300
Chloromethane	0.300
Dibromochloromethane	0.300
Dichlorodifluoromethane	0.300
Ethyl benzene	0.300
Methylene chloride	1.70 – 3.00
Styrene	0.300
Tetrachloroethene	0.300
Toluene	0.300
Trichloroethene	0.300
Vinyl acetate	1.50
Vinyl chloride	0.300
Xylene	0.300
cis-1,2-Dichloroethene	0.300
cis-1,3-Dichloropropene	0.300
trans-1,2-Dichloroethene	0.300
trans-1,3-Dichloropropene	0.300

Notes:
[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is greater than zero.
µg/L = Micrograms per liter.

Table 7-3
Summary of Cadmium, Chromium, Nickel, and Uranium Results (EPA Method 6020[a])
Mixed Waste Landfill Groundwater Monitoring
April and October 2014

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	Trigger Level (mg/L)	Laboratory Qualifier[b,c]	Validation Qualifier[b,d]
April 2014 Sampling Event							
MWL-BW2 21-Apr-14	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.00092	0.0005	0.002	0.050	J	0.0028 U
	Uranium	0.00696	0.000067	0.0002	0.015	--	--
MWL-BW2 21-Apr-14 (Duplicate)	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.000973	0.0005	0.002	0.050	J	0.0028 U
	Uranium	0.007	0.000067	0.0002	0.015	--	--
MWL-MW7 22-Apr-14	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.000942	0.0005	0.002	0.050	J	--
	Uranium	0.00741	0.000067	0.0002	0.015	--	--
MWL-MW8 28-Apr-14	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.00173	0.0005	0.002	0.050	J	--
	Uranium	0.00839	0.000067	0.0002	0.015	--	--
MWL-MW9 23-Apr-14	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.000815	0.0005	0.002	0.050	J	--
	Uranium	0.00922	0.000067	0.0002	0.015	--	--

Refer to notes at end of table.

Table 7-3 (Concluded)
Summary of Cadmium, Chromium, Nickel, and Uranium Results (EPA Method 6020[a])
Mixed Waste Landfill Groundwater Monitoring
April and October 2014

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	Trigger Level (mg/L)	Laboratory Qualifier[b,c]	Validation Qualifier[b,d]
October 2014 Sampling Event							
MWL-BW2 16-Oct-14	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.000914	0.0005	0.002	0.050	J	--
	Uranium	0.00759	0.000067	0.0002	0.015	--	--
MWL-MW7 17-Oct-14	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.000878	0.0005	0.002	0.050	J	--
	Uranium	0.00864	0.000067	0.0002	0.015	--	--
MWL-MW7 17-Oct-14 (Duplicate)	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.00084	0.0005	0.002	0.050	J	--
	Uranium	0.00863	0.000067	0.0002	0.015	--	--
MWL-MW8 21-Oct-14	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.000827	0.0005	0.002	0.050	J	--
	Uranium	0.00798	0.000067	0.0002	0.015	--	--
MWL-MW9 20-Oct-14	Cadmium	ND	0.00011	0.001	0.0025	U	--
	Chromium	ND	0.002	0.010	0.043	U	--
	Nickel	0.000777	0.0005	0.002	0.050	J	--
	Uranium	0.00973	0.000067	0.0002	0.015	--	--

Notes:
[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.
[b]Laboratory/Validation Qualifiers - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples.
[c]Laboratory Qualifiers:
J = Estimated value, the analyte concentration is below the PQL.
U = Analyte was not detected.
[d]Validation Qualifier
U = Analyte was reported as a detection by the laboratory but was qualified during data validation review as not detected due to laboratory contamination. The associated numerical value is the revised sample quantitation limit, in accordance with the data validation process.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
MDL = Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix-specific.
mg/L = Milligrams per liter.
ND = Not detected (at MDL).
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by the applicable method under routine laboratory operating conditions.

Table 7-4
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Tritium, and Radon Results
Mixed Waste Landfill Groundwater Monitoring
April and October 2014

Well ID	Analyte	Result[a] (pCi/L)	Trigger Level	Laboratory Qualifier[b]	Validation Qualifier[b]	Analytical Method[c]
April 2014 Sampling Event						
MWL-BW2 21-Apr-14	Americium-241	4.12 ± 12.0	NE	U	BD	EPA 901.1
	Cesium-137	0.835 ± 2.88	NE	U	BD	EPA 901.1
	Cobalt-60	-0.22 ± 2.18	NE	U	BD	EPA 901.1
	Gross Alpha	3.93	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	12.2 ± 2.50	4 mrem/yr	--	--	EPA 900.0
	Tritium[e]	-11.4 ± 93.5	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	416 ± 98.6	1000 pCi/L	--	--	SM7500 RnB
MWL-BW2 (Duplicate) 21-Apr-14	Americium-241	-0.40 ± 17.8	NE	U	BD	EPA 901.1
	Cesium-137	-0.148 ± 17.8	NE	U	BD	EPA 901.1
	Cobalt-60	0.445 ± 1.77	NE	U	BD	EPA 901.1
	Gross Alpha	3.22	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	6.83 ± 1.62	4 mrem/yr	--	--	EPA 900.0
	Tritium[e]	-36.9 ± 94.3	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	394 ± 94.1	1000 pCi/L	--	--	SM7500 RnB
MWL-MW7 22-Apr-14	Americium-241	2.30 ±14.0	NE	U	BD	EPA 901.1
	Cesium-137	-0.186 ± 1.85	NE	U	BD	EPA 901.1
	Cobalt-60	-1.37 ± 2.01	NE	U	BD	EPA 901.1
	Gross Alpha	4.37	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	6.10 ± 1.49	4 mrem/yr	--	--	EPA 900.0
	Tritium[e]	-57.2 ± 93.1	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	156 ± 50.2	1000 pCi/L	--	J	SM7500 RnB
MWL-MW8 28-Apr-14	Americium-241	2.56 ± 8.68	NE	U	BD	EPA 901.1
	Cesium-137	-0.465 ± 2.65	NE	U	BD	EPA 901.1
	Cobalt-60	-1.68 ± 2.84	NE	U	BD	EPA 901.1
	Gross Alpha	4.98	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	4.46 ± 1.25	4 mrem/yr	--	--	EPA 900.0
	Tritium[e]	-13.5 ± 99.5	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	167 ± 55.6	1000 pCi/L	--	J	SM7500 RnB

Refer to notes at end of table.

Table 7-4 (Continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Tritium, and Radon Results
Mixed Waste Landfill Groundwater Monitoring
April and October 2014

Well ID	Analyte	Result[a] (pCi/L)	Trigger Level	Laboratory Qualifier[b]	Validation Qualifier[b]	Analytical Method[c]
April 2014 Sampling Event (Continued)						
MWL-MW9 23-Apr-14	Americium-241	1.53 ± 13.0	NE	U	BD	EPA 901.1
	Cesium-137	1.64 ± 1.95	NE	U	BD	EPA 901.1
	Cobalt-60	-0.466 ± 2.15	NE	U	BD	EPA 901.1
	Gross Alpha	2.99	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	8.01 ± 1.99	4 mrem/yr	--	--	EPA 900.0
	Tritium[e]	64.1 ± 98.7	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	375 ± 90.6	1000 pCi/L	--	--	SM7500 RnB

Refer to notes at end of table.

Table 7-4 (Continued)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Tritium, and Radon Results
Mixed Waste Landfill Groundwater Monitoring
April and October 2014

Well ID	Analyte	Result[a] (pCi/L)	Trigger Level	Laboratory Qualifier[b]	Validation Qualifier[b]	Analytical Method[c]
October 2014 Sampling Event						
MWL-BW2 16-Oct-14	Americium-241	6.07 ± 6.76	NE	U	BD	EPA 901.1
	Cesium-137	1.21 ± 1.63	NE	U	BD	EPA 901.1
	Cobalt-60	0.499 ± 2.26	NE	U	BD	EPA 901.1
	Gross Alpha	1.23	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	5.55 ± 1.32	4 mrem/yr	--	J	EPA 900.0
	Tritium[e]	-21.6 ± 72.7	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	427 ± 119	1000 pCi/L	--	--	SM7500 RnB
MWL-MW7 17-Oct-14	Americium-241	4.45 ± 6.58	NE	U	BD	EPA 901.1
	Cesium-137	1.31 ± 1.87	NE	U	BD	EPA 901.1
	Cobalt-60	-1.29 ± 2.50	NE	U	BD	EPA 901.1
	Gross Alpha	0.85	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	5.30 ± 1.23	4 mrem/yr	--	J	EPA 900.0
	Tritium[e]	-9.94 ± 73.9	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	156 ± 62.6	1000 pCi/L	--	J	SM7500 RnB
MWL-MW7 (Duplicate) 17-Oct-14	Americium-241	2.40 ± 19.6	NE	U	BD	EPA 901.1
	Cesium-137	1.13 ± 2.08	NE	U	BD	EPA 901.1
	Cobalt-60	2.52 ± 2.62	NE	U	BD	EPA 901.1
	Gross Alpha	-0.10	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	7.42 ± 1.56	4 mrem/yr	--	J	EPA 900.0
	Tritium[e]	3.05 ± 75.8	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	110 ± 55.8	1000 pCi/L	--	J	SM7500 RnB
MWL-MW7 (Resample) 29-Oct-14	Radon-222	135 ± 56.4	1000 pCi/L	--	J	SM7500 RnB
MWL-MW7 (Resample Duplicate) 29-Oct-14	Radon-222	192 ± 66.0	1000 pCi/L	--	J	SM7500 RnB

Refer to notes at end of table.

Table 7-4 (Concluded)
Summary of Gamma Spectroscopy, Gross Alpha, Gross Beta, Tritium, and Radon Results
Mixed Waste Landfill Groundwater Monitoring
April and October 2014

Well ID	Analyte	Result[a] (pCi/L)	Trigger Level	Laboratory Qualifier[b]	Validation Qualifier[b]	Analytical Method[c]
MWL-MW8 21-Oct-14	Americium-241	10.6 ± 7.92	NE	U	BD	EPA 901.1
	Cesium-137	1.17 ± 1.82	NE	U	BD	EPA 901.1
	Cobalt-60	-3.11 ± 2.63	NE	U	BD	EPA 901.1
	Gross Alpha	2.97	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	6.15 ± 1.43	4 mrem/yr	--	J	EPA 900.0
	Tritium[e]	-24.7 ± 71.3	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	122 ± 53.0	1000 pCi/L	--	J	SM7500 RnB
MWL-MW9 21-Oct-14	Americium-241	12.3 ± 13.6	NE	U	BD	EPA 901.1
	Cesium-137	-3.01 ± 4.22	NE	U	BD	EPA 901.1
	Cobalt-60	-0.908 ± 1.99	NE	U	BD	EPA 901.1
	Gross Alpha	4.38	15 pCi/L	NA	None	EPA 900.0
	Gross Beta[d]	7.16 ± 1.55	4 mrem/yr	--	J	EPA 900.0
	Tritium[e]	7.26 ± 76.3	4 mrem/yr	U	BD	EPA 906.0 M
	Radon-222	290 ± 88.8	1000 pCi/L	--	--	SM7500 RnB

Notes:
[a]Gross alpha activity measurements were corrected by subtracting the total uranium activity from the total gross alpha result (40 Code of Federal Regulations Parts 9, 141, and 142, Table I-4). Negative numbers indicate the sample count or result was less than the instrument background; result is below the minimum detectable activity.
[b]If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples. Qualifiers "BD" "J" and "U" see below.
[c]Analytical Methods EPA 900.0, EPA 900.6, and EPA 906.0 -- U.S. Environmental Protection Agency, 1980, "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," EPA-600/4-80-032, U.S. Environmental Protection Agency, Cincinnati, Ohio.
Analytical Method SM7500 RnB -- American Public Health Association, American Water Works Association, and Water Environment Federation, 1988, "Standard Methods for the Examination of Water and Wastewater," 7500-Rn B Method, 20th Edition, published jointly by American Public Health Association, American Water Works Association, and Water Environment Federation, Washington, D.C., 1988.
[d]Refer to Section 7.2.1 for an explanation of the gross beta trigger level.
[e]The approximate equivalent activity for the 4 mrem/yr tritium trigger level is 20,000 pCi/ L.
BD = Below detectable activity as used in radiochemistry to identify results that are not statistically different from zero.
EPA = U.S. Environmental Protection Agency.
ID = Identification.
J = The associated value is an estimated quantity.
mrem/yr = Millirem per year.
NA = Not applicable.
NE = Not established.
None = No data validation for corrected gross alpha activity.
pCi/L = Picocuries per liter.
U = Analyte was not detected.

Table 7-5
Summary of Field Water Quality Measurements[a]
Mixed Waste Landfill Groundwater Monitoring
April/June and October 2014

Well ID/ Sample Date	Temperature (°C)	SC (µmhos/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (% Sat)	DO (mg/L)
April 2014 Sampling Event							
MWL-BW2	22.44	695.7	110.0	7.41	0.20	11.0	0.95
MWL-MW7	23.88	594.4	246.0	7.66	0.26	74.6	6.24
MWL-MW8	18.35	528.1	202.7	7.66	0.23	40.0	3.70
MWL-MW9	23.97	589.9	120.0	7.55	0.41	20.0	1.72
June 2014 Resampling Event							
MWL-MW8	26.35	644.1	276.4	7.54	0.25	40.4	3.25
October 2014 Sampling Event							
MWL-BW2	20.93	707.3	192.1	7.12	0.22	11.1	0.98
MWL-MW7	20.94	585.8	327.2	7.37	0.26	69.7	6.19
MWL-MW7 (resample)	19.17	571.4	37.2	7.58	0.32	73.5	6.65
MWL-MW8	19.17	571.4	37.2	7.58	0.32	73.5	6.65
MWL-MW9	21.42	604.4	275.0	7.43	0.37	35.6	3.14

Notes:
[a]Field measurements collected prior to sampling.
°C = Degrees Celsius.
% Sat = Percent saturation.
ID = Identification.
DO = Dissolved oxygen.
mg/L = Milligrams per liter.
µmhos/cm = Micromhos per centimeter.
mV = Millivolts.
NTU = Nephelometric turbidity units.
ORP = Oxidation-reduction potential.
pH = Potential of hydrogen (negative logarithm of the hydrogen ion concentration).
SC = Specific Conductance.

gross beta activity is significantly different than natural background beta activity). If there are indications of radiological anomalies, additional analysis may be required to identify the specific radionuclide that is causing the anomalous beta activity. Once the specific radionuclide is identified, the corresponding dose to a human receptor can be determined and compared to the trigger of 4 millirem per year. Additional analysis based on elevated gross alpha or gross beta screening results would only be required if the results are not explained by the other radionuclide-specific results. If performed, the new radioisotope results would then be further evaluated and the corresponding dose determined and compared to the trigger of 4 millirem per year. For these reasons, a direct comparison of gross beta results to the LTMMP trigger level is not possible. However, the screening and evaluation process ensures that if radiological contamination is present, it will be detected, evaluated, and appropriate follow up actions will be taken. As part of the groundwater data evaluation process, a Sandia radiological SME reviews and evaluates all MWL radiological groundwater monitoring results to determine if further sampling and analysis is warranted.

First Semi-Annual Sampling Event – April 17-28, 2014 & Follow-up VOC Sampling at MWL-MW8 – June 30, 2014

No VOCs other than PCE and TCE were detected in environmental samples above laboratory MDLs. In the April 2014 MWL-MW8 sample PCE and TCE were reported at concentrations of 0.450 µg/L and 0.380 µg/L, respectively. These very low, estimated concentrations are below the associated LTMMP trigger level of 2.50 micrograms per liter (µg/L). To confirm the detections, monitoring well MWL-MW8 was resampled for VOCs in June 2014. PCE was reported in the MWL-MW8 environmental resample and duplicate resample at concentrations of 0.370 µg/L and 0.390 µg/L, respectively. TCE was not detected in the June resamples. All VOC detections from April and June were qualified by the laboratory as estimated concentrations (i.e., "J" qualified) because the results were between the laboratory MDL and PQL of 0.300 and 1.00 µg/L, respectively.

Cadmium and chromium were not detected above the associated MDLs. Nickel was detected in all samples at concentrations ranging from 0.000815 milligrams per liter (mg/L) at MWL-MW9 to 0.00173 mg/L at MWL-MW8. Uranium concentrations ranged from 0.00696 mg/L at MWL-BW2 to 0.00922 mg/L at MWL-MW9. All results are consistent with historical MWL groundwater monitoring results and are below LTMMP trigger levels.

MWL environmental samples were screened for gamma-emitting radionuclides, gross alpha activity, gross beta activity, tritium, and radon-222. There were no detections of gamma-emitting radionuclides (as determined by gamma spectroscopy) or tritium (as determined by liquid scintillation counting). Negative results in Table 7-4 indicate the sample result was lower than the instrument background (i.e., below the instrument detection limit). Radon-222 was detected in all samples, with activities ranging from 156 picocuries per liter (pCi/L) at MWL-MW7 to 416 pCi/L at MWL-BW2. All radiological results were reviewed by a Sandia radiological SME to screen for potential indications of radiological contamination; there were no indications of radiological anomalies in the groundwater sample results. Results are consistent with historical results and below LTMMP trigger levels.

Second Semi-Annual Sampling Event – October 16-29, 2014

No VOCs were detected in environmental samples above laboratory MDLs.

Cadmium and chromium were not detected above the associated MDLs. Nickel was detected in all samples at concentrations ranging from 0.000777 mg/L at MWL-MW9 to 0.000914 mg/L at MWL-BW2. Uranium concentrations ranged from 0.00759 mg/L at MWL-BW2 to 0.00973 mg/L at MWL-MW9. All results are consistent with historical MWL groundwater monitoring results and below LTMMP trigger levels.

MWL groundwater samples were screened for gamma-emitting radionuclides, gross alpha activity, gross beta activity, tritium, and radon-222. Resampling of MWL-MW7 for radon-222 on October 29, 2014 was performed due to a holding time issue with the October 17, 2014 equipment blank sample. There were no detections of gamma-emitting radionuclides (as determined by gamma spectroscopy) or tritium (as determined by liquid scintillation counting). Radon-222 was detected in all samples, with activities ranging from 110 pCi/L at MWL-MW7 (October 17, 2014 duplicate) to 427 pCi/L at MWL-BW2. All radiological results were reviewed

by a Sandia radiological SME to screen for potential indications of radiological contamination; there were no indications of radiological anomalies in the groundwater sample results. Results are consistent with historical results and below LTMMP trigger levels.

7.2.2 Field Quality Control Sample Results

Table 7-6 summarizes results of duplicate sample analyses and the calculated RPD values between the environmental-duplicate sample pair results for the April, June, and October 2014 data sets. Calculated RPDs for detected constituents show good agreement (i.e., RPD values < 20 for organics and < 35 for metals) for all sampling events. A discussion of equipment, field, and trip blank results for the April/June and October sampling events is provided below.

Table 7-6
Summary of Duplicate Sample Results
Mixed Waste Landfill Groundwater Monitoring
April/June and October 2014

Well ID/Parameter	Environmental Sample (R_1)	Duplicate Sample (R_2)	RPD[a]
April Sampling Event			
MWL-BW2			
Uranium (mg/L)	0.00696	0.007	1
June Resampling Event			
MWL-MW8			
Tetrachloroethene (µg/L)	0.370	0.390	5
October Sampling Event			
MWL-MW7			
Nickel (mg/L)	0.000878	0.00084	4
Uranium (mg/L)	0.00864	0.00863	< 1

Notes:
[a]RPD = Relative percent difference is calculated with the following equation and rounded to the nearest whole number.

$$RPD = \frac{|R_1 - R_2|}{[(R_1 + R_2)/2]} \times 100$$

where: R_1 = Environmental sample result.
R_2 = Duplicate sample result.
ID = Identification.
µg/L = Microgram(s) per liter.
mg/L = Milligram(s) per liter.

First Semi-Annual Sampling Event – April 17-28, 2014 & Follow-up VOC Sampling at MWL-MW8 – June 30, 2014

Equipment blank samples were collected prior to sampling MWL-BW2 in April and prior to resampling of MWL-MW8 in June. The samples were analyzed for all constituents. Bromodichloromethane, chloroform, dibromochloromethane, nickel, and toluene were detected above laboratory MDLs. No corrective action was necessary for bromodichloromethane, chloroform, dibromochloromethane, or toluene since these compounds were not detected in the environmental samples. Bromodichloromethane, chloroform, dibromochloromethane are a by-product of the DI water purification process (i.e., chlorination) and are routinely detected in equipment blank samples at very low concentrations. Toluene is a common laboratory

contaminant. Nickel was detected in the equipment blank sample associated with MWL-BW2. The nickel concentrations for the MWL-BW2 environmental and duplicate samples were less than five times the reported concentration for the equipment blank sample. Therefore, nickel qualified as not detected during data validation for both environmental and duplicate environmental samples.

The field blank collected at ERFO during the decontamination process and the four field blanks collected at the monitoring well locations during April all showed detections of bromodichloromethane and chloroform above laboratory MDLs. Dibromochloromethane was detected in the field blank samples collected at ERFO after equipment decontamination and at the MWL-MW9 location. No corrective action was required since these compounds were not detected in associated environmental samples. No VOCs were detected in the June field blank sample.

No VOCs were detected in the seven trip blank samples associated with the April and June sampling event.

Second Semi-Annual Sampling Event – October 16-29, 2014

Equipment blank samples were collected on October 16 and October 28 prior to sampling and resampling of MWL-MW7. The equipment blank samples collected on October 16 were analyzed for all constituents. Bromodichloromethane, chloroform, and dibromochloromethane were detected above laboratory MDLs. No corrective action was necessary since these compounds were not detected in associated MWL-MW7 environmental-duplicate sample pair and they are a by-product of the DI water purification process. The equipment blank collected on October 28 was analyzed for radon-222 only to replicate the analysis of the environmental-duplicate sample pair for radon-222 only. Radon-222 was not detected in the equipment blank.

The field blank collected at ERFO during the decontamination process and the four field blanks collected at the monitoring wells all showed detections of acetone, bromodichloromethane, chloroform, and dibromochloromethane. No corrective action was required since these compounds were not detected in associated environmental samples. Acetone is a common laboratory contaminant and the other compounds are a by-product of the DI water purification process.

No VOCs were detected in the five trip blank samples associated with the October sampling event.

7.2.3 Data Quality

Field QC sample results met the sampling DQOs and validated the adequacy of the field sampling procedures and protocol. Internal laboratory QC samples were analyzed concurrently with all environmental samples in accordance with laboratory procedures and EPA methods. These samples included laboratory control samples, method blanks, matrix spike and matrix spike duplicate samples, surrogate spike samples, and replicate samples. The results were used to evaluate potential contamination associated with the laboratory analytical process and to determine the accuracy and precision of the analytical methods. All chemical data were

reviewed and qualified in accordance with SNL/NM AOP 00-03, “Data Validation Procedure for Chemical and Radiochemical Data” (SNL/NM June 2014a).

Based upon the data validation and review criteria, all analytical data were determined to be technically defensible. Reported QC sample results were in compliance with analytical method and laboratory procedure requirements. Data Validation Reports and Contract Verification Review forms are provided in Annex E.

7.2.4 Variances and Non-Conformances

No variances, non-conformances, or project-specific issues were identified during the April/June and October 2014 semi-annual groundwater sampling events.

7.3 Hydrogeologic Assessment

A detailed conceptual site model is provided in the MWL Phase 2 RCRA Facility Investigation Report (Peace et al. 2002) and the Mixed Waste Landfill Groundwater Report, 1990 through 2001, Sandia National Laboratories, Albuquerque, New Mexico (Goering et al. 2002). An update to the conceptual site model integrating the findings from the four monitoring wells installed in 2008 is presented in the Mixed Waste Landfill Annual Groundwater Monitoring Report, Calendar Year 2009 (SNL/NM June 2010) and the Annual Groundwater Monitoring Report, Calendar Year 2012 (SNL/NM June 2013).

The upper surface of the regional aquifer at the MWL is contained within the interfingering, unconsolidated, fine-grained alluvial-fan deposits of the Santa Fe Group. The more transmissive, coarser-grained Ancestral Rio Grande sediments underlie the fine-grained alluvial deposits beneath the MWL. The depth to water is approximately 500 feet bgs and groundwater flows generally westward, away from the Manzanita Mountains and towards the Rio Grande. Several water-supply wells operated by KAFB and the Albuquerque Bernalillo County Water Utility Authority have profoundly modified the natural groundwater flow regime near the MWL by creating a trough in the water table in the western and northern portions of KAFB. As a result, water levels at the MWL have continued to decline since monitoring began in 1990.

Since 2009, the rate of groundwater elevation decline in all wells except MWL-MW4 has been relatively slow and constant, and less than 2 feet overall. The rate of groundwater elevation decline in the upper screen interval of MWL-MW4 has stabilized since April 2010. Recharge from infiltration of direct precipitation at the MWL is negligible due to high evapotranspiration, low precipitation, the thick sequence of unsaturated Santa Fe Group deposits above the water table. Groundwater recharge of the regional aquifer occurs by the infiltration of precipitation in the Manzanita Mountains located approximately 5 miles to the east.

Figure 7-2 shows the October 2014 potentiometric surface of the regional aquifer beneath the MWL. Groundwater flows towards the west and northwest. Measured orthogonally from the potentiometric surface contours, the horizontal gradient for October 2014 ranges from 0.03 to 0.08 feet per foot. Groundwater velocities in the alluvial-fan sediments were calculated using the current potentiometric surface gradient, the average hydraulic conductivity obtained from the

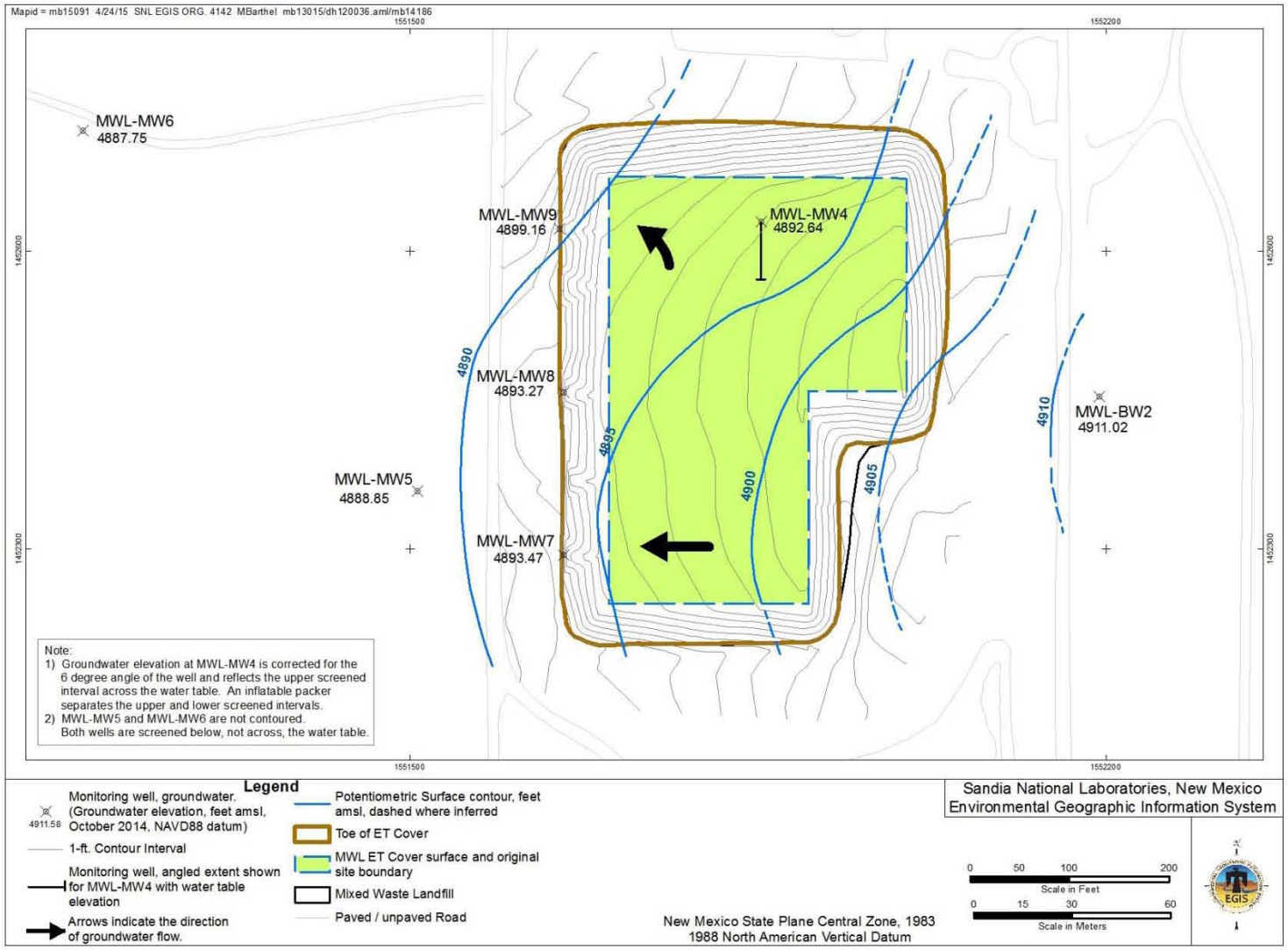

Figure 7-2
Localized Potentiometric Surface of the Basin Fill Aquifer at the Mixed Waste Landfill, October 2014

slug testing of four monitoring wells, and an effective porosity of 25 percent. The calculated groundwater velocity ranges from 0.02 to 0.06 feet per day. This is equivalent to 5.4×10^{-6} to 1.34×10^{-5} centimeters per second. The average groundwater velocity is 0.04 feet per day (equivalent to 9.4×10^{-6} centimeters per second). These very low values are consistent with previous estimates for horizontal groundwater flow at the water table in the MWL vicinity.

8.0 BIOTA MONITORING RESULTS

This chapter presents biota monitoring activities (i.e., sampling and analysis), analytical results, and data evaluation in accordance with the LTMMP, Sections 3.6 and 5.2.2, and Appendix F (SNL/NM March 2012). The monitoring objective is to provide data to evaluate biotic mobilization of contaminants (i.e., metals and radionuclides) from the subsurface to surface. Sampling of surface soil from animal burrows and ant hills is performed, as well as sampling of potentially deep-rooted vegetation if present. Biota monitoring field activities are described in Section 8.1, analytical laboratory results and a discussion of data quality are presented in Section 8.2, and data evaluation and a comparison of results to monitoring trigger levels are presented in Section 8.3. A summary of biota monitoring activities and results is provided in Section 11.1.

8.1 Biota Monitoring Field Activities

One annual sampling event was conducted during the April 1, 2014 through March 31, 2015 reporting period fulfilling the LTMMP annual monitoring requirement. The biota sampling locations were identified during the growing season ET Cover Biology Inspection performed on August 14, 2014. The sampling locations are shown in Figure 8-1 and consist of two ant hills (MWL AHSS-01and MWL AHSS-02), two animal burrows (MWL ABSS-01 and MWL ABSS-02), and one potentially deep–rooted plant (MWL PDRV-01). Locations were selected by the staff biologist during the August14, 2014 Biology Inspection. The largest, most active ant hills and small animal burrows were selected for surface soil sampling. Only one potentially deep-rooted plant (juvenile fourwing saltbush) was identified. Sampling of these locations was conducted on August 21, 2014. One of the coolers containing samples for locations MWL AHSS-01, MWL ABSS-01, and MWL ABSS-02, arrived at the analytical laboratory out of temperature specifications for mercury. These locations were resampled for mercury on August 27, 2014. The gamma spectroscopy results were reviewed by a Sandia radiological SME and documented in a data evaluation memo. This memo and biota monitoring AR/COC forms are provided in Annex B.

8.1.1 Field Quality Control

In accordance with the Tritium and Biota SAP (MWL LTMMP Appendix G, Table G-4.2-1), only one field QC sample (duplicate sample) is required per group of twenty environmental samples collected. Since the biota and tritium monitoring were performed together and the total number of samples was less than 20, the duplicate sample for this sampling event was collected at MWL TS-2NE (a tritium surface soil sample discussed in Section 4.1.1).

8.1.2 Waste Management

Waste generated during sampling activities included PPE, such as gloves, and decontamination wipes. Analytical data collected from the sampling event was used to characterize the waste as non-hazardous; it was managed as solid waste.

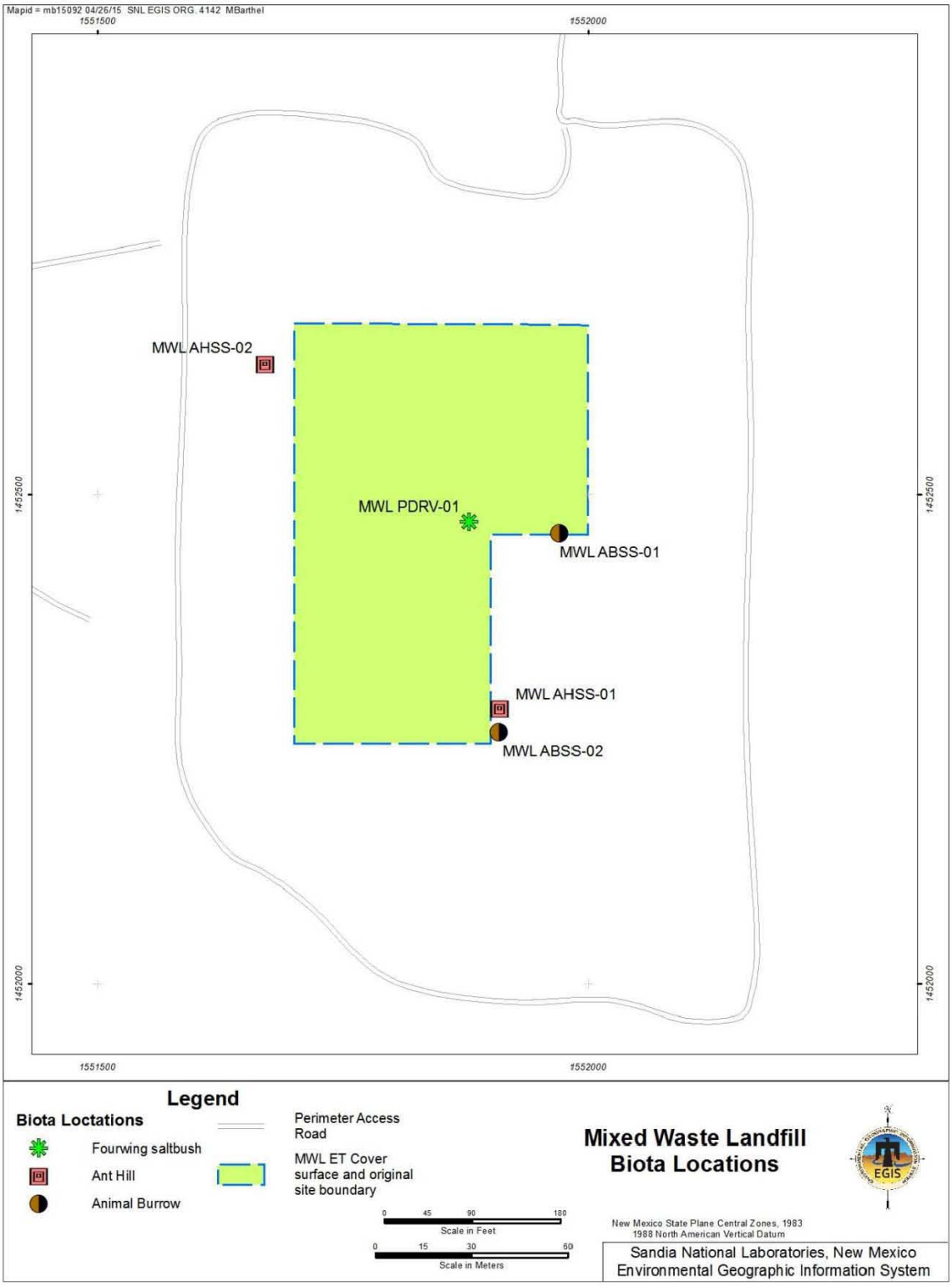

Figure 8-1
Mixed Waste Landfill Biota Sampling Locations

8.2 Laboratory Results

Biota samples were submitted to GEL for analyses. Samples were analyzed in accordance with applicable EPA analytical methods. Metals results that are above the laboratory MDL but below the PQL are qualified as estimated values by the laboratory and designated with a "J" qualifier. Gamma spectroscopy analytical results that are below the MDA are qualified with a "U" and are designated as "not detected." Both laboratory and data validation qualifiers are included in the data tables presented in this section. Analytical laboratory reports, including certificates of analyses, analytical methods, sample results, dates of analyses, results of QC analyses, and data validation reports are filed in the SNL/NM Record Center.

8.2.1 Environmental Sample Results

Table 8-1 summarizes metal results and Table 8-2 summarizes gamma spectroscopy results. NMED-approved background concentrations and activities (Dinwiddie September 1997) and LTMMP trigger levels are included in Tables 8-1 and 8-2 for comparison.

All metals results are at or below the respective NMED-approved background concentrations. All cadmium, selenium, and silver results were non-detects or estimated concentrations near the MDL.

All gamma spectroscopy radionuclide results were below the respective NMED-approved background activities. Many results were non-detections, including all results for the vegetation sample MWL- PDRV-01.

8.2.2 Field Quality Control Sample Results

As discussed in Section 4.2.2, an environmental-duplicate sample pair was collected at location MWL TS-2NE. The tritium result was qualified as undetected during data validation; therefore, an RPD value between the environmental and duplicate sample was not calculated.

8.2.3 Data Quality

Internal laboratory QC samples were analyzed concurrently with all environmental samples in accordance with laboratory procedures and EPA methods. These included laboratory control samples, method blanks, and matrix spike samples (matrix spike duplicate samples also included in the metals analysis). The results were used to evaluate potential contamination associated with the laboratory analytical process and to determine the accuracy and precision of the analytical methods. All radiochemical data were reviewed and qualified in accordance with SNL/NM Administrative Operating Procedure (AOP) AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data" (SNL/NM June 2014a). Data Validation Reports and Contract Verification Review forms are provided in Annex B.

Table 8-1
Summary of Metals Results (EPA Method 6020/7470[a])
Mixed Waste Landfill Biota Monitoring
August 2014

Sample Location	Parameter	NMED Background[b] (mg/kg)	Result (mg/kg)	Trigger Level[b] (mg/kg)	Laboratory Qualifier[c,d]	Validation Qualifier[c,e]
MWL AHSS-01	Arsenic	5.6	4.14	17.7	--	--
21-Aug-14	Barium	130	74.4	100,000	N	J
and	Beryllium	0.65	0.364	2,260	J	--
27-Aug-14 for mercury only	Cadmium	<1	ND (0.0956)	897	--	--
	Chromium	17.3	6.12	63.1	--	--
	Cobalt	5.2	2.58	20,500	--	--
	Copper	15.4	5.50	45,400	--	--
	Lead	21.4	6.08	800	--	--
	Mercury	<0.25	0.00636	73.6	J	J
	Nickel	11.5	5.26	22,500	--	--
	Selenium	<1	ND (0.478)	5,680	U	--
	Silver	<1	0.141	5,680	J	0.535U, B
	Vanadium	20.4	15.9	5,680	--	--
	Zinc	62	17.7	100,000	--	--
MWL AHSS-02	Arsenic	5.6	3.43	17.7		--
21-Aug-14	Barium	130	66.1	100,000	N	J
	Beryllium	0.65	0.328	2,260	J	--
	Cadmium	<1	ND (0.0988)	897	U	--
	Chromium	17.3	4.90	63.1	--	--
	Cobalt	5.2	2.14	20,500	--	--
	Copper	15.4	4.96	45,400	--	--
	Lead	21.4	5.57	800	--	--
	Mercury	<0.25	0.00716	73.6	J	--
	Nickel	11.5	4.55	22,500	--	--
	Selenium	<1	1.02	5,680	J	5.2U, B
	Silver	<1	ND (0.0988)	5,680	U	--
	Vanadium	20.4	13.7	5,680	--	--
	Zinc	62	15.9	100,000	--	--
MWL ABSS-01	Arsenic	5.6	4.27	17.7	--	--
21-Aug-14	Barium	130	75.9	100,000	N	J
and	Beryllium	0.65	0.390	2,260	J	--
27-Aug-14 for mercury only	Cadmium	<1	ND (0.0893)	897	U	--
	Chromium	17.3	6.37	63.1	--	--
	Cobalt	5.2	2.89	20,500	--	--
	Copper	15.4	5.86	45,400	--	--
	Lead	21.4	7.29	800	--	--
	Mercury	<0.25	0.0163	73.6	--	J
	Nickel	11.5	5.72	22,500	--	--
	Selenium	<1	ND (0.446)	5,680	U	--
	Silver	<1	ND (0.0893)	5,680	U	--
	Vanadium	20.4	16.6	5,680	--	--
	Zinc	62	18.4	100,000	--	--

Refer to notes at end of table.

Table 8-1 (Concluded)
Summary of Metals Results (EPA Method 6020/7470[a])
Mixed Waste Landfill Biota Monitoring
August 2014

Sample Location	Parameter	NMED Background[b] (mg/kg)	Result (mg/kg)	Trigger Level (mg/kg)	Laboratory Qualifier[c,d]	Validation Qualifier[c,e]
MWL ABSS-02	Arsenic	5.6	4.57	17.7	--	--
21-Aug-14	Barium	130	79.7	100,000	N	J
and	Beryllium	0.65	0.454	2,260	J	--
27-Aug-14 for mercury only	Cadmium	<1	0.0948	897	J	--
	Chromium	17.3	8.48	63.1	--	--
	Cobalt	5.2	3.50	20,500	--	--
	Copper	15.4	6.87	45,400	--	--
	Lead	21.4	9.63	800	--	--
	Mercury	<0.25	0.0141	73.6	--	J
	Nickel	11.5	6.79	22,500	--	--
	Selenium	<1	ND (0.465)	5,680	U	--
	Silver	<1	0.133	5,680	J	0.535U, B
	Vanadium	20.4	20.4	5,680	--	--
	Zinc	62	23.4	100,000	--	--

Notes:
[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.
[b]Dinwiddie September 1997, Letter from R.S. Dinwiddie (NMED) to M.J. Zamorski (DOE), "Request for Supplemental Information: Background Concentrations Report, SNL/KAFB," dated September 24, 1997.
[c]If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples.
[d]Laboratory qualifiers:
J = Estimated value.
N = Result for the associated matrix spike had low recovery.
U = Analyte was not detected.
[e]Validation qualifiers:
B = The laboratory method blank was contaminated at a concentration greater than the MDL.
J = Value is estimated due to poor replicate precision (mercury results) or low matrix spike recovery (barium results).
U = The analyte was reported as a detection by the laboratory but was qualified during data validation review as not detected due to laboratory contamination. The associated numerical value is the revised sample quantitation limit, in accordance with the data validation process.
DOE = U.S. Department of Energy
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
N = Result for the associated matrix spike had low recovery.
ND = Not detected above the MDL, shown in parentheses.
NMED = New Mexico Environment Department.

Table 8-2
Summary of Gamma Spectroscopy Results (EPA Method 901.1[a])
Mixed Waste Landfill Biota Monitoring
August 2014

Sample Location	Parameter	Result (pCi/g)	NMED Background[b] (pCi/g)	Laboratory Qualifier[c]	Validation Qualifier[c]
MWL AHSS-01	Cesium-137	0.0465 ± 0.0334	1.5	--	J
	Cobalt-60	0.00719 ± 0.0201	NA	U	BD
	Radium-226	0.695 ± 0.104	2.7	--	--
	Thorium-232[b]	0.841 ± 0.0874	1.5	--	--
	Uranium-235	0.0646 ± 0.151	0.18	U	BD
	Uranium-238	0.577 ± 1.24	2.3	U	BD
MWL AHSS-02	Cesium-137	0.0949 ± 0.0229	1.5	--	--
	Cobalt-60	0.0086 ± 0.016	NA	U	BD
	Radium-226	0.681 ± 0.0879	2.7	--	--
	Thorium-232[d]	0.858 ± 0.0966	1.5	--	--
	Uranium-235	0.0744 ± 0.0978	0.18	U	BD
	Uranium-238	0.708 ± 0.456	2.3	--	J
MWL ABSS-01	Cesium-137	0.0992 ± 0.0254	1.5	--	--
	Cobalt-60	0.00526 ± 0.0169	NA	U	BD
	Radium-226	0.772 ± 0.100	2.7	--	--
	Thorium-232[d]	0.858 ± 0.0924	1.5	--	--
	Uranium-235	0.0434 ± 0.132	0.18	U	BD
	Uranium-238	0.440 ± 1.56	2.3	U	BD
MWL ABSS-02	Cesium-137	0.173 ± 0.0392	1.5	--	--
	Cobalt-60	0.00301 ± 0.0217	NA	U	BD
	Radium-226	0.761 ± 0.0973	2.7	--	--
	Thorium-232[d]	1.02 ± 0.0999	1.5	--	--
	Uranium-235	0.0351 ± 0.100	0.18	U	BD
	Uranium-238	1.16 ± 1.26	2.3	X	R
MWL PDRV-01	Cesium-137	-0.00542 ± 0.0136	NA	U	BD
	Cobalt-60	0.0188 ± 0.0169	NA	U	BD
	Radium-226	0.0112 ± 0.0287	NA	U	BD
	Thorium-232[d]	-0.00803 ± 0.0228	NA	U	BD
	Uranium-235	0.00297 ± 0.0718	NA	U	BD
	Uranium-238	0.452 ± 0.507	NA	U	BD

Notes:
[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.
[b]Dinwiddie September 1997, Letter from R.S. Dinwiddie (NMED) to M.J. Zamorski (DOE), "Request for Supplemental Information: Background Concentrations Report, SNL/KAFB," dated September 24, 1997. Cobalt-60 is not naturally occurring; therefore, it does not have a listed background activity. There are no established background activities for vegetation.
[c]If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples. Qualifiers "BD" "J" "R" "U" and "X" see below.
[d]Thorium-232 activity is quantified and reported using the daughter isotope Lead-212 results.
ABSS = Animal burrow soil sample.
AHSS = Ant hill soil sample.
BD = Result is below the MDA.
DOE = U.S. Department of Energy.
J = The associated value is an estimated quantity.
MDA = Minimum detectable activity.
NA = Not applicable.
NMED = New Mexico Environment Department.
pCi/g = Picocuries per gram.
PDRV = Perennial deep-rooted vegetation sample.
R = Result is not valid, peak could not be identified.
U = Analytewas not detected.
X = Analytical result is not valid due to peak not meeting identification criteria.

Based upon the data validation and review criteria, all analytical data were determined to be technical defensible. Reported QC samples results were in compliance with analytical method and laboratory procedure requirements.

8.3 Data Evaluation and Monitoring Trigger Level

Trigger levels for metals in surface soil samples collected at animal burrows and/or ant hills are specified in the MWL LTMMP, Table 5.2.2-1 and included in Table 8-1. No surface soil metals results exceeded the trigger levels.

There are no trigger levels established for radionuclides. In accordance with the LTMMP Section 5.2.2.2, the gamma spectroscopy results are compared with NMED-approved background activity levels (Dinwiddie September 1997) for comparison only. There are no established background activities for vegetation. All radionuclide results for surface soil samples collected at animal burrows and ant hills were below the NMED-approved background activity levels. All vegetation radionuclide results were non-detections.

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9.0 INSPECTION, MAINTENANCE, AND REPAIR RESULTS

This chapter presents a summary of inspection, maintenance, and repair activities in accordance with requirements in MWL LTMMP Section 4.0 and Appendix I, MWL Long-Term Monitoring Inspection Checklists/Forms (SNL/NM March 2012). Inspection requirements are summarized in Table 2-2 of this Annual LTMM Report. Table 9-1 lists the date(s) each type of inspection was performed during the April 1, 2014 through March 31, 2015 reporting period. Inspection results are presented in the following sections and documented on the inspection forms/checklists called out in Table 9-1 and provided in Annex F. A summary of inspection activities and results is provided in Section 11.2.

9.1 Final Cover System

The final cover system includes the ET Cover vegetation and ET Cover surface. ET Cover vegetation is inspected by an SNL/NM staff biologist and the results documented on the Biology Inspection Form/Checklist for the MWL Cover. The ET Cover surface is also inspected by a field technician together with the storm-water diversion structures, security fence, and survey monuments, and results documented on the MWL Cover Inspection Checklist/Form.

9.1.1 Biology Inspection

Two ET Cover Biology Inspections were performed by the staff biologist during the reporting period (Table 9-1). Based upon results from the inspection conducted in August 2014 (i.e., the growing season inspection), it was determined that the three criteria for successful revegetation described in MWL LTMMP Section 4.1 had been met. Since the criteria were met, this determination changed the required inspection frequency of cover vegetation inspection to an annual basis, during the growing season (i.e., August-September). The next ET Cover Biology Inspection will be performed in August-September 2015. The results of the inspections are provided below.

May 15, 2014 – Quarterly Inspection

The approximate foliar coverage on the ET Cover and side slopes was 52 percent, with 95 percent of this coverage composed of native vegetation. The foliar coverage is dominated by native grasses, with James' galleta (native grass species) comprising approximately 45 percent of the total foliar coverage. There were no contiguous areas without vegetation exceeding 200 square feet in size.

One juvenile fourwing saltbush plant was identified growing on the ET Cover. This shrub species is capable of developing deep root systems, so its location was noted for biota sampling in accordance with MWL LTTMP Section 3.6.2. This small shrub was removed on August 21, 2014 during the annual biota sampling event (described in Section 8.1). No other plants capable of developing deep root systems were observed.

Table 9-1
Inspection Frequency and Dates Performed
Mixed Waste Landfill
April 2014 – March 2015 Reporting Period

Inspection Type	Frequency	Form/Checklist	Date Performed
ET Cover Biology Inspection	Quarterly (through August 2014 then, annually)[a]	Biology Inspection Checklist/Form	May 15, 2014
			August 14, 2014
ET Cover Surface Inspection	Quarterly	Cover Inspection Checklist/Form	May 21, 2014
			August 4, 2014
			December 3, 2014
			February 16, 2015
Storm-Water Diversion Structure Inspection	Quarterly	Cover Inspection Checklist/Form	May 21, 2014
			August 4, 2014
			December 3, 2014
			February 16, 2015
Soil-Vapor Monitoring Network Inspection	Semiannually	Soil-Vapor Monitoring Network Checklist/Form	September 11, 2014
			October 22, 2014
Groundwater Monitoring Network Inspection	Semiannually	Groundwater Monitoring Network Checklist/Form	April 21, 2014
			October 16, 2014
Soil-Moisture Monitoring Network Inspection	Semiannually	Soil-Moisture Monitoring Network Checklist/Form	April 15, 2014
			October 16, 2014
Security Fence Inspection	Quarterly	Cover Inspection Checklist/Form	May 21, 2014
			August 4, 2014
			December 3, 2014
			February 16, 2015

Notes:
[a]Transition from quarterly to annual inspection frequency based upon meeting successful revegetation criteria as determined by the staff biologist during the August 2014 growing season inspection.
ET = Evapotranspirative.

Several (less than 12) ant hills/burrows and approximately 25 small mammal burrows with a diameter less than 4 inches were observed and noted. None of the burrows appeared to be created by a species capable of burrowing 6 feet or greater, and most appeared to be test burrows (temporary, abandoned burrows). Small animal burrows were located across the cover surface and side slopes, especially the northern side slope and side slopes at the southwestern corner. Ant hills were located predominantly on the side slopes or on cover surface near the side slopes. No action or repairs were required.

August 14, 2014 – Inspection

The approximate foliar coverage on the ET Cover and side slopes was very similar to the May inspection. Total foliar coverage was the same; approximately 52 percent, with 99 percent of this coverage composed of native vegetation. James' galleta comprised approximately 42 percent of the total foliar coverage. There were no contiguous areas without vegetation exceeding 200 square feet in size.

No plants capable of developing deep root systems were identified other than the juvenile fourwing saltbush plant discussed above in the May inspection results.

Nine ant hills/burrows were identified, mostly on or near the side slopes. Seven small mammal burrows with diameters less than 4 inches were noted, near or on the northern and southern side slopes. None of the burrows appeared to be created by a species capable of burrowing 6 feet or greater. No action or repairs were required.

9.1.2 ET Cover System/Surface Inspection

Four ET Cover surface inspections were performed by a field technician during the reporting period fulfilling the LTMMP quarterly inspection requirement (Table 9-1). No inspection parameters required follow-up actions.

9.1.3 ET Cover Supplemental Watering and Maintenance

The MWL LTMMP addresses all cover maintenance and supplemental watering activities from the completion of the ET Cover in September 2009 through 2011. Supplemental watering and cover maintenance activities performed in 2012 through March 31, 2014 are summarized in the MWL Annual LTMM Report, January – March 2014 (SNL/NM June 2014b). Maintenance performed in response to the ET Cover Surface and Physical Controls Inspections, if required, is discussed separately in sections 9.1.2, 9.2, and 9.6. Routine ET Cover maintenance and supplemental watering performed from April 1, 2014 through March 31, 2015 to facilitate the healthy growth and establishment of mature native grasses is discussed below.

Supplemental watering was conducted during the reporting period at the direction of the staff biologist to augment natural precipitation and facilitate the healthy growth and establishment of the native grasses. Water was applied using the temporary irrigation system installed on top of the ET Cover surface in 2011 (SNL/NM March 2012, Appendix B) in accordance with LTMMP conditions (SNL/NM March 2012, Section 4.2.3). For each watering event, the equivalent of a 0.5-inch rain event was applied to the ET Cover and side slopes over a period of approximately 6 to 7 hours. All 2014 supplemental watering activities are summarized below. No supplemental watering activities were performed from January 1 through March 31, 2015.

Supplemental Watering & Natural Precipitation for Calendar Year 2014		
Supplemental Watering Date	**Supplemental Water Applied[a] (inches)**	**Supplemental Water + Natural Precipitation[b] (inches)**
May 22 and 29, 2014	1.0	2.5 + 7.48 = **9.98**
June 5, 2014	0.5	
October 16 and 28, 2014	1.0	

[a]Supplemental water was applied over the ET Cover area using a temporary, above-ground sprinkler system. The volume of water used was tracked and converted to "inches of precipitation" for the ET Cover surface area.
[b]Natural precipitation determined from the SNL/NM Meteorological Monitoring Program.
ET = Evapotranspirative.
SNL/NM = Sandia National Laboratories, New Mexico.

Maintenance activities performed on the MWL ET Cover during the April 1, 2014 through March 31, 2015 reporting period are summarized below. Most of the maintenance effort involved clearing the perimeter fence of windblown tumbleweeds and to ensure that mature, deep-rooted Russian thistle plants did not establish on the ET Cover in accordance with the

NMED conditions of approval for the Corrective Measures Implementation Plan (Bearzi December 2008). All work was done by hand (except herbicide application to the staging areas) and no vehicle traffic was allowed on the ET Cover. The number of live, annual weedy species growing on the cover during the 2014 growing season was relatively small, and has declined considerably since ET Cover installation in 2009.

March 31 - April 4, 2014

Dead weedy vegetation was removed from the MWL ET Cover and perimeter fence. This maintenance activity primarily removed loose tumbleweeds that had blown into the area and accumulated along the fence line. Approximately 60 cubic yards of highly compressed weeds were removed from the site.

June 3 – 4, 2014

Live and dead weedy vegetation was removed from the MWL ET Cover, perimeter fence, and surrounding ET cover perimeter area (including the storm-water diversion features). The majority of this maintenance activity involved clearing tumbleweeds from the perimeter fence; there were very few live weedy species present on the ET Cover. Approximately 30 cubic yards of lightly compressed weeds were removed from the site.

August 18 – 28, 2014

Loose and dead weedy vegetation was removed by hand from the MWL ET Cover, perimeter fence, and surrounding ET Cover perimeter area, including the storm-water diversion features. Growing, live non-native grass species were also removed by hand from the ET Cover and perimeter area to approximately 10 feet outside the perimeter fence. The post-emergent herbicide Strike 3® from Winfield Solutions was applied to the North and South Staging Areas (i.e., graveled staging areas outside the perimeter fence) to prevent additional tumbleweed growth. Approximately 10 cubic yards of highly compressed weeds were removed from the site.

October 29 – 30, 2014

Live and dead weedy vegetation was removed by hand from the MWL ET Cover, perimeter fence, and ET Cover perimeter area, including the storm-water diversion features. Growing, live non-native grass species were also removed by hand from the ET Cover and perimeter area to approximately 10 feet outside the perimeter fence. Approximately 9 cubic yards of highly compressed weeds were removed from the site.

March 4 – 5, 2015

Live and dead weedy vegetation was removed by hand from the MWL ET Cover, perimeter fence, and ET Cover perimeter area, including the storm-water diversion features. Growing, live non-native grass species were also removed by hand from the ET Cover, the western perimeter

area between the fence and road, and a 10-foot buffer area outside the fence. The pre-emergent herbicide Payload® from Valent was applied to the North and South Staging Areas (i.e., graveled staging areas outside the perimeter fence) to prevent additional tumbleweed growth. Approximately 15 cubic yards of highly compressed weeds were removed from the site.

9.2 Storm-Water Diversion Structure Inspection

Storm-water diversion structure inspections were combined with the quarterly ET Cover System/Surface Inspections during the reporting period, fulfilling the LTMMP quarterly inspection requirement (Table 9-1). These inspections addressed the storm-water diversion swale on the north, east, and south sides of the ET Cover (just outside the toe of the cover side slope) and were documented on the same Cover Inspection Checklist/Form. No inspection parameters required follow-up actions; however, windblown weeds were removed from the swale during ET Cover weed removal events described in Section 9.1.3 as a best management practice.

9.3 Soil-Vapor Monitoring Network Inspection

Soil vapor monitoring network inspections were performed in conjunction with two soil-vapor monitoring events conducted during the reporting period, fulfilling the LTMMP semiannual inspection requirement (Table 9-1). No inspection parameters required follow-up actions.

9.4 Soil-Moisture Monitoring Network Inspection

Two inspections of the soil-moisture monitoring network were performed during the reporting period fulfilling the LTMMP semiannual inspection requirement (Table 9-1). The results of the semiannual inspections are provided below.

April 15, 2014 – Semiannual Inspection

The protective casings and bollards for MWL-VZ-1, MWL-VZ-2, and MWL-VZ-3 needed repainting. The protective casings and bollards at all three monitoring locations were repainted on April 21, 2014. No other inspection parameters required action.

October 16, 2014 – Semiannual Inspection

The locks at MWL-VZ-1, MWL-VZ-2, and MWL-VZ-3 were not functioning properly and were replaced during the inspection. No other inspection parameters required action.

9.5 Groundwater Monitoring Well Network Inspection

Inspections of the groundwater monitoring well network were performed in conjunction with two groundwater monitoring events conducted during the reporting period fulfilling the LTMMP

semiannual inspection requirement (Table 9-1). No inspection parameters required follow-up actions.

Passive soil-vapor venting devices (BaroBalls™) were installed on the four compliance groundwater monitoring wells (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9) on February 2, 2015. These devices were installed on the wells after a review of the September 2014 soil-vapor monitoring results (low ppbv VOC concentrations at 400 feet bgs). The groundwater monitoring wells have a large screen interval above the water table that could provide a conduit for VOC soil-vapor migration into the monitoring well. BaroBall™ devices were installed as a best management practice to minimize the potential impact of VOC soil vapor on groundwater within the monitoring wells. They are designed to facilitate the upward movement and venting to the atmosphere of soil vapor in the monitoring well, and prevent downward movement from barometric pressure (i.e., barometric pumping during periods of high pressure in the atmosphere). This same technology has been successfully applied at the Chemical Waste Landfill since the late 1990s.

9.6 Security Fence Inspection

Perimeter security fence inspections were combined with the four quarterly ET Cover System/Surface Inspections during the reporting period fulfilling the LTMMP quarterly inspection requirement (Table 9-1). The inspections of the security fence, access controls (gates, locks, signs), and survey monuments were documented on the Cover Inspection Checklist/Form. Results of the quarterly inspections are provided below.

May 21, 2014 – Quarterly Inspection

Accumulation of wind-blown plant debris was identified on the security fence. The plant debris was removed from the security fence on June 4, 2014. No other inspection parameters required action.

August 4, 2014 – Quarterly Inspection

Accumulation of wind-blown plant debris was identified on the security fence. The plant debris was removed on August 27, 2014. The top barbed wire strand on the security fence in the east dog-leg area had been severed and was loose. It was repaired by the field technician performing the inspection on the day of the inspection. No other inspection parameters required action.

December 3, 2014 – Quarterly Inspection

No inspection parameters required action.

February 16, 2015 – Quarterly Inspection

Accumulation of wind-blown plant debris was identified on the security fence. The plant debris was removed on March 5, 2015. Survey monuments were not visible due to excessive weed growth. Weeds were cleared around the monuments on March 5, 2015. No other inspection parameters required action.

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10.0 REGULATORY ACTIVITIES

On January 8, 2014, the NMED approved the MWL LTMMP (Blaine January 2014). DOE and Sandia regulatory submittals (January 2014 through March 2015) are summarized in Chapter 1. Regulatory activities at the MWL that occurred prior to and during the April 2014 through March 2015 reporting period are summarized in this Section. There were no Permit modification requests during the reporting period related to changing the LTMMP.

10.1 MWL Regulatory Submittals

This section addresses MWL regulatory submittals associated with implementation of the LTMMP (Section 10.1.1), MWL regulatory submittals that occurred during this reporting period associated with LTMMP requirements (Section 10.1.2), and other MWL regulatory submittals that occurred during this reporting period (Section 10.1.3).

10.1.1 LTMMP Implementation Regulatory Submittals

After NMED approval of the LTMMP on January 8, 2014 (Blaine January 2014), DOE and Sandia submitted two documents related to installation of three multi-port FLUTe™ soil-vapor monitoring wells. The first document was the installation work plan, submitted to NMED on January 15, 2014 (SNL/NM January 2014). The installation work plan was approved by NMED on February 14, 2014 (Blaine February 2014) and the drilling and installation field work was completed in July 2014. DOE and Sandia submitted the installation report on September 10, 2014 (SNL/NM September 2014) and NMED approved the report on September 25, 2014 (Kieling September 2014).

10.1.2 LTMMP Regulatory Submittals

On June 18, 2014, DOE and Sandia submitted the MWL LTMM Report (reporting period January 2014-March 2014) for the first reporting period of January 8, 2014 through March 31, 2014, under the LTMMP (SNL/NM June 2014c). The NMED approved the LTMM Report on August 6, 2014 (Kieling August 2014).

On July 9, 2014, DOE and Sandia submitted three updated reference documents cited in the LTMMP in accordance with requirements of the Soil-Vapor and Groundwater Sampling and Analysis Plans (Appendices D and F) of the LTMMP (Todd July 2014). Revisions included updates to keep the reference documents current and to reflect ongoing modifications and improvements in industry practices. The revised reference documents became effective on June 16, 2014.

On February 18, 2015, DOE and Sandia submitted five updated reference documents cited in the LTMMP in accordance with requirements of the Groundwater Sampling and Analysis Plan (Appendix F) of the LTMMP (Todd February 2015a). Revisions included updates to keep the

reference documents current and to reflect ongoing modifications and improvements in industry practices. The revised reference documents became effective on January 23, 2015.

10.1.3 Other MWL Regulatory Submittals

As stated in Table 2-1, groundwater wells MWL–MW4, MWL-MW5, and MWL-MW6 were retained for monitoring groundwater elevation only. During annual groundwater monitoring conducted in January and February 2013, unfiltered metals results in the groundwater sample from well MWL-MW4 were anomalously elevated. All of the unfiltered sample results for chromium, cobalt, copper, iron, and nickel were historic maximum concentrations for well MWL-MW4, which has been monitored since 1993. On May 20, 2014, DOE and Sandia submitted a report to NMED documenting the results and providing recommendations for follow-up work (Todd May 2014). The suspected source of the elevated metals concentrations in the samples was corrosion by-products from the dedicated stainless steel sampling pump, which was required in well MWL-MW4 due to the unique well configuration. MWL-MW4 is angled 6 degrees from vertical and has two screens that require an inflatable packer in the well to isolate the screen intervals. On July 24, 2014, the NMED provided recommendations to DOE/Sandia for pumping/purging and sampling to remove sediment and corrosion particles from groundwater monitoring well MWL-MW4 (Kieling July 2014).

From September 8 through September 29, 2014, pumping and sampling of MWL-MW4 was conducted to remove sediment and corrosion particles from the well in accordance with the NMED recommendations (Kieling July 2014). The pumping and sampling results included decreasing trends of field turbidity measurements and unfiltered metals analytical results that were all much lower than the anomalous 2013 unfiltered results. On December 16, 2014 the packer and dedicated stainless steel sampling pump were removed from the well and inspected. The visual inspection of the pump provided conclusive evidence of substantial corrosion capable of causing elevated, anomalous metals results in groundwater samples – a source within the well. A photograph of the pump after removal is provided in Figure 10-1. The September and December 2014 field work and results were documented in a report submitted to NMED (Todd February 2015b) that was approved by NMED on March 10, 2015 (Kieling March 2015).

10.2 Class 3 Permit Modification Request for Corrective Action Complete With Controls for the Mixed Waste Landfill

DOE and Sandia requested a Certification of Completion for the MWL in accordance with Section VII.D.6 of the Consent Order on September 25, 2014 (Beausoleil September 2014). On October 8, 2014, NMED determined that all LTMMP monitoring systems are deployed for long-term controls and issued the Certificate of Completion (Cobrain October 2014).

Figure 10-1
Photograph of Stainless Steel Sampling Pump Removed from
Mixed Waste Landfill Groundwater Well MWL-MW4 on December 16, 2014

DOE and Sandia submitted a request dated October 17, 2014 to NMED for a Class 3 Permit Modification for Corrective Action Complete with Controls at the MWL (Beausoleil October 2014). The request and associated legal notice initiated the DOE and Sandia 60-day public comment period that ended on January 5, 2015. Activities associated with this Class 3 Permit Modification request included:

- Delivery to NMED of one printed copy and one copy in electronic format of an eight-volume set of documents titled Justification for Class 3 Permit Modification for Corrective Action Complete with Controls, Solid Waste Management Unit 76, Mixed Waste Landfill (SNL/NM October 2014),

- Delivery of two printed sets of the eight-volume justification binders to the University of New Mexico Zimmerman Library for the SNL/NM public reading room, and

- Hosting a public meeting/poster session on November 18, 2014 in Albuquerque, New Mexico at the Manzano Mesa Multigenerational Center.

After DOE and Sandia completed their public comment period on January 5, 2015, NMED initiated a 60-day public comment period that started on January 12, 2015 (Cobrain January 2015). On March 17, 2015 NMED extended this public comment period an additional 30 days, to April 13, 2015.

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11.0 SUMMARY AND CONCLUSIONS

This chapter presents a summary and conclusions of all MWL LTMMP monitoring, inspection, and maintenance/repair activities in this reporting period.

11.1 Monitoring Activities

All monitoring activities for the April 1, 2014 through March 31, 2015 reporting period were completed in accordance with LTMMP requirements. The results for each monitoring activity are summarized as follows.

Radon Monitoring

The radon air monitoring frequency is quarterly. During the first quarter monitoring event the result for the RN2 location was rejected due to the detector dislodging from the protective casing during the monitoring period. Quarterly average radon concentrations ranged from 0.4 to 0.9 pCi/L at monitoring locations RN1 through RN15, and average background radon concentrations at locations RN16 and RN17 ranged from 0.5 to 0.6 pCi/L. The trigger level applies data collected from detectors located along the perimeter fence, locations RN1 through RN10. All results for locations RN1 through RN10 were well below the trigger level of 4.0 pCi/L.

Tritium Surface Soil Monitoring

The tritium surface soil monitoring frequency is annual. Soil samples were collected on August 21, 2014. Samples were also collected on January 20, 2015 to address sample location issues and to obtain soil samples with higher moisture content. Tritium levels for the August 2014 samples were all non-detections, and for the January 2015 sampling event they were all detections, with activities ranging from 1,010 to 1,830 pCi/L. All values were well below the trigger level of 20,000 pCi/L.

Soil-Vapor Monitoring

The vadose zone soil-vapor monitoring frequency is semiannual. Installation of the three FLUTe™ multi-port soil-vapor monitoring wells was completed in July 2014, and the wells were ready for sampling in September 2014, (after 2 months to allow for vadose zone equilibration). For this reporting period only, semiannual sampling was performed in September and October 2014 to allow for two monitoring events to be included in this report. Future soil-vapor monitoring will be performed in April and October of each annual reporting period, consistent with groundwater and soil-moisture semiannual monitoring. A total of 31 compounds were detected above laboratory MDLs between the two sampling events. Results for PCE, TCE, and Total VOCs from the deepest port of wells MWL-SV03, MWL-SV04, and MWL-SV05 were below the 20 ppmv trigger level for PCE and TCE, and the 25 ppmv trigger level for total organics. The maximum concentrations detected for PCE and TCE at the 400 feet bgs sampling

ports were 0.400 ppmv and 0.290 ppmv, respectively. The maximum concentration for total organics was 0.87270 ppmv.

Soil-Moisture Monitoring

The vadose zone soil-moisture monitoring frequency is semiannual. The trigger level for soil moisture applies to the shallow depth interval of 8.7 to 86.6 feet bgs at the three monitoring locations. The soil-moisture content by volume for this depth interval ranged from 1.5 to 4.8 percent, below the 23 percent soil-moisture content by volume trigger level.

Groundwater Monitoring

The groundwater monitoring frequency is semiannual. No groundwater constituents were detected at concentrations exceeding trigger levels and the results are consistent with historical MWL groundwater monitoring results.

Biota Monitoring

Biota monitoring frequency is annual. All results were below the trigger levels and radionuclide results were below background activities.

11.2 Inspections/Maintenance/Repairs Activities

The ET Cover Biology Inspection was performed quarterly until the August 2014 growing season inspection when the staff biologist determined the ET Cover met LTMMP successful revegetation criteria. This transitioned the Biology Inspection frequency to annual. No issues requiring maintenance or repairs were identified.

The ET Cover System inspection was performed quarterly. There were no issues identified.

The engineered storm-water drainage swale inspection was performed quarterly. There were no issues identified.

The soil-vapor monitoring network inspection was performed semiannually. There were no issues identified.

The soil-moisture monitoring network inspection was performed semiannually. The protective casings and bollards for MWL-VZ-1, MWL-VZ-2, and MWL-VZ-3 were repainted and the locks were replaced. The corrective actions were completed within 60 days of being identified. There were no other issues identified.

The groundwater monitoring network inspection was performed semiannually. There were no issues identified. Passive soil-vapor venting devices (i.e., BaroBalls™) were installed on groundwater monitoring wells MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9 as a best

management practice on February 2, 2015 after a review of the September 2014 soil-vapor monitoring results that showed “ppbv” VOC soil-vapor concentrations at 400 feet bgs.

The perimeter security fence inspection which also includes access controls (i.e., gates, locks, signs), and survey monuments was performed quarterly. Accumulation of wind-blown plant debris was identified on the security fence in three of the inspections. A strand of barbed wire on the security fence was repaired during one inspection. Excessive weed growth was identified around the survey monuments during one of the inspections. All repairs were completed within 60 days of being identified. There were no other issues identified.

11.3 Regulatory Activities

Regulatory activities during the April 2014 – March 2015 reporting period include submittal and NMED approval of a soil-vapor well installation report in September 2014; the MWL LTMM Report, January – March 2014; and two separate submittals of updated reference documents cited in the LTMMP in July 2014 and February 2015.

Other MWL regulatory submittals included a February 2015 report that presented sampling results and subsequent field work documenting corrosion of the dedicated stainless steel sampling pump in well MWL-MW4 as the cause of anomalous unfiltered metals results from the annual CY 2013 sampling event. This MWL-MW4 report was approved by NMED on March 10, 2015 (Kieling March 2015).

DOE and Sandia also requested a Class 3 Permit Modification for Corrective Action Complete with Controls for the MWL in October 2014, and held a public comment period and public meeting associated with the request.

11.4 Conclusions

SNL/NM has performed and documented all required MWL LTMMP monitoring and inspection requirements. This first full-year Annual LTMM Report presents the monitoring, inspection, and repair activities and results for the April 1, 2014 through March 31, 2015 reporting period as required by the MWL LTMMP, Section 4.8.1. The monitoring and inspection results indicate the final remedy, which includes the ET Cover and related physical and institutional controls, is performing as designed. Site conditions continue to be protective of groundwater, human health and the environment.

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ANNEX A

Mixed Waste Landfill
Radon Monitoring

January-December 2014

Data Evaluation Memos

Field Forms

Inspection Forms

MIXED WASTE LANDFILL

RADON MONITORING

January-March 2014 Monitoring Period

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation

Albuquerque, New Mexico 87185-

date: June 26, 2014

to: Mike Mitchell (6234), Robert Ziock (4142), and Annemarie Rader (4143)

from: Mark Miller (41281), CHP

subject: Review of MWL Radon-in-Air Data – 1st Quarter 2014 (January – March 2014)

The purpose of this memo is to document my review of the radon-in-air monitoring data results for the 1st Quarter of Calendar Year 2014 relative to the data quality objectives (DQOs) in the MWL Long-Term Monitoring and Maintenance Plan (Appendix C), approved by the NMED on January 8, 2014. The radon-in-air monitoring measurements per the NMED-approved LTMMP are made by exposure of Radtrak® radon detectors manufactured by Landauer® Incorporated (or equivalent type detectors) which are exposed and exchanged quarterly (for year 1 and year 2) (January 13, 2014 – April 2, 2014 in this instance), per AR/COC #61440 and submitted to Landauer® Incorporated for analysis. With the exception of the anomalous reading observed for detector RN2 (discussed below), the results meets the LTMMP DQOs found in Appendix C, *Air Sampling and Analysis Plan for the Mixed Waste Landfill* (*…radon measurement procedures are consistent and can be used to establish radon emission trends. The DQO is to produce representative, accurate, defensible, and comparable analytical results to support the monitoring objective (i.e., provide radon emission data). This DQO will be accomplished through the implementation and use of standard operating procedures, analytical procedures/methods, quality assurance (QA) measures, quality control (QC) samples, and data evaluation protocols*.).

During the routine exchange of radon Track Etch® dosimeters (i.e., detectors) on April 2, 2014, detector RN2 was discovered lying on the ground approximately 2 feet from its protective casing, which is secured to a perimeter fence post along the northern edge of the MWL. The detector was covered with dirt, was likely exposed to rain and blowing dust/soil, and the internal chip that is analyzed by the laboratory was warped and damaged. This detector was deployed on January 13, 2014 at the standard monitoring height of approximately 3-feet above the ground surface. When it fell to the ground is unknown. The field technician noted these conditions on the field collection log and sent the detector to the analytical laboratory for analysis. Based on an inspection performed after collection of the RN2 detector, faulty Velcro™ that secures the detector cup inside the protective casing was the reason this particular detector fell to the ground. Strong winds typical of this time of year also were a likely contributor to the situation. The result reported by the analytical laboratory for the RN2 detector was 10.6 pCi/L, and exceeded the 4 pCi/L MWL LTMMP trigger level.

Because of the conditions noted for this detector, the analytical result is not a valid, representative result and does not meet the DQOs as specified above. To provide a valid, representative result, the detector must remain approximately 3-feet above the ground surface and be protected from the weather (i.e., precipitation and wind) and surface soil by the protective casing. The RN2 detector was exposed on the ground surface for an undetermined period of time. Because the detector was submitted for laboratory analysis, the result should be logged into the data base with a notation that it is a rejected, non-valid result along with a brief note in the "comments" column explaining the conditions/reason for the data qualification.

Since this type of situation was not anticipated, I recommend that the field protocol for this monitoring be revised as follows:

- If this situation or something similar were to re-occur in the future, the project leader (Mike Mitchell), Robert Ziock (Air Monitoring Lead), and I should be notified and the detector should not be sent to the laboratory for analysis.

- Upon discovery, additional documentation would be "good practice" and include photographs of the detector as it was discovered.

- A "pre-deployment/exchange inspection" should be performed and documented to ensure the faulty Velcro™ or other potential manufacturer's flaws are caught prior to deployment of the detectors. In addition, the integrity of the protective casing and the hardware that secures the protective casing to the fence post should also be inspected and repaired or replaced if appropriate.

- On a monthly basis, as time permits, the detectors should be visually inspected to make sure the detectors are in place. These monthly inspections can be documented on the deployment inspection form.

Recent radon results are available for the RN2 location. Radon-in-air monitoring at the MWL began in July 2013 in anticipation of NMED approval of the LTMMP. Data sets for July 18 – October 29, 2013 and October 29, 2013 through January 13, 2014 have been reviewed and the results for the RN2 location for both of these previous monitoring periods were "non-detects" (i.e., less than the 0.4 pCi/L laboratory detection limit). Consistent with the MWL LTMMP requirements, re-sampling is being performed as part of the monitoring for the next quarterly period, which began on April 2, 2014 when all the remaining MWL detectors were collected and new detectors were deployed. No other actions are required at this time.

Photographs of the Environmental Track Etch® detectors are provided below for your information. They look like an inverted plastic cup with a filter across the open face and are attached to a fence post as described earlier and shown below. This configuration helps to keep rain water, dust, and dirt away from the track etch chip where it could damage the chip or make the chip difficult for the lab to process.

Outdoor Use

For monitoring outdoors, the detector is fastened to the bottom of a clear plastic cup. The cup is then installed inside a protective canister that has been attached to a post or other location.

SMO 2012-ARCOC (4-2012) AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 2

Batch No. N/A

SMO Use

AR/COC 615440

Project Name:	MWL Radon monitoring	Date Samples Shipped:	4/10/14	SMO Authorization:	☐ Waste Characterization ☐ RMMA ☐ Released by COC No.
Project/Task Manager:	M Miller	Carrier/Waybill No.	213 815	SMO Contact Phone:	☐ 4° Celsius
Project/Task Number:	146422/10.11.08	Lab Contact:	Landauer 800.528.8327	Mark Miller/505.284.2107	
Service Order:	CFO 378-14	Lab Destination:	Landauer, INC.	Send Report to SMO:	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154
		Contract No.:	Acct # 0410548	Rita Kavanaugh/505.284.2553	
Tech Area: TA3 MWL					
Building:	Room:	Operational Site: TA3 MWL			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
095786	--001	RN 1/ 4893709	N/A	1/13/2014*	F	N/A	N/A	None	Collection	Sample	Radon	
095787	--001	RN 2/ 4893710	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095788	--001	RN 3/ 4893711	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095789	--001	RN 4/ 4893712	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095790	--001	RN 5/ 4893713	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095791	--001	RN 6/ 4893714	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095792	--001	RN 7/ 4893715	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095793	--001	RN 8/ 4897921	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095794	--001	RN 9/ 4897922	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095795	--001	RN 10/4897923	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	

Last Chain:	☐ Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd:	☐ Yes	Date Entered:		EDD ☑ Yes ☐ No	
Background:	☐ Yes	Entered by:		Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day	
Confirmatory:	☐ Yes	QC inits:		Negotiated TAT ☐	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Annemarie Rader		AR	SNL/4143/844-2640

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments:

*Samples put out on 01/13/14 and picked up on 04/2/14

Lab Use

1.Relinquished by		Org. 4143	Date 4/8/14	Time 1558	3.Relinquished by	Org.	Date Time
1. Received by	SMO	Org. 4142	Date 4/8/14	Time 1558	3. Received by	Org.	Date 4/16/14 Time
2.Relinquished by	SMO	Org. 4142	Date 4/9/14	Time 0800	4.Relinquished by	Org.	Date Time
2. Received by		Org.	Date	Time	4. Received by	Org.	Date Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012)

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AOP 95-16

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AR/COC 615440

Project Name: MWL Radon Monitoring	Project/Task Manager: M. Miller	Project/Task No.: 146422/10.11.08	
Tech Area: TA# MWL			
Building:	Room:	Acct # 0410548	Lab use

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
095796	--001	RN 11/ 4897924	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095797	--001	RN 12/ 4893706	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095798	--001	RN 13/ ~~4893707~~ 4893716	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095799	--001	RN 14/ ~~4893708~~ 4893717	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095800	--001	RN 15/ 4897867	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095801	--001	RN BKG N/ 4897868	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	
095802	--001	RN BKG S/ 4897869	N/A	1/13/14	F	N/A	N/A	None	Collection	Sample	Radon	

Recipient Initials_____

Radon Monitoring Report

NATIONAL LAB
ARK MILLER
O, RM108, MS1103
BANK SE
ROUE, NM 87123

LICENSES: 101146AL,100584RT
Acct. No. 0410548

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7016

Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
DRNF	13-JAN-14	02-APR-14	RN 12	51.9 ±4.29	0.7 ±0.05	
DRNF	13-JAN-14	02-APR-14	RN 1	53.8 ±4.42	0.7 ±0.06	
DRNF	13-JAN-14	02-APR-14	RN 2 THIS SAMPLE WAS FOUND ON GRND	840.7 ±27.3	10.6 ±0.35	Anomalous Reading
DRNF	13-JAN-14	02-APR-14	RN3	64.3 ±5.10	0.8 ±0.06	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 4	* 30.0	* 0.4 ±0.03	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 5	* 30.0	* 0.4 ±0.04	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 6	* 30.0	* 0.4 ±0.03	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 7	* 30.0	* 0.4 ±0.04	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 13	* 30.0	* 0.4 ±0.04	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 14	* 30.0	* 0.4 ±0.04	

② ③ ④ ⑤ ⑥ ⑦ ⑧

ATED ONLY TO MONITORS BY LANDAUER.

O.C. Release	Process No.	Report Date	Date Received
LMR	A22926	25-APR-14	11-APR-14

PAGE 1 OF 2

Radon Monitoring Report

NATIONAL LAB
ARK MILLER
0, RM108, MS1103
BANK SE
ROUE, NM 87123

LICENSES: 101146AL,100584RT

Acct. No. 0410548

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-0727 Facsimile: (708) 755-7018

Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 15	* 30.0	* 0.4 ±0.04	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN BKG N	* 30.0	* 0.4 ±0.04	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN BKG S	* 30.0	* 0.4 ±0.04	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 8	* 30.0	* 0.4 ±0.04	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 9	* 30.0	* 0.4 ±0.03	
DRNF	13-JAN-14	02-APR-14	* - LESS THAN INDICATED VALUE RN 10	* 30.0	* 0.4 ±0.04	
DRNF	13-JAN-14	02-APR-14	RN 11	68.6 ±5.31	0.9 ±0.07	

(2) (3) (4) (5) (6) (7) (8)

ATED ONLY TO MONITORS BY LANDAUER.

C.C. Release	Process No.	Report Date	Date Received
LMR	A22926	25-APR-14	11-APR-14

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cc: CFRC

LANDAUER®

RADTRAK® RADON TEST DATA SHEET

Company: Sandia Nat'l Labs
Acct. Number: _____
Contact: Mark Miller
Phone: (505) 284-2107
Email: mmiller@sandia.gov

Send Radon Report To:
(If different from account settings)

Company: Sandia Nat'l Laboratories
Attn: Mark Miller
Address: PO Box 5800
MS-0729
City: Albuquerque
ST/Prov: NM Post Code: 87185
Country: USA
Phone: (505) 284-2107
Email: mmiller@sandia.gov

Site Information:
(Please provide information on where detectors are being deployed. Reports will be labeled and sorted by value provided in 'Site Name' below.)

Site Name: SNL / mwl
Site Type: Outdoor
Additional Information: _____

If Applicable:
Technician Name: A.L.Rader
Technician Number: _____
Technician Signature: _____

Please include all detector numbers, exposure periods and location information to appear on report

Detector Number	Building Name / Nbr	Unit Nbr	Floor	Comment / Note	Start Date mm/dd/yyyy	End Date mm/dd/yyyy
please see attached list						

R-105DS-0213

Landauer Use Only: Processed By: _____ **Date:**

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586 T: (708) 755-7000 F: (708) 755-7048 E: radon@landauer.com

COC #

Detector #	Location	Unit #	Start Date	End Date	Comments
4893709	RN 1	095786-001	01/13/2014	04/02/2014	
4893710	RN 2	095787-001	01/13/2014	04/02/2014	This sample was found on ground,
4893711	RN 3	095788-001	01/13/2014	04/02/2014	
4893712	RN 4	095789-001	01/13/2014	04/02/2014	
4893713	RN 5	095790-001	01/13/2014	04/02/2014	
4893714	RN 6	095791-001	01/13/2014	04/02/2014	
4893715	RN 7	095792-001	01/13/2014	04/02/2014	
4897921	RN 8	095793-001	01/13/2014	04/02/2014	
4897922	RN 9	095794-001	01/13/2014	04/02/2014	
4897923	RN 10	095795-001	01/13/2014	04/02/2014	
4897924	RN 11	095796-001	01/13/2014	04/02/2014	
4893706	RN 12	095797-001	01/13/2014	04/02/2014	
4893707	RN 13	095798-001	01/13/2014	04/02/2014	
4893708	RN 14	095799-001	01/13/2014	04/02/2014	
4897867	RN 15	095800-001	01/13/2014	04/02/2014	
4897868	RN BKG N	095802-001	01/13/2014	04/02/2014	
4897869	RN BKG S	095803-001	01/13/2014	04/02/2014	

MIXED WASTE LANDFILL

RADON MONITORING

April-June 2014 Monitoring Period

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation

Albuquerque, New Mexico 87185-

date: July 25, 2014

to: Mike Mitchell (6234), Robert Ziock (4142), Bonnie Little (4142) and Annemarie Rader (4143)

from: Mark Miller (41281), CHP

subject: Review of MWL Radon-in-Air Data – 2nd Quarter of 2014, April through June 2014

The purpose of this memo is to document my review of the radon-in-air monitoring data results for the 2nd Quarter of Calendar Year (CY) 2014, April through June 2014, relative to the data quality objective (DQO) and monitoring objectives specified in the Mixed Waste Landfill (MWL) Long-Term Monitoring and Maintenance Plan (Appendix C, *Air Sampling and Analysis Plan for the Mixed Waste Landfill*). The DQO for this monitoring is to produce representative, accurate, defensible, and comparable analytical results to support the monitoring objective. Monitoring results provide radon emission data from across the site and at two background locations (Figure 1). These results are compared to historic results to evaluate radon air emission trends and for direct comparison to the LTMMP trigger level of 4 picocuries per liter. This DQO and these monitoring objectives are met through the implementation of standard operating procedures, analytical procedures/methods, quality assurance and control measures, and data evaluation protocol.

The radon-in-air monitoring measurements for the monitoring period April through June 2014 were obtained using Radtrak® radon detectors that were submitted to Landauer® Incorporated for analysis on Analysis Request/Chain of Custody (AR/COC) #615614. On April 2, 2014, the detectors were deployed on and around the MWL (locations RN1 through RN15 at the MWL, and background locations RN16 and RN17) in accordance with the requirements of Section 3.2.1 of the LTMMP. These detectors remained in the field for approximately 3 months (one quarter), and were collected on July 3, 2014. The protective casing and mounting hardware were inspected during the collection effort and repairs were made if needed. The location of these detectors is shown in Figure 1.

I have reviewed the results for this monitoring period along with supporting field documentation and determined the results meet the LTMMP DQO and monitoring objectives. The radon trigger level was not exceeded by any of the individual sample results; however, it only applies to the results from the perimeter locations (locations RN1 through RN10, Figure 1). The results from this quarterly monitoring event will be presented in the next MWL Annual LTMM Report that will be submitted to NMED in June 2015 (reporting period is April 1, 2014 through March 31, 2015).

Attachments
Analysis Request/Chain of Custody #615614
Landauer Radon Monitoring Report (analytical laboratory results)
Figure 1 Location of the Radon Track Etch® Detectors at the MWL

SMO 2012-ARCOC (4-2012) AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

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Batch No. N/A — SMO Use — **AR/COC 615614**

Project Name:	MWL Radon monitoring	Date Samples Shipped:	7/10/14	SMO Authorization:	☐ Waste Characterization ☐ RMMA ☐ Released by COC No.
Project/Task Manager:	M Miller	Carrier/Waybill No.	220926	SMO Contact Phone:	
Project/Task Number:	146422/10.11.08	Lab Contact:	Landauer 800.528.8327	Mark Miller/505.284.2107	☐ 4° Celsius
Service Order:	CFO 378-14	Lab Destination:	Landauer, INC.	Send Report to SMO:	
		Contract No.:	Acct # 0410548	Rita Kavanaugh/505.284.2553	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154, Albuquerque, NM 87185-0154
Tech Area: TA3 MWL					
Building:	Room:	Operational Site: TA3 MWL			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096208	--001	RN 1/ 4893707	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096209	--001	RN 2/ 4893708	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096210	--001	RN 3/ 4897886	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096211	--001	RN 4/ 4897887	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096212	--001	RN 5/ 4897888	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096213	--001	RN 6/ 4897892	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096214	--001	RN 7/ 4897893	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096215	--001	RN 8/ 4897894	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096216	--001	RN 9/ 4897911	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096217	--001	RN 10/4897912	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	

Last Chain:	☐ Yes	Sample Tracking — SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☐ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐
			Sample Disposal ☐ Return to Client ☑ Disposal by Lab
			Return Samples By:
			Comments: Samples deployed on 04/02/14 and collected on 07/03/14

Conditions on Receipt

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Annemarie Rader		AMR	SNL/4143/844-2640

Lab Use

1. Relinquished by		Org. 4143	Date 7-9-14	Time 1100	3. Relinquished by	Org.	Date / Time
1. Received by	SMO	Org. 4142	Date 7-9-14	Time 1100	3. Received by	Org.	Date / Time
2. Relinquished by	SMO	Org. 4142	Date 7-10-14	Time 0700	4. Relinquished by	Org.	Date / Time
2. Received by		Org.	Date	Time	4. Received by	Org.	Date / Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012) AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2

AR/COC 615614

Project Name: MWL Radon Monitoring	Project/Task Manager: M. Miller	Project/Task No.: 146422/10.11.08	
Tech Area: TA# MWL			
Building:	Room:	Acct # 0410548	Lab use

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096218	--001	RN 11/ 4897913	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096219	--001	RN 12/ 4897914	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096220	--001	RN 13/ 4897915	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096221	--001	RN 14/ 4897916	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096222	--001	RN 15/ 4897917	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096223	--001	RN 16/ 4897918	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	
096224	--001	RN 17/ 4897920	N/A	7/3/14	F	N/A	N/A	None	Collection	Sample	Radon	

Recipient Initials_____

Radon Monitoring Report

SANDIA NATIONAL LABORATORIES
ATTN: RITA KAVANAUGH
DEPT. 4142, MS 0729
PO BOX 5800
ALBUQUERQUE, NM 87185

LICENSES: 101146AL,100584RT

Acct. No. 0410548

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
4893707	DRNF	02-APR-14	03-JUL-14	096208-001 RN 1	77.5 ±5.68	0.8 ±0.06	
4893708	DRNF	02-APR-14	03-JUL-14	096209-001 RN 2	130.3 ±8.4	1.4 ±0.09	
4897886	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096210-001 RN 3	* 30.0	* 0.3 ±0.03	
4897887	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096211-001 RN 4	* 30.0	* 0.3 ±0.03	
4897888	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096212-001 RN 5	* 30.0	* 0.3 ±0.03	
4897892	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096213-001 RN 6	* 30.0	* 0.3 ±0.04	
4897893	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096214-001 RN 7	* 30.0	* 0.3 ±0.03	
4897894	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096215-001 RN 8	* 30.0	* 0.3 ±0.03	
①	②	③	④	⑤	⑥	⑦	⑧

RESULTS RELATED ONLY TO MONITORS AS RECEIVED BY LANDAUER.

Q.C. Release	Process No.	Report Date	Date Received
KJT	A23045	16-JUL-14	11-JUL-14

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Radon Monitoring Report

SANDIA NATIONAL LABORATORIES
ATTN: RITA KAVANAUGH
DEPT. 4142, MS 0729
PO BOX 5800
ALBUQUERQUE, NM 87185

LICENSES: 101146AL,100584RT

Acct. No. 0410548

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
4897911	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096216-001 RN 9	* 30.0	* 0.3 ±0.03	
4897912	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096217-001 RN 10	* 30.0	* 0.3 ±0.03	
4897913	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096218-001 RN 11	* 30.0	* 0.3 ±0.03	
4897914	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096219-001 RN 12	* 30.0	* 0.3 ±0.03	
4897915	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096220-001 RN 13	* 30.0	* 0.3 ±0.04	
4897916	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096221-001 RN 14	* 30.0	* 0.3 ±0.03	
4897917	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096222-001	* 30.0	* 0.3 ±0.04	
①	②	③	④	⑤	⑥	⑦	⑧

RESULTS RELATED ONLY TO MONITORS AS RECEIVED BY LANDAUER.

Q.C. Release	Process No.	Report Date	Date Received
KJT	A23045	16-JUL-14	11-JUL-14

Radon Monitoring Report

SANDIA NATIONAL LABORATORIES
ATTN: RITA KAVANAUGH
DEPT. 4142, MS 0729
PO BOX 5800
ALBUQUERQUE, NM 87185

LICENSES: 101146AL,100584RT

Acct. No. 0410548

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
4897918	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096223-001 RN 16	* 30.0	* 0.3 ±0.03	
4897920	DRNF	02-APR-14	03-JUL-14	* - LESS THAN INDICATED VALUE 096224-001 RN 17	* 30.0	* 0.3 ±0.03	
①	②	③	④	⑤	⑥	⑦	⑧

RESULTS RELATED ONLY TO MONITORS AS RECEIVED BY LANDAUER.

Q.C. Release	Process No.	Report Date	Date Received
KJT	A23045	16-JUL-14	11-JUL-14

PAGE 3 OF 3

Radon Track Etch® Results for the 2nd Quarter of CY 2014 at the MWL

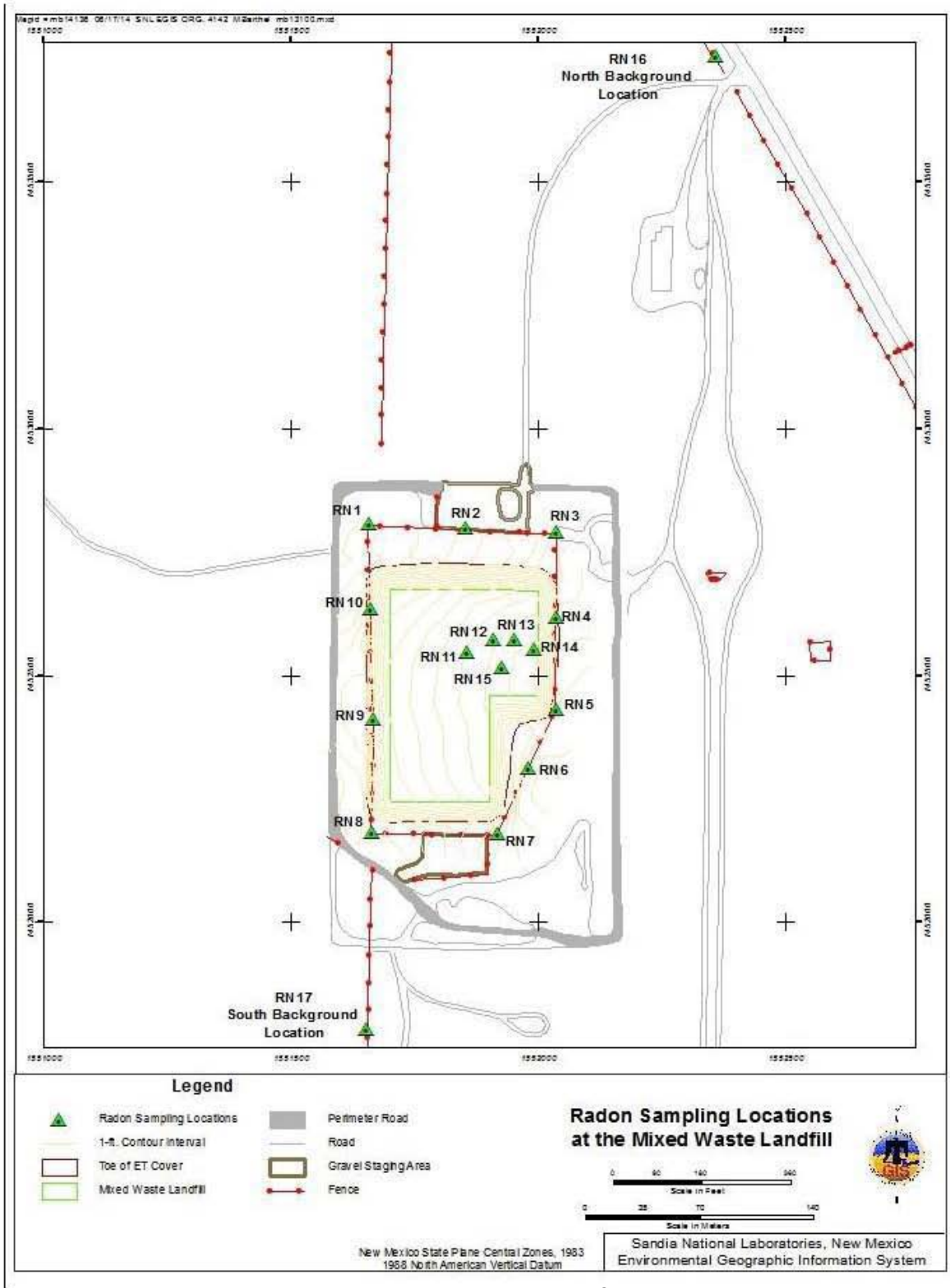

Figure 1. Location of the Radon Track Etch® Detectors at the MWL

LANDAUER®

RADTRAK® RADON TEST DATA SHEET

Company: Sandia Nat'l Labs
Acct. Number: 0410548
Contact: Mark Miller
Phone: (505) 284-2107
Email: mmiller@sandia.gov

Send Radon Report To:
(If different from account settings)

Company: Sandia Nat'l Laboratories
Attn: Mark Miller
Address: PO Box 5800
MS-0729
City: Albuquerque
ST/Prov: NM Post Code: 87185
Country: USA
Phone: (505) 284-2107
Email: mmiller@sandia.gov

Site Information:
(Please provide information on where detectors are being deployed. Reports will be labeled and sorted by value provided in 'Site Name' below.)

Site Name: SNL / MWL
Site Type: Outdoor
Additional Information:

If Applicable:
Technician Name: Annemarie Rader
Technician Number: 505-844-2640
Technician Signature:

Please include all detector numbers, exposure periods and location information to appear on report

Detector Number	Building Name / Nbr	Unit Nbr	Floor	Comment / Note	Start Date mm/dd/yyyy	End Date mm/dd/yyyy
	Please See		attached	sheets.		

R-105DS-0213

Landauer Use Only: Processed By: _____ Date: _____

Page ____ of ____

Detector #	COC Sample #	Location #	Start Date	End Date	Comments
4893707	096208-001	RN 1	04/02/2014	07/03/2014	
4893708	096209-001	RN 2	04/02/2014	07/03/2014	
4897886	096210-001	RN 3	04/02/2014	07/03/2014	
4897887	096211-001	RN 4	04/02/2014	07/03/2014	
4897888	096212-001	RN 5	04/02/2014	07/03/2014	
4897892	096213-001	RN 6	04/02/2014	07/03/2014	
4897893	096214-001	RN 7	04/02/2014	07/03/2014	
4897894	096215-001	RN 8	04/02/2014	07/03/2014	
4897911	096216-001	RN 9	04/02/2014	07/03/2014	
4897912	096217-001	RN 10	04/02/2014	07/03/2014	
4897913	096218-001	RN 11	04/02/2014	07/03/2014	
4897914	096219-001	RN 12	04/02/2014	07/03/2014	
4897915	096220-001	RN 13	04/02/2014	07/03/2014	
4897916	096221-001	RN 14	04/02/2014	07/03/2014	
4897917	096222-001	RN 15	04/02/2014	07/03/2014	
4897918	096223-001	RN 16	04/02/2014	07/03/2014	
4897920	096224-001	RN 17	04/02/2014	07/03/2014	

Mixed Waste Landfill
Radon Monitoring Detector Collection/Deployment Inspection Form

Name of Inspector Annemarie Rader

Collection Date 7-3-14

Deployment Date 4-2-14

Radon Monitoring Frequency: X Quarterly ___Semiannually___Annually

Radon Monitoring Location Inspection Parameters	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Action Required at Location Numbers*
A. Monitoring location identification labeling.	Yes	NO	
B. Mounting (fence) post condition.	Yes	NO	
C. Radon monitoring outer housing securely fastened (stainless steel hose clamps).	Yes	Yes	RN10
D. Radon monitoring apparatus components assembly (outer housing, 2-wingnuts, plastic retaining ring and plastic cup)	Yes	NO	
E. Radon monitoring apparatus interior clean of debris (dirt, insects, spider webs, etc.)	Yes	NO	
F. Radon monitoring apparatus assembled with detector securely fastened with Velcro.	Yes	NO	
Radon Monitoring Detectors Inspection Parameters			
A. Condition of detector at time of collection.	good	NO	
B. Condition of detector at time of deployment.	good	NO	

Mixed Waste Landfill
Radon Monitoring Detector Collection/Deployment Inspection Form

Location	Action Required (Note any action required and date resolved, otherwise note "None")
RN1	None
RN2	None
RN3	None
RN4	None
RN5	None
RN6	None
RN7	None
RN8	None
RN9	None
RN10	This unit needed a stainless steel hose clamp. Clamp was installed on 7-3-14. alr
RN11	None
RN12	None
RN13	None
RN14	None
RN15	None
RN16	None
RN17	None

Inspector's Signature _____

Original to: Mixed Waste Landfill Operating Record

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MIXED WASTE LANDFILL

RADON MONITORING

July-September 2014 Monitoring Period

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation

Albuquerque, New Mexico 87185-

date: October 27, 2014

to: Mike Mitchell (6234), Robert Ziock (4142), Bonnie Little (4142) and Annemarie Rader (4143)

from: Mark Miller (41281), CHP

subject: Review of MWL Radon-in-Air Data –3rd Quarter of 2014, July through September 2014

The purpose of this memo is to document my review of the radon-in-air monitoring data results for the 3rd Quarter of Calendar Year (CY) 2014, July through September 2014, relative to the data quality objective (DQO) and monitoring objectives specified in the Mixed Waste Landfill (MWL) Long-Term Monitoring and Maintenance Plan (Appendix C, *Air Sampling and Analysis Plan for the Mixed Waste Landfill*). The DQO for this monitoring is to produce representative, accurate, defensible, and comparable analytical results to support the monitoring objective. Monitoring results provide radon emission data from across the site and at two background locations (Figure 1). These results are compared to historic results to evaluate radon air emission trends and for direct comparison to the LTMMP trigger level of 4 picocuries per liter. This DQO and these monitoring objectives are met through the implementation of standard operating procedures, analytical procedures/methods, quality assurance and control measures, and data evaluation protocol.

The radon-in-air monitoring measurements for the monitoring period July through September 2014 were obtained using Radtrak® radon detectors that were submitted to Landauer® Incorporated for analysis on Analysis Request/Chain of Custody (AR/COC) #615861. On July 3, 2014, the detectors were deployed on and around the MWL (locations RN1 through RN15 at the MWL, and background locations RN16 and RN17) in accordance with the requirements of Section 3.2.1 of the LTMMP. These detectors remained in the field for approximately 3 months (one quarter), and were collected on October 2, 2014. The protective casing and mounting hardware were inspected during the collection effort and repairs were made if needed. The location of these detectors is shown in Figure 1.

I have reviewed the results for this monitoring period along with supporting field documentation and determined the results meet the LTMMP DQO and monitoring objectives. The radon trigger level was not exceeded by any of the individual sample results; however, it only applies to the results from the perimeter locations (locations RN1 through RN10, Figure 1). The results from this quarterly monitoring event will be presented in the next MWL Annual LTMM Report that will be submitted to NMED in June 2015 (reporting period is April 1, 2014 through March 31, 2015).

Attachments
Analysis Request/Chain of Custody #615861
Landauer Radon Monitoring Report (analytical laboratory results)
Figure 1 Location of the Radon Track Etch® Detectors at the MWL

SMO 2012-ARCOC (4-2012) AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 2

Batch No. SMO Use AR/COC 615861

Project Name:	MWL Radon monitoring	Date Samples Shipped:		SMO Authorization:	Waste Characterization / RIMMA / Released by COC No. / 4° Celsius
Project/Task Manager:	M Miller	Carrier/Waybill No:		SMO Contact Phone:	
Project/Task Number:	146422/10.11.08	Lab Contact:	Landauer 800.528.8327	Mark Miller/505.284.2107	
Service Order:	CFO 378-15	Lab Destination:	Landauer, INC.	Send Report to SMO:	Bill to: Sandia National Laboratories (Accounts Payable)
		Contract No:	Acct # 0410548	Rita Kavanaugh/505.284.2553	P.O. Box 5800, MS-0154
Tech Area: TA3 MWL					Albuquerque, NM 87185-0154
Building:	Room:	Operational Site: TA3 MWL			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
966777	-001	RN 1/ 4943943	N/A	10/2/14 / 1710	F	N/A	N/A	None	Collection	Sample	Radon	
966778	-001	RN 2/ 4943942	N/A	10/2/14 / 1705	F	N/A	N/A	None	Collection	Sample	Radon	
966779	-001	RN 3/ 4943941	N/A	10/2/14 / 1707	F	N/A	N/A	None	Collection	Sample	Radon	
966780	-001	RN 4/ 4943940	N/A	10/2/14 / 1730	F	N/A	N/A	None	Collection	Sample	Radon	
966781	-001	RN 5/ 4943909	N/A	10/2/14 / 1725	F	N/A	N/A	None	Collection	Sample	Radon	
966782	-001	RN 6/ 4943908	N/A	10/2/14 / 1721	F	N/A	N/A	None	Collection	Sample	Radon	
966783	-001	RN 7/ 4943907	N/A	10/2/14 / 1718	F	N/A	N/A	None	Collection	Sample	Radon	
966784	-001	RN 8/ 4943906	N/A	10/2/14 / 1715	F	N/A	N/A	None	Collection	Sample	Radon	
966785	-001	RN 9/ 4943905	N/A	10/2/14 / 1753	F	N/A	N/A	None	Collection	Sample	Radon	
966786	-001	RN 10/ 4943904	N/A	10/2/14 / 1712	F	N/A	N/A	None	Collection	Sample	Radon	

Last Chain:	☐ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements: Parameter & Method
Validation Req'd:	☐ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Confirmatory:	☐ Yes	QC Initls:	Negotiated TAT

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Annemarie Rader			SNL/4143/844-2640

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments:

Samples deployed on 07/03/14 and collected on 10/02/14

Conditions on Receipt

Lab Use

1.Relinquished by		Org. 4143	Date 10/3/14	Time 1403	3.Relinquished by	Org.	Date / Time
1. Received by		Org. 4642	Date 10/3/14	Time 1403	3. Received by	Org.	Date / Time
2.Relinquished by		Org.	Date	Time	4.Relinquished by	Org.	Date / Time
2. Received by		Org.	Date	Time	4. Received by	Org.	Date / Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012) ADP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2

AR/COC 615861

Project Name: MWL Radon Monitoring	Project/Task Manager: M. Miller	Project/Task No.: 146422/10.11.08	
Tech Area: TA8 MWL			
Building:	Room:	Acct # 0410548	Lab use

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
966787	-001	RN 11/ 4943903	N/A	10/2/14 1739	F	N/A	N/A	None	Collection	Sample	Radon	
966788	-001	RN 12/ 4943919	N/A	10/2/14 1741	F	N/A	N/A	None	Collection	Sample	Radon	
966789	-001	RN 13/ 4943918	N/A	10/2/14 1745	F	N/A	N/A	None	Collection	Sample	Radon	
966790	-001	RN 14/ 4943917	N/A	10/2/14 1747	F	N/A	N/A	None	Collection	Sample	Radon	
966791	-001	RN 15/ 4943916	N/A	10/2/14 1750	F	N/A	N/A	None	Collection	Sample	Radon	
966792	-001	RN 16/ 4943915	N/A	10/2/14 1655	F	N/A	N/A	None	Collection	Sample	Radon	
966793	-001	RN 17/ 4943914	N/A	10/2/14 1801	F	N/A	N/A	None	Collection	Sample	Radon	
966794	-001	RNTB/ 4943902	N/A	10/2/14 1630	F	N/A	N/A	None	Collection	Sample	Radon	

Recipient Initials:

Radon Monitoring Report

SANDIA NATIONAL LABORATORIES
ATTN: RITA KAVANAUGH
1515 EUBANK SE. ORG 4142
BLDG 1090/120. MS1103
ALBUQUERQUE. NM 87123

LICENSE: 101146AL-100584RT

Acct. No. 0410548

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 323-8830 Facsimile: (708) 755-7040

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
4943902	DRNF	03-JUL-14	02-OCT-14	096796-001 RNTB	33.4 ±4.31	0.4 ±0.06	
4943903	DRNF	03-JUL-14	02-OCT-14	* - LESS THAN INDICATED VALUE 096787-001 RN 11	* 30.0	* 0.3 ±0.05	
4943904	DRNF	03-JUL-14	02-OCT-14	096786-001 RN 10	38.9 ±4.79	0.4 ±0.05	
4943905	DRNF	03-JUL-14	02-OCT-14	096785-001 RN 9	60.0 ±6.36	0.7 ±0.07	
4943906	DRNF	03-JUL-14	02-OCT-14	096784-001 RN 8	41.7 ±5.01	0.5 ±0.06	
4943907	DRNF	03-JUL-14	02-OCT-14	096783-001 RN 7	55.4 ±6.05	0.6 ±0.07	
4943914	DRNF	03-JUL-14	02-OCT-14	096793-001 RN 17	57.3 ±6.17	0.6 ±0.07	
4943915	DRNF	03-JUL-14	02-OCT-14	096792-001 RN 16	65.5 ±6.72	0.7 ±0.07	
4943916	DRNF	03-JUL-14	02-OCT-14	096791-001 RN 15	49.9 ±5.65	0.5 ±0.06	

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

RESULTS RELATED ONLY TO MONITORS AS RECEIVED BY LANDAUER. RADON IN AIR BY ALPHA TRACK - EPA 402-R92-004

Q.C. Release	Process No.	Report Date	Date Received
KJT	AZ3120	15-OCT-14	09-OCT-14

PAGE 1 OF 2

Radon Monitoring Report

SANDIA NATIONAL LABORATORIES
ATTN: RITA KAVANAUGH
1515 EUBANK SE. ORG 4142
BLDG 1090/120. MS1103
ALBUQUERQUE. NM 87123

LICENSE: 101146AL-100584RT

Acct. No. 0410548

LANDAUER

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
4943917	DRNF	03-JUL-14	02-OCT-14	* - LESS THAN INDICATED VALUE 096790-001 RN 14	* 30.0	* 0.3 ±0.04	
4943918	DRNF	03-JUL-14	02-OCT-14	096789-001 RN 13	38.0 ±4.71	0.4 ±0.05	
4943919	DRNF	03-JUL-14	02-OCT-14	096788-001 RN 12	33.4 ±4.31	0.4 ±0.05	
4943938	DRNF	03-JUL-14	02-OCT-14	096782-001 RN 6	44.4 ±5.23	0.5 ±0.06	
4943939	DRNF	03-JUL-14	02-OCT-14	096781-001 RN 5	47.2 ±5.45	0.5 ±0.06	
4943940	DRNF	03-JUL-14	02-OCT-14	096780-001 RN 4	40.7 ±4.94	0.4 ±0.05	
4943941	DRNF	03-JUL-14	02-OCT-14	096779-001 RN 3	43.5 ±5.16	0.5 ±0.06	
4943942	DRNF	03-JUL-14	02-OCT-14	096778-001 RN 2	51.7 ±5.79	0.6 ±0.06	
4943943	DRNF	03-JUL-14	02-OCT-14	096777-001 RN 1	51.7 ±5.79	0.6 ±0.06	

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

RESULTS RELATED ONLY TO MONITORS AS RECEIVED BY LANDAUER. RADON IN AIR BY ALPHA TRACK - EPA 402-R92-004

Q.C. Release	Process No.	Report Date	Date Received
KJT	AZ3120	15-OCT-14	09-OCT-14

PAGE 2 OF 2

Radon Track Etch® Results for the 2nd Quarter of CY 2014 at the MWL

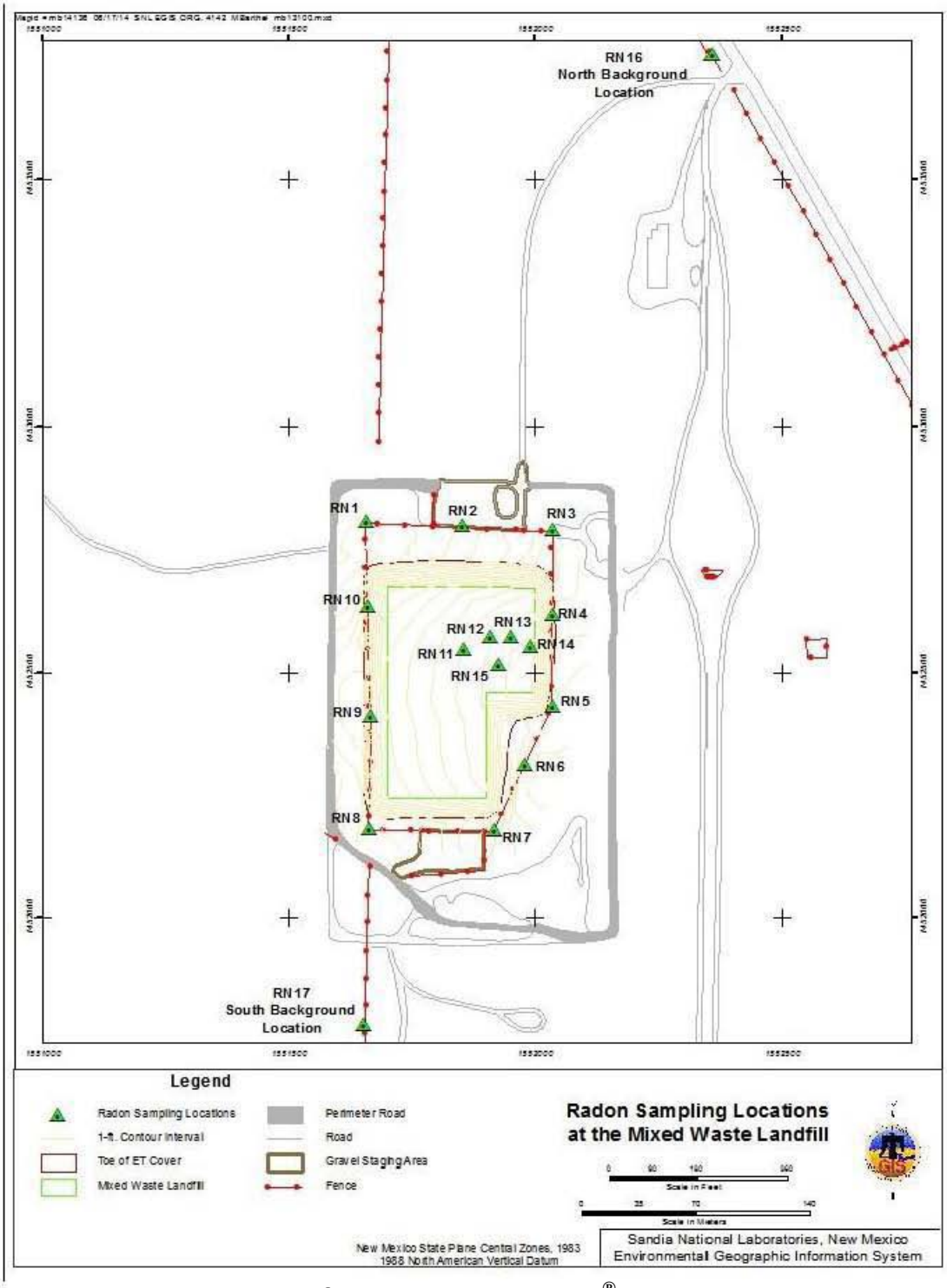


Figure 1. Location of the Radon Track Etch® Detectors at the MWL

LANDAUER®

RADTRAK® RADON TEST DATA SHEET

Company: Sandia Nat'l Labs
Acct. Number: 040548
Contact: Mark Miller
Phone: (505) 284-2107
Email: mmiller@sandia.gov

Send Radon Report To:
(If different from account settings)

Company: Sandia Nat'l Laboratories
Attn: Mark Miller
Address: PO Box 5800
MS-0729
City: Albuquerque
ST/Prov: NM Post Code: 87185
Country: USA
Phone: (505) 284-2107
Email: mmiller@sandia.gov

Site Information:
(Please provide information on where detectors are being deployed. Reports will be labeled and sorted by value provided in 'Site Name' below.)

Site Name: SNL / MWL
Site Type: Outdoor
Additional Information:

If Applicable:
Technician Name: Annamarie Rader
Technician Number: 4143
Technician Signature:

10-2-14

Please include all detector numbers, exposure periods and location information to appear on report

Detector Number	Building Name / Nbr	Unit Nbr	Floor	Comment / Note	Start Date mm/dd/yyyy	End Date mm/dd/yyyy

Please see attached List

R-105DS-0213

Landauer Use Only: Processed By: _____ Date:

Page ____ of ____

Detector #	Location	Start Date	End Date	Time	Comments
4943943	RN 1	07/03/2014	10/02/2014	1710	
4943942	RN 2	07/03/2014	10/02/2014	1705	
4943941	RN 3	07/03/2014	10/02/2014	1707	
4943940	RN 4	07/03/2014	10/02/2014	1730	
4943939	RN 5	07/03/2014	10/02/2014	1725	
4943938	RN 6	07/03/2014	10/02/2014	1721	
4943907	RN 7	07/03/2014	10/02/2014	1718	
4943906	RN 8	07/03/2014	10/02/2014	1715	
4943905	RN 9	07/03/2014	10/02/2014	1733	
4943904	RN 10	07/03/2014	10/02/2014	1712	
4943903	RN 11	07/03/2014	10/02/2014	1739	
4943919	RN 12	07/03/2014	10/02/2014	1741	
4943918	RN 13	07/03/2014	10/02/2014	1743	
4943917	RN 14	07/03/2014	10/02/2014	1747	
4943916	RN 15	07/03/2014	10/02/2014	1750	
4943915	RN 16	07/03/2014	10/02/2014	1655	
4943914	RN 17	07/03/2014	10/02/2014	1801	
4943902	RNTB	07/03/2014	10/02/2014	1630	

Mixed Waste Landfill
Radon Monitoring Location Monthly Inspection Form

Name of Inspector _Annemarie Rader_ Date of Inspection ___08/21/2014_____

Inspection parameters: Identification labeling; mounting post & hose clamps; radon monitoring apparatus components (outer housing, 2 wing nuts, plastic retaining ring, plastic cup, Velcro, detector).

Location	Findings (Note any findings and date resolved, otherwise note "None")
RN1	NONE
RN2	NONE
RN3	NONE
RN4	NONE
RN5	NONE
RN6	NONE
RN7	NONE
RN8	NONE
RN9	NONE
RN10	NONE
RN11	NONE
RN12	NONE
RN13	NONE
RN14	NONE
RN15	NONE
RN16	NONE
RN17	NONE

Inspector's Signature _____ 8/21/2014

Original to: Mixed Waste Landfill Operating Record
Copy to: SNL/NM Records Center

Mixed Waste Landfill
Radon Monitoring Detector Collection/Deployment Inspection Form

Name of Inspector Anderson Rader

Collection Date 10-2-14

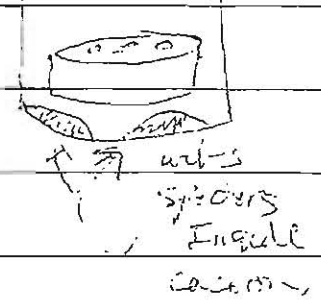
Deployment Date 7-3-14

Radon Monitoring Frequency: X Quarterly ___Semiannually ___Annually

***Radon** Monitoring Location Inspection Parameters*	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Action Required at Location Numbers*
A. Monitoring location identification labeling	good	N	
B. Mounting (fence) post condition.	good	N	
C. Radon monitoring outer housing securely fastened (stainless steel hose clamps).	yes	N	
D. Radon monitoring apparatus components assembly (outer housing, 2-wingnuts, plastic retaining ring and plastic cup)	good	N all	
E. Radon monitoring apparatus interior clean of debris (dirt, insects, spider webs, etc.)	yes	yes - had to clean a couple webs.	had spiders but not destructive mon. tos.
F. Radon monitoring apparatus assembled with detector securely fastened with Velcro.	yes	N all	
Radon Monitoring Detectors Inspection Parameters			
A. Condition of detector at time of collection.	good	N all	
B. Condition of detector at time of deployment.	good	N all	

Mixed Waste Landfill
Radon Monitoring Detector Collection/Deployment Inspection Form

Location	Action Required (Note any action required and date resolved, otherwise note "None")	
RN1	None	Some spider and cocoon like
RN2	None	webs in all of the Cups.
RN3	None	The spiders and webs were
RN4	None	on the sides of the holes
RN5	None	monitor, not disturbing.
RN6	None	monitor.
RN7	None	
RN8	None	
RN9	None	
RN10	None	
RN11	None	
RN12	None	
RN13	None	
RN14	None	
RN15	None	
RN16	None	
RN17	None	



Inspector's Signature _____ 10/22/04

Original to: Mixed Waste Landfill Operating Record
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MIXED WASTE LANDFILL

RADON MONITORING

October-December 2014 Monitoring Period

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation

Albuquerque, New Mexico 87185-

date: February 10, 2015

to: Mike Mitchell (6234), Robert Ziock (4142), Bonnie Little (4142) and Annemarie Rader (4143)

from: Mark Miller (41281), CHP

subject: Review of MWL Radon-in-Air Data – 4th Quarter of 2014, October through December 2014

The purpose of this memo is to document my review of the radon-in-air monitoring data results for the 4th Quarter of Calendar Year (CY) 2014, October through December 2014, relative to the data quality objective (DQO) and monitoring objectives specified in the Mixed Waste Landfill (MWL) Long-Term Monitoring and Maintenance Plan (Appendix C, *Air Sampling and Analysis Plan for the Mixed Waste Landfill*). The DQO for this monitoring is to produce representative, accurate, defensible, and comparable analytical results to support the monitoring objective. Monitoring results provide radon emission data from across the site and at two background locations (Figure 1). These results are compared to historic results to evaluate radon air emission trends and for direct comparison to the LTMMP trigger level of 4 picocuries per liter. This DQO and these monitoring objectives are met through the implementation of standard operating procedures, analytical procedures/methods, quality assurance and control measures, and data evaluation protocol.

The radon-in-air monitoring measurements for the monitoring period October through December 2014 were obtained using Radtrak® radon detectors that were submitted to Landauer® Incorporated for analysis on Analysis Request/Chain of Custody (AR/COC) #615960. On October 2, 2014, the detectors were deployed on and around the MWL (locations RN1 through RN15 at the MWL, background locations RN16 and RN17, and a trip blank that was never exposed, RN18) in accordance with the requirements of Section 3.2.1 of the LTMMP. These detectors remained in the field for approximately 3 months (one quarter), and were collected on January 7, 2015. The protective casing and mounting hardware were inspected during the collection effort and repairs were made if needed. The location of these detectors is shown in Figure 1.

I have reviewed the results for this monitoring period along with supporting field documentation and determined the results meet the LTMMP DQO and monitoring objectives. The radon trigger level was not exceeded by any of the individual sample results; however, it only applies to the results from the perimeter locations (locations RN1 through RN10, Figure 1). The results from this quarterly monitoring event will be presented in the next MWL Annual LTMM Report that will be submitted to NMED in June 2015 (reporting period is April 1, 2014 through March 31, 2015).

Attachments:
Analysis Request/Chain of Custody #615960
Landauer Radon Monitoring Report (analytical laboratory results)
Figure 1 Location of the Radon Track Etch® Detectors at the MWL

SMO 2012-ARCOC (4-2012)

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

AOP 95-16

Internal Lab

Page 1 of 2

Batch No. N/A

SMO Use

AR/COC 615960

Project Name:	MWL Radon monitoring	Date Samples Shipped:	1/12/15	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	M Miller	Carrier/Waybill No.	422818	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422/10.11.08	Lab Contact:	Landauer 800.528.8327	Mark Miller/505.284.2107	☐ Released by COC No.
Service Order:	CFO 378-15	Lab Destination:	Landauer, INC.	Send Report to SMO:	☐ 4° Celsius
		Contract No:	Acct # 0410548	Rita Kavanaugh/505.284.2553	Bill to: Sandia National Laboratories (Accounts Payable)
Tech Area: TA3 MWL					P.O. Box 5800, MS-0154
Building:	Room:	Operational Site: TA3 MWL			Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
097047	--001	RN 1/ 4956321	N/A	1/7/15 1607	F	N/A	N/A	None	Collection	Sample	Radon	
097048	--001	RN 2/ 4956322	N/A	1/7/15 1555	F	N/A	N/A	None	Collection	Sample	Radon	
097049	--001	RN 3/ 4956323	N/A	1/7/15 1706	F	N/A	N/A	None	Collection	Sample	Radon	
097050	--001	RN 4/ 4956325	N/A	1/7/15 1701	F	N/A	N/A	None	Collection	Sample	Radon	
097051	--001	RN 5/ 4956152	N/A	1/7/15 1653	F	N/A	N/A	None	Collection	Sample	Radon	
097052	--001	RN 6/ 4956153	N/A	1/7/15 1648	F	N/A	N/A	None	Collection	Sample	Radon	
097053	--001	RN 7/ 4956154	N/A	1/7/15 1644	F	N/A	N/A	None	Collection	Sample	Radon	
097054	--001	RN 8/ 4956155	N/A	1/7/15 1628	F	N/A	N/A	None	Collection	Sample	Radon	
097055	--001	RN 9/ 4956156	N/A	1/7/15 1613	F	N/A	N/A	None	Collection	Sample	Radon	
097056	--001	RN 10/ 4956363	N/A	1/7/15 1620	F	N/A	N/A	None	Collection	Sample	Radon	

Last Chain:	☐ Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Parameter & Method
Validation Req'd:	☐ Yes	Date Entered:		EDD	☑ Yes ☐ No
Background:	☐ Yes	Entered by:		Turnaround Time	☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Confirmatory:	☐ Yes	QC Inits.:		Negotiated TAT	☐
				Sample Disposal	☐ Return to Client ☑ Disposal by Lab
				Return Samples By:	
				Comments:	Samples deployed on 10/02/14 and collected on 01/07/15

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Annemarie Rader	AJ Rader	AMR	SNL/4143/844-2640

1. Relinquished by	AJ Rader	Org. 4143	Date 1-08-15	Time 1611	3. Relinquished by	Org.	Date Time
1. Received by	SMO	Org. 4142	Date 1-8-15	Time 1611	3. Received by	Org.	Date Time
2. Relinquished by	SMO	Org. 4142	Date 1-12-15	Time 1000	4. Relinquished by	Org.	Date Time
2. Received by		Org.	Date	Time	4. Received by	Org.	Date Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012) AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

Page 2 of 2

AR/COC 615960

Project Name:	MWL Radon Monitoring	Project/Task Manager: M. Miller				Project/Task No.:	146422/10.11.08						
Tech Area: TA# MWL													
Building:	Room:	Acct # 0410548											Lab use
Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
097057	--001	RN 11/ 4956364	N/A	1/7/15	1534	F	N/A	N/A	None	Collection	Sample	Radon	
097058	--001	RN 12/ 4949667	N/A	1/7/15	1530	F	N/A	N/A	None	Collection	Sample	Radon	
097059	--001	RN 13/ 4949668	N/A	1/7/15	1542	F	N/A	N/A	None	Collection	Sample	Radon	
097060	--001	RN 14/ 4949669	N/A	1/7/15	1547	F	N/A	N/A	None	Collection	Sample	Radon	
097061	--001	RN 15/ 4949670	N/A	1/7/15	1520	F	N/A	N/A	None	Collection	Sample	Radon	
097062	--001	RN 16/ 4949671	N/A	1/7/15	1511	F	N/A	N/A	None	Collection	Sample	Radon	
097063	--001	RN 17/ 4949672	N/A	1/7/15	1637	F	N/A	N/A	None	Collection	Sample	Radon	
097064	--001	RNTB/ 4956365	N/A	1/7/15	NA	F	N/A	N/A	None	Collection	Sample	Radon	

Recipient Initials_____

SANDIA NATIONAL LABORATORIES
ATTN: RITA KAVANAUGH
1515 EUBANK SE, ORG 4142
BLDG 1090/120, MS1103
ALBUQUERQUE, NM 87123

Radon Monitoring Report

LICENSES: 101146AL,100584RT

Acct. No. 0410548

LANDAUER®
Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800)528-8327 Facsimile: (708) 755-7048

Correction Data: START DATES CHANGED

*** CORRECTED REPORT ***

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
4949667	DRNF	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097058 SAMPLE LOCATION RN 12	80.2 ±7.20	0.8 ±0.07	
4949668	DRNF	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097059 SAMPLE LOCATION RN 13	44.2 ±4.82	0.5 ±0.05	
4949669	DRNF	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097060 SAMPLE LOCATION RN 14	71.2 ±6.67	0.7 ±0.07	
4949670	DRNF	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097061 SAMPLE LOCATION RN 15	64.9 ±6.27	0.7 ±0.06	
4949671	DRNF	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097062 SAMPLE LOCATION RN 16	53.2 ±5.49	0.5 ±0.06	
4949672	DRNF	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097063 SAMPLE LOCATION RN 17	86.5 ±7.56	0.9 ±0.08	
4956152	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097051 SAMPLE LOCATION RN 5	65.1 ±6.67	0.7 ±0.07	
4956153	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097052 SAMPLE LOCATION RN 6	75.7 ±7.32	0.8 ±0.08	
4956154	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097053 SAMPLE LOCATION RN 7	82.9 ±7.73	0.9 ±0.08	
4956155	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097054 SAMPLE LOCATION RN 8	88.2 ±8.02	0.9 ±0.08	
①	②	③	④	⑤	⑥	⑦	⑧

RESULTS RELATED ONLY TO MONITORS AS RECEIVED BY LANDAUER. RADON IN AIR BY ALPHA TRACK - EPA 402-R92-004.

Q.C. Release	Process No.	Report Date	Date Received
LMR	A23168	30-JAN-15	13-JAN-15

Mark Solasky
Radon Measurement Specialist

SANDIA NATIONAL LABORATORIES
ATTN: RITA KAVANAUGH
1515 EUBANK SE, ORG 4142
BLDG 1090/120, MS1103
ALBUQUERQUE, NM 87123

Radon Monitoring Report

LICENSES: 101146AL,100584RT

Acct. No. 0410548

LANDAUER®

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800)528-8327 Facsimile: (708) 755-7048

Correction Data: START DATES CHANGED

*** CORRECTED REPORT ***

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	
4956156	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097055 SAMPLE LOCATION RN 9	106.1 ±8.9	1.1 ±0.09	
4956321	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097047 SAMPLE LOCATION RN1	63.3 ±6.56	0.7 ±0.07	
4956322	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097048 SAMPLE LOCATION RN2	58.8 ±6.27	0.6 ±0.07	
4956323	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097049 SAMPLE LOCATION RN 3	82.9 ±7.73	0.9 ±0.08	
4956325	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 97050 SAMPLE LOCATION RN 4	83.8 ±7.78	1.1 ±0.10	
4956363	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097056 SAMPLE LOCATION RN 10	39.2 ±4.83	0.4 ±0.05	
4956364	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097057 SAMPLE LOCATION RN 11	70.4 ±7.00	0.7 ±0.07	
4956365	DRN	02-OCT-14	07-JAN-15	SAMPLE NUMBER 097064 SAMPLE LOCATION RNTB	94.5 ±8.35	1.0 ±0.09	
①	②	③	④	⑤	⑥	⑦	⑧

RESULTS RELATED ONLY TO MONITORS AS RECEIVED BY LANDAUER. RADON IN AIR BY ALPHA TRACK - EPA 402-R92-004.

Q.C. Release	Process No.	Report Date	Date Received
LMR	A23168	30-JAN-15	13-JAN-15

Mark Salasky
Radon Measurement Specialist

The United States Environmental Protection Agency recommends fixing your home if the results of one long-term test or the average of two short-term tests taken in the lowest lived-in level of the home show radon levels of 4.0 pCi/l or higher. A short term test remains in your home for two days to 90 days, whereas a long-term test remains in your home for more than 90 days under these guidelines.

Column 7 of this report indicates the radon test result, i.e., the average radon concentration in pCi/l for the test period. If you did not provide us the starting and ending dates (days the detector was exposed) we are unable to calculate the average radon concentration. To calculate the average radon concentration, divide the total exposure in pCi/l-days (column 6) by the number of days the detector was exposed.

For more information about the interpretation of your test result or about other radon related issues we suggest you contact your state radon office. Your state radon office should have available the following EPA publications:

- A Citizen's Guide to Radon
- Home Buyer's and Seller's Guide to Radon
- Consumer's Guide to Radon Reduction

DISCLAIMER

LANDAUER®

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586 Telephone: (800) 528-8327 Facsimile: (708) 755-7048
Email: radon@landauer.com Website: www.landauer.com

Radon Track Etch® Results for the 4th Quarter of CY 2014 at the MWL

LANDAUER®

RADTRAK® RADON TEST DATA SHEET

Company: Sandia Nat'l Labs
Acct. Number: 0410548
Contact: Mark Miller
Phone: (505) 284-2107
Email: mmiller@sandia.gov

Send Radon Report To:
(If different from account settings)

Company: Sandia Nat'l Laboratories
Attn: Mark Miller
Address: PO Box 5800
MS-0729
City: Albuquerque
ST/Prov: NM Post Code: 87185
Country: USA
Phone: (505) 284-2107
Email: mmiller@sandia.gov

Site Information:
(Please provide information on where detectors are being deployed. Reports will be labeled and sorted by value provided in 'Site Name' below.)

Site Name: SNL / MWL
Site Type: Outdoor
Additional Information:

If Applicable:
Technician Name: A.L. Rader
Technician Number:
Technician Signature:

Please include all detector numbers, exposure periods and location information to appear on report

Detector Number	Building Name / Nbr	Unit Nbr	Floor	Comment / Note	Start Date mm/dd/yyyy	End Date mm/dd/yyyy
		please see attached page				

R-105DS-0213

Landauer Use Only: Processed By: _____ **Date:** _____ Page ____ of ____

Mixed Waste Landfill
Radon Detector
Deployment / Collection Form

COC # 615960

Detector Serial Number	Sample Number	Sampling Location	Deployment Date	Collection Date	Time/Comments
4956321	097047-001	RN1	10/02/2014	01/07/2015	1607
4956322	097048-001	RN2	10/02/2014	01/07/2015	1555
4956323	097049-001	RN3	10/02/2014	01/07/2015	1706
4956325	097050-001	RN4	10/02/2014	01/07/2015	1701
4956152	097051-001	RN5	10/02/2014	01/07/2015	1653
4956153	097052-001	RN6	10/02/2014	01/07/2015	1648
4956154	097053-001	RN7	10/02/2014	01/07/2015	1644
4956155	097054-001	RN8	10/02/2014	01/07/2015	1628
4956363	097055-001	RN9	10/02/2014	01/07/2015	1613
4956364	097056-001	RN10	10/02/2014	01/07/2015	1620
4949667	097057-001	RN11	10/02/2014	01/07/2015	1534
4949667	097058-001	RN12	10/02/2014	01/07/2015	1530
4949668	097059-001	RN13	10/02/2014	01/07/2015	1542
4949669	097060-001	RN14	10/02/2014	01/07/2015	1547
4949670	097061-001	RN15	10/02/2014	01/07/2015	1520
4949671	097062-001	RN16	10/02/2014	01/07/2015	1511
4949672	097063-001	RN17	10/02/2014	01/07/2015	1637
4956365	097064-001	RNTB	10/02/2014	01/07/2015	NA

AR 01/07/15

Mixed Waste Landfill
Radon Monitoring Location Monthly Inspection Form

Name of Inspector Annemarie Rader Date of Inspection 11/26/2014

Inspection parameters: Identification labeling; mounting post & hose clamps; radon monitoring apparatus components (outer housing, 2 wing nuts, plastic retaining ring, plastic cup, Velcro, detector).

Location	Findings (Note any findings and date resolved, otherwise note "None")
RN1	None
RN2	None
RN3	None
RN4	None
RN5	None
RN6	None
RN7	None
RN8	None
RN9	None
RN10	None
RN11	None
RN12	None
RN13	None
RN14	None
RN15	None
RN16	None
RN17	None

Inspector's Signature _____ 11/26/14
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Mixed Waste Landfill Radon Monitoring Location Monthly Inspection Form

Name of Inspector Annemarie Rader Date of Inspection 12/24/2014

Inspection parameters: Identification labeling; mounting post; mounting bracket and stainless steel clamp; radon monitoring apparatus components (outer metal housing, 2 wing nuts, plastic retaining ring, plastic cup, Velcro®, Radtrak® detector).

Location	Action Required (Note any action required and date resolved, otherwise note "None")
RN1	None
RN2	None
RN3	None
RN4	None
RN5	None
RN6	None
RN7	None
RN8	None
RN9	None
RN10	None
RN11	None
RN12	None
RN13	None
RN14	None
RN15	None
RN16	None
RN17	None

Inspector's Signature [signature] 12/24/2014

Original to: Mixed Waste Landfill Operating Record
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Mixed Waste Landfill
Radon Detector Collection Inspection Form

Name of Inspector Annemarie Rader

Collection Date 01/07/2015

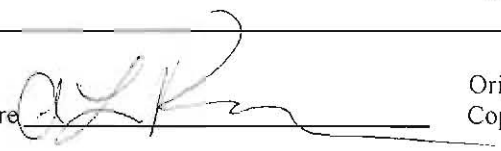
Deployment Date 10/02/2014

Radon Monitoring Frequency: ~ Quarterly ~ Semiannually ~ Annually

Radon Monitoring Location Inspection Parameters	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Action Required at Location Numbers*
A. Monitoring location identification labeling.	Yes	No	
B. Mounting (fence) post condition.	Yes	No	
C. Radon monitoring outer metal housing securely fastened (mounting bracket and stainless steel clamp).	Yes	No	
D. Radon monitoring apparatus components (outer metal housing, 2 wing nuts, plastic retaining ring, and plastic cup)	Yes	No	
E. Radon monitoring apparatus interior clean of debris (dirt, insects, spider webs, etc.).	Yes	No	
F. Radon monitoring apparatus assembled and detector securely fastened with Velcro® to inside of plastic cup.	Yes	No	
Radon Monitoring Detectors Inspection Parameters			
A. Condition of Radtrak® detector at time of collection.	Yes	No	
B. Condition of Radtrak® detector at time of deployment.	Yes	No	

Mixed Waste Landfill
Radon Detector Collection / Deployment Inspection Form

Location	Action Required (Note any action required and date resolved, otherwise note "None")
RN1	None
RN2	None
RN3	None
RN4	None
RN5	None
RN6	None
RN7	None
RN8	None
RN9	None
RN10	None
RN11	None
RN12	None
RN13	None
RN14	None
RN15	None
RN16	None
RN17	None

Inspector's Signature 

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ANNEX B

Mixed Waste Landfill
Surface Soil Tritium and Biota Monitoring Forms and Reports

April 2014-March 2015

Data Evaluation Memo

Data Validation Reports

Contract Verification Reports

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation

Albuquerque, New Mexico 87185-

date: March 26, 2015

to: Mike Mitchell (6234), Robert Ziock (4142), and Bonnie Little (4142)

from: Mark Miller (41281), CHP

subject: Review of Tritium-in-Soil Results for LTMMP Monitoring at the Mixed Waste Landfill

The purpose of this memo is to document my review of the tritium-in-soil monitoring data results for the 8/21/14 and the 1/20/15 sample events.

Sample Date	Location	Concentration	Units	Comments
8/21/2014	MWL TS-2NW	151	pCi/L	U
8/21/2014	MWL TS-2SW	-39.4	pCi/L	U
8/21/2014	MWL TS-2SE	-45.9	pCi/L	U
8/21/2014	MWL TS-2NE	147	pCi/L	U
1/20/2015	MWL TS-2NW	1210	pCi/L	
1/20/2015	MWL TS-2SW	1660	pCi/L	
1/20/2015	MWL TS-2SE	1830	pCi/L	
1/20/2015	MWL TS-2NE	1010	pCi/L	

These results are consistent with the historic monitoring data collected at the MWL as part of the routine Terrestrial Surveillance Program, where the data collected between 2000 and 2014 ranged from 182 pCi/L ("not detected, or "U" qualified) to 6140 pCi/L. The August 2014 sampling locations were consistent with those established for the routine Terrestrial Surveillance monitoring program, however, even these locations have been shifted over time to accommodate construction of the subgrade (2006) and evapotranspirative (ET) cover (2009). The January 2015 locations were shifted to be consistent with the locations shown in the MWL Long-Term Monitoring and Maintenance Plan (LTMMP).

The data from the August 2014 sampling event were all "U" since the soil was very dry and tritium assay in soil depends on the presence of measurable soil moisture. There was more soil moisture present during the January 2015 sampling event due to winter precipitation events and cooler temperatures. Based on the large tritium surface-soil data set for the MWL, the nature of tritium flux from the MWL with the final ET cover in place, and my professional judgement, the variation in the two sets of results are mostly related to soil-moisture content and not the minor changes in sampling locations.

As previously stated, these results are consistent with historical sampling at the MWL and far below the LTMMP trigger level of 20,000 pCi/L. However, given the myriad of factors (soil moisture, tritium flux, barometric conditions, etc.) that affect the results observed at these very low concentrations that are very close to or less than the analytical method minimum detectable activity, plotting the data to show trends will not be useful or meaningful. In other words, the variation in sample results due to changes in soil moisture content will overwhelm any slight changes in actual tritium flux at low levels.

I recommend results be presented in tabular form and be evaluated relative to the historic data set and the LTMMP trigger level of 20,000 pCi/L. If the tritium flux from the disposal areas increases in the future due to changing conditions, they will be detected, compared to the trigger level, and reported appropriately.

cc: CFRC

Mixed Waste Landfill

Surface Soil Tritium and Biota Monitoring

August 2014 Sampling Event

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: September 25, 2014

To: File

From: Mary Donivan

Subject: Inorganic Data Review and Validation – SNL
Site: MWL Surface Soil
AR/COC: 615736
SDG: 355364
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Four soil samples were prepared and analyzed with approved procedures using methods EPA 6010B (ICP-AES). One soil sample was prepared and analyzed for Hg with approved procedures using method EPA 7471A (CVAA mercury). Data were reported for all required analytes. Problems were identified with the data package that resulted in the qualification of data.

ICP-AES:

1. Ag was detected in a bracketing CCB at a concentration < the PQL. The associated results for samples 355364006 and -012 were detects ≤5X the blank concentration and will be **qualified 0.535U,B3** at 5X the blank value.
2. Se was detected in the ICB and a bracketing CCB at concentrations < the PQL. The associated result for sample -008 was a detect ≤5X the highest blank concentration and will be **qualified 5.2U,B3** at 5X the highest blank value.
3. The MS %R was <75% but ≥30% for Ba. The associated sample results were detects and will be **qualified J,MS3** due to low matrix spike recovery.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and properly preserved except as follows. Samples -006, -010 and -012 were received at 27°C and not at the method-specified temperature of ≤6°C for Hg; the analysis for those samples was cancelled by the client.

ICP-MS Instrument Tune

The ICP-MS tunes met QC acceptance criteria.

Calibration

All initial and continuing calibration criteria met QC acceptance criteria.

Reporting Limit Verification

All CRI recoveries associated with the samples met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks except as noted above in the Summary section and as follows. Ag was detected in a bracketing CCB at a concentration < the PQL. The associated results for samples -008 and -010 were non-detects and will not be qualified.

As was detected in bracketing CCB at a concentration <PQL. All associated sample results were detects >5X the CCB concentration and will not be qualified.

Pb was detected in bracketing CCB at a negative concentration with an absolute value > the MDL but ≤ PQL. The associated sample results were detects >5X the MDL and will not be qualified.

Se was detected in the ICB and a bracketing CCB at concentrations < the PQL. The associated results for samples -006, -010 and -012 were non-detects and will not be qualified.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria except as noted above in the Summary section.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported.

ICP Interference Check Sample (ICS A and AB)

Results of the ICS A and AB analyses were not evaluated because the sample concentrations of Ca, Mg, Al and Fe were < that in the ICS solution except as noted.

ICP Serial Dilution

The serial dilutions met all QC acceptance criteria.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski **Level I** **Date:** 09/30/14

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: September 26, 2014

To: File

From: Mary Donivan

Subject: Inorganic Data Review and Validation – SNL
Site: MWL Surface Soil
AR/COC: 615736
SDG: 355634
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Five soil samples were prepared and analyzed with approved procedures using method HASL 300 (gamma spec, solid – long list) and GL-RAD-A-002 (LSC,tritium). Problems were identified with the data package that resulted in the qualification of data.

Gamma Spec and tritium:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**

Gamma Spec:

1. The Th-234 and U-238 results for sample 355364013 were rejected by the laboratory due to the peak not meeting identification criteria and will be **qualified R,Z2**.
2. According to the case narrative, no peaks were identified for Bi-212 in sample -011. The associated sample result is considered ND at the calculated MDA and will be **qualified BD,Z2.**
3. All sample results that were > the MDA but ≤3X the MDA will be **qualified J,FR7.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were properly preserved and prepared and analyzed within the prescribed holding time.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Tracers or carriers were not required for these methods.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria,

Detection Limits/Dilutions

The samples were not diluted. All required detection limits were met.

Other QC

One field duplicate was submitted with ARCOC 615736. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski **Level I** **Date:** 09/30/14

Sample Findings Summary

AR/COC: 615736

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
DOE HASL 300, 4.5.2.3/Ga-			
	096501-002/MWL AHSS-01	Americium-241 (14596-10-2)	BD, FR3
	096501-002/MWL AHSS-01	Beryllium-7 (13966-02-4)	BD, FR3
	096501-002/MWL AHSS-01	Cesium-137 (10045-97-3)	J, FR7
	096501-002/MWL AHSS-01	Cobalt-60 (10198-40-0)	BD, FR3
	096501-002/MWL AHSS-01	Neptunium-237 (13994-20-2)	BD, FR3
	096501-002/MWL AHSS-01	Radium-223 (15623-45-7)	BD, FR3
	096501-002/MWL AHSS-01	Radium-224 (13233-32-4)	BD, FR3
	096501-002/MWL AHSS-01	Sodium-22 (13966-32-0)	BD, FR3
	096501-002/MWL AHSS-01	Thorium-227 (15623-47-9)	BD, FR3
	096501-002/MWL AHSS-01	Thorium-231 (14932-40-2)	BD, FR3
	096501-002/MWL AHSS-01	Thorium-234 (15065-10-8)	BD, FR3
	096501-002/MWL AHSS-01	Uranium-235 (15117-96-1)	BD, FR3
	096501-002/MWL AHSS-01	Uranium-238 (7440-61-1)	BD, FR3
	096502-002/MWL AHSS-02	Americium-241 (14596-10-2)	BD, FR3
	096502-002/MWL AHSS-02	Beryllium-7 (13966-02-4)	J, FR7
	096502-002/MWL AHSS-02	Cobalt-60 (10198-40-0)	BD, FR3
	096502-002/MWL AHSS-02	Neptunium-237 (13994-20-2)	BD, FR3
	096502-002/MWL AHSS-02	Radium-223 (15623-45-7)	BD, FR3
	096502-002/MWL AHSS-02	Sodium-22 (13966-32-0)	BD, FR3
	096502-002/MWL AHSS-02	Thorium-227 (15623-47-9)	BD, FR3
	096502-002/MWL AHSS-02	Thorium-231 (14932-40-2)	BD, FR3
	096502-002/MWL AHSS-02	Thorium-234 (15065-10-8)	J, FR7
	096502-002/MWL AHSS-02	Uranium-235 (15117-96-1)	BD, FR3
	096502-002/MWL AHSS-02	Uranium-238 (7440-61-1)	J, FR7

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096503-002/MWL ABSS-01	Americium-241 (14596-10-2)	BD, FR3
	096503-002/MWL ABSS-01	Beryllium-7 (13966-02-4)	BD, FR3
	096503-002/MWL ABSS-01	Bismuth-212 (14913-49-6)	BD, Z2
	096503-002/MWL ABSS-01	Cobalt-60 (10198-40-0)	BD, FR3
	096503-002/MWL ABSS-01	Neptunium-237 (13994-20-2)	BD, FR3
	096503-002/MWL ABSS-01	Radium-223 (15623-45-7)	BD, FR3
	096503-002/MWL ABSS-01	Radium-224 (13233-32-4)	BD, FR3
	096503-002/MWL ABSS-01	Sodium-22 (13966-32-0)	BD, FR3
	096503-002/MWL ABSS-01	Thorium-227 (15623-47-9)	BD, FR3
	096503-002/MWL ABSS-01	Thorium-231 (14932-40-2)	BD, FR3
	096503-002/MWL ABSS-01	Thorium-234 (15065-10-8)	BD, FR3
	096503-002/MWL ABSS-01	Uranium-235 (15117-96-1)	BD, FR3
	096503-002/MWL ABSS-01	Uranium-238 (7440-61-1)	BD, FR3
	096504-002/MWL ABSS-02	Americium-241 (14596-10-2)	BD, FR3
	096504-002/MWL ABSS-02	Beryllium-7 (13966-02-4)	BD, FR3
	096504-002/MWL ABSS-02	Cobalt-60 (10198-40-0)	BD, FR3
	096504-002/MWL ABSS-02	Neptunium-237 (13994-20-2)	BD, FR3
	096504-002/MWL ABSS-02	Radium-223 (15623-45-7)	BD, FR3
	096504-002/MWL ABSS-02	Radium-224 (13233-32-4)	J, FR7
	096504-002/MWL ABSS-02	Sodium-22 (13966-32-0)	BD, FR3
	096504-002/MWL ABSS-02	Thorium-227 (15623-47-9)	BD, FR3
	096504-002/MWL ABSS-02	Thorium-231 (14932-40-2)	BD, FR3
	096504-002/MWL ABSS-02	Thorium-234 (15065-10-8)	R, Z2
	096504-002/MWL ABSS-02	Uranium-235 (15117-96-1)	BD, FR3
	096504-002/MWL ABSS-02	Uranium-238 (7440-61-1)	R, Z2
	096505-001/MWL PDRV-01	Actinium-228 (14331-83-0)	BD, FR3
	096505-001/MWL PDRV-01	Americium-241 (14596-10-2)	BD, FR3
	096505-001/MWL PDRV-01	Bismuth-212 (14913-49-6)	BD, FR3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096505-001/MWL PDRV-01	Bismuth-214 (14733-03-0)	BD, FR3
	096505-001/MWL PDRV-01	Cesium-137 (10045-97-3)	BD, FR3
	096505-001/MWL PDRV-01	Cobalt-60 (10198-40-0)	BD, FR3
	096505-001/MWL PDRV-01	Lead-212 (15092-94-1)	BD, FR3
	096505-001/MWL PDRV-01	Lead-214 (15067-28-4)	BD, FR3
	096505-001/MWL PDRV-01	Neptunium-237 (13994-20-2)	BD, FR3
	096505-001/MWL PDRV-01	Radium-223 (15623-45-7)	BD, FR3
	096505-001/MWL PDRV-01	Radium-224 (13233-32-4)	BD, FR3
	096505-001/MWL PDRV-01	Radium-226 (13982-63-3)	BD, FR3
	096505-001/MWL PDRV-01	Radium-228 (15262-20-1)	BD, FR3
	096505-001/MWL PDRV-01	Sodium-22 (13966-32-0)	BD, FR3
	096505-001/MWL PDRV-01	Thorium-227 (15623-47-9)	BD, FR3
	096505-001/MWL PDRV-01	Thorium-231 (14932-40-2)	BD, FR3
	096505-001/MWL PDRV-01	Thorium-234 (15065-10-8)	BD, FR3
	096505-001/MWL PDRV-01	Uranium-235 (15117-96-1)	BD, FR3
	096505-001/MWL PDRV-01	Uranium-238 (7440-61-1)	BD, FR3
GL-RAD-A-002			
	096496-001/MWL TS-2NW	Tritium (10028-17-8)	BD, FR3
	096497-001/MWL TS-2SW	Tritium (10028-17-8)	BD, FR3
	096498-001/MWL TS-2SE	Tritium (10028-17-8)	BD, FR3
	096499-001/MWL TS-2NE	Tritium (10028-17-8)	BD, FR3
	096500-001/MWL TS-2NE	Tritium (10028-17-8)	BD, FR3
SW846 3050B/6010B			
	096501-001/MWL AHSS-01	Barium (7440-39-3)	J, MS3
	096501-001/MWL AHSS-01	Silver (7440-22-4)	0.535U, B3
	096502-001/MWL AHSS-02	Barium (7440-39-3)	J, MS3
	096502-001/MWL AHSS-02	Selenium (7782-49-2)	5.2U, B3
	096503-001/MWL ABSS-01	Barium (7440-39-3)	J, MS3
	096504-001/MWL ABSS-02	Barium (7440-39-3)	J, MS3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096504-001/MWL ABSS-02	Silver (7440-22-4)	0.535U, B3

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615736 | Site/Project: MWL Surface Soil | Validation Date: 09/25/14

SDG #: 355364 | Laboratory: GEL Laboratories, LLC | Validator: Mary Donivan

Matrix: Soil | # of Samples: 14 | CVR present: Yes | Analysis Type: □ Organic X□ Metals

AR/COC(s) present: Yes | Sample Container Integrity: OK | X □ Rad □ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
096501-001, 096503-001, 096504-001	355364006, -010 and -012	Hg	Received @ 27°C					

Comments: Samples collected 08/21/2014; samples 096501-001, 096503-001 and 096504-001were received at 27°C and not at method-specified temperature of ≤6°C for Hg, analysis cancelled by client

Revised 7/2007

Validated By: Mary A. Donivan

Inorganic Metals Worksheet

AR/COC #: 615736 SDG #: 355364 Matrix: Soil

Laboratory Sample IDs: 355364006, -008, -010 and -012

Method/Batch #s: **3050B/6010B:** 1414864/1414865 **7471A:** 1417518/1417519

ICPMS Mass Cal (pass/fail) NA ICPMS Resolution (pass/fail) NA

Analyte (outliers)	**Calibration**						**Method Blank mg/kg**	**5X Blank or (5X MDL) mg/kg**	**LCS %R**	**MS %R**	**Lab Rep. RPD**	**Serial Dil. %D**	**ICS AB %R**	**ICS A ± MDL**	**CRI %R**				
	Int.	**R^2**	**ICV**	**CCV**	**ICB µg/L**	**CCB µg/L**													
Ba	✓	✓	✓	✓	✓	✓	✓	NA	✓	51	✓	✓	✓	✓	✓				
Ag	✓	✓	✓	✓	1.07	✓	✓	0.535	✓	✓	✓	✓	✓	✓	✓				
As	✓	✓	✓	✓	✓	7.85	✓	3.92	✓	✓	✓	✓	✓	✓	✓				
Pb	✓	✓	✓	✓	✓	-5.06	✓	(1.65)	✓	✓	✓	✓	✓	✓	✓				
Se	✓	✓	✓	✓	7.89	10.4	✓	5.2	✓	✓	✓	✓	✓	✓	✓				

IS Outliers *60-125%*				**IS Outliers *80-120%***			
Sample ID	**%Recovery**	**%Recovery**	**%Recovery**	**CCV/CCB ID**	**%Recovery**	**%Recovery**	**%Recovery**
None				None			

Comments:_HTs OK; Matrix QC -006 (ICP-AES) and -008 (CVAA)

Radiochemistry Worksheet

AR/COC #: 615736 SDG #: 355364 Matrix: Soil

Laboratory Sample IDs: 355364– see below

Method/Batch#s: HASL 300 (Gammaspec) **1414754/1414869** -007, -009, -011 and -013 **1414754/1414872** -014

Method/Batch#s: GL-RAD-A-002 (LSC, Tritium Vacuum) **1415004** -001, -002, -003, -004 and -005

Analyte (outliers)	**Control Freq.**	**Control Eval.**	**Method Blank**	**5X Blank or 5X MDC**	**LCS %R**	**MS %R**	**MSD %R**	**MS/ MSD RER**	**Lab Rep. RER**				
None													

Tracer/Carrier Recovery Outliers

Sample ID	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**
NA								

Comments: HTs OK, GS DUP -007 and -014; H3 MS and DUP -001
Data rejected by the lab due to peaks not meeting identification criteria -013 (Th-234 and U-238)

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615736

Project Name:	MWL Surface Soil	Date Samples Shipped:	8/22/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	R. Ziock	Carrier/Waybill No.	222851	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422/10.11.08	Lab Contact:	Edie Kent	Wendy Palencia/505.844.3132	☐ Released by COC No.
Service Order:	CF426-14	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	1303873	Rita Kavanaugh/505.284.2553	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 355364
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096496	-001	MWL TS-2NW	N/A	8/21/14 0900	S	P	2 x 1L	None	G	SA	Tritium	001
096497	-001	MWL TS-2SW	N/A	0910	S	P	2 x 1L	None	G	SA	Tritium	
096498	-001	MWL TS-2SE	N/A	0915	S	P	2 x 1L	None	G	SA	Tritium	003
096499	-001	MWL TS-2NE	N/A	0920	S	P	2 x 1L	None	G	SA	Tritium	004
096500	-001	MWL TS-2NE	N/A	↓	S	P	2 x 1L	None	G	DU	Tritium	
096501	-001	MWL AHSS-01	N/A	8/21/14 820	S	P	250ml	None	G	SA	RCRA Metals*	
096501	-002	MWL AHSS-01	N/A	↓	S	P	250ml	None	G	SA	Gamma Spec	
096502	-001	MWL AHSS-02	N/A	8/21/14 845	S	P	250ml	None	G	SA	RCRA Metals*	008
096502	-002	MWL AHSS-02	N/A	↓	S	P	250ml	None	G	SA	Gamma Spec	009

Last Chain:	☑ Yes	Sample Tracking	SMO Use
Validation Req'd:	☐ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD ☑ Yes ☐ No

Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day

Negotiated TAT ☐

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments:

* Include CU, Ni, V, Zn, Co, and Be

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Danielle M. Nieto	Danielle M Nieto	dn	SNL/4143/845-7706
	~~Robert Ziock~~			~~SNL/4142/845-0485~~

1. Relinquished by	Danielle M Nieto	Org. 4143	Date 8/21/14	Time 945	3. Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 8/21/14	Time 0945	3. Received by	Org.	Date	Time
2. Relinquished by		Org. 4142	Date 8/22/14	Time 0900	4. Relinquished by	Org.	Date	Time
2. Received by		Org. Ceb	Date 8-23-14	Time 0915	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AR/COC 615736

Project Name:	MWL Surface Soil	Project/Task Manager:	R. Ziock	Project/Task No.:	146422/10.11.08	Lab use
Tech Area:						
Building:	Room:					

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096503	-001	MWL ABSS-01	N/A	8/21/14 825	S	P	250ml	None	G	SA	RCRA Metals*	
096503	-002	MWL ABSS-01	N/A	↓ ↓	S	P	250ml	None	G	SA	Gamma Spec	
096504	-001	MWL ABSS-02	N/A	8/21/14 850	S	P	250ml	None	G	SA	RCRA Metals*	
096504	-002	MWL ABSS-02	N/A	↓ ↓	S	P	250ml	None	G	SA	Gamma Spec	
096505	-001	MWL PDRV-01	N/A	8/21/14 830	V	P	1 Gal	None	G	SA	Gamma Spec	
~~096506~~	~~-001~~	~~MWL PDRV-02~~	~~N/A~~		~~V~~	~~P~~	~~1 Gal~~	~~None~~	~~G~~	~~SA~~	~~Gamma Spec~~	

Recipient Initials MV

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615736

Project Name:	MWL Surface Soil	Date Samples Shipped:	8/22/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	R. Ziock	Carrier/Waybill No.	722851	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422/10.11.08	Lab Contact:	Edie Kent	Wendy Palencia/505.844.3132	☐ Released by COC No.
Service Order:	CF426-14	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	1303873	Rita Kavanaugh/505.284.2553	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 355364
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096496	-001	MWL TS-2NW	N/A	8/21/14 0900	S	P	2 x 1L	None	G	SA	Tritium	
096497	-001	MWL TS-2SW	N/A	0910	S	P	2 x 1L	None	G	SA	Tritium	002
096498	-001	MWL TS-2SE	N/A	0915	S	P	2 x 1L	None	G	SA	Tritium	
096499	-001	MWL TS-2NE	N/A	0920	S	P	2 x 1L	None	G	SA	Tritium	
096500	-001	MWL TS-2NE	N/A	↓	S	P	2 x 1L	None	G	DU	Tritium	005
096501	-001	MWL AHSS-01	N/A	8/21/14 820	S	P	250ml	None	G	SA	RCRA Metals*	006
096501	-002	MWL AHSS-01	N/A	↓	S	P	250ml	None	G	SA	Gamma Spec	007
096502	-001	MWL AHSS-02	N/A	8/21/14 845	S	P	250ml	None	G	SA	RCRA Metals*	
096502	-002	MWL AHSS-02	N/A	↓	S	P	250ml	None	G	SA	Gamma Spec	

Last Chain:	☑ Yes	Sample Tracking	SMO Use
Validation Req'd:	☐ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD ☑ Yes ☐ No

Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day

Negotiated TAT ☐

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments:
* Include CU, Ni, V, Zn, Co, and Be

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Danielle M. Nieto	Danielle M Nieto	dn	SNL/4143/845-7706
	~~Robert Ziock~~			~~SNL/4142/845-0485~~

1. Relinquished by	Danielle M Nieto	Org. 4143	Date 8/21/14	Time 945	3. Relinquished by	Org.	Date	Time
1. Received by	[signature] SMO	Org. 4142	Date 8/21/14	Time 0945	3. Received by	Org.	Date	Time
2. Relinquished by	[signature]	Org. 4142	Date 8/22/14	Time 0900	4. Relinquished by	Org.	Date	Time
2. Received by	[signature]	Org.	Date 8-26-14	Time 0900	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AR/COC 615736

Project Name:	MWL Surface Soil	Project/Task Manager:	R. Ziock	Project/Task No.:	146422/10.11.08	Lab use
Tech Area:						
Building:	Room:					

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096503	-001	MWL ABSS-01	N/A	8/21/14 825	S	P	250ml	None	G	SA	RCRA Metals*	010
096503	-002	MWL ABSS-01	N/A	↓ ↓	S	P	250ml	None	G	SA	Gamma Spec	011
096504	-001	MWL ABSS-02	N/A	8/21/14 850	S	P	250ml	None	G	SA	RCRA Metals*	012
096504	-002	MWL ABSS-02	N/A	↓ ↓	S	P	250ml	None	G	SA	Gamma Spec	013
096505	-001	MWL PDRV-01	N/A	8/21/14 830	V	P	1 Gal	None	G	SA	Gamma Spec	014
~~096506~~	~~-001~~	~~MWL PDRV-02~~	~~N/A~~		~~V~~	~~P~~	~~1 Gal~~	~~None~~	~~G~~	~~SA~~	~~Gamma Spec~~	

Recipient Initials

Contract Verification Review (CVR)

Project Leader ZIOCK Project Name MWL SURFACE SOIL Project/Task No. 146422_10.11.08

ARCOC No. 615736 Analytical Lab GEL SDG No. 355364

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		Hg CANCELED FOR SAMPLES 096501-001, 096503-001 & 096504-001 DUE TO TEMPERATURE ISSUE

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control sample accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met		X	BARIUM OUTSIDE RECOVERY LIMITS FOR MATRIX SPIKE
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	N/A		
3.6 Contractual qualifiers provided: “J”- estimated quantity; “B”- analyte found in method blank above the MDL for organic and inorganic; “U”- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); “H”- analysis done beyond the holding time; “h” - analysis done beyond the extraction/preparation holding time; “N” - result associated with spike analysis outside control limits	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	X		

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted	N/A		
5.3 Verification or reanalysis requested from lab	N/A		

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes X No

Based on the review, this data package is complete. X Yes θ No

If no, provide nonconformance report or correction request number _____ and date correction request was submitted: _____

Reviewed by: W. Palencia Date: 9.25.2014

Were resolutions adequate and data package complete? θ Yes θ No

Closed by: _____ Date: _____

Mixed Waste Landfill

Surface Soil Tritium and Biota Monitoring

January 2015 Tritium Re-sampling Event

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: February 25, 2015

To: File

From: Mary Donivan

Subject: Inorganic Data Review and Validation – SNL
Site: MWL Surface Soil
AR/COC: 615978
SDG: 365592
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Five soil samples were prepared and analyzed with approved procedures using method GL-RAD-A-002 (LSC,tritium). No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were properly preserved and prepared and analyzed within the prescribed holding time.

Quantification

All quantification criteria were met.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Tracers or carriers were not required for these methods.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria,

Detection Limits/Dilutions

The samples were not diluted. All required detection limits were met.

Other QC

One field duplicate was submitted with ARCOC 615978. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski **Level I** **Date:** 02/25/15

Sample Findings Summary

AR/COC: 615978

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC

All other analyses met QC acceptance criteria; no further data should be qualified.

Radiochemistry Worksheet

AR/COC #: 615978 SDG #: 365592 Matrix: Soil

Laboratory Sample IDs: 365592 - see below

Method/Batch#s: GL-RAD-A-002 (LSC, Tritium Vacuum)/**1454287:** -001, -002, -003, -004 and -005

Analyte (outliers)	**Control Freq.**	**Control Eval.**	**Method Blank**	**5X Blank or 5X MDC**	**LCS %R**	**MS %R**	**MSD %R**	**MS/ MSD RER**	**Lab Rep. RER**				
None													

Tracer/Carrier Recovery Outliers

Sample ID	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**
NA								

Comments: HTs OK, MS and DUP -004

All samples were realiquotted and recounted to verify analysis results. The original results were confirmed and reported.

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. N/A

SMO Use

AR/COC 615978

Project Name:	MWL Surface Soil	Date Samples Shipped:	1/21/15	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	R. Ziock	Carrier/Waybill No.	022579	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422/10.11.08	Lab Contact:	Edie Kent	Wendy Palencia/505.844.3132	☐ Released by COC No.
Service Order:	CF426-15	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	1303873	Rita Kavanaugh/505.284.2553	Bill to: Sandia National Laboratories (Accounts Payable),
Tech Area:					P.O. Box 5800, MS-0154
Building:	Room:	Operational Site:			Albuquerque, NM 87185-0154 365592

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
097125	-001	MWL TS-2NW	N/A	1-20-15/1315	S	P	2 x 1L	None	G	SA	Tritium	001
097126	-001	MWL TS-2SW	N/A	1-20-15/1325	S	P	2 x 1L	None	G	SA	Tritium	002
097127	-001	MWL TS-2SE	N/A	1-20-15/1330	S	P	2 x 1L	None	G	SA	Tritium	003
097128	-001	MWL TS-2NE	N/A	1-20-15/1335	S	P	2 x 1L	None	G	SA	Tritium	004
097128	-002	MWL TS-2NE	N/A	1-20-15/1335	S	P	2 x 1L	None	G	DU	Tritium	005

Last Chain:	☑ Yes	**Sample Tracking**	**SMO Use**	**Special Instructions/QC Requirements:**	Conditions on Receipt
Validation Req'd:	☐ Yes	Date Entered:		**EDD** ☑ Yes ☐ No	
Background:	☐ Yes	Entered by:		**Turnaround Time** ☐ 7 Day* ☐ 15 Day* ☑ 30 Day	
Confirmatory:	☐ Yes	QC inits.:		**Negotiated TAT** ☐	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Danielle M. Nieto			SNL/4143/845-7706
	Robert Ziock			SNL/4142/845-0485

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments:
* Include CU, Ni, V, Zn, Co, and Be

Lab Use

1. Relinquished by		Org. 4142	Date 1/20/15	Time 1354	3. Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 1/20/15	Time 1354	3. Received by	Org.	Date	Time
2. Relinquished by	SMO	Org. 4142	Date 1/21/15	Time 0703	4. Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 1.22.15	Time 0850	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

Contract Verification Form (CVR)

Project Leader Ziock **Project Name** MWL Surface Soil **Project/Task No.** 146422_10.11.08

ARCOC No. 615978 **Analytical Lab** GEL **SDG No.** 365592

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain
		Yes	No	
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain
		Yes	No	
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and Lc	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

3.0 Data Quality Evaluation

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1	Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2	Quantitation limit met for all samples	X		
3.3	Accuracy a) Laboratory control sample accuracy reported and met for all samples	X		
	b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
	c) Matrix spike recovery data reported and met	X		
3.4	Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
	b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met	N/A		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.6	Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7	Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151.	N/A		

4.0 Calibration and Validation Documentation

Line No.	Item	Yes	No	Comments
4.1	GC/MS (8260 and 8270) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		

Line No.	Item	Yes	No	Comments
	e) Instrument run logs provided	N/A		
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		

Line No.	Item	Yes	No	Comments
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) ICP interference check sample data provided	N/A		
	d) ICP serial dilution provided	N/A		
	e) Instrument run logs provided	N/A		
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
5.1	DAR completed for monitoring and surveillance sample data	N/A		
5.2	Problems or outliers noted	N/A		
5.3	Verification or reanalysis requested from lab	N/A		

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies has been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? ○ Yes ◉ No

Based on the review, this data package is complete. ◉ Yes ○ No

Reviewed by: Wendy Palencia Date: 02-23-2015 13:11:00

Closed by: Wendy Palencia Date: 02-23-2015 13:11:00

ANNEX C

Mixed Waste Landfill
Soil-Vapor Monitoring Forms and Reports

April 2014-March 2015

Field Forms

Data Validation Reports

Contract Verification Reports

Certificates of Analysis – provided on compact disc in plastic sleeve insert

FIELD SAMPLING FORMS

MWL LONG-TERM MONITORING AND MAINTENANCE

SOIL-VAPOR MONITORING

Form Title	Corresponding Procedure
Tailgate Safety Briefing	PLA 05-09
SUMMA® Canister Log	FOP 08-22
Soil Vapor Sampling Form	FOP 08-22
Analysis Request and Chain of Custody*	LOP 94-03

*Completed AR/COC forms are provided in the Data Validation Section of this Annex.

FIELD SAMPLING FORMS

SEPTEMBER 2014 SOIL-VAPOR MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL Date: 09/11/14 Time: 0810

Activities: Soil Vapor Monitoring and Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill _____ °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU VAC ampules~~ TJ 9/11/14
Other: _____

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.		☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.		☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.		☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.		☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.		☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
x Chris Armijo	
Catrina Johnson	
Rick Dotson	
Robert Lynch	
William Gibson	

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN), department home page

Tim Jackson
Gilbert L. Quintana

SUMMA® Canister Log

Serial #	Date Received	Date Tested for Initial VAC	Initial VAC at 5400 ft (in. Hg)	Date Used	End VAC at 5400 ft (in. Hg)	Date Returned to SMO
34001413	9/9/14	9/11/14	-27	9/11/14	-8	9/12/14
34000217			-25		-8	
0497			-25		-8	
0493			-25		-8	
0164			-25		-8	
0433			-25		-8	
0022			-26		-8	
1393			-25		-8	
0457			-25		-8	
0077			-25		-8	
0249			-25		-8	
1802			-25		-8	
0381			-25		-8	
0055			-25		-8	
0116			-26		-8	
0225			-25		-8	
0030			-25		-8	
1424			-25		-8	
1479			-25		-8	
0104			-25		-8	
0050			-26		-8	
1202			-25		-8	
1451			-26		-8	
1364			-25		-8	

SUMMA® Canister Log completed by:

Tim Jaclesz
Printed Name

Signature

1 of 2

Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
MWL-SV03 ~~-50~~	9/11/14	841	34001413	n/a	-27	-8	MWL-FB3
MWL-SV03-50		847	n/a	0.2	n/a	n/a	
↓		848	34000217	0.2	-25	-8	
MWL-SV03-100		852	n/a	0.2	n/a	n/a	
↓		853	n/a	0.1	n/a	n/a	
↓		854	34000497	0.2	-25	-8	
MWL-SV03-200		857	n/a	0.2	n/a	n/a	
↓		858	n/a	0.2	n/a	n/a	
↓		859	3400493	0.2	-25	-8	
MWL-SV03-300		902	n/a	0.1	n/a	n/a	
↓		903	n/a	0.2	n/a	n/a	
↓		904	34000164	0.2	-25	-8	difficult filling 7 min Summa (NMED OR)
MWL-SV03-400		911	n/a	0.2	n/a	n/a	
↓		912	n/a	0.2	n/a	n/a	
↓		913	34000433	0.2	-25	-8	difficult filling Summa > 9 min (NMED OR)
MWL-SV04		942	34000022	n/a	-26	-8	MWL-FB4
MWL-SV04-50		948	n/a	0.1	n/a	n/a	
↓		949	34001393	0.2	-25	-8	
MWL-SV04-100		951	n/a	0.2	n/a	n/a	
↓		952	34000457	0.2	-25	-8	
↓		954	34000077	n/a	-25	-8	Duplicate
MWL-SV04-200		955	n/a	0.2	n/a	n/a	
↓		956	34001249	0.1	-25	-8	
MWL-SV04-300		958	n/a	0.1	n/a	n/a	
↓		959	n/a	0.2	n/a	n/a	
↓		1000	34001802	0.2	-25	-8	
↓		1003	34000381	n/a	-25	-8	Duplicate (NMED OR)
MWL-SV04-400		1006	n/a	0.1	n/a	n/a	
↓	↓	1007	n/a	0.1	n/a	n/a	

PID # 110-008538

Background = 0.2 ppm

2 of 2

Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
MWL-SV04-400	9/11/14	1004	34000055	0.1	-25	-8	NMED OB
MWL-SV05		1030	34000116	n/a	-26	-8	MWL-FB5
MWL-SV05-50		1031	n/a	0.2	n/a	n/a	
↓		1032	34000225	0.2	-25	-8	
MWL-SV05-100		1034	n/a	0.2	n/a	n/a	
↓		1037	34000030	0.1	-25	-8	
MWL-SV05-200		1039	n/a	0.1	n/a	n/a	
↓		1040	34001424	0.2	-25	-8	
MWL-SV05-300		1042	n/a	0.2	n/a	n/a	
↓		1043	n/a	0.2	n/a	n/a	
↓		1044	34001479	0.2	-25	-8	NMED OB
MWL-SV05-400		1048	n/a	0.2	n/a	n/a	
↓		1049	n/a	0.1	n/a	n/a	
↓		1050	34000104	0.1	-25	-8	NMED OB
MWL-SV01		1059	34000080	0.1	-26	-8	MWL-FB1
MWL-SV01-425		1122	n/a	0.1	n/a	n/a	
↓		1123	34001202	0.1	-25	-8	NMED OB
MWL-SV02		1105	34001451	n/a	-26	-8	MWL-FB2
MWL-SV02-415		1131	n/a	0.1	n/a	n/a	
↓	↓	1131	34001364	0.1	-25	-8	NMED OB

FIELD SAMPLING FORMS

OCTOBER 2014 SOIL-VAPOR MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-SV 1,2,3,4,5 Date: 10/22/14 Time: 0730

Activities: Soil vapor monitoring and sampling
(Anyone has the right to eease field activities for safety eoneerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 68.4 °F Wind Speed: 0 MPH Humidity: 32.6 % Wind Chill NA °F

Chemicals Used: ~~Acids in sample containers; standard solutions; Hach ACCU-VAC ampules~~ PL
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.		☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.		☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.		☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.		☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.		☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert T Lynch	
William Gibson	
ALFRED SANTILLANES	
Tim Judson	

SUMMA® Canister Log

	Serial #	Date Received	Date Tested for Initial VAC	Initial VAC at 5400 ft (in. Hg)	Date Used	End VAC at 5400 ft (in. Hg)	Date Returned to SMO
*	30400039	10/21/14	10/22/14	-25	10/22/14	-8	10/22/14
	34000823			-25		-8	
FB-1 *	34000389			-26		-8	
FB-2	34000378			-26		-8	
FB-3	34000173			-26		-8	
	34002059			-24		-6	
	7704			-25		-6	
	3400 0820			-25		-6	
	34001490			-26		-6	
	34001324			-25		-6	
FB4	34001585			-27		-6	
	34000226			-25		-6	
	34001554			-24		-6	
	3400 0406			-25		-6	
	34001208			-25		-6	
	34000469			-25		-8	
FB5	34001248			-26		-6	
	3400 0846			-25		-6	
	34000456			-25		-8	
	8437			-25		-8	
	34001574			-25		-8	
	34001132			-24		-6	
	34001279			-25		-8	
	34001444			-25		-6	

SUMMA® Canister Log completed by:

Tim Jackson — Printed Name

T Jackson — Signature

Background = 0.1 ppm

Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
MWL-SV02	10/22/14	0831	34000239	0.1	-25	-8	
MWL-SV01		0841	34000823	0.0	-25	-8	
FB1		0852	34000384	NA	-26	-8	
FB2		0854	34000378	↓	-26	-8	
FB3		0857	34000173	↓	-26	-8	
MWL-SV03-50		0914	NA	0.0	NA	NA	
↓		0916	34002059	0.0	-24	-8	
MWL-SV03-100		0918	NA	0.0	NA	NA	
↓		0921	7704	0.0	-25	-8	
MWL-SV03-200		0922	NA	0.0	NA	NA	
↓		0924	34000870	0.1	-25	-8	
MWL-SV03-300		0926	NA	0.0	NA	NA	end purge @ 0924
↓		0929	34001490	0.0	-26	-8	SA collection = 0932
MWL-SV03-400		0932	NA	0.1	NA	NA	end purge @ 0935
↓		0935	34001324	0.1	-25	-8	SA collection = 0945
FB4		0953	34001588	NA	-27	-8	
MWL-SV04-50		0955	NA	0.0	NA	NA	
↓		0956	34001226	0.0	-25	-8	
MWL-SV04-100		0957	NA	0.1	NA	NA	
↓		0959	34001558	0.1	-24	-8	
MWL-SV04-200		1001	NA	0.0	NA	NA	
↓		1003	34000406	0.0	-25	-8	
MWL-SV04-300		1005	NA	0.0	NA	NA	
↓		1007	34001208	0.0	-25	-8	
MWL-SV04-400		1009	NA	0.0	NA	NA	
↓		1012	34000464	0.0	-25	-8	
FB5		1024	34001248	NA	-26	-8	
MWL-SV05-50		1026	NA	0.0	NA	NA	
↓	↓	1028	34000896	0.0	-25	-8	

Background = 0.1 ppm

Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
MWL-SV05-100	10/22/14	1029	NA	0.0	NA	NA	
↓		1030	34000456	0.0	-25	-8	
MWL-SV05-200		1032	NA	0.0	NA	NA	
↓		1034	8437	0.0	-25	-8	
↓		1036	34001574	NA	-25	-8	Duplicate
MWL-SV05-300		1037	NA	0.0	NA	NA	
↓		1039	34001132	0.0	-24	-8	
MWL-SV05-400		1041	NA	0.0	NA	NA	
↓		1043	34001279	0.0	-25	-8	
↓		1045	34001444	NA	-25	-8	Duplicate

SUMMARY SHEET FOR

SEPTEMBER 2014 SOIL-VAPOR SAMPLES

Sample Summary for September 2014 MWL Soil Vapor Monitoring

Well ID	Sample Date	Sample ID / Port	*SUMMA Number*	ARCOC	Sample Number	Sample Type	Associated Field Blank (ARCOC #/Sample #)	Comments
Mixed Waste Landfill Soil Vapor Monitoring: Project Task Number 146422.10.11.08 / Service Order Number CF 01-15								
MWL-SV01	11-Sep-14	**MWL-SV01-42.5**	34001202	615738	096510	Environmental	615738 / 096511	
		MWL-FB1	34000050		096511	Field QC	n/a	Ultra Pure N2
MWL-SV02	11-Sep-14	**MWL-SV02-41.5**	34001364	615739	096512	Environmental	615739 / 096513	
		MWL-FB2	34001451		096513	Field QC	n/a	Ultra Pure N2
MWL-SV03	11-Sep-14	**MWL-SV03-50**	34000217	615740	096514	Environmental	615740 / 096519	
		MWL-SV03-100	34000497		096515	Environmental		
		MWL-SV03-200	34000493		096516	Environmental		
		MWL-SV03-300	34000164		096517	Environmental		
		MWL-SV03-400	34000433		096518	Environmental		
		MWL-FB3	34001413		096519	Field QC	n/a	Ultra Pure N2
MWL-SV04	11-Sep-14	**MWL-SV04-50**	34001393	615741	096520	Environmental	615741 / 096527	
		MWL-SV04-100	34000457		096521	Environmental		
		MWL-SV04-100	34000077		096522	Duplicate		
		MWL-SV04-200	34001249		096523	Environmental		
		MWL-SV04-300	34001802		096524	Environmental		
		MWL-SV04-300	34000381		096525	Duplicate		
		MWL-SV04-400	34000055		096526	Environmental		
		MWL-FB4	34000022		096527	Field QC	n/a	Ultra Pure N2
MWL-SV05	11-Sep-14	**MWL-SV05-50**	34000225	615742	096528	Environmental	615742 / 096533	
		MWL-SV05-100	34000030		096529	Environmental		
		MWL-SV05-200	34001424		096530	Environmental		
		MWL-SV05-300	34001479		096531	Environmental		
		MWL-SV05-400	34000104		096532	Environmental		
		MWL-FB5	34000116		096533	Field QC	n/a	Ultra Pure N2

SUMMARY SHEET FOR

OCTOBER 2014 SOIL-VAPOR SAMPLES

Sample Summary for October 2014 MWL Soil Vapor Monitoring

Well ID	Sample Date	Sample ID / Port	*SUMMA Number*	ARCOC	Sample Number	Sample Type	Associated Field Blank (ARCOC #/Sample #)	Comments
Mixed Waste Landfill Soil Vapor Monitoring: Project Task Number 146422.10.11.08 / Service Order Number CF 01-15								
MWL-SV01	22-Oct-14	**MWL-SV01-42.5**	34000823	615830	096712	Environmental	615830 / 096713	
		MWL-SV-FB1	34000389		096713	Field QC	n/a	Ultra Pure N2
MWL-SV02	22-Oct-14	**MWL-SV02-41.5**	34000239	615831	096714	Environmental	615831 / 096715	
		MWL-SV-FB2	34000378		096715	Field QC	n/a	Ultra Pure N2
MWL-SV03	22-Oct-14	**MWL-SV03-50**	34002059	615832	096716	Environmental	615832 / 096721	
		MWL-SV03-100	7704		096717	Environmental		
		MWL-SV03-200	34000820		096718	Environmental		
		MWL-SV03-300	34001490		096719	Environmental		
		MWL-SV03-400	34001324		096720	Environmental		
		MWL-SV-FB3	34000173		096721	Field QC	n/a	Ultra Pure N2
MWL-SV04	22-Oct-14	**MWL-SV04-50**	34000226	615833	096722	Environmental	615833 / 096727	
		MWL-SV04-100	34001558		096723	Environmental		
		MWL-SV04-200	34000406		096724	Environmental		
		MWL-SV04-300	34001208		096725	Environmental		
		MWL-SV04-400	34000464		096726	Environmental		
		MWL-SV-FB4	34001588		096727	Field QC	n/a	Ultra Pure N2
MWL-SV05	22-Oct-14	**MWL-SV05-50**	34000896	615834	096728	Environmental	615834 / 096735	
		MWL-SV05-100	34000456		096729	Environmental		
		MWL-SV05-200	8437		096730	Environmental		
		MWL-SV05-200	34001574		096731	Duplicate		
		MWL-SV05-300	34001132		096732	Environmental		
		MWL-SV05-400	34001279		096733	Environmental		
		MWL-SV05-400	34001444		096734	Duplicate		
		MWL-SV-FB5	34001248		096735	Field QC	n/a	Ultra Pure N2

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

AR/COC NUMBERS 615738, 615739, 615740, 615741, 615742

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: October 14, 2014

To: File

From: Monica Dymerski

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL SVM
AR/COC: 615738, 615739, 615740, 615741 and 615742
SDG: 320-9478-1
Laboratory: TestAmerica Laboratories, Inc. – West Sacramento
Project/Task: 146422.10.11.08
Analysis: TO-15 VOCs in Ambient Air

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Twenty-four samples were prepared and analyzed with accepted procedures using method EPA TO-15a (VOCs in Ambient Air). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. Acetone was detected in the method blanks associated with all samples at concentrations < the PQL. All samples *except* -5, -16, -19, -22, and -17 were detects ≤ the PQL and will be **qualified U,B** at the PQL. Sample -17 was a detect > the PQL but ≤10X the MB concentration and will be **qualified 8.7U,B**, at the reported concentration.
2. Benzene was detected in all FB samples (-2, -4, -10, -18, and -24), associated with all field samples, at concentrations < the PQL. The associated results for samples -11, -12, -15, -17, and -19 were detects > the PQL but ≤5X the FB concentrations, and will be **qualified U,B2** at their reported values. All field samples *except* -1, -5, -11, -12, -15, -17, and -19 were < the PQL and ≤5X the method blank concentration and will be **qualified U,B2** at the PQL.
3. Carbon disulfide was detected in FB1 and FB3 samples -2 and -10, associated with samples -1 and 5 through 9, respectively. The associated results for samples -1, -5, -6, and -7 were detects ≤the PQL and ≤5X the FB concentrations and will be **qualified U,B2** at the PQL.
4. Toluene was detected in FB2, FB3, FB4, and FB5 samples -4, -10, -18, and -24, associated with all samples *except* sample -1. The associated results for samples -5, -6, and -7 were detects > the PQL but ≤10X the FB concentration and will be **qualified U,B2** at the reported concentrations.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as noted above in the Summary section and as follows. Acetone was detected in the method blanks at concentrations < the PQL. Samples -5, -16, -19, and -22, were detects > the PQL and >10X the blanks concentration and will not be qualified.

Benzene was detected in all FB samples (-2, -4, -10, -18, and -24), associated with all field samples. The associated result for sample -1 was a non-detect and will not be qualified. The associated result for sample -5 was a detect >5X the FB result and > the PQL and will not be qualified.

Carbon disulfide was detected in FB1 and FB3 samples -2 and -10, associated with samples -1 and 5 through 9, respectively. The associated results for samples -8 and -9 were detects > the PQL and >5X the FB concentration and will not be qualified.

Methylene chloride was detected in FB1 sample -2, associated with sample -1. The methylene chloride result for sample -1 was a non-detect and will not be qualified.

Toluene was detected in FB2, FB3, FB4, and FB5 samples -4, -10, -18, and -24, associated with all field samples *except* sample -1. The associated result for sample -3 was a non-detect and will not be qualified. The associated results for all samples *except* 3, -5, -6, and -7 were detects > the PQL and >10X the FB concentrations and will not be qualified.

Acetone was detected in the method blanks at concentrations < the PQL. Acetone results for all field blanks were qualified U due to method blank contamination and will not be applied to field sample results.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD analyses are not required for this method.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS/LCSD acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. Initial dilution factors were applied to all samples. Additional dilution factors were applied to samples -1, -3, -5, -6, -7, -9, -12, -14, -15, -17, -19, -20, -21, -22, and -23 to bring over range analytes into calibration range.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Five FBs were submitted, one for each ARCOC. Two field duplicate pairs were submitted with ARCOC 615741. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 10/14/14

Sample Findings Summary

AR/COC: 615738, 615739, 615740, 615741, 615742

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
TO15			
	096510-001/MWL-SV01-42.5	ACETONE (67-64-1)	25U, B
	096510-001/MWL-SV01-42.5	CARBON DISULFIDE (75-15-0)	4U, B2
	096511-001/MWL-FB1	ACETONE (67-64-1)	6.6U, B
	096512-001/MWL-SV02-41.5	ACETONE (67-64-1)	11U, B
	096512-001/MWL-SV02-41.5	BENZENE (71-43-2)	0.84U, B2
	096513-001/MWL-FB2	ACETONE (67-64-1)	6.5U, B
	096514-001/MWL-SV03-50	CARBON DISULFIDE (75-15-0)	1.1U, B2
	096514-001/MWL-SV03-50	TOLUENE (108-88-3)	2.8U, B2
	096515-001/MWL-SV03-100	ACETONE (67-64-1)	11U, B
	096515-001/MWL-SV03-100	BENZENE (71-43-2)	0.85U, B2
	096515-001/MWL-SV03-100	CARBON DISULFIDE (75-15-0)	1.7U, B2
	096515-001/MWL-SV03-100	TOLUENE (108-88-3)	3.0U, B2
	096516-001/MWL-SV03-200	ACETONE (67-64-1)	15U, B
	096516-001/MWL-SV03-200	BENZENE (71-43-2)	1.2U, B2
	096516-001/MWL-SV03-200	CARBON DISULFIDE (75-15-0)	2.4U, B2
	096516-001/MWL-SV03-200	TOLUENE (108-88-3)	3.6U, B2
	096517-001/MWL-SV03-300	ACETONE (67-64-1)	25U, B
	096517-001/MWL-SV03-300	BENZENE (71-43-2)	2.0U, B2
	096518-001/MWL-SV03-400	ACETONE (67-64-1)	25U, B
	096518-001/MWL-SV03-400	BENZENE (71-43-2)	2.0U, B2
	096519-001/MWL-FB3	ACETONE (67-64-1)	6.6U, B
	096520-001/MWL-SV04-50	ACETONE (67-64-1)	12U, B
	096520-001/MWL-SV04-50	BENZENE (71-43-2)	1.7U, B2
	096521-001/MWL-SV04-100	ACETONE (67-64-1)	6.8U, B

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096521-001/MWL-SV04-100	BENZENE (71-43-2)	0.94U, B2
	096522-001/MWL-SV04-100	ACETONE (67-64-1)	12U, B
	096522-001/MWL-SV04-100	BENZENE (71-43-2)	0.99U, B2
	096523-001/MWL-SV04-200	ACETONE (67-64-1)	15U, B
	096523-001/MWL-SV04-200	BENZENE (71-43-2)	1.2U, B2
	096524-001/MWL-SV04-300	ACETONE (67-64-1)	7.2U, B
	096524-001/MWL-SV04-300	BENZENE (71-43-2)	0.64U, B2
	096525-001/MWL-SV04-300	BENZENE (71-43-2)	0.57U, B2
	096526-001/MWL-SV04-400	ACETONE (67-64-1)	8.7U, B
	096526-001/MWL-SV04-400	BENZENE (71-43-2)	1.2U, B2
	096527-001/MWL-FB4	ACETONE (67-64-1)	6.5U, B
	096528-001/MWL-SV05-50	BENZENE (71-43-2)	0.68U, B2
	096529-001/MWL-SV05-100	ACETONE (67-64-1)	11U, B
	096529-001/MWL-SV05-100	BENZENE (71-43-2)	0.86U, B2
	096530-001/MWL-SV05-200	ACETONE (67-64-1)	13U, B
	096530-001/MWL-SV05-200	BENZENE (71-43-2)	1.0U, B2
	096531-001/MWL-SV05-300	BENZENE (71-43-2)	0.6U, B2
	096532-001/MWL-SV05-400	ACETONE (67-64-1)	15U, B
	096532-001/MWL-SV05-400	BENZENE (71-43-2)	1.2U, B2
	096533-001/MWL-FB5	ACETONE (67-64-1)	6.4U, B

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615738, 615739, 615740, 615741 and 615742 Site/Project: MWL SVM Validation Date: 10/14/14

SDG #: 320-9478-1 Laboratory: TestAmerica Laboratories, Inc. West Sacramento Validator: Monica Dymerski

Matrix: Air # of Samples: 24 CVR present: Yes Analysis Type: X Organic Metals

AR/COC(s) present: Yes Sample Container Integrity: Intact Rad Gen Chem

Requested Analyses Not Reported						
Sample Number	**Laboratory ID**	**organic**	**genchem**	**metals**	**rad**	**Comments**
None						

Hold Time/Preservation Outliers								
Sample Number	**Laboratory ID**	**Analysis**	**Pres.**	**Coll. Date**	**Prep. Date**	**Anal. Date**	**Anal. within 2X HT**	**Anal. beyond 2X HT**
None								

Comments: Samples collected 09/11/14.

Revised 7/2007

Monica L Dymerski

Validated By: _____

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615738

Project Name:	MWL SVM	Date Samples Shipped	9/15/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No	221974	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact:	Both Riley	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-14 #15	Lab Destination:	Test America/CA SAC.	Send Report to SMO:	☐ 4° Celsius
		Contract No.:	PO 691437	Rita Kavanaugh/505-284-2553	Bill to Sandia National Laboratories (Accounts Payable), P.O Box 5800, MS-0154 Albuquerque, NM 87185-0154
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Sample Port	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096510	-001	MWL-SV01-42.5	1	9/11/14 11:23	SG	SC	6 L	None	G	SA	VOC-TO-15	
096511	-001	MWL-FB1	NA	9/11/14 10:59	UPN	SC	6 L	None	G	FB	VOC-TO-15	

Last Chain:	☐ Yes	Sample Tracking	SMO Use
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC Inits.:	

Special Instructions/QC Requirements:

EDD	☑ Yes	☐ No	
Turnaround Time	☐ 7 Day*	☐ 15 Day*	☑ 30 Day
Negotiated TAT	☐		
Sample Disposal	☐ Return to Client	☑ Disposal by Lab	
Return Samples By:			
Comments:	Send report to Tim Jackson/4142/MS 0729/284-2547		

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Gilbert Quintana	Gilbert Quintana	GQ	SNL/4144/505-228-2606
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367

1. Relinquished by	William Gibson	Org. 4142	Date 09/12/14	Time 0920	3. Relinquished by	SMO	Org. 4142	Date 9/15/14	Time 0805
1. Received by	T Quintana	Org. 4142	Date 09/12/14	Time 0920	3. Received by		Org.	Date 9/18/14	Time 0915
2. Relinquished by	T Quintana	Org. 4142	Date 9-12-14	Time 0945	4. Relinquished by		Org.	Date	Time
2. Received by		Org. 4142	Date 9-12-14	Time 0945	4. Received by		Org.	Date	Time

Prior confirmation with SMO required for 7 and 15 day TAT

10/09/2014

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615739

Project Name:	MWL SVM	Date Samples Shipped:	9/15/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No	221974	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact:	BETH RILEY	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-14 15	Lab Destination:	Test America/CA	Send Report to SMO:	☐ 4° Celsius
Tech Area:	14	Contract No.:	PO 691437	Rita Kavanaugh/505-284-2553	Bill to Sandia National Laboratories (Accounts Payable), P.O Box 5800, MS-0154 Albuquerque, NM 87185-0154
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Sample Port	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096512	-001	MWL-SV02-41.5	1	9/11/14 11:31	SG	SC	6 L	None	G	SA	VOC-TO-15	
096513	-001	MWL-FB2	NA	9/11/14 11:05	UPN	SC	6 L	None	G	FB	VOC-TO-15	

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Last Chain:	☐ Yes	**Sample Tracking**	**SMO Use**
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD	☑ Yes	☐ No		
Turnaround Time	☐ 7 Day*	☐ 15 Day*	☑ 30 Day	
Negotiated TAT	☐			
Sample Disposal	☐ Return to Client	☑ Disposal by Lab		
Return Samples By:				
Comments:	Send report to Tim Jackson/4142/MS 0729/284-2547			

Conditions on Receipt

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Gilbert Quintana	Gilbert Quintana	GQ	SNL/4144/505-228-2606
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367

1.Relinquished by	William Gibson	Org. 4142	Date 09-12-14	Time 0920	3.Relinquished by	Org. 4142	Date 9/15/14	Time 0805
2. Received by		Org. 4142	Date 09-12-14	Time 0920	3. Received by	Org.	Date 9/18/14	Time 0915
2.Relinquished by		Org. 4142	Date 9-12-14	Time 945	4.Relinquished by	Org.	Date	Time
2. Received by		Org. 4142	Date 9-12-14	Time 0945	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

10 Oct 2014

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615740

Project Name:	MWL SVM	Date Samples Shipped:	9/15/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	221974	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact:	BETH RILEY	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-1K5	Lab Destination:	Test America/CA SACRO.	Send Report to SMO:	☐ 4° Celsius
		Contract No.:	PO 691437	Rita Kavanaugh/505-284-2553	Bill to: Sandia National Laboratories (Accounts Payable),
Tech Area:	00				P O. Box 5800, MS-0154
Building:	Room:	Operational Site:			Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Sample Port	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096514	-001	MWL-SV03-50	1	9/11/14 8:48	SG	SC	6 L	None	G	SA	VOC-TO-15	
096515	-001	MWL-SV03-100	2	9/11/14 8:54	SG	SC	6 L	None	G	SA	VOC-TO-15	
096516	-001	MWL-SV03-200	3	9/11/14 8:59	SG	SC	6 L	None	G	SA	VOC-TO-15	
096517	-001	MWL-SV03-300	4	9/11/14 9:04	SG	SC	6 L	None	G	SA	VOC-TO-15	
096518	-001	MWL-SV03-400	5	9/11/14 9:13	SG	SC	6 L	None	G	SA	VOC-TO-15	
096519	-001	MWL-FB3	NA	9/11/14 9:41	UPN	SC	6 L	None	G	FB	VOC-TO-15	

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Last Chain:	☐ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☑ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch		RL	SNL/4142/505-844-4013/505-250-7090
	Gilbert Quintana			SNL/4144/505-228-2606
	William Gibson			SNL/4142/505-284-3307/505-239-7367

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

1. Relinquished by		Org. 4142	Date 9-12-14	Time 0920	3. Relinquished by	SMO	Org. 4142	Date 9/15/14	Time 0805
2. Received by		Org. 4142	Date 9-12-14	Time 0920	3. Received by		Org.	Date 9/15/14	Time 0915
2. Relinquished by		Org. 4142	Date 9-12-14	Time 0945	4. Relinquished by		Org.	Date	Time
2. Received by	SMO	Org. 4142	Date 9-12-14	Time 0945	4. Received by		Org.	Date	Time

Prior confirmation with SMO required for 7 and 15 day TAT

10/09/2014

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615741

Project Name:	MWL SVM	Date Samples Shipped.	9/15/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager.	Mike Mitchell	Carrier/Waybill No.	221974	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact:	BOTH RILEY	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-14/5 DUP	Lab Destination:	Test America/CA, SACRA.	Send Report to SMO:	☐ 4° Celsius
		Contract No.:	PO 691437	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable),
Tech Area:					P O Box 5800, MS-0154
Building:	Room:	Operational Site:			Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Sample Port	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096520	-001	MWL-SV04-50	1	9/11/14 9:49	SG	SC	6 L	None	G	SA	VOC-TO-15	
096521	-001	MWL-SV04-100	2	9/11/14 9:52	SG	SC	6 L	None	G	SA	VOC-TO-15	
096522	-001	MWL-SV04-100	2	9/11/14 9:54	SG	SC	6 L	None	G	DU	VOC-TO-15	
096523	-001	MWL-SV04-200	3	9/11/14 9:56	SG	SC	6 L	None	G	SA	VOC-TO-15	
096524	-001	MWL-SV04-300	4	9/11/14 10:00	SG	SC	6 L	None	G	SA	VOC-TO-15	
096525	-001	MWL-SV04-300	4	9/11/14 10:03	SG	SC	6 L	None	G	DU	VOC-TO-15	
096526	-001	MWL-SV04-400	5	9/11/14 10:08	SG	SC	6 L	None	G	SA	VOC-TO-15	
096527	-001	MWL-FB4	NA	9/11/14 9:42	UPN	SC	6 L	None	G	FB	VOC-TO-15	

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Last Chain:	☐ Yes	Sample Tracking	SMO Use
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch		RL	SNL/4142/505-844-4013/505-250-7090
	Gilbert Quintana			SNL/4144/505-228-2606
	William Gibson			SNL/4142/505-284-3307/505-239-7367

Special Instructions/QC Requirements:

EDD ☑ Yes ☐ No

Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day

Negotiated TAT ☐

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

1.Relinquished by		Org. 4142	Date 09-12-14	Time 0920	3.Relinquished by	Org. 4142	Date 9/15/14	Time 0805
2. Received by		Org. 4142	Date 09-12-14	Time 0920	3. Received by	Org.	Date 9/19/14	Time 0915
2.Relinquished by		Org. 4142	Date 9-12-14	Time 0945	4.Relinquished by	Org.	Date	Time
2. Received by		Org. 4142	Date 9-12-14	Time 0945	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

10/09/2014

SMO 2012-ARCOC (4-2012)

ORIGINALS

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

AOP 95-16

Internal Lab

Page 1 of 1

Batch No. N/A

SMO Use

AR/COC 615742

Project Name:	MWL SVM	Date Samples Shipped:	9/15/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No	221974	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact	BOTH KILOY	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order.	CF01-1#5	Lab Destination.	Test America/CA	Send Report to SMO:	☐ 4° Celsius
	004	Contract No :	PO 691437	Rita Kavanaugh/505-284-2553	Bill to Sandia National Laboratories (Accounts Payable),
Tech Area:					P.O. Box 5800, MS-0154
Building:	Room:	Operational Site:			Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Sample Port	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096528	-001	MWL-SV05-50	1	9/11/14 10:32	SG	SC	6 L	None	G	SA	VOC-TO-15	
096529	-001	MWL-SV05-100	2	9/11/14 10:37	SG	SC	6 L	None	G	SA	VOC-TO-15	
096530	-001	MWL-SV05-200	3	9/11/14 10:40	SG	SC	6 L	None	G	SA	VOC-TO-15	
096531	-001	MWL-SV05-300	4	9/11/14 10:44	SG	SC	6 L	None	G	SA	VOC-TO-15	
096532	-001	MWL-SV05-400	5	9/11/14 10:50	SG	SC	6 L	None	G	SA	VOC-TO-15	
096533	-001	MWL-FB5	NA	9/11/14 10:30	UPN	SC	6 L	None	G	FB	VOC-TO-15	

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Last Chain:	☐ Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd:	☑ Yes	Date Entered:		EDD ☑ Yes ☐ No	
Background:	☐ Yes	Entered by:		Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day	
Confirmatory:	☐ Yes	QC inits.:		Negotiated TAT ☐	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Gilbert Quintana	Gilbert Quintana	GQ	SNL/4144/505-228-2606
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Lab Use

1.Relinquished by	William Gibson	Org. 4142	Date 09-12-14	Time 0920	3.Relinquished by	Org. 4142	Date 9/15/14	Time 0805
2. Received by	Tim Jackson	Org. 4142	Date 09-12-14	Time 0920	3. Received by	Org.	Date 9/18/14	Time 0915
2.Relinquished by	Tim Jackson	Org. 4142	Date 9-12-14	Time 945	4.Relinquished by	Org.	Date	Time
2. Received by	Rita Kavanaugh SMO	Org. 4142	Date 9-12-14	Time 0945	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

10/29/2014

AR/COC NUMBERS 615830, 615831, 615832, 615833, 615834

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: December 3, 2014

To: File

From: Mary Donivan

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL SVM
AR/COC: 615830, 615831, 615832, 615833 and 615834
SDG: 320-10172-1
Laboratory: TestAmerica Laboratories, Inc. – West Sacramento
Project/Task: 146422.10.11.08
Analysis: TO-15 VOCs in Ambient Air

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Twenty-four samples were prepared and analyzed with accepted procedures using method EPA TO-15A (VOCs in Ambient Air). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. Styrene, m,p-xylene and o-xylene were detected in the method blanks associated with all samples *except* 320-10172-1 through -4 at concentrations < the PQL. All associated results for samples -5, -7, -15,-16, -17, -18 and -20, the m,p-xylene and o-xylene results for samples -19 and -21 and the o-xylene result for sample -23 were detects ≤ the PQL and will be **qualified U,B** at the PQL.
2. Chlorobenzene, 1,3-dichlorobenzene and ethylbenzene were detected in the method blank associated with samples -7, -16 and -17 at concentrations < the PQLs. The chlorobenzene and ethylbenzene results for samples -7 and -17 and the 1,3-dichlorobenzene result for sample -7 were detects ≤ the PQLs and will be **qualified U,B** at the PQL.
3. Chlorobenzene, ethylbenzene and toluene were detected in the method blank associated with samples -15 and -18 through -24 at concentrations < the PQLs. The chlorobenzene result for sample -20, the ethylbenzene results for samples -15 and -20 and the toluene results for samples -15, -18 and -19 were detects ≤ the PQLs and will be **qualified U,B** at the PQL.
4. Acetone was detected in FB2 sample -4, associated with sample -003, at a concentration < the PQL. The associated sample result was a detect < the PQL and ≤10X the method blank concentration and will be **qualified 45U,B2** at the PQL.
5. Benzene and toluene were detected in FB4 sample -16, associated with samples -11 through -15, at concentrations <the PQL. The benzene results for samples -12, -14 and -15 and the toluene results for all associated samples were detects ≤ the PQLs and will be **qualified U,B2** at the PQL.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as noted above in the Summary section and as follows. Styrene, m,p-xylene and o-xylene were detected in the method blanks associated with all samples *except* 320-10172-1 through -4 at concentrations < the PQL. The remaining associated sample results were non-detects and will not be qualified. Styrene, m,p-xylene and o-xylene results for FB4 sample -16 associated with samples -11 through -15, were qualified U due to MB contamination and will not be applied to field sample results.

Chlorobenzene, 1,3-dichlorobenzene and ethylbenzene were detected in the method blank associated with samples -7, -16 and -17 at concentrations < the PQLs. All associated results for sample -16, and the 1,3-dichlorobenzene result for sample -17 were non-detects and will not be qualified.

Chlorobenzene, ethylbenzene and toluene were detected in the method blank associated with samples -15 and -18 through -24 at concentrations < the PQLs. The toluene results for samples -020, -21, -22 and -23 were detects >10X the MB concentration and > the PQL and will not be qualified. The chlorobenzene result for sample -15; the chlorobenzene and ethylbenzene results for samples -18, -19, and 20 through -23, and all associated results for sample -24 were non-detects and will not be qualified.

Acetone and toluene were detected in FB1 sample -2, associated with sample -001, at concentrations < the PQLs. The associated sample results were non-detects and will not be qualified.

2-Butanone was detected in FB2 sample -4, associated with sample -003, at a concentration < the PQL. The associated sample result was non-detect and will not be qualified.

Benzene and toluene were detected in FB4 sample -16, associated with samples -11 through -15, at concentrations <the PQL. The benzene result for sample -11 was a detect >5X the FB concentration and > the PQL and the result for sample -13 was non-detect. These sample results will not be qualified.

Trichloroethene was detected in FB5 sample -24, associated with samples -17 through -19, -20DL and -21through -23, at a concentration < the PQL. All associated sample results were detects >5X the FB concentration and >the PQL and will not be qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD analyses are not required for this method.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS/LCSD acceptance criteria were met except as follows. The %Rs were > the upper acceptance limit for 1,2,4-trichlorobenzene for the LCSs associated with samples -5 through -14, -16, and -17 (Batches 58105 and 58139). Three recoveries per LCS are allowed to fall outside acceptance criteria since 50 analytes were reported. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. Initial dilution factors were applied to all samples. An additional dilution factor was applied to sample -20 to bring over range analytes into calibration range.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Five FBs were submitted, one for each ARCOC. Two field duplicate pairs were submitted with ARCOC 615834. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski **Level I** **Date:** 12/04/14

Sample Findings Summary

AR/COC: 615830, 615831, 615832, 615833, 615834

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
TO15			
	096714-001/MWL-SV02-41.5	ACETONE (67-64-1)	45U, B2
	096716-001/MWL-SV03-50 (port 1)	M,P-XYLENE (179601-23-1)	6U, B
	096716-001/MWL-SV03-50 (port 1)	O-XYLENE (95-47-6)	3U, B
	096716-001/MWL-SV03-50 (port 1)	STYRENE (100-42-5)	3U, B
	096718-001/MWL-SV03-200 (port 3)	1,3-DICHLOROBENZENE (541-73-1)	3U, B
	096718-001/MWL-SV03-200 (port 3)	CHLOROBENZENE (108-90-7)	2.2U, B
	096718-001/MWL-SV03-200 (port 3)	ETHYLBENZENE (100-41-4)	3U, B
	096718-001/MWL-SV03-200 (port 3)	M,P-XYLENE (179601-23-1)	6U, B
	096718-001/MWL-SV03-200 (port 3)	O-XYLENE (95-47-6)	3U, B
	096718-001/MWL-SV03-200 (port 3)	STYRENE (100-42-5)	3U, B
	096722-001/MWL-SV04-50 (port 1)	TOLUENE (108-88-3)	1.2U, B2
	096723-001/MWL-SV04-100 (port 2)	BENZENE (71-43-2)	2U, B2
	096723-001/MWL-SV04-100 (port 2)	TOLUENE (108-88-3)	2U, B2
	096724-001/MWL-SV04-200 (port 3)	TOLUENE (108-88-3)	3U, B2
	096725-001/MWL-SV04-300 (port 4)	BENZENE (71-43-2)	2U, B2

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096725-001/MWL-SV04-300 (port 4)	TOLUENE (108-88-3)	2U, B2
	096726-001/MWL-SV04-400 (port 5)	BENZENE (71-43-2)	2U, B2
	096726-001/MWL-SV04-400 (port 5)	ETHYLBENZENE (100-41-4)	2U, B
	096726-001/MWL-SV04-400 (port 5)	M,P-XYLENE (179601-23-1)	4.1U, B
	096726-001/MWL-SV04-400 (port 5)	O-XYLENE (95-47-6)	2U, B
	096726-001/MWL-SV04-400 (port 5)	STYRENE (100-42-5)	2U, B
	096726-001/MWL-SV04-400 (port 5)	TOLUENE (108-88-3)	2U, B,B2
	096727-001/MWL-SV-FB4	M,P-XYLENE (179601-23-1)	0.8U, B
	096727-001/MWL-SV-FB4	O-XYLENE (95-47-6)	0.4U, B
	096727-001/MWL-SV-FB4	STYRENE (100-42-5)	0.4U, B
	096728-001/MWL-SV05-50 (port 1)	CHLOROBENZENE (108-90-7)	0.88U, B
	096728-001/MWL-SV05-50 (port 1)	ETHYLBENZENE (100-41-4)	1.2U, B
	096728-001/MWL-SV05-50 (port 1)	M,P-XYLENE (179601-23-1)	2.3U, B
	096728-001/MWL-SV05-50 (port 1)	O-XYLENE (95-47-6)	1.2U, B
	096728-001/MWL-SV05-50 (port 1)	STYRENE (100-42-5)	1.2U, B
	096729-001/MWL-SV05-100 (port 2)	M,P-XYLENE (179601-23-1)	2.5U, B
	096729-001/MWL-SV05-100 (port 2)	O-XYLENE (95-47-6)	1.3U, B
	096729-001/MWL-SV05-100 (port 2)	STYRENE (100-42-5)	1.3U, B
	096729-001/MWL-SV05-100 (port 2)	TOLUENE (108-88-3)	1.3U, B

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096730-001/MWL-SV05-200 (port 3)	M,P-XYLENE (179601-23-1)	5U, B
	096730-001/MWL-SV05-200 (port 3)	O-XYLENE (95-47-6)	2.5U, B
	096730-001/MWL-SV05-200 (port 3)	TOLUENE (108-88-3)	2.5U, B
	096731-001/MWL-SV05-200 (port 3)	CHLOROBENZENE (108-90-7)	0.3U, B
	096731-001/MWL-SV05-200 (port 3)	ETHYLBENZENE (100-41-4)	0.4U, B
	096731-001/MWL-SV05-200 (port 3)	M,P-XYLENE (179601-23-1)	0.8U, B
	096731-001/MWL-SV05-200 (port 3)	O-XYLENE (95-47-6)	0.4U, B
	096731-001/MWL-SV05-200 (port 3)	STYRENE (100-42-5)	0.4U, B
	096732-001/MWL-SV05-300 (port 4)	M,P-XYLENE (179601-23-1)	2.8U, B
	096732-001/MWL-SV05-300 (port 4)	O-XYLENE (95-47-6)	1.4U, B
	096734-001/MWL-SV05-400 (port 5)	O-XYLENE (95-47-6)	1.6U, B

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615830, 615831, 615832, 615833 and 615834 Site/Project: MWL SVM Validation Date: 12/03/14

SDG #: 320-10172-1 Laboratory: TestAmerica Laboratories, Inc. West Sacramento Validator: Mary Donivan

Matrix: Air # of Samples: 24 CVR present: Yes Analysis Type: X Organic Metals

AR/COC(s) present: Yes Sample Container Integrity: Intact Rad Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments: Samples collected 10/22/2014

Revised 7/2007

Validated By: Mary A. Donivan

Organic Worksheet (GC/MS)

AR/COC #: 615830, 615831, 615832, 615833 and 615834 SDG #:320-10172-1 Matrix: Air

Laboratory Sample IDs: 320-10172-1 through -24

Method/Batch #s: **EPA TO-15:** [A]58064, [B]58105, [C]58139 and [D]58224 Tuning (pass/fail): pass TICs Required? (yes/no) no

Analyte (outliers)	**Calibration**				**Method Blank**	**5X (10X) Blank**	**LCS %R**	**LCSD %R**	**LCS/ LCSD RPD**	**FB1 - 2**	**5X (10X) FB**			
	Int.	**RF**	**RSD/R²**	**CCV (ICV) %D**										
acetone	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.75J	(7.5)			
toluene	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.065J	(0.65)			
										FB2-4	**5X (10X) FB**			
acetone	NA	✓	✓	✓	✓	NA	✓	✓	✓	1.5J	(15)			
2-butanone	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.22J	(2.2)			
										FB3-10	**5X (10X) FB**			
styrene	NA	✓	✓	✓	[B]0.0995J	0.498	✓	✓	✓	✓	✓			
m,p-xylene	NA	✓	✓	✓	0.174J	0.87	✓	✓	✓	✓	✓			
o-xylene	NA	✓	✓	✓	0.0892J	0.446	✓	✓	✓	✓	✓			
1,2,4-trichlorobenzene	NA	✓	✓	✓	✓	NA	151	156	✓	✓	✓			
										FB4-16	**5X (10X) FB**			
benzene	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.083J	0.415			
chlorobenzene	NA	✓	✓	✓	[C]0.0795J	0.398	✓	✓	✓	✓	✓			
1,3-dichlorobenzene	NA	✓	✓	✓	0.118J	0.59	✓	✓	✓	✓	✓			
ethylbenzene					0.0886J	0.443	✓	✓	✓	✓	✓			
styrene	NA	✓	✓	✓	0.112J	0.56	✓	✓	✓	0.064J	0.32	NA*		
toluene	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.051J	(0.51)			
m,p-xylene	NA	✓	✓	✓	0.230J	1.15	✓	✓	✓	0.15J	0.75	NA*		
o-xylene	NA	✓	✓	✓	0.0992J	0.496	✓	✓	✓	0.067J	0.34	NA*		
1,2,4-trichlorobenzene	NA	✓	✓	✓	✓	NA	156	154	✓	✓	✓			
										FB5-24	**5X (10X) FB**			
chlorobenzene	NA	✓	✓	✓	[D]0.0787J	0.394	✓	✓	✓	✓	✓			
ethylbenzene	NA	✓	✓	✓	0.0891J	0.456	✓	✓	✓	✓	✓			
styrene	NA	✓	✓	✓	0.112J	0.56	✓	✓	✓	✓	✓			
toluene	NA	✓	✓	✓	0.0549J	(0.549)	✓	✓	✓	✓	✓			
trichloroethene	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.17J	0.85			
m,p-xylene	NA	✓	✓	✓	0.224J	1.12	✓	✓	✓	✓	✓			
o-xylene	NA	✓	✓	✓	0.0982J	0.491	✓	✓	✓	✓	✓			

Surrogate Recovery Outliers

Sample ID						
NA						

IS Outliers

Sample ID	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**
None												

Comments: HTs OK, ICAL MS2 11/13/14. [A]Batch 58064 (11/15/14), samples -1 through -4. ICAL MS7 10/01/14 [B]Batch 58105 (11/16/14), samples -5 through -6,-8 through -14. [C]Batch 58139 (11/16-17/14), samples -7, -16 and -17. [D]Batch 58224 (11/17-18/14), samples -15, -18 through -24 and -20 dilution. *Qualified U in the FB sample. FB result not applied to associated field samples.

Revised 2007

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No

SMO Use

AR/COC **615830**

Project Name:	MWL SVM	Date Samples Shipped:	[signature]	SMO Authorization: [signature]	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No	225573	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact:	Beth Riley,916-373-5600	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-15	Lab Destination.	TA/West Sacramento	Send Report to SMO:	☐ 4° Celsius
		Contract No..	PO 691437	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable),
Tech Area:					P.O. Box 5800, MS-0154
Building:	Room:	Operational Site:			Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096712	-001	MWL-SV01-42.5		10/22/14 8:41	SG	SC	6 L	None	G	SA	VOC-TO-15	
096713	-001	MWL-SV-FB1		10/22/14 8:52	UPN	SC	6 L	None	G	FB	VOC-TO-15	

320-10172 Chain of Custody

Last Chain: ☐ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd: ☑ Yes	Date Entered:	EDD ☑ Yes ☐ No	
Background: ☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day	
Confirmatory: ☐ Yes	QC inits.:	Negotiated TAT ☐	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	[signature]	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	[signature]	[initials]	SNL/4142/505-844-5130/505-228-0710
	William Gibson	[signature]	[initials]	SNL/4142/505-284-3307/505-239-7367
	Tim Jackson	[signature]	[initials]	SNL/4142/505-284-2547

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Lab Use

1.Relinquished by [signature]	Org. 4142	Date 10-22-14	Time 1120	3.Relinquished by	Org	Date	Time
1. Received by [signature]	Org. 4142	Date 10-22-14	Time 1120	3. Received by	Org.	Date	Time
2.Relinquished by [signature]	Org. 4142	Date 10/27/14	Time 0600	4.Relinquished by	Org.	Date	Time
2. Received by [signature]	Org. TA WS	Date 10/30/14	Time 1000	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

Page 1 of 1

AR/COC **615831**

Project Name:	MWL SVM	Date Samples Shipped:	10/27/14	SMO Authorization:	[signature]
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	225573	SMO Contact Phone:	
Project/Task Number.	146422.10.11.08	Lab Contact.	Beth Riley,916-373-5600		Lorraine Herrera/505-844-3199
Service Order:	CF01-15	Lab Destination:	TA/West Sacramento	Send Report to SMO:	
		Contract No.:	PO 691437		Rita Kavanaugh/505-284-2553

☐ Waste Characterization
☐ RMMA
☐ Released by COC No.
☐ 4° Celsius

Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154, Albuquerque, NM 87185-0154

Tech Area:

Building: **Room:** **Operational Site:**

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096714	-001	MWL-SV02-41.5		10/22/14 8:31	SG	SC	6 L	None	G	SA	VOC-TO-15	
096715	-001	MWL-SV-FB2		10/22/14 8:54	UPN	SC	6 L	None	G	FB	VOC-TO-15	

Last Chain: ☐ Yes
Validation Req'd: ☑ Yes
Background: ☐ Yes
Confirmatory: ☐ Yes

Sample Tracking — **SMO Use**
Date Entered:
Entered by:
QC inits.:

Special Instructions/QC Requirements:
EDD ☑ Yes ☐ No
Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Negotiated TAT ☐
Sample Disposal ☐ Return to Client ☑ Disposal by Lab
Return Samples By:
Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	[signature]	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	[signature]	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	[signature]	WJG	SNL/4142/505-284-3307/505-239-7367
	Tim Jackson	[signature]	TJ	SNL/4142/505-284-2547

	Org.	Date	Time		Org.	Date	Time
1. Relinquished by [signature]	4142	10-22-14	1120	3. Relinquished by			
1. Received by [signature]	4142	10-22-14	1120	3. Received by			
2. Relinquished by [signature]	4142	10/27/14	0800	4. Relinquished by			
2. Received by [signature]	TA WS	10/30/14	1000	4. Received by			

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012) AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. SMO Use

Page 1 of 1

AR/COC 615832

Project Name:	MWL SVM	Date Samples Shipped:	10/27/14	SMO Authorization:	[signature]
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	225573	SMO Contact Phone:	
Project/Task Number:	146422.10.11.08	Lab Contact:	Beth Riley 916-373-5600		Lorraine Herrera/505-844-3199
Service Order:	CF01-15	Lab Destination:	TA/West Sacramento	Send Report to SMO:	
		Contract No..	PO 691437		Rita Kavanaugh/505-284-2553

☐ Waste Characterization
☐ RMMA
☐ Released by COC No.
☐ 4° Celsius

Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154

Tech Area:

Building: **Room:** **Operational Site:**

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096716	-001	MWL-SV03-50 (port 1)		10/22/14 9:16	SG	SC	6 L	None	G	SA	VOC-TO-15	
096717	-001	MWL-SV03-100 (port 2)		10/22/14 9:21	SG	SC	6 L	None	G	SA	VOC-TO-15	
096718	-001	MWL-SV03-200 (port 3)		10/22/14 9:24	SG	SC	6 L	None	G	SA	VOC-TO-15	
096719	-001	MWL-SV03-300 (port 4)		10/22/14 9:32	SG	SC	6 L	None	G	SA	VOC-TO-15	
096720	-001	MWL-SV03-400 (port 5)		10/22/14 9:45	SG	SC	6 L	None	G	SA	VOC-TO-15	
096721	-001	MWL-SV-FB3		10/22/14 8:57	UPN	SC	6 L	None	G	FB	VOC-TO-15	

Last Chain: ☐ Yes
Validation Req'd: ☑ Yes
Background: ☐ Yes
Confirmatory: ☐ Yes

Sample Tracking **SMO Use**
Date Entered:
Entered by:
QC inits.:

Special Instructions/QC Requirements:
EDD ☑ Yes ☐ No
Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Negotiated TAT ☐
Sample Disposal ☐ Return to Client ☑ Disposal by Lab
Return Samples By:
Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

Sample Team Members

Name	Signature	Init	Company/Organization/Phone/Cell
Robert Lynch	[signature]	RL	SNL/4142/505-844-4013/505-250-7090
Alfred Santillanes	[signature]	AS	SNL/4142/505-844-5130/505-228-0710
William Gibson	[signature]	WG	SNL/4142/505-284-3307/505-239-7367
Tim Jackson	[signature]	TJ	SNL/4142/505-284-2547

	Org.	Date	Time		Org.	Date	Time
1.Relinquished by [signature]	4142	10-22-14	1120	3.Relinquished by			
1. Received by [signature]	4142	10-22-14	1120	3. Received by			
2.Relinquished by [signature]	4142	10/27/14	0800	4.Relinquished by			
2. Received by [signature]	TA WS	10/30/14	1100	4 Received by			

*Prior confirmation with SMO required for 7 and 15 day TAT

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CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 615833

Project Name:	MWL SVM	Date Samples Shipped	10/27/14	SMO Authorization:	Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	225573	SMO Contact Phone:	RMMA
Project/Task Number:	146422.10.11.08	Lab Contact.	Beth Riley,916-373-5600	Lorraine Herrera/505-844-3199	Released by COC No.
Service Order:	CF01-15	Lab Destination	TA/West Sacramento	Send Report to SMO:	4° Celsius
		Contract No.:	PO 691437	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096722	-001	MWL-SV04-50 (port 1)		10/22/14 9:56	SG	SC	6 L	None	G	SA	VOC-TO-15	
096723	-001	MWL-SV04-100 (port 2)		10/22/14 9:59	SG	SC	6 L	None	G	SA	VOC-TO-15	
096724	-001	MWL-SV04-200 (port 3)		10/22/14 10:03	SG	SC	6 L	None	G	SA	VOC-TO-15	
096725	-001	MWL-SV04-300 (port 4)		10/22/14 10:07	SG	SC	6 L	None	G	SA	VOC-TO-15	
096726	-001	MWL-SV04-400 (port 5)		10/22/14 10:12	SG	SC	6 L	None	G	SA	VOC-TO-15	
096727	-001	MWL-SV-FB4		10/22/14 9:53	UPN	SC	6 L	None	G	FB	VOC-TO-15	

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Last Chain:	☐ Yes	Sample Tracking	SMO Use
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD ☑ Yes ☐ No

Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day

Negotiated TAT ☐

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367
	Tim Jackson	Tim Jackson	TJ	SNL/4142/505-284-2547

1.Relinquished by	William Gibson	Org. 4142	Date 10-22-14	Time 1120	3.Relinquished by		Org.	Date	Time
1. Received by	Robert Lynch	Org. 4142	Date 10-22-14	Time 1120	3. Received by		Org.	Date	Time
2.Relinquished by	Robert Lynch	Org. 4142	Date 10/27/14	Time 0900	4.Relinquished by		Org.	Date	Time
2. Received by	Tim Jackson	Org. TA WS	Date 10/30/14	Time 1000	4. Received by		Org.	Date	Time

Prior confirmation with SMO required for 7 and 15 day TAT

FY14Q2/2014

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. | SMO Use | AR/COC 615834

Project Name:	MWL SVM	Date Samples Shipped:	10/27/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	225573	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact:	Beth Riley,916-373-5600	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-15	Lab Destination:	TA/West Sacramento	Send Report to SMO:	☐ 4° Celsius
		Contract No.:	PO 691437	Rita Kavanaugh/505-284-2553	Bill to.Sandia National Laboratories (Accounts Payable), P.O Box 5800, MS-0154 Albuquerque, NM 87185-0154
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096728	-001	MWL-SV05-50 (port 1)		10/22/14 10:28	SG	SC	6 L	None	G	SA	VOC-TO-15	
096729	-001	MWL-SV05-100 (port 2)		10/22/14 10:30	SG	SC	6 L	None	G	SA	VOC-TO-15	
096730	-001	MWL-SV05-200 (port 3)		10/22/14 10:34	SG	SC	6 L	None	G	SA	VOC-TO-15	
096731	-001	MWL-SV05-200 (port 3)		10/22/14 10:36	SG	SC	6 L	None	G	DU	VOC-TO-15	
096732	-001	MWL-SV05-300 (port 4)		10/22/14 10:39	SG	SC	6 L	None	G	SA	VOC-TO-15	
096733	-001	MWL-SV05-400 (port 5)		10/22/14 10:43	SG	SC	6 L	None	G	SA	VOC-TO-15	
096734	-001	MWL-SV05-400 (port 5)		10/22/14 10:45	SG	SC	6 L	None	G	DU	VOC-TO-15	
096735	-001	MWL-SV-FB5		10/22/14 10:24	UPN	SC	6 L	None	G	FB	VOC-TO-15	

Last Chain:	☑ Yes	Sample Tracking	SMO Use
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC Inits.:	

Special Instructions/QC Requirements:
EDD ☑ Yes ☐ No
Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Negotiated TAT ☐
Sample Disposal ☐ Return to Client ☑ Disposal by Lab
Return Samples By:
Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367
	Tim Jackson	Tim Jackson	TJ	SNL/4142/505-284-2547

1.Relinquished by	William Gibson	Org. 4142	Date 10-22-14	Time 1120	3.Relinquished by	Org.	Date	Time
1. Received by	Dennis Stone	Org. 4142	Date 10-22-14	Time 1120	3. Received by	Org.	Date	Time
2.Relinquished by	Dennis Stone	Org. 4142	Date 10/27/14	Time 0900	4.Relinquished by	Org.	Date	Time
2. Received by	Tim Nay	Org. TA WS	Date 10/30/14	Time 1000	4. Received by	Org.	Date	Time

Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT VERIFICATION REVIEW FORMS

AR/COC Number	Sample Type
615738	Environmental*
615739	Environmental*
615740	Environmental*
615741	Environmental*
615742	Environmental*
615830	Environmental*
615831	Environmental*
615832	Environmental*
615833	Environmental*
615834	Environmental*

* AR/COC forms are provided in the Data Validation Section of this Annex.

Contract Verification Review (CVR)

Project Leader	MITCHELL	Project Name	MWL SVM	Project/Task No.	146422_10.11.08
ARCOC No.	615738, 615739, 615740, 615741 & 615742	Analytical Lab	TEST AMERICA- WEST SACRAMENTO	SDG No.	320-9478-1

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	N/A		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control sample accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples		X	ACETONE DETECTED IN BLANKS
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		ALL HITS IN FIELD BLANKS LOWER THAN RL
3.6 Contractual qualifiers provided: “J”- estimated quantity; “B”- analyte found in method blank above the MDL for organic and inorganic; “U”- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); “H”- analysis done beyond the holding time; “h” - analysis done beyond the extraction/preparation holding time; “N” - result associated with spike analysis outside control limits	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270) a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	N/A		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted	N/A		
5.3 Verification or reanalysis requested from lab	N/A		

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes X No

Based on the review, this data package is complete. X Yes θ No

If no, provide nonconformance report or correction request number _____ and date correction request was submitted: _____

Reviewed by: W. Palencia Date: 10.13.2014

Were resolutions adequate and data package complete? θ Yes θ No

Closed by: _____ Date: _____

Contract Verification Review (CVR)

Project Leader	MITCHELL	Project Name	MWL SVM	Project/Task No.	146422_10.11.08
ARCOC No.	615830, 615831, 615832, 615833 & 615834	Analytical Lab	TEST AMERICA- WEST SACRAMENTO	SDG No.	320-10172-1

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	N/A		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control sample accuracy reported and met for all samples		X	1,2,4-TRICHLOROBENZENE FAILED RECOVERY LIMITS FOR LCS/LCSD (BATCH 58105 & 58139)
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples		X	STYRENE, M&P-XYLENE & O-XYLENE DETECTED IN BLANK (58105) CHLOROBENZENE, 1,3-DICHLOROBENZENE, ETHYLBENZENE, STYRENE, M&P-XYLENE & O-XYLENE DETECTED IN BLANK (58139) CHLOROBENZENE, ETHYLBENZENE, STYRENE, TOLUENE, M&P-XYLENE & O-XYLENE DETECTED IN BLANK (58224)
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		ALL HITS IN FIELD BLANKS LOWER THAN RL
3.6 Contractual qualifiers provided: “J”- estimated quantity; “B”- analyte found in method blank above the MDL for organic and inorganic; “U”- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); “H”- analysis done beyond the holding time; “h” - analysis done beyond the extraction/preparation holding time; “N” - result associated with spike analysis outside control limits	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		

3.9 Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270) a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	N/A		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for monitoring and surveillance sample data	X		
5.2 Problems or outliers noted		X	
5.3 Verification or reanalysis requested from lab	X		

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes X No

Based on the review, this data package is complete. X Yes θ No

If no, provide nonconformance report or correction request number _____ and date correction request was submitted: _____

Reviewed by: W. Palencia Date: 11.24.2014

Were resolutions adequate and data package complete? θ Yes θ No

Closed by: _____ Date: _____

SOIL-VAPOR SAMPLING RESULTS
CERTIFICATES OF ANALYSIS

Mixed Waste Landfill

April 2014-March 2015 Reporting Period

Note: Certificates of Analysis are provided on compact disc only, for printed copies of this report.

SEPTEMBER 2014 SOIL-VAPOR SAMPLING RESULTS

CERTIFICATES OF ANALYSIS

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-9478-1

Client Sample ID: 096510-001/MWL-SV01-42.5
Lab Sample ID: 320-9478-1
Date Collected: 09/11/14 11:23
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**13**	**J B**	25	0.89	ppb v/v			10/04/14 00:25	4.99
Benzene	ND		2.0	0.39	ppb v/v			10/04/14 00:25	4.99
Benzyl chloride	ND		4.0	0.81	ppb v/v			10/04/14 00:25	4.99
Bromodichloromethane	**0.40**	**J**	1.5	0.33	ppb v/v			10/04/14 00:25	4.99
Bromoform	ND		2.0	0.35	ppb v/v			10/04/14 00:25	4.99
Bromomethane	ND		4.0	1.7	ppb v/v			10/04/14 00:25	4.99
2-Butanone (MEK)	**2.7**	**J**	4.0	0.99	ppb v/v			10/04/14 00:25	4.99
Carbon disulfide	**3.1**	**J**	4.0	0.39	ppb v/v			10/04/14 00:25	4.99
Carbon tetrachloride	**0.35**	**J**	4.0	0.32	ppb v/v			10/04/14 00:25	4.99
Chlorobenzene	ND		1.5	0.32	ppb v/v			10/04/14 00:25	4.99
Chloroethane	ND		4.0	1.5	ppb v/v			10/04/14 00:25	4.99
Chloroform	**13**		1.5	0.47	ppb v/v			10/04/14 00:25	4.99
Chloromethane	**1.2**	**J**	4.0	0.98	ppb v/v			10/04/14 00:25	4.99
Dibromochloromethane	ND		2.0	0.39	ppb v/v			10/04/14 00:25	4.99
1,2-Dibromoethane (EDB)	ND		4.0	0.37	ppb v/v			10/04/14 00:25	4.99
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	0.77	ppb v/v			10/04/14 00:25	4.99
1,2-Dichlorobenzene	ND		2.0	0.65	ppb v/v			10/04/14 00:25	4.99
1,3-Dichlorobenzene	ND		2.0	0.55	ppb v/v			10/04/14 00:25	4.99
1,4-Dichlorobenzene	ND		2.0	0.74	ppb v/v			10/04/14 00:25	4.99
Dichlorodifluoromethane	**100**		2.0	0.72	ppb v/v			10/04/14 00:25	4.99
1,1-Dichloroethane	**2.8**		1.5	0.36	ppb v/v			10/04/14 00:25	4.99
1,2-Dichloroethane	ND		4.0	0.44	ppb v/v			10/04/14 00:25	4.99
1,1-Dichloroethene	**8.0**		4.0	0.64	ppb v/v			10/04/14 00:25	4.99
cis-1,2-Dichloroethene	**1.5**	**J**	2.0	0.44	ppb v/v			10/04/14 00:25	4.99
trans-1,2-Dichloroethene	ND		2.0	0.50	ppb v/v			10/04/14 00:25	4.99
1,2-Dichloropropane	ND		2.0	1.2	ppb v/v			10/04/14 00:25	4.99
cis-1,3-Dichloropropene	ND		2.0	0.52	ppb v/v			10/04/14 00:25	4.99
trans-1,3-Dichloropropene	ND		2.0	0.44	ppb v/v			10/04/14 00:25	4.99
Ethylbenzene	ND		2.0	0.31	ppb v/v			10/04/14 00:25	4.99
4-Ethyltoluene	ND		2.0	0.93	ppb v/v			10/04/14 00:25	4.99
Hexachlorobutadiene	ND		10	2.2	ppb v/v			10/04/14 00:25	4.99
2-Hexanone	ND		2.0	0.43	ppb v/v			10/04/14 00:25	4.99
4-Methyl-2-pentanone (MIBK)	ND		2.0	0.67	ppb v/v			10/04/14 00:25	4.99
Methylene Chloride	ND		2.0	0.36	ppb v/v			10/04/14 00:25	4.99
Styrene	ND		2.0	0.29	ppb v/v			10/04/14 00:25	4.99
1,1,2,2-Tetrachloroethane	ND		2.0	0.34	ppb v/v			10/04/14 00:25	4.99
Toluene	**1.1**	**J**	2.0	0.25	ppb v/v			10/04/14 00:25	4.99
1,1,2-Trichloro-1,2,2-trifluoroethane	**94**		2.0	0.81	ppb v/v			10/04/14 00:25	4.99
1,2,4-Trichlorobenzene	ND		10	2.2	ppb v/v			10/04/14 00:25	4.99
1,1,1-Trichloroethane	**55**		1.5	0.32	ppb v/v			10/04/14 00:25	4.99
1,1,2-Trichloroethane	ND		2.0	0.33	ppb v/v			10/04/14 00:25	4.99
Trichloroethene	**110**		2.0	0.52	ppb v/v			10/04/14 00:25	4.99
Trichlorofluoromethane	**190**		2.0	0.98	ppb v/v			10/04/14 00:25	4.99
1,2,4-Trimethylbenzene	ND		4.0	0.81	ppb v/v			10/04/14 00:25	4.99
1,3,5-Trimethylbenzene	ND		2.0	0.62	ppb v/v			10/04/14 00:25	4.99
Vinyl acetate	ND		4.0	0.72	ppb v/v			10/04/14 00:25	4.99
Vinyl chloride	ND		2.0	0.60	ppb v/v			10/04/14 00:25	4.99

Client Sample ID: 096510-001/MWL-SV01-42.5

Lab Sample ID: 320-9478-1

Date Collected: 09/11/14 11:23
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		4.0	0.50	ppb v/v			10/04/14 00:25	4.99
o-Xylene	ND		2.0	0.27	ppb v/v			10/04/14 00:25	4.99

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*85*		*70 - 130*		*10/04/14 00:25*	*4.99*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*		*10/04/14 00:25*	*4.99*
Toluene-d8 (Surr)	*99*		*70 - 130*		*10/04/14 00:25*	*4.99*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	**560**		6.0	0.77	ppb v/v			10/05/14 15:53	15

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*70 - 130*		*10/05/14 15:53*	*15*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*		*10/05/14 15:53*	*15*
Toluene-d8 (Surr)	*96*		*70 - 130*		*10/05/14 15:53*	*15*

Client Sample ID: 096511-001/MWL-FB1

Lab Sample ID: 320-9478-2

Date Collected: 09/11/14 10:59
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**0.29**	**J B**	6.6	0.23	ppb v/v			10/04/14 01:23	1.31
Benzene	**0.44**	**J**	0.52	0.10	ppb v/v			10/04/14 01:23	1.31
Benzyl chloride	ND		1.0	0.21	ppb v/v			10/04/14 01:23	1.31
Bromodichloromethane	ND		0.39	0.086	ppb v/v			10/04/14 01:23	1.31
Bromoform	ND		0.52	0.092	ppb v/v			10/04/14 01:23	1.31
Bromomethane	ND		1.0	0.44	ppb v/v			10/04/14 01:23	1.31
2-Butanone (MEK)	ND		1.0	0.26	ppb v/v			10/04/14 01:23	1.31
Carbon disulfide	**0.19**	**J**	1.0	0.10	ppb v/v			10/04/14 01:23	1.31
Carbon tetrachloride	ND		1.0	0.084	ppb v/v			10/04/14 01:23	1.31
Chlorobenzene	ND		0.39	0.084	ppb v/v			10/04/14 01:23	1.31
Chloroethane	ND		1.0	0.40	ppb v/v			10/04/14 01:23	1.31
Chloroform	ND		0.39	0.12	ppb v/v			10/04/14 01:23	1.31
Chloromethane	ND		1.0	0.26	ppb v/v			10/04/14 01:23	1.31
Dibromochloromethane	ND		0.52	0.10	ppb v/v			10/04/14 01:23	1.31
1,2-Dibromoethane (EDB)	ND		1.0	0.098	ppb v/v			10/04/14 01:23	1.31
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.52	0.20	ppb v/v			10/04/14 01:23	1.31
1,2-Dichlorobenzene	ND		0.52	0.17	ppb v/v			10/04/14 01:23	1.31
1,3-Dichlorobenzene	ND		0.52	0.14	ppb v/v			10/04/14 01:23	1.31
1,4-Dichlorobenzene	ND		0.52	0.20	ppb v/v			10/04/14 01:23	1.31
Dichlorodifluoromethane	ND		0.52	0.19	ppb v/v			10/04/14 01:23	1.31
1,1-Dichloroethane	ND		0.39	0.094	ppb v/v			10/04/14 01:23	1.31
1,2-Dichloroethane	ND		1.0	0.12	ppb v/v			10/04/14 01:23	1.31
1,1-Dichloroethene	ND		1.0	0.17	ppb v/v			10/04/14 01:23	1.31
cis-1,2-Dichloroethene	ND		0.52	0.12	ppb v/v			10/04/14 01:23	1.31
trans-1,2-Dichloroethene	ND		0.52	0.13	ppb v/v			10/04/14 01:23	1.31

Client Sample ID: 096511-001/MWL-FB1

Lab Sample ID: 320-9478-2

Date Collected: 09/11/14 10:59
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		0.52	0.31	ppb v/v			10/04/14 01:23	1.31
cis-1,3-Dichloropropene	ND		0.52	0.14	ppb v/v			10/04/14 01:23	1.31
trans-1,3-Dichloropropene	ND		0.52	0.12	ppb v/v			10/04/14 01:23	1.31
Ethylbenzene	ND		0.52	0.083	ppb v/v			10/04/14 01:23	1.31
4-Ethyltoluene	ND		0.52	0.24	ppb v/v			10/04/14 01:23	1.31
Hexachlorobutadiene	ND		2.6	0.57	ppb v/v			10/04/14 01:23	1.31
2-Hexanone	ND		0.52	0.11	ppb v/v			10/04/14 01:23	1.31
4-Methyl-2-pentanone (MIBK)	ND		0.52	0.18	ppb v/v			10/04/14 01:23	1.31
Methylene Chloride	**0.12**	**J**	0.52	0.094	ppb v/v			10/04/14 01:23	1.31
Styrene	ND		0.52	0.077	ppb v/v			10/04/14 01:23	1.31
1,1,2,2-Tetrachloroethane	ND		0.52	0.090	ppb v/v			10/04/14 01:23	1.31
Tetrachloroethene	ND		0.52	0.067	ppb v/v			10/04/14 01:23	1.31
Toluene	ND		0.52	0.067	ppb v/v			10/04/14 01:23	1.31
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.52	0.21	ppb v/v			10/04/14 01:23	1.31
1,2,4-Trichlorobenzene	ND		2.6	0.57	ppb v/v			10/04/14 01:23	1.31
1,1,1-Trichloroethane	ND		0.39	0.085	ppb v/v			10/04/14 01:23	1.31
1,1,2-Trichloroethane	ND		0.52	0.088	ppb v/v			10/04/14 01:23	1.31
Trichloroethene	ND		0.52	0.14	ppb v/v			10/04/14 01:23	1.31
Trichlorofluoromethane	ND		0.52	0.26	ppb v/v			10/04/14 01:23	1.31
1,2,4-Trimethylbenzene	ND		1.0	0.21	ppb v/v			10/04/14 01:23	1.31
1,3,5-Trimethylbenzene	ND		0.52	0.16	ppb v/v			10/04/14 01:23	1.31
Vinyl acetate	ND		1.0	0.19	ppb v/v			10/04/14 01:23	1.31
Vinyl chloride	ND		0.52	0.16	ppb v/v			10/04/14 01:23	1.31
m,p-Xylene	ND		1.0	0.13	ppb v/v			10/04/14 01:23	1.31
o-Xylene	ND		0.52	0.071	ppb v/v			10/04/14 01:23	1.31

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*112*		*70 - 130*		*10/04/14 01:23*	*1.31*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 130*		*10/04/14 01:23*	*1.31*
Toluene-d8 (Surr)	*89*		*70 - 130*		*10/04/14 01:23*	*1.31*

Client Sample ID: 096512-001/MWL-SV02-41.5

Lab Sample ID: 320-9478-3

Date Collected: 09/11/14 11:31
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**8.3**	**J B**	11	0.38	ppb v/v			10/04/14 02:19	2.11
Benzene	**0.17**	**J**	0.84	0.17	ppb v/v			10/04/14 02:19	2.11
Benzyl chloride	ND		1.7	0.34	ppb v/v			10/04/14 02:19	2.11
Bromodichloromethane	ND		0.63	0.14	ppb v/v			10/04/14 02:19	2.11
Bromoform	ND		0.84	0.15	ppb v/v			10/04/14 02:19	2.11
Bromomethane	ND		1.7	0.71	ppb v/v			10/04/14 02:19	2.11
2-Butanone (MEK)	**4.1**		1.7	0.42	ppb v/v			10/04/14 02:19	2.11
Carbon disulfide	**1.9**		1.7	0.16	ppb v/v			10/04/14 02:19	2.11
Carbon tetrachloride	ND		1.7	0.14	ppb v/v			10/04/14 02:19	2.11
Chlorobenzene	ND		0.63	0.14	ppb v/v			10/04/14 02:19	2.11
Chloroethane	ND		1.7	0.65	ppb v/v			10/04/14 02:19	2.11

Client Sample ID: 096512-001/MWL-SV02-41.5
Date Collected: 09/11/14 11:31
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-9478-3
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	**3.1**		0.63	0.20	ppb v/v			10/04/14 02:19	2.11
Chloromethane	**0.52**	**J**	1.7	0.42	ppb v/v			10/04/14 02:19	2.11
Dibromochloromethane	ND		0.84	0.17	ppb v/v			10/04/14 02:19	2.11
1,2-Dibromoethane (EDB)	ND		1.7	0.16	ppb v/v			10/04/14 02:19	2.11
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.84	0.33	ppb v/v			10/04/14 02:19	2.11
1,2-Dichlorobenzene	ND		0.84	0.27	ppb v/v			10/04/14 02:19	2.11
1,3-Dichlorobenzene	ND		0.84	0.23	ppb v/v			10/04/14 02:19	2.11
1,4-Dichlorobenzene	ND		0.84	0.31	ppb v/v			10/04/14 02:19	2.11
Dichlorodifluoromethane	**94**		0.84	0.31	ppb v/v			10/04/14 02:19	2.11
1,1-Dichloroethane	**2.6**		0.63	0.15	ppb v/v			10/04/14 02:19	2.11
1,2-Dichloroethane	ND		1.7	0.19	ppb v/v			10/04/14 02:19	2.11
1,1-Dichloroethene	**11**		1.7	0.27	ppb v/v			10/04/14 02:19	2.11
cis-1,2-Dichloroethene	**0.96**		0.84	0.19	ppb v/v			10/04/14 02:19	2.11
trans-1,2-Dichloroethene	ND		0.84	0.21	ppb v/v			10/04/14 02:19	2.11
1,2-Dichloropropane	ND		0.84	0.51	ppb v/v			10/04/14 02:19	2.11
cis-1,3-Dichloropropene	ND		0.84	0.22	ppb v/v			10/04/14 02:19	2.11
trans-1,3-Dichloropropene	ND		0.84	0.19	ppb v/v			10/04/14 02:19	2.11
Ethylbenzene	ND		0.84	0.13	ppb v/v			10/04/14 02:19	2.11
4-Ethyltoluene	ND		0.84	0.39	ppb v/v			10/04/14 02:19	2.11
Hexachlorobutadiene	ND		4.2	0.91	ppb v/v			10/04/14 02:19	2.11
2-Hexanone	**0.43**	**J**	0.84	0.18	ppb v/v			10/04/14 02:19	2.11
4-Methyl-2-pentanone (MIBK)	ND		0.84	0.28	ppb v/v			10/04/14 02:19	2.11
Methylene Chloride	**0.61**	**J**	0.84	0.15	ppb v/v			10/04/14 02:19	2.11
Styrene	ND		0.84	0.12	ppb v/v			10/04/14 02:19	2.11
1,1,2,2-Tetrachloroethane	ND		0.84	0.15	ppb v/v			10/04/14 02:19	2.11
Tetrachloroethene	**86**		0.84	0.11	ppb v/v			10/04/14 02:19	2.11
Toluene	ND		0.84	0.11	ppb v/v			10/04/14 02:19	2.11
1,1,2-Trichloro-1,2,2-trifluoroethane	**56**		0.84	0.34	ppb v/v			10/04/14 02:19	2.11
1,2,4-Trichlorobenzene	ND		4.2	0.91	ppb v/v			10/04/14 02:19	2.11
1,1,1-Trichloroethane	**82**		0.63	0.14	ppb v/v			10/04/14 02:19	2.11
1,1,2-Trichloroethane	ND		0.84	0.14	ppb v/v			10/04/14 02:19	2.11
Trichloroethene	**75**		0.84	0.22	ppb v/v			10/04/14 02:19	2.11
1,2,4-Trimethylbenzene	ND		1.7	0.34	ppb v/v			10/04/14 02:19	2.11
1,3,5-Trimethylbenzene	ND		0.84	0.26	ppb v/v			10/04/14 02:19	2.11
Vinyl acetate	ND		1.7	0.31	ppb v/v			10/04/14 02:19	2.11
Vinyl chloride	ND		0.84	0.25	ppb v/v			10/04/14 02:19	2.11
m,p-Xylene	ND		1.7	0.21	ppb v/v			10/04/14 02:19	2.11
o-Xylene	ND		0.84	0.11	ppb v/v			10/04/14 02:19	2.11

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*70 - 130*		*10/04/14 02:19*	*2.11*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*10/04/14 02:19*	*2.11*
Toluene-d8 (Surr)	*99*		*70 - 130*		*10/04/14 02:19*	*2.11*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	**300**		3.4	1.7	ppb v/v			10/05/14 16:48	8.43

Client Sample ID: 096512-001/MWL-SV02-41.5

Lab Sample ID: 320-9478-3

Date Collected: 09/11/14 11:31
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	*88*		*70 - 130*		*10/05/14 16:48*	*8.43*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*10/05/14 16:48*	*8.43*
Toluene-d8 (Surr)	*93*		*70 - 130*		*10/05/14 16:48*	*8.43*

Client Sample ID: 096513-001/MWL-FB2

Lab Sample ID: 320-9478-4

Date Collected: 09/11/14 11:05
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**0.75**	**J B**	6.5	0.23	ppb v/v			10/04/14 03:20	1.29
Benzene	**0.44**	**J**	0.52	0.10	ppb v/v			10/04/14 03:20	1.29
Benzyl chloride	ND		1.0	0.21	ppb v/v			10/04/14 03:20	1.29
Bromodichloromethane	ND		0.39	0.085	ppb v/v			10/04/14 03:20	1.29
Bromoform	ND		0.52	0.090	ppb v/v			10/04/14 03:20	1.29
Bromomethane	ND		1.0	0.43	ppb v/v			10/04/14 03:20	1.29
2-Butanone (MEK)	ND		1.0	0.26	ppb v/v			10/04/14 03:20	1.29
Carbon disulfide	ND		1.0	0.10	ppb v/v			10/04/14 03:20	1.29
Carbon tetrachloride	ND		1.0	0.083	ppb v/v			10/04/14 03:20	1.29
Chlorobenzene	ND		0.39	0.083	ppb v/v			10/04/14 03:20	1.29
Chloroethane	ND		1.0	0.40	ppb v/v			10/04/14 03:20	1.29
Chloroform	ND		0.39	0.12	ppb v/v			10/04/14 03:20	1.29
Chloromethane	ND		1.0	0.25	ppb v/v			10/04/14 03:20	1.29
Dibromochloromethane	ND		0.52	0.10	ppb v/v			10/04/14 03:20	1.29
1,2-Dibromoethane (EDB)	ND		1.0	0.097	ppb v/v			10/04/14 03:20	1.29
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.52	0.20	ppb v/v			10/04/14 03:20	1.29
1,2-Dichlorobenzene	ND		0.52	0.17	ppb v/v			10/04/14 03:20	1.29
1,3-Dichlorobenzene	ND		0.52	0.14	ppb v/v			10/04/14 03:20	1.29
1,4-Dichlorobenzene	ND		0.52	0.19	ppb v/v			10/04/14 03:20	1.29
Dichlorodifluoromethane	ND		0.52	0.19	ppb v/v			10/04/14 03:20	1.29
1,1-Dichloroethane	ND		0.39	0.093	ppb v/v			10/04/14 03:20	1.29
1,2-Dichloroethane	ND		1.0	0.11	ppb v/v			10/04/14 03:20	1.29
1,1-Dichloroethene	ND		1.0	0.17	ppb v/v			10/04/14 03:20	1.29
cis-1,2-Dichloroethene	ND		0.52	0.11	ppb v/v			10/04/14 03:20	1.29
trans-1,2-Dichloroethene	ND		0.52	0.13	ppb v/v			10/04/14 03:20	1.29
1,2-Dichloropropane	ND		0.52	0.31	ppb v/v			10/04/14 03:20	1.29
cis-1,3-Dichloropropene	ND		0.52	0.13	ppb v/v			10/04/14 03:20	1.29
trans-1,3-Dichloropropene	ND		0.52	0.11	ppb v/v			10/04/14 03:20	1.29
Ethylbenzene	ND		0.52	0.081	ppb v/v			10/04/14 03:20	1.29
4-Ethyltoluene	ND		0.52	0.24	ppb v/v			10/04/14 03:20	1.29
Hexachlorobutadiene	ND		2.6	0.56	ppb v/v			10/04/14 03:20	1.29
2-Hexanone	ND		0.52	0.11	ppb v/v			10/04/14 03:20	1.29
4-Methyl-2-pentanone (MIBK)	ND		0.52	0.17	ppb v/v			10/04/14 03:20	1.29
Methylene Chloride	ND		0.52	0.093	ppb v/v			10/04/14 03:20	1.29
Styrene	ND		0.52	0.076	ppb v/v			10/04/14 03:20	1.29
1,1,2,2-Tetrachloroethane	ND		0.52	0.089	ppb v/v			10/04/14 03:20	1.29
Tetrachloroethene	ND		0.52	0.066	ppb v/v			10/04/14 03:20	1.29
Toluene	**0.10**	**J**	0.52	0.066	ppb v/v			10/04/14 03:20	1.29

Client Sample ID: 096513-001/MWL-FB2

Lab Sample ID: 320-9478-4

Date Collected: 09/11/14 11:05

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.52	0.21	ppb v/v			10/04/14 03:20	1.29
1,2,4-Trichlorobenzene	ND		2.6	0.56	ppb v/v			10/04/14 03:20	1.29
1,1,1-Trichloroethane	ND		0.39	0.084	ppb v/v			10/04/14 03:20	1.29
1,1,2-Trichloroethane	ND		0.52	0.086	ppb v/v			10/04/14 03:20	1.29
Trichloroethene	ND		0.52	0.14	ppb v/v			10/04/14 03:20	1.29
Trichlorofluoromethane	ND		0.52	0.25	ppb v/v			10/04/14 03:20	1.29
1,2,4-Trimethylbenzene	ND		1.0	0.21	ppb v/v			10/04/14 03:20	1.29
1,3,5-Trimethylbenzene	ND		0.52	0.16	ppb v/v			10/04/14 03:20	1.29
Vinyl acetate	ND		1.0	0.19	ppb v/v			10/04/14 03:20	1.29
Vinyl chloride	ND		0.52	0.15	ppb v/v			10/04/14 03:20	1.29
m,p-Xylene	ND		1.0	0.13	ppb v/v			10/04/14 03:20	1.29
o-Xylene	ND		0.52	0.070	ppb v/v			10/04/14 03:20	1.29

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*76*		*70 - 130*		*10/04/14 03:20*	*1.29*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 130*		*10/04/14 03:20*	*1.29*
Toluene-d8 (Surr)	*99*		*70 - 130*		*10/04/14 03:20*	*1.29*

Client Sample ID: 096514-001/MWL-SV03-50

Lab Sample ID: 320-9478-5

Date Collected: 09/11/14 08:48

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**7.2**	**B**	6.8	0.24	ppb v/v			10/04/14 04:18	1.35
Benzene	**6.0**		0.54	0.11	ppb v/v			10/04/14 04:18	1.35
Benzyl chloride	ND		1.1	0.22	ppb v/v			10/04/14 04:18	1.35
Bromodichloromethane	ND		0.41	0.089	ppb v/v			10/04/14 04:18	1.35
Bromoform	ND		0.54	0.095	ppb v/v			10/04/14 04:18	1.35
Bromomethane	ND		1.1	0.45	ppb v/v			10/04/14 04:18	1.35
2-Butanone (MEK)	**2.1**		1.1	0.27	ppb v/v			10/04/14 04:18	1.35
Carbon disulfide	**0.20**	**J**	1.1	0.11	ppb v/v			10/04/14 04:18	1.35
Carbon tetrachloride	**0.22**	**J**	1.1	0.086	ppb v/v			10/04/14 04:18	1.35
Chlorobenzene	ND		0.41	0.086	ppb v/v			10/04/14 04:18	1.35
Chloroethane	ND		1.1	0.42	ppb v/v			10/04/14 04:18	1.35
Chloroform	**1.8**		0.41	0.13	ppb v/v			10/04/14 04:18	1.35
Chloromethane	ND		1.1	0.27	ppb v/v			10/04/14 04:18	1.35
Dibromochloromethane	ND		0.54	0.11	ppb v/v			10/04/14 04:18	1.35
1,2-Dibromoethane (EDB)	ND		1.1	0.10	ppb v/v			10/04/14 04:18	1.35
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.54	0.21	ppb v/v			10/04/14 04:18	1.35
1,2-Dichlorobenzene	ND		0.54	0.18	ppb v/v			10/04/14 04:18	1.35
1,3-Dichlorobenzene	ND		0.54	0.15	ppb v/v			10/04/14 04:18	1.35
1,4-Dichlorobenzene	ND		0.54	0.20	ppb v/v			10/04/14 04:18	1.35
Dichlorodifluoromethane	**22**		0.54	0.20	ppb v/v			10/04/14 04:18	1.35
1,1-Dichloroethane	**2.4**		0.41	0.097	ppb v/v			10/04/14 04:18	1.35
1,2-Dichloroethane	ND		1.1	0.12	ppb v/v			10/04/14 04:18	1.35
1,1-Dichloroethene	**8.5**		1.1	0.17	ppb v/v			10/04/14 04:18	1.35
cis-1,2-Dichloroethene	**1.6**		0.54	0.12	ppb v/v			10/04/14 04:18	1.35

Client Sample ID: 096514-001/MWL-SV03-50
Lab Sample ID: 320-9478-5
Date Collected: 09/11/14 08:48
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		0.54	0.14	ppb v/v			10/04/14 04:18	1.35
1,2-Dichloropropane	ND		0.54	0.32	ppb v/v			10/04/14 04:18	1.35
cis-1,3-Dichloropropene	ND		0.54	0.14	ppb v/v			10/04/14 04:18	1.35
trans-1,3-Dichloropropene	ND		0.54	0.12	ppb v/v			10/04/14 04:18	1.35
Ethylbenzene	ND		0.54	0.085	ppb v/v			10/04/14 04:18	1.35
4-Ethyltoluene	ND		0.54	0.25	ppb v/v			10/04/14 04:18	1.35
Hexachlorobutadiene	ND		2.7	0.58	ppb v/v			10/04/14 04:18	1.35
2-Hexanone	**0.19**	**J**	0.54	0.12	ppb v/v			10/04/14 04:18	1.35
4-Methyl-2-pentanone (MIBK)	ND		0.54	0.18	ppb v/v			10/04/14 04:18	1.35
Methylene Chloride	**0.46**	**J**	0.54	0.097	ppb v/v			10/04/14 04:18	1.35
Styrene	ND		0.54	0.080	ppb v/v			10/04/14 04:18	1.35
1,1,2,2-Tetrachloroethane	ND		0.54	0.093	ppb v/v			10/04/14 04:18	1.35
Toluene	**2.8**		0.54	0.069	ppb v/v			10/04/14 04:18	1.35
1,1,2-Trichloro-1,2,2-trifluoroethane	**49**		0.54	0.22	ppb v/v			10/04/14 04:18	1.35
1,2,4-Trichlorobenzene	ND		2.7	0.58	ppb v/v			10/04/14 04:18	1.35
1,1,1-Trichloroethane	**6.1**		0.41	0.088	ppb v/v			10/04/14 04:18	1.35
1,1,2-Trichloroethane	ND		0.54	0.090	ppb v/v			10/04/14 04:18	1.35
Trichlorofluoromethane	**22**		0.54	0.26	ppb v/v			10/04/14 04:18	1.35
1,2,4-Trimethylbenzene	ND		1.1	0.22	ppb v/v			10/04/14 04:18	1.35
1,3,5-Trimethylbenzene	ND		0.54	0.17	ppb v/v			10/04/14 04:18	1.35
Vinyl acetate	ND		1.1	0.20	ppb v/v			10/04/14 04:18	1.35
Vinyl chloride	ND		0.54	0.16	ppb v/v			10/04/14 04:18	1.35
m,p-Xylene	ND		1.1	0.14	ppb v/v			10/04/14 04:18	1.35
o-Xylene	ND		0.54	0.073	ppb v/v			10/04/14 04:18	1.35

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*10/04/14 04:18*	*1.35*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*		*10/04/14 04:18*	*1.35*
Toluene-d8 (Surr)	*100*		*70 - 130*		*10/04/14 04:18*	*1.35*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	**140**		1.2	0.15	ppb v/v			10/05/14 17:45	2.97
Trichloroethene	**100**		1.2	0.31	ppb v/v			10/05/14 17:45	2.97

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*10/05/14 17:45*	*2.97*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*10/05/14 17:45*	*2.97*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/05/14 17:45*	*2.97*

Client Sample ID: 096515-001/MWL-SV03-100
Lab Sample ID: 320-9478-6
Date Collected: 09/11/14 08:54
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**11**	**B**	11	0.38	ppb v/v			10/05/14 18:44	2.13
Benzene	**0.81**	**J**	0.85	0.17	ppb v/v			10/05/14 18:44	2.13

Client Sample ID: 096515-001/MWL-SV03-100
Lab Sample ID: 320-9478-6
Date Collected: 09/11/14 08:54
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzyl chloride	ND		1.7	0.35	ppb v/v			10/05/14 18:44	2.13
Bromodichloromethane	ND		0.64	0.14	ppb v/v			10/05/14 18:44	2.13
Bromoform	ND		0.85	0.15	ppb v/v			10/05/14 18:44	2.13
Bromomethane	ND		1.7	0.71	ppb v/v			10/05/14 18:44	2.13
2-Butanone (MEK)	**2.1**		1.7	0.42	ppb v/v			10/05/14 18:44	2.13
Carbon disulfide	**0.86**	**J**	1.7	0.17	ppb v/v			10/05/14 18:44	2.13
Carbon tetrachloride	**0.37**	**J**	1.7	0.14	ppb v/v			10/05/14 18:44	2.13
Chlorobenzene	ND		0.64	0.14	ppb v/v			10/05/14 18:44	2.13
Chloroethane	ND		1.7	0.66	ppb v/v			10/05/14 18:44	2.13
Chloroform	**2.3**		0.64	0.20	ppb v/v			10/05/14 18:44	2.13
Chloromethane	**0.52**	**J**	1.7	0.42	ppb v/v			10/05/14 18:44	2.13
Dibromochloromethane	ND		0.85	0.17	ppb v/v			10/05/14 18:44	2.13
1,2-Dibromoethane (EDB)	ND		1.7	0.16	ppb v/v			10/05/14 18:44	2.13
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.85	0.33	ppb v/v			10/05/14 18:44	2.13
1,2-Dichlorobenzene	ND		0.85	0.28	ppb v/v			10/05/14 18:44	2.13
1,3-Dichlorobenzene	ND		0.85	0.23	ppb v/v			10/05/14 18:44	2.13
1,4-Dichlorobenzene	ND		0.85	0.32	ppb v/v			10/05/14 18:44	2.13
Dichlorodifluoromethane	**40**		0.85	0.31	ppb v/v			10/05/14 18:44	2.13
1,1-Dichloroethane	**5.1**		0.64	0.15	ppb v/v			10/05/14 18:44	2.13
1,2-Dichloroethane	ND		1.7	0.19	ppb v/v			10/05/14 18:44	2.13
1,1-Dichloroethene	**19**		1.7	0.27	ppb v/v			10/05/14 18:44	2.13
cis-1,2-Dichloroethene	**3.4**		0.85	0.19	ppb v/v			10/05/14 18:44	2.13
trans-1,2-Dichloroethene	ND		0.85	0.21	ppb v/v			10/05/14 18:44	2.13
1,2-Dichloropropane	ND		0.85	0.51	ppb v/v			10/05/14 18:44	2.13
cis-1,3-Dichloropropene	ND		0.85	0.22	ppb v/v			10/05/14 18:44	2.13
trans-1,3-Dichloropropene	ND		0.85	0.19	ppb v/v			10/05/14 18:44	2.13
Ethylbenzene	ND		0.85	0.13	ppb v/v			10/05/14 18:44	2.13
4-Ethyltoluene	ND		0.85	0.40	ppb v/v			10/05/14 18:44	2.13
Hexachlorobutadiene	ND		4.3	0.92	ppb v/v			10/05/14 18:44	2.13
2-Hexanone	ND		0.85	0.19	ppb v/v			10/05/14 18:44	2.13
4-Methyl-2-pentanone (MIBK)	ND		0.85	0.29	ppb v/v			10/05/14 18:44	2.13
Methylene Chloride	**1.9**		0.85	0.15	ppb v/v			10/05/14 18:44	2.13
Styrene	ND		0.85	0.13	ppb v/v			10/05/14 18:44	2.13
1,1,2,2-Tetrachloroethane	ND		0.85	0.15	ppb v/v			10/05/14 18:44	2.13
Toluene	**3.0**		0.85	0.11	ppb v/v			10/05/14 18:44	2.13
1,1,2-Trichloro-1,2,2-trifluoroethane	**100**		0.85	0.35	ppb v/v			10/05/14 18:44	2.13
1,2,4-Trichlorobenzene	ND		4.3	0.92	ppb v/v			10/05/14 18:44	2.13
1,1,1-Trichloroethane	**6.6**		0.64	0.14	ppb v/v			10/05/14 18:44	2.13
1,1,2-Trichloroethane	ND		0.85	0.14	ppb v/v			10/05/14 18:44	2.13
Trichlorofluoromethane	**30**		0.85	0.42	ppb v/v			10/05/14 18:44	2.13
1,2,4-Trimethylbenzene	ND		1.7	0.35	ppb v/v			10/05/14 18:44	2.13
1,3,5-Trimethylbenzene	ND		0.85	0.27	ppb v/v			10/05/14 18:44	2.13
Vinyl acetate	ND		1.7	0.31	ppb v/v			10/05/14 18:44	2.13
Vinyl chloride	ND		0.85	0.26	ppb v/v			10/05/14 18:44	2.13
m,p-Xylene	**0.22**	**J**	1.7	0.21	ppb v/v			10/05/14 18:44	2.13
o-Xylene	ND		0.85	0.12	ppb v/v			10/05/14 18:44	2.13

Client Sample ID: 096515-001/MWL-SV03-100

Lab Sample ID: 320-9478-6

Date Collected: 09/11/14 08:54

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*10/05/14 18:44*	*2.13*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*		*10/05/14 18:44*	*2.13*
Toluene-d8 (Surr)	*99*		*70 - 130*		*10/05/14 18:44*	*2.13*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	**210**		1.7	0.22	ppb v/v			10/06/14 03:43	4.25
Trichloroethene	**190**		1.7	0.45	ppb v/v			10/06/14 03:43	4.25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*70 - 130*		*10/06/14 03:43*	*4.25*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*10/06/14 03:43*	*4.25*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/06/14 03:43*	*4.25*

Client Sample ID: 096516-001/MWL-SV03-200

Lab Sample ID: 320-9478-7

Date Collected: 09/11/14 08:59

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**4.7**	**J B**	15	0.53	ppb v/v			10/05/14 19:42	2.96
Benzene	**0.68**	**J**	1.2	0.23	ppb v/v			10/05/14 19:42	2.96
Benzyl chloride	ND		2.4	0.48	ppb v/v			10/05/14 19:42	2.96
Bromodichloromethane	ND		0.89	0.20	ppb v/v			10/05/14 19:42	2.96
Bromoform	ND		1.2	0.21	ppb v/v			10/05/14 19:42	2.96
Bromomethane	ND		2.4	0.99	ppb v/v			10/05/14 19:42	2.96
2-Butanone (MEK)	**1.3**	**J**	2.4	0.59	ppb v/v			10/05/14 19:42	2.96
Carbon disulfide	**0.61**	**J**	2.4	0.23	ppb v/v			10/05/14 19:42	2.96
Carbon tetrachloride	**0.56**	**J**	2.4	0.19	ppb v/v			10/05/14 19:42	2.96
Chlorobenzene	ND		0.89	0.19	ppb v/v			10/05/14 19:42	2.96
Chloroethane	ND		2.4	0.91	ppb v/v			10/05/14 19:42	2.96
Chloroform	**2.0**		0.89	0.28	ppb v/v			10/05/14 19:42	2.96
Chloromethane	ND		2.4	0.58	ppb v/v			10/05/14 19:42	2.96
Dibromochloromethane	ND		1.2	0.23	ppb v/v			10/05/14 19:42	2.96
1,2-Dibromoethane (EDB)	ND		2.4	0.22	ppb v/v			10/05/14 19:42	2.96
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.2	0.46	ppb v/v			10/05/14 19:42	2.96
1,2-Dichlorobenzene	ND		1.2	0.38	ppb v/v			10/05/14 19:42	2.96
1,3-Dichlorobenzene	ND		1.2	0.33	ppb v/v			10/05/14 19:42	2.96
1,4-Dichlorobenzene	ND		1.2	0.44	ppb v/v			10/05/14 19:42	2.96
Dichlorodifluoromethane	**57**		1.2	0.43	ppb v/v			10/05/14 19:42	2.96
1,1-Dichloroethane	**7.6**		0.89	0.21	ppb v/v			10/05/14 19:42	2.96
1,2-Dichloroethane	ND		2.4	0.26	ppb v/v			10/05/14 19:42	2.96
1,1-Dichloroethene	**34**		2.4	0.38	ppb v/v			10/05/14 19:42	2.96
cis-1,2-Dichloroethene	**5.0**		1.2	0.26	ppb v/v			10/05/14 19:42	2.96
trans-1,2-Dichloroethene	ND		1.2	0.30	ppb v/v			10/05/14 19:42	2.96
1,2-Dichloropropane	ND		1.2	0.71	ppb v/v			10/05/14 19:42	2.96
cis-1,3-Dichloropropene	ND		1.2	0.31	ppb v/v			10/05/14 19:42	2.96
trans-1,3-Dichloropropene	ND		1.2	0.26	ppb v/v			10/05/14 19:42	2.96
Ethylbenzene	ND		1.2	0.19	ppb v/v			10/05/14 19:42	2.96

Client Sample ID: 096516-001/MWL-SV03-200

Lab Sample ID: 320-9478-7

Date Collected: 09/11/14 08:59
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Ethyltoluene	ND		1.2	0.55	ppb v/v			10/05/14 19:42	2.96
Hexachlorobutadiene	ND		5.9	1.3	ppb v/v			10/05/14 19:42	2.96
2-Hexanone	ND		1.2	0.26	ppb v/v			10/05/14 19:42	2.96
4-Methyl-2-pentanone (MIBK)	ND		1.2	0.40	ppb v/v			10/05/14 19:42	2.96
Methylene Chloride	**3.2**		1.2	0.21	ppb v/v			10/05/14 19:42	2.96
Styrene	ND		1.2	0.17	ppb v/v			10/05/14 19:42	2.96
1,1,2,2-Tetrachloroethane	ND		1.2	0.20	ppb v/v			10/05/14 19:42	2.96
Toluene	**3.6**		1.2	0.15	ppb v/v			10/05/14 19:42	2.96
1,2,4-Trichlorobenzene	ND		5.9	1.3	ppb v/v			10/05/14 19:42	2.96
1,1,1-Trichloroethane	**2.4**		0.89	0.19	ppb v/v			10/05/14 19:42	2.96
1,1,2-Trichloroethane	ND		1.2	0.20	ppb v/v			10/05/14 19:42	2.96
Trichlorofluoromethane	**26**		1.2	0.58	ppb v/v			10/05/14 19:42	2.96
1,2,4-Trimethylbenzene	ND		2.4	0.48	ppb v/v			10/05/14 19:42	2.96
1,3,5-Trimethylbenzene	ND		1.2	0.37	ppb v/v			10/05/14 19:42	2.96
Vinyl acetate	ND		2.4	0.43	ppb v/v			10/05/14 19:42	2.96
Vinyl chloride	ND		1.2	0.36	ppb v/v			10/05/14 19:42	2.96
m,p-Xylene	ND		2.4	0.30	ppb v/v			10/05/14 19:42	2.96
o-Xylene	ND		1.2	0.16	ppb v/v			10/05/14 19:42	2.96

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*70 - 130*		*10/05/14 19:42*	*2.96*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*		*10/05/14 19:42*	*2.96*
Toluene-d8 (Surr)	*99*		*70 - 130*		*10/05/14 19:42*	*2.96*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	**300**		2.4	0.30	ppb v/v			10/06/14 04:41	5.91
1,1,2-Trichloro-1,2,2-trifluoroethane	**180**		2.4	0.96	ppb v/v			10/06/14 04:41	5.91
Trichloroethene	**300**		2.4	0.62	ppb v/v			10/06/14 04:41	5.91

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*10/06/14 04:41*	*5.91*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*		*10/06/14 04:41*	*5.91*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/06/14 04:41*	*5.91*

Client Sample ID: 096517-001/MWL-SV03-300

Lab Sample ID: 320-9478-8

Date Collected: 09/11/14 09:04
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**14**	**J B**	25	0.90	ppb v/v			10/05/14 20:38	5.05
Benzene	**1.2**	**J**	2.0	0.40	ppb v/v			10/05/14 20:38	5.05
Benzyl chloride	ND		4.0	0.82	ppb v/v			10/05/14 20:38	5.05
Bromodichloromethane	ND		1.5	0.33	ppb v/v			10/05/14 20:38	5.05
Bromoform	ND		2.0	0.35	ppb v/v			10/05/14 20:38	5.05
Bromomethane	ND		4.0	1.7	ppb v/v			10/05/14 20:38	5.05
2-Butanone (MEK)	**3.5**	**J**	4.0	1.0	ppb v/v			10/05/14 20:38	5.05

Client Sample ID: 096517-001/MWL-SV03-300
Lab Sample ID: 320-9478-8
Date Collected: 09/11/14 09:04
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon disulfide	**23**		4.0	0.39	ppb v/v			10/05/14 20:38	5.05
Carbon tetrachloride	ND		4.0	0.32	ppb v/v			10/05/14 20:38	5.05
Chlorobenzene	ND		1.5	0.32	ppb v/v			10/05/14 20:38	5.05
Chloroethane	ND		4.0	1.6	ppb v/v			10/05/14 20:38	5.05
Chloroform	**0.81**	**J**	1.5	0.48	ppb v/v			10/05/14 20:38	5.05
Chloromethane	ND		4.0	0.99	ppb v/v			10/05/14 20:38	5.05
Dibromochloromethane	ND		2.0	0.40	ppb v/v			10/05/14 20:38	5.05
1,2-Dibromoethane (EDB)	ND		4.0	0.38	ppb v/v			10/05/14 20:38	5.05
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	0.78	ppb v/v			10/05/14 20:38	5.05
1,2-Dichlorobenzene	ND		2.0	0.66	ppb v/v			10/05/14 20:38	5.05
1,3-Dichlorobenzene	ND		2.0	0.56	ppb v/v			10/05/14 20:38	5.05
1,4-Dichlorobenzene	ND		2.0	0.75	ppb v/v			10/05/14 20:38	5.05
Dichlorodifluoromethane	**27**		2.0	0.73	ppb v/v			10/05/14 20:38	5.05
1,1-Dichloroethane	**2.0**		1.5	0.36	ppb v/v			10/05/14 20:38	5.05
1,2-Dichloroethane	ND		4.0	0.44	ppb v/v			10/05/14 20:38	5.05
1,1-Dichloroethene	**15**		4.0	0.65	ppb v/v			10/05/14 20:38	5.05
cis-1,2-Dichloroethene	**2.0**		2.0	0.45	ppb v/v			10/05/14 20:38	5.05
trans-1,2-Dichloroethene	ND		2.0	0.51	ppb v/v			10/05/14 20:38	5.05
1,2-Dichloropropane	ND		2.0	1.2	ppb v/v			10/05/14 20:38	5.05
cis-1,3-Dichloropropene	ND		2.0	0.53	ppb v/v			10/05/14 20:38	5.05
trans-1,3-Dichloropropene	ND		2.0	0.44	ppb v/v			10/05/14 20:38	5.05
Ethylbenzene	ND		2.0	0.32	ppb v/v			10/05/14 20:38	5.05
4-Ethyltoluene	ND		2.0	0.94	ppb v/v			10/05/14 20:38	5.05
Hexachlorobutadiene	ND		10	2.2	ppb v/v			10/05/14 20:38	5.05
2-Hexanone	ND		2.0	0.44	ppb v/v			10/05/14 20:38	5.05
4-Methyl-2-pentanone (MIBK)	ND		2.0	0.68	ppb v/v			10/05/14 20:38	5.05
Methylene Chloride	**1.1**	**J**	2.0	0.36	ppb v/v			10/05/14 20:38	5.05
Styrene	ND		2.0	0.30	ppb v/v			10/05/14 20:38	5.05
1,1,2,2-Tetrachloroethane	ND		2.0	0.35	ppb v/v			10/05/14 20:38	5.05
Tetrachloroethene	**290**		2.0	0.26	ppb v/v			10/05/14 20:38	5.05
Toluene	**6.0**		2.0	0.26	ppb v/v			10/05/14 20:38	5.05
1,1,2-Trichloro-1,2,2-trifluoroethane	**79**		2.0	0.82	ppb v/v			10/05/14 20:38	5.05
1,2,4-Trichlorobenzene	ND		10	2.2	ppb v/v			10/05/14 20:38	5.05
1,1,1-Trichloroethane	**0.66**	**J**	1.5	0.33	ppb v/v			10/05/14 20:38	5.05
1,1,2-Trichloroethane	ND		2.0	0.34	ppb v/v			10/05/14 20:38	5.05
Trichloroethene	**190**		2.0	0.53	ppb v/v			10/05/14 20:38	5.05
Trichlorofluoromethane	**9.1**		2.0	0.99	ppb v/v			10/05/14 20:38	5.05
1,2,4-Trimethylbenzene	ND		4.0	0.82	ppb v/v			10/05/14 20:38	5.05
1,3,5-Trimethylbenzene	ND		2.0	0.63	ppb v/v			10/05/14 20:38	5.05
Vinyl acetate	ND		4.0	0.73	ppb v/v			10/05/14 20:38	5.05
Vinyl chloride	ND		2.0	0.61	ppb v/v			10/05/14 20:38	5.05
m,p-Xylene	ND		4.0	0.51	ppb v/v			10/05/14 20:38	5.05
o-Xylene	ND		2.0	0.27	ppb v/v			10/05/14 20:38	5.05

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*10/05/14 20:38*	*5.05*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*		*10/05/14 20:38*	*5.05*
Toluene-d8 (Surr)	*99*		*70 - 130*		*10/05/14 20:38*	*5.05*

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-9478-1

Client Sample ID: 096518-001/MWL-SV03-400
Lab Sample ID: 320-9478-9
Date Collected: 09/11/14 09:13
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**13**	**J B**	25	0.90	ppb v/v			10/05/14 21:30	5.04
Benzene	**1.5**	**J**	2.0	0.40	ppb v/v			10/05/14 21:30	5.04
Benzyl chloride	ND		4.0	0.82	ppb v/v			10/05/14 21:30	5.04
Bromodichloromethane	ND		1.5	0.33	ppb v/v			10/05/14 21:30	5.04
Bromoform	ND		2.0	0.35	ppb v/v			10/05/14 21:30	5.04
Bromomethane	ND		4.0	1.7	ppb v/v			10/05/14 21:30	5.04
2-Butanone (MEK)	**4.4**		4.0	1.0	ppb v/v			10/05/14 21:30	5.04
Carbon disulfide	**26**		4.0	0.39	ppb v/v			10/05/14 21:30	5.04
Carbon tetrachloride	**0.33**	**J**	4.0	0.32	ppb v/v			10/05/14 21:30	5.04
Chlorobenzene	ND		1.5	0.32	ppb v/v			10/05/14 21:30	5.04
Chloroethane	ND		4.0	1.6	ppb v/v			10/05/14 21:30	5.04
Chloroform	**1.2**	**J**	1.5	0.48	ppb v/v			10/05/14 21:30	5.04
Chloromethane	**1.9**	**J**	4.0	0.99	ppb v/v			10/05/14 21:30	5.04
Dibromochloromethane	ND		2.0	0.40	ppb v/v			10/05/14 21:30	5.04
1,2-Dibromoethane (EDB)	ND		4.0	0.38	ppb v/v			10/05/14 21:30	5.04
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	0.78	ppb v/v			10/05/14 21:30	5.04
1,2-Dichlorobenzene	ND		2.0	0.66	ppb v/v			10/05/14 21:30	5.04
1,3-Dichlorobenzene	ND		2.0	0.55	ppb v/v			10/05/14 21:30	5.04
1,4-Dichlorobenzene	ND		2.0	0.75	ppb v/v			10/05/14 21:30	5.04
Dichlorodifluoromethane	**26**		2.0	0.73	ppb v/v			10/05/14 21:30	5.04
1,1-Dichloroethane	**2.9**		1.5	0.36	ppb v/v			10/05/14 21:30	5.04
1,2-Dichloroethane	ND		4.0	0.44	ppb v/v			10/05/14 21:30	5.04
1,1-Dichloroethene	**19**		4.0	0.65	ppb v/v			10/05/14 21:30	5.04
cis-1,2-Dichloroethene	**2.8**		2.0	0.45	ppb v/v			10/05/14 21:30	5.04
trans-1,2-Dichloroethene	ND		2.0	0.50	ppb v/v			10/05/14 21:30	5.04
1,2-Dichloropropane	ND		2.0	1.2	ppb v/v			10/05/14 21:30	5.04
cis-1,3-Dichloropropene	ND		2.0	0.52	ppb v/v			10/05/14 21:30	5.04
trans-1,3-Dichloropropene	ND		2.0	0.44	ppb v/v			10/05/14 21:30	5.04
Ethylbenzene	ND		2.0	0.32	ppb v/v			10/05/14 21:30	5.04
4-Ethyltoluene	ND		2.0	0.94	ppb v/v			10/05/14 21:30	5.04
Hexachlorobutadiene	ND		10	2.2	ppb v/v			10/05/14 21:30	5.04
2-Hexanone	ND		2.0	0.44	ppb v/v			10/05/14 21:30	5.04
4-Methyl-2-pentanone (MIBK)	ND		2.0	0.68	ppb v/v			10/05/14 21:30	5.04
Methylene Chloride	ND		2.0	0.36	ppb v/v			10/05/14 21:30	5.04
Styrene	ND		2.0	0.30	ppb v/v			10/05/14 21:30	5.04
1,1,2,2-Tetrachloroethane	ND		2.0	0.35	ppb v/v			10/05/14 21:30	5.04
Toluene	**22**		2.0	0.26	ppb v/v			10/05/14 21:30	5.04
1,1,2-Trichloro-1,2,2-trifluoroethane	**75**		2.0	0.82	ppb v/v			10/05/14 21:30	5.04
1,2,4-Trichlorobenzene	ND		10	2.2	ppb v/v			10/05/14 21:30	5.04
1,1,1-Trichloroethane	**1.3**	**J**	1.5	0.33	ppb v/v			10/05/14 21:30	5.04
1,1,2-Trichloroethane	ND		2.0	0.34	ppb v/v			10/05/14 21:30	5.04
Trichloroethene	**290**		2.0	0.53	ppb v/v			10/05/14 21:30	5.04
Trichlorofluoromethane	**9.6**		2.0	0.99	ppb v/v			10/05/14 21:30	5.04
1,2,4-Trimethylbenzene	ND		4.0	0.82	ppb v/v			10/05/14 21:30	5.04
1,3,5-Trimethylbenzene	ND		2.0	0.63	ppb v/v			10/05/14 21:30	5.04
Vinyl acetate	ND		4.0	0.73	ppb v/v			10/05/14 21:30	5.04
Vinyl chloride	ND		2.0	0.60	ppb v/v			10/05/14 21:30	5.04
m,p-Xylene	ND		4.0	0.50	ppb v/v			10/05/14 21:30	5.04

Client Sample ID: 096518-001/MWL-SV03-400

Lab Sample ID: 320-9478-9

Date Collected: 09/11/14 09:13

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	0.27	J	2.0	0.27	ppb v/v			10/05/14 21:30	5.04

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*		*10/05/14 21:30*	*5.04*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*10/05/14 21:30*	*5.04*
Toluene-d8 (Surr)	*95*		*70 - 130*		*10/05/14 21:30*	*5.04*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	390		4.0	0.51	ppb v/v			10/06/14 05:37	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*70 - 130*		*10/06/14 05:37*	*10*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*10/06/14 05:37*	*10*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/06/14 05:37*	*10*

Client Sample ID: 096519-001/MWL-FB3

Lab Sample ID: 320-9478-10

Date Collected: 09/11/14 09:41

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	J B	6.6	0.23	ppb v/v			10/06/14 17:30	1.31
Benzene	0.45	J	0.52	0.10	ppb v/v			10/06/14 17:30	1.31
Benzyl chloride	ND		1.0	0.21	ppb v/v			10/06/14 17:30	1.31
Bromodichloromethane	ND		0.39	0.086	ppb v/v			10/06/14 17:30	1.31
Bromoform	ND		0.52	0.092	ppb v/v			10/06/14 17:30	1.31
Bromomethane	ND		1.0	0.44	ppb v/v			10/06/14 17:30	1.31
2-Butanone (MEK)	ND		1.0	0.26	ppb v/v			10/06/14 17:30	1.31
Carbon disulfide	0.22	J	1.0	0.10	ppb v/v			10/06/14 17:30	1.31
Carbon tetrachloride	ND		1.0	0.084	ppb v/v			10/06/14 17:30	1.31
Chlorobenzene	ND		0.39	0.084	ppb v/v			10/06/14 17:30	1.31
Chloroethane	ND		1.0	0.40	ppb v/v			10/06/14 17:30	1.31
Chloroform	ND		0.39	0.12	ppb v/v			10/06/14 17:30	1.31
Chloromethane	ND		1.0	0.26	ppb v/v			10/06/14 17:30	1.31
Dibromochloromethane	ND		0.52	0.10	ppb v/v			10/06/14 17:30	1.31
1,2-Dibromoethane (EDB)	ND		1.0	0.098	ppb v/v			10/06/14 17:30	1.31
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.52	0.20	ppb v/v			10/06/14 17:30	1.31
1,2-Dichlorobenzene	ND		0.52	0.17	ppb v/v			10/06/14 17:30	1.31
1,3-Dichlorobenzene	ND		0.52	0.14	ppb v/v			10/06/14 17:30	1.31
1,4-Dichlorobenzene	ND		0.52	0.20	ppb v/v			10/06/14 17:30	1.31
Dichlorodifluoromethane	ND		0.52	0.19	ppb v/v			10/06/14 17:30	1.31
1,1-Dichloroethane	ND		0.39	0.094	ppb v/v			10/06/14 17:30	1.31
1,2-Dichloroethane	ND		1.0	0.12	ppb v/v			10/06/14 17:30	1.31
1,1-Dichloroethene	ND		1.0	0.17	ppb v/v			10/06/14 17:30	1.31
cis-1,2-Dichloroethene	ND		0.52	0.12	ppb v/v			10/06/14 17:30	1.31
trans-1,2-Dichloroethene	ND		0.52	0.13	ppb v/v			10/06/14 17:30	1.31
1,2-Dichloropropane	ND		0.52	0.31	ppb v/v			10/06/14 17:30	1.31

Client Sample ID: 096519-001/MWL-FB3

Lab Sample ID: 320-9478-10

Date Collected: 09/11/14 09:41
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.52	0.14	ppb v/v			10/06/14 17:30	1.31
trans-1,3-Dichloropropene	ND		0.52	0.12	ppb v/v			10/06/14 17:30	1.31
Ethylbenzene	ND		0.52	0.083	ppb v/v			10/06/14 17:30	1.31
4-Ethyltoluene	ND		0.52	0.24	ppb v/v			10/06/14 17:30	1.31
Hexachlorobutadiene	ND		2.6	0.57	ppb v/v			10/06/14 17:30	1.31
2-Hexanone	ND		0.52	0.11	ppb v/v			10/06/14 17:30	1.31
4-Methyl-2-pentanone (MIBK)	ND		0.52	0.18	ppb v/v			10/06/14 17:30	1.31
Methylene Chloride	ND		0.52	0.094	ppb v/v			10/06/14 17:30	1.31
Styrene	ND		0.52	0.077	ppb v/v			10/06/14 17:30	1.31
1,1,2,2-Tetrachloroethane	ND		0.52	0.090	ppb v/v			10/06/14 17:30	1.31
Tetrachloroethene	ND		0.52	0.067	ppb v/v			10/06/14 17:30	1.31
Toluene	**0.41**	**J**	0.52	0.067	ppb v/v			10/06/14 17:30	1.31
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.52	0.21	ppb v/v			10/06/14 17:30	1.31
1,2,4-Trichlorobenzene	ND		2.6	0.57	ppb v/v			10/06/14 17:30	1.31
1,1,1-Trichloroethane	ND		0.39	0.085	ppb v/v			10/06/14 17:30	1.31
1,1,2-Trichloroethane	ND		0.52	0.088	ppb v/v			10/06/14 17:30	1.31
Trichloroethene	ND		0.52	0.14	ppb v/v			10/06/14 17:30	1.31
Trichlorofluoromethane	ND		0.52	0.26	ppb v/v			10/06/14 17:30	1.31
1,2,4-Trimethylbenzene	ND		1.0	0.21	ppb v/v			10/06/14 17:30	1.31
1,3,5-Trimethylbenzene	ND		0.52	0.16	ppb v/v			10/06/14 17:30	1.31
Vinyl acetate	ND		1.0	0.19	ppb v/v			10/06/14 17:30	1.31
Vinyl chloride	ND		0.52	0.16	ppb v/v			10/06/14 17:30	1.31
m,p-Xylene	ND		1.0	0.13	ppb v/v			10/06/14 17:30	1.31
o-Xylene	ND		0.52	0.071	ppb v/v			10/06/14 17:30	1.31

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*83*		*70 - 130*		*10/06/14 17:30*	*1.31*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*		*10/06/14 17:30*	*1.31*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/06/14 17:30*	*1.31*

Client Sample ID: 096520-001/MWL-SV04-50

Lab Sample ID: 320-9478-11

Date Collected: 09/11/14 09:49
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**6.9**	**J B**	12	0.44	ppb v/v			10/05/14 23:49	2.49
Benzene	**1.7**		1.0	0.20	ppb v/v			10/05/14 23:49	2.49
Benzyl chloride	ND		2.0	0.41	ppb v/v			10/05/14 23:49	2.49
Bromodichloromethane	ND		0.75	0.16	ppb v/v			10/05/14 23:49	2.49
Bromoform	ND		1.0	0.17	ppb v/v			10/05/14 23:49	2.49
Bromomethane	ND		2.0	0.83	ppb v/v			10/05/14 23:49	2.49
2-Butanone (MEK)	**0.64**	**J**	2.0	0.50	ppb v/v			10/05/14 23:49	2.49
Carbon disulfide	**0.24**	**J**	2.0	0.19	ppb v/v			10/05/14 23:49	2.49
Carbon tetrachloride	ND		2.0	0.16	ppb v/v			10/05/14 23:49	2.49
Chlorobenzene	ND		0.75	0.16	ppb v/v			10/05/14 23:49	2.49
Chloroethane	ND		2.0	0.77	ppb v/v			10/05/14 23:49	2.49
Chloroform	**1.8**		0.75	0.24	ppb v/v			10/05/14 23:49	2.49

Client Sample ID: 096520-001/MWL-SV04-50
Date Collected: 09/11/14 09:49
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-9478-11
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		2.0	0.49	ppb v/v			10/05/14 23:49	2.49
Dibromochloromethane	ND		1.0	0.20	ppb v/v			10/05/14 23:49	2.49
1,2-Dibromoethane (EDB)	ND		2.0	0.19	ppb v/v			10/05/14 23:49	2.49
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.0	0.39	ppb v/v			10/05/14 23:49	2.49
1,2-Dichlorobenzene	ND		1.0	0.32	ppb v/v			10/05/14 23:49	2.49
1,3-Dichlorobenzene	ND		1.0	0.27	ppb v/v			10/05/14 23:49	2.49
1,4-Dichlorobenzene	ND		1.0	0.37	ppb v/v			10/05/14 23:49	2.49
Dichlorodifluoromethane	**21**		1.0	0.36	ppb v/v			10/05/14 23:49	2.49
1,1-Dichloroethane	**1.3**		0.75	0.18	ppb v/v			10/05/14 23:49	2.49
1,2-Dichloroethane	ND		2.0	0.22	ppb v/v			10/05/14 23:49	2.49
1,1-Dichloroethene	**6.4**		2.0	0.32	ppb v/v			10/05/14 23:49	2.49
cis-1,2-Dichloroethene	**0.51**	**J**	1.0	0.22	ppb v/v			10/05/14 23:49	2.49
trans-1,2-Dichloroethene	ND		1.0	0.25	ppb v/v			10/05/14 23:49	2.49
1,2-Dichloropropane	ND		1.0	0.60	ppb v/v			10/05/14 23:49	2.49
cis-1,3-Dichloropropene	ND		1.0	0.26	ppb v/v			10/05/14 23:49	2.49
trans-1,3-Dichloropropene	ND		1.0	0.22	ppb v/v			10/05/14 23:49	2.49
Ethylbenzene	ND		1.0	0.16	ppb v/v			10/05/14 23:49	2.49
4-Ethyltoluene	ND		1.0	0.47	ppb v/v			10/05/14 23:49	2.49
Hexachlorobutadiene	ND		5.0	1.1	ppb v/v			10/05/14 23:49	2.49
2-Hexanone	ND		1.0	0.22	ppb v/v			10/05/14 23:49	2.49
4-Methyl-2-pentanone (MIBK)	ND		1.0	0.34	ppb v/v			10/05/14 23:49	2.49
Methylene Chloride	ND		1.0	0.18	ppb v/v			10/05/14 23:49	2.49
Styrene	ND		1.0	0.15	ppb v/v			10/05/14 23:49	2.49
1,1,2,2-Tetrachloroethane	ND		1.0	0.17	ppb v/v			10/05/14 23:49	2.49
Tetrachloroethene	**72**		1.0	0.13	ppb v/v			10/05/14 23:49	2.49
Toluene	**1.3**		1.0	0.13	ppb v/v			10/05/14 23:49	2.49
1,1,2-Trichloro-1,2,2-trifluoroethane	**64**		1.0	0.41	ppb v/v			10/05/14 23:49	2.49
1,2,4-Trichlorobenzene	ND		5.0	1.1	ppb v/v			10/05/14 23:49	2.49
1,1,1-Trichloroethane	**6.3**		0.75	0.16	ppb v/v			10/05/14 23:49	2.49
1,1,2-Trichloroethane	ND		1.0	0.17	ppb v/v			10/05/14 23:49	2.49
Trichloroethene	**61**		1.0	0.26	ppb v/v			10/05/14 23:49	2.49
Trichlorofluoromethane	**23**		1.0	0.49	ppb v/v			10/05/14 23:49	2.49
1,2,4-Trimethylbenzene	ND		2.0	0.40	ppb v/v			10/05/14 23:49	2.49
1,3,5-Trimethylbenzene	ND		1.0	0.31	ppb v/v			10/05/14 23:49	2.49
Vinyl acetate	ND		2.0	0.36	ppb v/v			10/05/14 23:49	2.49
Vinyl chloride	ND		1.0	0.30	ppb v/v			10/05/14 23:49	2.49
m,p-Xylene	ND		2.0	0.25	ppb v/v			10/05/14 23:49	2.49
o-Xylene	ND		1.0	0.13	ppb v/v			10/05/14 23:49	2.49

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*10/05/14 23:49*	*2.49*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*10/05/14 23:49*	*2.49*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/05/14 23:49*	*2.49*

Client Sample ID: 096521-001/MWL-SV04-100
Lab Sample ID: 320-9478-12
Date Collected: 09/11/14 09:52
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**3.3**	**J B**	6.8	0.24	ppb v/v			10/06/14 00:46	1.35
Benzene	**0.94**		0.54	0.11	ppb v/v			10/06/14 00:46	1.35
Benzyl chloride	ND		1.1	0.22	ppb v/v			10/06/14 00:46	1.35
Bromodichloromethane	ND		0.41	0.089	ppb v/v			10/06/14 00:46	1.35
Bromoform	ND		0.54	0.095	ppb v/v			10/06/14 00:46	1.35
Bromomethane	ND		1.1	0.45	ppb v/v			10/06/14 00:46	1.35
2-Butanone (MEK)	**0.50**	**J**	1.1	0.27	ppb v/v			10/06/14 00:46	1.35
Carbon disulfide	**0.14**	**J**	1.1	0.11	ppb v/v			10/06/14 00:46	1.35
Carbon tetrachloride	**0.38**	**J**	1.1	0.086	ppb v/v			10/06/14 00:46	1.35
Chlorobenzene	ND		0.41	0.086	ppb v/v			10/06/14 00:46	1.35
Chloroethane	ND		1.1	0.42	ppb v/v			10/06/14 00:46	1.35
Chloroform	**1.8**		0.41	0.13	ppb v/v			10/06/14 00:46	1.35
Chloromethane	**0.29**	**J**	1.1	0.27	ppb v/v			10/06/14 00:46	1.35
Dibromochloromethane	ND		0.54	0.11	ppb v/v			10/06/14 00:46	1.35
1,2-Dibromoethane (EDB)	ND		1.1	0.10	ppb v/v			10/06/14 00:46	1.35
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.54	0.21	ppb v/v			10/06/14 00:46	1.35
1,2-Dichlorobenzene	ND		0.54	0.18	ppb v/v			10/06/14 00:46	1.35
1,3-Dichlorobenzene	ND		0.54	0.15	ppb v/v			10/06/14 00:46	1.35
1,4-Dichlorobenzene	ND		0.54	0.20	ppb v/v			10/06/14 00:46	1.35
Dichlorodifluoromethane	**35**		0.54	0.20	ppb v/v			10/06/14 00:46	1.35
1,1-Dichloroethane	**2.9**		0.41	0.097	ppb v/v			10/06/14 00:46	1.35
1,2-Dichloroethane	ND		1.1	0.12	ppb v/v			10/06/14 00:46	1.35
1,1-Dichloroethene	**16**		1.1	0.17	ppb v/v			10/06/14 00:46	1.35
cis-1,2-Dichloroethene	**1.7**		0.54	0.12	ppb v/v			10/06/14 00:46	1.35
trans-1,2-Dichloroethene	ND		0.54	0.14	ppb v/v			10/06/14 00:46	1.35
1,2-Dichloropropane	ND		0.54	0.32	ppb v/v			10/06/14 00:46	1.35
cis-1,3-Dichloropropene	ND		0.54	0.14	ppb v/v			10/06/14 00:46	1.35
trans-1,3-Dichloropropene	ND		0.54	0.12	ppb v/v			10/06/14 00:46	1.35
Ethylbenzene	ND		0.54	0.085	ppb v/v			10/06/14 00:46	1.35
4-Ethyltoluene	ND		0.54	0.25	ppb v/v			10/06/14 00:46	1.35
Hexachlorobutadiene	ND		2.7	0.58	ppb v/v			10/06/14 00:46	1.35
2-Hexanone	ND		0.54	0.12	ppb v/v			10/06/14 00:46	1.35
4-Methyl-2-pentanone (MIBK)	ND		0.54	0.18	ppb v/v			10/06/14 00:46	1.35
Methylene Chloride	**0.45**	**J**	0.54	0.097	ppb v/v			10/06/14 00:46	1.35
Styrene	ND		0.54	0.080	ppb v/v			10/06/14 00:46	1.35
1,1,2,2-Tetrachloroethane	ND		0.54	0.093	ppb v/v			10/06/14 00:46	1.35
Toluene	**1.9**		0.54	0.069	ppb v/v			10/06/14 00:46	1.35
1,2,4-Trichlorobenzene	ND		2.7	0.58	ppb v/v			10/06/14 00:46	1.35
1,1,1-Trichloroethane	**5.0**		0.41	0.088	ppb v/v			10/06/14 00:46	1.35
1,1,2-Trichloroethane	ND		0.54	0.090	ppb v/v			10/06/14 00:46	1.35
Trichlorofluoromethane	**29**		0.54	0.26	ppb v/v			10/06/14 00:46	1.35
1,2,4-Trimethylbenzene	ND		1.1	0.22	ppb v/v			10/06/14 00:46	1.35
1,3,5-Trimethylbenzene	ND		0.54	0.17	ppb v/v			10/06/14 00:46	1.35
Vinyl acetate	ND		1.1	0.20	ppb v/v			10/06/14 00:46	1.35
Vinyl chloride	ND		0.54	0.16	ppb v/v			10/06/14 00:46	1.35
m,p-Xylene	ND		1.1	0.14	ppb v/v			10/06/14 00:46	1.35
o-Xylene	ND		0.54	0.073	ppb v/v			10/06/14 00:46	1.35

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-9478-1

Client Sample ID: 096521-001/MWL-SV04-100

Lab Sample ID: 320-9478-12

Date Collected: 09/11/14 09:52

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*70 - 130*		*10/06/14 00:46*	*1.35*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*		*10/06/14 00:46*	*1.35*
Toluene-d8 (Surr)	*96*		*70 - 130*		*10/06/14 00:46*	*1.35*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	**130**		1.6	0.21	ppb v/v			10/06/14 18:27	4.03
1,1,2-Trichloro-1,2,2-trifluoroethane	**100**		1.6	0.66	ppb v/v			10/06/14 18:27	4.03
Trichloroethene	**130**		1.6	0.42	ppb v/v			10/06/14 18:27	4.03

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*70 - 130*		*10/06/14 18:27*	*4.03*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*		*10/06/14 18:27*	*4.03*
Toluene-d8 (Surr)	*99*		*70 - 130*		*10/06/14 18:27*	*4.03*

Client Sample ID: 096522-001/MWL-SV04-100

Lab Sample ID: 320-9478-13

Date Collected: 09/11/14 09:54

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**11**	**J B**	12	0.44	ppb v/v			10/06/14 01:47	2.48
Benzene	**0.85**	**J**	0.99	0.20	ppb v/v			10/06/14 01:47	2.48
Benzyl chloride	ND		2.0	0.40	ppb v/v			10/06/14 01:47	2.48
Bromodichloromethane	ND		0.74	0.16	ppb v/v			10/06/14 01:47	2.48
Bromoform	ND		0.99	0.17	ppb v/v			10/06/14 01:47	2.48
Bromomethane	ND		2.0	0.83	ppb v/v			10/06/14 01:47	2.48
2-Butanone (MEK)	**2.4**		2.0	0.49	ppb v/v			10/06/14 01:47	2.48
Carbon disulfide	**0.45**	**J**	2.0	0.19	ppb v/v			10/06/14 01:47	2.48
Carbon tetrachloride	**0.39**	**J**	2.0	0.16	ppb v/v			10/06/14 01:47	2.48
Chlorobenzene	ND		0.74	0.16	ppb v/v			10/06/14 01:47	2.48
Chloroethane	ND		2.0	0.76	ppb v/v			10/06/14 01:47	2.48
Chloroform	**1.8**		0.74	0.24	ppb v/v			10/06/14 01:47	2.48
Chloromethane	ND		2.0	0.49	ppb v/v			10/06/14 01:47	2.48
Dibromochloromethane	ND		0.99	0.20	ppb v/v			10/06/14 01:47	2.48
1,2-Dibromoethane (EDB)	ND		2.0	0.19	ppb v/v			10/06/14 01:47	2.48
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.99	0.38	ppb v/v			10/06/14 01:47	2.48
1,2-Dichlorobenzene	ND		0.99	0.32	ppb v/v			10/06/14 01:47	2.48
1,3-Dichlorobenzene	ND		0.99	0.27	ppb v/v			10/06/14 01:47	2.48
1,4-Dichlorobenzene	ND		0.99	0.37	ppb v/v			10/06/14 01:47	2.48
Dichlorodifluoromethane	**35**		0.99	0.36	ppb v/v			10/06/14 01:47	2.48
1,1-Dichloroethane	**2.9**		0.74	0.18	ppb v/v			10/06/14 01:47	2.48
1,2-Dichloroethane	ND		2.0	0.22	ppb v/v			10/06/14 01:47	2.48
1,1-Dichloroethene	**16**		2.0	0.32	ppb v/v			10/06/14 01:47	2.48
cis-1,2-Dichloroethene	**1.8**		0.99	0.22	ppb v/v			10/06/14 01:47	2.48
trans-1,2-Dichloroethene	ND		0.99	0.25	ppb v/v			10/06/14 01:47	2.48
1,2-Dichloropropane	ND		0.99	0.60	ppb v/v			10/06/14 01:47	2.48
cis-1,3-Dichloropropene	ND		0.99	0.26	ppb v/v			10/06/14 01:47	2.48

Client Sample ID: 096522-001/MWL-SV04-100

Lab Sample ID: 320-9478-13

Date Collected: 09/11/14 09:54

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		0.99	0.22	ppb v/v			10/06/14 01:47	2.48
Ethylbenzene	ND		0.99	0.16	ppb v/v			10/06/14 01:47	2.48
4-Ethyltoluene	ND		0.99	0.46	ppb v/v			10/06/14 01:47	2.48
Hexachlorobutadiene	ND		5.0	1.1	ppb v/v			10/06/14 01:47	2.48
2-Hexanone	ND		0.99	0.22	ppb v/v			10/06/14 01:47	2.48
4-Methyl-2-pentanone (MIBK)	ND		0.99	0.33	ppb v/v			10/06/14 01:47	2.48
Methylene Chloride	**0.47**	**J**	0.99	0.18	ppb v/v			10/06/14 01:47	2.48
Styrene	ND		0.99	0.15	ppb v/v			10/06/14 01:47	2.48
1,1,2,2-Tetrachloroethane	ND		0.99	0.17	ppb v/v			10/06/14 01:47	2.48
Tetrachloroethene	**130**		0.99	0.13	ppb v/v			10/06/14 01:47	2.48
Toluene	**2.1**		0.99	0.13	ppb v/v			10/06/14 01:47	2.48
1,1,2-Trichloro-1,2,2-trifluoroethane	**97**		0.99	0.40	ppb v/v			10/06/14 01:47	2.48
1,2,4-Trichlorobenzene	ND		5.0	1.1	ppb v/v			10/06/14 01:47	2.48
1,1,1-Trichloroethane	**5.0**		0.74	0.16	ppb v/v			10/06/14 01:47	2.48
1,1,2-Trichloroethane	ND		0.99	0.17	ppb v/v			10/06/14 01:47	2.48
Trichloroethene	**130**		0.99	0.26	ppb v/v			10/06/14 01:47	2.48
Trichlorofluoromethane	**31**		0.99	0.49	ppb v/v			10/06/14 01:47	2.48
1,2,4-Trimethylbenzene	ND		2.0	0.40	ppb v/v			10/06/14 01:47	2.48
1,3,5-Trimethylbenzene	ND		0.99	0.31	ppb v/v			10/06/14 01:47	2.48
Vinyl acetate	ND		2.0	0.36	ppb v/v			10/06/14 01:47	2.48
Vinyl chloride	ND		0.99	0.30	ppb v/v			10/06/14 01:47	2.48
m,p-Xylene	ND		2.0	0.25	ppb v/v			10/06/14 01:47	2.48
o-Xylene	ND		0.99	0.13	ppb v/v			10/06/14 01:47	2.48

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*70 - 130*		*10/06/14 01:47*	*2.48*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 130*		*10/06/14 01:47*	*2.48*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/06/14 01:47*	*2.48*

Client Sample ID: 096523-001/MWL-SV04-200

Lab Sample ID: 320-9478-14

Date Collected: 09/11/14 09:56

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**7.2**	**J B**	15	0.52	ppb v/v			10/06/14 02:45	2.9
Benzene	**0.60**	**J**	1.2	0.23	ppb v/v			10/06/14 02:45	2.9
Benzyl chloride	ND		2.3	0.47	ppb v/v			10/06/14 02:45	2.9
Bromodichloromethane	ND		0.87	0.19	ppb v/v			10/06/14 02:45	2.9
Bromoform	ND		1.2	0.20	ppb v/v			10/06/14 02:45	2.9
Bromomethane	ND		2.3	0.97	ppb v/v			10/06/14 02:45	2.9
2-Butanone (MEK)	**0.81**	**J**	2.3	0.58	ppb v/v			10/06/14 02:45	2.9
Carbon disulfide	**0.58**	**J**	2.3	0.23	ppb v/v			10/06/14 02:45	2.9
Carbon tetrachloride	**0.62**	**J**	2.3	0.19	ppb v/v			10/06/14 02:45	2.9
Chlorobenzene	ND		0.87	0.19	ppb v/v			10/06/14 02:45	2.9
Chloroethane	ND		2.3	0.89	ppb v/v			10/06/14 02:45	2.9
Chloroform	**1.4**		0.87	0.28	ppb v/v			10/06/14 02:45	2.9

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-9478-1

Client Sample ID: 096523-001/MWL-SV04-200
Date Collected: 09/11/14 09:56
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-9478-14
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		2.3	0.57	ppb v/v			10/06/14 02:45	2.9
Dibromochloromethane	ND		1.2	0.23	ppb v/v			10/06/14 02:45	2.9
1,2-Dibromoethane (EDB)	ND		2.3	0.22	ppb v/v			10/06/14 02:45	2.9
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.2	0.45	ppb v/v			10/06/14 02:45	2.9
1,2-Dichlorobenzene	ND		1.2	0.38	ppb v/v			10/06/14 02:45	2.9
1,3-Dichlorobenzene	ND		1.2	0.32	ppb v/v			10/06/14 02:45	2.9
1,4-Dichlorobenzene	ND		1.2	0.43	ppb v/v			10/06/14 02:45	2.9
Dichlorodifluoromethane	**51**		1.2	0.42	ppb v/v			10/06/14 02:45	2.9
1,1-Dichloroethane	**4.9**		0.87	0.21	ppb v/v			10/06/14 02:45	2.9
1,2-Dichloroethane	ND		2.3	0.26	ppb v/v			10/06/14 02:45	2.9
1,1-Dichloroethene	**34**		2.3	0.37	ppb v/v			10/06/14 02:45	2.9
cis-1,2-Dichloroethene	**3.1**		1.2	0.26	ppb v/v			10/06/14 02:45	2.9
trans-1,2-Dichloroethene	ND		1.2	0.29	ppb v/v			10/06/14 02:45	2.9
1,2-Dichloropropane	ND		1.2	0.70	ppb v/v			10/06/14 02:45	2.9
cis-1,3-Dichloropropene	ND		1.2	0.30	ppb v/v			10/06/14 02:45	2.9
trans-1,3-Dichloropropene	ND		1.2	0.26	ppb v/v			10/06/14 02:45	2.9
Ethylbenzene	ND		1.2	0.18	ppb v/v			10/06/14 02:45	2.9
4-Ethyltoluene	ND		1.2	0.54	ppb v/v			10/06/14 02:45	2.9
Hexachlorobutadiene	ND		5.8	1.3	ppb v/v			10/06/14 02:45	2.9
2-Hexanone	ND		1.2	0.25	ppb v/v			10/06/14 02:45	2.9
4-Methyl-2-pentanone (MIBK)	ND		1.2	0.39	ppb v/v			10/06/14 02:45	2.9
Methylene Chloride	**1.2**		1.2	0.21	ppb v/v			10/06/14 02:45	2.9
Styrene	ND		1.2	0.17	ppb v/v			10/06/14 02:45	2.9
1,1,2,2-Tetrachloroethane	ND		1.2	0.20	ppb v/v			10/06/14 02:45	2.9
Toluene	**3.0**		1.2	0.15	ppb v/v			10/06/14 02:45	2.9
1,1,2-Trichloro-1,2,2-trifluoroethane	**160**		1.2	0.47	ppb v/v			10/06/14 02:45	2.9
1,2,4-Trichlorobenzene	ND		5.8	1.3	ppb v/v			10/06/14 02:45	2.9
1,1,1-Trichloroethane	**2.0**		0.87	0.19	ppb v/v			10/06/14 02:45	2.9
1,1,2-Trichloroethane	ND		1.2	0.19	ppb v/v			10/06/14 02:45	2.9
Trichlorofluoromethane	**31**		1.2	0.57	ppb v/v			10/06/14 02:45	2.9
1,2,4-Trimethylbenzene	ND		2.3	0.47	ppb v/v			10/06/14 02:45	2.9
1,3,5-Trimethylbenzene	ND		1.2	0.36	ppb v/v			10/06/14 02:45	2.9
Vinyl acetate	ND		2.3	0.42	ppb v/v			10/06/14 02:45	2.9
Vinyl chloride	ND		1.2	0.35	ppb v/v			10/06/14 02:45	2.9
m,p-Xylene	ND		2.3	0.29	ppb v/v			10/06/14 02:45	2.9
o-Xylene	ND		1.2	0.16	ppb v/v			10/06/14 02:45	2.9

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*70 - 130*		*10/06/14 02:45*	*2.9*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 130*		*10/06/14 02:45*	*2.9*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/06/14 02:45*	*2.9*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	**180**		2.3	0.30	ppb v/v			10/06/14 19:21	5.79
Trichloroethene	**210**		2.3	0.61	ppb v/v			10/06/14 19:21	5.79

Client Sample ID: 096523-001/MWL-SV04-200

Lab Sample ID: 320-9478-14

Date Collected: 09/11/14 09:56

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		70 - 130		10/06/14 19:21	5.79
1,2-Dichloroethane-d4 (Surr)	91		70 - 130		10/06/14 19:21	5.79
Toluene-d8 (Surr)	98		70 - 130		10/06/14 19:21	5.79

Client Sample ID: 096524-001/MWL-SV04-300

Lab Sample ID: 320-9478-15

Date Collected: 09/11/14 10:00

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**4.5**	**J B**	7.2	0.25	ppb v/v			10/06/14 20:31	1.43
Benzene	**0.64**		0.57	0.11	ppb v/v			10/06/14 20:31	1.43
Benzyl chloride	ND		1.1	0.23	ppb v/v			10/06/14 20:31	1.43
Bromodichloromethane	ND		0.43	0.094	ppb v/v			10/06/14 20:31	1.43
Bromoform	ND		0.57	0.10	ppb v/v			10/06/14 20:31	1.43
Bromomethane	ND		1.1	0.48	ppb v/v			10/06/14 20:31	1.43
2-Butanone (MEK)	**0.84**	**J**	1.1	0.28	ppb v/v			10/06/14 20:31	1.43
Carbon disulfide	**0.44**	**J**	1.1	0.11	ppb v/v			10/06/14 20:31	1.43
Carbon tetrachloride	ND		1.1	0.092	ppb v/v			10/06/14 20:31	1.43
Chlorobenzene	ND		0.43	0.092	ppb v/v			10/06/14 20:31	1.43
Chloroethane	ND		1.1	0.44	ppb v/v			10/06/14 20:31	1.43
Chloroform	**0.44**		0.43	0.14	ppb v/v			10/06/14 20:31	1.43
Chloromethane	ND		1.1	0.28	ppb v/v			10/06/14 20:31	1.43
Dibromochloromethane	ND		0.57	0.11	ppb v/v			10/06/14 20:31	1.43
1,2-Dibromoethane (EDB)	ND		1.1	0.11	ppb v/v			10/06/14 20:31	1.43
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.57	0.22	ppb v/v			10/06/14 20:31	1.43
1,2-Dichlorobenzene	ND		0.57	0.19	ppb v/v			10/06/14 20:31	1.43
1,3-Dichlorobenzene	ND		0.57	0.16	ppb v/v			10/06/14 20:31	1.43
1,4-Dichlorobenzene	ND		0.57	0.21	ppb v/v			10/06/14 20:31	1.43
Dichlorodifluoromethane	**16**		0.57	0.21	ppb v/v			10/06/14 20:31	1.43
1,1-Dichloroethane	**0.71**		0.43	0.10	ppb v/v			10/06/14 20:31	1.43
1,2-Dichloroethane	ND		1.1	0.13	ppb v/v			10/06/14 20:31	1.43
1,1-Dichloroethene	**9.5**		1.1	0.18	ppb v/v			10/06/14 20:31	1.43
cis-1,2-Dichloroethene	**0.71**		0.57	0.13	ppb v/v			10/06/14 20:31	1.43
trans-1,2-Dichloroethene	ND		0.57	0.14	ppb v/v			10/06/14 20:31	1.43
1,2-Dichloropropane	ND		0.57	0.34	ppb v/v			10/06/14 20:31	1.43
cis-1,3-Dichloropropene	ND		0.57	0.15	ppb v/v			10/06/14 20:31	1.43
trans-1,3-Dichloropropene	ND		0.57	0.13	ppb v/v			10/06/14 20:31	1.43
Ethylbenzene	ND		0.57	0.090	ppb v/v			10/06/14 20:31	1.43
4-Ethyltoluene	ND		0.57	0.27	ppb v/v			10/06/14 20:31	1.43
Hexachlorobutadiene	ND		2.9	0.62	ppb v/v			10/06/14 20:31	1.43
2-Hexanone	ND		0.57	0.12	ppb v/v			10/06/14 20:31	1.43
4-Methyl-2-pentanone (MIBK)	ND		0.57	0.19	ppb v/v			10/06/14 20:31	1.43
Methylene Chloride	**0.26**	**J**	0.57	0.10	ppb v/v			10/06/14 20:31	1.43
Styrene	ND		0.57	0.084	ppb v/v			10/06/14 20:31	1.43
1,1,2,2-Tetrachloroethane	ND		0.57	0.099	ppb v/v			10/06/14 20:31	1.43
Toluene	**3.3**		0.57	0.073	ppb v/v			10/06/14 20:31	1.43

Client Sample ID: 096524-001/MWL-SV04-300

Lab Sample ID: 320-9478-15

Date Collected: 09/11/14 10:00

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloro-1,2,2-trifluoroethane	**39**		0.57	0.23	ppb v/v			10/06/14 20:31	1.43
1,2,4-Trichlorobenzene	ND		2.9	0.62	ppb v/v			10/06/14 20:31	1.43
1,1,1-Trichloroethane	**0.46**		0.43	0.093	ppb v/v			10/06/14 20:31	1.43
1,1,2-Trichloroethane	ND		0.57	0.096	ppb v/v			10/06/14 20:31	1.43
Trichloroethene	**76**		0.57	0.15	ppb v/v			10/06/14 20:31	1.43
Trichlorofluoromethane	**7.9**		0.57	0.28	ppb v/v			10/06/14 20:31	1.43
1,2,4-Trimethylbenzene	**0.38**	**J**	1.1	0.23	ppb v/v			10/06/14 20:31	1.43
1,3,5-Trimethylbenzene	ND		0.57	0.18	ppb v/v			10/06/14 20:31	1.43
Vinyl acetate	ND		1.1	0.21	ppb v/v			10/06/14 20:31	1.43
Vinyl chloride	ND		0.57	0.17	ppb v/v			10/06/14 20:31	1.43
m,p-Xylene	**0.20**	**J**	1.1	0.14	ppb v/v			10/06/14 20:31	1.43
o-Xylene	**0.10**	**J**	0.57	0.077	ppb v/v			10/06/14 20:31	1.43

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*70 - 130*		*10/06/14 20:31*	*1.43*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 130*		*10/06/14 20:31*	*1.43*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/06/14 20:31*	*1.43*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	**110**		1.1	0.15	ppb v/v			10/07/14 17:10	2.86

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*10/07/14 17:10*	*2.86*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*		*10/07/14 17:10*	*2.86*
Toluene-d8 (Surr)	*99*		*70 - 130*		*10/07/14 17:10*	*2.86*

Client Sample ID: 096525-001/MWL-SV04-300

Lab Sample ID: 320-9478-16

Date Collected: 09/11/14 10:03

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**8.9**	**B**	7.1	0.25	ppb v/v			10/06/14 21:30	1.42
Benzene	**0.55**	**J**	0.57	0.11	ppb v/v			10/06/14 21:30	1.42
Benzyl chloride	ND		1.1	0.23	ppb v/v			10/06/14 21:30	1.42
Bromodichloromethane	ND		0.43	0.094	ppb v/v			10/06/14 21:30	1.42
Bromoform	ND		0.57	0.099	ppb v/v			10/06/14 21:30	1.42
Bromomethane	ND		1.1	0.48	ppb v/v			10/06/14 21:30	1.42
2-Butanone (MEK)	**1.9**		1.1	0.28	ppb v/v			10/06/14 21:30	1.42
Carbon disulfide	**0.71**	**J**	1.1	0.11	ppb v/v			10/06/14 21:30	1.42
Carbon tetrachloride	**0.19**	**J**	1.1	0.091	ppb v/v			10/06/14 21:30	1.42
Chlorobenzene	ND		0.43	0.091	ppb v/v			10/06/14 21:30	1.42
Chloroethane	ND		1.1	0.44	ppb v/v			10/06/14 21:30	1.42
Chloroform	**0.19**	**J**	0.43	0.13	ppb v/v			10/06/14 21:30	1.42
Chloromethane	ND		1.1	0.28	ppb v/v			10/06/14 21:30	1.42
Dibromochloromethane	**0.17**	**J**	0.57	0.11	ppb v/v			10/06/14 21:30	1.42
1,2-Dibromoethane (EDB)	ND		1.1	0.11	ppb v/v			10/06/14 21:30	1.42

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-9478-1

Client Sample ID: 096525-001/MWL-SV04-300
Date Collected: 09/11/14 10:03
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-9478-16
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.57	0.22	ppb v/v			10/06/14 21:30	1.42
1,2-Dichlorobenzene	ND		0.57	0.18	ppb v/v			10/06/14 21:30	1.42
1,3-Dichlorobenzene	ND		0.57	0.16	ppb v/v			10/06/14 21:30	1.42
1,4-Dichlorobenzene	ND		0.57	0.21	ppb v/v			10/06/14 21:30	1.42
Dichlorodifluoromethane	**15**		0.57	0.21	ppb v/v			10/06/14 21:30	1.42
1,1-Dichloroethane	**0.16**	**J**	0.43	0.10	ppb v/v			10/06/14 21:30	1.42
1,2-Dichloroethane	ND		1.1	0.12	ppb v/v			10/06/14 21:30	1.42
1,1-Dichloroethene	**5.2**		1.1	0.18	ppb v/v			10/06/14 21:30	1.42
cis-1,2-Dichloroethene	ND		0.57	0.13	ppb v/v			10/06/14 21:30	1.42
trans-1,2-Dichloroethene	ND		0.57	0.14	ppb v/v			10/06/14 21:30	1.42
1,2-Dichloropropane	ND		0.57	0.34	ppb v/v			10/06/14 21:30	1.42
cis-1,3-Dichloropropene	ND		0.57	0.15	ppb v/v			10/06/14 21:30	1.42
trans-1,3-Dichloropropene	ND		0.57	0.12	ppb v/v			10/06/14 21:30	1.42
Ethylbenzene	ND		0.57	0.089	ppb v/v			10/06/14 21:30	1.42
4-Ethyltoluene	ND		0.57	0.27	ppb v/v			10/06/14 21:30	1.42
Hexachlorobutadiene	ND		2.8	0.61	ppb v/v			10/06/14 21:30	1.42
2-Hexanone	**0.19**	**J**	0.57	0.12	ppb v/v			10/06/14 21:30	1.42
4-Methyl-2-pentanone (MIBK)	ND		0.57	0.19	ppb v/v			10/06/14 21:30	1.42
Methylene Chloride	ND		0.57	0.10	ppb v/v			10/06/14 21:30	1.42
Styrene	ND		0.57	0.084	ppb v/v			10/06/14 21:30	1.42
1,1,2,2-Tetrachloroethane	ND		0.57	0.098	ppb v/v			10/06/14 21:30	1.42
Tetrachloroethene	**82**		0.57	0.072	ppb v/v			10/06/14 21:30	1.42
Toluene	**3.4**		0.57	0.072	ppb v/v			10/06/14 21:30	1.42
1,1,2-Trichloro-1,2,2-trifluoroethane	**36**		0.57	0.23	ppb v/v			10/06/14 21:30	1.42
1,2,4-Trichlorobenzene	ND		2.8	0.61	ppb v/v			10/06/14 21:30	1.42
1,1,1-Trichloroethane	**0.13**	**J**	0.43	0.092	ppb v/v			10/06/14 21:30	1.42
1,1,2-Trichloroethane	ND		0.57	0.095	ppb v/v			10/06/14 21:30	1.42
Trichloroethene	**44**		0.57	0.15	ppb v/v			10/06/14 21:30	1.42
Trichlorofluoromethane	**5.3**		0.57	0.28	ppb v/v			10/06/14 21:30	1.42
1,2,4-Trimethylbenzene	**0.47**	**J**	1.1	0.23	ppb v/v			10/06/14 21:30	1.42
1,3,5-Trimethylbenzene	**0.18**	**J**	0.57	0.18	ppb v/v			10/06/14 21:30	1.42
Vinyl acetate	ND		1.1	0.21	ppb v/v			10/06/14 21:30	1.42
Vinyl chloride	ND		0.57	0.17	ppb v/v			10/06/14 21:30	1.42
m,p-Xylene	**0.18**	**J**	1.1	0.14	ppb v/v			10/06/14 21:30	1.42
o-Xylene	**0.11**	**J**	0.57	0.077	ppb v/v			10/06/14 21:30	1.42

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*10/06/14 21:30*	*1.42*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*		*10/06/14 21:30*	*1.42*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/06/14 21:30*	*1.42*

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-9478-1

Client Sample ID: 096526-001/MWL-SV04-400
Lab Sample ID: 320-9478-17
Date Collected: 09/11/14 10:08
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**8.7**	**B**	8.2	0.29	ppb v/v			10/06/14 22:27	1.63
Benzene	**1.2**		0.65	0.13	ppb v/v			10/06/14 22:27	1.63
Benzyl chloride	ND		1.3	0.27	ppb v/v			10/06/14 22:27	1.63
Bromodichloromethane	ND		0.49	0.11	ppb v/v			10/06/14 22:27	1.63
Bromoform	ND		0.65	0.11	ppb v/v			10/06/14 22:27	1.63
Bromomethane	ND		1.3	0.55	ppb v/v			10/06/14 22:27	1.63
2-Butanone (MEK)	**1.6**		1.3	0.32	ppb v/v			10/06/14 22:27	1.63
Carbon disulfide	**2.3**		1.3	0.13	ppb v/v			10/06/14 22:27	1.63
Carbon tetrachloride	**0.16**	**J**	1.3	0.10	ppb v/v			10/06/14 22:27	1.63
Chlorobenzene	ND		0.49	0.10	ppb v/v			10/06/14 22:27	1.63
Chloroethane	ND		1.3	0.50	ppb v/v			10/06/14 22:27	1.63
Chloroform	**0.40**	**J**	0.49	0.15	ppb v/v			10/06/14 22:27	1.63
Chloromethane	**1.2**	**J**	1.3	0.32	ppb v/v			10/06/14 22:27	1.63
Dibromochloromethane	ND		0.65	0.13	ppb v/v			10/06/14 22:27	1.63
1,2-Dibromoethane (EDB)	ND		1.3	0.12	ppb v/v			10/06/14 22:27	1.63
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.65	0.25	ppb v/v			10/06/14 22:27	1.63
1,2-Dichlorobenzene	ND		0.65	0.21	ppb v/v			10/06/14 22:27	1.63
1,3-Dichlorobenzene	ND		0.65	0.18	ppb v/v			10/06/14 22:27	1.63
1,4-Dichlorobenzene	ND		0.65	0.24	ppb v/v			10/06/14 22:27	1.63
Dichlorodifluoromethane	**11**		0.65	0.24	ppb v/v			10/06/14 22:27	1.63
1,1-Dichloroethane	**0.68**		0.49	0.12	ppb v/v			10/06/14 22:27	1.63
1,2-Dichloroethane	ND		1.3	0.14	ppb v/v			10/06/14 22:27	1.63
1,1-Dichloroethene	**7.3**		1.3	0.21	ppb v/v			10/06/14 22:27	1.63
cis-1,2-Dichloroethene	**0.75**		0.65	0.15	ppb v/v			10/06/14 22:27	1.63
trans-1,2-Dichloroethene	ND		0.65	0.16	ppb v/v			10/06/14 22:27	1.63
1,2-Dichloropropane	ND		0.65	0.39	ppb v/v			10/06/14 22:27	1.63
cis-1,3-Dichloropropene	ND		0.65	0.17	ppb v/v			10/06/14 22:27	1.63
trans-1,3-Dichloropropene	ND		0.65	0.14	ppb v/v			10/06/14 22:27	1.63
Ethylbenzene	**0.12**	**J**	0.65	0.10	ppb v/v			10/06/14 22:27	1.63
4-Ethyltoluene	ND		0.65	0.30	ppb v/v			10/06/14 22:27	1.63
Hexachlorobutadiene	ND		3.3	0.70	ppb v/v			10/06/14 22:27	1.63
2-Hexanone	ND		0.65	0.14	ppb v/v			10/06/14 22:27	1.63
4-Methyl-2-pentanone (MIBK)	ND		0.65	0.22	ppb v/v			10/06/14 22:27	1.63
Methylene Chloride	**0.26**	**J**	0.65	0.12	ppb v/v			10/06/14 22:27	1.63
Styrene	ND		0.65	0.096	ppb v/v			10/06/14 22:27	1.63
1,1,2,2-Tetrachloroethane	ND		0.65	0.11	ppb v/v			10/06/14 22:27	1.63
Toluene	**2.3**		0.65	0.083	ppb v/v			10/06/14 22:27	1.63
1,1,2-Trichloro-1,2,2-trifluoroethane	**30**		0.65	0.27	ppb v/v			10/06/14 22:27	1.63
1,2,4-Trichlorobenzene	ND		3.3	0.71	ppb v/v			10/06/14 22:27	1.63
1,1,1-Trichloroethane	**0.39**	**J**	0.49	0.11	ppb v/v			10/06/14 22:27	1.63
1,1,2-Trichloroethane	ND		0.65	0.11	ppb v/v			10/06/14 22:27	1.63
Trichloroethene	**75**		0.65	0.17	ppb v/v			10/06/14 22:27	1.63
Trichlorofluoromethane	**6.0**		0.65	0.32	ppb v/v			10/06/14 22:27	1.63
1,2,4-Trimethylbenzene	**0.42**	**J**	1.3	0.26	ppb v/v			10/06/14 22:27	1.63
1,3,5-Trimethylbenzene	ND		0.65	0.20	ppb v/v			10/06/14 22:27	1.63
Vinyl acetate	ND		1.3	0.24	ppb v/v			10/06/14 22:27	1.63
Vinyl chloride	ND		0.65	0.20	ppb v/v			10/06/14 22:27	1.63
m,p-Xylene	**0.29**	**J**	1.3	0.16	ppb v/v			10/06/14 22:27	1.63

Client Sample ID: 096526-001/MWL-SV04-400
Lab Sample ID: 320-9478-17

Date Collected: 09/11/14 10:08
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	0.14	J	0.65	0.088	ppb v/v			10/06/14 22:27	1.63

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*		*10/06/14 22:27*	*1.63*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*		*10/06/14 22:27*	*1.63*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/06/14 22:27*	*1.63*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	110		1.3	0.17	ppb v/v			10/07/14 18:05	3.25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*10/07/14 18:05*	*3.25*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 130*		*10/07/14 18:05*	*3.25*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/07/14 18:05*	*3.25*

Client Sample ID: 096527-001/MWL-FB4
Lab Sample ID: 320-9478-18

Date Collected: 09/11/14 09:42
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.87	J B	6.5	0.23	ppb v/v			10/06/14 23:25	1.29
Benzene	0.43	J	0.52	0.10	ppb v/v			10/06/14 23:25	1.29
Benzyl chloride	ND		1.0	0.21	ppb v/v			10/06/14 23:25	1.29
Bromodichloromethane	ND		0.39	0.085	ppb v/v			10/06/14 23:25	1.29
Bromoform	ND		0.52	0.090	ppb v/v			10/06/14 23:25	1.29
Bromomethane	ND		1.0	0.43	ppb v/v			10/06/14 23:25	1.29
2-Butanone (MEK)	ND		1.0	0.26	ppb v/v			10/06/14 23:25	1.29
Carbon disulfide	ND		1.0	0.10	ppb v/v			10/06/14 23:25	1.29
Carbon tetrachloride	ND		1.0	0.083	ppb v/v			10/06/14 23:25	1.29
Chlorobenzene	ND		0.39	0.083	ppb v/v			10/06/14 23:25	1.29
Chloroethane	ND		1.0	0.40	ppb v/v			10/06/14 23:25	1.29
Chloroform	ND		0.39	0.12	ppb v/v			10/06/14 23:25	1.29
Chloromethane	ND		1.0	0.25	ppb v/v			10/06/14 23:25	1.29
Dibromochloromethane	ND		0.52	0.10	ppb v/v			10/06/14 23:25	1.29
1,2-Dibromoethane (EDB)	ND		1.0	0.097	ppb v/v			10/06/14 23:25	1.29
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.52	0.20	ppb v/v			10/06/14 23:25	1.29
1,2-Dichlorobenzene	ND		0.52	0.17	ppb v/v			10/06/14 23:25	1.29
1,3-Dichlorobenzene	ND		0.52	0.14	ppb v/v			10/06/14 23:25	1.29
1,4-Dichlorobenzene	ND		0.52	0.19	ppb v/v			10/06/14 23:25	1.29
Dichlorodifluoromethane	ND		0.52	0.19	ppb v/v			10/06/14 23:25	1.29
1,1-Dichloroethane	ND		0.39	0.093	ppb v/v			10/06/14 23:25	1.29
1,2-Dichloroethane	ND		1.0	0.11	ppb v/v			10/06/14 23:25	1.29
1,1-Dichloroethene	ND		1.0	0.17	ppb v/v			10/06/14 23:25	1.29
cis-1,2-Dichloroethene	ND		0.52	0.11	ppb v/v			10/06/14 23:25	1.29
trans-1,2-Dichloroethene	ND		0.52	0.13	ppb v/v			10/06/14 23:25	1.29
1,2-Dichloropropane	ND		0.52	0.31	ppb v/v			10/06/14 23:25	1.29

Client Sample ID: 096527-001/MWL-FB4

Lab Sample ID: 320-9478-18

Date Collected: 09/11/14 09:42

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		0.52	0.13	ppb v/v			10/06/14 23:25	1.29
trans-1,3-Dichloropropene	ND		0.52	0.11	ppb v/v			10/06/14 23:25	1.29
Ethylbenzene	ND		0.52	0.081	ppb v/v			10/06/14 23:25	1.29
4-Ethyltoluene	ND		0.52	0.24	ppb v/v			10/06/14 23:25	1.29
Hexachlorobutadiene	ND		2.6	0.56	ppb v/v			10/06/14 23:25	1.29
2-Hexanone	ND		0.52	0.11	ppb v/v			10/06/14 23:25	1.29
4-Methyl-2-pentanone (MIBK)	ND		0.52	0.17	ppb v/v			10/06/14 23:25	1.29
Methylene Chloride	ND		0.52	0.093	ppb v/v			10/06/14 23:25	1.29
Styrene	ND		0.52	0.076	ppb v/v			10/06/14 23:25	1.29
1,1,2,2-Tetrachloroethane	ND		0.52	0.089	ppb v/v			10/06/14 23:25	1.29
Tetrachloroethene	ND		0.52	0.066	ppb v/v			10/06/14 23:25	1.29
Toluene	**0.10**	**J**	0.52	0.066	ppb v/v			10/06/14 23:25	1.29
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.52	0.21	ppb v/v			10/06/14 23:25	1.29
1,2,4-Trichlorobenzene	ND		2.6	0.56	ppb v/v			10/06/14 23:25	1.29
1,1,1-Trichloroethane	ND		0.39	0.084	ppb v/v			10/06/14 23:25	1.29
1,1,2-Trichloroethane	ND		0.52	0.086	ppb v/v			10/06/14 23:25	1.29
Trichloroethene	ND		0.52	0.14	ppb v/v			10/06/14 23:25	1.29
Trichlorofluoromethane	ND		0.52	0.25	ppb v/v			10/06/14 23:25	1.29
1,2,4-Trimethylbenzene	ND		1.0	0.21	ppb v/v			10/06/14 23:25	1.29
1,3,5-Trimethylbenzene	ND		0.52	0.16	ppb v/v			10/06/14 23:25	1.29
Vinyl acetate	ND		1.0	0.19	ppb v/v			10/06/14 23:25	1.29
Vinyl chloride	ND		0.52	0.15	ppb v/v			10/06/14 23:25	1.29
m,p-Xylene	ND		1.0	0.13	ppb v/v			10/06/14 23:25	1.29
o-Xylene	ND		0.52	0.070	ppb v/v			10/06/14 23:25	1.29

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*82*		*70 - 130*		*10/06/14 23:25*	*1.29*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*		*10/06/14 23:25*	*1.29*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/06/14 23:25*	*1.29*

Client Sample ID: 096528-001/MWL-SV05-50

Lab Sample ID: 320-9478-19

Date Collected: 09/11/14 10:32

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**12**	**B**	6.8	0.24	ppb v/v			10/07/14 00:25	1.35
Benzene	**0.68**		0.54	0.11	ppb v/v			10/07/14 00:25	1.35
Benzyl chloride	ND		1.1	0.22	ppb v/v			10/07/14 00:25	1.35
Bromodichloromethane	ND		0.41	0.089	ppb v/v			10/07/14 00:25	1.35
Bromoform	ND		0.54	0.095	ppb v/v			10/07/14 00:25	1.35
Bromomethane	ND		1.1	0.45	ppb v/v			10/07/14 00:25	1.35
2-Butanone (MEK)	**1.9**		1.1	0.27	ppb v/v			10/07/14 00:25	1.35
Carbon disulfide	**0.21**	**J**	1.1	0.11	ppb v/v			10/07/14 00:25	1.35
Carbon tetrachloride	**0.39**	**J**	1.1	0.086	ppb v/v			10/07/14 00:25	1.35
Chlorobenzene	ND		0.41	0.086	ppb v/v			10/07/14 00:25	1.35
Chloroethane	ND		1.1	0.42	ppb v/v			10/07/14 00:25	1.35
Chloroform	**1.5**		0.41	0.13	ppb v/v			10/07/14 00:25	1.35

Client Sample ID: 096528-001/MWL-SV05-50
Date Collected: 09/11/14 10:32
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-9478-19
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		1.1	0.27	ppb v/v			10/07/14 00:25	1.35
Dibromochloromethane	ND		0.54	0.11	ppb v/v			10/07/14 00:25	1.35
1,2-Dibromoethane (EDB)	ND		1.1	0.10	ppb v/v			10/07/14 00:25	1.35
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.54	0.21	ppb v/v			10/07/14 00:25	1.35
1,2-Dichlorobenzene	ND		0.54	0.18	ppb v/v			10/07/14 00:25	1.35
1,3-Dichlorobenzene	ND		0.54	0.15	ppb v/v			10/07/14 00:25	1.35
1,4-Dichlorobenzene	ND		0.54	0.20	ppb v/v			10/07/14 00:25	1.35
Dichlorodifluoromethane	**45**		0.54	0.20	ppb v/v			10/07/14 00:25	1.35
1,1-Dichloroethane	**1.8**		0.41	0.097	ppb v/v			10/07/14 00:25	1.35
1,2-Dichloroethane	ND		1.1	0.12	ppb v/v			10/07/14 00:25	1.35
1,1-Dichloroethene	**11**		1.1	0.17	ppb v/v			10/07/14 00:25	1.35
cis-1,2-Dichloroethene	**0.71**		0.54	0.12	ppb v/v			10/07/14 00:25	1.35
trans-1,2-Dichloroethene	ND		0.54	0.14	ppb v/v			10/07/14 00:25	1.35
1,2-Dichloropropane	ND		0.54	0.32	ppb v/v			10/07/14 00:25	1.35
cis-1,3-Dichloropropene	ND		0.54	0.14	ppb v/v			10/07/14 00:25	1.35
trans-1,3-Dichloropropene	ND		0.54	0.12	ppb v/v			10/07/14 00:25	1.35
Ethylbenzene	ND		0.54	0.085	ppb v/v			10/07/14 00:25	1.35
4-Ethyltoluene	ND		0.54	0.25	ppb v/v			10/07/14 00:25	1.35
Hexachlorobutadiene	ND		2.7	0.58	ppb v/v			10/07/14 00:25	1.35
2-Hexanone	**0.15**	**J**	0.54	0.12	ppb v/v			10/07/14 00:25	1.35
4-Methyl-2-pentanone (MIBK)	ND		0.54	0.18	ppb v/v			10/07/14 00:25	1.35
Methylene Chloride	**0.31**	**J**	0.54	0.097	ppb v/v			10/07/14 00:25	1.35
Styrene	ND		0.54	0.080	ppb v/v			10/07/14 00:25	1.35
1,1,2,2-Tetrachloroethane	ND		0.54	0.093	ppb v/v			10/07/14 00:25	1.35
Tetrachloroethene	**52**		0.54	0.069	ppb v/v			10/07/14 00:25	1.35
Toluene	**1.5**		0.54	0.069	ppb v/v			10/07/14 00:25	1.35
1,1,2-Trichloro-1,2,2-trifluoroethane	**47**		0.54	0.22	ppb v/v			10/07/14 00:25	1.35
1,2,4-Trichlorobenzene	ND		2.7	0.58	ppb v/v			10/07/14 00:25	1.35
1,1,1-Trichloroethane	**13**		0.41	0.088	ppb v/v			10/07/14 00:25	1.35
1,1,2-Trichloroethane	ND		0.54	0.090	ppb v/v			10/07/14 00:25	1.35
Trichloroethene	**67**		0.54	0.14	ppb v/v			10/07/14 00:25	1.35
1,2,4-Trimethylbenzene	ND		1.1	0.22	ppb v/v			10/07/14 00:25	1.35
1,3,5-Trimethylbenzene	ND		0.54	0.17	ppb v/v			10/07/14 00:25	1.35
Vinyl acetate	ND		1.1	0.20	ppb v/v			10/07/14 00:25	1.35
Vinyl chloride	ND		0.54	0.16	ppb v/v			10/07/14 00:25	1.35
m,p-Xylene	ND		1.1	0.14	ppb v/v			10/07/14 00:25	1.35
o-Xylene	ND		0.54	0.073	ppb v/v			10/07/14 00:25	1.35

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*10/07/14 00:25*	*1.35*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 130*		*10/07/14 00:25*	*1.35*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/07/14 00:25*	*1.35*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	**110**		1.1	0.53	ppb v/v			10/07/14 19:01	2.71

Client Sample ID: 096528-001/MWL-SV05-50

Lab Sample ID: 320-9478-19

Date Collected: 09/11/14 10:32

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		70 - 130		10/07/14 19:01	2.71
1,2-Dichloroethane-d4 (Surr)	90		70 - 130		10/07/14 19:01	2.71
Toluene-d8 (Surr)	97		70 - 130		10/07/14 19:01	2.71

Client Sample ID: 096529-001/MWL-SV05-100

Lab Sample ID: 320-9478-20

Date Collected: 09/11/14 10:37

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 3L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**5.2**	**J B**	11	0.38	ppb v/v			10/07/14 01:24	2.15
Benzene	**0.56**	**J**	0.86	0.17	ppb v/v			10/07/14 01:24	2.15
Benzyl chloride	ND		1.7	0.35	ppb v/v			10/07/14 01:24	2.15
Bromodichloromethane	ND		0.65	0.14	ppb v/v			10/07/14 01:24	2.15
Bromoform	ND		0.86	0.15	ppb v/v			10/07/14 01:24	2.15
Bromomethane	ND		1.7	0.72	ppb v/v			10/07/14 01:24	2.15
2-Butanone (MEK)	**1.0**	**J**	1.7	0.43	ppb v/v			10/07/14 01:24	2.15
Carbon disulfide	**0.26**	**J**	1.7	0.17	ppb v/v			10/07/14 01:24	2.15
Carbon tetrachloride	**0.70**	**J**	1.7	0.14	ppb v/v			10/07/14 01:24	2.15
Chlorobenzene	ND		0.65	0.14	ppb v/v			10/07/14 01:24	2.15
Chloroethane	ND		1.7	0.66	ppb v/v			10/07/14 01:24	2.15
Chloroform	**2.1**		0.65	0.20	ppb v/v			10/07/14 01:24	2.15
Chloromethane	ND		1.7	0.42	ppb v/v			10/07/14 01:24	2.15
Dibromochloromethane	ND		0.86	0.17	ppb v/v			10/07/14 01:24	2.15
1,2-Dibromoethane (EDB)	ND		1.7	0.16	ppb v/v			10/07/14 01:24	2.15
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.86	0.33	ppb v/v			10/07/14 01:24	2.15
1,2-Dichlorobenzene	ND		0.86	0.28	ppb v/v			10/07/14 01:24	2.15
1,3-Dichlorobenzene	ND		0.86	0.24	ppb v/v			10/07/14 01:24	2.15
1,4-Dichlorobenzene	ND		0.86	0.32	ppb v/v			10/07/14 01:24	2.15
Dichlorodifluoromethane	**66**		0.86	0.31	ppb v/v			10/07/14 01:24	2.15
1,1-Dichloroethane	**3.4**		0.65	0.15	ppb v/v			10/07/14 01:24	2.15
1,2-Dichloroethane	ND		1.7	0.19	ppb v/v			10/07/14 01:24	2.15
1,1-Dichloroethene	**23**		1.7	0.28	ppb v/v			10/07/14 01:24	2.15
cis-1,2-Dichloroethene	**1.6**		0.86	0.19	ppb v/v			10/07/14 01:24	2.15
trans-1,2-Dichloroethene	ND		0.86	0.22	ppb v/v			10/07/14 01:24	2.15
1,2-Dichloropropane	ND		0.86	0.52	ppb v/v			10/07/14 01:24	2.15
cis-1,3-Dichloropropene	ND		0.86	0.22	ppb v/v			10/07/14 01:24	2.15
trans-1,3-Dichloropropene	ND		0.86	0.19	ppb v/v			10/07/14 01:24	2.15
Ethylbenzene	ND		0.86	0.14	ppb v/v			10/07/14 01:24	2.15
4-Ethyltoluene	ND		0.86	0.40	ppb v/v			10/07/14 01:24	2.15
Hexachlorobutadiene	ND		4.3	0.93	ppb v/v			10/07/14 01:24	2.15
2-Hexanone	ND		0.86	0.19	ppb v/v			10/07/14 01:24	2.15
4-Methyl-2-pentanone (MIBK)	ND		0.86	0.29	ppb v/v			10/07/14 01:24	2.15
Methylene Chloride	**0.92**		0.86	0.15	ppb v/v			10/07/14 01:24	2.15
Styrene	ND		0.86	0.13	ppb v/v			10/07/14 01:24	2.15
1,1,2,2-Tetrachloroethane	ND		0.86	0.15	ppb v/v			10/07/14 01:24	2.15
Tetrachloroethene	**92**		0.86	0.11	ppb v/v			10/07/14 01:24	2.15
Toluene	**1.8**		0.86	0.11	ppb v/v			10/07/14 01:24	2.15

Client Sample ID: 096529-001/MWL-SV05-100

Lab Sample ID: 320-9478-20

Date Collected: 09/11/14 10:37

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 3L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloro-1,2,2-trifluoroethane	**91**		0.86	0.35	ppb v/v			10/07/14 01:24	2.15
1,2,4-Trichlorobenzene	ND		4.3	0.93	ppb v/v			10/07/14 01:24	2.15
1,1,1-Trichloroethane	**12**		0.65	0.14	ppb v/v			10/07/14 01:24	2.15
1,1,2-Trichloroethane	ND		0.86	0.14	ppb v/v			10/07/14 01:24	2.15
Trichlorofluoromethane	**130**		0.86	0.42	ppb v/v			10/07/14 01:24	2.15
1,2,4-Trimethylbenzene	ND		1.7	0.35	ppb v/v			10/07/14 01:24	2.15
1,3,5-Trimethylbenzene	ND		0.86	0.27	ppb v/v			10/07/14 01:24	2.15
Vinyl acetate	ND		1.7	0.31	ppb v/v			10/07/14 01:24	2.15
Vinyl chloride	ND		0.86	0.26	ppb v/v			10/07/14 01:24	2.15
m,p-Xylene	ND		1.7	0.22	ppb v/v			10/07/14 01:24	2.15
o-Xylene	ND		0.86	0.12	ppb v/v			10/07/14 01:24	2.15

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*10/07/14 01:24*	*2.15*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 130*		*10/07/14 01:24*	*2.15*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/07/14 01:24*	*2.15*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	**140**		1.7	0.45	ppb v/v			10/07/14 19:58	4.3

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*10/07/14 19:58*	*4.3*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 130*		*10/07/14 19:58*	*4.3*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/07/14 19:58*	*4.3*

Client Sample ID: 096530-001/MWL-SV05-200

Lab Sample ID: 320-9478-21

Date Collected: 09/11/14 10:40

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**8.3**	**J B**	13	0.45	ppb v/v			10/07/14 02:23	2.51
Benzene	**0.34**	**J**	1.0	0.20	ppb v/v			10/07/14 02:23	2.51
Benzyl chloride	ND		2.0	0.41	ppb v/v			10/07/14 02:23	2.51
Bromodichloromethane	ND		0.75	0.17	ppb v/v			10/07/14 02:23	2.51
Bromoform	ND		1.0	0.18	ppb v/v			10/07/14 02:23	2.51
Bromomethane	ND		2.0	0.84	ppb v/v			10/07/14 02:23	2.51
2-Butanone (MEK)	**1.8**	**J**	2.0	0.50	ppb v/v			10/07/14 02:23	2.51
Carbon disulfide	**0.27**	**J**	2.0	0.20	ppb v/v			10/07/14 02:23	2.51
Carbon tetrachloride	**1.2**	**J**	2.0	0.16	ppb v/v			10/07/14 02:23	2.51
Chlorobenzene	ND		0.75	0.16	ppb v/v			10/07/14 02:23	2.51
Chloroethane	ND		2.0	0.77	ppb v/v			10/07/14 02:23	2.51
Chloroform	**1.9**		0.75	0.24	ppb v/v			10/07/14 02:23	2.51
Chloromethane	ND		2.0	0.49	ppb v/v			10/07/14 02:23	2.51
Dibromochloromethane	ND		1.0	0.20	ppb v/v			10/07/14 02:23	2.51
1,2-Dibromoethane (EDB)	ND		2.0	0.19	ppb v/v			10/07/14 02:23	2.51
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.0	0.39	ppb v/v			10/07/14 02:23	2.51

Client Sample ID: 096530-001/MWL-SV05-200
Date Collected: 09/11/14 10:40
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-9478-21
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		1.0	0.33	ppb v/v			10/07/14 02:23	2.51
1,3-Dichlorobenzene	ND		1.0	0.28	ppb v/v			10/07/14 02:23	2.51
1,4-Dichlorobenzene	ND		1.0	0.37	ppb v/v			10/07/14 02:23	2.51
Dichlorodifluoromethane	**66**		1.0	0.36	ppb v/v			10/07/14 02:23	2.51
1,1-Dichloroethane	**4.9**		0.75	0.18	ppb v/v			10/07/14 02:23	2.51
1,2-Dichloroethane	ND		2.0	0.22	ppb v/v			10/07/14 02:23	2.51
1,1-Dichloroethene	**42**		2.0	0.32	ppb v/v			10/07/14 02:23	2.51
cis-1,2-Dichloroethene	**2.3**		1.0	0.22	ppb v/v			10/07/14 02:23	2.51
trans-1,2-Dichloroethene	ND		1.0	0.25	ppb v/v			10/07/14 02:23	2.51
1,2-Dichloropropane	ND		1.0	0.60	ppb v/v			10/07/14 02:23	2.51
cis-1,3-Dichloropropene	ND		1.0	0.26	ppb v/v			10/07/14 02:23	2.51
trans-1,3-Dichloropropene	ND		1.0	0.22	ppb v/v			10/07/14 02:23	2.51
Ethylbenzene	ND		1.0	0.16	ppb v/v			10/07/14 02:23	2.51
4-Ethyltoluene	ND		1.0	0.47	ppb v/v			10/07/14 02:23	2.51
Hexachlorobutadiene	ND		5.0	1.1	ppb v/v			10/07/14 02:23	2.51
2-Hexanone	ND		1.0	0.22	ppb v/v			10/07/14 02:23	2.51
4-Methyl-2-pentanone (MIBK)	ND		1.0	0.34	ppb v/v			10/07/14 02:23	2.51
Methylene Chloride	**2.5**		1.0	0.18	ppb v/v			10/07/14 02:23	2.51
Styrene	ND		1.0	0.15	ppb v/v			10/07/14 02:23	2.51
1,1,2,2-Tetrachloroethane	ND		1.0	0.17	ppb v/v			10/07/14 02:23	2.51
Tetrachloroethene	**140**		1.0	0.13	ppb v/v			10/07/14 02:23	2.51
Toluene	**4.2**		1.0	0.13	ppb v/v			10/07/14 02:23	2.51
1,2,4-Trichlorobenzene	ND		5.0	1.1	ppb v/v			10/07/14 02:23	2.51
1,1,1-Trichloroethane	**3.3**		0.75	0.16	ppb v/v			10/07/14 02:23	2.51
1,1,2-Trichloroethane	ND		1.0	0.17	ppb v/v			10/07/14 02:23	2.51
Trichlorofluoromethane	**72**		1.0	0.49	ppb v/v			10/07/14 02:23	2.51
1,2,4-Trimethylbenzene	ND		2.0	0.41	ppb v/v			10/07/14 02:23	2.51
1,3,5-Trimethylbenzene	ND		1.0	0.31	ppb v/v			10/07/14 02:23	2.51
Vinyl acetate	ND		2.0	0.36	ppb v/v			10/07/14 02:23	2.51
Vinyl chloride	ND		1.0	0.30	ppb v/v			10/07/14 02:23	2.51
m,p-Xylene	ND		2.0	0.25	ppb v/v			10/07/14 02:23	2.51
o-Xylene	ND		1.0	0.14	ppb v/v			10/07/14 02:23	2.51

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*10/07/14 02:23*	*2.51*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 130*		*10/07/14 02:23*	*2.51*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/07/14 02:23*	*2.51*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloro-1,2,2-trifluoroethane	**160**		2.0	0.82	ppb v/v			10/07/14 20:51	5.03
Trichloroethene	**200**		2.0	0.53	ppb v/v			10/07/14 20:51	5.03

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*10/07/14 20:51*	*5.03*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 130*		*10/07/14 20:51*	*5.03*
Toluene-d8 (Surr)	*93*		*70 - 130*		*10/07/14 20:51*	*5.03*

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-9478-1

Client Sample ID: 096531-001/MWL-SV05-300
Lab Sample ID: 320-9478-22
Date Collected: 09/11/14 10:44
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**13**	**B**	7.5	0.27	ppb v/v			10/07/14 03:22	1.5
Benzene	**0.53**	**J**	0.60	0.12	ppb v/v			10/07/14 03:22	1.5
Benzyl chloride	ND		1.2	0.24	ppb v/v			10/07/14 03:22	1.5
Bromodichloromethane	ND		0.45	0.099	ppb v/v			10/07/14 03:22	1.5
Bromoform	ND		0.60	0.11	ppb v/v			10/07/14 03:22	1.5
Bromomethane	ND		1.2	0.50	ppb v/v			10/07/14 03:22	1.5
2-Butanone (MEK)	**2.0**		1.2	0.30	ppb v/v			10/07/14 03:22	1.5
Carbon disulfide	**3.1**		1.2	0.12	ppb v/v			10/07/14 03:22	1.5
Carbon tetrachloride	**0.87**	**J**	1.2	0.096	ppb v/v			10/07/14 03:22	1.5
Chlorobenzene	ND		0.45	0.096	ppb v/v			10/07/14 03:22	1.5
Chloroethane	ND		1.2	0.46	ppb v/v			10/07/14 03:22	1.5
Chloroform	**0.61**		0.45	0.14	ppb v/v			10/07/14 03:22	1.5
Chloromethane	**0.51**	**J**	1.2	0.30	ppb v/v			10/07/14 03:22	1.5
Dibromochloromethane	ND		0.60	0.12	ppb v/v			10/07/14 03:22	1.5
1,2-Dibromoethane (EDB)	ND		1.2	0.11	ppb v/v			10/07/14 03:22	1.5
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.60	0.23	ppb v/v			10/07/14 03:22	1.5
1,2-Dichlorobenzene	ND		0.60	0.20	ppb v/v			10/07/14 03:22	1.5
1,3-Dichlorobenzene	ND		0.60	0.17	ppb v/v			10/07/14 03:22	1.5
1,4-Dichlorobenzene	ND		0.60	0.22	ppb v/v			10/07/14 03:22	1.5
Dichlorodifluoromethane	**24**		0.60	0.22	ppb v/v			10/07/14 03:22	1.5
1,1-Dichloroethane	**1.2**		0.45	0.11	ppb v/v			10/07/14 03:22	1.5
1,2-Dichloroethane	ND		1.2	0.13	ppb v/v			10/07/14 03:22	1.5
1,1-Dichloroethene	**20**		1.2	0.19	ppb v/v			10/07/14 03:22	1.5
cis-1,2-Dichloroethene	**0.89**		0.60	0.13	ppb v/v			10/07/14 03:22	1.5
trans-1,2-Dichloroethene	ND		0.60	0.15	ppb v/v			10/07/14 03:22	1.5
1,2-Dichloropropane	ND		0.60	0.36	ppb v/v			10/07/14 03:22	1.5
cis-1,3-Dichloropropene	ND		0.60	0.16	ppb v/v			10/07/14 03:22	1.5
trans-1,3-Dichloropropene	ND		0.60	0.13	ppb v/v			10/07/14 03:22	1.5
Ethylbenzene	ND		0.60	0.095	ppb v/v			10/07/14 03:22	1.5
4-Ethyltoluene	ND		0.60	0.28	ppb v/v			10/07/14 03:22	1.5
Hexachlorobutadiene	ND		3.0	0.65	ppb v/v			10/07/14 03:22	1.5
2-Hexanone	**0.13**	**J**	0.60	0.13	ppb v/v			10/07/14 03:22	1.5
4-Methyl-2-pentanone (MIBK)	ND		0.60	0.20	ppb v/v			10/07/14 03:22	1.5
Methylene Chloride	**0.72**		0.60	0.11	ppb v/v			10/07/14 03:22	1.5
Styrene	ND		0.60	0.089	ppb v/v			10/07/14 03:22	1.5
1,1,2,2-Tetrachloroethane	ND		0.60	0.10	ppb v/v			10/07/14 03:22	1.5
Tetrachloroethene	**90**		0.60	0.077	ppb v/v			10/07/14 03:22	1.5
Toluene	**6.1**		0.60	0.077	ppb v/v			10/07/14 03:22	1.5
1,1,2-Trichloro-1,2,2-trifluoroethane	**73**		0.60	0.24	ppb v/v			10/07/14 03:22	1.5
1,2,4-Trichlorobenzene	ND		3.0	0.65	ppb v/v			10/07/14 03:22	1.5
1,1,1-Trichloroethane	**0.90**		0.45	0.098	ppb v/v			10/07/14 03:22	1.5
1,1,2-Trichloroethane	ND		0.60	0.10	ppb v/v			10/07/14 03:22	1.5
Trichlorofluoromethane	**19**		0.60	0.29	ppb v/v			10/07/14 03:22	1.5
1,2,4-Trimethylbenzene	ND		1.2	0.24	ppb v/v			10/07/14 03:22	1.5
1,3,5-Trimethylbenzene	ND		0.60	0.19	ppb v/v			10/07/14 03:22	1.5
Vinyl acetate	ND		1.2	0.22	ppb v/v			10/07/14 03:22	1.5
Vinyl chloride	ND		0.60	0.18	ppb v/v			10/07/14 03:22	1.5
m,p-Xylene	**0.16**	**J**	1.2	0.15	ppb v/v			10/07/14 03:22	1.5

Client Sample ID: 096531-001/MWL-SV05-300

Lab Sample ID: 320-9478-22

Date Collected: 09/11/14 10:44

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	0.085	J	0.60	0.081	ppb v/v			10/07/14 03:22	1.5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*70 - 130*		*10/07/14 03:22*	*1.5*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 130*		*10/07/14 03:22*	*1.5*
Toluene-d8 (Surr)	*96*		*70 - 130*		*10/07/14 03:22*	*1.5*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	100		1.2	0.32	ppb v/v			10/07/14 21:48	3

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*10/07/14 21:48*	*3*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 130*		*10/07/14 21:48*	*3*
Toluene-d8 (Surr)	*98*		*70 - 130*		*10/07/14 21:48*	*3*

Client Sample ID: 096532-001/MWL-SV05-400

Lab Sample ID: 320-9478-23

Date Collected: 09/11/14 10:50

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	14	J B	15	0.52	ppb v/v			10/07/14 04:19	2.94
Benzene	0.99	J	1.2	0.23	ppb v/v			10/07/14 04:19	2.94
Benzyl chloride	ND		2.4	0.48	ppb v/v			10/07/14 04:19	2.94
Bromodichloromethane	ND		0.88	0.19	ppb v/v			10/07/14 04:19	2.94
Bromoform	ND		1.2	0.21	ppb v/v			10/07/14 04:19	2.94
Bromomethane	ND		2.4	0.98	ppb v/v			10/07/14 04:19	2.94
2-Butanone (MEK)	2.2	J	2.4	0.59	ppb v/v			10/07/14 04:19	2.94
Carbon disulfide	1.2	J	2.4	0.23	ppb v/v			10/07/14 04:19	2.94
Carbon tetrachloride	0.49	J	2.4	0.19	ppb v/v			10/07/14 04:19	2.94
Chlorobenzene	ND		0.88	0.19	ppb v/v			10/07/14 04:19	2.94
Chloroethane	ND		2.4	0.91	ppb v/v			10/07/14 04:19	2.94
Chloroform	0.54	J	0.88	0.28	ppb v/v			10/07/14 04:19	2.94
Chloromethane	1.7	J	2.4	0.58	ppb v/v			10/07/14 04:19	2.94
Dibromochloromethane	ND		1.2	0.23	ppb v/v			10/07/14 04:19	2.94
1,2-Dibromoethane (EDB)	ND		2.4	0.22	ppb v/v			10/07/14 04:19	2.94
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.2	0.46	ppb v/v			10/07/14 04:19	2.94
1,2-Dichlorobenzene	ND		1.2	0.38	ppb v/v			10/07/14 04:19	2.94
1,3-Dichlorobenzene	ND		1.2	0.32	ppb v/v			10/07/14 04:19	2.94
1,4-Dichlorobenzene	ND		1.2	0.44	ppb v/v			10/07/14 04:19	2.94
Dichlorodifluoromethane	15		1.2	0.43	ppb v/v			10/07/14 04:19	2.94
1,1-Dichloroethane	1.2		0.88	0.21	ppb v/v			10/07/14 04:19	2.94
1,2-Dichloroethane	ND		2.4	0.26	ppb v/v			10/07/14 04:19	2.94
1,1-Dichloroethene	14		2.4	0.38	ppb v/v			10/07/14 04:19	2.94
cis-1,2-Dichloroethene	0.82	J	1.2	0.26	ppb v/v			10/07/14 04:19	2.94
trans-1,2-Dichloroethene	ND		1.2	0.29	ppb v/v			10/07/14 04:19	2.94
1,2-Dichloropropane	ND		1.2	0.71	ppb v/v			10/07/14 04:19	2.94

Client Sample ID: 096532-001/MWL-SV05-400

Lab Sample ID: 320-9478-23

Date Collected: 09/11/14 10:50

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		1.2	0.31	ppb v/v			10/07/14 04:19	2.94
trans-1,3-Dichloropropene	ND		1.2	0.26	ppb v/v			10/07/14 04:19	2.94
Ethylbenzene	ND		1.2	0.19	ppb v/v			10/07/14 04:19	2.94
4-Ethyltoluene	ND		1.2	0.55	ppb v/v			10/07/14 04:19	2.94
Hexachlorobutadiene	ND		5.9	1.3	ppb v/v			10/07/14 04:19	2.94
2-Hexanone	ND		1.2	0.26	ppb v/v			10/07/14 04:19	2.94
4-Methyl-2-pentanone (MIBK)	ND		1.2	0.40	ppb v/v			10/07/14 04:19	2.94
Methylene Chloride	**0.71**	**J**	1.2	0.21	ppb v/v			10/07/14 04:19	2.94
Styrene	ND		1.2	0.17	ppb v/v			10/07/14 04:19	2.94
1,1,2,2-Tetrachloroethane	ND		1.2	0.20	ppb v/v			10/07/14 04:19	2.94
Tetrachloroethene	**100**		1.2	0.15	ppb v/v			10/07/14 04:19	2.94
1,1,2-Trichloro-1,2,2-trifluoroethane	**40**		1.2	0.48	ppb v/v			10/07/14 04:19	2.94
1,2,4-Trichlorobenzene	ND		5.9	1.3	ppb v/v			10/07/14 04:19	2.94
1,1,1-Trichloroethane	**1.1**		0.88	0.19	ppb v/v			10/07/14 04:19	2.94
1,1,2-Trichloroethane	ND		1.2	0.20	ppb v/v			10/07/14 04:19	2.94
Trichloroethene	**94**		1.2	0.31	ppb v/v			10/07/14 04:19	2.94
Trichlorofluoromethane	**18**		1.2	0.58	ppb v/v			10/07/14 04:19	2.94
1,2,4-Trimethylbenzene	ND		2.4	0.48	ppb v/v			10/07/14 04:19	2.94
1,3,5-Trimethylbenzene	ND		1.2	0.37	ppb v/v			10/07/14 04:19	2.94
Vinyl acetate	ND		2.4	0.43	ppb v/v			10/07/14 04:19	2.94
Vinyl chloride	ND		1.2	0.35	ppb v/v			10/07/14 04:19	2.94
m,p-Xylene	ND		2.4	0.29	ppb v/v			10/07/14 04:19	2.94
o-Xylene	ND		1.2	0.16	ppb v/v			10/07/14 04:19	2.94

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*10/07/14 04:19*	*2.94*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 130*		*10/07/14 04:19*	*2.94*
Toluene-d8 (Surr)	*96*		*70 - 130*		*10/07/14 04:19*	*2.94*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	**250**		2.4	0.30	ppb v/v			10/07/14 22:44	5.88

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*10/07/14 22:44*	*5.88*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 130*		*10/07/14 22:44*	*5.88*
Toluene-d8 (Surr)	*99*		*70 - 130*		*10/07/14 22:44*	*5.88*

Client Sample ID: 096533-001/MWL-FB5

Lab Sample ID: 320-9478-24

Date Collected: 09/11/14 10:30

Matrix: Air

Date Received: 09/18/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**1.2**	**J B**	6.4	0.23	ppb v/v			10/07/14 05:20	1.28
Benzene	**0.42**	**J**	0.51	0.10	ppb v/v			10/07/14 05:20	1.28
Benzyl chloride	ND		1.0	0.21	ppb v/v			10/07/14 05:20	1.28
Bromodichloromethane	ND		0.38	0.084	ppb v/v			10/07/14 05:20	1.28

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-9478-1

Client Sample ID: 096533-001/MWL-FB5
Date Collected: 09/11/14 10:30
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-9478-24
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromoform	ND		0.51	0.090	ppb v/v			10/07/14 05:20	1.28
Bromomethane	ND		1.0	0.43	ppb v/v			10/07/14 05:20	1.28
2-Butanone (MEK)	ND		1.0	0.25	ppb v/v			10/07/14 05:20	1.28
Carbon disulfide	ND		1.0	0.10	ppb v/v			10/07/14 05:20	1.28
Carbon tetrachloride	ND		1.0	0.082	ppb v/v			10/07/14 05:20	1.28
Chlorobenzene	ND		0.38	0.082	ppb v/v			10/07/14 05:20	1.28
Chloroethane	ND		1.0	0.39	ppb v/v			10/07/14 05:20	1.28
Chloroform	ND		0.38	0.12	ppb v/v			10/07/14 05:20	1.28
Chloromethane	ND		1.0	0.25	ppb v/v			10/07/14 05:20	1.28
Dibromochloromethane	ND		0.51	0.10	ppb v/v			10/07/14 05:20	1.28
1,2-Dibromoethane (EDB)	ND		1.0	0.096	ppb v/v			10/07/14 05:20	1.28
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.51	0.20	ppb v/v			10/07/14 05:20	1.28
1,2-Dichlorobenzene	ND		0.51	0.17	ppb v/v			10/07/14 05:20	1.28
1,3-Dichlorobenzene	ND		0.51	0.14	ppb v/v			10/07/14 05:20	1.28
1,4-Dichlorobenzene	ND		0.51	0.19	ppb v/v			10/07/14 05:20	1.28
Dichlorodifluoromethane	ND		0.51	0.19	ppb v/v			10/07/14 05:20	1.28
1,1-Dichloroethane	ND		0.38	0.092	ppb v/v			10/07/14 05:20	1.28
1,2-Dichloroethane	ND		1.0	0.11	ppb v/v			10/07/14 05:20	1.28
1,1-Dichloroethene	ND		1.0	0.17	ppb v/v			10/07/14 05:20	1.28
cis-1,2-Dichloroethene	ND		0.51	0.11	ppb v/v			10/07/14 05:20	1.28
trans-1,2-Dichloroethene	ND		0.51	0.13	ppb v/v			10/07/14 05:20	1.28
1,2-Dichloropropane	ND		0.51	0.31	ppb v/v			10/07/14 05:20	1.28
cis-1,3-Dichloropropene	ND		0.51	0.13	ppb v/v			10/07/14 05:20	1.28
trans-1,3-Dichloropropene	ND		0.51	0.11	ppb v/v			10/07/14 05:20	1.28
Ethylbenzene	ND		0.51	0.081	ppb v/v			10/07/14 05:20	1.28
4-Ethyltoluene	ND		0.51	0.24	ppb v/v			10/07/14 05:20	1.28
Hexachlorobutadiene	ND		2.6	0.55	ppb v/v			10/07/14 05:20	1.28
2-Hexanone	ND		0.51	0.11	ppb v/v			10/07/14 05:20	1.28
4-Methyl-2-pentanone (MIBK)	ND		0.51	0.17	ppb v/v			10/07/14 05:20	1.28
Methylene Chloride	ND		0.51	0.092	ppb v/v			10/07/14 05:20	1.28
Styrene	ND		0.51	0.076	ppb v/v			10/07/14 05:20	1.28
1,1,2,2-Tetrachloroethane	ND		0.51	0.088	ppb v/v			10/07/14 05:20	1.28
Tetrachloroethene	ND		0.51	0.065	ppb v/v			10/07/14 05:20	1.28
Toluene	**0.11**	**J**	0.51	0.065	ppb v/v			10/07/14 05:20	1.28
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.51	0.21	ppb v/v			10/07/14 05:20	1.28
1,2,4-Trichlorobenzene	ND		2.6	0.55	ppb v/v			10/07/14 05:20	1.28
1,1,1-Trichloroethane	ND		0.38	0.083	ppb v/v			10/07/14 05:20	1.28
1,1,2-Trichloroethane	ND		0.51	0.086	ppb v/v			10/07/14 05:20	1.28
Trichloroethene	ND		0.51	0.13	ppb v/v			10/07/14 05:20	1.28
Trichlorofluoromethane	ND		0.51	0.25	ppb v/v			10/07/14 05:20	1.28
1,2,4-Trimethylbenzene	ND		1.0	0.21	ppb v/v			10/07/14 05:20	1.28
1,3,5-Trimethylbenzene	ND		0.51	0.16	ppb v/v			10/07/14 05:20	1.28
Vinyl acetate	ND		1.0	0.19	ppb v/v			10/07/14 05:20	1.28
Vinyl chloride	ND		0.51	0.15	ppb v/v			10/07/14 05:20	1.28
m,p-Xylene	ND		1.0	0.13	ppb v/v			10/07/14 05:20	1.28
o-Xylene	ND		0.51	0.069	ppb v/v			10/07/14 05:20	1.28

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*10/07/14 05:20*	*1.28*

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-9478-1

Client Sample ID: 096533-001/MWL-FB5
Lab Sample ID: 320-9478-24
Date Collected: 09/11/14 10:30
Matrix: Air
Date Received: 09/18/14 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		70 - 130		10/07/14 05:20	1.28
Toluene-d8 (Surr)	95		70 - 130		10/07/14 05:20	1.28

OCTOBER 2014 SOIL-VAPOR SAMPLING RESULTS

CERTIFICATES OF ANALYSIS

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-10172-1

Client Sample ID: 096712-001/MWL-SV01-42.5
Lab Sample ID: 320-10172-1
Date Collected: 10/22/14 08:41
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		120	4.3	ppb v/v			11/15/14 02:15	24
Benzene	ND		9.6	1.9	ppb v/v			11/15/14 02:15	24
Benzyl chloride	ND		19	3.9	ppb v/v			11/15/14 02:15	24
Bromodichloromethane	ND		7.2	1.6	ppb v/v			11/15/14 02:15	24
Bromoform	ND		9.6	1.7	ppb v/v			11/15/14 02:15	24
Bromomethane	ND		19	8.0	ppb v/v			11/15/14 02:15	24
2-Butanone (MEK)	ND		19	4.8	ppb v/v			11/15/14 02:15	24
Carbon disulfide	ND		19	1.9	ppb v/v			11/15/14 02:15	24
Carbon tetrachloride	ND		19	1.5	ppb v/v			11/15/14 02:15	24
Chlorobenzene	ND		7.2	1.5	ppb v/v			11/15/14 02:15	24
Chloroethane	ND		19	7.4	ppb v/v			11/15/14 02:15	24
Chloroform	**12**		7.2	2.3	ppb v/v			11/15/14 02:15	24
Chloromethane	ND		19	4.7	ppb v/v			11/15/14 02:15	24
Dibromochloromethane	ND		9.6	1.9	ppb v/v			11/15/14 02:15	24
1,2-Dibromoethane (EDB)	ND		19	1.8	ppb v/v			11/15/14 02:15	24
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		9.6	3.7	ppb v/v			11/15/14 02:15	24
1,2-Dichlorobenzene	ND		9.6	3.1	ppb v/v			11/15/14 02:15	24
1,3-Dichlorobenzene	ND		9.6	2.6	ppb v/v			11/15/14 02:15	24
1,4-Dichlorobenzene	ND		9.6	3.6	ppb v/v			11/15/14 02:15	24
Dichlorodifluoromethane	**110**		9.6	3.5	ppb v/v			11/15/14 02:15	24
1,1-Dichloroethane	**2.7**	**J**	7.2	1.7	ppb v/v			11/15/14 02:15	24
1,2-Dichloroethane	ND		19	2.1	ppb v/v			11/15/14 02:15	24
1,1-Dichloroethene	**10**	**J**	19	3.1	ppb v/v			11/15/14 02:15	24
cis-1,2-Dichloroethene	ND		9.6	2.1	ppb v/v			11/15/14 02:15	24
trans-1,2-Dichloroethene	ND		9.6	2.4	ppb v/v			11/15/14 02:15	24
1,2-Dichloropropane	ND		9.6	5.8	ppb v/v			11/15/14 02:15	24
cis-1,3-Dichloropropene	ND		9.6	2.5	ppb v/v			11/15/14 02:15	24
trans-1,3-Dichloropropene	ND		9.6	2.1	ppb v/v			11/15/14 02:15	24
Ethylbenzene	ND		9.6	1.5	ppb v/v			11/15/14 02:15	24
4-Ethyltoluene	ND		9.6	4.5	ppb v/v			11/15/14 02:15	24
Hexachlorobutadiene	ND		48	10	ppb v/v			11/15/14 02:15	24
2-Hexanone	ND		9.6	2.1	ppb v/v			11/15/14 02:15	24
4-Methyl-2-pentanone (MIBK)	ND		9.6	3.2	ppb v/v			11/15/14 02:15	24
Methylene Chloride	ND		9.6	1.7	ppb v/v			11/15/14 02:15	24
Styrene	ND		9.6	1.4	ppb v/v			11/15/14 02:15	24
1,1,2,2-Tetrachloroethane	ND		9.6	1.7	ppb v/v			11/15/14 02:15	24
Tetrachloroethene	**400**		9.6	1.2	ppb v/v			11/15/14 02:15	24
Toluene	ND		9.6	1.2	ppb v/v			11/15/14 02:15	24
1,1,2-Trichloro-1,2,2-trifluoroethane	**100**		9.6	3.9	ppb v/v			11/15/14 02:15	24
1,2,4-Trichlorobenzene	ND		48	10	ppb v/v			11/15/14 02:15	24
1,1,1-Trichloroethane	**54**		7.2	1.6	ppb v/v			11/15/14 02:15	24
1,1,2-Trichloroethane	ND		9.6	1.6	ppb v/v			11/15/14 02:15	24
Trichloroethene	**90**		9.6	2.5	ppb v/v			11/15/14 02:15	24
Trichlorofluoromethane	**230**		9.6	4.7	ppb v/v			11/15/14 02:15	24
1,2,4-Trimethylbenzene	ND		19	3.9	ppb v/v			11/15/14 02:15	24
1,3,5-Trimethylbenzene	ND		9.6	3.0	ppb v/v			11/15/14 02:15	24
Vinyl acetate	ND		19	3.5	ppb v/v			11/15/14 02:15	24

Client Sample ID: 096712-001/MWL-SV01-42.5

Lab Sample ID: 320-10172-1

Date Collected: 10/22/14 08:41

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		9.6	2.9	ppb v/v			11/15/14 02:15	24
m,p-Xylene	ND		19	2.4	ppb v/v			11/15/14 02:15	24
o-Xylene	ND		9.6	1.3	ppb v/v			11/15/14 02:15	24

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*70 - 130*		*11/15/14 02:15*	*24*
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 130*		*11/15/14 02:15*	*24*
Toluene-d8 (Surr)	*97*		*70 - 130*		*11/15/14 02:15*	*24*

Client Sample ID: 096713-001/MWL-SV-FB1

Lab Sample ID: 320-10172-2

Date Collected: 10/22/14 08:52

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**0.75**	**J**	5.0	0.18	ppb v/v			11/15/14 03:05	1
Benzene	ND		0.40	0.079	ppb v/v			11/15/14 03:05	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			11/15/14 03:05	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			11/15/14 03:05	1
Bromoform	ND		0.40	0.070	ppb v/v			11/15/14 03:05	1
Bromomethane	ND		0.80	0.34	ppb v/v			11/15/14 03:05	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			11/15/14 03:05	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			11/15/14 03:05	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			11/15/14 03:05	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			11/15/14 03:05	1
Chloroethane	ND		0.80	0.31	ppb v/v			11/15/14 03:05	1
Chloroform	ND		0.30	0.095	ppb v/v			11/15/14 03:05	1
Chloromethane	ND		0.80	0.20	ppb v/v			11/15/14 03:05	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			11/15/14 03:05	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			11/15/14 03:05	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			11/15/14 03:05	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			11/15/14 03:05	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			11/15/14 03:05	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			11/15/14 03:05	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			11/15/14 03:05	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			11/15/14 03:05	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			11/15/14 03:05	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			11/15/14 03:05	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			11/15/14 03:05	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			11/15/14 03:05	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			11/15/14 03:05	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			11/15/14 03:05	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			11/15/14 03:05	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			11/15/14 03:05	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			11/15/14 03:05	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			11/15/14 03:05	1
2-Hexanone	ND		0.40	0.087	ppb v/v			11/15/14 03:05	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			11/15/14 03:05	1

Client Sample ID: 096713-001/MWL-SV-FB1

Lab Sample ID: 320-10172-2

Date Collected: 10/22/14 08:52

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylene Chloride	ND		0.40	0.072	ppb v/v			11/15/14 03:05	1
Styrene	ND		0.40	0.059	ppb v/v			11/15/14 03:05	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			11/15/14 03:05	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			11/15/14 03:05	1
Toluene	**0.065**	**J**	0.40	0.051	ppb v/v			11/15/14 03:05	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			11/15/14 03:05	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			11/15/14 03:05	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			11/15/14 03:05	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			11/15/14 03:05	1
Trichloroethene	ND		0.40	0.11	ppb v/v			11/15/14 03:05	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			11/15/14 03:05	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			11/15/14 03:05	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			11/15/14 03:05	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			11/15/14 03:05	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			11/15/14 03:05	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			11/15/14 03:05	1
o-Xylene	ND		0.40	0.054	ppb v/v			11/15/14 03:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*11/15/14 03:05*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*		*11/15/14 03:05*	*1*
Toluene-d8 (Surr)	*104*		*70 - 130*		*11/15/14 03:05*	*1*

Client Sample ID: 096714-001/MWL-SV02-41.5

Lab Sample ID: 320-10172-3

Date Collected: 10/22/14 08:31

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**2.8**	**J**	45	1.6	ppb v/v			11/15/14 03:48	9.08
Benzene	ND		3.6	0.72	ppb v/v			11/15/14 03:48	9.08
Benzyl chloride	ND		7.3	1.5	ppb v/v			11/15/14 03:48	9.08
Bromodichloromethane	ND		2.7	0.60	ppb v/v			11/15/14 03:48	9.08
Bromoform	ND		3.6	0.64	ppb v/v			11/15/14 03:48	9.08
Bromomethane	ND		7.3	3.0	ppb v/v			11/15/14 03:48	9.08
2-Butanone (MEK)	ND		7.3	1.8	ppb v/v			11/15/14 03:48	9.08
Carbon disulfide	ND		7.3	0.71	ppb v/v			11/15/14 03:48	9.08
Carbon tetrachloride	ND		7.3	0.58	ppb v/v			11/15/14 03:48	9.08
Chlorobenzene	ND		2.7	0.58	ppb v/v			11/15/14 03:48	9.08
Chloroethane	ND		7.3	2.8	ppb v/v			11/15/14 03:48	9.08
Chloroform	**2.6**	**J**	2.7	0.86	ppb v/v			11/15/14 03:48	9.08
Chloromethane	ND		7.3	1.8	ppb v/v			11/15/14 03:48	9.08
Dibromochloromethane	ND		3.6	0.72	ppb v/v			11/15/14 03:48	9.08
1,2-Dibromoethane (EDB)	ND		7.3	0.68	ppb v/v			11/15/14 03:48	9.08
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		3.6	1.4	ppb v/v			11/15/14 03:48	9.08
1,2-Dichlorobenzene	ND		3.6	1.2	ppb v/v			11/15/14 03:48	9.08
1,3-Dichlorobenzene	ND		3.6	1.0	ppb v/v			11/15/14 03:48	9.08
1,4-Dichlorobenzene	ND		3.6	1.4	ppb v/v			11/15/14 03:48	9.08

Client Sample ID: 096714-001/MWL-SV02-41.5

Lab Sample ID: 320-10172-3

Date Collected: 10/22/14 08:31

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**89**		3.6	1.3	ppb v/v			11/15/14 03:48	9.08
1,1-Dichloroethane	**2.2**	**J**	2.7	0.65	ppb v/v			11/15/14 03:48	9.08
1,2-Dichloroethane	ND		7.3	0.80	ppb v/v			11/15/14 03:48	9.08
1,1-Dichloroethene	**11**		7.3	1.2	ppb v/v			11/15/14 03:48	9.08
cis-1,2-Dichloroethene	ND		3.6	0.81	ppb v/v			11/15/14 03:48	9.08
trans-1,2-Dichloroethene	ND		3.6	0.91	ppb v/v			11/15/14 03:48	9.08
1,2-Dichloropropane	ND		3.6	2.2	ppb v/v			11/15/14 03:48	9.08
cis-1,3-Dichloropropene	ND		3.6	0.94	ppb v/v			11/15/14 03:48	9.08
trans-1,3-Dichloropropene	ND		3.6	0.80	ppb v/v			11/15/14 03:48	9.08
Ethylbenzene	ND		3.6	0.57	ppb v/v			11/15/14 03:48	9.08
4-Ethyltoluene	ND		3.6	1.7	ppb v/v			11/15/14 03:48	9.08
Hexachlorobutadiene	ND		18	3.9	ppb v/v			11/15/14 03:48	9.08
2-Hexanone	ND		3.6	0.79	ppb v/v			11/15/14 03:48	9.08
4-Methyl-2-pentanone (MIBK)	ND		3.6	1.2	ppb v/v			11/15/14 03:48	9.08
Methylene Chloride	ND		3.6	0.65	ppb v/v			11/15/14 03:48	9.08
Styrene	ND		3.6	0.54	ppb v/v			11/15/14 03:48	9.08
1,1,2,2-Tetrachloroethane	ND		3.6	0.63	ppb v/v			11/15/14 03:48	9.08
Tetrachloroethene	**67**		3.6	0.46	ppb v/v			11/15/14 03:48	9.08
Toluene	ND		3.6	0.46	ppb v/v			11/15/14 03:48	9.08
1,1,2-Trichloro-1,2,2-trifluoroethane	**53**		3.6	1.5	ppb v/v			11/15/14 03:48	9.08
1,2,4-Trichlorobenzene	ND		18	3.9	ppb v/v			11/15/14 03:48	9.08
1,1,1-Trichloroethane	**76**		2.7	0.59	ppb v/v			11/15/14 03:48	9.08
1,1,2-Trichloroethane	ND		3.6	0.61	ppb v/v			11/15/14 03:48	9.08
Trichloroethene	**58**		3.6	0.95	ppb v/v			11/15/14 03:48	9.08
Trichlorofluoromethane	**320**		3.6	1.8	ppb v/v			11/15/14 03:48	9.08
1,2,4-Trimethylbenzene	ND		7.3	1.5	ppb v/v			11/15/14 03:48	9.08
1,3,5-Trimethylbenzene	ND		3.6	1.1	ppb v/v			11/15/14 03:48	9.08
Vinyl acetate	ND		7.3	1.3	ppb v/v			11/15/14 03:48	9.08
Vinyl chloride	ND		3.6	1.1	ppb v/v			11/15/14 03:48	9.08
m,p-Xylene	ND		7.3	0.91	ppb v/v			11/15/14 03:48	9.08
o-Xylene	ND		3.6	0.49	ppb v/v			11/15/14 03:48	9.08

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*70 - 130*		*11/15/14 03:48*	*9.08*
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 130*		*11/15/14 03:48*	*9.08*
Toluene-d8 (Surr)	*99*		*70 - 130*		*11/15/14 03:48*	*9.08*

Client Sample ID: 096715-001/MWL-SV-FB2

Lab Sample ID: 320-10172-4

Date Collected: 10/22/14 08:54

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**1.5**	**J**	5.0	0.18	ppb v/v			11/15/14 04:38	1
Benzene	ND		0.40	0.079	ppb v/v			11/15/14 04:38	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			11/15/14 04:38	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			11/15/14 04:38	1

Client Sample ID: 096715-001/MWL-SV-FB2
Lab Sample ID: 320-10172-4
Date Collected: 10/22/14 08:54
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromoform	ND		0.40	0.070	ppb v/v			11/15/14 04:38	1
Bromomethane	ND		0.80	0.34	ppb v/v			11/15/14 04:38	1
2-Butanone (MEK)	**0.22**	**J**	0.80	0.20	ppb v/v			11/15/14 04:38	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			11/15/14 04:38	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			11/15/14 04:38	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			11/15/14 04:38	1
Chloroethane	ND		0.80	0.31	ppb v/v			11/15/14 04:38	1
Chloroform	ND		0.30	0.095	ppb v/v			11/15/14 04:38	1
Chloromethane	ND		0.80	0.20	ppb v/v			11/15/14 04:38	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			11/15/14 04:38	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			11/15/14 04:38	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			11/15/14 04:38	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			11/15/14 04:38	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			11/15/14 04:38	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			11/15/14 04:38	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			11/15/14 04:38	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			11/15/14 04:38	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			11/15/14 04:38	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			11/15/14 04:38	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			11/15/14 04:38	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			11/15/14 04:38	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			11/15/14 04:38	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			11/15/14 04:38	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			11/15/14 04:38	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			11/15/14 04:38	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			11/15/14 04:38	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			11/15/14 04:38	1
2-Hexanone	ND		0.40	0.087	ppb v/v			11/15/14 04:38	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			11/15/14 04:38	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			11/15/14 04:38	1
Styrene	ND		0.40	0.059	ppb v/v			11/15/14 04:38	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			11/15/14 04:38	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			11/15/14 04:38	1
Toluene	ND		0.40	0.051	ppb v/v			11/15/14 04:38	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			11/15/14 04:38	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			11/15/14 04:38	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			11/15/14 04:38	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			11/15/14 04:38	1
Trichloroethene	ND		0.40	0.11	ppb v/v			11/15/14 04:38	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			11/15/14 04:38	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			11/15/14 04:38	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			11/15/14 04:38	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			11/15/14 04:38	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			11/15/14 04:38	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			11/15/14 04:38	1
o-Xylene	ND		0.40	0.054	ppb v/v			11/15/14 04:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*11/15/14 04:38*	*1*

Client Sample ID: 096715-001/MWL-SV-FB2

Lab Sample ID: 320-10172-4

Date Collected: 10/22/14 08:54
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*		*11/15/14 04:38*	*1*
Toluene-d8 (Surr)	*104*		*70 - 130*		*11/15/14 04:38*	*1*

Client Sample ID: 096716-001/MWL-SV03-50 (port 1)

Lab Sample ID: 320-10172-5

Date Collected: 10/22/14 09:16
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**5.5**	**J**	37	1.3	ppb v/v			11/16/14 02:23	7.44
Benzene	**5.0**		3.0	0.59	ppb v/v			11/16/14 02:23	7.44
Benzyl chloride	ND		6.0	1.2	ppb v/v			11/16/14 02:23	7.44
Bromodichloromethane	ND		2.2	0.49	ppb v/v			11/16/14 02:23	7.44
Bromoform	ND		3.0	0.52	ppb v/v			11/16/14 02:23	7.44
Bromomethane	ND		6.0	2.5	ppb v/v			11/16/14 02:23	7.44
2-Butanone (MEK)	ND		6.0	1.5	ppb v/v			11/16/14 02:23	7.44
Carbon disulfide	ND		6.0	0.58	ppb v/v			11/16/14 02:23	7.44
Carbon tetrachloride	ND		6.0	0.48	ppb v/v			11/16/14 02:23	7.44
Chlorobenzene	ND		2.2	0.48	ppb v/v			11/16/14 02:23	7.44
Chloroethane	ND		6.0	2.3	ppb v/v			11/16/14 02:23	7.44
Chloroform	**1.6**	**J**	2.2	0.71	ppb v/v			11/16/14 02:23	7.44
Chloromethane	ND		6.0	1.5	ppb v/v			11/16/14 02:23	7.44
Dibromochloromethane	ND		3.0	0.59	ppb v/v			11/16/14 02:23	7.44
1,2-Dibromoethane (EDB)	ND		6.0	0.56	ppb v/v			11/16/14 02:23	7.44
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		3.0	1.2	ppb v/v			11/16/14 02:23	7.44
1,2-Dichlorobenzene	ND		3.0	0.97	ppb v/v			11/16/14 02:23	7.44
1,3-Dichlorobenzene	ND		3.0	0.82	ppb v/v			11/16/14 02:23	7.44
1,4-Dichlorobenzene	ND		3.0	1.1	ppb v/v			11/16/14 02:23	7.44
Dichlorodifluoromethane	**20**		3.0	1.1	ppb v/v			11/16/14 02:23	7.44
1,1-Dichloroethane	**2.1**	**J**	2.2	0.54	ppb v/v			11/16/14 02:23	7.44
1,2-Dichloroethane	ND		6.0	0.65	ppb v/v			11/16/14 02:23	7.44
1,1-Dichloroethene	**7.1**		6.0	0.96	ppb v/v			11/16/14 02:23	7.44
cis-1,2-Dichloroethene	**1.3**	**J**	3.0	0.66	ppb v/v			11/16/14 02:23	7.44
trans-1,2-Dichloroethene	ND		3.0	0.74	ppb v/v			11/16/14 02:23	7.44
1,2-Dichloropropane	ND		3.0	1.8	ppb v/v			11/16/14 02:23	7.44
cis-1,3-Dichloropropene	ND		3.0	0.77	ppb v/v			11/16/14 02:23	7.44
trans-1,3-Dichloropropene	ND		3.0	0.65	ppb v/v			11/16/14 02:23	7.44
Ethylbenzene	ND		3.0	0.47	ppb v/v			11/16/14 02:23	7.44
4-Ethyltoluene	ND		3.0	1.4	ppb v/v			11/16/14 02:23	7.44
Hexachlorobutadiene	ND		15	3.2	ppb v/v			11/16/14 02:23	7.44
2-Hexanone	ND		3.0	0.65	ppb v/v			11/16/14 02:23	7.44
4-Methyl-2-pentanone (MIBK)	ND		3.0	1.0	ppb v/v			11/16/14 02:23	7.44
Methylene Chloride	ND		3.0	0.54	ppb v/v			11/16/14 02:23	7.44
Styrene	**0.45**	**J B**	3.0	0.44	ppb v/v			11/16/14 02:23	7.44
1,1,2,2-Tetrachloroethane	ND		3.0	0.51	ppb v/v			11/16/14 02:23	7.44
Tetrachloroethene	**120**		3.0	0.38	ppb v/v			11/16/14 02:23	7.44
Toluene	**2.2**	**J**	3.0	0.38	ppb v/v			11/16/14 02:23	7.44

Client Sample ID: 096716-001/MWL-SV03-50 (port 1)

Lab Sample ID: 320-10172-5

Date Collected: 10/22/14 09:16
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloro-1,2,2-trifluoroethane	**46**		3.0	1.2	ppb v/v			11/16/14 02:23	7.44
1,2,4-Trichlorobenzene	ND	*	15	3.2	ppb v/v			11/16/14 02:23	7.44
1,1,1-Trichloroethane	**5.7**		2.2	0.48	ppb v/v			11/16/14 02:23	7.44
1,1,2-Trichloroethane	ND		3.0	0.50	ppb v/v			11/16/14 02:23	7.44
Trichloroethene	**82**		3.0	0.78	ppb v/v			11/16/14 02:23	7.44
Trichlorofluoromethane	**19**		3.0	1.5	ppb v/v			11/16/14 02:23	7.44
1,2,4-Trimethylbenzene	ND		6.0	1.2	ppb v/v			11/16/14 02:23	7.44
1,3,5-Trimethylbenzene	ND		3.0	0.93	ppb v/v			11/16/14 02:23	7.44
Vinyl acetate	ND		6.0	1.1	ppb v/v			11/16/14 02:23	7.44
Vinyl chloride	ND		3.0	0.89	ppb v/v			11/16/14 02:23	7.44
m,p-Xylene	**0.85**	**J B**	6.0	0.74	ppb v/v			11/16/14 02:23	7.44
o-Xylene	**0.46**	**J B**	3.0	0.40	ppb v/v			11/16/14 02:23	7.44

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*70 - 130*		*11/16/14 02:23*	*7.44*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 130*		*11/16/14 02:23*	*7.44*
Toluene-d8 (Surr)	*96*		*70 - 130*		*11/16/14 02:23*	*7.44*

Client Sample ID: 096717-001/MWL-SV03-100 (port 2)

Lab Sample ID: 320-10172-6

Date Collected: 10/22/14 09:21
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		75	2.7	ppb v/v			11/16/14 03:14	14.9
Benzene	ND		6.0	1.2	ppb v/v			11/16/14 03:14	14.9
Benzyl chloride	ND		12	2.4	ppb v/v			11/16/14 03:14	14.9
Bromodichloromethane	ND		4.5	0.98	ppb v/v			11/16/14 03:14	14.9
Bromoform	ND		6.0	1.0	ppb v/v			11/16/14 03:14	14.9
Bromomethane	ND		12	5.0	ppb v/v			11/16/14 03:14	14.9
2-Butanone (MEK)	ND		12	3.0	ppb v/v			11/16/14 03:14	14.9
Carbon disulfide	ND		12	1.2	ppb v/v			11/16/14 03:14	14.9
Carbon tetrachloride	ND		12	0.95	ppb v/v			11/16/14 03:14	14.9
Chlorobenzene	ND		4.5	0.95	ppb v/v			11/16/14 03:14	14.9
Chloroethane	ND		12	4.6	ppb v/v			11/16/14 03:14	14.9
Chloroform	**2.3**	**J**	4.5	1.4	ppb v/v			11/16/14 03:14	14.9
Chloromethane	ND		12	2.9	ppb v/v			11/16/14 03:14	14.9
Dibromochloromethane	ND		6.0	1.2	ppb v/v			11/16/14 03:14	14.9
1,2-Dibromoethane (EDB)	ND		12	1.1	ppb v/v			11/16/14 03:14	14.9
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		6.0	2.3	ppb v/v			11/16/14 03:14	14.9
1,2-Dichlorobenzene	ND		6.0	1.9	ppb v/v			11/16/14 03:14	14.9
1,3-Dichlorobenzene	ND		6.0	1.6	ppb v/v			11/16/14 03:14	14.9
1,4-Dichlorobenzene	ND		6.0	2.2	ppb v/v			11/16/14 03:14	14.9
Dichlorodifluoromethane	**39**		6.0	2.2	ppb v/v			11/16/14 03:14	14.9
1,1-Dichloroethane	**5.3**		4.5	1.1	ppb v/v			11/16/14 03:14	14.9
1,2-Dichloroethane	ND		12	1.3	ppb v/v			11/16/14 03:14	14.9
1,1-Dichloroethene	**19**		12	1.9	ppb v/v			11/16/14 03:14	14.9

Client Sample ID: 096717-001/MWL-SV03-100 (port 2)

Lab Sample ID: 320-10172-6

Date Collected: 10/22/14 09:21
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**3.7**	**J**	6.0	1.3	ppb v/v			11/16/14 03:14	14.9
trans-1,2-Dichloroethene	ND		6.0	1.5	ppb v/v			11/16/14 03:14	14.9
1,2-Dichloropropane	ND		6.0	3.6	ppb v/v			11/16/14 03:14	14.9
cis-1,3-Dichloropropene	ND		6.0	1.5	ppb v/v			11/16/14 03:14	14.9
trans-1,3-Dichloropropene	ND		6.0	1.3	ppb v/v			11/16/14 03:14	14.9
Ethylbenzene	ND		6.0	0.94	ppb v/v			11/16/14 03:14	14.9
4-Ethyltoluene	ND		6.0	2.8	ppb v/v			11/16/14 03:14	14.9
Hexachlorobutadiene	ND		30	6.4	ppb v/v			11/16/14 03:14	14.9
2-Hexanone	ND		6.0	1.3	ppb v/v			11/16/14 03:14	14.9
4-Methyl-2-pentanone (MIBK)	ND		6.0	2.0	ppb v/v			11/16/14 03:14	14.9
Methylene Chloride	**1.7**	**J**	6.0	1.1	ppb v/v			11/16/14 03:14	14.9
Styrene	ND		6.0	0.88	ppb v/v			11/16/14 03:14	14.9
1,1,2,2-Tetrachloroethane	ND		6.0	1.0	ppb v/v			11/16/14 03:14	14.9
Tetrachloroethene	**230**		6.0	0.76	ppb v/v			11/16/14 03:14	14.9
Toluene	**1.6**	**J**	6.0	0.76	ppb v/v			11/16/14 03:14	14.9
1,1,2-Trichloro-1,2,2-trifluoroethane	**110**		6.0	2.4	ppb v/v			11/16/14 03:14	14.9
1,2,4-Trichlorobenzene	ND	*	30	6.5	ppb v/v			11/16/14 03:14	14.9
1,1,1-Trichloroethane	**6.6**		4.5	0.97	ppb v/v			11/16/14 03:14	14.9
1,1,2-Trichloroethane	ND		6.0	1.0	ppb v/v			11/16/14 03:14	14.9
Trichloroethene	**190**		6.0	1.6	ppb v/v			11/16/14 03:14	14.9
Trichlorofluoromethane	**29**		6.0	2.9	ppb v/v			11/16/14 03:14	14.9
1,2,4-Trimethylbenzene	ND		12	2.4	ppb v/v			11/16/14 03:14	14.9
1,3,5-Trimethylbenzene	ND		6.0	1.9	ppb v/v			11/16/14 03:14	14.9
Vinyl acetate	ND		12	2.2	ppb v/v			11/16/14 03:14	14.9
Vinyl chloride	ND		6.0	1.8	ppb v/v			11/16/14 03:14	14.9
m,p-Xylene	ND		12	1.5	ppb v/v			11/16/14 03:14	14.9
o-Xylene	ND		6.0	0.80	ppb v/v			11/16/14 03:14	14.9

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*11/16/14 03:14*	*14.9*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 130*		*11/16/14 03:14*	*14.9*
Toluene-d8 (Surr)	*96*		*70 - 130*		*11/16/14 03:14*	*14.9*

Client Sample ID: 096718-001/MWL-SV03-200 (port 3)

Lab Sample ID: 320-10172-7

Date Collected: 10/22/14 09:24
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**3.3**	**J**	37	1.3	ppb v/v			11/16/14 19:40	7.44
Benzene	**0.92**	**J**	3.0	0.59	ppb v/v			11/16/14 19:40	7.44
Benzyl chloride	ND		6.0	1.2	ppb v/v			11/16/14 19:40	7.44
Bromodichloromethane	ND		2.2	0.49	ppb v/v			11/16/14 19:40	7.44
Bromoform	ND		3.0	0.52	ppb v/v			11/16/14 19:40	7.44
Bromomethane	ND		6.0	2.5	ppb v/v			11/16/14 19:40	7.44
2-Butanone (MEK)	ND		6.0	1.5	ppb v/v			11/16/14 19:40	7.44
Carbon disulfide	**0.59**	**J**	6.0	0.58	ppb v/v			11/16/14 19:40	7.44

Client Sample ID: 096718-001/MWL-SV03-200 (port 3)

Lab Sample ID: 320-10172-7

Date Collected: 10/22/14 09:24

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		6.0	0.48	ppb v/v			11/16/14 19:40	7.44
Chlorobenzene	**0.56**	**J B**	2.2	0.48	ppb v/v			11/16/14 19:40	7.44
Chloroethane	ND		6.0	2.3	ppb v/v			11/16/14 19:40	7.44
Chloroform	**2.3**		2.2	0.71	ppb v/v			11/16/14 19:40	7.44
Chloromethane	ND		6.0	1.5	ppb v/v			11/16/14 19:40	7.44
Dibromochloromethane	ND		3.0	0.59	ppb v/v			11/16/14 19:40	7.44
1,2-Dibromoethane (EDB)	ND		6.0	0.56	ppb v/v			11/16/14 19:40	7.44
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		3.0	1.2	ppb v/v			11/16/14 19:40	7.44
1,2-Dichlorobenzene	**1.1**	**J**	3.0	0.97	ppb v/v			11/16/14 19:40	7.44
1,3-Dichlorobenzene	**1.1**	**J B**	3.0	0.82	ppb v/v			11/16/14 19:40	7.44
1,4-Dichlorobenzene	**1.2**	**J**	3.0	1.1	ppb v/v			11/16/14 19:40	7.44
Dichlorodifluoromethane	**54**		3.0	1.1	ppb v/v			11/16/14 19:40	7.44
1,1-Dichloroethane	**8.1**		2.2	0.54	ppb v/v			11/16/14 19:40	7.44
1,2-Dichloroethane	ND		6.0	0.65	ppb v/v			11/16/14 19:40	7.44
1,1-Dichloroethene	**35**		6.0	0.96	ppb v/v			11/16/14 19:40	7.44
cis-1,2-Dichloroethene	**5.7**		3.0	0.66	ppb v/v			11/16/14 19:40	7.44
trans-1,2-Dichloroethene	ND		3.0	0.74	ppb v/v			11/16/14 19:40	7.44
1,2-Dichloropropane	ND		3.0	1.8	ppb v/v			11/16/14 19:40	7.44
cis-1,3-Dichloropropene	ND		3.0	0.77	ppb v/v			11/16/14 19:40	7.44
trans-1,3-Dichloropropene	ND		3.0	0.65	ppb v/v			11/16/14 19:40	7.44
Ethylbenzene	**0.61**	**J B**	3.0	0.47	ppb v/v			11/16/14 19:40	7.44
4-Ethyltoluene	ND		3.0	1.4	ppb v/v			11/16/14 19:40	7.44
Hexachlorobutadiene	ND		15	3.2	ppb v/v			11/16/14 19:40	7.44
2-Hexanone	ND		3.0	0.65	ppb v/v			11/16/14 19:40	7.44
4-Methyl-2-pentanone (MIBK)	ND		3.0	1.0	ppb v/v			11/16/14 19:40	7.44
Methylene Chloride	**3.4**		3.0	0.54	ppb v/v			11/16/14 19:40	7.44
Styrene	**0.85**	**J B**	3.0	0.44	ppb v/v			11/16/14 19:40	7.44
1,1,2,2-Tetrachloroethane	**0.53**	**J**	3.0	0.51	ppb v/v			11/16/14 19:40	7.44
Tetrachloroethene	**320**		3.0	0.38	ppb v/v			11/16/14 19:40	7.44
Toluene	**2.5**	**J**	3.0	0.38	ppb v/v			11/16/14 19:40	7.44
1,1,2-Trichloro-1,2,2-trifluoroethane	**180**		3.0	1.2	ppb v/v			11/16/14 19:40	7.44
1,2,4-Trichlorobenzene	ND	*	15	3.2	ppb v/v			11/16/14 19:40	7.44
1,1,1-Trichloroethane	**2.8**		2.2	0.48	ppb v/v			11/16/14 19:40	7.44
1,1,2-Trichloroethane	ND		3.0	0.50	ppb v/v			11/16/14 19:40	7.44
Trichloroethene	**300**		3.0	0.78	ppb v/v			11/16/14 19:40	7.44
Trichlorofluoromethane	**25**		3.0	1.5	ppb v/v			11/16/14 19:40	7.44
1,2,4-Trimethylbenzene	ND		6.0	1.2	ppb v/v			11/16/14 19:40	7.44
1,3,5-Trimethylbenzene	**1.1**	**J**	3.0	0.93	ppb v/v			11/16/14 19:40	7.44
Vinyl acetate	ND		6.0	1.1	ppb v/v			11/16/14 19:40	7.44
Vinyl chloride	ND		3.0	0.89	ppb v/v			11/16/14 19:40	7.44
m,p-Xylene	**1.6**	**J B**	6.0	0.74	ppb v/v			11/16/14 19:40	7.44
o-Xylene	**0.79**	**J B**	3.0	0.40	ppb v/v			11/16/14 19:40	7.44

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*70 - 130*		*11/16/14 19:40*	*7.44*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 130*		*11/16/14 19:40*	*7.44*
Toluene-d8 (Surr)	*95*		*70 - 130*		*11/16/14 19:40*	*7.44*

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-10172-1

Client Sample ID: 096719-001/MWL-SV03-300 (port 4)
Lab Sample ID: 320-10172-8
Date Collected: 10/22/14 09:32
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**6.5**	**J**	37	1.3	ppb v/v			11/16/14 04:59	7.44
Benzene	**0.88**	**J**	3.0	0.59	ppb v/v			11/16/14 04:59	7.44
Benzyl chloride	ND		6.0	1.2	ppb v/v			11/16/14 04:59	7.44
Bromodichloromethane	ND		2.2	0.49	ppb v/v			11/16/14 04:59	7.44
Bromoform	ND		3.0	0.52	ppb v/v			11/16/14 04:59	7.44
Bromomethane	ND		6.0	2.5	ppb v/v			11/16/14 04:59	7.44
2-Butanone (MEK)	ND		6.0	1.5	ppb v/v			11/16/14 04:59	7.44
Carbon disulfide	**2.3**	**J**	6.0	0.58	ppb v/v			11/16/14 04:59	7.44
Carbon tetrachloride	ND		6.0	0.48	ppb v/v			11/16/14 04:59	7.44
Chlorobenzene	ND		2.2	0.48	ppb v/v			11/16/14 04:59	7.44
Chloroethane	ND		6.0	2.3	ppb v/v			11/16/14 04:59	7.44
Chloroform	**1.0**	**J**	2.2	0.71	ppb v/v			11/16/14 04:59	7.44
Chloromethane	ND		6.0	1.5	ppb v/v			11/16/14 04:59	7.44
Dibromochloromethane	ND		3.0	0.59	ppb v/v			11/16/14 04:59	7.44
1,2-Dibromoethane (EDB)	ND		6.0	0.56	ppb v/v			11/16/14 04:59	7.44
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		3.0	1.2	ppb v/v			11/16/14 04:59	7.44
1,2-Dichlorobenzene	ND		3.0	0.97	ppb v/v			11/16/14 04:59	7.44
1,3-Dichlorobenzene	ND		3.0	0.82	ppb v/v			11/16/14 04:59	7.44
1,4-Dichlorobenzene	ND		3.0	1.1	ppb v/v			11/16/14 04:59	7.44
Dichlorodifluoromethane	**24**		3.0	1.1	ppb v/v			11/16/14 04:59	7.44
1,1-Dichloroethane	**2.5**		2.2	0.54	ppb v/v			11/16/14 04:59	7.44
1,2-Dichloroethane	ND		6.0	0.65	ppb v/v			11/16/14 04:59	7.44
1,1-Dichloroethene	**17**		6.0	0.96	ppb v/v			11/16/14 04:59	7.44
cis-1,2-Dichloroethene	**2.4**	**J**	3.0	0.66	ppb v/v			11/16/14 04:59	7.44
trans-1,2-Dichloroethene	ND		3.0	0.74	ppb v/v			11/16/14 04:59	7.44
1,2-Dichloropropane	ND		3.0	1.8	ppb v/v			11/16/14 04:59	7.44
cis-1,3-Dichloropropene	ND		3.0	0.77	ppb v/v			11/16/14 04:59	7.44
trans-1,3-Dichloropropene	ND		3.0	0.65	ppb v/v			11/16/14 04:59	7.44
Ethylbenzene	ND		3.0	0.47	ppb v/v			11/16/14 04:59	7.44
4-Ethyltoluene	ND		3.0	1.4	ppb v/v			11/16/14 04:59	7.44
Hexachlorobutadiene	ND		15	3.2	ppb v/v			11/16/14 04:59	7.44
2-Hexanone	ND		3.0	0.65	ppb v/v			11/16/14 04:59	7.44
4-Methyl-2-pentanone (MIBK)	ND		3.0	1.0	ppb v/v			11/16/14 04:59	7.44
Methylene Chloride	**0.97**	**J**	3.0	0.54	ppb v/v			11/16/14 04:59	7.44
Styrene	ND		3.0	0.44	ppb v/v			11/16/14 04:59	7.44
1,1,2,2-Tetrachloroethane	ND		3.0	0.51	ppb v/v			11/16/14 04:59	7.44
Tetrachloroethene	**320**		3.0	0.38	ppb v/v			11/16/14 04:59	7.44
Toluene	**3.1**		3.0	0.38	ppb v/v			11/16/14 04:59	7.44
1,1,2-Trichloro-1,2,2-trifluoroethane	**78**		3.0	1.2	ppb v/v			11/16/14 04:59	7.44
1,2,4-Trichlorobenzene	ND	*	15	3.2	ppb v/v			11/16/14 04:59	7.44
1,1,1-Trichloroethane	**1.2**	**J**	2.2	0.48	ppb v/v			11/16/14 04:59	7.44
1,1,2-Trichloroethane	ND		3.0	0.50	ppb v/v			11/16/14 04:59	7.44
Trichloroethene	**210**		3.0	0.78	ppb v/v			11/16/14 04:59	7.44
Trichlorofluoromethane	**8.5**		3.0	1.5	ppb v/v			11/16/14 04:59	7.44
1,2,4-Trimethylbenzene	ND		6.0	1.2	ppb v/v			11/16/14 04:59	7.44
1,3,5-Trimethylbenzene	ND		3.0	0.93	ppb v/v			11/16/14 04:59	7.44
Vinyl acetate	ND		6.0	1.1	ppb v/v			11/16/14 04:59	7.44
Vinyl chloride	ND		3.0	0.89	ppb v/v			11/16/14 04:59	7.44

Client Sample ID: 096719-001/MWL-SV03-300 (port 4)

Lab Sample ID: 320-10172-8

Date Collected: 10/22/14 09:32
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		6.0	0.74	ppb v/v			11/16/14 04:59	7.44
o-Xylene	ND		3.0	0.40	ppb v/v			11/16/14 04:59	7.44

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*70 - 130*		*11/16/14 04:59*	*7.44*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 130*		*11/16/14 04:59*	*7.44*
Toluene-d8 (Surr)	*95*		*70 - 130*		*11/16/14 04:59*	*7.44*

Client Sample ID: 096720-001/MWL-SV03-400 (port 5)

Lab Sample ID: 320-10172-9

Date Collected: 10/22/14 09:45
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		93	3.3	ppb v/v			11/16/14 05:51	18.6
Benzene	ND		7.4	1.5	ppb v/v			11/16/14 05:51	18.6
Benzyl chloride	ND		15	3.0	ppb v/v			11/16/14 05:51	18.6
Bromodichloromethane	ND		5.6	1.2	ppb v/v			11/16/14 05:51	18.6
Bromoform	ND		7.4	1.3	ppb v/v			11/16/14 05:51	18.6
Bromomethane	ND		15	6.2	ppb v/v			11/16/14 05:51	18.6
2-Butanone (MEK)	ND		15	3.7	ppb v/v			11/16/14 05:51	18.6
Carbon disulfide	ND		15	1.5	ppb v/v			11/16/14 05:51	18.6
Carbon tetrachloride	ND		15	1.2	ppb v/v			11/16/14 05:51	18.6
Chlorobenzene	ND		5.6	1.2	ppb v/v			11/16/14 05:51	18.6
Chloroethane	ND		15	5.7	ppb v/v			11/16/14 05:51	18.6
Chloroform	ND		5.6	1.8	ppb v/v			11/16/14 05:51	18.6
Chloromethane	ND		15	3.7	ppb v/v			11/16/14 05:51	18.6
Dibromochloromethane	ND		7.4	1.5	ppb v/v			11/16/14 05:51	18.6
1,2-Dibromoethane (EDB)	ND		15	1.4	ppb v/v			11/16/14 05:51	18.6
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		7.4	2.9	ppb v/v			11/16/14 05:51	18.6
1,2-Dichlorobenzene	ND		7.4	2.4	ppb v/v			11/16/14 05:51	18.6
1,3-Dichlorobenzene	ND		7.4	2.0	ppb v/v			11/16/14 05:51	18.6
1,4-Dichlorobenzene	ND		7.4	2.8	ppb v/v			11/16/14 05:51	18.6
Dichlorodifluoromethane	**23**		7.4	2.7	ppb v/v			11/16/14 05:51	18.6
1,1-Dichloroethane	**2.8**	**J**	5.6	1.3	ppb v/v			11/16/14 05:51	18.6
1,2-Dichloroethane	ND		15	1.6	ppb v/v			11/16/14 05:51	18.6
1,1-Dichloroethene	**17**		15	2.4	ppb v/v			11/16/14 05:51	18.6
cis-1,2-Dichloroethene	**2.4**	**J**	7.4	1.7	ppb v/v			11/16/14 05:51	18.6
trans-1,2-Dichloroethene	ND		7.4	1.9	ppb v/v			11/16/14 05:51	18.6
1,2-Dichloropropane	ND		7.4	4.5	ppb v/v			11/16/14 05:51	18.6
cis-1,3-Dichloropropene	ND		7.4	1.9	ppb v/v			11/16/14 05:51	18.6
trans-1,3-Dichloropropene	ND		7.4	1.6	ppb v/v			11/16/14 05:51	18.6
Ethylbenzene	ND		7.4	1.2	ppb v/v			11/16/14 05:51	18.6
4-Ethyltoluene	ND		7.4	3.5	ppb v/v			11/16/14 05:51	18.6
Hexachlorobutadiene	ND		37	8.0	ppb v/v			11/16/14 05:51	18.6
2-Hexanone	ND		7.4	1.6	ppb v/v			11/16/14 05:51	18.6
4-Methyl-2-pentanone (MIBK)	ND		7.4	2.5	ppb v/v			11/16/14 05:51	18.6
Methylene Chloride	ND		7.4	1.3	ppb v/v			11/16/14 05:51	18.6

Client Sample ID: 096720-001/MWL-SV03-400 (port 5)

Lab Sample ID: 320-10172-9

Date Collected: 10/22/14 09:45
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	ND		7.4	1.1	ppb v/v			11/16/14 05:51	18.6
1,1,2,2-Tetrachloroethane	ND		7.4	1.3	ppb v/v			11/16/14 05:51	18.6
Tetrachloroethene	**400**		7.4	0.95	ppb v/v			11/16/14 05:51	18.6
Toluene	**6.2**	**J**	7.4	0.95	ppb v/v			11/16/14 05:51	18.6
1,1,2-Trichloro-1,2,2-trifluoroethane	**72**		7.4	3.0	ppb v/v			11/16/14 05:51	18.6
1,2,4-Trichlorobenzene	ND	*	37	8.1	ppb v/v			11/16/14 05:51	18.6
1,1,1-Trichloroethane	**1.5**	**J**	5.6	1.2	ppb v/v			11/16/14 05:51	18.6
1,1,2-Trichloroethane	ND		7.4	1.2	ppb v/v			11/16/14 05:51	18.6
Trichloroethene	**280**		7.4	2.0	ppb v/v			11/16/14 05:51	18.6
Trichlorofluoromethane	**9.2**		7.4	3.6	ppb v/v			11/16/14 05:51	18.6
1,2,4-Trimethylbenzene	ND		15	3.0	ppb v/v			11/16/14 05:51	18.6
1,3,5-Trimethylbenzene	ND		7.4	2.3	ppb v/v			11/16/14 05:51	18.6
Vinyl acetate	ND		15	2.7	ppb v/v			11/16/14 05:51	18.6
Vinyl chloride	ND		7.4	2.2	ppb v/v			11/16/14 05:51	18.6
m,p-Xylene	ND		15	1.9	ppb v/v			11/16/14 05:51	18.6
o-Xylene	ND		7.4	1.0	ppb v/v			11/16/14 05:51	18.6

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*88*		*70 - 130*		*11/16/14 05:51*	*18.6*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 130*		*11/16/14 05:51*	*18.6*
Toluene-d8 (Surr)	*97*		*70 - 130*		*11/16/14 05:51*	*18.6*

Client Sample ID: 096721-001/MWL-SV-FB3

Lab Sample ID: 320-10172-10

Date Collected: 10/22/14 08:57
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		5.0	0.18	ppb v/v			11/16/14 06:50	1
Benzene	ND		0.40	0.079	ppb v/v			11/16/14 06:50	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			11/16/14 06:50	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			11/16/14 06:50	1
Bromoform	ND		0.40	0.070	ppb v/v			11/16/14 06:50	1
Bromomethane	ND		0.80	0.34	ppb v/v			11/16/14 06:50	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			11/16/14 06:50	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			11/16/14 06:50	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			11/16/14 06:50	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			11/16/14 06:50	1
Chloroethane	ND		0.80	0.31	ppb v/v			11/16/14 06:50	1
Chloroform	ND		0.30	0.095	ppb v/v			11/16/14 06:50	1
Chloromethane	ND		0.80	0.20	ppb v/v			11/16/14 06:50	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			11/16/14 06:50	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			11/16/14 06:50	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			11/16/14 06:50	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			11/16/14 06:50	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			11/16/14 06:50	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			11/16/14 06:50	1

Client Sample ID: 096721-001/MWL-SV-FB3

Lab Sample ID: 320-10172-10

Date Collected: 10/22/14 08:57
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			11/16/14 06:50	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			11/16/14 06:50	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			11/16/14 06:50	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			11/16/14 06:50	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			11/16/14 06:50	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			11/16/14 06:50	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			11/16/14 06:50	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			11/16/14 06:50	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			11/16/14 06:50	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			11/16/14 06:50	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			11/16/14 06:50	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			11/16/14 06:50	1
2-Hexanone	ND		0.40	0.087	ppb v/v			11/16/14 06:50	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			11/16/14 06:50	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			11/16/14 06:50	1
Styrene	ND		0.40	0.059	ppb v/v			11/16/14 06:50	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			11/16/14 06:50	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			11/16/14 06:50	1
Toluene	ND		0.40	0.051	ppb v/v			11/16/14 06:50	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			11/16/14 06:50	1
1,2,4-Trichlorobenzene	ND	*	2.0	0.43	ppb v/v			11/16/14 06:50	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			11/16/14 06:50	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			11/16/14 06:50	1
Trichloroethene	ND		0.40	0.11	ppb v/v			11/16/14 06:50	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			11/16/14 06:50	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			11/16/14 06:50	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			11/16/14 06:50	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			11/16/14 06:50	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			11/16/14 06:50	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			11/16/14 06:50	1
o-Xylene	ND		0.40	0.054	ppb v/v			11/16/14 06:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*70 - 130*		*11/16/14 06:50*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 130*		*11/16/14 06:50*	*1*
Toluene-d8 (Surr)	*92*		*70 - 130*		*11/16/14 06:50*	*1*

Client Sample ID: 096722-001/MWL-SV04-50 (port 1)

Lab Sample ID: 320-10172-11

Date Collected: 10/22/14 09:56
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**5.8**	**J**	15	0.52	ppb v/v			11/16/14 07:43	2.9
Benzene	**1.3**		1.2	0.23	ppb v/v			11/16/14 07:43	2.9
Benzyl chloride	ND		2.3	0.47	ppb v/v			11/16/14 07:43	2.9
Bromodichloromethane	ND		0.87	0.19	ppb v/v			11/16/14 07:43	2.9
Bromoform	ND		1.2	0.20	ppb v/v			11/16/14 07:43	2.9

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-10172-1

Client Sample ID: 096722-001/MWL-SV04-50 (port 1)
Date Collected: 10/22/14 09:56
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Lab Sample ID: 320-10172-11
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	ND		2.3	0.97	ppb v/v			11/16/14 07:43	2.9
2-Butanone (MEK)	**0.69**	**J**	2.3	0.58	ppb v/v			11/16/14 07:43	2.9
Carbon disulfide	**1.6**	**J**	2.3	0.23	ppb v/v			11/16/14 07:43	2.9
Carbon tetrachloride	ND		2.3	0.19	ppb v/v			11/16/14 07:43	2.9
Chlorobenzene	ND		0.87	0.19	ppb v/v			11/16/14 07:43	2.9
Chloroethane	ND		2.3	0.89	ppb v/v			11/16/14 07:43	2.9
Chloroform	**1.8**		0.87	0.28	ppb v/v			11/16/14 07:43	2.9
Chloromethane	ND		2.3	0.57	ppb v/v			11/16/14 07:43	2.9
Dibromochloromethane	ND		1.2	0.23	ppb v/v			11/16/14 07:43	2.9
1,2-Dibromoethane (EDB)	ND		2.3	0.22	ppb v/v			11/16/14 07:43	2.9
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.2	0.45	ppb v/v			11/16/14 07:43	2.9
1,2-Dichlorobenzene	ND		1.2	0.38	ppb v/v			11/16/14 07:43	2.9
1,3-Dichlorobenzene	ND		1.2	0.32	ppb v/v			11/16/14 07:43	2.9
1,4-Dichlorobenzene	ND		1.2	0.43	ppb v/v			11/16/14 07:43	2.9
Dichlorodifluoromethane	**19**		1.2	0.42	ppb v/v			11/16/14 07:43	2.9
1,1-Dichloroethane	**1.2**		0.87	0.21	ppb v/v			11/16/14 07:43	2.9
1,2-Dichloroethane	ND		2.3	0.26	ppb v/v			11/16/14 07:43	2.9
1,1-Dichloroethene	**5.9**		2.3	0.37	ppb v/v			11/16/14 07:43	2.9
cis-1,2-Dichloroethene	ND		1.2	0.26	ppb v/v			11/16/14 07:43	2.9
trans-1,2-Dichloroethene	ND		1.2	0.29	ppb v/v			11/16/14 07:43	2.9
1,2-Dichloropropane	ND		1.2	0.70	ppb v/v			11/16/14 07:43	2.9
cis-1,3-Dichloropropene	ND		1.2	0.30	ppb v/v			11/16/14 07:43	2.9
trans-1,3-Dichloropropene	ND		1.2	0.26	ppb v/v			11/16/14 07:43	2.9
Ethylbenzene	ND		1.2	0.18	ppb v/v			11/16/14 07:43	2.9
4-Ethyltoluene	ND		1.2	0.54	ppb v/v			11/16/14 07:43	2.9
Hexachlorobutadiene	ND		5.8	1.3	ppb v/v			11/16/14 07:43	2.9
2-Hexanone	ND		1.2	0.25	ppb v/v			11/16/14 07:43	2.9
4-Methyl-2-pentanone (MIBK)	ND		1.2	0.39	ppb v/v			11/16/14 07:43	2.9
Methylene Chloride	ND		1.2	0.21	ppb v/v			11/16/14 07:43	2.9
Styrene	ND		1.2	0.17	ppb v/v			11/16/14 07:43	2.9
1,1,2,2-Tetrachloroethane	ND		1.2	0.20	ppb v/v			11/16/14 07:43	2.9
Tetrachloroethene	**76**		1.2	0.15	ppb v/v			11/16/14 07:43	2.9
Toluene	**0.62**	**J**	1.2	0.15	ppb v/v			11/16/14 07:43	2.9
1,1,2-Trichloro-1,2,2-trifluoroethane	**64**		1.2	0.47	ppb v/v			11/16/14 07:43	2.9
1,2,4-Trichlorobenzene	ND	*	5.8	1.3	ppb v/v			11/16/14 07:43	2.9
1,1,1-Trichloroethane	**6.3**		0.87	0.19	ppb v/v			11/16/14 07:43	2.9
1,1,2-Trichloroethane	ND		1.2	0.19	ppb v/v			11/16/14 07:43	2.9
Trichloroethene	**59**		1.2	0.30	ppb v/v			11/16/14 07:43	2.9
Trichlorofluoromethane	**21**		1.2	0.57	ppb v/v			11/16/14 07:43	2.9
1,2,4-Trimethylbenzene	ND		2.3	0.47	ppb v/v			11/16/14 07:43	2.9
1,3,5-Trimethylbenzene	ND		1.2	0.36	ppb v/v			11/16/14 07:43	2.9
Vinyl acetate	ND		2.3	0.42	ppb v/v			11/16/14 07:43	2.9
Vinyl chloride	ND		1.2	0.35	ppb v/v			11/16/14 07:43	2.9
m,p-Xylene	ND		2.3	0.29	ppb v/v			11/16/14 07:43	2.9
o-Xylene	ND		1.2	0.16	ppb v/v			11/16/14 07:43	2.9

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*70 - 130*		*11/16/14 07:43*	*2.9*

Client Sample ID: 096722-001/MWL-SV04-50 (port 1)

Lab Sample ID: 320-10172-11

Date Collected: 10/22/14 09:56

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 130*		*11/16/14 07:43*	*2.9*
Toluene-d8 (Surr)	*91*		*70 - 130*		*11/16/14 07:43*	*2.9*

Client Sample ID: 096723-001/MWL-SV04-100 (port 2)

Lab Sample ID: 320-10172-12

Date Collected: 10/22/14 09:59

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**5.0**	**J**	25	0.89	ppb v/v			11/16/14 08:36	4.98
Benzene	**0.84**	**J**	2.0	0.39	ppb v/v			11/16/14 08:36	4.98
Benzyl chloride	ND		4.0	0.81	ppb v/v			11/16/14 08:36	4.98
Bromodichloromethane	ND		1.5	0.33	ppb v/v			11/16/14 08:36	4.98
Bromoform	ND		2.0	0.35	ppb v/v			11/16/14 08:36	4.98
Bromomethane	ND		4.0	1.7	ppb v/v			11/16/14 08:36	4.98
2-Butanone (MEK)	ND		4.0	0.99	ppb v/v			11/16/14 08:36	4.98
Carbon disulfide	ND		4.0	0.39	ppb v/v			11/16/14 08:36	4.98
Carbon tetrachloride	ND		4.0	0.32	ppb v/v			11/16/14 08:36	4.98
Chlorobenzene	ND		1.5	0.32	ppb v/v			11/16/14 08:36	4.98
Chloroethane	ND		4.0	1.5	ppb v/v			11/16/14 08:36	4.98
Chloroform	**1.8**		1.5	0.47	ppb v/v			11/16/14 08:36	4.98
Chloromethane	ND		4.0	0.98	ppb v/v			11/16/14 08:36	4.98
Dibromochloromethane	ND		2.0	0.39	ppb v/v			11/16/14 08:36	4.98
1,2-Dibromoethane (EDB)	ND		4.0	0.37	ppb v/v			11/16/14 08:36	4.98
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	0.77	ppb v/v			11/16/14 08:36	4.98
1,2-Dichlorobenzene	ND		2.0	0.65	ppb v/v			11/16/14 08:36	4.98
1,3-Dichlorobenzene	ND		2.0	0.55	ppb v/v			11/16/14 08:36	4.98
1,4-Dichlorobenzene	ND		2.0	0.74	ppb v/v			11/16/14 08:36	4.98
Dichlorodifluoromethane	**32**		2.0	0.72	ppb v/v			11/16/14 08:36	4.98
1,1-Dichloroethane	**2.8**		1.5	0.36	ppb v/v			11/16/14 08:36	4.98
1,2-Dichloroethane	ND		4.0	0.44	ppb v/v			11/16/14 08:36	4.98
1,1-Dichloroethene	**15**		4.0	0.64	ppb v/v			11/16/14 08:36	4.98
cis-1,2-Dichloroethene	**1.7**	**J**	2.0	0.44	ppb v/v			11/16/14 08:36	4.98
trans-1,2-Dichloroethene	ND		2.0	0.50	ppb v/v			11/16/14 08:36	4.98
1,2-Dichloropropane	ND		2.0	1.2	ppb v/v			11/16/14 08:36	4.98
cis-1,3-Dichloropropene	ND		2.0	0.52	ppb v/v			11/16/14 08:36	4.98
trans-1,3-Dichloropropene	ND		2.0	0.44	ppb v/v			11/16/14 08:36	4.98
Ethylbenzene	ND		2.0	0.31	ppb v/v			11/16/14 08:36	4.98
4-Ethyltoluene	ND		2.0	0.93	ppb v/v			11/16/14 08:36	4.98
Hexachlorobutadiene	ND		10	2.2	ppb v/v			11/16/14 08:36	4.98
2-Hexanone	ND		2.0	0.43	ppb v/v			11/16/14 08:36	4.98
4-Methyl-2-pentanone (MIBK)	ND		2.0	0.67	ppb v/v			11/16/14 08:36	4.98
Methylene Chloride	**0.49**	**J**	2.0	0.36	ppb v/v			11/16/14 08:36	4.98
Styrene	ND		2.0	0.29	ppb v/v			11/16/14 08:36	4.98
1,1,2,2-Tetrachloroethane	ND		2.0	0.34	ppb v/v			11/16/14 08:36	4.98
Tetrachloroethene	**120**		2.0	0.25	ppb v/v			11/16/14 08:36	4.98
Toluene	**0.99**	**J**	2.0	0.25	ppb v/v			11/16/14 08:36	4.98

Client Sample ID: 096723-001/MWL-SV04-100 (port 2)

Lab Sample ID: 320-10172-12

Date Collected: 10/22/14 09:59
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloro-1,2,2-trifluoroethane	**96**		2.0	0.81	ppb v/v			11/16/14 08:36	4.98
1,2,4-Trichlorobenzene	ND	*	10	2.2	ppb v/v			11/16/14 08:36	4.98
1,1,1-Trichloroethane	**5.0**		1.5	0.32	ppb v/v			11/16/14 08:36	4.98
1,1,2-Trichloroethane	ND		2.0	0.33	ppb v/v			11/16/14 08:36	4.98
Trichloroethene	**120**		2.0	0.52	ppb v/v			11/16/14 08:36	4.98
Trichlorofluoromethane	**29**		2.0	0.98	ppb v/v			11/16/14 08:36	4.98
1,2,4-Trimethylbenzene	ND		4.0	0.81	ppb v/v			11/16/14 08:36	4.98
1,3,5-Trimethylbenzene	ND		2.0	0.62	ppb v/v			11/16/14 08:36	4.98
Vinyl acetate	ND		4.0	0.72	ppb v/v			11/16/14 08:36	4.98
Vinyl chloride	ND		2.0	0.60	ppb v/v			11/16/14 08:36	4.98
m,p-Xylene	ND		4.0	0.50	ppb v/v			11/16/14 08:36	4.98
o-Xylene	ND		2.0	0.27	ppb v/v			11/16/14 08:36	4.98

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*11/16/14 08:36*	*4.98*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 130*		*11/16/14 08:36*	*4.98*
Toluene-d8 (Surr)	*97*		*70 - 130*		*11/16/14 08:36*	*4.98*

Client Sample ID: 096724-001/MWL-SV04-200 (port 3)

Lab Sample ID: 320-10172-13

Date Collected: 10/22/14 10:03
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		37	1.3	ppb v/v			11/16/14 09:28	7.45
Benzene	ND		3.0	0.59	ppb v/v			11/16/14 09:28	7.45
Benzyl chloride	ND		6.0	1.2	ppb v/v			11/16/14 09:28	7.45
Bromodichloromethane	ND		2.2	0.49	ppb v/v			11/16/14 09:28	7.45
Bromoform	ND		3.0	0.52	ppb v/v			11/16/14 09:28	7.45
Bromomethane	ND		6.0	2.5	ppb v/v			11/16/14 09:28	7.45
2-Butanone (MEK)	ND		6.0	1.5	ppb v/v			11/16/14 09:28	7.45
Carbon disulfide	ND		6.0	0.58	ppb v/v			11/16/14 09:28	7.45
Carbon tetrachloride	**0.55**	**J**	6.0	0.48	ppb v/v			11/16/14 09:28	7.45
Chlorobenzene	ND		2.2	0.48	ppb v/v			11/16/14 09:28	7.45
Chloroethane	ND		6.0	2.3	ppb v/v			11/16/14 09:28	7.45
Chloroform	**1.2**	**J**	2.2	0.71	ppb v/v			11/16/14 09:28	7.45
Chloromethane	ND		6.0	1.5	ppb v/v			11/16/14 09:28	7.45
Dibromochloromethane	ND		3.0	0.59	ppb v/v			11/16/14 09:28	7.45
1,2-Dibromoethane (EDB)	ND		6.0	0.56	ppb v/v			11/16/14 09:28	7.45
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		3.0	1.2	ppb v/v			11/16/14 09:28	7.45
1,2-Dichlorobenzene	ND		3.0	0.97	ppb v/v			11/16/14 09:28	7.45
1,3-Dichlorobenzene	ND		3.0	0.82	ppb v/v			11/16/14 09:28	7.45
1,4-Dichlorobenzene	ND		3.0	1.1	ppb v/v			11/16/14 09:28	7.45
Dichlorodifluoromethane	**48**		3.0	1.1	ppb v/v			11/16/14 09:28	7.45
1,1-Dichloroethane	**4.4**		2.2	0.54	ppb v/v			11/16/14 09:28	7.45
1,2-Dichloroethane	ND		6.0	0.66	ppb v/v			11/16/14 09:28	7.45
1,1-Dichloroethene	**30**		6.0	0.96	ppb v/v			11/16/14 09:28	7.45

Client Sample ID: 096724-001/MWL-SV04-200 (port 3)

Lab Sample ID: 320-10172-13

Date Collected: 10/22/14 10:03
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**3.0**		3.0	0.66	ppb v/v			11/16/14 09:28	7.45
trans-1,2-Dichloroethene	ND		3.0	0.75	ppb v/v			11/16/14 09:28	7.45
1,2-Dichloropropane	ND		3.0	1.8	ppb v/v			11/16/14 09:28	7.45
cis-1,3-Dichloropropene	ND		3.0	0.77	ppb v/v			11/16/14 09:28	7.45
trans-1,3-Dichloropropene	ND		3.0	0.66	ppb v/v			11/16/14 09:28	7.45
Ethylbenzene	ND		3.0	0.47	ppb v/v			11/16/14 09:28	7.45
4-Ethyltoluene	ND		3.0	1.4	ppb v/v			11/16/14 09:28	7.45
Hexachlorobutadiene	ND		15	3.2	ppb v/v			11/16/14 09:28	7.45
2-Hexanone	ND		3.0	0.65	ppb v/v			11/16/14 09:28	7.45
4-Methyl-2-pentanone (MIBK)	ND		3.0	1.0	ppb v/v			11/16/14 09:28	7.45
Methylene Chloride	**1.1**	**J**	3.0	0.54	ppb v/v			11/16/14 09:28	7.45
Styrene	ND		3.0	0.44	ppb v/v			11/16/14 09:28	7.45
1,1,2,2-Tetrachloroethane	ND		3.0	0.51	ppb v/v			11/16/14 09:28	7.45
Tetrachloroethene	**180**		3.0	0.38	ppb v/v			11/16/14 09:28	7.45
Toluene	**1.9**	**J**	3.0	0.38	ppb v/v			11/16/14 09:28	7.45
1,1,2-Trichloro-1,2,2-trifluoroethane	**160**		3.0	1.2	ppb v/v			11/16/14 09:28	7.45
1,2,4-Trichlorobenzene	ND	*	15	3.2	ppb v/v			11/16/14 09:28	7.45
1,1,1-Trichloroethane	**2.1**	**J**	2.2	0.48	ppb v/v			11/16/14 09:28	7.45
1,1,2-Trichloroethane	ND		3.0	0.50	ppb v/v			11/16/14 09:28	7.45
Trichloroethene	**210**		3.0	0.78	ppb v/v			11/16/14 09:28	7.45
Trichlorofluoromethane	**29**		3.0	1.5	ppb v/v			11/16/14 09:28	7.45
1,2,4-Trimethylbenzene	ND		6.0	1.2	ppb v/v			11/16/14 09:28	7.45
1,3,5-Trimethylbenzene	ND		3.0	0.93	ppb v/v			11/16/14 09:28	7.45
Vinyl acetate	ND		6.0	1.1	ppb v/v			11/16/14 09:28	7.45
Vinyl chloride	ND		3.0	0.89	ppb v/v			11/16/14 09:28	7.45
m,p-Xylene	ND		6.0	0.75	ppb v/v			11/16/14 09:28	7.45
o-Xylene	ND		3.0	0.40	ppb v/v			11/16/14 09:28	7.45

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*70 - 130*		*11/16/14 09:28*	*7.45*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 130*		*11/16/14 09:28*	*7.45*
Toluene-d8 (Surr)	*95*		*70 - 130*		*11/16/14 09:28*	*7.45*

Client Sample ID: 096725-001/MWL-SV04-300 (port 4)

Lab Sample ID: 320-10172-14

Date Collected: 10/22/14 10:07
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**10**	**J**	25	0.88	ppb v/v			11/16/14 10:21	4.97
Benzene	**0.58**	**J**	2.0	0.39	ppb v/v			11/16/14 10:21	4.97
Benzyl chloride	ND		4.0	0.81	ppb v/v			11/16/14 10:21	4.97
Bromodichloromethane	ND		1.5	0.33	ppb v/v			11/16/14 10:21	4.97
Bromoform	ND		2.0	0.35	ppb v/v			11/16/14 10:21	4.97
Bromomethane	ND		4.0	1.7	ppb v/v			11/16/14 10:21	4.97
2-Butanone (MEK)	**1.8**	**J**	4.0	0.99	ppb v/v			11/16/14 10:21	4.97
Carbon disulfide	**0.52**	**J**	4.0	0.39	ppb v/v			11/16/14 10:21	4.97

Client Sample ID: 096725-001/MWL-SV04-300 (port 4)
Date Collected: 10/22/14 10:07
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Lab Sample ID: 320-10172-14
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		4.0	0.32	ppb v/v			11/16/14 10:21	4.97
Chlorobenzene	ND		1.5	0.32	ppb v/v			11/16/14 10:21	4.97
Chloroethane	ND		4.0	1.5	ppb v/v			11/16/14 10:21	4.97
Chloroform	**0.51**	**J**	1.5	0.47	ppb v/v			11/16/14 10:21	4.97
Chloromethane	ND		4.0	0.98	ppb v/v			11/16/14 10:21	4.97
Dibromochloromethane	ND		2.0	0.39	ppb v/v			11/16/14 10:21	4.97
1,2-Dibromoethane (EDB)	ND		4.0	0.37	ppb v/v			11/16/14 10:21	4.97
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	0.77	ppb v/v			11/16/14 10:21	4.97
1,2-Dichlorobenzene	ND		2.0	0.65	ppb v/v			11/16/14 10:21	4.97
1,3-Dichlorobenzene	ND		2.0	0.55	ppb v/v			11/16/14 10:21	4.97
1,4-Dichlorobenzene	ND		2.0	0.74	ppb v/v			11/16/14 10:21	4.97
Dichlorodifluoromethane	**18**		2.0	0.72	ppb v/v			11/16/14 10:21	4.97
1,1-Dichloroethane	**0.96**	**J**	1.5	0.36	ppb v/v			11/16/14 10:21	4.97
1,2-Dichloroethane	ND		4.0	0.44	ppb v/v			11/16/14 10:21	4.97
1,1-Dichloroethene	**9.9**		4.0	0.64	ppb v/v			11/16/14 10:21	4.97
cis-1,2-Dichloroethene	**0.67**	**J**	2.0	0.44	ppb v/v			11/16/14 10:21	4.97
trans-1,2-Dichloroethene	ND		2.0	0.50	ppb v/v			11/16/14 10:21	4.97
1,2-Dichloropropane	ND		2.0	1.2	ppb v/v			11/16/14 10:21	4.97
cis-1,3-Dichloropropene	ND		2.0	0.52	ppb v/v			11/16/14 10:21	4.97
trans-1,3-Dichloropropene	ND		2.0	0.44	ppb v/v			11/16/14 10:21	4.97
Ethylbenzene	ND		2.0	0.31	ppb v/v			11/16/14 10:21	4.97
4-Ethyltoluene	ND		2.0	0.93	ppb v/v			11/16/14 10:21	4.97
Hexachlorobutadiene	ND		9.9	2.1	ppb v/v			11/16/14 10:21	4.97
2-Hexanone	ND		2.0	0.43	ppb v/v			11/16/14 10:21	4.97
4-Methyl-2-pentanone (MIBK)	ND		2.0	0.67	ppb v/v			11/16/14 10:21	4.97
Methylene Chloride	ND		2.0	0.36	ppb v/v			11/16/14 10:21	4.97
Styrene	ND		2.0	0.29	ppb v/v			11/16/14 10:21	4.97
1,1,2,2-Tetrachloroethane	ND		2.0	0.34	ppb v/v			11/16/14 10:21	4.97
Tetrachloroethene	**130**		2.0	0.25	ppb v/v			11/16/14 10:21	4.97
Toluene	**1.8**	**J**	2.0	0.25	ppb v/v			11/16/14 10:21	4.97
1,1,2-Trichloro-1,2,2-trifluoroethane	**50**		2.0	0.81	ppb v/v			11/16/14 10:21	4.97
1,2,4-Trichlorobenzene	ND	*	9.9	2.2	ppb v/v			11/16/14 10:21	4.97
1,1,1-Trichloroethane	**0.79**	**J**	1.5	0.32	ppb v/v			11/16/14 10:21	4.97
1,1,2-Trichloroethane	ND		2.0	0.33	ppb v/v			11/16/14 10:21	4.97
Trichloroethene	**91**		2.0	0.52	ppb v/v			11/16/14 10:21	4.97
Trichlorofluoromethane	**9.4**		2.0	0.97	ppb v/v			11/16/14 10:21	4.97
1,2,4-Trimethylbenzene	ND		4.0	0.81	ppb v/v			11/16/14 10:21	4.97
1,3,5-Trimethylbenzene	ND		2.0	0.62	ppb v/v			11/16/14 10:21	4.97
Vinyl acetate	ND		4.0	0.72	ppb v/v			11/16/14 10:21	4.97
Vinyl chloride	ND		2.0	0.60	ppb v/v			11/16/14 10:21	4.97
m,p-Xylene	ND		4.0	0.50	ppb v/v			11/16/14 10:21	4.97
o-Xylene	ND		2.0	0.27	ppb v/v			11/16/14 10:21	4.97

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*11/16/14 10:21*	*4.97*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 130*		*11/16/14 10:21*	*4.97*
Toluene-d8 (Surr)	*93*		*70 - 130*		*11/16/14 10:21*	*4.97*

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-10172-1

Client Sample ID: 096726-001/MWL-SV04-400 (port 5)
Lab Sample ID: 320-10172-15
Date Collected: 10/22/14 10:12
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**5.2**	**J**	25	0.90	ppb v/v			11/17/14 20:05	5.07
Benzene	**1.5**	**J**	2.0	0.40	ppb v/v			11/17/14 20:05	5.07
Benzyl chloride	ND		4.1	0.83	ppb v/v			11/17/14 20:05	5.07
Bromodichloromethane	ND		1.5	0.33	ppb v/v			11/17/14 20:05	5.07
Bromoform	ND		2.0	0.35	ppb v/v			11/17/14 20:05	5.07
Bromomethane	ND		4.1	1.7	ppb v/v			11/17/14 20:05	5.07
2-Butanone (MEK)	ND		4.1	1.0	ppb v/v			11/17/14 20:05	5.07
Carbon disulfide	**1.0**	**J**	4.1	0.40	ppb v/v			11/17/14 20:05	5.07
Carbon tetrachloride	ND		4.1	0.32	ppb v/v			11/17/14 20:05	5.07
Chlorobenzene	ND		1.5	0.32	ppb v/v			11/17/14 20:05	5.07
Chloroethane	ND		4.1	1.6	ppb v/v			11/17/14 20:05	5.07
Chloroform	**0.61**	**J**	1.5	0.48	ppb v/v			11/17/14 20:05	5.07
Chloromethane	**1.2**	**J**	4.1	1.0	ppb v/v			11/17/14 20:05	5.07
Dibromochloromethane	**0.45**	**J**	2.0	0.40	ppb v/v			11/17/14 20:05	5.07
1,2-Dibromoethane (EDB)	ND		4.1	0.38	ppb v/v			11/17/14 20:05	5.07
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	0.79	ppb v/v			11/17/14 20:05	5.07
1,2-Dichlorobenzene	ND		2.0	0.66	ppb v/v			11/17/14 20:05	5.07
1,3-Dichlorobenzene	ND		2.0	0.56	ppb v/v			11/17/14 20:05	5.07
1,4-Dichlorobenzene	ND		2.0	0.76	ppb v/v			11/17/14 20:05	5.07
Dichlorodifluoromethane	**15**		2.0	0.74	ppb v/v			11/17/14 20:05	5.07
1,1-Dichloroethane	**1.1**	**J**	1.5	0.37	ppb v/v			11/17/14 20:05	5.07
1,2-Dichloroethane	ND		4.1	0.45	ppb v/v			11/17/14 20:05	5.07
1,1-Dichloroethene	**8.9**		4.1	0.65	ppb v/v			11/17/14 20:05	5.07
cis-1,2-Dichloroethene	**0.95**	**J**	2.0	0.45	ppb v/v			11/17/14 20:05	5.07
trans-1,2-Dichloroethene	ND		2.0	0.51	ppb v/v			11/17/14 20:05	5.07
1,2-Dichloropropane	ND		2.0	1.2	ppb v/v			11/17/14 20:05	5.07
cis-1,3-Dichloropropene	ND		2.0	0.53	ppb v/v			11/17/14 20:05	5.07
trans-1,3-Dichloropropene	ND		2.0	0.45	ppb v/v			11/17/14 20:05	5.07
Ethylbenzene	**0.37**	**J B**	2.0	0.32	ppb v/v			11/17/14 20:05	5.07
4-Ethyltoluene	ND		2.0	0.95	ppb v/v			11/17/14 20:05	5.07
Hexachlorobutadiene	ND		10	2.2	ppb v/v			11/17/14 20:05	5.07
2-Hexanone	ND		2.0	0.44	ppb v/v			11/17/14 20:05	5.07
4-Methyl-2-pentanone (MIBK)	ND		2.0	0.68	ppb v/v			11/17/14 20:05	5.07
Methylene Chloride	ND		2.0	0.37	ppb v/v			11/17/14 20:05	5.07
Styrene	**0.52**	**J B**	2.0	0.30	ppb v/v			11/17/14 20:05	5.07
1,1,2,2-Tetrachloroethane	ND		2.0	0.35	ppb v/v			11/17/14 20:05	5.07
Tetrachloroethene	**140**		2.0	0.26	ppb v/v			11/17/14 20:05	5.07
Toluene	**1.5**	**J B**	2.0	0.26	ppb v/v			11/17/14 20:05	5.07
1,1,2-Trichloro-1,2,2-trifluoroethane	**44**		2.0	0.83	ppb v/v			11/17/14 20:05	5.07
1,2,4-Trichlorobenzene	ND		10	2.2	ppb v/v			11/17/14 20:05	5.07
1,1,1-Trichloroethane	**0.99**	**J**	1.5	0.33	ppb v/v			11/17/14 20:05	5.07
1,1,2-Trichloroethane	ND		2.0	0.34	ppb v/v			11/17/14 20:05	5.07
Trichloroethene	**96**		2.0	0.53	ppb v/v			11/17/14 20:05	5.07
Trichlorofluoromethane	**9.2**		2.0	0.99	ppb v/v			11/17/14 20:05	5.07
1,2,4-Trimethylbenzene	ND		4.1	0.82	ppb v/v			11/17/14 20:05	5.07
1,3,5-Trimethylbenzene	ND		2.0	0.63	ppb v/v			11/17/14 20:05	5.07
Vinyl acetate	ND		4.1	0.74	ppb v/v			11/17/14 20:05	5.07
Vinyl chloride	ND		2.0	0.61	ppb v/v			11/17/14 20:05	5.07

Client Sample ID: 096726-001/MWL-SV04-400 (port 5)

Lab Sample ID: 320-10172-15

Date Collected: 10/22/14 10:12
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	0.98	J B	4.1	0.51	ppb v/v			11/17/14 20:05	5.07
o-Xylene	0.51	J B	2.0	0.27	ppb v/v			11/17/14 20:05	5.07

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*11/17/14 20:05*	*5.07*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 130*		*11/17/14 20:05*	*5.07*
Toluene-d8 (Surr)	*95*		*70 - 130*		*11/17/14 20:05*	*5.07*

Client Sample ID: 096727-001/MWL-SV-FB4

Lab Sample ID: 320-10172-16

Date Collected: 10/22/14 09:53
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		5.0	0.18	ppb v/v			11/16/14 20:39	1
Benzene	0.083	J	0.40	0.079	ppb v/v			11/16/14 20:39	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			11/16/14 20:39	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			11/16/14 20:39	1
Bromoform	ND		0.40	0.070	ppb v/v			11/16/14 20:39	1
Bromomethane	ND		0.80	0.34	ppb v/v			11/16/14 20:39	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			11/16/14 20:39	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			11/16/14 20:39	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			11/16/14 20:39	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			11/16/14 20:39	1
Chloroethane	ND		0.80	0.31	ppb v/v			11/16/14 20:39	1
Chloroform	ND		0.30	0.095	ppb v/v			11/16/14 20:39	1
Chloromethane	ND		0.80	0.20	ppb v/v			11/16/14 20:39	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			11/16/14 20:39	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			11/16/14 20:39	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			11/16/14 20:39	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			11/16/14 20:39	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			11/16/14 20:39	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			11/16/14 20:39	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			11/16/14 20:39	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			11/16/14 20:39	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			11/16/14 20:39	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			11/16/14 20:39	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			11/16/14 20:39	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			11/16/14 20:39	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			11/16/14 20:39	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			11/16/14 20:39	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			11/16/14 20:39	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			11/16/14 20:39	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			11/16/14 20:39	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			11/16/14 20:39	1
2-Hexanone	ND		0.40	0.087	ppb v/v			11/16/14 20:39	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			11/16/14 20:39	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			11/16/14 20:39	1

Client Sample ID: 096727-001/MWL-SV-FB4

Lab Sample ID: 320-10172-16

Date Collected: 10/22/14 09:53

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	**0.064**	**J B**	0.40	0.059	ppb v/v			11/16/14 20:39	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			11/16/14 20:39	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			11/16/14 20:39	1
Toluene	**0.051**	**J**	0.40	0.051	ppb v/v			11/16/14 20:39	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			11/16/14 20:39	1
1,2,4-Trichlorobenzene	ND	*	2.0	0.43	ppb v/v			11/16/14 20:39	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			11/16/14 20:39	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			11/16/14 20:39	1
Trichloroethene	ND		0.40	0.11	ppb v/v			11/16/14 20:39	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			11/16/14 20:39	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			11/16/14 20:39	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			11/16/14 20:39	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			11/16/14 20:39	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			11/16/14 20:39	1
m,p-Xylene	**0.15**	**J B**	0.80	0.10	ppb v/v			11/16/14 20:39	1
o-Xylene	**0.067**	**J B**	0.40	0.054	ppb v/v			11/16/14 20:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*88*		*70 - 130*		*11/16/14 20:39*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 130*		*11/16/14 20:39*	*1*
Toluene-d8 (Surr)	*94*		*70 - 130*		*11/16/14 20:39*	*1*

Client Sample ID: 096728-001/MWL-SV05-50 (port 1)

Lab Sample ID: 320-10172-17

Date Collected: 10/22/14 10:28

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**8.3**	**J**	15	0.52	ppb v/v			11/17/14 09:50	2.93
Benzene	**0.79**	**J**	1.2	0.23	ppb v/v			11/17/14 09:50	2.93
Benzyl chloride	ND		2.3	0.48	ppb v/v			11/17/14 09:50	2.93
Bromodichloromethane	ND		0.88	0.19	ppb v/v			11/17/14 09:50	2.93
Bromoform	ND		1.2	0.21	ppb v/v			11/17/14 09:50	2.93
Bromomethane	ND		2.3	0.98	ppb v/v			11/17/14 09:50	2.93
2-Butanone (MEK)	**1.2**	**J**	2.3	0.58	ppb v/v			11/17/14 09:50	2.93
Carbon disulfide	**1.4**	**J**	2.3	0.23	ppb v/v			11/17/14 09:50	2.93
Carbon tetrachloride	**0.38**	**J**	2.3	0.19	ppb v/v			11/17/14 09:50	2.93
Chlorobenzene	**0.22**	**J B**	0.88	0.19	ppb v/v			11/17/14 09:50	2.93
Chloroethane	ND		2.3	0.90	ppb v/v			11/17/14 09:50	2.93
Chloroform	**1.3**		0.88	0.28	ppb v/v			11/17/14 09:50	2.93
Chloromethane	ND		2.3	0.58	ppb v/v			11/17/14 09:50	2.93
Dibromochloromethane	ND		1.2	0.23	ppb v/v			11/17/14 09:50	2.93
1,2-Dibromoethane (EDB)	ND		2.3	0.22	ppb v/v			11/17/14 09:50	2.93
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.2	0.45	ppb v/v			11/17/14 09:50	2.93
1,2-Dichlorobenzene	ND		1.2	0.38	ppb v/v			11/17/14 09:50	2.93
1,3-Dichlorobenzene	ND		1.2	0.32	ppb v/v			11/17/14 09:50	2.93
1,4-Dichlorobenzene	ND		1.2	0.44	ppb v/v			11/17/14 09:50	2.93
Dichlorodifluoromethane	**39**		1.2	0.42	ppb v/v			11/17/14 09:50	2.93

Client Sample ID: 096728-001/MWL-SV05-50 (port 1)

Lab Sample ID: 320-10172-17

Date Collected: 10/22/14 10:28

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethane	**1.5**		0.88	0.21	ppb v/v			11/17/14 09:50	2.93
1,2-Dichloroethane	ND		2.3	0.26	ppb v/v			11/17/14 09:50	2.93
1,1-Dichloroethene	**9.4**		2.3	0.38	ppb v/v			11/17/14 09:50	2.93
cis-1,2-Dichloroethene	**0.68**	**J**	1.2	0.26	ppb v/v			11/17/14 09:50	2.93
trans-1,2-Dichloroethene	ND		1.2	0.29	ppb v/v			11/17/14 09:50	2.93
1,2-Dichloropropane	ND		1.2	0.70	ppb v/v			11/17/14 09:50	2.93
cis-1,3-Dichloropropene	ND		1.2	0.30	ppb v/v			11/17/14 09:50	2.93
trans-1,3-Dichloropropene	ND		1.2	0.26	ppb v/v			11/17/14 09:50	2.93
Ethylbenzene	**0.25**	**J B**	1.2	0.18	ppb v/v			11/17/14 09:50	2.93
4-Ethyltoluene	ND		1.2	0.55	ppb v/v			11/17/14 09:50	2.93
Hexachlorobutadiene	ND		5.9	1.3	ppb v/v			11/17/14 09:50	2.93
2-Hexanone	ND		1.2	0.25	ppb v/v			11/17/14 09:50	2.93
4-Methyl-2-pentanone (MIBK)	ND		1.2	0.40	ppb v/v			11/17/14 09:50	2.93
Methylene Chloride	**0.28**	**J**	1.2	0.21	ppb v/v			11/17/14 09:50	2.93
Styrene	**0.27**	**J B**	1.2	0.17	ppb v/v			11/17/14 09:50	2.93
1,1,2,2-Tetrachloroethane	ND		1.2	0.20	ppb v/v			11/17/14 09:50	2.93
Tetrachloroethene	**48**		1.2	0.15	ppb v/v			11/17/14 09:50	2.93
Toluene	**1.1**	**J**	1.2	0.15	ppb v/v			11/17/14 09:50	2.93
1,1,2-Trichloro-1,2,2-trifluoroethane	**43**		1.2	0.48	ppb v/v			11/17/14 09:50	2.93
1,2,4-Trichlorobenzene	ND	*	5.9	1.3	ppb v/v			11/17/14 09:50	2.93
1,1,1-Trichloroethane	**12**		0.88	0.19	ppb v/v			11/17/14 09:50	2.93
1,1,2-Trichloroethane	ND		1.2	0.20	ppb v/v			11/17/14 09:50	2.93
Trichloroethene	**61**		1.2	0.31	ppb v/v			11/17/14 09:50	2.93
Trichlorofluoromethane	**89**		1.2	0.57	ppb v/v			11/17/14 09:50	2.93
1,2,4-Trimethylbenzene	ND		2.3	0.47	ppb v/v			11/17/14 09:50	2.93
1,3,5-Trimethylbenzene	ND		1.2	0.37	ppb v/v			11/17/14 09:50	2.93
Vinyl acetate	ND		2.3	0.42	ppb v/v			11/17/14 09:50	2.93
Vinyl chloride	ND		1.2	0.35	ppb v/v			11/17/14 09:50	2.93
m,p-Xylene	**0.60**	**J B**	2.3	0.29	ppb v/v			11/17/14 09:50	2.93
o-Xylene	**0.27**	**J B**	1.2	0.16	ppb v/v			11/17/14 09:50	2.93

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*70 - 130*		*11/17/14 09:50*	*2.93*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 130*		*11/17/14 09:50*	*2.93*
Toluene-d8 (Surr)	*95*		*70 - 130*		*11/17/14 09:50*	*2.93*

Client Sample ID: 096729-001/MWL-SV05-100 (port 2)

Lab Sample ID: 320-10172-18

Date Collected: 10/22/14 10:30

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**7.2**	**J**	16	0.56	ppb v/v			11/17/14 20:58	3.16
Benzene	**0.53**	**J**	1.3	0.25	ppb v/v			11/17/14 20:58	3.16
Benzyl chloride	ND		2.5	0.52	ppb v/v			11/17/14 20:58	3.16
Bromodichloromethane	ND		0.95	0.21	ppb v/v			11/17/14 20:58	3.16
Bromoform	ND		1.3	0.22	ppb v/v			11/17/14 20:58	3.16

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-10172-1

Client Sample ID: 096729-001/MWL-SV05-100 (port 2)
Lab Sample ID: 320-10172-18
Date Collected: 10/22/14 10:30
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	ND		2.5	1.1	ppb v/v			11/17/14 20:58	3.16
2-Butanone (MEK)	**1.2**	**J**	2.5	0.63	ppb v/v			11/17/14 20:58	3.16
Carbon disulfide	ND		2.5	0.25	ppb v/v			11/17/14 20:58	3.16
Carbon tetrachloride	**0.67**	**J**	2.5	0.20	ppb v/v			11/17/14 20:58	3.16
Chlorobenzene	ND		0.95	0.20	ppb v/v			11/17/14 20:58	3.16
Chloroethane	ND		2.5	0.97	ppb v/v			11/17/14 20:58	3.16
Chloroform	**2.1**		0.95	0.30	ppb v/v			11/17/14 20:58	3.16
Chloromethane	ND		2.5	0.62	ppb v/v			11/17/14 20:58	3.16
Dibromochloromethane	ND		1.3	0.25	ppb v/v			11/17/14 20:58	3.16
1,2-Dibromoethane (EDB)	ND		2.5	0.24	ppb v/v			11/17/14 20:58	3.16
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.3	0.49	ppb v/v			11/17/14 20:58	3.16
1,2-Dichlorobenzene	ND		1.3	0.41	ppb v/v			11/17/14 20:58	3.16
1,3-Dichlorobenzene	ND		1.3	0.35	ppb v/v			11/17/14 20:58	3.16
1,4-Dichlorobenzene	ND		1.3	0.47	ppb v/v			11/17/14 20:58	3.16
Dichlorodifluoromethane	**60**		1.3	0.46	ppb v/v			11/17/14 20:58	3.16
1,1-Dichloroethane	**3.3**		0.95	0.23	ppb v/v			11/17/14 20:58	3.16
1,2-Dichloroethane	ND		2.5	0.28	ppb v/v			11/17/14 20:58	3.16
1,1-Dichloroethene	**22**		2.5	0.41	ppb v/v			11/17/14 20:58	3.16
cis-1,2-Dichloroethene	**1.7**		1.3	0.28	ppb v/v			11/17/14 20:58	3.16
trans-1,2-Dichloroethene	ND		1.3	0.32	ppb v/v			11/17/14 20:58	3.16
1,2-Dichloropropane	ND		1.3	0.76	ppb v/v			11/17/14 20:58	3.16
cis-1,3-Dichloropropene	ND		1.3	0.33	ppb v/v			11/17/14 20:58	3.16
trans-1,3-Dichloropropene	ND		1.3	0.28	ppb v/v			11/17/14 20:58	3.16
Ethylbenzene	ND		1.3	0.20	ppb v/v			11/17/14 20:58	3.16
4-Ethyltoluene	ND		1.3	0.59	ppb v/v			11/17/14 20:58	3.16
Hexachlorobutadiene	ND		6.3	1.4	ppb v/v			11/17/14 20:58	3.16
2-Hexanone	ND		1.3	0.27	ppb v/v			11/17/14 20:58	3.16
4-Methyl-2-pentanone (MIBK)	ND		1.3	0.43	ppb v/v			11/17/14 20:58	3.16
Methylene Chloride	**0.86**	**J**	1.3	0.23	ppb v/v			11/17/14 20:58	3.16
Styrene	**0.25**	**J B**	1.3	0.19	ppb v/v			11/17/14 20:58	3.16
1,1,2,2-Tetrachloroethane	ND		1.3	0.22	ppb v/v			11/17/14 20:58	3.16
Tetrachloroethene	**96**		1.3	0.16	ppb v/v			11/17/14 20:58	3.16
Toluene	**0.97**	**J B**	1.3	0.16	ppb v/v			11/17/14 20:58	3.16
1,1,2-Trichloro-1,2,2-trifluoroethane	**88**		1.3	0.52	ppb v/v			11/17/14 20:58	3.16
1,2,4-Trichlorobenzene	ND		6.3	1.4	ppb v/v			11/17/14 20:58	3.16
1,1,1-Trichloroethane	**12**		0.95	0.21	ppb v/v			11/17/14 20:58	3.16
1,1,2-Trichloroethane	ND		1.3	0.21	ppb v/v			11/17/14 20:58	3.16
Trichloroethene	**130**		1.3	0.33	ppb v/v			11/17/14 20:58	3.16
Trichlorofluoromethane	**120**		1.3	0.62	ppb v/v			11/17/14 20:58	3.16
1,2,4-Trimethylbenzene	ND		2.5	0.51	ppb v/v			11/17/14 20:58	3.16
1,3,5-Trimethylbenzene	ND		1.3	0.40	ppb v/v			11/17/14 20:58	3.16
Vinyl acetate	ND		2.5	0.46	ppb v/v			11/17/14 20:58	3.16
Vinyl chloride	ND		1.3	0.38	ppb v/v			11/17/14 20:58	3.16
m,p-Xylene	**0.48**	**J B**	2.5	0.32	ppb v/v			11/17/14 20:58	3.16
o-Xylene	**0.25**	**J B**	1.3	0.17	ppb v/v			11/17/14 20:58	3.16

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*11/17/14 20:58*	*3.16*

Client Sample ID: 096729-001/MWL-SV05-100 (port 2)

Lab Sample ID: 320-10172-18

Date Collected: 10/22/14 10:30
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 130*		*11/17/14 20:58*	*3.16*
Toluene-d8 (Surr)	*91*		*70 - 130*		*11/17/14 20:58*	*3.16*

Client Sample ID: 096730-001/MWL-SV05-200 (port 3)

Lab Sample ID: 320-10172-19

Date Collected: 10/22/14 10:34
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**6.4**	**J**	31	1.1	ppb v/v			11/17/14 21:49	6.29
Benzene	ND		2.5	0.50	ppb v/v			11/17/14 21:49	6.29
Benzyl chloride	ND		5.0	1.0	ppb v/v			11/17/14 21:49	6.29
Bromodichloromethane	ND		1.9	0.42	ppb v/v			11/17/14 21:49	6.29
Bromoform	ND		2.5	0.44	ppb v/v			11/17/14 21:49	6.29
Bromomethane	ND		5.0	2.1	ppb v/v			11/17/14 21:49	6.29
2-Butanone (MEK)	**1.6**	**J**	5.0	1.3	ppb v/v			11/17/14 21:49	6.29
Carbon disulfide	ND		5.0	0.49	ppb v/v			11/17/14 21:49	6.29
Carbon tetrachloride	**1.2**	**J**	5.0	0.40	ppb v/v			11/17/14 21:49	6.29
Chlorobenzene	ND		1.9	0.40	ppb v/v			11/17/14 21:49	6.29
Chloroethane	ND		5.0	1.9	ppb v/v			11/17/14 21:49	6.29
Chloroform	**2.1**		1.9	0.60	ppb v/v			11/17/14 21:49	6.29
Chloromethane	ND		5.0	1.2	ppb v/v			11/17/14 21:49	6.29
Dibromochloromethane	ND		2.5	0.50	ppb v/v			11/17/14 21:49	6.29
1,2-Dibromoethane (EDB)	ND		5.0	0.47	ppb v/v			11/17/14 21:49	6.29
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.5	0.97	ppb v/v			11/17/14 21:49	6.29
1,2-Dichlorobenzene	ND		2.5	0.82	ppb v/v			11/17/14 21:49	6.29
1,3-Dichlorobenzene	ND		2.5	0.69	ppb v/v			11/17/14 21:49	6.29
1,4-Dichlorobenzene	ND		2.5	0.94	ppb v/v			11/17/14 21:49	6.29
Dichlorodifluoromethane	**62**		2.5	0.91	ppb v/v			11/17/14 21:49	6.29
1,1-Dichloroethane	**5.1**		1.9	0.45	ppb v/v			11/17/14 21:49	6.29
1,2-Dichloroethane	ND		5.0	0.55	ppb v/v			11/17/14 21:49	6.29
1,1-Dichloroethene	**42**		5.0	0.81	ppb v/v			11/17/14 21:49	6.29
cis-1,2-Dichloroethene	**2.5**		2.5	0.56	ppb v/v			11/17/14 21:49	6.29
trans-1,2-Dichloroethene	ND		2.5	0.63	ppb v/v			11/17/14 21:49	6.29
1,2-Dichloropropane	ND		2.5	1.5	ppb v/v			11/17/14 21:49	6.29
cis-1,3-Dichloropropene	ND		2.5	0.65	ppb v/v			11/17/14 21:49	6.29
trans-1,3-Dichloropropene	ND		2.5	0.55	ppb v/v			11/17/14 21:49	6.29
Ethylbenzene	ND		2.5	0.40	ppb v/v			11/17/14 21:49	6.29
4-Ethyltoluene	ND		2.5	1.2	ppb v/v			11/17/14 21:49	6.29
Hexachlorobutadiene	ND		13	2.7	ppb v/v			11/17/14 21:49	6.29
2-Hexanone	ND		2.5	0.55	ppb v/v			11/17/14 21:49	6.29
4-Methyl-2-pentanone (MIBK)	ND		2.5	0.85	ppb v/v			11/17/14 21:49	6.29
Methylene Chloride	**2.4**	**J**	2.5	0.45	ppb v/v			11/17/14 21:49	6.29
Styrene	ND		2.5	0.37	ppb v/v			11/17/14 21:49	6.29
1,1,2,2-Tetrachloroethane	ND		2.5	0.43	ppb v/v			11/17/14 21:49	6.29
Tetrachloroethene	**140**		2.5	0.32	ppb v/v			11/17/14 21:49	6.29
Toluene	**2.2**	**J B**	2.5	0.32	ppb v/v			11/17/14 21:49	6.29

Client Sample ID: 096730-001/MWL-SV05-200 (port 3)
Lab Sample ID: 320-10172-19

Date Collected: 10/22/14 10:34
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloro-1,2,2-trifluoroethane	**160**		2.5	1.0	ppb v/v			11/17/14 21:49	6.29
1,2,4-Trichlorobenzene	ND		13	2.7	ppb v/v			11/17/14 21:49	6.29
1,1,1-Trichloroethane	**3.6**		1.9	0.41	ppb v/v			11/17/14 21:49	6.29
1,1,2-Trichloroethane	ND		2.5	0.42	ppb v/v			11/17/14 21:49	6.29
Trichloroethene	**210**		2.5	0.66	ppb v/v			11/17/14 21:49	6.29
Trichlorofluoromethane	**70**		2.5	1.2	ppb v/v			11/17/14 21:49	6.29
1,2,4-Trimethylbenzene	ND		5.0	1.0	ppb v/v			11/17/14 21:49	6.29
1,3,5-Trimethylbenzene	ND		2.5	0.79	ppb v/v			11/17/14 21:49	6.29
Vinyl acetate	ND		5.0	0.91	ppb v/v			11/17/14 21:49	6.29
Vinyl chloride	ND		2.5	0.75	ppb v/v			11/17/14 21:49	6.29
m,p-Xylene	**0.77**	**J B**	5.0	0.63	ppb v/v			11/17/14 21:49	6.29
o-Xylene	**0.43**	**J B**	2.5	0.34	ppb v/v			11/17/14 21:49	6.29

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*11/17/14 21:49*	*6.29*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 130*		*11/17/14 21:49*	*6.29*
Toluene-d8 (Surr)	*92*		*70 - 130*		*11/17/14 21:49*	*6.29*

Client Sample ID: 096731-001/MWL-SV05-200 (port 3)
Lab Sample ID: 320-10172-20

Date Collected: 10/22/14 10:36
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**4.3**	**J**	5.0	0.18	ppb v/v			11/18/14 11:45	1
Benzene	**0.33**	**J**	0.40	0.079	ppb v/v			11/18/14 11:45	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			11/18/14 11:45	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			11/18/14 11:45	1
Bromoform	ND		0.40	0.070	ppb v/v			11/18/14 11:45	1
Bromomethane	ND		0.80	0.34	ppb v/v			11/18/14 11:45	1
2-Butanone (MEK)	**0.81**		0.80	0.20	ppb v/v			11/18/14 11:45	1
Carbon disulfide	**0.53**	**J**	0.80	0.078	ppb v/v			11/18/14 11:45	1
Carbon tetrachloride	**1.2**		0.80	0.064	ppb v/v			11/18/14 11:45	1
Chlorobenzene	**0.076**	**J B**	0.30	0.064	ppb v/v			11/18/14 11:45	1
Chloroethane	ND		0.80	0.31	ppb v/v			11/18/14 11:45	1
Chloroform	**1.9**		0.30	0.095	ppb v/v			11/18/14 11:45	1
Chloromethane	**0.23**	**J**	0.80	0.20	ppb v/v			11/18/14 11:45	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			11/18/14 11:45	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			11/18/14 11:45	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			11/18/14 11:45	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			11/18/14 11:45	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			11/18/14 11:45	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			11/18/14 11:45	1
1,1-Dichloroethane	**5.3**		0.30	0.072	ppb v/v			11/18/14 11:45	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			11/18/14 11:45	1
1,1-Dichloroethene	**45**		0.80	0.13	ppb v/v			11/18/14 11:45	1
cis-1,2-Dichloroethene	**2.7**		0.40	0.089	ppb v/v			11/18/14 11:45	1

Client Sample ID: 096731-001/MWL-SV05-200 (port 3)

Lab Sample ID: 320-10172-20

Date Collected: 10/22/14 10:36
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			11/18/14 11:45	1
1,2-Dichloropropane	**0.30**	**J**	0.40	0.24	ppb v/v			11/18/14 11:45	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			11/18/14 11:45	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			11/18/14 11:45	1
Ethylbenzene	**0.071**	**J B**	0.40	0.063	ppb v/v			11/18/14 11:45	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			11/18/14 11:45	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			11/18/14 11:45	1
2-Hexanone	**0.12**	**J**	0.40	0.087	ppb v/v			11/18/14 11:45	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			11/18/14 11:45	1
Methylene Chloride	**2.6**		0.40	0.072	ppb v/v			11/18/14 11:45	1
Styrene	**0.063**	**J B**	0.40	0.059	ppb v/v			11/18/14 11:45	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			11/18/14 11:45	1
Toluene	**2.4**	**B**	0.40	0.051	ppb v/v			11/18/14 11:45	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			11/18/14 11:45	1
1,1,1-Trichloroethane	**3.3**		0.30	0.065	ppb v/v			11/18/14 11:45	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			11/18/14 11:45	1
1,2,4-Trimethylbenzene	**0.18**	**J**	0.80	0.16	ppb v/v			11/18/14 11:45	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			11/18/14 11:45	1
Vinyl acetate	**0.95**		0.80	0.15	ppb v/v			11/18/14 11:45	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			11/18/14 11:45	1
m,p-Xylene	**0.17**	**J B**	0.80	0.10	ppb v/v			11/18/14 11:45	1
o-Xylene	**0.093**	**J B**	0.40	0.054	ppb v/v			11/18/14 11:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*11/18/14 11:45*	*1*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 130*		*11/18/14 11:45*	*1*
Toluene-d8 (Surr)	*96*		*70 - 130*		*11/18/14 11:45*	*1*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	**71**		2.6	0.93	ppb v/v			11/18/14 12:52	6.42
Tetrachloroethene	**170**		2.6	0.33	ppb v/v			11/18/14 12:52	6.42
1,1,2-Trichloro-1,2,2-trifluoroethane	**190**		2.6	1.0	ppb v/v			11/18/14 12:52	6.42
Trichloroethene	**240**		2.6	0.67	ppb v/v			11/18/14 12:52	6.42
Trichlorofluoromethane	**78**		2.6	1.3	ppb v/v			11/18/14 12:52	6.42

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*70 - 130*		*11/18/14 12:52*	*6.42*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 130*		*11/18/14 12:52*	*6.42*
Toluene-d8 (Surr)	*94*		*70 - 130*		*11/18/14 12:52*	*6.42*

Client Sample ID: 096732-001/MWL-SV05-300 (port 4)

Lab Sample ID: 320-10172-21

Date Collected: 10/22/14 10:39
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**10**	**J**	18	0.63	ppb v/v			11/17/14 23:37	3.55

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-10172-1

Client Sample ID: 096732-001/MWL-SV05-300 (port 4)
Date Collected: 10/22/14 10:39
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Lab Sample ID: 320-10172-21
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.33**	**J**	1.4	0.28	ppb v/v			11/17/14 23:37	3.55
Benzyl chloride	ND		2.8	0.58	ppb v/v			11/17/14 23:37	3.55
Bromodichloromethane	ND		1.1	0.23	ppb v/v			11/17/14 23:37	3.55
Bromoform	ND		1.4	0.25	ppb v/v			11/17/14 23:37	3.55
Bromomethane	ND		2.8	1.2	ppb v/v			11/17/14 23:37	3.55
2-Butanone (MEK)	**1.9**	**J**	2.8	0.71	ppb v/v			11/17/14 23:37	3.55
Carbon disulfide	ND		2.8	0.28	ppb v/v			11/17/14 23:37	3.55
Carbon tetrachloride	**0.96**	**J**	2.8	0.23	ppb v/v			11/17/14 23:37	3.55
Chlorobenzene	ND		1.1	0.23	ppb v/v			11/17/14 23:37	3.55
Chloroethane	ND		2.8	1.1	ppb v/v			11/17/14 23:37	3.55
Chloroform	**0.79**	**J**	1.1	0.34	ppb v/v			11/17/14 23:37	3.55
Chloromethane	ND		2.8	0.70	ppb v/v			11/17/14 23:37	3.55
Dibromochloromethane	ND		1.4	0.28	ppb v/v			11/17/14 23:37	3.55
1,2-Dibromoethane (EDB)	ND		2.8	0.27	ppb v/v			11/17/14 23:37	3.55
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.4	0.55	ppb v/v			11/17/14 23:37	3.55
1,2-Dichlorobenzene	ND		1.4	0.46	ppb v/v			11/17/14 23:37	3.55
1,3-Dichlorobenzene	ND		1.4	0.39	ppb v/v			11/17/14 23:37	3.55
1,4-Dichlorobenzene	ND		1.4	0.53	ppb v/v			11/17/14 23:37	3.55
Dichlorodifluoromethane	**26**		1.4	0.51	ppb v/v			11/17/14 23:37	3.55
1,1-Dichloroethane	**1.7**		1.1	0.26	ppb v/v			11/17/14 23:37	3.55
1,2-Dichloroethane	ND		2.8	0.31	ppb v/v			11/17/14 23:37	3.55
1,1-Dichloroethene	**23**		2.8	0.46	ppb v/v			11/17/14 23:37	3.55
cis-1,2-Dichloroethene	**0.98**	**J**	1.4	0.32	ppb v/v			11/17/14 23:37	3.55
trans-1,2-Dichloroethene	ND		1.4	0.36	ppb v/v			11/17/14 23:37	3.55
1,2-Dichloropropane	ND		1.4	0.85	ppb v/v			11/17/14 23:37	3.55
cis-1,3-Dichloropropene	ND		1.4	0.37	ppb v/v			11/17/14 23:37	3.55
trans-1,3-Dichloropropene	ND		1.4	0.31	ppb v/v			11/17/14 23:37	3.55
Ethylbenzene	ND		1.4	0.22	ppb v/v			11/17/14 23:37	3.55
4-Ethyltoluene	ND		1.4	0.66	ppb v/v			11/17/14 23:37	3.55
Hexachlorobutadiene	ND		7.1	1.5	ppb v/v			11/17/14 23:37	3.55
2-Hexanone	ND		1.4	0.31	ppb v/v			11/17/14 23:37	3.55
4-Methyl-2-pentanone (MIBK)	ND		1.4	0.48	ppb v/v			11/17/14 23:37	3.55
Methylene Chloride	**0.85**	**J**	1.4	0.26	ppb v/v			11/17/14 23:37	3.55
Styrene	ND		1.4	0.21	ppb v/v			11/17/14 23:37	3.55
1,1,2,2-Tetrachloroethane	ND		1.4	0.24	ppb v/v			11/17/14 23:37	3.55
Tetrachloroethene	**120**		1.4	0.18	ppb v/v			11/17/14 23:37	3.55
Toluene	**2.7**	**B**	1.4	0.18	ppb v/v			11/17/14 23:37	3.55
1,1,2-Trichloro-1,2,2-trifluoroethane	**81**		1.4	0.58	ppb v/v			11/17/14 23:37	3.55
1,2,4-Trichlorobenzene	ND		7.1	1.5	ppb v/v			11/17/14 23:37	3.55
1,1,1-Trichloroethane	**1.5**		1.1	0.23	ppb v/v			11/17/14 23:37	3.55
1,1,2-Trichloroethane	ND		1.4	0.24	ppb v/v			11/17/14 23:37	3.55
Trichloroethene	**130**		1.4	0.37	ppb v/v			11/17/14 23:37	3.55
Trichlorofluoromethane	**22**		1.4	0.70	ppb v/v			11/17/14 23:37	3.55
1,2,4-Trimethylbenzene	ND		2.8	0.58	ppb v/v			11/17/14 23:37	3.55
1,3,5-Trimethylbenzene	ND		1.4	0.44	ppb v/v			11/17/14 23:37	3.55
Vinyl acetate	ND		2.8	0.51	ppb v/v			11/17/14 23:37	3.55
Vinyl chloride	ND		1.4	0.43	ppb v/v			11/17/14 23:37	3.55
m,p-Xylene	**0.42**	**J B**	2.8	0.36	ppb v/v			11/17/14 23:37	3.55

Client Sample ID: 096732-001/MWL-SV05-300 (port 4)

Lab Sample ID: 320-10172-21

Date Collected: 10/22/14 10:39
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	0.23	J B	1.4	0.19	ppb v/v			11/17/14 23:37	3.55

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*11/17/14 23:37*	*3.55*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 130*		*11/17/14 23:37*	*3.55*
Toluene-d8 (Surr)	*92*		*70 - 130*		*11/17/14 23:37*	*3.55*

Client Sample ID: 096733-001/MWL-SV05-400 (port 5)

Lab Sample ID: 320-10172-22

Date Collected: 10/22/14 10:43
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	5.1	J	18	0.62	ppb v/v			11/18/14 00:29	3.51
Benzene	0.83	J	1.4	0.28	ppb v/v			11/18/14 00:29	3.51
Benzyl chloride	ND		2.8	0.57	ppb v/v			11/18/14 00:29	3.51
Bromodichloromethane	ND		1.1	0.23	ppb v/v			11/18/14 00:29	3.51
Bromoform	ND		1.4	0.25	ppb v/v			11/18/14 00:29	3.51
Bromomethane	ND		2.8	1.2	ppb v/v			11/18/14 00:29	3.51
2-Butanone (MEK)	ND		2.8	0.70	ppb v/v			11/18/14 00:29	3.51
Carbon disulfide	0.63	J	2.8	0.27	ppb v/v			11/18/14 00:29	3.51
Carbon tetrachloride	0.51	J	2.8	0.22	ppb v/v			11/18/14 00:29	3.51
Chlorobenzene	ND		1.1	0.22	ppb v/v			11/18/14 00:29	3.51
Chloroethane	ND		2.8	1.1	ppb v/v			11/18/14 00:29	3.51
Chloroform	0.67	J	1.1	0.33	ppb v/v			11/18/14 00:29	3.51
Chloromethane	2.2	J	2.8	0.69	ppb v/v			11/18/14 00:29	3.51
Dibromochloromethane	ND		1.4	0.28	ppb v/v			11/18/14 00:29	3.51
1,2-Dibromoethane (EDB)	ND		2.8	0.26	ppb v/v			11/18/14 00:29	3.51
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.4	0.54	ppb v/v			11/18/14 00:29	3.51
1,2-Dichlorobenzene	ND		1.4	0.46	ppb v/v			11/18/14 00:29	3.51
1,3-Dichlorobenzene	ND		1.4	0.39	ppb v/v			11/18/14 00:29	3.51
1,4-Dichlorobenzene	ND		1.4	0.52	ppb v/v			11/18/14 00:29	3.51
Dichlorodifluoromethane	14		1.4	0.51	ppb v/v			11/18/14 00:29	3.51
1,1-Dichloroethane	1.4		1.1	0.25	ppb v/v			11/18/14 00:29	3.51
1,2-Dichloroethane	ND		2.8	0.31	ppb v/v			11/18/14 00:29	3.51
1,1-Dichloroethene	14		2.8	0.45	ppb v/v			11/18/14 00:29	3.51
cis-1,2-Dichloroethene	0.77	J	1.4	0.31	ppb v/v			11/18/14 00:29	3.51
trans-1,2-Dichloroethene	ND		1.4	0.35	ppb v/v			11/18/14 00:29	3.51
1,2-Dichloropropane	ND		1.4	0.84	ppb v/v			11/18/14 00:29	3.51
cis-1,3-Dichloropropene	ND		1.4	0.37	ppb v/v			11/18/14 00:29	3.51
trans-1,3-Dichloropropene	ND		1.4	0.31	ppb v/v			11/18/14 00:29	3.51
Ethylbenzene	ND		1.4	0.22	ppb v/v			11/18/14 00:29	3.51
4-Ethyltoluene	ND		1.4	0.66	ppb v/v			11/18/14 00:29	3.51
Hexachlorobutadiene	ND		7.0	1.5	ppb v/v			11/18/14 00:29	3.51
2-Hexanone	ND		1.4	0.31	ppb v/v			11/18/14 00:29	3.51
4-Methyl-2-pentanone (MIBK)	ND		1.4	0.47	ppb v/v			11/18/14 00:29	3.51
Methylene Chloride	0.58	J	1.4	0.25	ppb v/v			11/18/14 00:29	3.51
Styrene	ND		1.4	0.21	ppb v/v			11/18/14 00:29	3.51

Client Sample ID: 096733-001/MWL-SV05-400 (port 5)
Lab Sample ID: 320-10172-22

Date Collected: 10/22/14 10:43
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		1.4	0.24	ppb v/v			11/18/14 00:29	3.51
Tetrachloroethene	**110**		1.4	0.18	ppb v/v			11/18/14 00:29	3.51
Toluene	**74**	**B**	1.4	0.18	ppb v/v			11/18/14 00:29	3.51
1,1,2-Trichloro-1,2,2-trifluoroethane	**40**		1.4	0.57	ppb v/v			11/18/14 00:29	3.51
1,2,4-Trichlorobenzene	ND		7.0	1.5	ppb v/v			11/18/14 00:29	3.51
1,1,1-Trichloroethane	**1.5**		1.1	0.23	ppb v/v			11/18/14 00:29	3.51
1,1,2-Trichloroethane	ND		1.4	0.24	ppb v/v			11/18/14 00:29	3.51
Trichloroethene	**100**		1.4	0.37	ppb v/v			11/18/14 00:29	3.51
Trichlorofluoromethane	**18**		1.4	0.69	ppb v/v			11/18/14 00:29	3.51
1,2,4-Trimethylbenzene	ND		2.8	0.57	ppb v/v			11/18/14 00:29	3.51
1,3,5-Trimethylbenzene	ND		1.4	0.44	ppb v/v			11/18/14 00:29	3.51
Vinyl acetate	ND		2.8	0.51	ppb v/v			11/18/14 00:29	3.51
Vinyl chloride	ND		1.4	0.42	ppb v/v			11/18/14 00:29	3.51
m,p-Xylene	ND		2.8	0.35	ppb v/v			11/18/14 00:29	3.51
o-Xylene	ND		1.4	0.19	ppb v/v			11/18/14 00:29	3.51

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*70 - 130*		*11/18/14 00:29*	*3.51*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 130*		*11/18/14 00:29*	*3.51*
Toluene-d8 (Surr)	*93*		*70 - 130*		*11/18/14 00:29*	*3.51*

Client Sample ID: 096734-001/MWL-SV05-400 (port 5)
Lab Sample ID: 320-10172-23

Date Collected: 10/22/14 10:45
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**6.3**	**J**	20	0.70	ppb v/v			11/18/14 01:21	3.93
Benzene	**1.2**	**J**	1.6	0.31	ppb v/v			11/18/14 01:21	3.93
Benzyl chloride	ND		3.1	0.64	ppb v/v			11/18/14 01:21	3.93
Bromodichloromethane	ND		1.2	0.26	ppb v/v			11/18/14 01:21	3.93
Bromoform	ND		1.6	0.28	ppb v/v			11/18/14 01:21	3.93
Bromomethane	ND		3.1	1.3	ppb v/v			11/18/14 01:21	3.93
2-Butanone (MEK)	**0.88**	**J**	3.1	0.78	ppb v/v			11/18/14 01:21	3.93
Carbon disulfide	**0.39**	**J**	3.1	0.31	ppb v/v			11/18/14 01:21	3.93
Carbon tetrachloride	ND		3.1	0.25	ppb v/v			11/18/14 01:21	3.93
Chlorobenzene	ND		1.2	0.25	ppb v/v			11/18/14 01:21	3.93
Chloroethane	ND		3.1	1.2	ppb v/v			11/18/14 01:21	3.93
Chloroform	ND		1.2	0.37	ppb v/v			11/18/14 01:21	3.93
Chloromethane	**3.3**		3.1	0.77	ppb v/v			11/18/14 01:21	3.93
Dibromochloromethane	ND		1.6	0.31	ppb v/v			11/18/14 01:21	3.93
1,2-Dibromoethane (EDB)	ND		3.1	0.29	ppb v/v			11/18/14 01:21	3.93
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.6	0.61	ppb v/v			11/18/14 01:21	3.93
1,2-Dichlorobenzene	ND		1.6	0.51	ppb v/v			11/18/14 01:21	3.93
1,3-Dichlorobenzene	ND		1.6	0.43	ppb v/v			11/18/14 01:21	3.93
1,4-Dichlorobenzene	ND		1.6	0.59	ppb v/v			11/18/14 01:21	3.93
Dichlorodifluoromethane	**11**		1.6	0.57	ppb v/v			11/18/14 01:21	3.93

Client Sample ID: 096734-001/MWL-SV05-400 (port 5)

Lab Sample ID: 320-10172-23

Date Collected: 10/22/14 10:45

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethane	**0.56**	**J**	1.2	0.28	ppb v/v			11/18/14 01:21	3.93
1,2-Dichloroethane	ND		3.1	0.35	ppb v/v			11/18/14 01:21	3.93
1,1-Dichloroethene	**7.6**		3.1	0.51	ppb v/v			11/18/14 01:21	3.93
cis-1,2-Dichloroethene	ND		1.6	0.35	ppb v/v			11/18/14 01:21	3.93
trans-1,2-Dichloroethene	ND		1.6	0.39	ppb v/v			11/18/14 01:21	3.93
1,2-Dichloropropane	ND		1.6	0.94	ppb v/v			11/18/14 01:21	3.93
cis-1,3-Dichloropropene	ND		1.6	0.41	ppb v/v			11/18/14 01:21	3.93
trans-1,3-Dichloropropene	ND		1.6	0.35	ppb v/v			11/18/14 01:21	3.93
Ethylbenzene	ND		1.6	0.25	ppb v/v			11/18/14 01:21	3.93
4-Ethyltoluene	ND		1.6	0.73	ppb v/v			11/18/14 01:21	3.93
Hexachlorobutadiene	ND		7.9	1.7	ppb v/v			11/18/14 01:21	3.93
2-Hexanone	ND		1.6	0.34	ppb v/v			11/18/14 01:21	3.93
4-Methyl-2-pentanone (MIBK)	ND		1.6	0.53	ppb v/v			11/18/14 01:21	3.93
Methylene Chloride	**0.35**	**J**	1.6	0.28	ppb v/v			11/18/14 01:21	3.93
Styrene	ND		1.6	0.23	ppb v/v			11/18/14 01:21	3.93
1,1,2,2-Tetrachloroethane	ND		1.6	0.27	ppb v/v			11/18/14 01:21	3.93
Tetrachloroethene	**89**		1.6	0.20	ppb v/v			11/18/14 01:21	3.93
Toluene	**170**	**B**	1.6	0.20	ppb v/v			11/18/14 01:21	3.93
1,1,2-Trichloro-1,2,2-trifluoroethane	**32**		1.6	0.64	ppb v/v			11/18/14 01:21	3.93
1,2,4-Trichlorobenzene	ND		7.9	1.7	ppb v/v			11/18/14 01:21	3.93
1,1,1-Trichloroethane	**0.63**	**J**	1.2	0.26	ppb v/v			11/18/14 01:21	3.93
1,1,2-Trichloroethane	ND		1.6	0.26	ppb v/v			11/18/14 01:21	3.93
Trichloroethene	**60**		1.6	0.41	ppb v/v			11/18/14 01:21	3.93
Trichlorofluoromethane	**12**		1.6	0.77	ppb v/v			11/18/14 01:21	3.93
1,2,4-Trimethylbenzene	ND		3.1	0.64	ppb v/v			11/18/14 01:21	3.93
1,3,5-Trimethylbenzene	ND		1.6	0.49	ppb v/v			11/18/14 01:21	3.93
Vinyl acetate	ND		3.1	0.57	ppb v/v			11/18/14 01:21	3.93
Vinyl chloride	ND		1.6	0.47	ppb v/v			11/18/14 01:21	3.93
m,p-Xylene	ND		3.1	0.39	ppb v/v			11/18/14 01:21	3.93
o-Xylene	**0.21**	**J B**	1.6	0.21	ppb v/v			11/18/14 01:21	3.93

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*70 - 130*		*11/18/14 01:21*	*3.93*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 130*		*11/18/14 01:21*	*3.93*
Toluene-d8 (Surr)	*95*		*70 - 130*		*11/18/14 01:21*	*3.93*

Client Sample ID: 096735-001/MWL-SV-FB5

Lab Sample ID: 320-10172-24

Date Collected: 10/22/14 10:24

Matrix: Air

Date Received: 10/30/14 10:00

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		5.0	0.18	ppb v/v			11/18/14 02:19	1
Benzene	ND		0.40	0.079	ppb v/v			11/18/14 02:19	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			11/18/14 02:19	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			11/18/14 02:19	1
Bromoform	ND		0.40	0.070	ppb v/v			11/18/14 02:19	1

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-10172-1

Client Sample ID: 096735-001/MWL-SV-FB5
Date Collected: 10/22/14 10:24
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Lab Sample ID: 320-10172-24
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	ND		0.80	0.34	ppb v/v			11/18/14 02:19	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			11/18/14 02:19	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			11/18/14 02:19	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			11/18/14 02:19	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			11/18/14 02:19	1
Chloroethane	ND		0.80	0.31	ppb v/v			11/18/14 02:19	1
Chloroform	ND		0.30	0.095	ppb v/v			11/18/14 02:19	1
Chloromethane	ND		0.80	0.20	ppb v/v			11/18/14 02:19	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			11/18/14 02:19	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			11/18/14 02:19	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			11/18/14 02:19	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			11/18/14 02:19	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			11/18/14 02:19	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			11/18/14 02:19	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			11/18/14 02:19	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			11/18/14 02:19	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			11/18/14 02:19	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			11/18/14 02:19	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			11/18/14 02:19	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			11/18/14 02:19	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			11/18/14 02:19	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			11/18/14 02:19	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			11/18/14 02:19	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			11/18/14 02:19	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			11/18/14 02:19	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			11/18/14 02:19	1
2-Hexanone	ND		0.40	0.087	ppb v/v			11/18/14 02:19	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			11/18/14 02:19	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			11/18/14 02:19	1
Styrene	ND		0.40	0.059	ppb v/v			11/18/14 02:19	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			11/18/14 02:19	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			11/18/14 02:19	1
Toluene	ND		0.40	0.051	ppb v/v			11/18/14 02:19	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			11/18/14 02:19	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			11/18/14 02:19	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			11/18/14 02:19	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			11/18/14 02:19	1
Trichloroethene	**0.17**	**J**	0.40	0.11	ppb v/v			11/18/14 02:19	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			11/18/14 02:19	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			11/18/14 02:19	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			11/18/14 02:19	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			11/18/14 02:19	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			11/18/14 02:19	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			11/18/14 02:19	1
o-Xylene	ND		0.40	0.054	ppb v/v			11/18/14 02:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*82*		*70 - 130*		*11/18/14 02:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 130*		*11/18/14 02:19*	*1*

Client: Sandia National Laboratories
Project/Site: MWL SVM

TestAmerica Job ID: 320-10172-1

Client Sample ID: 096735-001/MWL-SV-FB5
Lab Sample ID: 320-10172-24
Date Collected: 10/22/14 10:24
Matrix: Air
Date Received: 10/30/14 10:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	94		70 - 130		11/18/14 02:19	1

ANNEX D

Mixed Waste Landfill
Soil-Moisture Monitoring Forms

April 2014-March 2015

Field Forms and Tables

MIXED WASTE LANDFILL

SOIL MOISTURE MONITORING

FIELD FORMS

April 2014

October 2014

Tailgate Safety Meeting Form

Dept: ____ Date: 4/15/14 Time: 0900

Activities: Soil Moisture Monitoring
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: ____ °F Wind Speed: ____ MPH Humidity: ____ % Wind Chill ____ °F

Chemicals Used: None

Safety Topics Presented

☑ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☑ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☑ Wear safety boots.		☐ Be aware of electrical hazards
☑ Wear leather gloves.		☐ Be aware of pressure hazards.
☐ Wear safety glasses.		☑ No eating or drinking on site.
☐ Wear nitrile or latex gloves.		☑ Be aware of biohazards (snakes, spiders, etc.)
☑ Use safe lifting practices.		☑ Wear communication device (cell phone, site radio, EOC pager).
☑ Be aware of pinch points		☐ Other (list).
☐ Other (list).		☐ Other (list).

Emergency: 844-0911 (cell phone) or 911 (Sandia land line)

Attendees

Printed Name	Signature
Robert Zook	
Danielle Nieto	
Don Watenpaugh	

Mixed Waste Landfill Neutron Logging Data Field Form (page 1 of 2)

Date: 4/15/14		Standard Count: 6566
Start Time: 0926		Chi: 1.00 KJ 4/15/14
Personnel: Robert Zack, Danielle Nieto	Don Watenpaugh	Previous Count: ~~6667~~ 6671
		Count Time: 30 seconds

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Winch Counter Reading (ft)	VZ-3 Counts (E Side)	VZ-2 Counts (SW Corner)	VZ-1 Counts (NW Corner)
0.0	0	0	1377	1485	2257
0.9	1	9999	2538	2048	2421
1.7	2	9998	2546	2284	2324
2.6	3	9997	2451	2335	2133
3.5	4	9996	1935	2329	2032
4.3	5	9995	2006	2288	1882
5.2	6	9994	1789	1952	1713
6.1	7	9993	1709	1640	1623
6.9	8	9992	1799	1725	1485
7.8	9	9991	1836	1769	1659
8.7	10	9990	1879	1597	2046
9.5	11	9989	1862	2029	1971
10.4	12	9988	1698	1869	1808
11.3	13	9987	1913	1782	1902
12.1	14	9986	1808	1681	2120
13.0	15	9985	1855	1799	2122
13.9	16	9984	1599	1746	2179
14.7	17	9983	1688	1826	1778
15.6	18	9982	1882	1896	1576
16.5	19	9981	1431	2190	1571
17.3	20	9980	1459	1985	1548
18.2	21	9979	1837	1760	1778
19.1	22	9978	1593	1858	2502
19.9	23	9977	1430	2083	2275
20.8	24	9976	1470	1659	1921
21.7	25	9975	1725	1663	1813

Mixed Waste Landfill Neutron Logging Data Field Form (page 2 of 2)

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Winch Counter Reading (ft)	VZ-3 Counts (E Side)	VZ-2 Counts (SW Corner)	VZ-1 Counts (NW Corner)
26.0	30	9970	1910	1707	1750
30.3	35	9965	1755	1766	2164
34.6	40	9960	1803	1625	1784
39.0	45	9955	1689	1591	2188
43.3	50	9950	2102	1746	1745
47.6	55	9945	1839	1927	1806
52.0	60	9940	1760	2021	1940
56.3	65	9935	2144	2303	2010
60.6	70	9930	1253	2539	1826
65.0	75	9925	2181	2227	2076
69.3	80	9920	2338	1810	1907
73.6	85	9915	2000	1835	1951
77.9	90	9910	1458	2213	1909
82.3	95	9905	2072	2322	2340
86.6	100	9900	2218	2121	2250
90.9	105	9895	1935	2177	2163
95.3	110	9890	2054	2233	2140
99.6	115	9885	1845	1771	1626
103.9	120	9880	1577	1774	2038
108.3	125	9875	1992	2248	1495
112.6	130	9870	2101	2219	1926
116.9	135	9865	1840	2429	1729
121.2	140	9860	1600	2065	1540
125.6	145	9855	2672	2793	3002
129.9	150	9850	3323	2110	2180
134.2	155	9845	2285	2370	1746
138.6	160	9840	2724	1961	2262
142.9	165	9835	2501	2347	2074
147.2	170	9830	2593	1670	1686
151.6	175	9825	1846	2918	2642
155.9	180	9820	2879	2841	3097
160.2	185	9815	2902	2786	2315
164.5	190	9810	1802	1710	1990
168.9	195	9805	1878	2919	3628
173.2	200	9800	1980	3161	2644

Tailgate Safety Meeting Form

Dept: 4143 Facility: MWL Date: 10/16/14 Time: 10:00

Activities: Soil moisture monitoring using CPN503DR Hydroprobe.

(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when performing field work.)

Weather Conditions:

Temp: 63 °F Wind Speed: < 5 MPH Humidity: 33 % Wind Chill: ____ °F

☑ Wear safety boots		☑ Wear leather gloves
☑ Wear safety glasses		☐ Wear sun screen
☑ Be aware of biohazards (snakes, spiders, etc.)		☑ Wear communication device (cell phone, EOC pager)
☑ Be aware of slips, trips, and falls		☑ Using safe lifting practices were discussed.
☑ Be aware of pinch points on winch		☑ Be aware of environmental conditions (heat/cold stress)
Does anyone have any weight restrictions on lifting? Circle **YES** or (**NO**). If answered **YES** explain.		
☑ Practice ALARA		☑ Notify RCT when using neutron probe

ATTENDEES

Printed Name	Signature
Danielle Nieto	Danielle M Nieto
Robert Stock	Robert Stock

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN), department home page.

Mixed Waste Landfill Neutron Logging Data Field Form (page 1 of 2)

Date: 10/16/14		Standard Count: 6675	
Start Time: 0955		Chi: 0.95	
Personnel: R. Zaluk, N. Nieto		Previous Count: 6566	
		Count Time: 30 seconds	

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Winch Counter Reading (ft)	VZ-3 Counts (E Side)	VZ-2 Counts (SW Corner)	VZ-1 Counts (NW Corner)
0.0	0	0	967	1132	1511
0.9	1	9999	2012	1799	2097
1.7	2	9998	2377	2177	2038
2.6	3	9997	2454	2336	1911
3.5	4	9996	2160	2314	1922
4.3	5	9995	1935	2320	1898
5.2	6	9994	2041	1974	1652
6.1	7	9993	1709	1754	1649
6.9	8	9992	1764	1703	1540
7.8	9	9991	1816	1695	1639
8.7	10	9990	1790	1608	2025
9.5	11	9989	1906	1997	2094
10.4	12	9988	1645	1924	1916
11.3	13	9987	1868	1797	1826
12.1	14	9986	1881	1712	1936
13.0	15	9985	1928	1673	1983
13.9	16	9984	1835	1739	2202
14.7	17	9983	1583	1786	1800
15.6	18	9982	1799	1845	1508
16.5	19	9981	1720	2295	1503
17.3	20	9980	1356	2167	1554
18.2	21	9979	1784	1762	1692
19.1	22	9978	1731	1865	2497
19.9	23	9977	1517	2083	2266
20.8	24	9976	1450	1738	2034
21.7	25	9975	1480	1608	1856

Mixed Waste Landfill Neutron Logging Data Field Form (page 2 of 2)

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Winch Counter Reading (ft)	VZ-3 Counts (E Side)	VZ-2 Counts (SW Corner)	VZ-1 Counts (NW Corner)
26.0	30	9970	1918	1796	1748
30.3	35	9965	1703	1928	2172
34.6	40	9960	1906	1739	1722
39.0	45	9955	1625	1658	2120
43.3	50	9950	2015	1556	1788
47.6	55	9945	1849	2185	1810
52.0	60	9940	1765	1860	1924
56.3	65	9935	2185	2129	1926
60.6	70	9930	1400	259	1798
65.0	75	9925	2490	2262	2124
69.3	80	9920	2217	1597	1951
73.6	85	9915	1997	1817	2698
77.9	90	9910	1457	2384	2026
82.3	95	9905	2171	2293	2330
86.6	100	9900	2300	2273	2610
90.9	105	9895	1949	2298	2358
95.3	110	9890	2402	1897	2040
99.6	115	9885	2148	1825	1982
103.9	120	9880	1635	1934	1925
108.3	125	9875	1890	2224	1492
112.6	130	9870	2296	2282	2028
116.9	135	9865	2303	2747	1729
121.2	140	9860	1670	1973	1474
125.6	145	9855	1538	2648	2276
129.9	150	9850	2718	2392	2089
134.2	155	9845	2113	2263	1723
138.6	160	9840	2563	2573	1590
142.9	165	9835	2637	2091	2324
147.2	170	9830	2392	1617	1662
151.6	175	9825	2460	2788	3072
155.9	180	9820	3300	2590	3039
160.2	185	9815	3184	2905	2515
164.5	190	9810	1740	1696	1877
168.9	195	9805	1856	2045	3461
173.2	200	9800	2146	~~3146~~ 3240	2659

MIXED WASTE LANDFILL

SOIL MOISTURE MONITORING

Soil Moisture Monitoring Results Tables

Table D-1
VZ-1 Soil-Moisture Monitoring Results
April and October 2014

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Collection Period 2014 Apr (Soil-Moisture % content by volume)	Collection Period 2014 Oct (Soil-Moisture % content by volume)	2014 Average (Soil-Moisture % content by volume)	2014 Std Dev	Baseline Average (2004-2006) (Soil-Moisture % content by volume)	Difference between Baseline Average & 2014 Average (Soil-Moisture % content by volume)	Soil-Moisture Trigger Level (% content by volume)
3.5	4	3.4	3.0	3.2	0.3	2.9	0.4	NA
4.3	5	3.0	3.0	3.0	0.0	2.9	0.1	NA
5.2	6	2.6	2.3	2.4	0.2	2.9	-0.5	NA
6.1	7	2.3	2.3	2.3	0.0	2.6	-0.3	NA
6.9	8	1.9	2.0	2.0	0.1	2.2	-0.2	NA
7.8	9	2.4	2.3	2.3	0.1	1.9	0.4	NA
8.7	10	3.5	3.3	3.4	0.1	1.7	1.7	23
9.5	11	3.3	3.5	3.4	0.2	2.0	1.4	23
10.4	12	2.8	3.0	2.9	0.1	2.7	0.2	23
11.3	13	3.1	2.8	2.9	0.2	3.1	-0.2	23
12.1	14	3.7	3.1	3.4	0.4	2.6	0.7	23
13.0	15	3.7	3.2	3.4	0.3	2.4	1.1	23
13.9	16	3.8	3.8	3.8	0.0	2.6	1.2	23
14.7	17	2.7	2.7	2.7	0.0	2.8	0.0	23
15.6	18	2.2	1.9	2.1	0.2	2.9	-0.8	23
16.5	19	2.2	1.9	2.0	0.2	2.4	-0.4	23
17.3	20	2.1	1.8	2.0	0.2	2.0	0.0	23
18.2	21	2.7	2.4	2.6	0.2	2.0	0.6	23
19.1	22	4.7	4.6	4.6	0.1	2.1	2.5	23
19.9	23	4.1	4.0	4.0	0.1	3.0	1.1	23
20.8	24	3.1	3.3	3.2	0.2	4.3	-1.1	23
21.7	25	2.8	2.9	2.8	0.0	4.0	-1.1	23
26.0	30	2.7	2.6	2.6	0.1	2.9	-0.2	23
30.3	35	3.8	3.7	3.7	0.1	2.7	1.1	23
34.6	40	2.8	2.5	2.6	0.2	2.3	0.4	23
39.0	45	3.8	3.6	3.7	0.2	3.0	0.7	23
43.3	50	2.6	2.7	2.7	0.0	2.9	-0.2	23
47.6	55	2.8	2.7	2.8	0.0	2.8	0.0	23
52.0	60	3.2	3.0	3.1	0.1	3.4	-0.3	23
56.3	65	3.4	3.2	3.3	0.1	2.9	0.3	23
60.6	70	2.9	2.7	2.8	0.1	2.1	0.7	23
65.0	75	3.5	3.6	3.6	0.0	5.6	-2.0	23
69.3	80	3.1	3.1	3.1	0.0	2.8	0.3	23
73.6	85	3.2	3.5	3.4	0.2	3.1	0.2	23

Table D-1
VZ-1 Soil-Moisture Monitoring Results
April and October 2014

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Collection Period 2014 Apr (Soil-Moisture % content by volume)	Collection Period 2014 Oct (Soil-Moisture % content by volume)	2014 Average (Soil-Moisture % content by volume)	2014 Std Dev	Baseline Average (2004-2006) (Soil-Moisture % content by volume)	Difference between Baseline Average & 2014 Average (Soil-Moisture % content by volume)	Soil-Moisture Trigger Level (% content by volume)
77.9	90	3.1	3.3	3.2	0.2	3.7	-0.5	23
82.3	95	4.3	4.1	4.2	0.1	3.7	0.4	23
86.6	100	4.0	4.9	4.4	0.6	5.4	-0.9	23
90.9	105	3.8	4.2	4.0	0.3	5.0	-1.0	NA
95.3	110	3.7	3.4	3.5	0.3	3.0	0.6	NA
99.6	115	2.3	2.9	2.6	0.4	3.6	-1.0	NA
103.9	120	3.4	3.0	3.2	0.3	2.2	1.0	NA
108.3	125	2.0	1.9	1.9	0.1	2.7	-0.8	NA
112.6	130	3.1	3.3	3.2	0.1	3.3	-0.1	NA
116.9	135	2.6	2.5	2.6	0.1	3.1	-0.6	NA
121.2	140	2.1	1.8	2.0	0.2	2.1	-0.2	NA
125.6	145	6.1	4.0	5.0	1.5	3.8	1.2	NA
129.9	150	3.8	3.5	3.7	0.2	3.2	0.5	NA
134.2	155	2.6	2.5	2.6	0.1	2.7	-0.1	NA
138.6	160	4.0	2.2	3.1	1.3	2.1	1.0	NA
142.9	165	3.5	4.1	3.8	0.4	3.8	0.0	NA
147.2	170	2.5	2.3	2.4	0.1	2.0	0.4	NA
151.6	175	5.1	6.1	5.6	0.7	6.0	-0.4	NA
155.9	180	6.3	6.0	6.2	0.2	5.5	0.6	NA
160.2	185	4.2	4.6	4.4	0.3	4.4	0.0	NA
164.5	190	3.3	2.9	3.1	0.3	3.0	0.1	NA
168.9	195	7.7	7.1	7.4	0.4	7.0	0.5	NA
173.2	200	5.1	5.0	5.0	0.1	5.4	-0.3	NA
	Average	3.4	3.3	3.3	Average	3.2		

Note: Shaded area represents depths where 23-percent soil moisture trigger applies.

Std Dev = Standard deviation.

NA = Not applicable

Table D-2
VZ-2 Soil-Moisture Monitoring Results
April and October 2014

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Collection Period 2014 Apr	Collection Period 2014 Oct	2014 Average	2014 Std Dev	Baseline Average (2004-2006)	Difference between Baseline Average & 2013 Average	Soil-Moisture Trigger Level (% content by volume)
		Soil-Moisture (% content by volume)				Soil-Moisture (% content by volume)		
3.5	4	4.2	4.1	4.2	0.1	2.7	1.5	NA
4.3	5	4.1	4.1	4.1	0.0	3.3	0.8	NA
5.2	6	3.2	3.2	3.2	0.0	3.6	-0.4	NA
6.1	7	2.4	2.6	2.5	0.2	3.6	-1.1	NA
6.9	8	2.6	2.5	2.5	0.1	3.5	-1.0	NA
7.8	9	2.7	2.4	2.6	0.2	3.1	-0.5	NA
8.7	10	2.2	2.2	2.2	0.0	2.4	-0.2	23
9.5	11	3.4	3.2	3.3	0.1	2.2	1.1	23
10.4	12	3.0	3.0	3.0	0.0	2.2	0.8	23
11.3	13	2.7	2.7	2.7	0.0	2.1	0.6	23
12.1	14	2.5	2.5	2.5	0.0	2.5	0.0	23
13.0	15	2.8	2.4	2.6	0.3	3.0	-0.4	23
13.9	16	2.6	2.6	2.6	0.1	2.8	-0.2	23
14.7	17	2.9	2.7	2.8	0.1	2.4	0.4	23
15.6	18	3.1	2.8	2.9	0.2	2.6	0.3	23
16.5	19	3.9	4.0	3.9	0.1	2.7	1.2	23
17.3	20	3.3	3.7	3.5	0.3	2.9	0.6	23
18.2	21	2.7	2.6	2.7	0.1	3.1	-0.4	23
19.1	22	3.0	1.3	2.1	1.2	3.6	-1.5	23
19.9	23	3.6	3.5	3.5	0.1	3.7	-0.2	23
20.8	24	2.4	2.6	2.5	0.1	3.1	-0.6	23
21.7	25	2.4	2.2	2.3	0.2	2.7	-0.4	23
26.0	30	2.5	2.7	2.6	0.1	2.4	0.2	23
30.3	35	2.7	3.1	2.9	0.2	2.9	0.0	23
34.6	40	2.3	2.6	2.4	0.2	2.7	-0.3	23
39.0	45	2.2	2.3	2.3	0.1	2.3	0.0	23
43.3	50	2.6	2.1	2.4	0.4	2.1	0.3	23
47.6	55	3.1	3.7	3.4	0.4	3.1	0.3	23
52.0	60	3.4	2.9	3.1	0.4	3.0	0.1	23
56.3	65	4.2	3.6	3.9	0.4	5.5	-1.6	23
60.6	70	4.8	4.8	4.8	0.0	4.8	0.0	23
65.0	75	4.0	3.9	3.9	0.0	5.1	-1.2	23
69.3	80	2.8	2.2	2.5	0.5	2.6	-0.1	23
73.6	85	2.9	2.8	2.8	0.1	2.6	0.2	23
77.9	90	3.9	4.3	4.1	0.3	3.1	1.0	23

Table D-2
VZ-2 Soil-Moisture Monitoring Results
April and October 2014

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Collection Period 2014 Apr (Soil-Moisture % content by volume)	Collection Period 2014 Oct (Soil-Moisture % content by volume)	2014 Average (Soil-Moisture % content by volume)	2014 Std Dev	Baseline Average (2004-2006) (Soil-Moisture % content by volume)	Difference between Baseline Average & 2013 Average (Soil-Moisture % content by volume)	Soil-Moisture Trigger Level (% content by volume)
82.3	95	4.2	4.0	4.1	0.1	3.6	0.5	23
86.6	100	3.7	4.0	3.8	0.2	4.7	-0.9	23
90.9	105	3.8	4.0	3.9	0.2	3.4	0.5	NA
95.3	110	4.0	3.0	3.5	0.7	3.1	0.4	NA
99.6	115	2.7	2.8	2.7	0.0	3.6	-0.9	NA
103.9	120	2.7	3.1	2.9	0.2	2.0	0.9	NA
108.3	125	4.0	3.8	3.9	0.1	3.8	0.1	NA
112.6	130	3.9	4.0	4.0	0.0	3.6	0.4	NA
116.9	135	4.5	5.2	4.9	0.5	3.4	1.5	NA
121.2	140	3.5	3.2	3.3	0.2	2.4	0.9	NA
125.6	145	5.5	5.0	5.2	0.4	5.9	-0.7	NA
129.9	150	3.6	4.3	4.0	0.5	7.0	-3.0	NA
134.2	155	4.3	3.9	4.1	0.3	3.6	0.5	NA
138.6	160	3.2	4.8	4.0	1.1	3.8	0.2	NA
142.9	165	4.3	3.5	3.9	0.6	3.0	0.9	NA
147.2	170	2.4	2.2	2.3	0.2	2.9	-0.6	NA
151.6	175	5.8	5.3	5.6	0.3	2.4	3.2	NA
155.9	180	5.6	4.8	5.2	0.6	5.4	-0.2	NA
160.2	185	5.5	5.7	5.6	0.1	5.4	0.2	NA
164.5	190	2.6	2.4	2.5	0.1	4.1	-1.6	NA
168.9	195	5.8	3.4	4.6	1.7	3.5	1.1	NA
173.2	200	6.5	6.6	6.5	0.0	6.3	0.2	NA
	Average	3.5	3.4	3.4	Average	3.4		

Note: Shaded area represents depths where 23-percent soil moisture trigger applies.

Std Dev = Standard deviation.

NA = Not applicable

Table D-3
VZ-3 Soil-Moisture Monitoring Results
April and October 2014

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Collection Period 2014 Apr (Soil-Moisture (% content by volume))	Collection Period 2014 Oct (Soil-Moisture (% content by volume))	2014 Average (Soil-Moisture (% content by volume))	2014 Std Dev	Baseline Average (2004-2006) (Soil-Moisture (% content by volume))	Difference between Baseline Average & 2014 Average (Soil-Moisture (% content by volume))	Soil-Moisture Trigger Level (% content by volume)
3.5	4	3.2	3.7	3.4	0.4	4.6	-1.2	NA
4.3	5	3.4	3.1	3.2	0.2	4.5	-1.3	NA
5.2	6	2.8	3.4	3.1	0.4	3.7	-0.6	NA
6.1	7	2.5	2.5	2.5	0.1	2.9	-0.4	NA
6.9	8	2.8	2.6	2.7	0.1	3.1	-0.4	NA
7.8	9	2.9	2.8	2.8	0.1	2.3	0.5	NA
8.7	10	3.0	2.7	2.8	0.2	2.4	0.4	23
9.5	11	3.0	3.0	3.0	0.0	2.6	0.4	23
10.4	12	2.5	2.3	2.4	0.2	2.7	-0.3	23
11.3	13	3.1	2.9	3.0	0.1	3.0	0.0	23
12.1	14	2.8	2.9	2.9	0.1	2.6	0.3	23
13.0	15	2.9	3.1	3.0	0.1	2.8	0.2	23
13.9	16	2.3	2.8	2.5	0.4	2.9	-0.4	23
14.7	17	2.5	2.1	2.3	0.3	3.1	-0.8	23
15.6	18	3.0	2.7	2.9	0.2	3.1	-0.2	23
16.5	19	1.8	2.5	2.1	0.5	2.3	-0.2	23
17.3	20	1.9	1.5	1.7	0.2	2.7	-1.0	23
18.2	21	2.9	2.7	2.8	0.2	2.7	0.1	23
19.1	22	2.2	2.5	2.4	0.2	1.8	0.6	23
19.9	23	1.8	2.0	1.9	0.1	2.7	-0.8	23
20.8	24	1.9	1.8	1.8	0.1	2.8	-1.0	23
21.7	25	2.6	1.9	2.2	0.5	2.1	0.1	23
26.0	30	3.1	3.0	3.1	0.0	2.5	0.6	23
30.3	35	2.7	2.5	2.6	0.2	2.8	-0.2	23
34.6	40	2.8	3.0	2.9	0.1	2.1	0.8	23
39.0	45	2.5	2.2	2.4	0.2	2.7	-0.3	23
43.3	50	3.6	3.3	3.5	0.2	2.9	0.6	23
47.6	55	2.9	2.8	2.9	0.0	3.4	-0.5	23
52.0	60	2.7	2.6	2.7	0.0	2.9	-0.2	23
56.3	65	3.7	3.7	3.7	0.0	3.5	0.2	23
60.6	70	1.3	1.6	1.5	0.2	1.9	-0.4	23
65.0	75	3.8	4.6	4.2	0.5	4.3	-0.1	23
69.3	80	4.3	3.8	4.0	0.3	4.5	-0.4	23

Table D-3
VZ-3 Soil-Moisture Monitoring Results
April and October 2014

Vertical Depth Below Top of Casing (ft)	Linear Depth Along Casing (ft)	Collection Period 2014 Apr (Soil-Moisture % content by volume)	Collection Period 2014 Oct (Soil-Moisture % content by volume)	2014 Average (Soil-Moisture % content by volume)	2014 Std Dev	Baseline Average (2004-2006) (Soil-Moisture % content by volume)	Difference between Baseline Average & 2014 Average (Soil-Moisture % content by volume)	Soil-Moisture Trigger Level (% content by volume)
73.6	85	3.3	3.2	3.3	0.1	3.5	-0.2	23
77.9	90	1.9	1.8	1.8	0.0	1.9	-0.1	23
82.3	95	3.5	3.7	3.6	0.1	3.3	0.3	23
86.6	100	3.9	4.0	4.0	0.1	3.4	0.6	23
90.9	105	3.2	3.1	3.1	0.0	3.3	-0.2	NA
95.3	110	3.5	4.3	3.9	0.6	4.7	-0.8	NA
99.6	115	2.9	3.6	3.3	0.5	3.6	-0.3	NA
103.9	120	2.2	2.3	2.2	0.1	2.1	0.1	NA
108.3	125	3.3	3.0	3.1	0.3	1.8	1.3	NA
112.6	130	3.6	4.0	3.8	0.3	4.3	-0.5	NA
116.9	135	2.9	4.1	3.5	0.8	4.0	-0.5	NA
121.2	140	2.3	2.4	2.3	0.1	2.3	0.0	NA
125.6	145	5.2	2.0	3.6	2.2	2.0	1.6	NA
129.9	150	6.9	5.2	6.0	1.2	4.4	1.6	NA
134.2	155	4.1	3.5	3.8	0.4	3.6	0.2	NA
138.6	160	5.3	4.7	5.0	0.4	4.4	0.6	NA
142.9	165	4.7	4.9	4.8	0.2	5.2	-0.4	NA
147.2	170	4.9	4.3	4.6	0.5	4.1	0.5	NA
151.6	175	2.9	4.5	3.7	1.1	4.3	-0.6	NA
155.9	180	5.7	6.7	6.2	0.7	6.6	-0.4	NA
160.2	185	5.8	6.4	6.1	0.4	5.6	0.5	NA
164.5	190	2.8	2.6	2.7	0.2	2.7	0.0	NA
168.9	195	3.0	2.9	2.9	0.1	3.1	-0.2	NA
173.2	200	3.3	3.6	3.5	0.3	4.1	-0.6	NA
	Average	2.9	3.2	3.2	Average	3.2		

Note: Shaded area represents depths where 23-percent soil moisture trigger applies.

Std Dev = Standard deviation.

NA = Not applicable

ANNEX E

Mixed Waste Landfill
Groundwater Monitoring Forms and Reports

April 2014-March 2015

Field Forms

Data Validation Reports

Contract Verification Reports

FIELD SAMPLING FORMS

MWL LONG-TERM MONITORING AND MAINTENANCE
GROUNDWATER MONITORING

Form Title	Corresponding Procedure
Tailgate Safety Briefing	PLA 05-09
Groundwater Sample Collection Field Equipment Check Log	FOP 05-02
Portable Pump and Tubing/Water Level Indicator Decontamination Log Form	FOP 05-03
Field Measurement Log For Groundwater Sample Collection	FOP 05-01
Analysis Request and Chain of Custody*	LOP 94-03

*Completed AR/COC forms are provided in the Data Validation Section of this Annex.

FIELD SAMPLING FORMS

APRIL 2014 GROUNDWATER MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-BW2 Date: 4/21/14 Time: 0750

Activities: GROUNDWATER MONITORING AND SAMPLING
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 70.7 °F Wind Speed: 0 MPH Humidity: 34.3 % Wind Chill ~~NA~~ °F 4/24/14

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~ N/A
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.		☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.		☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.		☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.		☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.		☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	
ALFRED SANTILLANES	
William Gibson	

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-MW7 Date: 4/22/14 Time: 0800

Activities: GROUNDWATER MONITORING AND SAMPLING
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 77.9 °F Wind Speed: 0 MPH Humidity: 30.2 % Wind Chill 77.9 °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~ N/A 4/24/14
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	
ALFREDO SANTILLANES	
William Gibson	

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-MW9 Date: 4/23/14 Time: 0750

Activities: GROUNDWATER MONITORING AND SAMPLING
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 77.7 °F Wind Speed: ~5 MPH Humidity: 22.7% Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~ NA 4/29/14
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
William Gibson	William Gibson
ALFRED SANTILLANES	Alfred Santillanes

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-MW8 Date: 4/28/14 Time: 0750

Activities: GROUNDWATER MONITORING AND SAMPLING
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 57.5 °F Wind Speed: 10-15 MPH Humidity: 32.9 % Wind Chill: ~54 °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~ N/A 4/29/14
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
William Gibson	William J Gibson
ALFRED SANTILLANES	Alfred Santillanes

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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.10.11.01
Well I.D.: MWL BW 2 4/21/14	Date: 04/21/14
Well Condition: See Inspection TI	Weather Condition: See Tailgate
Method: Portable pump X Dedicated pump ______	Pump depth: 496'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
479.75	0811		START						→
482.21	0842	5	19.60	648.5	99.7	7.43	0.38	17.1	1.56
483.04	0903	10	20.16	634.1	113.3	7.48	0.66	23.2	2.10
483.58	0924	15	20.63	646.0	119.0	7.47	0.36	22.8	2.04
483.94	0946	20	21.50	667.2	118.7	7.45	0.29	19.4	1.71
484.28	1006	25	21.89	681.1	115.8	7.43	0.22	15.8	1.38
484.54	1027	30	21.99	688.2	111.3	7.42	0.25	13.2	1.15
484.71	1039	33	22.31	693.1	111.7	7.42	0.29	12.4	1.07
484.80	1047	35	22.41	695.6	112.6	7.41	0.19	11.8	1.02
484.88	1056	37	22.41	696.1	110.6	7.41	0.17	11.4	0.99
484.96	1105	39	22.44	695.7	110.0	7.41	0.20	11.0	0.95
	1106		Sampling						→
									1.6 4-21-14
									~ 4.00 gals purged
									from tubing
									0821

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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.10.11.01
Well I.D.: MWL-MW 7 4/22/14	Date: 04/22/14
Well Condition: See Fortigraffy Inspection	Weather Condition: See Tailgate
Method: Portable pump X Dedicated pump ____	Pump depth: 497'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
489.92	0820	/	START						→
491.10	0849	2	22.23	573.0	232.9	7.64	1.00	75.8	6.59
491.32	0903	4	21.18	560.8	238.0	7.65	.75	74.1	6.57
491.44	0918	6	20.82	556.1	236.4	7.64	.62	72.1	6.44
491.49	0933	8	21.80	568.3	236.9	7.65	.45	72.7	6.37
491.46	0950	10	23.22	588.8	237.2	7.65	.34	73.5	6.38
491.43	0958	11	23.83	594.2	239.9	7.66	.26	74.2	6.26
491.38	1008	12	23.91	594.0	243.0	7.66	.27	74.4	6.24
491.33	1017	13	23.88	594.4	246.0	7.66	.26	74.6	6.24
	1018	/	Sample						→
									~1.6 gals DI water
									purged from tubing
									0834

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.10.11.01
Well I.D.: MWL-MW 8 4/28/14	Date: 04/28/14
Well Condition: See ~~Tailgate~~ Inspection	Weather Condition: See Tailgate
Method: Portable pump X Dedicated pump ____	Pump depth: 497'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
491.28	0812	/	START						
492.68	0840	1	16.08	489.6	198.3	7.62	0.30	70.2	6.90
493.12	0850	2	16.85	500.0	209.4	7.70	0.36	64.2	6.22
493.48	0859	3	17.36	507.2	214.9	7.72	0.50	61.6	5.90
493.71	0908	4	17.45	508.4	217.6	7.71	0.49	59.5	5.69
494.03	0918	5	17.79	512.2	218.3	7.70	0.48	57.0	5.41
494.24	0927	6	17.78	514.5	217.7	7.69	0.40	54.0	5.12
494.43	0937	7	17.56	512.3	215.3	7.68	0.36	51.0	4.87
494.61	0948	8	18.13	520.6	212.2	7.67	0.34	48.5	4.57
494.76	0958	9	18.30	525.1	209.2	7.66	0.32	45.4	4.27
494.90	1007	10	18.36	527.0	203.4	7.66	0.31	42.7	4.00
495.09	1016	11	18.35	528.1	202.7	7.66	0.23	40.0	3.70
	1017	/	sampling						
									~1.6 gals purged from tubing
									0830

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.10.11.01
Well I.D.: MWL-MW 9	Date: 04/23/14
Well Condition: See Fairfield Inspection 4/24/14	Weather Condition: See Tailgate
Method: Portable pump X Dedicated pump ____	Pump depth: 497'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
491.78	0806	✓	START						
493.44	0837	1	23.04	582.8	221.8	7.51	0.24	33.0	4.53
493.80	0848	2	23.50	587.1	210.4	7.58	0.29	41.9	3.55
494.10	0900	3	23.92	590.5	203.1	7.56	0.32	38.3	3.23
494.35	0913	4	24.32	596.1	198.8	7.57	0.34	35.9	3.00
494.67	0922	5	24.09	595.2	187.6	7.56	0.39	31.0	2.60
494.95	0932	6	23.92	594.7	172.4	7.56	0.29	27.1	2.28
495.24	0941	7	24.01	596.0	160.9	7.56	0.27	23.9	2.01
495.46	0950	8	24.17	599.2	151.5	7.55	0.42	21.4	1.80
495.70	0959	9	24.05	599.7	142.0	7.55	0.38	19.1	1.60
495.98	~~0947~~ 1008	10	23.96	589.9	129.3	7.55	0.29	21.0	1.79
496.20	1016	11	23.97	589.9	120.0	7.55	0.41	20.0	1.72
	1017	✓							
									~1.6 gals purged from tubing
									0827

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: MWL	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: R Lynch	Date: 4/21/14

Make & Model: YSI EXO 1

YSI 6820 Sonde (S/N) with DO, Ee, pH, ORP, and temperature probes: 13C101167

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0646	4.01	19.7	7.00	19.7	10.00	19.7
2. Time: 1329	4.02	20.2	7.00	20.2	9.99	20.2
3. Time:						
4. Time.						
Standard lot no..	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	

SC Calibration

Reference Value: 1225 uS Standard Lot No.: 3AE221

Expiration Date: 5/15

	Value	Temp
1. Time: 0648	1227	19.7
2. Time: 1331	1230	20.3
3. Time:		
4. Time.		

ORP Calibration

Reference Value. 220 mV Standard Lot No. 4AA010

Expiration Date: 7/14

	Value	Temp
1. Time: 0647	220.1	19.7
2. Time: 1330	220.4	20.1
3. Time:		
4. Time.		

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0645	85.1	24.78
2. Time: 1328	86.1	27.80
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: MWL		Project No.: 146422.10.11.01		
Calibration done by: R Lynch		Date: 9/21/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	22.1 10 4/21/14	20	100	800
Standard Lot No.	0161	0167	0168	0161
1. Time 0755	10.3	19.8	104	801
2. Time 1149	10.1	20.2	105	796
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: MWL	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: R Lynch	Date: 4/22/14

Make & Model: YSI EXO 1

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0637	4.00	18.9	7.00	18.9	10.01	19.0
2. Time: 1123	4.01	19.6	7.01	19.6	10.02	19.6
3. Time:						
4. Time:						
Standard lot no.:	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	

SC Calibration

Referenee Value: 1225 uS Standard Lot No.: 3AE221

	Value	Temp	Expiration Date: 5/15
1. Time: 0639	1224	19.0	
2. Time: 1121	1230	19.7	
3. Time:			
4. Time:			

ORP Calibration

Reference Value: 220 mV Standard Lot No. 4AA010

	Value	Temp	Expiration Date. 7/14
1. Time. 0638	219.9	19.1	
2. Time. 1122	220.4	19.6	
3. Time:			
4. Time:			

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0636	86.0	24.73
2. Time 1120	86.3	24.74
3. Time		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: MWL	Project No.: 145422.10 11.01
Calibration done by: R Lynch	Date: 4/22/14

TURBIDIMETER

Make & Model: HACH 2100P HACH 2100Q	Serial No S/N 10060C003010

Reference Value	4/22/14 R2 10	20	100	800
Standard Lot No.	0161	0167	0168	0161
1. Time 0805	9.97	20.1	99.5	803
2. Time 1037	9.95	20.4	99.1	806
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: MWL	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: R Lynch	Date: 4/23/14

Make & Model: YSI EXO 1

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0642	3.99	19.4	7.00	19.4	10.01	19.4
2. Time: 1312	4.01	19.9	7.00	19.9	9.99	19.9
3. Time:						
4. Time						
Standard lot no.:	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	

SC Calibration

Reference Value: 1225 uS Standard Lot No.: 3AE221

Expiration Date: 5/15

	Value	Temp
1. Time: 0641	1222	19.3
2. Time: 1311	1226	19.9
3. Time:		
4. Time:		

ORP Calibration

Reference Value: 220 mV Standard Lot No. 4AA010

Expiration Date: 7/14

	Value	Temp
1. Time: 0643	219.9	19.5
2. Time. 1313	220.2	19.9
3. Time:		
4. Time:		

DO Calibration

Calibration Value	81% air saturation @ 5200 ft	Atmospheric Pressure in Hg
1. Time 0640	86.2	24.50
2. Time. 1310	86.4	24.54
3. Time:		
4. Time.		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) **Page 2 of 2**

SNL/NM Project Name: MWL		Project No.: 146422.10.11.01		
Calibration done by: R Lynch		Date: 4/23/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q 4/23/14		Serial No. S/N 10060C003010		
Reference Value	BL 10	20	100	800
Standard Lot No.	0161	0167	0168	0161
1. Time 0753	10.1	19.7	103	795
2. Time 1036	10.3	19.8	99.8	793
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: MWL	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: R Lynch	Date: 4/28/14

Make & Model: YSI EXO 1

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0652	3.99	18.0	6.99	18.8	10.00	18.8
2. Time: 1302	4.02	19.2	7.00	19.3	10.00	19.3
3. Time:						
4. Time:						
Standard lot no.:	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	

SC Calibration

Reference Value 1225 uS Standard Lot No.: 3AE221

Expiration Date: 5/15

	Value	Temp
1. Time: 0651	1220	18.8
2. Time: 1301	1222	19.2
3. Time:		
4. Time:		

ORP Calibration

Reference Value: 220 mV Standard Lot No. 4AA010

Expiration Date. 7/14

	Value	Temp
1. Time: 0653	219.7	18.8
2. Time: 1303	220.1	19.3
3. Time:		
4. Time:		

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0650	81.7	24.55
2. Time. 1300	82.0	24.57
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: MWL		Project No.: 146422.10.11.01		
Calibration done by: R Lynch		Date: 4/28/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	~~RL~~ 4/28/14 10	20	100	800
Standard Lot No.	0161	0167	0168	0161
1. Time 0759	10.2	19.8	103	797
2. Time 1037	10.4	19.6	101	799
3. Time				
4. Time				

Comments:

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL	**Monitoring Well ID # :** NA	**Date:** 4/17/2014

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-14	**Water Level Indicator ID #:** NA
Personnel Performing Decontamination:	**Personnel Performing Decontamination:**
Robert Lynch (Print Name:) (Initial:)	Robert Lynch (Print Name:) (Initial:)
Alfred Santillanes (Print Name:) (Initial:)	Alfred Santillanes (Print Name:) (Initial:)

Condition of Equipment

Pump: New **Tubing Bundle:** New **Water Level Indicator:** NA

List of Decontamination Materials

Distilled or **Deonized** (circle one)	**HNO_3**
Source: Culligan	**Grade:** Reagent
Lot Number: 31714	**UN #:** 2031
	Manufacturer: Fisher Scientific
	Lot Number: A035803029

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL-GWM	**Monitoring Well ID # :** MWL-BW2	**Date:** 04-21-14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 210269
Personnel Performing Decontamination: William Gibson — Print Name: — Initial: WJG Alfred Santillanes — Print Name: — Initial: AS	**Personnel Performing Decontamination:** William Gibson — Print Name: — Initial: WJG Alfred Santillanes — Print Name: — Initial: AS

Condition of Equipment

Pump: Excellent **Tubing Bundle:** Excellent **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	HNO_3
Source: Culligan	**Grade:** Reagent
Lot Number: 4-3-14	**UN #:** 2031
	Manufacturer: AROC
	Lot Number: A0305629

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL-GWM	**Monitoring Well ID # :** MWL-MW7	**Date:** 4-22-14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 210269
Personnel Performing Decontamination: Robert Lynch (Print Name:) RL (Initial:) William Gibson (Print Name:) (Initial:)	**Personnel Performing Decontamination:** Robert Lynch (Print Name:) RL (Initial:) William Gibson (Print Name:) (Initial:)

Condition of Equipment

Pump: Excellent **Tubing Bundle:** Excellent **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	HNO_3
Source: Culligan	**Grade:** Reagent
Lot Number: 4-3-14	**UN #:** 2031
	Manufacturer: AROC
	Lot Number: A0305629

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL-GWM	**Monitoring Well ID # :** MWI-MW9	**Date:** 04/24/14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 210269
Personnel Performing Decontamination: William Gibson (Print Name:) (Initial:) Alfred Santillanes (Print Name:) (Initial:)	**Personnel Performing Decontamination:** William Gibson (Print Name:) (Initial:) Alfred Santillanes (Print Name:) (Initial:)

Condition of Equipment

Pump: Excellent **Tubing Bundle:** Excellent **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one) **Source:** Culligan **Lot Number:** 4-3-14	**HNO_3** **Grade:** Reagent **UN #:** 2031 **Manufacturer:** AROC **Lot Number:** A0305629

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL-GWM	**Monitoring Well ID # :** MWL-MW8	**Date:** 04-28-14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 210269
Personnel Performing Decontamination: Robert Lynch (Print Name:) Initial: Alfred Santillanes (Print Name:) Initial:	**Personnel Performing Decontamination:** Robert Lynch (Print Name:) Initial: Alfred Santillanes (Print Name:) Initial:

Condition of Equipment

Pump: Excellent **Tubing Bundle:** Excellent **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	**HNO_3**
Source: Culligan	**Grade:** Reagent
Lot Number: 041514	**UN #:** 2031
	Manufacturer: AROC
	Lot Number: A03035629

SUMMARY SHEET FOR APRIL 2014 SAMPLES

Sample Summary for April 2014 MWL Groundwater Monitoring

Well ID	Sample Date	ARCOC	Sample Number	Sample Type	Associated Equipment Blank (ARCOC #/Sample #)	Associated Trip Blank (ARCOC # / Sample #)	Associated Field Blank (ARCOC # / Sample #)	Comments
GEL Analytical Data: Project Task # 146422.10.11.01, Service Order # CF01-14								
MWL-BW2	21-Apr-14	615443	095811	Environmental	615442 / 095808	615443 / 095813	615443 / 095810	
MWL-BW2	21-Apr-14	615443	095812	Duplicate	615442 / 095808	615443 / 095813	615443 / 095810	
MWL-MW7	22-Apr-14	615444	095815	Environmental	NA	615444 / 095816	615444 / 095814	
MWL-MW8	28-Apr-14	615446	095821	Environmental	NA	615446 / 095822	615446 / 095820	
MWL-MW9	23-Apr-14	615445	095818	Environmental	NA	615445 / 095819	615445 / 095817	
MWL-EB1	17-Apr-14	615442	095808	Equipment Blank	NA	615442 / 095809	NA	Equipment blank sample prior to MWL-BW2.
MWL-FB1	17-Apr-14	615442	095807	Field QC	NA	615442 / 095809	NA	DI Water Source
MWL-FB2	21-Apr-14	615443	095810	Field Blank	NA	615443 / 095813	NA	at MWL-BW2
MWL-FB3	22-Apr-14	615444	095814	Field Blank	NA	615444 / 095816	NA	at MWL-MW7
MWL-FB4	23-Apr-14	615445	095817	Field Blank	NA	615445 / 095819	NA	at MWL-MW9
MWL-FB5	28-Apr-14	615446	095820	Field Blank	NA	615446 / 095822	NA	at MWL-MW8

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

GROUNDWATER MONITORING

APRIL 2014

AR/COC NUMBER 615442

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: June 5, 2014

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615442
SDG: 346998
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 3.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as follows. The ICAL %RSDs were >15% but ≤40% for bromoform and acetone. The associated sample results were NDs and since no other calibration infractions occurred, will not be qualified.

The ICV or CCV %Ds were >20% with positive bias for 2-butanone and carbon tetrachloride. All associated sample results were NDs and will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Bromodichloromethane and dibromochloromethane were detected at <the PQL and chloroform at > the PQL in the FB, sample 346998001. No samples were associated with this FB and, therefore, no data were qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

An MS/MSD was not associated with the samples in this SDG.

Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

All LCS/LCSD acceptance criteria were met for accuracy and precision.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

A TB was submitted with AR/COC 615442. A FB was submitted with AR/COC 615442 but was not associated with any samples. An EB was submitted with AR/COC 615442 and was associated with samples on AR/COC 615443.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 06/10/14

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: June 5, 2014

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615442
SDG: 346998
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 3.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as follows. The ICAL %RSDs were >15% but ≤40% for bromoform and acetone. The associated sample results were NDs and since no other calibration infractions occurred, will not be qualified.

The ICV or CCV %Ds were >20% with positive bias for 2-butanone and carbon tetrachloride. All associated sample results were NDs and will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Bromodichloromethane and dibromochloromethane were detected at <the PQL and chloroform at > the PQL in the FB, sample 346998001. No samples were associated with this FB and, therefore, no data were qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

An MS/MSD was not associated with the samples in this SDG.

Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

All LCS/LCSD acceptance criteria were met for accuracy and precision.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

A TB was submitted with AR/COC 615442. A FB was submitted with AR/COC 615442 but was not associated with any samples. An EB was submitted with AR/COC 615442 and was associated with samples on AR/COC 615443.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 06/10/14

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: June 5, 2014

To: File

From: Linda Thal

Subject: Radiochemical Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615442
SDG: 346998
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

One sample was prepared and analyzed with approved procedures using methods EPA 901.1 (gamma spec – short list), SM 7500 Rn B (radon-222), EPA 906.0 (tritium) and EPA 900.0 (gross alpha/beta). Problems were identified with the data package that resulted in the qualification of data.

All analyses:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**

Radon-222:

1. The sample was analyzed >1X but ≤2X past the method-specified holding time**.** The associated sample result was < the associated 2-sigma TPU and < the associated MDA and will be **qualified J,H1**.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The sample was properly preserved and prepared and analyzed within the prescribed holding time except as noted above in the Summary section.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Tracers or carriers were not required for these methods.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS and/or MSD met all QC acceptance criteria.

Gross alpha/beta and tritium:
The MS and/or MSD were performed on SNL samples of similar matrix from other SDGs.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Gross alpha/beta and tritium:
The replicate analyses were performed on SNL samples of similar matrix from other SDGs.

Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)

All LCS and/or LCSD recoveries met QC acceptance criteria.

Detection Limits/Dilutions

The sample was not diluted. All required detection limits were met.

Other QC

The EB submitted with AR/COC 615442 was associated with samples on AR/COC 615443.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 06/10/14

Sample Findings Summary

AR/COC: 615442

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	095808-034/MWL-EB1	ALPHA (12587-46-1)	BD, FR3
	095808-034/MWL-EB1	BETA (12587-47-2)	BD, FR3
EPA 901.1			
	095808-033/MWL-EB1	Americium-241 (14596-10-2)	BD, FR3
	095808-033/MWL-EB1	Cesium-137 (10045-97-3)	BD, FR3
	095808-033/MWL-EB1	Cobalt-60 (10198-40-0)	BD, FR3
	095808-033/MWL-EB1	Potassium-40 (13966-00-2)	BD, FR3
EPA 906.0 Modified			
	095808-036/MWL-EB1	Tritium (10028-17-8)	BD, FR3
SM 7500 Rn B			
	095808-040/MWL-EB1	Radon-222 (14859-67-7)	BD, FR3,H1

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615442 | Site/Project: MWL GWM | Validation Date: 06/05/2014

SDG #: 346998 | Laboratory: GEL | Validator: Linda Thal

Matrix: Aqueous | # of Samples: 8 CVR present: Yes | Analysis Type: X□ Organic X□ Metals

AR/COC(s) present: Yes | Sample Container Integrity: OK | X□ Rad X□ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
095808-040	346998007	SM 7500 Rn B	✓	4/17/14 9.20	4/21/14 18.39	4/21/14 18.39	Yes	No

Comments: Sampled 04/17/2014. A FB was submitted with AR/COC 615442 but was not associated with any samples. An EB was submitted with AR/COC 615442 and was associated with samples on AR/COC 615443. As per an email included with AR/COC 615443+, the task # for 615442 was changed to 146422.10.11.08.

Validated by: L Thal

Organic Worksheet (GC/MS)

AR/COC #: 615442 SDG #: 346998 Matrix: Aqueous

Laboratory Sample IDs: 346998001, -002, -008

Method/Batch #s: 8260B: 1383023 Tuning (pass/fail): Pass TICs Required? (yes/no): No

Analyte (outliers)	Calibration				Method Blank	5X (10X) MB	LCS %R	MS %R	MSD %R	LCS/ LCSD RPD	FB -001	TB -008		
	Int.	RF	RSD/ R^2	(ICV) CCV %D										
Bromodichloromethane	NA	✓	✓	✓	✓	NA	✓	NA	NA	✓	.77J	✓		
Chloroform	NA	✓	✓	✓	✓	NA	✓	NA	NA	✓	3.67	✓		
Dibromochloromethane	NA	✓	✓	✓	✓	NA	✓	NA	NA	✓	.42J	✓		
Acetone	NA	✓	16	✓	✓	NA	✓	NA	NA	✓	✓	✓		
Bromoform	NA	✓	21	✓	✓	NA	✓	NA	NA	✓	✓	✓		
2-Butanone	NA	✓	✓	(+21)	✓	NA	✓	NA	NA	✓	✓	✓		
Carbon tetrachloride	NA	✓	✓	+23	✓	NA	✓	NA	NA	✓	✓	✓		

Surrogate Recovery Outliers

Sample ID	Surrogate	% Recovery	Sample ID	Surrogate	% Recovery	
None						

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None												

Comments: HTs OK: ICAL VOA4.I 03/29/2014. Samples are an EB, FB and TB – no MS/MSD. LCS/LCSD

Inorganic Metals Worksheet

AR/COC #: 615442 SDG #: 346998 Matrix: Aqueous

Laboratory Sample IDs: 346998003

Method/Batch #s: **3005A/6020**: 1381779/1381781

ICPMS Mass Cal (pass/fail): Pass ICPMS Resolution (pass/fail): Pass

Analyte (outliers)	**Calibration**						**Method Blank mg/L**	**5X Blank or (5X MDL) mg/L**	**LCS %R**	**MS %R**	**Lab Rep. RPD**	**Serial Dil. %D**	**ICS AB %R**	**ICS A ± MDL ug/L x50 (mg/L)**	**CRA CRI %R**				
	Int.	**R^2**	**ICV**	**CCV**	**ICB ug/L**	**CCB ug/L**													
None																			

IS Outliers *60-125%*				**IS Outliers** *80-120%*			
Sample ID	**%Recovery**	**%Recovery**	**%Recovery**	**CCV/CCB ID**	**%Recovery**	**%Recovery**	**%Recovery**
None							

Comments: HTs OK. Matrix QC on -003 and an SNL sample from another SDG

Radiochemistry Worksheet

AR/COC #: 615442 SDG #: 346998 Matrix: Aqueous

Laboratory Sample IDs: 346998 – see below

Method/Batch#s: EPA 901.1 (Gammaspec): 1381294; -004

Method/Batch#s: EPA 900.0/SW846 9310 (Gross alpha/beta): 1380009; -005

Method/Batch#s: SM 7500 Rn B (Radon-222): 1381253; -007

Method/Batch#s: EPA 906.0 (Tritium): 1383645; -006

Analyte (outliers)	**Control Freq.**	**Control Eval.**	**Method Blank**	**5X Blank or 5X MDC**	**LCS %R**	**MS %R**	**MSD %R**	**MS/ MSD RER**	**Lab Rep. RER**	**EB**			
None													

Tracer/Carrier Recovery Outliers

Sample ID	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**
NA								

Comments: HTs OK except for Radon-222.

Sample is a field QC (EB). GS and Rn-222 – LCS/D, Gross A/B MS/MSD and DUP and tritium MS and DUP on SNL samples from another SDG,

Gross A/B parent =200ml, MS/MSD = 25ml (8X dilution with water) – since the sample is an EB (water) no data were qualified based on professional judgment.

Data rejected by the lab due to peak not meeting identification criteria: none

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. **SMO Use**

AR/COC 615442

Project Name:	MWL GWM	Date Samples Shipped:	4/17/15	SMO Authorization:	Don Watson
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	217546	SMO Contact Phone:	
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171		Lorraine Herrera/505-844-3199
Service Order:	CF01-14	Lab Destination:	GEL	Send Report to SMO:	
		Contract No.:	PO 1303873		Rita Kavanaugh/505-284-2553
Tech Area:					
Building:	Room:	Operational Site:			

☐ Waste Characterization ☐ RMMA ☐ Released by COC No. ☑ 4° Celsius

Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 346998

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
095807	-001	MWL-FB1	NA	4/17/14 9:14	DIW	G	3x40 ml	HCL	G	FB	VOC (SW846-8260B) (LTMMP List)	001
095808	-001	MWL-EB1	NA	4/17/14 9:14	DIW	G	3x40 ml	HCL	G	EB	VOC (SW846-8260B) (LTMMP List)	002
095808	-009	MWL-EB1	NA	4/17/14 9:15	DIW	P	500 ml	HNO3	G	EB	Metals Cd,Cr,Ni,U (SW846-6020)	003
095808	-033	MWL-EB1	NA	4/17/14 9:16	DIW	P	1 L	HNO3	G	EB	Gamma Spectroscopy (EPA 901.0)	004
095808	-034	MWL-EB1	NA	4/17/14 9:17	DIW	P	1 L	HNO3	G	EB	Gross Alpha and Beta (EPA 900.0)	005
095808	-036	MWL-EB1	NA	4/17/14 9:18	DIW	AG	250 ml	None	G	EB	Tritium (EPA 906.0)	006
095808	-040	MWL-EB1	NA	4/17/14 9:20	DIW	AG	2x40 ml	None	G	EB	Radon (SM 7500 Rn B)	007
095809	-001	MWL-TB1	NA	4/17/14 9:14	DIW	G	3x40 ml	HCL	G	TB	VOC (SW846-8260B) (LTMMP List)	008

Last Chain: ☐ Yes
Validation Req'd: ☑ Yes
Background: ☐ Yes
Confirmatory: ☐ Yes

Sample Tracking **SMO Use**
Date Entered:
Entered by:
QC inits.:

Special Instructions/QC Requirements:
EDD ☑ Yes ☐ No
Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Negotiated TAT ☐
Sample Disposal ☐ Return to Client ☑ Disposal by Lab
Return Samples By:
Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
Report specific list of VOCs (LTMMP list provided by SNL/NM SMO).
Report short list isotopes for Gamma Spectroscopy.

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 4/17/14	Time 1005	3.Relinquished by		Org.	Date	Time
1. Received by	Don Watson	Org. 4142	Date 4/17/14	Time 1005	3. Received by		Org.	Date	Time
2.Relinquished by	Don Watson	Org. 4142	Date 4/17/14	Time 1100	4.Relinquished by		Org.	Date	Time
2. Received by		Org. CCR	Date 4-18-14	Time 0700	4. Received by		Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

AR/COC NUMBERS 615443, 615444, 615445

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: June 6, 2014

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615443, 615444 and 615445
SDG: 347170
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 3.

Summary

Ten samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The ICAL intercept was negative and > the MDL but ≤3X the MDL for dichlorodifluoromethane. The associated sample results were NDs and will be **qualified UJ,I5**.

2. The ICAL, ICV and CCV RFs were <0.05 but ≥0.01 for 2-butanone. The associated sample results were NDs and will be **qualified UJ,I4**.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the Summary section and as follows. The ICAL %RSD was >15% but ≤40% for bromoform. The associated sample results were NDs and since no other calibration infraction occurred, will not be qualified.

The ICV/CCV %Ds were >20% with positive bias for dichlorodifluoromethane. The associated sample results were NDs and will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Bromodichloromethane was detected at < the PQL and chloroform at > the PQL in the EB, sample 346998002 and the FBs, samples 347170001, -015 and -023. Dibromochloromethane was detected at < the PQL in the EB, sample 346998002 and the FB, sample 347170023. All associated sample results were NDs and will not be qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Three TBs and three FBs were submitted, one for each AR/COC. An EB was submitted with AR/COC 615442 and was associated with the samples on AR/COC 615443. A field duplicate pair was submitted with AR/COC 615443. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 06/10/14

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: June 6, 2014

To: File

From: Linda Thal

Subject: Inorganic Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615443, 615444 and 615445
SDG: 347170
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

Four samples were prepared and analyzed with approved procedures using method EPA 6020 (ICP-MS). Data were reported for all required analytes. Problems were identified with the data package that resulted in the qualification of data.

1. Ni was detected at < the PQL in the EB, sample 346998003. The associated results for samples 347170003 and -009 were detects < 5X the EB value and will be **qualified 0.0028U,B2** at 5X the EB value.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding time and properly preserved.

ICP-MS Instrument Tune

The ICP-MS tunes met QC acceptance criteria.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRI recoveries met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks except as noted above in the Summary section.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

ICP Interference Check Sample (ICS A and AB)

Results of the ICS A and AB analyses were not evaluated because the sample concentrations of Ca, Mg, Fe and Al were < those in the ICS solution.

ICP Serial Dilution

The serial dilution met all QC acceptance criteria.

Other QC

The EB submitted with AR/COC 615442 was associated with samples on AR/COC 615443. A field duplicate pair was submitted with AR/COC 615443. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 06/10/14

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
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www.aqainc.net

Memorandum

Date: June 6, 2014

To: File

From: Linda Thal

Subject: Inorganic Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615443, 615444 and 615445
SDG: 347170
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

Four samples were prepared and analyzed with approved procedures using methods EPA 901.1 (gamma spec – short list), SM 7500 Rn B (Radon-222), EPA 906.0 (tritium) and EPA 900.0 (gross alpha/beta). Problems were identified with the data package that resulted in the qualification of data.

Gammaspec and tritium:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**

Gamma Spec:

1. The K-40 result for sample 347170010 was rejected by the laboratory due to the peak not meeting identification criteria and will be **qualified R,Z2**.

Radon-222:

1. Sample -021 was analyzed >1X but ≤2X past the method specified holding time and will be **qualified J,H1**.

2. Sample -021 was > the MDA but ≤3X the MDA and will be **qualified J,FR7.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were properly preserved and prepared and analyzed within the prescribed holding time except as noted above in the Summary section and as follows. Samples -004, -005, -010 and -011 were received at the laboratory with a pH of 3.0 and were further acidified by the laboratory.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU except as follows.

Gammaspec:
K-40 was detected in the MB at a concentration > the MDA and 2-sigma TPU. K-40 was not detected in the associated sample results or was rejected by the laboratory and, therefore, no data will be qualified.

Tracer/Carrier Recovery

Tracers or carriers were not required for these methods.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS and/or MSD met all QC acceptance criteria.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

The samples were not diluted. All required detection limits were met except as follows.

Gammaspec:
The Am-241 RDL was < the MDA for sample -010.

Other QC

The EB submitted with AR/COC 615442 was associated with samples on AR/COC 615443. A field duplicate pair was submitted with AR/COC 615443. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 06/10/14

Sample Findings Summary

AR/COC: 615443, 615444, 615445

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 901.1			
	095811-033/MWL-BW2	Americium-241 (14596-10-2)	BD, FR3
	095811-033/MWL-BW2	Cesium-137 (10045-97-3)	BD, FR3
	095811-033/MWL-BW2	Cobalt-60 (10198-40-0)	BD, FR3
	095811-033/MWL-BW2	Potassium-40 (13966-00-2)	BD, FR3
	095812-033/MWL-BW2	Americium-241 (14596-10-2)	BD, FR3
	095812-033/MWL-BW2	Cesium-137 (10045-97-3)	BD, FR3
	095812-033/MWL-BW2	Cobalt-60 (10198-40-0)	BD, FR3
	095812-033/MWL-BW2	Potassium-40 (13966-00-2)	R, Z2
	095815-033/MWL-MW7	Americium-241 (14596-10-2)	BD, FR3
	095815-033/MWL-MW7	Cesium-137 (10045-97-3)	BD, FR3
	095815-033/MWL-MW7	Cobalt-60 (10198-40-0)	BD, FR3
	095815-033/MWL-MW7	Potassium-40 (13966-00-2)	BD, FR3
	095818-033/MWL-MW9	Americium-241 (14596-10-2)	BD, FR3
	095818-033/MWL-MW9	Cesium-137 (10045-97-3)	BD, FR3
	095818-033/MWL-MW9	Cobalt-60 (10198-40-0)	BD, FR3
	095818-033/MWL-MW9	Potassium-40 (13966-00-2)	BD, FR3
EPA 906.0 Modified			
	095811-036/MWL-BW2	Tritium (10028-17-8)	BD, FR3
	095812-036/MWL-BW2	Tritium (10028-17-8)	BD, FR3
	095815-036/MWL-MW7	Tritium (10028-17-8)	BD, FR3
	095818-036/MWL-MW9	Tritium (10028-17-8)	BD, FR3
SM 7500 Rn B			
	095815-040/MWL-MW7	Radon-222 (14859-67-7)	J, FR7,H1
SW846 3005/6020 DOE-AL			
	095811-009/MWL-BW2	Nickel (7440-02-0)	0.0028U, B2

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	095812-009/MWL-BW2	Nickel (7440-02-0)	0.0028U, B2
SW846 8260B DOE-AL			
	095810-001/MWL-FB2	2-Butanone (78-93-3)	UJ, I4
	095810-001/MWL-FB2	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095811-001/MWL-BW2	2-Butanone (78-93-3)	UJ, I4
	095811-001/MWL-BW2	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095812-001/MWL-BW2	2-Butanone (78-93-3)	UJ, I4
	095812-001/MWL-BW2	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095813-001/MWL-TB2	2-Butanone (78-93-3)	UJ, I4
	095813-001/MWL-TB2	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095814-001/MWL-FB3	2-Butanone (78-93-3)	UJ, I4
	095814-001/MWL-FB3	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095815-001/MWL-MW7	2-Butanone (78-93-3)	UJ, I4
	095815-001/MWL-MW7	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095816-001/MWL-TB3	2-Butanone (78-93-3)	UJ, I4
	095816-001/MWL-TB3	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095817-001/MWL-FB4	2-Butanone (78-93-3)	UJ, I4
	095817-001/MWL-FB4	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095818-001/MWL-MW9	2-Butanone (78-93-3)	UJ, I4
	095818-001/MWL-MW9	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095819-001/MWL-TB4	2-Butanone (78-93-3)	UJ, I4
	095819-001/MWL-TB4	Dichlorodifluoromethane (75-71-8)	UJ, I5

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615443, 615444 and 615445 | Site/Project: MWL GWM | Validation Date: 06/06/2014

SDG #: 347170 | Laboratory: GEL | Validator: Linda Thal

Matrix: Aqueous | # of Samples: 30 CVR present: Yes | Analysis Type: X□ Organic X□ Metals

AR/COC(s) present: Yes | Sample Container Integrity: OK | X□ Rad □ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
095815-040	347170021	SM 7500 Rn B	✓	4/22/14 10.20	4/25/14 20.13	4/25/14 20.13	Yes	No

Comments: Sampled 04/21 through 4/23/2014. An EB was submitted with AR/COC 615442 and was associated with samples on AR/COC 615443.
The case narrative states that samples -004, -005, -011 and -12 were acidified by the lab. According to the email conversation and SR&R form this should be samples -004, -005 -010 and -011.

Validated by:  Revised 7/2007

Organic Worksheet (GC/MS)

AR/COC #: 615443, 615444 and 615445 SDG #: 347170 Matrix: Aqueous

Laboratory Sample IDs: 347170001, -002, -008, -014, -015, -016, -022, -023, -024, -030

Method/Batch #s: 8260B: 1384112 Tuning (pass/fail): Pass TICs Required? (yes/no): No

Analyte (outliers)	Calibration				MB	5X (10X) MB	LCS %R	MS %R	MSD %R	MS/ MSD RPD	EB 346998 002	FB --001	FB -015	FB -023
	Int.	RF	RSD/R^2	(ICV) CCV %D										
Bromodichloromethane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	.68J	.73J	.57J	.68J
Chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	3.48	9.3	3.74	3.67
Dibromochloromethane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	.34J	✓	✓	.33J
Bromoform	NA	✓	22	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓
Dichlorodifluoromethane	-.54	NA	✓	(+36) +36 +48*	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓
2-Butanone	NA	.036 .035 .037 .036*	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓
trans-1,2-Dichloroethylene	NA	✓	✓	✓	✓	NA	78*	✓	✓	✓	✓	✓	✓	✓

Surrogate Recovery Outliers

Sample ID						
None						

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None												

Comments: HTs OK. ICAL VOA2.I 03/17/2014; Acetone, dichlorodifluoromethane, methylene chloride linear; TBs all ND

MS/MSD performed on -002 spiked with trichlorotrifluoroethane; *associated with MS/MSD only EB from AR/COC 615442

Inorganic Metals Worksheet

AR/COC #: 615443, 615444 and 615445 SDG #: 347170 Matrix: Aqueous

Laboratory Sample IDs: 347170003, -009, -017, -025

Method/Batch #s: **3005A/6020**: 1383587/1383588

ICPMS Mass Cal (pass/fail): Pass ICPMS Resolution (pass/fail): Pass

Analyte (outliers)	**Calibration**						**Method Blank mg/L**	**5X Blank or (5X MDL) mg/L**	**LCS %R**	**MS %R**	**Lab Rep. RPD**	**Serial Dil. %D**	**ICS AB %R**	**ICS A ± MDL ug/L x50 (mg/L)**	**CRA CRI %R**	**EB 346998 003**	**EB X5**		
	Int.	**R^2**	**ICV**	**CCV**	**ICB ug/L**	**CCB ug/L**													
Ni	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	NA	NA	✓	.00055J	.0028		

IS Outliers *60-125%*				**IS Outliers** *80-120%*			
Sample ID	**%Recovery**	**%Recovery**	**%Recovery**	**CCV/CCB ID**	**%Recovery**	**%Recovery**	**%Recovery**
None							

Comments: HTs OK. Matrix QC on -003, EB from AR/COC 615442

Radiochemistry Worksheet

AR/COC #: 615443, 615444 and 615445 SDG #: 347170 Matrix: Aqueous

Laboratory Sample IDs: 347170 – see below

Method/Batch#s: EPA 901.1 (Gammaspec): 1383276; -004, -010, -018, -026

Method/Batch#s: EPA 900.0/SW846 9310 (Gross alpha/beta): 1387206; -005, -011, -019, - 027

Method/Batch#s: SM 7500 Rn B (Radon-222): 1382135; -007, -013 1382436; -021, -029

Method/Batch#s: EPA 906.0 (Tritium): 1383645; -006, -012, -020, -028

Analyte (outliers)	**Control Freq.**	**Control Eval.**	**Method Blank**	**5X Blank or 5X MDC**	**LCS %R**	**MS %R**	**MSD %R**	**MS/ MSD RER**	**Lab Rep. RER**	**EB**			
K-40	NA	NA	37.1	186	✓	NA	NA	NA	✓	✓			

Tracer/Carrier Recovery Outliers

Sample ID	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**
NA								

Comments: HTs OK except for Radon-222 sample -021 HT >5% past method specified. Sample-010 RDL < MDA for Am-241

GS DUP -004; Rn-222 MS and DUP -007 and -021; Gross A/B MS/MSD and DUP -019; tritium MS and DUP -006

Gross A/B parent =125ml, MS/MSD = 25ml (5X dilution) – no qual

Data rejected by the lab due to peak not meeting identification criteria: K-40 for sample -010

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615443

Project Name:	MWL GWM	Date Samples Shipped:	4/21/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	217962	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-14	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 1303873	Rita Kavanaugh/505-284-2553	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 347170
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
095810	-001	MWL-FB2	NA	4/21/14 11:06	DIW	G	3x40 ml	HCL	G	FB	VOC (SW846-8260B) (LTMMP List)	001
095811	-001	MWL-BW2	496	4/21/14 11:06	GW	G	3x40 ml	HCL	G	SA	VOC (SW846-8260B) (LTMMP List)	002
095811	-009	MWL-BW2	496	4/21/14 11:09	GW	P	500 ml	HNO3	G	SA	Metals Cd,Cr,Ni,U (SW846-6020)	003
095811	-033	MWL-BW2	496	4/21/14 11:10	GW	P	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	004
095811	-034	MWL-BW2	496	4/21/14 11:12	GW	P	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	005
095811	-036	MWL-BW2	496	4/21/14 11:14	GW	AG	250 ml	None	G	SA	Tritium (EPA 906.0)	006
095811	-040	MWL-BW2	496	4/21/14 11:08	GW	AG	2x40 ml	None	G	SA	Radon (SM 7500 Rn B)	007
095812	-001	MWL-BW2	496	4/21/14 11:06	GW	G	3x40 ml	HCL	G	DU	VOC (SW846-8260B) (LTMMP List)	008
095812	-009	MWL-BW2	496	4/21/14 11:09	GW	P	500 ml	HNO3	G	DU	Metals Cd,Cr,Ni,U (SW846-6020)	009
095812	-033	MWL-BW2	496	4/21/14 11:10	GW	P	1 L	HNO3	G	DU	Gamma Spectroscopy (EPA 901.0)	010

Last Chain:	☐ Yes	Sample Tracking	SMO Use
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD	☑ Yes	☐ No		
Turnaround Time	☐ 7 Day*	☐ 15 Day*	☑ 30 Day	
Negotiated TAT	☐			
Sample Disposal	☐ Return to Client	☑ Disposal by Lab		
Return Samples By:				

Conditions on Receipt

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
Report specific list of VOCs (LTMMP list provided by SNL/NM SMO).
Report short list isotopes for Gamma Spectroscopy. Provide level D package.

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	William Gibson		WG	SNL/4142/505-284-3307/505-239-7367
	Alfred Santillanes		AS	SNL/4142/505-844-5130/505-228-0710
	Robert Lynch		RL	SNL/4142/505-844-4013/505-250-7090

1. Relinquished by		Org. 4142	Date 4/21/14	Time 1134	3. Relinquished by		Org.	Date	Time
1. Received by		Org. 4142	Date 4/21/14	Time 1134	3. Received by		Org.	Date	Time
2. Relinquished by		Org. 4142	Date 4/21/14	Time 1200	4. Relinquished by		Org.	Date	Time
2. Received by		Org. CRL	Date 4-22-14	Time 0720	4. Received by		Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY (Continuation)

AR/COC 615443

Project Name:	MWL GWM	Project/Task Manager:	Tim Jackson	Project/Task No.:	146422.10.11.01	Lab use
Tech Area:						
Building:	Room:					

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
095812	-034	MWL-BW2	496	4/21/14 11:12	GW	P	1 L	HNO3	G	DU	Gross Alpha and Beta (EPA 900.0)	011
095812	-036	MWL-BW2	496	4/21/14 11:14	GW	AG	250 ml	None	G	DU	Tritium (EPA 906.0)	012
095812	-040	MWL-BW2	496	4/21/14 11:08	GW	AG	2x40 ml	None	G	DU	Radon (SM 7500 Rn B)	013
095813	-001	MWL-TB2	NA	4/21/14 11:06	DIW	G	3x40 ml	HCL	G	TB	VOC (SW846-8260B) (LTMMP List)	014

Recipient Initials MK

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615444

Project Name:	MWL GWM	Date Samples Shipped:	4/22/14	SMO Authorization: SMO	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	217662	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-14	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 1303873	Rita Kavanaugh/505-284-2553	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 347170
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
095814	-001	MWL-FB3	NA	4/22/14 10:18	DIW	G	3x40 ml	HCL	G	FB	VOC (SW846-8260B) (LTMMP List)	015
095815	-001	MWL-MW7	496	4/22/14 10:18	GW	G	3x40 ml	HCL	G	SA	VOC (SW846-8260B) (LTMMP List)	016
095815	-009	MWL-MW7	496	4/22/14 10:21	GW	P	500 ml	HNO3	G	SA	Metals Cd,Cr,Ni,U (SW846-6020)	017
095815	-033	MWL-MW7	496	4/22/14 10:22	GW	P	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	018
095815	-034	MWL-MW7	496	4/22/14 10:24	GW	P	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	019
095815	-036	MWL-MW7	496	4/22/14 10:26	GW	AG	250 ml	None	G	SA	Tritium (EPA 906.0)	020
095815	-040	MWL-MW7	496	4/22/14 10:20	GW	AG	2x40 ml	None	G	SA	Radon (SM 7500 Rn B)	021
095816	-001	MWL-TB3	NA	4/22/14 10:18	DIW	G	3x40 ml	HCL	G	TB	VOC (SW846-8260B) (LTMMP List)	022

Last Chain:	☐ Yes	Sample Tracking	SMO Use
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD	☑ Yes	☐ No		
Turnaround Time	☐ 7 Day*	☐ 15 Day*	☑ 30 Day	
Negotiated TAT	☐			
Sample Disposal	☐ Return to Client	☑ Disposal by Lab		
Return Samples By:				

Conditions on Receipt

Sample Team Members

Name	Signature	Init.	Company/Organization/Phone/Cell
William Gibson	William D Gibson	WDG	SNL/4142/505-284-3307/505-239-7367
Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
Robert Lynch	for RLynch	RL	SNL/4142/505-844-4013/505-250-7090

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
Report specific list of VOCs (LTMMP list provided by SNL/NM SMO). Report short list isotopes for Gamma Spectroscopy. Provide level D package.

Lab Use

1. Relinquished by	Alfred Santillanes	Org.	4142	Date	4/22/14	Time	1051	3. Relinquished by	Org. Date Time
1. Received by	SMO	Org.	4142	Date	4/22/14	Time	1051	3. Received by	Org. Date Time
2. Relinquished by		Org.	4142	Date	4/22/14	Time	1130	4. Relinquished by	Org. Date Time
2. Received by		Org.	CR1	Date	4-23-14	Time	0730	4. Received by	Org. Date Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615445

Project Name:	MWL GWM	Date Samples Shipped:	4/23/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	2177755	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-14	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 1303873	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 347170
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
095817	-001	MWL-FB4	NA	4/23/14 10:17	DIW	G	3x40 ml	HCL	G	FB	VOC (SW846-8260B) (LTMMP List)	023
095818	-001	MWL-MW9	497	4/23/14 10:17	GW	G	3x40 ml	HCL	G	SA	VOC (SW846-8260B) (LTMMP List)	024
095818	-009	MWL-MW9	497	4/23/14 10:19	GW	P	500 ml	HNO3	G	SA	Metals Cd,Cr,Ni,U (SW846-6020)	025
095818	-033	MWL-MW9	497	4/23/14 10:21	GW	P	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	026
095818	-034	MWL-MW9	497	4/23/14 10:23	GW	P	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	027
095818	-036	MWL-MW9	497	4/23/14 10:26	GW	AG	250 ml	None	G	SA	Tritium (EPA 906.0)	028
095818	-040	MWL-MW9	497	4/23/14 10:18	GW	AG	2x40 ml	None	G	SA	Radon (SM 7500 Rn B)	029
~~095819~~	-001	MWL-TB4	NA	4/23/14 10:17	DIW	G	3x40 ml	HCL	G	TB	VOC (SW846-8260B) (LTMMP List)	030
095819												
4/24/14												

Last Chain:	☐ Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd:	☑ Yes	Date Entered:		EDD	☑ Yes ☐ No
Background:	☐ Yes	Entered by:		Turnaround Time	☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Confirmatory:	☐ Yes	QC inits.:		Negotiated TAT	☐

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	William Gibson		WG	SNL/4142/505-284-3307/505-239-7367
	Alfred Santillanes		AS	~~SNL~~/4142/505-844-5130/505-228-0710
	Robert Lynch		RL	SNL/4142/505-844-4013/505-250-7090

Sample Disposal	☐ Return to Client ☑ Disposal by Lab
Return Samples By:	
Comments:	Send report to Tim Jackson/4142/MS 0729/284-2547
	Report specific list of VOCs (LTMMP list provided by SNL/NM SMO). Report short list isotopes for Gamma Spectroscopy. Provide level D package.

Lab Use

1.Relinquished by		Org.	4142	Date	4/23/14	Time	1055	3.Relinquished by	Org. Date Time
1. Received by		Org.	4142	Date	4/23/14	Time	1055	3. Received by	Org. Date Time
2.Relinquished by		Org.	4142	Date	4/23/14	Time	1110	4.Relinquished by	Org. Date Time
2. Received by		Org.	CCL	Date	4-24-14	Time	0725	4. Received by	Org. Date Time

*Prior confirmation with SMO required for 7 and 15 day TAT

AR/COC NUMBER 615446

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: June 9, 2014

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615446
SDG: 347594
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 3.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The ICAL intercept was negative and > the MDL but ≤3X the MDL for dichlorodifluoromethane. The associated sample results were NDs and will be **qualified UJ,I5**.

2. The ICAL, ICV and CCV RFs were <0.05 but ≥0.01 for 2-butanone. The associated sample results were NDs and will be **qualified UJ,I4**.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the Summary section and as follows. The ICAL %RSD was >15% but ≤40% for bromoform. The associated sample results were NDs and since no other calibration infraction occurred, will not be qualified.

The ICV/CCV %Ds were >20% with positive bias for dichlorodifluoromethane. The associated sample results were NDs and will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Bromodichloromethane was detected at < the PQL and chloroform at > the PQL in the FB, sample 347594001. All associated sample results were NDs and will not be qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met. It should be noted that the MS/MSD was performed on an SNL sample of similar matrix from another SDG.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

A FB and a TB were submitted with AR/COC 615446.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 06/09/14

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: June 9, 2014

To: File

From: Linda Thal

Subject: Inorganic Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615446
SDG: 347594
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

One sample was prepared and analyzed with approved procedures using method EPA 6020 (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The sample was prepared and analyzed within the prescribed holding time and properly preserved.

ICP-MS Instrument Tune

The ICP-MS tunes met QC acceptance criteria.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRI recoveries met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The sample was not diluted.

ICP Interference Check Sample (ICS A and AB)

Results of the ICS A and AB analyses were not evaluated because the sample concentrations of Ca, Mg, Fe and Al were < those in the ICS solution.

ICP Serial Dilution

The serial dilution met all QC acceptance criteria.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 06/09/14

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: June 9, 2014

To: File

From: Linda Thal

Subject: Inorganic Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615446
SDG: 347594
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 3.

Summary

One sample was prepared and analyzed with approved procedures using methods EPA 901.1 (gamma spec – short list), SM 7500 Rn B (Radon-222), EPA 906.0 (tritium) and EPA 900.0 (gross alpha/beta). Problems were identified with the data package that resulted in the qualification of data.

Gammaspec and tritium:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**

Radon-222:

1. Sample 347594007 was analyzed >1X but ≤2X past the method specified holding time and will be **qualified J,H1**.

2. Sample -007 was > the MDA but ≤3X the MDA and will be **qualified J,FR7.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The sample was properly preserved and prepared and analyzed within the prescribed holding time except as noted above in the Summary section.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Tracers or carriers were not required for these methods.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS and/or MSD met all QC acceptance criteria.

Gross alpha/beta:
It should be noted that the sample used for the MS/MSD was of similar matrix from another SNL SDG.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Gross alpha/beta:
It should be noted that the sample used for the replicate was of similar matrix from another SNL SDG.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

The sample was not diluted. All required detection limits were met.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 06/09/14

Sample Findings Summary

AR/COC: 615446

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 901.1			
	095821-033/MWL-MW8	Americium-241 (14596-10-2)	BD, FR3
	095821-033/MWL-MW8	Cesium-137 (10045-97-3)	BD, FR3
	095821-033/MWL-MW8	Cobalt-60 (10198-40-0)	BD, FR3
	095821-033/MWL-MW8	Potassium-40 (13966-00-2)	BD, FR3
EPA 906.0 Modified			
	095821-036/MWL-MW8	Tritium (10028-17-8)	BD, FR3
SM 7500 Rn B			
	095821-040/MWL-MW8	Radon-222 (14859-67-7)	J, FR7,H1
SW846 8260B DOE-AL			
	095820-001/MWL-FB5	2-Butanone (78-93-3)	UJ, I4
	095820-001/MWL-FB5	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095821-001/MWL-MW8	2-Butanone (78-93-3)	UJ, I4
	095821-001/MWL-MW8	Dichlorodifluoromethane (75-71-8)	UJ, I5
	095822-001/MWL-TB5	2-Butanone (78-93-3)	UJ, I4
	095822-001/MWL-TB5	Dichlorodifluoromethane (75-71-8)	UJ, I5

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615446 | Site/Project: MWL GWM | Validation Date: 06/09/2014

SDG #: 347594 | Laboratory: GEL | Validator: Linda Thal

Matrix: Aqueous | # of Samples: 8 CVR present: Yes | Analysis Type: X□ Organic X□ Metals

AR/COC(s) present: Yes | Sample Container Integrity: OK | X□ Rad □ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
095821-040	347594007	SM 7500 Rn B	✓	4/28/14 10.18	5/02/14 20.53	5/02/14 20.53	Yes	No

Comments: Sampled 04/28/2014.

Validated by: L Thal

Organic Worksheet (GC/MS)

AR/COC #: 615446 SDG #: 347594 Matrix: Aqueous

Laboratory Sample IDs: 347594001, -002, -008

Method/Batch #s: 8260B: 1384112 Tuning (pass/fail): Pass TICs Required? (yes/no): No

Analyte (outliers)	Calibration				MB	5X (10X) MB	LCS %R	MS %R	MSD %R	MS/ MSD RPD	FB -001	FB X5	TB -008	TB X5
	Int.	RF	RSD/R^2	(ICV) CCV %D										
Bromodichloromethane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	.54J	2.7	✓	NA
Chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	3.5	17.5	✓	NA
Bromoform	NA	✓	22	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓
Dichlorodifluoromethane	-.54	NA	✓	(+36) +36 +48*	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓
2-Butanone	NA	.036 .035 .037 .036*	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓
trans-1,2-Dichloroethylene	NA	✓	✓	✓	✓	NA	78*	✓	✓	✓	✓	✓	✓	✓

Surrogate Recovery Outliers

Sample ID						
None						

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None												

Comments: HTs OK. ICAL VOA2.I 03/17/2014; Acetone, dichlorodifluoromethane, methylene chloride linear; *associated with MS/MSD only

MS/MSD performed on SNL sample from another SDG spiked with trichlorotrifluoroethane;

Inorganic Metals Worksheet

AR/COC #: 615446 SDG #: 347594 Matrix: Aqueous

Laboratory Sample IDs: 347594003

Method/Batch #s: **3005A/6020**: 1384687/1384688

ICPMS Mass Cal (pass/fail): Pass ICPMS Resolution (pass/fail): Pass

Analyte (outliers)	**Calibration**						**Method Blank mg/L**	**5X Blank or (5X MDL) mg/L**	**LCS %R**	**MS %R**	**Lab Rep. RPD**	**Serial Dil. %D**	**ICS AB %R**	**ICS A ± MDL ug/L x50 (mg/L)**	**CRA CRI %R**				
	Int.	**R^2**	**ICV**	**CCV**	**ICB ug/L**	**CCB ug/L**													
None																			

IS Outliers *60-125%*				**IS Outliers** *80-120%*			
Sample ID	**%Recovery**	**%Recovery**	**%Recovery**	**CCV/CCB ID**	**%Recovery**	**%Recovery**	**%Recovery**
None							

Comments: HTs OK. Matrix QC on -003

Radiochemistry Worksheet

AR/COC #: 615446 SDG #: 347594 Matrix: Aqueous

Laboratory Sample IDs: 347594 – see below

Method/Batch#s: EPA 901.1 (Gammaspec): 1383767; -004

Method/Batch#s: EPA 900.0/SW846 9310 (Gross alpha/beta): 1387206; -005

Method/Batch#s: SM 7500 Rn B (Radon-222): 1384924; -007

Method/Batch#s: EPA 906.0 (Tritium): 1386334; -006

Analyte (outliers)	**Control Freq.**	**Control Eval.**	**Method Blank**	**5X Blank or 5X MDC**	**LCS %R**	**MS %R**	**MSD %R**	**MS/ MSD RER**	**Lab Rep. RER**	**EB**			
None													

Tracer/Carrier Recovery Outliers

Sample ID	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**
NA								

Comments: HTs OK except for Radon-222 sample -007 HT >5% past method specified.

GS DUP -004; Rn-222 MS and DUP -007; Gross A/B MS/MSD and DUP on SNL sample from another SDG; tritium MS and DUP -006

Gross A/B parent =125ml, MS/MSD = 25ml (5X dilution) – no qual

Data rejected by the lab due to peak not meeting identification criteria: None

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 615446

Project Name:	MWL GWM	Date Samples Shipped:	4/28/14	SMO Authorization:	Don Walker
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	217783	SMO Contact Phone:	Lorraine Herrera/505-844-3199
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171	☐ Waste Characterization	
Service Order:	CF01-14	Lab Destination:	GEL	☐ RMMA	
		Contract No.:	PO 1303873	☐ Released by COC No.	
				Send Report to SMO:	Rita Kavanaugh/505-284-2553
				☑ 4° Celsius	
Tech Area:				Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154	347594
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
095820	-001	MWL-FB5	NA	4/28/14 10:17	DIW	G	3x40 ml	HCL	G	FB	VOC (SW846-8260B) (LTMMP List)	001
095821	-001	MWL-MW8	497	4/28/14 10:17	GW	G	3x40 ml	HCL	G	SA	VOC (SW846-8260B) (LTMMP List)	002
095821	-009	MWL-MW8	497	4/28/14 10:19	GW	P	500 ml	HNO3	G	SA	Metals Cd,Cr,Ni,U (SW846-6020)	003
095821	-033	MWL-MW8	497	4/28/14 10:21	GW	P	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	004
095821	-034	MWL-MW8	497	4/28/14 10:24	GW	P	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	005
095821	-036	MWL-MW8	497	4/28/14 10:27	GW	AG	250 ml	None	G	SA	Tritium (EPA 906.0)	006
095821	-040	MWL-MW8	497	4/28/14 10:18	GW	AG	2x40 ml	None	G	SA	Radon (SM 7500 Rn B)	007
095822	-001	MWL-TB5	NA	4/28/14 10:17	DIW	G	3x40 ml	HCL	G	TB	VOC (SW846-8260B) (LTMMP List)	008

Last Chain:	☑ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☑ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐
			Sample Disposal ☐ Return to Client ☑ Disposal by Lab
			Return Samples By:

Conditions on Receipt

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
Report specific list of VOCs (LTMMP list provided by SNL/NM SMO). Report short list isotopes for Gamma Spectroscopy. Provide level D package.

Lab Use

1. Relinquished by	Alfred Santillanes	Org. 4142	Date 4/28/14	Time 11:00	3. Relinquished by		Org.	Date	Time
1. Received by	Don Walker	Org. 4142	Date 4/28/14	Time 1100	3. Received by		Org.	Date	Time
2. Relinquished by	Don Walker	Org. 4142	Date 4/28/14	Time 1100	4. Relinquished by		Org.	Date	Time
2. Received by	[illegible]	Org. [illegible]	Date 4-29-14	Time 0735	4. Received by		Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT VERIFICATION REVIEW FORMS

GROUNDWATER MONITORING

APRIL 2014

AR/COC Number	Sample Type
615442	Environmental*
615443	Environmental*
615444	Environmental*
615445	Environmental*
615446	Environmental*

* AR/COC forms are provided in the Data Validation Section of this Annex.

Contract Verification Review (CVR)

Project Leader Jackson Project Name MWL GWM Project/Task No. 146422_10.11.08

ARCOC No. 615442 Analytical Lab GEL SDG No. 346998

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control sample accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	X		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Detected in FB1: Bromodichloromethane, Chloroform, Dibromochloromethane (095807-001). Detected in EB1: Bromodichloromethane, Chloroform, Dibromochloromethane (095808-001); Nickel (095808-009)
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	X		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668)	N/A		
a) 12-hour tune check provided			
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	X		

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted		X	
5.3 Verification or reanalysis requested from lab		X	

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes x No

Based on the review, this data package is complete. x Yes θ No

If no, provide nonconformance report or correction request number _____ and date correction request was submitted: _____

Reviewed by: _____ Date: 05/27/2014

Were resolutions adequate and data package complete? θ Yes θ No

Closed by: _____ Date: _____

Contract Verification Review (CVR)

Project Leader Jackson Project Name MWL GWM Project/Task No. 146422_10.11.08

ARCOC No. 615443, 615444, 615445 Analytical Lab GEL SDG No. 347170

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control sample accuracy reported and met for all samples		X	VOC LCS recovery failed for trans-1,2-Dichloroethylene (1203078885)
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	X		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Detected in FB2 (095810-001) & FB3 (095814-001): Bromodichloromethane, Chloroform. Detected in FB4 ((095817-001): Bromodichloromethane, Chloroform, Dibromochloromethane
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	X		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668)	N/A		
a) 12-hour tune check provided			
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	X		

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted		X	
5.3 Verification or reanalysis requested from lab		X	

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes x No

Based on the review, this data package is complete. x Yes θ No

If no, provide nonconformance report or correction request number _____ and date correction request was submitted: _____

Reviewed by: _____ Date: 04/28/2014

Were resolutions adequate and data package complete? θ Yes θ No

Closed by: _____ Date: _____

COC: 615443, 615444, 615445

Contract Verification Review (CVR)

Project Leader Jackson Project Name MWL GWM Project/Task No. 146422_10.11.08

ARCOC No. 615446 Analytical Lab GEL SDG No. 347594

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control sample accuracy reported and met for all samples		X	VOC LCS recovery failed for trans-1,2-Dichloroethylene (1203078885)
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	X		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Detected in FB5: Bromodichloromethane, Chloroform (095820-001)
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	X		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270) a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided		X	
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	X		

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted		X	
5.3 Verification or reanalysis requested from lab		X	

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
QC	VOC	Missing Continuing Calibration

Were deficiencies unresolved? x Yes θ No

Based on the review, this data package is complete. θ Yes x No

If no, provide nonconformance report or correction request number 17690 and date correction request was submitted: 05/29/2014

Reviewed by: _____ Date: 05/29/2014

Were resolutions adequate and data package complete? x Yes θ No

Closed by: _____ Date: 06/03/2014

FIELD SAMPLING FORMS

JUNE 2014 GROUNDWATER MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-MW8 Date: 6/30/14 Time: 0755

Activities: Groundwater Monitoring and Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 91.2 °F Wind Speed: 0 MPH Humidity: 19.8 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~ T-1 7/3/14
Other: _____

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	
William Gibson	
ALFRED SANTILLANES	
Tim Jackson	

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN), department home page

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.01.11.08
Well I.D.: MWL-MW 8	Date: 06/30/14
Well Condition: good → excellent	Weather Condition: see tailgate 6/30/14
Method: Portable pump X	Dedicated pump _____ Pump depth: 497'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	DO mg/L Comments
491.49	0812		START						
493.26	0854	2	29.25	673.4	305.8	7.57	0.39	63.0	4.81
493.74	0919	4	30.50	688.6	300.8	7.59	0.36	59.5	4.46
494.00	0948	6	29.48	681.0	300.8	7.59	0.28	54.3	4.13
494.37	1008	8	26.44	642.5	293.1	7.54	0.27	45.4	3.65
494.48	1018	9	26.50	643.0	287.2	7.54	0.24	44.1	3.54
494.61	1030	10	26.62	646.7	281.8	7.56	0.27	42.6	3.41
494.81	1041	11	26.35	644.1	276.4	7.54	0.25	40.4	3.25
	1042								
									~1.6 gals purged from tubing
									0832

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: MWL	SNL/NM Project No.: 146422.10.11.08
Calibrations done by: R Lynch	Date: 06/30/14

Make & Model: YSI EXO1

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 | pH sloped to (std): 10.00

Reference value.	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0640	4.01	19.6	7.00	19.6	10.01	19.6
2. Time: 1300	4,00	20.2	7,00	20.2	10,00	20,2
3. Time:						
4. Time						
Standard lot no.:	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	

SC Calibration

Reference Value: 1225 uS | Standard Lot No: 3AE221

Expiration Date: 5/15

	Value	Temp
1. Time: 0639	1222	19.6
2. Time: 1259	1224	20,2
3. Time.		
4. Time		

ORP Calibration

Reference Value: 220 mV | Standard Lot No. 4AA010

Expiration Date: 7/14

	Value	Temp
1. Time: 0641	219.9	19.6
2. Time: 1302	220,1	20,2
3. Time:		
4. Time:		

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time 0638	81.4	24.59
2. Time: 1258	81,6	24.61
3. Time.		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: MWL		Project No.: 146422.10.11.08		
Calibration done by: R Lynch		Date: 06/30/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q 6/30/14		Serial No. S/N 10060C003010		
Reference Value	RL=10	20	100	800
Standard Lot No.	0161	0167	0168	0161
1. Time 0758	10.2	19.8	102	801
2. Time 1100	9.96	19.7	101	796
3. Time				
4. Time				

Comments:

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL-GWM	**Monitoring Well ID # :** MWL-MW8	**Date:** 06/30/14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 210269
Personnel Performing Decontamination: Alfred Santillanes — Print Name: — Initial: William Gibson — Print Name: — Initial:	**Personnel Performing Decontamination:** Alfred Santillanes — Print Name: — Initial: William Gibson — Print Name: — Initial:

Condition of Equipment

Pump: Excellent **Tubing Bundle:** Good **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one) **Source:** Culligan **Lot Number:** 062514	HNO_3 **Grade:** Reagent **UN #:** 2031 **Manufacturer:** AROC **Lot Number:** A0316863

SUMMARY SHEET FOR JUNE 2014 MWL-MW8 RESAMPLE

Sample Summary for June 2014 MWL Groundwater Monitoring MWL-MW8 Re-Sample

Well ID	*Sample Date*	*ARCOC*	*Sample Number*	*Sample Type*	*Associated Equipment Blank (ARCOC #/Sample #)*	*Associated Trip Blank (ARCOC # / Sample #)*	*Associated Field Blank (ARCOC # / Sample #)*	*Comments*
GEL Analytical Data: Project Task # 146422.10.11.08, Service Order # CF01-14								
MWL-MW8	30-Jun-14	615592	096150	Environmental	615591 / 096147	615592 / 096152	615592 / 096149	
MWL-MW8	30-Jun-14	615592	096151	Duplicate	615591 / 096147	615592 / 096152	615592 / 096149	
MWL-EB1	27-Jun-14	615591	096147	Equipment Blank	NA	615591 / 096148	NA	Equipment blank sample prior to MWL-MW8.
MWL-FB1	30-Jun-14	615592	096149	Field Blank	NA	615592 / 096152	NA	at MWL-MW8

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

GROUNDWATER MONITORING

JUNE 2014

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: August 12, 2014

To: File

From: Monica Dymerski

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL GWM
AR/COC: 615591 and 615592
SDG: 351610
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Six samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The ICAL %RSD was >15% but ≤40% and CCV %D was >20% but ≤40% with a negative bias for methylene chloride. The associated sample results were non-detects and will be **qualified UJ,I3,C3.**
2. The MS and MSD %Rs were < the laboratory acceptance limits but ≥10% for 2-butanone and acetone. The associated sample results were non-detects and will be **qualified UJ, MS3.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding times and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the Summary section and as follows.

The CCV %Ds were >20% but ≤40% with a negative bias for 2-butanone, acetone, and 2-hexanone. The associated sample results were non-detects and, since no other calibration infractions occurred for those analytes, will not be qualified.

The ICV %D was >20% with a positive bias for dibromochloromethane. The associated sample results were non-detects and will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Toluene was detected in EB sample -006. The toluene results for associated samples -002 and -003 were non-detects and will not be qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met except as noted above in the Summary section.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met except as follows. The LCS %R was < the laboratory acceptance limit but ≥10% for methylene chloride. One LCS outlier is allowed since 36 analytes were reported. Therefore, the associated sample results will not be qualified.

Target Compound Identification

Mass spectra met acceptance criteria for all detected analytes.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Two trip blanks were submitted, one on each ARCOC. An EB was submitted on ARCOC 615591 and was applied to the samples on ARCOC 615592. An FB was submitted on ARCOC 615592 and was applied to the field samples from 615592. A field duplicate pair was submitted on ARCOC 615592.

There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 08/12/14

Sample Findings Summary

AR/COC: 615591, 615592

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 8260B DOE-AL			
	096147-001/MWL-EB1	2-Butanone (78-93-3)	UJ, MS3
	096147-001/MWL-EB1	Acetone (67-64-1)	UJ, MS3
	096147-001/MWL-EB1	Methylene chloride (75-09-2)	UJ, I3,C3
	096148-001/MWL-TB1	2-Butanone (78-93-3)	UJ, MS3
	096148-001/MWL-TB1	Acetone (67-64-1)	UJ, MS3
	096148-001/MWL-TB1	Methylene chloride (75-09-2)	UJ, I3,C3
	096149-001/MWL-FB1	2-Butanone (78-93-3)	UJ, MS3
	096149-001/MWL-FB1	Acetone (67-64-1)	UJ, MS3
	096149-001/MWL-FB1	Methylene chloride (75-09-2)	UJ, I3,C3
	096150-001/MWL-MW8	2-Butanone (78-93-3)	UJ, MS3
	096150-001/MWL-MW8	Acetone (67-64-1)	UJ, MS3
	096150-001/MWL-MW8	Methylene chloride (75-09-2)	UJ, I3,C3
	096151-001/MWL-MW8	2-Butanone (78-93-3)	UJ, MS3
	096151-001/MWL-MW8	Acetone (67-64-1)	UJ, MS3
	096151-001/MWL-MW8	Methylene chloride (75-09-2)	UJ, I3,C3
	096152-001/MWL-TB2	2-Butanone (78-93-3)	UJ, MS3
	096152-001/MWL-TB2	Acetone (67-64-1)	UJ, MS3
	096152-001/MWL-TB2	Methylene chloride (75-09-2)	UJ, I3,C3

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615591 and 615592 | Site/Project: MWL GWM | Validation Date: 08/12/14

SDG #: 351610 | Laboratory: GEL Laboratories LLC | Validator: Monica Dymerski

Matrix: Aqueous | # of Samples: 6 | CVR present yes | Analysis Type: X Organic Metals

AR/COC(s) present: yes | Sample Container Integrity: intact | Rad Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments: Sampled 06/27/14 and 06/30/14

Revised 7/2007

Validated By: Monica L Dymerski

Organic Worksheet (GC/MS)

AR/COC #: 615591 and 615592 SDG #:351610 Matrix: Aqueous

Laboratory Sample IDs: 351610001 through -006

Method/Batch #s: 1400680 Tuning (pass/fail): pass TICs Required? (yes/no) no

Analyte (outliers)	Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/ MSD RPD	FB -001	TB -004	EB -005	5X EB	TB -006
	Int.	RF	RSD/ R^2	CCV (ICV) %D											
toluene	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	0.400J	2.0	✓
methylene chloride	NA	✓	41.9	-24.6	✓	NA	71.3	✓	✓	✓	✓	✓	✓	NA	✓
2-butanone	NA	✓	✓	-35.6	✓	NA	✓	37.4	37.5	✓	✓	✓	✓	NA	✓
acetone	NA	✓	✓	-37.4	✓	NA	✓	27.3	27.2	✓	✓	✓	✓	NA	✓
dibromochloromethane	NA	✓	✓	(20.5)	✓	NA	✓	✓	✓	✓	✓	✓	✓	NA	✓
2-hexanone	NA	✓	✓	-30.3	✓	NA	✓	✓	✓	✓	✓	✓	✓	NA	✓

Surrogate Recovery Outliers

Sample ID							
None							

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area		RT	Area	RT
None													

Comments: HTs OK. I-cal VOA6, 06/17/14. Samples analyzed 07/04/14. MS/MSD performed on sample -002.

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. NA EDK 7/2/14

SMO Use

AR/COC 615591

Project Name:	MWL GWM	Date Samples Shipped:	6/30/14	SMO Authorization:	Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	220524	SMO Contact Phone	RMMA
Project/Task Number:	146422.10.11.0108	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	Released by COC No.
Service Order:	CF01-14	Lab Destination:	GEL	Send Report to SMO:	4° Celsius
		Contract No.:	PO 1303873	Rita Kavanaugh/505-284-2553	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 351610
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096147	-001	MWL-EB1	NA	6/27/14 12:45	DIW	G	3x40ml	HCL	G	EB	VOC (LTMMP list) (SW846-8260B)	005
096148	-001	MWL-TB1	NA	6/27/14 12:45	DIW	G	3x40ml	HCL	G	TB	VOC (LTMMP list) (SW846-8260B)	006

Last Chain:	Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	Yes	Date Entered:	EDD Yes No
Background:	Yes	Entered by:	Turnaround Time 7 Day* 15 Day* 30 Day
Confirmatory:	Yes	QC inits.:	Negotiated TAT

Conditions on Receipt

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch		RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes		AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson		WJG	SNL/4142/505-284-3307/505-239-7367

Sample Disposal: Return to Client Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Lab Use

1. Relinquished by	Robert Lynch	Org. 4142	Date 6/30/14	Time 10:52	3. Relinquished by	SMO	Org. 4142	Date 6/30/14	Time 1130
1. Received by	T-Axelrod	Org. 4142	Date 6/30/14	Time 10:52	3. Received by		Org.	Date 7-1-14	Time 0910
2. Relinquished by	T-Axelrod	Org. 4142	Date 6/30/14	Time 11:20	4. Relinquished by		Org.	Date	Time
2. Received by	SMO	Org. 4142	Date 6/30/14	Time 1120	4. Received by		Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. NA 6MW 7/2/14

SMO Use

AR/COC 615592

Project Name:	MWL GWM	Date Samples Shipped:	6/30/14	SMO Authorization:	
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	220524	SMO Contact Phone:	
Project/Task Number:	146122.10.11.0108	Lab Contact:	Edie Kent/803-556-8171		Lorraine Herrera/505-844-3199
Service Order:	CF01-14	Lab Destination:	GEL	Send Report to SMO:	
		Contract No.:	PO 1303873		Rita Kavanaugh/505-284-2553
Tech Area:					
Building:	Room:	Operational Site:			

☐ Waste Characterization
☐ RMMA
☐ Released by COC No.
☐ 4° Celsius

Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154, Albuquerque, NM 87185-0154 351616

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096149	-001	MWL-FB1	NA	6/30/14 10:42	DIW	G	3x40ml	HCL	G	FB	VOC (LTMMP list) (SW846-8260B)	001
096150	-001	MWL-MW8	497	6/30/14 10:42	GW	G	3x40ml	HCL	G	SA	VOC (LTMMP list) (SW846-8260B)	002
096151	-001	MWL-MW8	497	6/30/14 10:42	GW	G	3x40ml	HCL	G	DU	VOC (LTMMP list) (SW846-8260B)	003
096152	-001	MWL-TB2	NA	6/30/14 10:42	DIW	G	3x40ml	HCL	G	TB	VOC (LTMMP list) (SW846-8260B)	004

Last Chain:	☐ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☐ Yes	Date Entered:	EDD ☐ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐

Conditions on Receipt

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cell
	Robert Lynch		RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes			SNL/4142/505-844-5130/505-228-0710
	William Gibson			SNL/4142/505-284-3307/505-239-7367

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Lab Use

1. Relinquished by		Org. 4142	Date 6/30/14	Time 10:52	3. Relinquished by	Org. 4142	Date 6/30/14	Time 1630
1 Received by		Org. 4142	Date 6/30/14	Time 10:52	3 Received by	Org.	Date 7-1-14	Time 0910
2. Relinquished by		Org. 4142	Date 6/30/14	Time 11:20	4. Relinquished by	Org.	Date	Time
2. Received by		Org. 4142	Date 6/30/14	Time 11:20	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT VERIFICATION REVIEW FORMS

GROUNDWATER MONITORING

JUNE 2014

AR/COC Number	Sample Type
615591	Environmental*
615592	Environmental*

* AR/COC forms are provided in the Data Validation Section of this Annex.

Contract Verification Review (CVR)

Project Leader Jackson Project Name MWL GWM Project/Task No. 146422_10.11.08

ARCOC No. 615591, 615592 Analytical Lab GEL SDG No. 351610

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	No	If no, explain
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	No	If no, explain
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	N/A		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control sample accuracy reported and met for all samples		X	VOC LCS recovery failed for Methylene Chloride (1203121132)
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met		X	VOC PS recovery failed for 2-Butanone, Acetone (1203121130)
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Trichloroethylene detected in EB1 (096147-001)
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	X		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270) a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	N/A		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted		X	
5.3 Verification or reanalysis requested from lab		X	

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes x No

Based on the review, this data package is complete. x Yes θ No

If no, provide nonconformance report or correction request number _____ and date correction request was submitted: _____

Reviewed by: _____ Date: 08/04/2014

Were resolutions adequate and data package complete? θ Yes θ No

Closed by: _____ Date: _____

FIELD SAMPLING FORMS

OCTOBER 2014 MIXED WASTE LANDFILL GROUNDWATER MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-BW2 Date: 10/16/14 Time: 0755

Activities: Groundwater Monitoring and Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 64.9 °F Wind Speed: 0 MPH Humidity: 40.6 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~ TJ 11-4-14
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert T Lynch	
ALFRED SANTILLANES	
William Gibson	

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-MW7 Date: 10/17/14 Time: 0800

Activities: Groundwater Monitoring and Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 65.3 °F Wind Speed: 0 MPH Humidity: 46.8 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~ 11-4-14 TT
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.		☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.		☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.		☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.		☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.		☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
William Gibson	William Gibson
ALFRED SANTILLANES	Alfred Santillanes

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-MW9 Date: 10/20/14 Time: 0755

Activities: Groundwater Monitoring and Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 62.7 °F Wind Speed: 0 MPH Humidity: 56.5 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~ 11-4-14
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
William Gibson	William Gibson
ALFRED SANTILLANES	Alfred Santillanes

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-MW8 Date: 10/21/14 Time: 0753

Activities: Groundwater Monitoring and Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 62.9 °F Wind Speed: Ø MPH Humidity: 63.8% Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU VAC ampules~~ 11-4-14
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	[signature]
William Gibson	[signature]
ALFRED SANTILLANES	[signature]

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: MWL-MW 7 Date: 10/29/14 Time: 0810

Activities: Groundwater Monitoring and Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 66.1 °F Wind Speed: 0 MPH Humidity: 36.3 % Wind Chill: NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~ 11-4-14
Other:

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
Tim Jackson	Tim Jackson

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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.10.11.01
Well I.D.: MWL-BW2	Date: 10/16/14
Well Condition:	Weather Condition:
Method: Portable pump X	Dedicated pump _____ Pump depth: 496'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	DO mg/L	Comments
480.06	0811		START							
482.73	0842	5	18.14	664.0	234.1	7.13	0.25	15.6	1.45	
483.45	0859	10	19.32	652.0	217.6	7.16	0.84	21.3	1.96	
483.96	0918	15	19.66	661.2	217.0	7.16	0.35	21.6	1.97	
484.39	0935	20	20.07	677.7	209.7	7.14	0.43	17.8	1.61	
484.76	0953	25	20.32	689.5	202.0	7.13	0.19	14.8	1.33	
484.94	1010	30	20.69	698.9	200.8	7.12	0.19	12.9	1.15	
485.04	1017	32	20.94	703.6	195.8	7.12	0.23	12.3	1.09	
485.12	1024	34	20.93	706.8	193.7	7.12	0.21	11.8	1.05	
485.22	1031	36	20.96	707.1	192.1	7.12	0.18	11.3	1.00	
485.31	1038	38	20.93	707.3	192.1	7.12	0.22	11.1	0.98	
	1039		SAMPLING							
										~1.6 gals purged from tubing
										0818

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.10.11.01
Well I.D.: MWL-MW 7	Date: 10/17/14
Well Condition:	Weather Condition:
Method: Portable pump X	Dedicated pump _____ Pump depth: 496'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	DO mg/L Comments
489.98	0822		START						
490.91	0900	2	18.14	547.1	342.3	7.37	0.50	71.0	6.69
491.02	0921	4	19.44	564.4	335.3	7.39	0.52	70.7	6.49
491.09	0942	6	20.51	578.6	332.1	7.39	0.44	70.1	6.30
491.19	1000	8	20.57	579.5	330.7	7.38	0.42	69.2	6.21
491.23	1010	9	20.89	583.5	329.2	7.37	0.32	69.7	6.22
491.25	1020	10	20.87	583.2	328.1	7.37	0.33	69.7	6.22
491.26	1030	11	20.93	584.2	327.8	7.37	0.23	70.0	6.24
491.27	1040	12	20.94	585.8	327.0	7.37	0.26	69.7	6.19
	1041		sampling						
									~11.6 gals purged from tubing
									0841

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.10.11.01
Well I.D.: MWL-MW 7	Date: 10/29/14
Well Condition: Good	Weather Condition: See tailgate form
Method: Portable pump X	Dedicated pump _____ Pump depth: 496'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	DO mg/L Comments
490.14	0828	/	START						
491.30	0854	2	16.45	532.7	112.6	7.44	0.67	73.3	7.17 10/29/14
491.52	0909	4	18.58	562.2	70.5	7.56	0.59	73.5	~~6.86~~ RC 6.86
491.60	0925	6	19.31	572.1	52.1	7.58	0.62	74.0	6.81
491.62	0941	8	19.06	568.8	41.8	7.58	0.58	73.0	6.75
491.62	0957	10	19.11	571.2	39.9	7.58	0.47	72.4	6.69
491.64	1005	11	19.16	572.2	37.5	7.58	0.30	73.3	6.68
491.64	1013	12	19.17	571.4	37.2	7.58	0.32	73.5	6.65
	1014	/	SAMPLING						→
									~1.6 gals purged from tubing 0840

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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.10.11.01
Well I.D.: MWL-MW 8	Date: 10/21/14
Well Condition:	Weather Condition:
Method: Portable pump X	Dedicated pump _____ Pump depth: 497'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	DO mg/L Comments
491.58	0810	/	START →						
493.25	0848	2	16.01	521.8	313.6	7.45	0.35	50.4	4.96
493.35	0925	4	19.40	566.8	305.1	7.47	0.32	50.7	4.65
493.81	0950	6	20.33	584.9	249.5	7.44	0.25	45.7	4.12
493.55	1025	8	21.70	605.9	279.5	7.43	0.45	46.0	3.95
493.86	1034	9	21.78	610.1	280.7	7.44	0.27	42.7	3.73
494.11	1045	10	21.30	603.7	281.5	7.42	0.28	37.7	3.34
494.18	1057	11	21.42	604.4	275.0	7.43	0.37	35.6	3.14
	1058	/							
									~1.6 gals purged from tubing 0827

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: MWL	Project No.: 146422.10.11.01
Well I.D.: MWL-MW 9	Date: 10/20/14
Well Condition:	Weather Condition:
Method: Portable pump X	Dedicated pump _____ Pump depth: 497'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	DO mg/L	Comments
492.16	0813		START							
494.06	0848	2	16.88	522.8	271.8	6.99	6.40	3.85	39.7	2022 10-20-14
494.81	0906	4	16.62	521.0	247.1	7.22	0.55	3.10	31.9	2022 10-20-14
495.38	0923	6	16.95	529.3	218.4	7.27	0.63	25.4	2.45	
495.75	0944	8	19.99	544.1	190.7	7.31	0.58	22.6	2.14	
495.86	0954	9	19.97	566.4	178.6	7.34	0.46	20.8	1.91	
495.87	1006	10	20.94	585.8	171.8	7.35	0.49	23.6	2.10	
495.84	1018	11	20.97	584.4	171.3	7.35	0.44	23.0	2.01	
	1019		SAMPLING							
										~11 gals purged from tubing
										0829

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: MWL	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: R Lynch	Date: 10/16/14

Make & Model: YSi EXO1

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0642	3.99	18.1	7.00	18.1	10.00	18.1
2. Time: 1153	4.01	18.3	7.00	18.2	10.01	18.2
3. Time:						
4. Time:						
Standard lot no.:	4AE330		4AE635		4AD984	
Expiration date:	5/16		5/16		4/16	

SC Calibration

Reference Value: 1225 uS Standard Lot No.: 4AE659

Expiration Date: 5/15

	Value	Temp
1. Time: 0641	1222	18.2
2. Time: 1157	1224	18.3
3. Time:		
4. Time:		

ORP Calibration

Reference Value: 220 mV Standard Lot No. 4AE189

Expiration Date 2/15

	Value	Temp
1. Time: 0644	220.2	18.2
2. Time: 1155	220.4	18.4
3. Time:		
4. Time:		

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0640	82.1	24.75
2. Time: 1150	82.2	24.75
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: MWL	Project No.: 146422.10.11.01
Calibration done by: R Lynch	Date: 10/16/14

TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	.1	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time 0757	.09	20.1	101	799
2. Time 1045	.13	20.4	99.8	794
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: MWL	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: R Lynch	Date: 10/17/14

Make & Model: YSI EXO1

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 | pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0642	4.00	18.1	7.00	18.1	10.00	18.1
2. Time: 1310	4.01	18.2	7.00	18.2	10.00	18.2
3. Time:						
4. Time:						
Standard lot no.:	4AE330		4AE635		4AD984	
Expiration date:	5/16		5/16		4/16	

SC Calibration

Reference Value: 1225 uS | Standard Lot No.: 4AE659

	Value	Temp	Expiration Date: 5/15
1. Time: 0641	1220	18.0	
2. Time: 1309	1222	18.2	
3. Time:			
4. Time:			

ORP Calibration

Reference Value: 220 mV | Standard Lot No.: 4AE189

	Value	Temp	Expiration Date: 2/15
1. Time: 0644	219.8	18.0	
2. Time: 1311	220.1	18.2	
3. Time:			
4. Time:			

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft	Atmospheric Pressure in Hg
1. Time: 0640	82.0	24.73
2. Time: 1308	82.2	24.74
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: MWL		Project No.: 146422.10.11.01		
Calibration done by: R Lynch		Date: 10/17/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	.1	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time 0808	.16	20.1	99.7	802
2. Time 1102	.14	20.3	101	804
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name MWL	SNL/NM Project No.: 146422.10.11.01
Calibrations done by R Lynch	Date: 10/20/14

Make & Model: YS EXO1

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0644	3.99	19.2	7.00	19.2	10.01	19.2
2. Time: 1114	4.00	19.4	7.01	19.3	10.00	19.3
3. Time:						
4. Time:						
Standard lot no.:	4AE330		4AE635		4AD984	
Expiration date:	5/16		5/16		4/16	

SC Calibration

Reference Value: 1225 uS Standard Lot No.: 4AE659

	Value	Temp	Expiration Date 5/15
1. Time: 0643	1224	19.2	
2. Time: 1113	1225	19.4	
3. Time:			
4. Time:			

ORP Calibration

Reference Value: 220 mV Standard Lot No. 4AE189

	Value	Temp	Expiration Date: 2/15
1. Time: 0646	220.2	19.2	
2. Time: 1115	220.1	19.4	
3. Time:			
4. Time:			

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0642	82.3	24.77
2. Time: 1112	82.2	24.74
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: MWL		Project No.: 146422.10.11.01		
Calibration done by: R Lynch		Date: 10/20/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	.1	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time 0800	.09	19.9	103	802
2. Time 1035	.14	20.2	101	796
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

SNL/NM Project Name: MWL	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: R Lynch	Date: 10/21/14

Make & Model: YSI EXO1

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 | pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0639	4.00	18.9	6.99	18.9	10.00	18.9
2. Time: 1311	4.01	19.1	7.00	19.2	10.00	19.2
3. Time:						
4. Time:						
Standard lot no.:	4AE330		4AE635		4AD984	
Expiration date:	5/16		5/16		4/16	

SC Calibration

Reference Value: 1225 uS | Standard Lot No.: 4AE659

	Value	Temp	Expiration Date: 5/15
1. Time: 0638	1222	18.9	
2. Time: 1310	1225	19.2	
3. Time:			
4. Time:			

ORP Calibration

Reference Value: 220 mV | Standard Lot No 4AE189

	Value	Temp	Expiration Date 2/15
1. Time: 0641	220.2	18.9	
2. Time: 1312	220.3	19.2	
3. Time:			
4. Time:			

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0637	81.8	24.74
2. Time: 1309	81.9	24.76
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: MWL		Project No.: 146422.10.11.01		
Calibration done by: R Lynch		Date: 10/21/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	.1	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time 0755	.15	20.1	99.6	798
2. Time 1120	.13	20.2	99.9	796
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: MWL	SNL/NM Project No.: 146422.10.11.08
Calibrations done by: R Lynch	Date: 10/29/14

Make & Model: YSI EXO1

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101166

YSI 650 MDS (S/N): NA

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.00

Reference value	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0701	4.01	18.1	7.00	18.1	10.00	18.1
2. Time: 1051	4.00	18.3	7.00	18.3	10.00	18.3
3. Time:						
4. Time:						
Standard lot no.:	4AE330		4AE635		4AD984	
Expiration date:	5/16		5/16		4/16	

SC Calibration

Reference Value: 1225 uS Standard Lot No.: 4AE659

	Value	Temp	Expiration Date: 5/15
1. Time: 0659	1225.1	18.2	
2. Time: 1050	1224	18.4	
3. Time:			
4. Time:			

ORP Calibration

Reference Value: 220 mV Standard Lot No. 4AE189

	Value	Temp	Expiration Date 2/15
1. Time: 0703	219.8	17.9	
2. Time: 1053	220.1	18.4	
3. Time:			
4. Time:			

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0658	82.1	24.55
2. Time: 1049	82.2	24.57
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: MWL		Project No.: 146422.10.11.08		
Calibration done by: R Lynch		Date: 10/29/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 14060C033238		
Reference Value	.1	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time 0815	.13	20.1	99.7	799
2. Time 1021	.11	20.2	102	796
3. Time				
4. Time				

Comments:

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL-GWM	**Monitoring Well ID # :** RL 10-16-14 ~~MWL-BW3~~ BW2	**Date:** 10-16-14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 210269
Personnel Performing Decontamination: Alfred Santillanes (Print Name:) (Initial:) Robert Lynch (Print Name:) RL (Initial:)	**Personnel Performing Decontamination:** Alfred Santillanes (Print Name:) (Initial:) Robert Lynch (Print Name:) RL (Initial:)

Condition of Equipment

Pump: Excellent **Tubing Bundle:** Excellent **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	**HNO_3**
Source: Culligan	**Grade:** Reagent
Lot Number: 09-17-14	**UN #:** 2031
	Manufacturer: AROC
	Lot Number: A0316863

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL-GWM	**Monitoring Well ID # :** MWL-MW7	**Date:** 10-17-14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 210269
Personnel Performing Decontamination: William Gibson (Print Name:) Initial: WJG Robert Lynch (Print Name:) Initial: RL	**Personnel Performing Decontamination:** William Gibson (Print Name:) Initial: WJG Robert Lynch (Print Name:) Initial: RL

Condition of Equipment

Pump: Excellent **Tubing Bundle:** Excellent **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	HNO_3
Source: Culligan	**Grade:** Reagent
Lot Number: 10-15-14	**UN #:** 2031
	Manufacturer: AROC
	Lot Number: A0316863

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL-GWM	**Monitoring Well ID # :** MWL-MW9	**Date:** 10-20-14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 210269

Personnel Performing Decontamination:		**Personnel Performing Decontamination:**	
William Gibson Print Name:	Initial:	William Gibson Print Name:	Initial:
Alfred Santillanes Print Name:	Initial:	Alfred Santillanes Print Name:	Initial:

Condition of Equipment

Pump: Excellent **Tubing Bundle:** Excellent **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	**HNO_3**
Source: Culligan	**Grade:** Reagent
Lot Number: 10-15-14	**UN #:** 2031
	Manufacturer: AROC
	Lot Number: A0316863

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL-GWM	**Monitoring Well ID # :** MWL-MW8	**Date:** 10-21-14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 210269
Personnel Performing Decontamination: Robert Lynch (Print Name:) RL (Initial:) Alfred Santillanes (Print Name:) (Initial:)	**Personnel Performing Decontamination:** Robert Lynch (Print Name:) RL (Initial:) Alfred Santillanes (Print Name:) (Initial:)

Condition of Equipment

Pump: Excellent **Tubing Bundle:** Excellent **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	**HNO_3**
Source: Culligan	**Grade:** Reagent
Lot Number: 10-15-14	**UN #:** 2031
	Manufacturer: AROC
	Lot Number: A0316863

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL GWM	**Monitoring Well ID # :** MWL-MW7	**Date:** 10-28-14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 62187

Personnel Performing Decontamination:		**Personnel Performing Decontamination:**	
Robert Lynch Print Name:	RL Initial:	Print Name:	Initial:
Print Name:	Initial:	Print Name:	Initial:

Condition of Equipment

Pump: New **Tubing Bundle:** New **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	**HNO_3**
Source: Culligan	**Grade:** Reagent
Lot Number: 101514	**UN #:** 2031
	Manufacturer: AROC
	Lot Number: A0305629

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: MWL GWM	**Monitoring Well ID #:** MWL-MW7	**Date:** 10-29-14

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: 1806-814	**Water Level Indicator ID #:** 62187
Personnel Performing Decontamination: Robert Lynch (Print Name:) RL (Initial:) Tim Jackson (Print Name:) TJ (Initial:)	**Personnel Performing Decontamination:** Robert Lynch (Print Name:) RL (Initial:) Tim Jackson (Print Name:) TJ (Initial:)

Condition of Equipment

Pump: New **Tubing Bundle:** New **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	HNO_3
Source: Culligan	**Grade:** Reagent
Lot Number: 101514	**UN #:** 2031
	Manufacturer: AROC
	Lot Number: A0305629

SUMMARY SHEET FOR

OCTOBER 2014 GROUNDWATER SAMPLES

Sample Summary for October 2014 MWL Groundwater Monitoring

Well ID	*Sample Date*	*ARCOC*	*Sample Number*	*Sample Type*	*Associated Equipment Blank (ARCOC #/Sample #)*	*Associated Trip Blank (ARCOC # / Sample #)*	*Associated Field Blank (ARCOC # / Sample #)*	*Comments*
GEL Analytical Data: Project Task # 146422.10.11.08, Service Order # CF01-15								
MWL-BW2	16-Oct-14	615825	096697	Environmental	NA	615825 / 096698	615825 / 096696	
MWL-MW7	17-Oct-14	615827	096703	Environmental	615826 / 096700	615827 / 096705	615827 / 096702	
MWL-MW7	17-Oct-14	615827	096704	Duplicate	615826 / 096700	615827 / 096705	615827 / 096702	
MWL-MW7	29-Oct-14	615890	096857	Environmental	615889 / 096856	NA	NA	resample for radon only
MWL-MW7	29-Oct-14	615890	096858	Duplicate	615889 / 096856	NA	NA	resample for radon only
MWL-MW8	21-Oct-14	615829	096710	Environmental	NA	615829 / 096711	615829 / 096709	
MWL-MW9	20-Oct-14	615828	096707	Environmental	NA	615828 / 096708	615828 / 096706	
MWL-EB1	16-Oct-14	615826	096700	Equipment Blank	NA	615826 / 096701	NA	Equipment blank sample prior to MWL-MW7.
MWL-EB2	28-Oct-14	615889	096856	Equipment Blank	NA	NA	NA	Equipment blank sample prior to MWL-MW7 resample.
MWL-FB1	16-Oct-14	615825	096696	Field Blank	NA	615825 / 096698	NA	at MWL-BW2
MWL-FB2	16-Oct-14	615826	096699	Field QC	NA	615826 / 096701	NA	DI Water Source
MWL-FB3	17-Oct-14	615827	096702	Field Blank	NA	615827 / 096705	NA	at MWL-MW7
MWL-FB4	20-Oct-14	615828	096706	Field Blank	NA	615828 / 096708	NA	at MWL-MW9
MWL-FB5	21-Oct-14	615829	096709	Field Blank	NA	615829 / 096711	NA	at MWL-MW8

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

GROUNDWATER MONITORING

OCTOBER 2014

AR/COC NUMBER 615825

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum - Revised

Date: December 2, 2014

To: File

From: Monica Dymerski

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615825
SDG: 359291
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The ICAL %RSD was >40% but ≤60%, the ICV %D was >20% but ≤40% with negative bias, and the CCV %D was >40% but ≤60% with negative bias for methylene chloride. The associated sample results were non-detects and will be **qualified UJ,I3,C3.**
2. The ICAL %RSD was >15% but ≤40%, and the ICV %D was >20% but ≤40% with negative bias for bromomethane. The associated sample results were non-detects and will be **qualified UJ,I3,C3.**
3. The ICAL intercept was negative with absolute value > the MDL but ≤3X the MDL for dibromochloromethane. The associated result for samples -002 and -008 were non-detects and will be **qualified UJ,I5.**
4. The MS and MSD %Rs were < the lower acceptance limit but ≥10% for methylene chloride. The associated sample results were non-detects and will be **qualified UJ,MS3.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the Summary section and as follows.

The ICAL intercept was negative with absolute value > the MDL but ≤3X the MDL for dibromochloromethane. The associated result for sample -001 was a detect >3X the absolute value of the intercept and will not be qualified.

The ICAL %RSD was >15% and ≤40% for bromoform. The associated sample results were non-detects and, since no second calibration infraction occurred for that analyte, will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Acetone, bromodichloromethane, and dibromochloromethane were detected at concentrations < the PQL and chloroform at a concentration > the PQL in FB sample -001, associated with sample -002. The associated sample results were non-detects and will not be qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met except as noted above in the Summary section.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met except as follows. The %R was < the lower acceptance limit but ≥10% for methylene chloride. One LCS recovery is allowed to fall outside acceptance criteria since 36 analytes were reported. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

One TB was submitted with the ARCOC. An FB was submitted with the ARCOC, associated with the field sample.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 11/24/14

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: November 24, 2014

To: File

From: Monica Dymerski

Subject: Inorganic Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615825
SDG: 359291
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

One unfiltered sample was prepared and analyzed with approved procedures using method EPA 6020 (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The sample was prepared and analyzed within the prescribed holding times and was properly preserved.

ICP-MS Instrument Tune

The ICP-MS tunes met QC acceptance criteria.

Calibration

All initial and continuing calibration criteria met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries associated with the samples met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks except as follows. U was detected in the ICB and CCB at < the PQL. The associated sample result was a detect >5X the greatest ICB/CCB concentration and will not be qualified.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria. The MS analysis was performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria. The replicate analysis was performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

The LCS met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The sample was not diluted.

ICP Interference Check Sample (ICS A and AB)

Results of the ICS A and AB analyses were not evaluated because the sample concentration of Ca, Mg, Al and Fe were < that in the ICS solution.

ICP Serial Dilution

The serial dilutions met all QC acceptance criteria. The serial dilution analysis was performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 11/24/14

ANALYTICAL QUALITY ASSOCIATES, INC.

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1-888-678-5447
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Memorandum

Date: November 24, 2014

To: File

From: Monica Dymerski

Subject: Radiochemical Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615825
SDG: 359291
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

One sample was prepared and analyzed with approved procedures using methods EPA 901.1 (gamma spec – short list), EPA 900.0 (gross alpha/beta), EPA 906.0 (tritium), and SM 7500 Rn B (Radon-222 by Liquid Scintillation). Problems were identified with the data package that resulted in the qualification of data.

Gamma Spec:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**
2. The K-40 result was > the MDA but ≤3X the MDA and will be **qualified J,FR7.**

Tritium:

1. The sample result was either < the associated 2-sigma TPU or < the associated MDA and will be **qualified BD,FR3.**

Gross Alpha/Beta:

1. The relative dilution factor between the parent sample and the gross alpha/beta MS/MSD QC samples was >5 and, as a result, the MS/MSD analyses were not used to evaluate gross alpha and gross beta sample data. The associated sample results will be **qualified J,MS1.**

Holding Times and Preservation

The sample fractions were prepared and analyzed within the prescribed holding times and were properly preserved.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Tracers and /or carriers are not required for the methods used.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD met all QC acceptance criteria except as noted above in the Summary section.

Gross alpha/beta and radon-222:
It should be noted that the MS/MSD was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Gamma spec, gross alpha/beta and radon-222:
It should be noted that the replicate was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

The samples were not diluted. All required detection limits were met.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 11/24/14

Sample Findings Summary

AR/COC: 615825

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	096697-034/MWL-BW2	ALPHA (12587-46-1)	J, MS1
	096697-034/MWL-BW2	BETA (12587-47-2)	J, MS1
EPA 901.1			
	096697-033/MWL-BW2	Americium-241 (14596-10-2)	BD, FR3
	096697-033/MWL-BW2	Cesium-137 (10045-97-3)	BD, FR3
	096697-033/MWL-BW2	Cobalt-60 (10198-40-0)	BD, FR3
	096697-033/MWL-BW2	Potassium-40 (13966-00-2)	J, FR7
EPA 906.0 Modified			
	096697-036/MWL-BW2	Tritium (10028-17-8)	BD, FR3
SW846 8260B DOE-AL			
	096696-001/MWL-FB1	Bromomethane (74-83-9)	UJ, I3,C3
	096696-001/MWL-FB1	Methylene chloride (75-09-2)	UJ, I3,C3,MS3
	096697-001/MWL-BW2	Bromomethane (74-83-9)	UJ, I3,C3
	096697-001/MWL-BW2	Dibromochloromethane (124-48-1)	UJ, I5
	096697-001/MWL-BW2	Methylene chloride (75-09-2)	UJ, I3,C3,MS3
	096698-001/MWL-TB1	Bromomethane (74-83-9)	UJ, I3,C3
	096698-001/MWL-TB1	Dibromochloromethane (124-48-1)	UJ, I5
	096698-001/MWL-TB1	Methylene chloride (75-09-2)	UJ, I3,C3,MS3

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615825 | Site/Project: MWL GWM/SVM | Validation Date: 11/24/2014

SDG #: 359291 | Laboratory: GEL Laboratories LLC | Validator: Monica Dymerski

Matrix: Aqueous | # of Samples: 8 | CVR present: Yes | Analysis Type: X Organic X Metals

AR/COC(s) present: Yes | Sample Container Integrity: OK | X Rad Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments: Samples collected 10/16/2014.

Revised 7/2007

Validated By: _____ Monica L Dymerski

Organic Worksheet (GC/MS) - Revised

AR/COC #: 615825 SDG #:359291 Matrix: Aqueous

Laboratory Sample IDs: 359291001, -002, and -008

Method/Batch #s: 8260B: **1431851** Tuning (pass/fail): pass TICs Required? (yes/no) no

Analyte (outliers)	Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/ MSD RPD	FB1 -001	5X (10X) FB1				
	Int.	RF	RSD/ R^2	CCV (ICV) %D												
acetone	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	3.63J	(36.3)				
bromodichloromethane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.460J	2.30				
chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	4.65	23.25				
dibromochloromethane	-0.325	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.990J	4.95				
methylene chloride	NA	✓	50.2	(-32.4)/ -40.6	✓	NA	66.2	66.1	65.6	✓	✓	NA				
bromomethane	NA	✓	27.9	(-22.5)	✓	NA	✓	✓	✓	✓	✓	NA				
bromoform	NA	✓	23.0	✓	✓	NA	✓	✓	✓	✓	✓	NA				

Surrogate Recovery Outliers

Sample ID									
None									

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT			Area	RT
None														

Comments: HTs OK, ICAL VOAA 10/28/14. Samples analyzed on 10/30/14. MS/MSD performed on -002

Inorganic Metals Worksheet

AR/COC #: 615825 SDG #: 359291 Matrix: Aqueous

Laboratory Sample IDs: 359291003

Method/Batch #s: **3005A/6020** (ICP-MS): 1429071(prep)/1429072

ICPMS Mass Cal (pass/fail) pass ICPMS Resolution (pass/fail) pass

Analyte (outliers)	Calibration						Method Blank	5X Blank or 5X MDL	LCS %R	MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL	CRA/ CRI %R					
	Int.	R^2	ICV	CCV	ICB	CCB														
U	✓	✓	✓	✓	0.077J	0.07J	✓	0.385	✓	✓	✓	✓	NA	NA	✓					

IS Outliers *60-125%*				IS Outliers *80-120%*			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None				None			

Comments: HTs OK. Matrix QC: performed on an SNL sample from another SDG.

Radiochemistry Worksheet

AR/COC #: 615825 SDG #: 359291 Matrix: Aqueous

Laboratory Sample IDs: 359291- See below

Method/Batch #s: EPA 901.1 (gamma spec): Batch 1428944 Sample -004

Method/Batch #s: EPA 900.0 (Gross alpha/beta): Batch 1433145 Sample -005

Method/Batch #s: EPA 906.0 (Tritium): Batch 1432902 Sample -006

Method/Batch #s: SM 7500 Rn B (Radon): Batch 1428735 Sample -007

Analyte (outliers)	**Control Freq.**	**Control Eval.**	**Method Blank**	**5X Blank or 5X MDC**	**LCS %R**	**MS %R**	**MSD %R**	**MS/ MSD RER**	**Lab Rep. RER**	**EB**			
None													

Tracer/Carrier Recovery Outliers

Sample ID	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**
None								

Comments: **Matrix QC: 901.1, 900.0, and SM 7500 Rn B:** Performed on SNL samples from other SDGs. **906.0:** Performed on sample -006.

Gross alpha/beta parent and DUP = 150 ml, MS/MSD=25 ml (6X dilution)-results qualified.

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615825

Project Name:	MWL GWM/SVM	Date Samples Shipped:	10/16/14	SMO Authorization:	
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	225032	SMO Contact Phone:	SMO
Project/Task Number:	146422.10.11 ~~.0108~~	Lab Contact:	Edie Kent/803-556-8171		Lorraine Herrera/505-844-3199
Service Order:	CF01-15 EDW 10/21/14	Lab Destination:	GEL	Send Report to SMO:	
		Contract No.:	PO 1303873		Rita Kavanaugh/505-284-2553
Tech Area:					
Building:	Room:	Operational Site:			

☐ Waste Characterization
☐ RMMA
☐ Released by COC No.
☑ 4° Celsius

Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 35929

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096696	-001	MWL-FB1	NA	10/16/14 10:39	DIW	G	3x40 ml	HCL	G	FB	VOC (LTMMP List) (SW846-8260B)	001
096697	-001	MWL-BW2	496	10/16/14 10:39	GW	G	3x40 ml	HCL	G	SA	VOC (LTMMP List) (SW846-8260B)	002
096697	-010	MWL-BW2	496	10/16/14 10:40	GW	P	500 ml	HNO3	G	SA	Metals (Cd,Cr,Ni,U)(SW846-6020)	003
096697	-033	MWL-BW2	496	10/16/14 10:41	GW	P	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	004
096697	-034	MWL-BW2	496	10/16/14 10:42	GW	P	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	005
096697	-036	MWL-BW2	496	10/16/14 10:43	GW	AG	250 ml	None	G	SA	Tritium (EPA 906.0)	006
096697	-037	MWL-BW2	496	10/16/14 10:44	GW	AG	2x40 ml	None	G	SA	Radon (SM 7500 Rn B)	007
096698	-001	MWL-TB1	NA	10/16/14 10:39	DIW	G	3x40 ml	HCL	G	TB	VOC (LTMMP List) (SW846-8260B)	008

Last Chain:	☐ Yes	**Sample Tracking**	**SMO Use**
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD ☑ Yes ☐ No

Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day

Negotiated TAT ☐

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
Report specific list of VOCs (LTMMP list provided by SNL/NM SMO).
Report short list isotopes for Gamma Spectroscopy.

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William J Gibson	WJG	SNL/4142/505-284-3307/505-239-7367

1. Relinquished by	Alfred Santillanes	Org.	4142	Date	10/16/14	Time	1105	3. Relinquished by	Org. Date Time
1. Received by	SMO	Org.	4142	Date	10/16/14	Time	1105	3. Received by	Org. Date Time
2. Relinquished by	SMO	Org.	4142	Date	10/16/14	Time	1140	4. Relinquished by	Org. Date Time
2. Received by		Org.	COC	Date	10-17-14	Time	0745	4. Received by	Org. Date Time

*Prior confirmation with SMO required for 7 and 15 day TAT

AR/COC NUMBER 615826

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: December 1, 2014

To: File

From: Monica Dymerski

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615826
SDG: 359857
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The ICAL %RSD was >40% but ≤60%, the ICV %D was >20% but ≤40% with negative bias, and the CCV %D was >40% but ≤60% with negative bias for methylene chloride. The associated sample results were non-detects and will be **qualified UJ,I3,C3.**
2. The ICAL %RSD was >15% but ≤40%, and the ICV %D was >20% but ≤40% with negative bias for bromomethane. The associated sample results were non-detects and will be **qualified UJ,I3,C3.**
3. The ICAL intercept was negative with absolute value > the MDL but ≤3X the MDL for dibromochloromethane. The associated result for sample -008 was a non-detect and will be **qualified UJ,I5.**
4. The MS and MSD %Rs were < the lower acceptance limit but ≥10% for methylene chloride. The associated sample results were non-detects and will be **qualified UJ,MS3.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the Summary section and as follows.

The ICAL intercept was negative with absolute value > the MDL but ≤3X the MDL for dibromochloromethane. The associated results for samples -001 and -002 were detects >3X the absolute value of the intercept and will not be qualified.

The ICAL %RSD was >15% and ≤40% for bromoform. The associated sample results were non-detects and, since no second calibration infraction occurred for that analyte, will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Chloroform and dibromochloromethane were detected at concentrations > the PQL, and acetone and bromodichloromethane were detected at < the PQL in FB sample -001, which was not associated with any samples.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met except as noted above in the Summary section. The MS/MSD analyses were performed on an SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met except as follows. The %R was < the lower acceptance limit but ≥10% for methylene chloride. One LCS recovery is allowed to fall outside acceptance criteria since 36 analytes were reported. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

One TB was submitted with the ARCOC. An FB was submitted with the ARCOC which was not associated with any field samples. The sample is an EB associated with ARCOC 615827.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 12/02/14

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: December 1, 2014

To: File

From: Monica Dymerski

Subject: Inorganic Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615826
SDG: 359857
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

One unfiltered sample was prepared and analyzed with approved procedures using method EPA 6020 (ICP-MS). Data were reported for all required analytes. Problems were identified with the data package that resulted in the qualification of data.

1. The parent sample concentration was >50X the MDL and the serial dilution %D was >10% for U. The associated sample result was a non-detect and will be **qualified UJ,D1.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The sample was prepared and analyzed within the prescribed holding times and was properly preserved.

ICP-MS Instrument Tune

The ICP-MS tunes met QC acceptance criteria.

Calibration

All initial and continuing calibration criteria met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries associated with the samples met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks except as follows. Cd was detected in the MB at < the PQL, and U was detected in the ICB at < the PQL. The associated sample results were non-detects and will not be qualified.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria. The MS analyses were performed on an SNL samples from other SDGs. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria. The replicate analyses were performed on SNL samples from other SDGs. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

The LCS met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The sample was not diluted.

ICP Interference Check Sample (ICS A and AB)

Results of the ICS A and AB analyses were not evaluated because the sample concentration of Ca, Mg, Al and Fe were < that in the ICS solution.

ICP Serial Dilution

The serial dilutions met all QC acceptance criteria except as noted above in the Summary section. The serial dilution analyses were performed on SNL samples from other SDGs. No sample data will be qualified as a result.

Other QC

The sample is an EB associated with ARCOC 615827.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 12/02/14

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
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Memorandum

Date: December 1, 2014

To: File

From: Monica Dymerski

Subject: Radiochemical Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615826
SDG: 359857
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

One sample was prepared and analyzed with approved procedures using methods EPA 901.1 (gamma spec – short list), EPA 900.0 (gross alpha/beta), and EPA 906.0 (tritium). Method SM 7500 Rn B (Radon-222 by Liquid Scintillation) was listed on the COC but was canceled by the client prior to laboratory receipt. Problems were identified with the data package that resulted in the qualification of data.

Gamma Spec and tritium:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**

Gross Alpha/Beta:

1. The relative dilution factor between the parent sample and the gross alpha/beta MS/MSD QC samples was >5 and, as a result, the MS/MSD analyses were not used to evaluate gross alpha and gross beta sample data. The associated sample results will be **qualified J,MS1.**
2. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**

Holding Times and Preservation

The sample fractions were prepared and analyzed within the prescribed holding times and were properly preserved.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Tracers and /or carriers are not required for the methods used.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD met all QC acceptance criteria except as noted above in the Summary section.

Gross alpha/beta and tritium:
It should be noted that the MS/MSD was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Gross alpha/beta and tritium:
It should be noted that the replicate was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

The samples were not diluted. All required detection limits were met.

Other QC

The sample is an EB associated with ARCOC 615827.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 12/02/14

Sample Findings Summary

AR/COC: 615826

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	096700-034/MWL-EB1	ALPHA (12587-46-1)	BD, FR3,MS1
	096700-034/MWL-EB1	BETA (12587-47-2)	BD, FR3,MS1
EPA 901.1			
	096700-033/MWL-EB1	Americium-241 (14596-10-2)	BD, FR3
	096700-033/MWL-EB1	Cesium-137 (10045-97-3)	BD, FR3
	096700-033/MWL-EB1	Cobalt-60 (10198-40-0)	BD, FR3
	096700-033/MWL-EB1	Potassium-40 (13966-00-2)	BD, FR3
EPA 906.0 Modified			
	096700-036/MWL-EB1	Tritium (10028-17-8)	BD, FR3
SW846 3005/6020 DOE-AL			
	096700-010/MWL-EB1	Uranium (U)	UJ, D1
SW846 8260B DOE-AL			
	096699-001/MWL-FB2	Bromomethane (74-83-9)	UJ, I3,C3
	096699-001/MWL-FB2	Methylene chloride (75-09-2)	UJ, I3,C3,MS3
	096700-001/MWL-EB1	Bromomethane (74-83-9)	UJ, I3,C3
	096700-001/MWL-EB1	Methylene chloride (75-09-2)	UJ, I3,C3,MS3
	096701-001/MWL-TB2	Bromomethane (74-83-9)	UJ, I3,C3
	096701-001/MWL-TB2	Dibromochloromethane (124-48-1)	UJ, I5
	096701-001/MWL-TB2	Methylene chloride (75-09-2)	UJ, I3,C3,MS3

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615826 | Site/Project: MWL GWM/SVM | Validation Date: 12/01/2014

SDG #: 359857 | Laboratory: GEL Laboratories LLC | Validator: Monica Dymerski

Matrix: Aqueous | # of Samples: 7 | CVR present: Yes | Analysis Type: X Organic X Metals

AR/COC(s) present: Yes | Sample Container Integrity: OK | X Rad Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments: Sample collected 10/16/2014. Sample is equipment blank associated with MWL-MW7 from ARCOC 615827. Rn-222 analysis was cancelled prior to laboratory receipt.

Revised 7/2007

Validated By: Monica L Dymerski

Organic Worksheet (GC/MS)

AR/COC #: 615826 SDG #:359857 Matrix: Aqueous

Laboratory Sample IDs: 359001, -002, and -008

Method/Batch #s: 8260B: **1431851** Tuning (pass/fail): pass TICs Required? (yes/no) no

Analyte (outliers)	Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/ MSD RPD	FB1 -001	5X (10X) FB1				
	Int.	RF	RSD/ R^2	CCV (ICV) %D												
acetone	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	3.52J	(35.2)				
bromodichloromethane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.620J	3.1				
chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	4.68	23.4				
dibromochloromethane	-0.325	✓	✓	✓	✓	NA	✓	✓	✓	✓	1.05	5.25				
methylene chloride	✓	✓	50.2	(-32.4)/ -40.6	✓	NA	66.2	66.1	65.6	✓	✓	NA				
bromomethane	NA	✓	27.9	(-22.5)	✓	NA	✓	✓	✓	✓	✓	NA				
bromoform	NA	✓	23.0	✓	✓	NA	✓	✓	✓	✓	✓	NA				

Surrogate Recovery Outliers

Sample ID									
None									

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT			Area	RT
None														

Comments: HTs OK, ICAL VOAA 10/28/14. Samples analyzed on 10/30/14. MS/MSD performed on an SNL sample from another SDG.

Inorganic Metals Worksheet

AR/COC #: 615826 SDG #: 359857 Matrix: Aqueous

Laboratory Sample IDs: 359857003

Method/Batch #s: **3005A/6020** (ICP-MS): 1430900(prep)/1430903

ICPMS Mass Cal (pass/fail) pass ICPMS Resolution (pass/fail) pass

Analyte (outliers)	Calibration						Method Blank	5X Blank or 5X MDL	LCS %R	MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL	CRA/ CRI %R					
	Int.	R^2	ICV	CCV	ICB	CCB														
U	✓	✓	✓	✓	0.072J	✓	✓	0.36	✓	✓	✓	10.6	NA	NA	✓					
Cd	✓	✓	✓	✓	✓	✓	0.000146	0.00073	✓	✓	✓	✓	NA	NA	✓					

IS Outliers *60-125%*				IS Outliers *80-120%*			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None				None			

Comments: HT OK. Matrix QC: performed on SNL samples from other SDGs.

Radiochemistry Worksheet

AR/COC #: 615826 SDG #: 359857 Matrix: Aqueous

Laboratory Sample IDs: 359857- See below

Method/Batch #s: EPA 901.1 (gamma spec): Batch 1431643 Sample -004

Method/Batch #s: EPA 900.0 (Gross alpha/beta): Batch 1433145 Sample -005

Method/Batch #s: EPA 906.0 (Tritium): Batch 1432902 Sample -006

Analyte (outliers)	**Control Freq.**	**Control Eval.**	**Method Blank**	**5X Blank or 5X MDC**	**LCS %R**	**MS %R**	**MSD %R**	**MS/ MSD RER**	**Lab Rep. RER**	**EB**			
None													

Tracer/Carrier Recovery Outliers

Sample ID	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**
None								

Comments: **Matrix QC: 900.0 and -906.0:** Performed on SNL samples from other SDGs. **901.1:** Performed on sample -004.

Gross alpha/beta parent and DUP = 150 ml. MS/MSD=25 ml (6X dilution)-results qualified.

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 615826

Project Name:	MWL GWM/SVM	Date Samples Shipped:	10/23/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	225502	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.01.08	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-15	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 1303873	Rita Kavanaugh/505-284-2553	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 359857
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096699	-001	MWL-FB2	NA	10/16/14 13:03	DIW	G	3x40 ml	HCL	G	FB	VOC (LTMMP List) (SW846-8260B)	001
096700	-001	MWL-EB1	NA	10/16/14 13:03	DIW	G	3x40 ml	HCL	G	EB	VOC (LTMMP List) (SW846-8260B)	002
096700	-010	MWL-EB1	NA	10/16/14 13:04	DIW	P	500 ml	HNO3	G	EB	Metals (Cd,Cr,Ni,U)(SW846-6020)	003
096700	-033	MWL-EB1	NA	10/16/14 13:05	DIW	P	1 L	HNO3	G	EB	Gamma Spectroscopy (EPA 901.0)	004
096700	-034	MWL-EB1	NA	10/16/14 13:06	DIW	P	1 L	HNO3	G	EB	Gross Alpha and Beta (EPA 900.0)	005
096700	-036	MWL-EB1	NA	10/16/14 13:07	DIW	AG	250 ml	None	G	EB	Tritium (EPA 906.0)	006
096700	-037	MWL-EB1	NA	10/16/14 13:08	DIW	AG	2x40 ml	None	G	EB	Radon (SM 7500 Rn B)	007
096701	-001	MWL-TB2	NA	10/16/14 13:03	DIW	G	3x40 ml	HCL	G	TB	VOC (LTMMP List) (SW846-8260B)	008

Last Chain:	☐ Yes	**Sample Tracking**	**SMO Use**
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD	☑ Yes	☐ No		
Turnaround Time	☐ 7 Day*	☐ 15 Day*	☑ 30 Day	
Negotiated TAT	☐			
Sample Disposal	☐ Return to Client	☑ Disposal by Lab		
Return Samples By:				

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
Report specific list of VOCs (LTMMP list provided by SNL/NM SMO).
Report short list isotopes for Gamma Spectroscopy.

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William Gibson	WJG	SNL/4142/505-284-3307/505-239-7367

1. Relinquished by	Alfred Santillanes	Org. 4142	Date 10/23/14	Time 11:33	3. Relinquished by		Org.	Date	Time
1. Received by	Don Solomon	Org. 4142	Date 10/23/14	Time 1433	3. Received by		Org.	Date	Time
2. Relinquished by	Don Solomon	Org. 4142	Date 10/23/14	Time 1200	4. Relinquished by		Org.	Date	Time
2. Received by	[illegible]	Org. GEL	Date 10-24-14	Time 0840	4. Received by		Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

AR/COC NUMBER 615827

AR/COC NUMBERS 615828, 615829

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: December 2, 2014

To: File

From: Monica Dymerski

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615828 and 615829
SDG: 359428
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 4.

Summary

Six samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The ICAL %RSD was >40% but ≤60%, the ICV and CCV associated with all samples *except* -010 %Ds were >20% but ≤40% with negative bias, and the CCV associated with sample -010 %D was >40% but ≤60% with negative bias for methylene chloride. All associated sample results were non-detects and will be **qualified UJ,I3,C3.**
2. The ICAL %RSD was >15% but ≤40%, and the ICV %D was >20% but ≤40% with negative bias for bromomethane. The associated sample results were non-detects and will be **qualified UJ,I3,C3.**
3. The ICAL intercept was negative with absolute value > the MDL but ≤3X the MDL for dibromochloromethane. The associated results for samples -002, -008, -010, and -016 were non-detects and will be **qualified UJ,I5.**
4. The MS and MSD %Rs were < the lower acceptance limit but ≥10% for methylene chloride. The associated sample results were non-detects and will be **qualified UJ,MS3.**

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times

The samples were analyzed within the prescribed holding time and were properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the Summary section and as follows.

The ICAL intercept was negative with absolute value and > the MDL but ≤3X the MDL for dibromochloromethane. The associated results for samples -001 and -009 were detects >3X the absolute value of the intercept and will not be qualified.

The ICAL %RSD was >15% and ≤40% for bromoform. The associated sample results were non-detects and, since no second calibration infraction occurred for that analyte, will not be qualified.

The %Ds were >20% with positive bias for dichlorodifluoromethane in CCVs associated with all samples, and for acetone in the CCV associated with all samples *except* -010. The associated sample results were non-detects and will not be qualified.

Blanks

No target analytes were detected in the blanks except as follows. Bromodichloromethane, chloroform, and dibromochloromethane were detected at concentrations > the PQL in FB sample -001, associated with sample -002, and in FB sample -009, associated with sample -010. The associated sample results were non-detects and will not be qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met except as noted above in the Summary section..

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met except as follows. The %Rs were < the lower acceptance limit but ≥10% for methylene chloride for LCSs associated with all samples. One recovery per LCS is allowed to fall outside acceptance criteria since 36 analytes were reported. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Two trip blanks were submitted, one for each ARCOC. Two FBs were submitted with the ARCOC, one for each ARCOC.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 12/03/14

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: December 2, 2014

To: File

From: Monica Dymerski

Subject: Inorganic Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615828 and 615829
SDG: 359428
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: Metals

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Two unfiltered samples were prepared and analyzed with approved procedures using method EPA 6020 (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and were properly preserved.

ICP-MS Instrument Tune

The ICP-MS tunes met QC acceptance criteria.

Calibration

All initial and continuing calibration criteria met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries associated with the samples met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks except as follows. U was detected in a bracketing CCB at < the PQL. The associated sample results were detects >5X the ICB concentration and will not be qualified.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

ICP Interference Check Sample (ICS A and AB)

Results of the ICS A and AB analyses were not evaluated because the sample concentration of Ca, Mg, Al and Fe were < that in the ICS solution.

ICP Serial Dilution

The serial dilutions met all QC acceptance criteria.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 12/03/14

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: December 2, 2014

To: File

From: Monica Dymerski

Subject: Radiochemical Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615828 and 615829
SDG: 359428
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Two samples were prepared and analyzed with approved procedures using methods EPA 901.1 (gamma spec – short list), EPA 900.0 (gross alpha/beta), EPA 906.0 (tritium), and SM 7500 Rn B (Radon-222 by Liquid Scintillation). Problems were identified with the data package that resulted in the qualification of data.

Gamma Spec:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**
2. No peaks were identified for Am-241 for sample 359428012. The sample result should be considered a non-detect at the MDA and will be **qualified BD,Z2.**

Gross Alpha/Beta:

1. The relative dilution factor between the parent sample and the gross alpha/beta MS/MSD QC samples was >5 and, as a result, the MS/MSD analyses were not used to evaluate gross alpha and gross beta sample data. The associated sample results will be **qualified J,MS1.**

Tritium:

1. All sample results which were either < the associated 2-sigma TPU or < the associated MDA will be **qualified BD,FR3.**

Radon-222:

1. The Rn-222 result for sample -015 was > the MDA but ≤3X the MDA and will be **qualified J,FR7.**

Holding Times and Preservation

The sample fractions were prepared and analyzed within the prescribed holding times and were properly preserved.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Tracers and /or carriers are not required for the methods used.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD met all QC acceptance criteria except as noted above in the Summary section.

Tritium:
It should be noted that the MS/MSD was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Tritium:
It should be noted that the replicate was performed on a sample of similar matrix from another SNL SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

The samples were not diluted. All required detection limits were met.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 12/03/14

Sample Findings Summary

AR/COC: 615828, 615829

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
EPA 900.0/SW846 9310			
	096707-034/MWL-MW9	ALPHA (12587-46-1)	J, MS1
	096707-034/MWL-MW9	BETA (12587-47-2)	J, MS1
	096710-034/MWL-MW8	ALPHA (12587-46-1)	J, MS1
	096710-034/MWL-MW8	BETA (12587-47-2)	J, MS1
EPA 901.1			
	096707-033/MWL-MW9	Americium-241 (14596-10-2)	BD, FR3
	096707-033/MWL-MW9	Cesium-137 (10045-97-3)	BD, FR3
	096707-033/MWL-MW9	Cobalt-60 (10198-40-0)	BD, FR3
	096707-033/MWL-MW9	Potassium-40 (13966-00-2)	BD, FR3
	096710-033/MWL-MW8	Americium-241 (14596-10-2)	BD, Z2
	096710-033/MWL-MW8	Cesium-137 (10045-97-3)	BD, FR3
	096710-033/MWL-MW8	Cobalt-60 (10198-40-0)	BD, FR3
	096710-033/MWL-MW8	Potassium-40 (13966-00-2)	BD, FR3
EPA 906.0 Modified			
	096707-036/MWL-MW9	Tritium (10028-17-8)	BD, FR3
	096710-036/MWL-MW8	Tritium (10028-17-8)	BD, FR3
SM 7500 Rn B			
	096710-037/MWL-MW8	Radon-222 (14859-67-7)	J, FR7
SW846 8260B DOE-AL			
	096706-001/MWL-FB4	Bromomethane (74-83-9)	UJ, I3,C3
	096706-001/MWL-FB4	Methylene chloride (75-09-2)	UJ, I3,C3,MS3
	096707-001/MWL-MW9	Bromomethane (74-83-9)	UJ, I3,C3
	096707-001/MWL-MW9	Dibromochloromethane (124-48-1)	UJ, I5
	096707-001/MWL-MW9	Methylene chloride (75-09-2)	UJ, I3,C3,MS3
	096708-001/MWL-TB4	Bromomethane (74-83-9)	UJ, I3,C3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	096708-001/MWL-TB4	Dibromochloromethane (124-48-1)	UJ, I5
	096708-001/MWL-TB4	Methylene chloride (75-09-2)	UJ, I3,C3,MS3
	096709-001/MWL-FB5	Bromomethane (74-83-9)	UJ, I3,C3
	096709-001/MWL-FB5	Methylene chloride (75-09-2)	UJ, I3,C3,MS3
	096710-001/MWL-MW8	Bromomethane (74-83-9)	UJ, I3,C3
	096710-001/MWL-MW8	Dibromochloromethane (124-48-1)	UJ, I5
	096710-001/MWL-MW8	Methylene chloride (75-09-2)	UJ, I3,C3,MS3
	096711-001/MWL-TB5	Bromomethane (74-83-9)	UJ, I3,C3
	096711-001/MWL-TB5	Dibromochloromethane (124-48-1)	UJ, I5
	096711-001/MWL-TB5	Methylene chloride (75-09-2)	UJ, I3,C3,MS3

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615828 and 615829 | Site/Project: MWL GWM/SVM | Validation Date: 12/02/2014

SDG #: 359428 | Laboratory: GEL Laboratories LLC | Validator: Monica Dymerski

Matrix: Aqueous | # of Samples: 16 | CVR present: Yes | Analysis Type: X Organic X Metals

AR/COC(s) present: Yes | Sample Container Integrity: OK | X Rad Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments: Samples collected 10/20 and 21/2014.

Revised 7/2007

Validated By: _____ Monica L Dymerski

Organic Worksheet (GC/MS)

AR/COC #: 615828 and 615829 SDG #:359428 Matrix: Aqueous

Laboratory Sample IDs: 359428 001, -002, -008, -009, -010, and -016

Method/Batch #s: 8260B: **1432564** Tuning (pass/fail): pass TICs Required? (yes/no) no

Analyte (outliers)	Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/ MSD RPD	FB4 -001	5X (10X) FB4	FB5 -009	5X FB5		
	Int.	RF	RSD/ R^2	CCV (ICV) %D												
bromodichloromethane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	1.23	6.15	1.30	6.5		
chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	2.90	14.5	2.99	14.95		
dibromochloromethane	-0.325	✓	✓	✓	✓	NA	✓	✓	✓	✓	1.54	7.7	1.59	7.95		
dichlorodifluoro-methane	NA	✓	✓	30.3*/ 25.7**	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA		
acetone	NA	✓	✓	23.1*	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA		
methylene chloride	✓	✓	50.2	(-32.4)/ -39.1* -42.0**	✓	NA	68/ 54.8	61.1	61.9	✓	✓	NA	✓	NA		
bromomethane	NA	✓	27.9	(-22.5)	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA		
bromoform	NA	✓	23.0	✓	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA		

Surrogate Recovery Outliers

Sample ID									
None									

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT			Area	RT
None														

Comments: HTs OK, ICAL VOAA 10/28/14. *Samples -001, -002, -008, -009, and -016 analyzed on 10/31/14. **Sample -010 analyzed on 11/3/14. MS/MSD performed on sample -002.

Inorganic Metals Worksheet

AR/COC #: 615828 and 615829 SDG #: 359428 Matrix: Aqueous

Laboratory Sample IDs: 359428003 and -011

Method/Batch #s: **3005A/6020** (ICP-MS): 1429712(prep)/1429714

ICPMS Mass Cal (pass/fail) pass ICPMS Resolution (pass/fail) pass

Analyte (outliers)	**Calibration**						**Method Blank**	**5X Blank or 5X MDL**	**LCS %R**	**MS %R**	**Lab Rep. RPD**	**Serial Dil. %D**	**ICS AB %R**	**ICS A ± MDL**	**CRA/ CRI %R**					
	Int.	**R^2**	**ICV**	**CCV**	**ICB**	**CCB**														
U	✓	✓	✓	✓	✓	0.14 8J	✓	0.740	✓	✓	✓	✓	NA	NA	✓					

IS Outliers *60-125%*				**IS Outliers *80-120%***			
Sample ID	**%Recovery**	**%Recovery**	**%Recovery**	**CCV/CCB ID**	**%Recovery**	**%Recovery**	**%Recovery**
None				None			

Comments: HTs OK. Matrix QC: performed on sample -003.

Radiochemistry Worksheet

AR/COC #: 615828 and 615829 SDG #: 359428 Matrix: Aqueous

Laboratory Sample IDs: 359428- See below

Method/Batch #s: EPA 901.1 (gamma spec): Batch 1429632 Samples -004 and -012

Method/Batch #s: EPA 900.0 (Gross alpha/beta): Batch 1433145 Samples -005 and -013

Method/Batch #s: EPA 906.0 (Tritium): Batch 1432902 Samples -006 and -014

Method/Batch #s: SM 7500 Rn B (Radon): Batch 1430187 Samples -007 and -015

Analyte (outliers)	**Control Freq.**	**Control Eval.**	**Method Blank**	**5X Blank or 5X MDC**	**LCS %R**	**MS %R**	**MSD %R**	**MS/ MSD RER**	**Lab Rep. RER**	**EB (359857)**	**5X EB**		
None													

Tracer/Carrier Recovery Outliers

Sample ID	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**
None								

Comments: **Matrix QC: 901.1:** Performed on sample -004. **900.0:** Performed on sample -005. **906.0:** Performed on an SNL sample from another SDG. **SM 7500 Rn B:** Performed on sample -007.

Gross alpha/beta parent and DUP = 150 ml, MS/MSD=25 ml (6X dilution)-results qualified.

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No.

SMO Use

AR/COC 615828

Project Name:	MWL GWM	Date Samples Shipped:	10/20/14	SMO Authorization:	Don Jackson
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	223993	SMO Contact Phone:	
Project/Task Number:	146422.10.11.08	Lab Contact:	Edie Kent/803-556-8171		Lorraine Herrera/505-844-3199
Service Order:	CF01-15	Lab Destination:	GEL	Send Report to SMO:	
		Contract No.:	PO 1303873		Rita Kavanaugh/505-284-2553
Tech Area:					
Building:	Room:	Operational Site:			

☐ Waste Characterization ☐ RMMA ☐ Released by COC No. ☑ 4° Celsius

Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 359428

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096706	-001	MWL-FB4	NA	10/20/14 10:19	DIW	G	3x40 ml	HCL	G	FB	VOC (LTMMP List) (SW846-8260B)	001
096707	-001	MWL-MW9	497	10/20/14 10:19	GW	G	3x40 ml	HCL	G	SA	VOC (LTMMP List) (SW846-8260B)	002
096707	-010	MWL-MW9	497	10/20/14 10:21	GW	P	500 ml	HNO3	G	SA	Metals (Cd,Cr,Ni,U)(SW846-6020)	003
096707	-033	MWL-MW9	497	10/20/14 10:22	GW	P	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	004
096707	-034	MWL-MW9	497	10/20/14 10:24	GW	P	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	005
096707	-036	MWL-MW9	497	10/20/14 10:26	GW	AG	250 ml	None	G	SA	Tritium (EPA 906.0)	006
096707	-037	MWL-MW9	497	10/20/14 10:27	GW	AG	2x40 ml	None	G	SA	Radon (SM 7500 Rn B)	007
096708	-001	MWL-TB4	NA	10/20/14 10:19	DIW	G	3x40 ml	HCL	G	TB	VOC (LTMMP List) (SW846-8260B)	008

Last Chain: ☐ Yes
Validation Req'd: ☑ Yes
Background: ☐ Yes
Confirmatory: ☐ Yes

Sample Tracking (SMO Use)
Date Entered:
Entered by:
QC inits.:

Special Instructions/QC Requirements:
EDD ☑ Yes ☐ No
Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Negotiated TAT ☐
Sample Disposal ☐ Return to Client ☑ Disposal by Lab
Return Samples By:
Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
Report specific list of VOCs (LTMMP list provided by SNL/NM SMO).
Report short list isotopes for Gamma Spectroscopy.

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William J Gibson	WJG	SNL/4142/505-284-3307/505-239-7367

1. Relinquished by	Alfred Santillanes	Org. 4142	Date 10/20/14	Time 1053	3. Relinquished by		Org.	Date	Time
1. Received by	[signature]	Org. 4142	Date 10/20/14	Time 1053	3. Received by		Org.	Date	Time
2. Relinquished by	[signature]	Org. 4142	Date 10/20/14	Time 1130	4. Relinquished by		Org.	Date	Time
2. Received by	[signature]	Org. GEL	Date 10-21-14	Time 0740	4. Received by		Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC 615829

Project Name.	MWL GWM / SVM	Date Samples Shipped:	10/21/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	225345	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-15	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 1303873	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 359428
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096709	-001	MWL-FB5	NA	10/21/14 10:58	DIW	G	3x40 ml	HCL	G	FB	VOC (LTMMP List) (SW846-8260B)	009
096710	-001	MWL-MW8	497	10/21/14 10:58	GW	G	3x40 ml	HCL	G	SA	VOC (LTMMP List) (SW846-8260B)	010
096710	-010	MWL-MW8	497	10/21/14 11:00	GW	P	500 ml	HNO3	G	SA	Metals (Cd,Cr,Ni,U)(SW846-6020)	011
096710	-033	MWL-MW8	497	10/21/14 11:02	GW	P	1 L	HNO3	G	SA	Gamma Spectroscopy (EPA 901.0)	012
096710	-034	MWL-MW8	497	10/21/14 11:05	GW	P	1 L	HNO3	G	SA	Gross Alpha and Beta (EPA 900.0)	013
096710	-036	MWL-MW8	497	10/21/14 11:07	GW	AG	250 ml	None	G	SA	Tritium (EPA 906.0)	014
096710	-037	MWL-MW8	497	10/21/14 11:09	GW	AG	2x40 ml	None	G	SA	Radon (SM 7500 Rn B)	015
096711	-001	MWL-TB5	NA	10/21/14 10:58	DIW	G	3x40 ml	HCL	G	TB	VOC (LTMMP List) (SW846-8260B)	016

Last Chain:	☑ Yes	**Sample Tracking**	**SMO Use**
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD ☑ Yes ☐ No

Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day

Negotiated TAT ☐

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
Report specific list of VOCs (LTMMP list provided by SNL/NM SMO).
Report short list isotopes for Gamma Spectroscopy.

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William Gibson	WJG	SNL/4142/505-284-3307/505-239-7367

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 10/21/14	Time 11:30	3.Relinquished by		Org.	Date	Time
1. Received by		Org. 4142	Date 10/21/14	Time 1150	3. Received by		Org.	Date	Time
2.Relinquished by		Org. 4142	Date 10/21/14	Time 1150	4.Relinquished by		Org.	Date	Time
2. Received by		Org. CRL	Date 10-22-14	Time 0740	4. Received by		Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

AR/COC NUMBERS 615889, 615890

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: December 9, 2014

To: File

From: Monica Dymerski

Subject: Radiochemical Data Review and Validation – SNL
Site: MWL GWM/SVM
AR/COC: 615889 and 615890
SDG: 360118
Laboratory: GEL
Project/Task: 146422.10.11.08
Analysis: RAD

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 4.

Summary

Three samples were prepared and analyzed with approved procedures using method SM 7500 Rn B (Radon-222 by Liquid Scintillation). Problems were identified with the data package that resulted in the qualification of data.

1. The result for sample 360118003 was < the associated MDA and will be **qualified BD,FR3.**
2. The results for samples -001 and -002 were > the MDA but ≤3X the MDA and will be **qualified J,FR7.**

Holding Times and Preservation

The samples were prepared and analyzed within the prescribed holding times and were properly preserved.

Quantification

All quantification criteria were met except as noted above in the Summary section.

Calibration

The case narratives stated that the instruments used were properly calibrated.

Blanks

No target analytes were detected in the blanks at concentrations > the MDA and 2-sigma TPU.

Tracer/Carrier Recovery

Tracers and /or carriers are not required for the method used.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

All replicate error ratio acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

The samples were not diluted. All required detection limits were met.

Other QC

An EB was submitted with ARCOC 615889 and is associated with the samples from ARCOC 615890. A field duplicate pair was submitted with ARCOC 615890. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan **Level:** I **Date:** 12/09/14

Sample Findings Summary

AR/COC: 615889, 615890

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SM 7500 Rn B			
	096856-037/MWL-EB2	Radon-222 (14859-67-7)	BD, FR3
	096857-037/MWL-MW7	Radon-222 (14859-67-7)	J, FR7
	096858-037/MWL-MW7	Radon-222 (14859-67-7)	J, FR7

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615889 and 615890 | Site/Project: MWL GWM/SVM | Validation Date: 12/09/2014

SDG #: 360118 | Laboratory: GEL Laboratories LLC | Validator: Monica Dymerski

Matrix: Aqueous | # of Samples: 3 | CVR present: Yes | Analysis Type: Organic Metals

AR/COC(s) present: Yes | Sample Container Integrity: OK | X Rad Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments: Samples collected 10/28-29/2014.

Revised 7/2007

Validated By: _____ Monica L Dymerski

Radiochemistry Worksheet

AR/COC #: 615889 and 615890 SDG #: 360118 Matrix: Aqueous

Laboratory Sample IDs: 360118001 through -003

Method/Batch #s: SM 7500 Rn B (Radon): Batch 1432418

Analyte (outliers)	**Control Freq.**	**Control Eval.**	**Method Blank**	**5X Blank or 5X MDC**	**LCS %R**	**MS %R**	**MSD %R**	**MS/ MSD RER**	**Lab Rep. RER**	**EB -003**	**5X EB**		
None													

Tracer/Carrier Recovery Outliers

Sample ID	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**	**Sample ID**	**Tracer/Carrier**	**%R**
NA								

Comments: HTs OK. Matrix QC performed on sample -001.

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615889

Project Name:	MWL GWM/SVM	Date Samples Shipped:	10/29/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	7257514	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-15	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 1303873	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 360118
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096856	-037	MWL-EB2	NA	10/28/14 13:48	DIW	AG	2x40 ml	None	G	EB	Radon (SM 7500 Rn B)	003

Last Chain:	☐ Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd:	☑ Yes	Date Entered:		EDD ☑ Yes ☐ No	
Background:	☐ Yes	Entered by:		Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day	
Confirmatory:	☐ Yes	QC inits.:		Negotiated TAT ☐	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367
	Tim Jackson	Tim Jackson	TJ	SNL/4142/505-284-2547/505-263-6639

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Lab Use

1.Relinquished by	Tim Jackson	Org. 4142	Date 10/29/14	Time 1048	3.Relinquished by		Org.	Date	Time
1. Received by	GWD	Org. 4142	Date 10/29/14	Time 1048	3. Received by		Org.	Date	Time
2.Relinquished by		Org. 4142	Date 10/29/14	Time 1200	4.Relinquished by		Org.	Date	Time
2. Received by		Org. CEL	Date 10-30-14	Time 0735	4. Received by		Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012)

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

AOP 95-16

Internal Lab

Batch No. N/A

SMO Use

AR/COC 615890

Project Name:	MWL GWM/SVM	Date Samples Shipped:	10/29/14	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.	225754	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.08	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF01-15	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 1303873	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 360118
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
096857	-037	MWL-MW7	496	10/29/14 1014	GW	AG	2x40 ml	None	G	SA	Radon (SM 7500 Rn B)	001
096858	-037	MWL-MW7	496	10/29/14 1015	GW	AG	2x40 ml	None	G	DU	Radon (SM 7500 Rn B)	002

Last Chain:	☑ Yes	Sample Tracking	SMO Use
Validation Req'd:	☑ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Tim Jackson	T Jackson	TJ	SNL/4142/505-284-2547/505-263-6639

Special Instructions/QC Requirements:

EDD ☑ Yes ☐ No

Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day

Negotiated TAT ☐

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

1.Relinquished by	T Jackson	Org. 4142	Date 10/29/14	Time 1050	3.Relinquished by	Org.	Date	Time
1. Received by		Org. 4142	Date 10/29/14	Time 1050	3. Received by	Org.	Date	Time
2.Relinquished by		Org 4142	Date 10/29/14	Time 1200	4.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 10/30/14	Time 0735	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT VERIFICATION REVIEW FORMS

GROUNDWATER MONITORING

OCTOBER 2014

AR/COC Number	Sample Type
615825	Environmental*
615826	Environmental*
615827	Environmental*
615828	Environmental*
615829	Environmental*
615889	Environmental*
615890	Environmental*

* AR/COC forms are provided in the Data Validation Section of this Annex.

Contract Verification Form (CVR)

Project Leader Jackson **Project Name** MWL GWM/SVM **Project/Task No.** 146422_10.11.08

ARCOC No. 615825 **Analytical Lab** GEL **SDG No.** 359291

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain
		Yes	No	
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain
		Yes	No	
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and Lc	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

3.0 Data Quality Evaluation

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1	Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2	Quantitation limit met for all samples	X		
3.3	Accuracy a) Laboratory control sample accuracy reported and met for all samples		X	VOC LCS recovery failed for Methylene chloride (1203198900)
	b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
	c) Matrix spike recovery data reported and met		X	VOC PS recovery failed for Methylene chloride (1203198901)
3.4	Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Detected in FB1: Acetone, Bromodichloromethane, Chloroform, Dibromochloromethane (096696-001)

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.6	Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)): "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7	Narrative addresses planchet flaming for gross alpha/beta	X		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151.	N/A		

4.0 Calibration and Validation Documentation

Line No.	Item	Yes	No	Comments
4.1	GC/MS (8260 and 8270) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		
	d) Internal standard performance data provided	X		

Line No.	Item	Yes	No	Comments
	e) Instrument run logs provided	X		
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		

Line No.	Item	Yes	No	Comments
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
5.1	DAR completed for monitoring and surveillance sample data	N/A		
5.2	Problems or outliers noted	N/A		
5.3	Verification or reanalysis requested from lab	N/A		

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies has been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? ◉ Yes ○ No

Based on the review, this data package is complete. ○ Yes ◉ No

If no, provide nonconformance report or correction request number 18350 and date correction request was submitted: 11-17-2014

Reviewed by: Lorraine R. Herrera Date: 11-19-2014 10:57:00

Were resolutions adequate and data package complete? ◉ Yes ○ No

Closed by: Lorraine R. Herrera Date: 11-25-2014 10:57:00

Contract Verification Form (CVR)

Project Leader Jackson **Project Name** MWL GWM/SVM **Project/Task No.** 146422_10.11.08

ARCOC No. 615826 **Analytical Lab** GEL **SDG No.** 359857

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain
		Yes	No	
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain
		Yes	No	
2.1	Data reviewed, signature	X		

Line No.	Item	Complete?		If no, explain
		Yes	No	
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB. LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and Lc	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

3.0 Data Quality Evaluation

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1	Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2	Quantitation limit met for all samples	X		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.3	Accuracy a) Laboratory control sample accuracy reported and met for all samples		X	VOC LCS recovery failed for Methylene chloride (1203198900)
	b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
	c) Matrix spike recovery data reported and met		X	VOC PS recovery failed for Methylene chloride (1203198901)
3.4	Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5	Blank data a) Method or reagent blank data reported and met for all samples		X	Cadmium detected in Metals Method Blank (1203196434)
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Detected in FB2: Acetone, Bromodichloromethane, Chloroform, Dibromochloromethane (096699-001). Detected in EB2: Bromodichloromethane, Chloroform, Dibromochloromethane (096700-001)
3.6	Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7	Narrative addresses planchet flaming for gross alpha/beta	X		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151.	N/A		

4.0 Calibration and Validation Documentation

Line No.	Item	Yes	No	Comments
4.1	GC/MS (8260 and 8270) a) 12-hour tune check provided	X		

Line No.	Item	Yes	No	Comments
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		

Line No.	Item	Yes	No	Comments
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
5.1	DAR completed for monitoring and surveillance sample data	N/A		
5.2	Problems or outliers noted	N/A		
5.3	Verification or reanalysis requested from lab	N/A		

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies has been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? ○ Yes ◉ No

Based on the review, this data package is complete. ◉ Yes ○ No

Reviewed by: Lorraine R. Herrera Date: 11-26-2014 11:08:00

Closed by: Lorraine R. Herrera Date: 11-26-2014 11:08:00

Contract Verification Form (CVR)

Project Leader Jackson **Project Name** MWL GWM/SVM **Project/Task No.** 146422_10.11.08

ARCOC No. 615827 **Analytical Lab** GEL **SDG No.** 359343

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain
		Yes	No	
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain
		Yes	No	
2.1	Data reviewed. signature	X		

Line No.	Item	Complete?		If no, explain
		Yes	No	
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and Lc	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainly (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

3.0 Data Quality Evaluation

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1	Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2	Quantitation limit met for all samples	X		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.3	Accuracy a) Laboratory control sample accuracy reported and met for all samples		X	VOC LCS recovery failed for Methylene chloride (1203198900)
	b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
	c) Matrix spike recovery data reported and met		X	VOC PS recovery failed for Methylene chloride (1203198901)
3.4	Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Detected in FB3: Bromodichloromethane, Chloroform, Dibromochloromethane (096702-001)
3.6	Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7	Narrative addresses planchet flaming for gross alpha/beta	X		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151.	N/A		

4.0 Calibration and Validation Documentation

Line No.	Item	Yes	No	Comments
4.1	GC/MS (8260 and 8270) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		

Line No.	Item	Yes	No	Comments
	c) Continuing calibration provided	X		
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		

Line No.	Item	Yes	No	Comments
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
5.1	DAR completed for monitoring and surveillance sample data	N/A		
5.2	Problems or outliers noted	N/A		
5.3	Verification or reanalysis requested from lab	N/A		

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies has been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? ○ Yes ◉ No

Based on the review, this data package is complete. ◉ Yes ○ No

Reviewed by: Lorraine R. Herrera Date: 11-19-2014 13:10:00

Closed by: Lorraine R. Herrera Date: 11-19-2014 13:10:00

Contract Verification Form (CVR)

Project Leader Jackson **Project Name** MWL GWM/SVM **Project/Task No.** 146422_10.11.08

ARCOC No. 615828, 615829 **Analytical Lab** GEL **SDG No.** 359428

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain
		Yes	No	
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain
		Yes	No	
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and Lc	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	X		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

3.0 Data Quality Evaluation

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1	Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2	Quantitation limit met for all samples	X		
3.3	Accuracy a) Laboratory control sample accuracy reported and met for all samples		X	VOC LCS recovery failed for Methylene chloride (1203200625, 1203202875)
	b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
	c) Matrix spike recovery data reported and met		X	VOC PS recovery failed for Methylene chloride (1203200626)
3.4	Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Detected in FB4, FB5: Bromodichloromethane, Chloroform, Dibromochloromethane (096706-001, 096709-001)

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.6	Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7	Narrative addresses planchet flaming for gross alpha/beta	X		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151.	N/A		

4.0 Calibration and Validation Documentation

Line No.	Item	Yes	No	Comments
4.1	GC/MS (8260 and 8270) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		
	d) Internal standard performance data provided	X		

Line No.	Item	Yes	No	Comments
	e) Instrument run logs provided	X		
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		

Line No.	Item	Yes	No	Comments
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
5.1	DAR completed for monitoring and surveillance sample data	N/A		
5.2	Problems or outliers noted	N/A		
5.3	Verification or reanalysis requested from lab	N/A		

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies has been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? ○ Yes ◉ No

Based on the review, this data package is complete. ◉ Yes ○ No

Reviewed by: Lorraine R. Herrera Date: 11-25-2014 15:04:00

Closed by: Lorraine R. Herrera Date: 11-25-2014 15:04:00

Contract Verification Form (CVR)

Project Leader Jackson **Project Name** MWL GWM/SVM **Project/Task No.** 146422_10.11.08

ARCOC No. 615889, 615890 **Analytical Lab** GEL **SDG No.** 360118

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete?		If no, explain
		Yes	No	
1.1	All items on ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain
		Yes	No	
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	X		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and Lc	X		
2.6	QC batch numbers provided	X		
2.7	Dilution factors provided and all dilution levels reported	N/A		
2.8	Data reported in appropriate units and using correct significant figures	X		
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	X		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		
2.13	Contractual qualifiers provided	X		
2.14	All requested result and TIC (if requested) data provided	X		

3.0 Data Quality Evaluation

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1	Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2	Quantitation limit met for all samples	X		
3.3	Accuracy a) Laboratory control sample accuracy reported and met for all samples	X		
	b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
	c) Matrix spike recovery data reported and met	X		
3.4	Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
	b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.6	Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7	Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151.	N/A		

4.0 Calibration and Validation Documentation

Line No.	Item	Yes	No	Comments
4.1	GC/MS (8260 and 8270) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		

Line No.	Item	Yes	No	Comments
	e) Instrument run logs provided	N/A		
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		

Line No.	Item	Yes	No	Comments
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) ICP interference check sample data provided	N/A		
	d) ICP serial dilution provided	N/A		
	e) Instrument run logs provided	N/A		
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
5.1	DAR completed for monitoring and surveillance sample data	N/A		
5.2	Problems or outliers noted	N/A		
5.3	Verification or reanalysis requested from lab	N/A		

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies has been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? ○ Yes ◉ No

Based on the review, this data package is complete. ◉ Yes ○ No

Reviewed by: Lorraine R. Herrera Date: 12-08-2014 08:26:00

Closed by: Lorraine R. Herrera Date: 12-08-2014 08:26:00

ANNEX F

Mixed Waste Landfill Inspection Forms

April 2014-March 2015

Cover Inspection

Soil-Vapor Monitoring Network

Soil-Moisture Monitoring Network

Groundwater Monitoring Network

Biology Inspection

Note: Radon monitoring system inspection forms are provided in Annex A

Mixed Waste Landfill
Cover Inspection Checklist/Form

1. Date of Inspection May 21, 2014
2. Time of Inspection 11:00 am
3. Name of Inspector Don M Waterpayk

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required in notes section at the end of this form.

I. COVER SYSTEM [Quarterly]

Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Visible settlement of the soil cover in excess of 6 inches.	yes	NO	
B. Erosion of the soil cover in excess of 6 inches deep.	yes	NO	
C. Evidence of water ponding on the MWL cover surface in excess of 100 square feet.	yes	NO	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	yes	NO	
E. Contiguous areas of no vegetation greater than 200 ft^2. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	yes	NO	
F. Potentially deep-rooted plants present. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	yes	NO	

II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]

Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Channel or sidewall erosion in excess of 6 inches deep.	yes	NO	
B. Channel sediment accumulation in excess of 6 inches deep.	yes	NO	
C. Debris that blocks more than 1/3 of the channel width.	yes	NO	

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

III. SECURITY FENCE [Quarterly]			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Accumulation of wind-blown plants and debris.	yes	yes	1
B. Fence wires and posts in need of repair/maintenance.	yes	NO	
C. Gates in need of oiling/repair/maintenance.	yes	NO	
D. Loeks in need of eleaning or replacement.	yes	NO	
E. Warning signs in need of repair or replaeement.	yes	NO	
F. Survey monuments in vicinity of MWL visible.	yes	NO	

IV. PREVIOUS DEFICIENCIES			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
Uncorrcctcd/undocumentcd previous deficiencies.	yes	NO	

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

NOTES

Note Number	Description
1	Wind blown plant debris needs removed

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

Action (Note Number) 1 assigned to Don Schofield Date action completed 6/4/2014

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

Plant debris removed by Sequoia Landscape on 6/3 - 6/4/14 OMW 6/4/14

Inspector's Signature Don Watenpaugh 5/21/14

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Cover Inspection Checklist/Form

1. Date of Inspection August 4, 2014
2. Time of Inspection 1200
3. Name of Inspector Don Watenpaugh

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required in notes section at the end of this form.

I. COVER SYSTEM [Quarterly]			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Visible settlement of the soil cover in excess of 6 inches.	Yes	NO	
B. Erosion of the soil cover in excess of 6 inches deep.	Yes	NO	
C. Evidence of water ponding on the MWL cover surface in excess of 100 square feet.	Yes	NO	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	Yes	NO	
E. Contiguous areas of no vegetation greater than 200 ft^2. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	Yes	NO	
F. Potentially deep-rooted plants present. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	Yes	NO	

II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Channel or sidewall erosion in excess of 6 inches deep.	Yes	NO	
B. Channel sediment accumulation in excess of 6 inches deep.	Yes	NO	
C. Debris that blocks more than 1/3 of the channel width.	Yes	NO	

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

III. SECURITY FENCE [Quarterly]			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Accumulation of wind-blown plants and debris.	Yes	Yes	#1
B. Fence wires and posts in need of repair/maintenance.	Yes	Yes	#2
C. Gates in need of oiling/repair/maintenance.	Yes	NO	
D. Locks in need of cleaning or replacement.	Yes	NO	
E. Warning signs in need of repair or replacement.	Yes	NO	
F. Survey monuments in vicinity of MWL visible.	Yes	NO	
IV. PREVIOUS DEFICIENCIES			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
Uncorrected/undocumented previous deficiencies.	NO	NO	

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

NOTES

Note Number	Description
1	Accumulation of wind blown plants along inside of perimeter fence.
2	Top barbwire on fence in East dog-leg area had been cut.

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

Action (Note Number) 1 assigned to Don Schofield Date action completed August 27, 2014

Action (Note Number) 2 assigned to Don Waterpaugh Date action completed August 4, 2014

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

1. Accumulation of wind blown plants removed by Sequoia Landscaping. Work was completed on August 27, 2014.

2 Top barbwire on Fence in east dog-leg area was repaired at time of the inspection by Don Waterpaugh.

Inspector's Signature Don Waterpaugh 8/4/14

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Cover Inspection Checklist/Form

1. Date of Inspection Dec 3, 2014
2. Time of Inspection 1300
3. Name of Inspector Don Watenpaugh

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required in notes section at the end of this form.

I. COVER SYSTEM [Quarterly]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Visible settlement of the soil cover in excess of 6 inches.	Yes	NO	
B. Erosion of the soil cover in excess of 6 inches deep.	Yes	NO	
C. Evidence of water ponding on the MWL cover surface in excess of 100 square feet.	Yes	NO	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	Yes	NO	
E. Contiguous areas of no vegetation greater than 200 ft^2. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	Yes	NO	
F. Potentially deep-rooted plants present. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	Yes	NO	

II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Channel or sidewall erosion in excess of 6 inches deep.	Yes	NO	
B. Channel sediment accumulation in excess of 6 inches deep.	Yes	NO	
C. Debris that blocks more than 1/3 of the channel width.	Yes	NO	

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

III. SECURITY FENCE [Quarterly]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Accumulation of wind-blown plants and debris.	Yes	NO	
B. Fence wires and posts in need of repair/maintenance.	Yes	NO	
C. Gates in need of oiling/repair/maintenance.	Yes	NO	
D. Locks in need of cleaning or replacement.	Yes	NO	
E. Warning signs in need of repair or replacement.	Yes	NO	
F. Survey monuments in vicinity of MWL visible.	Yes	NO	

IV. PREVIOUS DEFICIENCIES			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undocumented previous deficiencies.	Yes	NO	

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

NOTES

Note Number	Description

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

Action (Note Number) _____ assigned to _____Date action completed_____

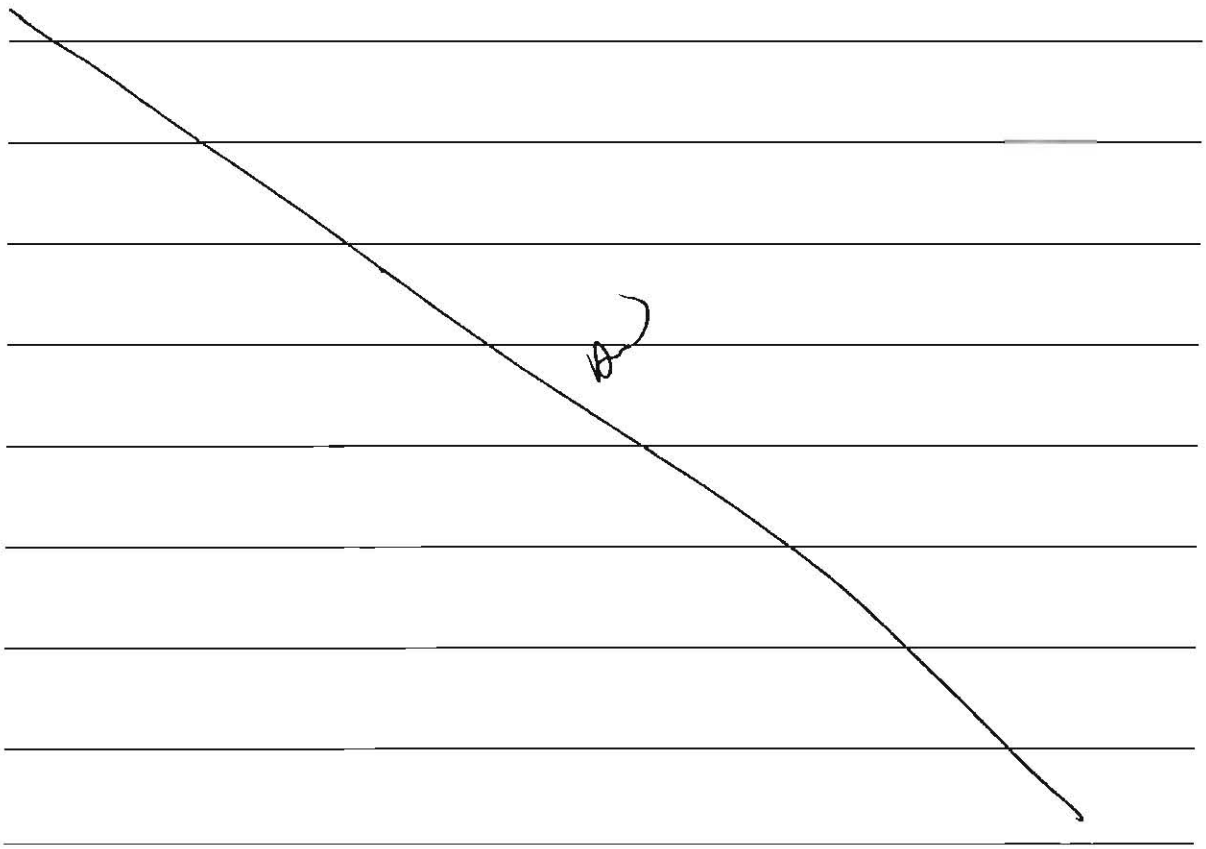
Action (Note Number) _____ assigned to _____Date action completed_____

Action (Note Number) _____ assigned to _____Date action completed_____

Action (Note Number) _____ assigned to _____Date action completed_____

Action (Note Number) _____ assigned to _____Date action completed_____

Additional Comments:



Inspector's Signature _____

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Cover Inspection Checklist/Form

1. Date of Inspection Feb, 16, 2015
2. Time of Inspection 1300
3. Name of Inspector Don Watenpaugh

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required in notes section at the end of this form.

I. COVER SYSTEM [Quarterly]

Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Visible settlement of the soil cover in excess of 6 inches.	yes	NO	NA
B. Erosion of the soil cover in excess of 6 inches deep.	yes	NO	↓
C. Evidence of water ponding on the MWL cover surface in excess of 100 square feet.	yes	NO	↓
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	yes	NO	↓
E. Contiguous areas of no vegetation greater than 200 ft^2. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	yes	NO	↓
F. Potentially deep-rooted plants present. Note: During period when the Biology Inspection is occurring quarterly, this inspection requirement will be covered on the Biology Inspection Checklist/Form.	yes	NO	↓

II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]

Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Channel or sidewall erosion in excess of 6 inches deep.	yes	NO	NA
B. Channel sediment accumulation in excess of 6 inches deep.	yes	NO	↓
C. Debris that blocks more than 1/3 of the channel width.	yes	NO	↓

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

III. SECURITY FENCE [Quarterly]			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Accumulation of wind-blown plants and debris.	Yes	Yes	1
B. Fence wires and posts in need of repair/maintenance.	Yes	NO	NA
C. Gates in need of oiling/repair/maintenance.	Yes	NO	1
D. Locks in need of cleaning or replacement.	Yes	NO	↓
E. Warning signs in need of repair or replacement.	Yes	NO	↓
F. Survey monuments in vicinity of MWL visible.	Yes	Yes	2

IV. PREVIOUS DEFICIENCIES			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
Uncorrected/undocumented previous deficiencies.	NA	NA	NA

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

NOTES

Note Number	Description
1	Wind blown plant debris needs to be removed
2	weeds have grown up around monuments, needs to be Cleared

Mixed Waste Landfill
Cover Inspection Checklist/Form (continued)

Action (Note Number) 1 assigned to Don Schofield Date action completed 3/5/2015

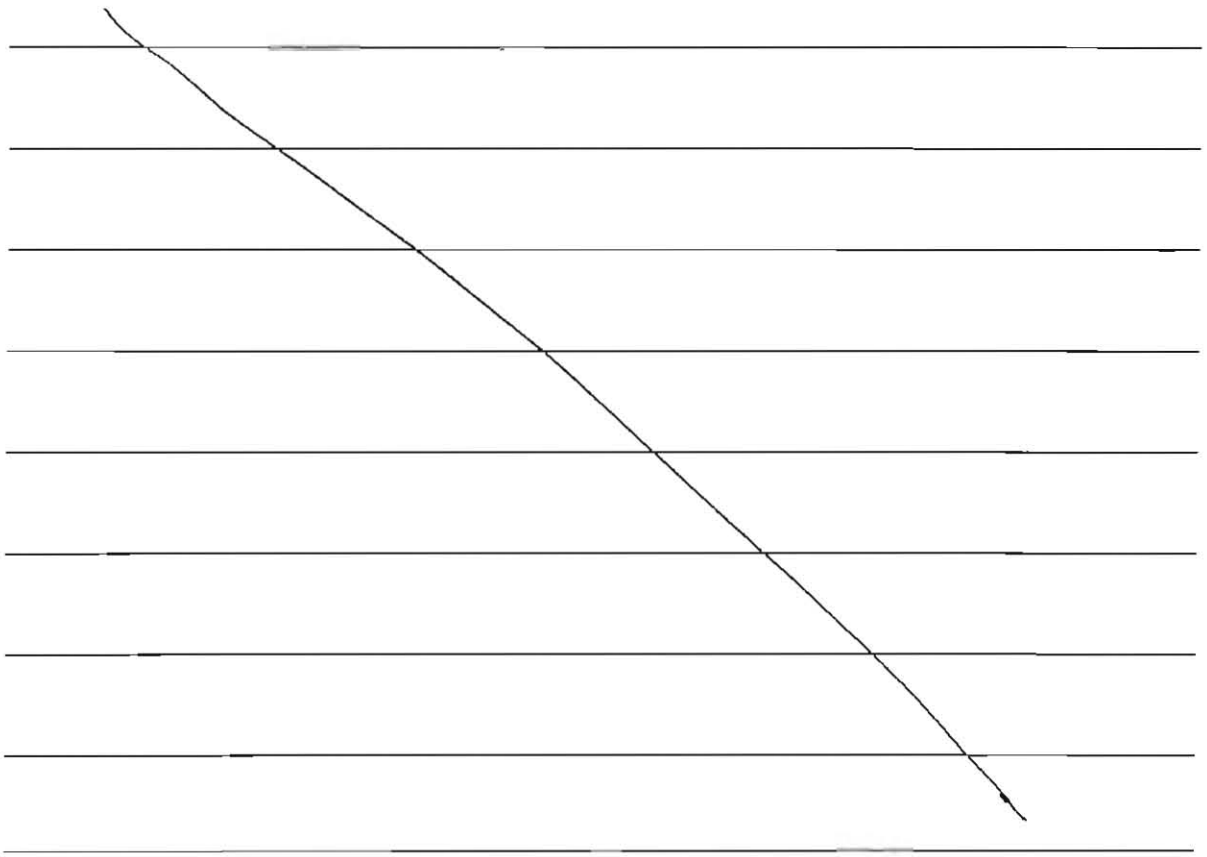
Action (Note Number) 2 assigned to Don Schofield Date action completed 3/5/2015

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:



Inspector's Signature Don Walkenhorst

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Soil-Vapor Monitoring Network Checklist/Form

1. Date of Inspection 9/11/14
2. Time of Inspection 0800
3. Name of Inspector Robert Lynch

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required.

I. SOIL–VAPOR MONITORING LOCATIONS [Semiannually or Annually]

Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	Yes	No	
B. Well cover caps in need of repair/maintenance.	Yes	No	
C. Well casing or sampling ports in need of repair/maintenance.	Yes	No	
D. Monitoring location and sampling ports properly labeled.	Yes	No	
E. Locks in need of cleaning or replacement.	Yes	No	

II. SAMPLING EQUIPMENT [Semiannually or Annually]

Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Sampling pump in need of repair/maintenance.	Yes	No	
B. Sampling assembly (e.g., tubing, gauges, and valves) in need of repair/maintenance.	Yes	No	

III. PREVIOUS DEFICIENCIES

Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undocumented previous deficiencies.	NA	NA	

Mixed Waste Landfill
Soil-Vapor Monitoring Network Checklist/Form (Continued)

NOTES

Note Number	Description

Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

* MWL-SV03 — 300 and 400 foot ports, Difficult or slow intake of soil vapor into sample containers.

* MWL-SV02 - cleaned rust and wipe rust off HPDE Tubing.

Inspector's Signature Patt Lynch

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Soil-Vapor Monitoring Network Checklist/Form

1. Date of Inspection 10/22/14
2. Time of Inspection 0800
3. Name of Inspector Tim Jackson

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required.

I. SOIL–VAPOR MONITORING LOCATIONS [Semiannually or Annually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	Yes	No	
B. Well cover caps in need of repair/maintenance.	Yes	No	
C. Well casing or sampling ports in need of repair/maintenance.	Yes	No	
D. Monitoring location and sampling ports properly labeled.	Yes	No	
E. Locks in need of cleaning or replacement.	Yes	No	
II. SAMPLING EQUIPMENT [Semiannually or Annually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Sampling pump in need of repair/maintenance.	Yes	No	
B. Sampling assembly (e.g., tubing, gauges, and valves) in need of repair/maintenance.	Yes	No	
III. PREVIOUS DEFICIENCIES			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undocumented previous deficiencies.	NA	NA	

Mixed Waste Landfill
Soil-Vapor Monitoring Network Checklist/Form (Continued)

NOTES

Note Number	Description

Action (Note Number) _____ assigned to _____ Date action completed_____
Action (Note Number) _____ assigned to _____ Date action completed_____
Action (Note Number) _____ assigned to _____ Date action completed_____
Action (Note Number) _____ assigned to _____ Date action completed_____

Additional Comments:

MWL-SV03 → 300 and 400 flags ports slow to fill SUMMA canisters.

MWL-SV02 → Damp/water present inside of protective casing.

Inspector's Signature Tim Jackson

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Soil-Moisture Monitoring Network Checklist/Form

1. Date of Inspection 4/15/14
2. Time of Inspection 0926
3. Name of Inspector Robert Bock

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required.

I. SOIL-MOISTURE MONITORING LOCATIONS [Semiannually or Annually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
F. Concrete pads, bollards, and protective casings in need of repair/maintenance.	yes	No	
G. Access tube cover caps in need of repair/maintenance.	yes	No	
H. Access tube casing in need of repair/maintenance.	yes	yes	1
I. Monitoring location properly labeled.	yes	No	
J. Locks in need of cleaning or replacement.	yes	No	

II. SAMPLING EQUIPMENT [Semiannually or Annually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Neutron probe in need of repair/maintenance.	yes	No	
B. Cable reel or cable in need of repair/maintenance.	yes	No	

III. PREVIOUS DEFICIENCIES			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undocumented previous deficiencies.	NA	NA	

Mixed Waste Landfill
Soil-Moisture Monitoring Network Checklist/Form (Continued)

NOTES

Note Number	Description
1	Protective casings and bollards need to be repainted.

Action (Note Number) 1 assigned to Robert Zbick Date action completed 4/21/14
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

Protective casings and bollards were repainted on 4/21/14.

Inspector's Signature _____

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Tailgate Safety Meeting Form

Dept: 4142 ~~Date~~: 4/21/14 Time: 1245

Activities: repaint protective casings & bollards of soil moisture wells
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill ____ °F

Chemicals Used: paint

Safety Topics Presented

☑ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☑ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☑ Wear safety boots.	☐ Be aware of electrical hazards
☑ Wear leather gloves.	☐ Be aware of pressure hazards.
☑ Wear safety glasses.	☐ No eating or drinking on site.
☑ Wear nitrile or latex gloves.	☑ Be aware of biohazards (snakes, spiders, etc.)
☐ Use safe lifting practices.	☑ Wear communication device (cell phone, site radio, EOC pager).
☐ Be aware of pinch points	☐ Other (list).
☐ Other (list).	☐ Other (list).

Emergency: 844-0911 (cell phone) or 911 (Sandia land line)

Attendees

Printed Name	Signature
Robert Zinck	

Mixed Waste Landfill
Soil-Moisture Monitoring Network Checklist/Form

1. Date of Inspection 10/16/14
2. Time of Inspection 0955
3. Name of Inspector Robert Bock

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required.

I. SOIL–MOSITURE MONITORING LOCATIONS [Semiannually or Annually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
F. Concrete pads, bollards, and protective casings in need of repair/maintenance.	yes	No	
G. Access tube cover caps in need of repair/maintenance.	yes	No	
H. Access tube casing in need of repair/maintenance.	yes	No	
I. Monitoring location properly labeled.	yes	No	
J. Locks in need of cleaning or replacement.	yes	yes	1

II. SAMPLING EQUIPMENT [Semiannually or Annually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Neutron probe in need of repair/maintenance.	yes	No	
B. Cable reel or cable in need of repair/maintenance.	yes	No	

III. PREVIOUS DEFICIENCIES			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undocumented previous deficiencies.	NA	NA	

Mixed Waste Landfill
Soil-Moisture Monitoring Network Checklist/Form (Continued)

NOTES

Note Number	Description
1	Locks at VZ-1, VZ-2, and VZ-3 need to be replaced

Action (Note Number) 1 assigned to Robert Zick Date action completed 10/16/14
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

1. Locks were replaced by Robert Zick at time of the inspection.

Inspector's Signature [signature]

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Groundwater Monitoring Network Checklist/Form

1. Date of Inspection 4/21/14
2. Time of Inspection 0750
3. Name of Inspector Robert Lynch

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required.

I. GROUNDWATER MONITORING LOCATIONS [Semiannually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	Yes	NO	
B. Well cover caps in need of repair/maintenance.	Yes	NO	
C. Well casing in need of repair/maintenance.	Yes	NO	
D. Monitoring well properly labeled.	Yes	NO	
E. Locks in need of cleaning or replacement.	Yes	NO	

II. GROUNDWATER SAMPLING EQUIPMENT [Semiannually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Sampling pump in need of repair/maintenance.	Yes	NO	
B. Sampling assembly (e.g., tubing, gauges, and valves) in need of repair/maintenance.	Yes	NO	

III. PREVIOUS DEFICIENCIES			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undocumented previous deficiencies.	NA	NA	

Mixed Waste Landfill
Groundwater Monitoring Network Checklist/Form (Continued)

NOTES

Note Number	Description

Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

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Inspector's Signature _____

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Groundwater Monitoring Network Checklist/Form

1. Date of Inspection 6/30/14
2. Time of Inspection 0800
3. Name of Inspector Robert Lynch

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required.

I. GROUNDWATER MONITORING LOCATIONS [Semiannually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	Yes	NO	
B. Well cover caps in need of repair/maintenance.	Yes	NO	
C. Well casing in need of repair/maintenance.	Yes	NO	
D. Monitoring well properly labeled.	Yes	NO	
E. Locks in need of cleaning or replacement.	Yes	NO	
II. GROUNDWATER SAMPLING EQUIPMENT [Semiannually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Sampling pump in need of repair/maintenance.	Yes	NO	
B. Sampling assembly (e.g., tubing, gauges, and valves) in need of repair/maintenance.	Yes	NO	
III. PREVIOUS DEFICIENCIES			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undocumented previous deficiencies.	NA	NA	

Mixed Waste Landfill
Groundwater Monitoring Network Checklist/Form (Continued)

NOTES

Note Number	Description

Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____
Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

Inspector's Signature _____

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Groundwater Monitoring Network Checklist/Form

1. Date of Inspection 10/16/14
2. Time of Inspection 0740 am
3. Name of Inspector Robert Lynch

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required.

I. GROUNDWATER MONITORING LOCATIONS [Semiannually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	YES	NO	
B. Well cover caps in need of repair/maintenance.	YES	NO	
C. Well casing in need of repair/maintenance.	YES	NO	
D. Monitoring well properly labeled.	YES	NO	
E. Locks in need of cleaning or replacement.	YES	NO	
II. GROUNDWATER SAMPLING EQUIPMENT [Semiannually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Sampling pump in need of repair/maintenance.	YES	NO	
B. Sampling assembly (e.g., tubing, gauges, and valves) in need of repair/maintenance.	YES	NO	
III. PREVIOUS DEFICIENCIES			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undocumented previous deficiencies.	NA	NA	

Mixed Waste Landfill
Groundwater Monitoring Network Checklist/Form (Continued)

NOTES

Note Number	Description

Action (Note Number) _____ assigned to _____ Date action completed_____
Action (Note Number) _____ assigned to _____ Date action completed_____
Action (Note Number) _____ assigned to _____ Date action completed_____
Action (Note Number) _____ assigned to _____ Date action completed_____

Additional Comments:

_____

_____

_____

_____

_____

Inspector's Signature _____

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

Mixed Waste Landfill
Groundwater Monitoring Network Checklist/Form

1. Date of Inspection 10/29/14
2. Time of Inspection 0800
3. Name of Inspector Robert Lynch

Provide explanatory notes for each parameter not inspected or each action required. Include any maintenance or repair required.

I. GROUNDWATER MONITORING LOCATIONS [Semiannually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	YES	NO	
B. Well cover caps in need of repair/maintenance.	YES	NO	
C. Well casing in need of repair/maintenance.	YES	NO	
D. Monitoring well properly labeled.	YES	NO	
E. Locks in need of cleaning or replacement.	YES	NO	
II. GROUNDWATER SAMPLING EQUIPMENT [Semiannually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Sampling pump in need of repair/maintenance.	YES	NO	
B. Sampling assembly (e.g., tubing, gauges, and valves) in need of repair/maintenance.	YES	NO	
III. PREVIOUS DEFICIENCIES			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undoeumented previous deficiencies.	NA	NA	

Mixed Waste Landfill
Groundwater Monitoring Network Checklist/Form (Continued)

NOTES

Note Number	Description

Action (Note Number) _____ assigned to _____Date action completed_____
Action (Note Number) _____ assigned to _____Date action completed_____
Action (Note Number) _____ assigned to _____Date action completed_____
Action (Note Number) _____ assigned to _____Date action completed_____

Additional Comments:

_____

_____

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_____

_____

Inspector's Signature _____

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

May 15, 2014

Mixed Waste Landfill
Biology Inspection Checklist/Form for the MWL Cover

Approximate vegetative coverage (actively photosynthesizing)*: 52 %

Approximate percent native vegetation of the total vegetative cover: 95 %

Listed below are the main plant species identified as growing on the MWL cover and the percentage of the cover populated by each species.

Scientific Name	Common Name (optional)	% of Cover[1]
Pleuraphis jamesii	James' galleta	45%
Erigeron divergens	Fleabane daisy	Trace**
Bouteloua gracilis	Blue grama	2%
Sporobolus flexuosus	Mesa dropseed	4%
Xanthisma spinulosum	Spiny goldenweed	Trace
Plantago patagonica	Woolly plantain	Trace
Dieteria canescens	Hoary tansyaster	Trace
Cryptantha crassisepala	Thicksepal cryptantha	Trace
Sisymbrium irio	London rocket	Trace
Gutierrezia sarothrae	Snakeweed	Trace
Sphaeralcea hastulata	Wrinkled globemallow	Trace
Atriplex canescens	Four-wing saltbush	Trace
Bouteloua eriopoda	Black grama	Trace

Note: [1] Percentage of total MWL Cover populated by actively-photosynthesizing plants of this species

* Living plants per Section 4.1 of the MWL LTMMP.

** Trace = species present at a rate of less than one-half of one-percent.

Mixed Waste Landfill
Biology Inspection Checklist/Form for the MWL Cover
(continued)

Are there any contiguous areas of no vegetation greater than 200 square feet? (approximately 14 x 14 ft)? No

If "Yes," mark such areas on a map and attach to this checklist. Address actions and schedule to improve such area(s) in the notes section below.

Are there any very deeply rooted (roots greater than 8 feet deep at maturity) plant species present on the cover? Yes

If "Yes," describe the plant(s) and their general distribution. Address actions and schedule to remove plant(s) from the cover in the notes section below.

Notes: One four-wing saltbush is growing on the cover. This individual is a juvenile with a shallow root system at this stage of development. Four-wing saltbush are most effectively killed by clipping in the winter when dormant. This plant will be clipped during winter 2014/2015 to achieve most effective mortality

Inspection for Animal and Insect Intrusion into MWL Cover

Are any burrows present on the cover? Yes

Do any of the burrows appear to be active? Yes

Any ant hills/nests? Yes

Describe below observations regarding animal and insect features. If burrows with an entrance diameter of 4 inches or greater are present or appear to be that of a species that is able to burrow 6 feet deep or greater, indicate the location(s) on a map and attach to this checklist. Address actions and schedule to repair cover damage that exceeds prescribed limits. As appropriate, identify animal and insect features and have them surveyed and marked for biota sampling.

Notes: Burrow entrances are smaller than 4-inches in diameter. No burrow appears to be that of a species able to burrow six feet or greater.

Mixed Waste Landfill
Biology Inspection Checklist/Form for the MWL Cover
(Continued)

Notes (continued):

Cover vegetation is currently not as green as surrounding vegetation, including ground-level vegetation inside the fenceline. This is likely due to the above-grade level of the cover, decreasing the amount of overland flow it receives from upslope land.

Tumble weeds are scattered in low quantity on the cover. West fenceline has the highest density of wind-blown tumble weeds on the fencelines.

Many small "tot" burrow entrances on the north slope, particularly at the eastern end. Earthen slopes are attractive to small mammals, especially kangaroo rats to create burrows. Larger gravel on side-slopes will deter this activity.

Forbs are primarily observed on side-slopes.

I anticipate a die-off of some grass clumps. The bunch grasses are more tightly spaced that what naturally occurs in the surrounding upland areas.

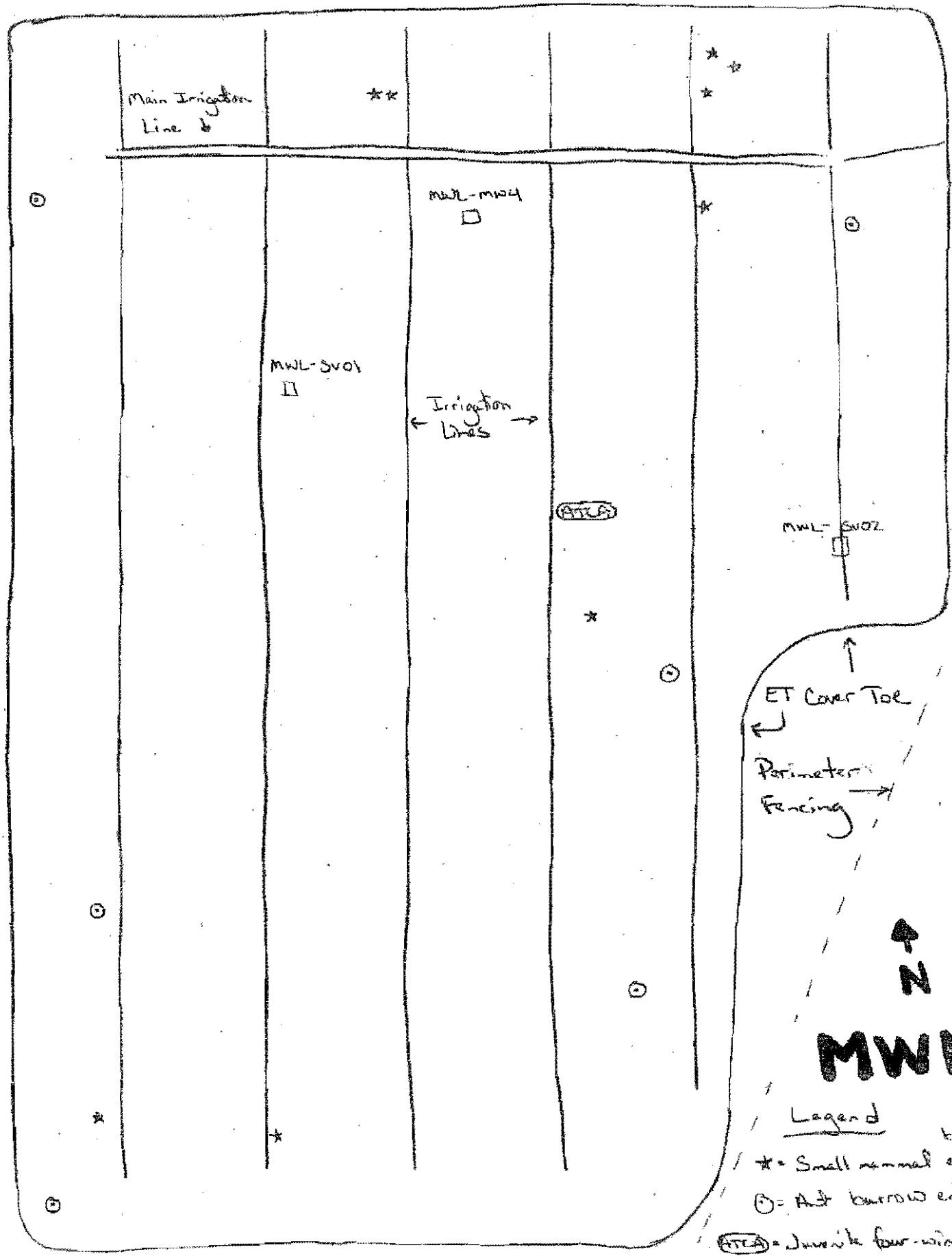
Biological Aspects Map -- [note: sketch map to locate specific features described above will be attached as appropriate]

Inspector's Signature: _____ Date: May 15, 2014

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

May 15, 2014


Main Irrigation Line
MWL-MW04
MWL-SV01
Irrigation Lines
ATCA
MWL-SV02
ET Cover Toe
Perimeter Fencing
N
MWL
Legend
★ = Small mammal burrow entrance
⊙ = Alt burrow entrance
ATCA = Juvenile four-wing saltbush

August 14, 2014

Mixed Waste Landfill
Biology Inspection Checklist/Form for the MWL Cover

*

Approximate vegetative coverage (actively photosynthesizing): 52 %

Approximate percent native vegetation of the total vegetative cover: 99 %

Listed below are the main plant species identified as growing on the MWL cover and the percentage of the cover populated by each species.

Scientific Name	Common Name (optional)	% of Cover[1]
Pleuraphis jamesii	James' galleta	42%
Sporobolus flexuosus	Mesa dropseed	6%
Sporobolus contractus	Spike dropseed	2%
Bouteloua gracilis	Blue grama	1%
Bouteloua eriopoda	Black grama	Trace**
Erigeron divergens	Fleabane daisy	Trace
Sphaeralcea hastulata	Wrinkled globemallow	Trace
Salsola tragus	Russian thistle	Trace
Dieteria canescens	Hoary tansyaster	Trace
Xanthisma spinulosum	Spiny goldenweed	Trace
Atriplex canescens	Four-wing saltbush	Trace
Gutierrezia sarothrae	Snakeweed	Trace
Aristida purpurea	Purple three-awn	Trace
Sphaeralcea angustifolia	Narrowleaf globemallow	Trace

Note: [1] Percentage of total MWL Cover populated by actively-photosynthesizing plants of this species

* Living plants per Section 4.1 of the MWL IMMP

** Trace = species present at a rate of less than one-half of one-percent.

Mixed Waste Landfill
Biology Inspection Checklist/Form for the MWL Cover
(continued)

Are there any contiguous areas of no vegetation greater than 200 square feet? (approximately 14 x 14 ft)? No

If "Yes," mark such areas on a map and attach to this checklist. Address actions and schedule to improve such area(s) in the notes section below.

Are there any very deeply rooted (roots greater than 8 feet deep at maturity) plant species present on the cover? Yes

If "Yes," describe the plant(s) and their general distribution. Address actions and schedule to remove plant(s) from the cover in the notes section below.

Notes: One four-wing saltbush observed to the NW of the dogleg corner. This shrub is juvenile with a shallow root system. It will be removed in August 2014 as part of biota monitoring. This plant was flagged for biota sampling* and surveyed using a GPS unit.

Inspection for Animal and Insect Intrusion into MWL Cover

Are any burrows present on the cover? Yes

Do any of the burrows appear to be active? Yes

Any ant hills/nests? Yes

Describe below observations regarding animal and insect features. If burrows with an entrance diameter of 4 inches or greater are present or appear to be that of a species that is able to burrow 6 feet deep or greater, indicate the location(s) on a map and attach to this checklist. Address actions and schedule to repair cover damage that exceeds prescribed limits. As appropriate, identify animal and insect features and have them surveyed and marked for biota sampling.

Notes: All burrows have entrances smaller than 4-inches in diameter. No burrow appears to be that of a species able to burrow six feet or greater in depth.

Mixed Waste Landfill
Biology Inspection Checklist/Form for the MWL Cover
(Continued)

Notes (continued):

General Observations:

- Very low weed growth on the MWL cover. Weed growth is primarily located on flat areas surrounding the cover. Limited weed growth at the NW corner of the cover, noted in previous surveys as lowest perennial grass density.
- Many small lizards observed across the cover.
- 3 active mourning dove nests observed, marked, and gps coordinates taken.
- Ant burrows*: two locations selected, flagged for biota sampling, and surveyed using a GPS unit.
- Animal burrows*: two locations selected, flagged for biota sampling, and surveyed using a GPS unit.

* Sampling locations shown on biological inspection map.

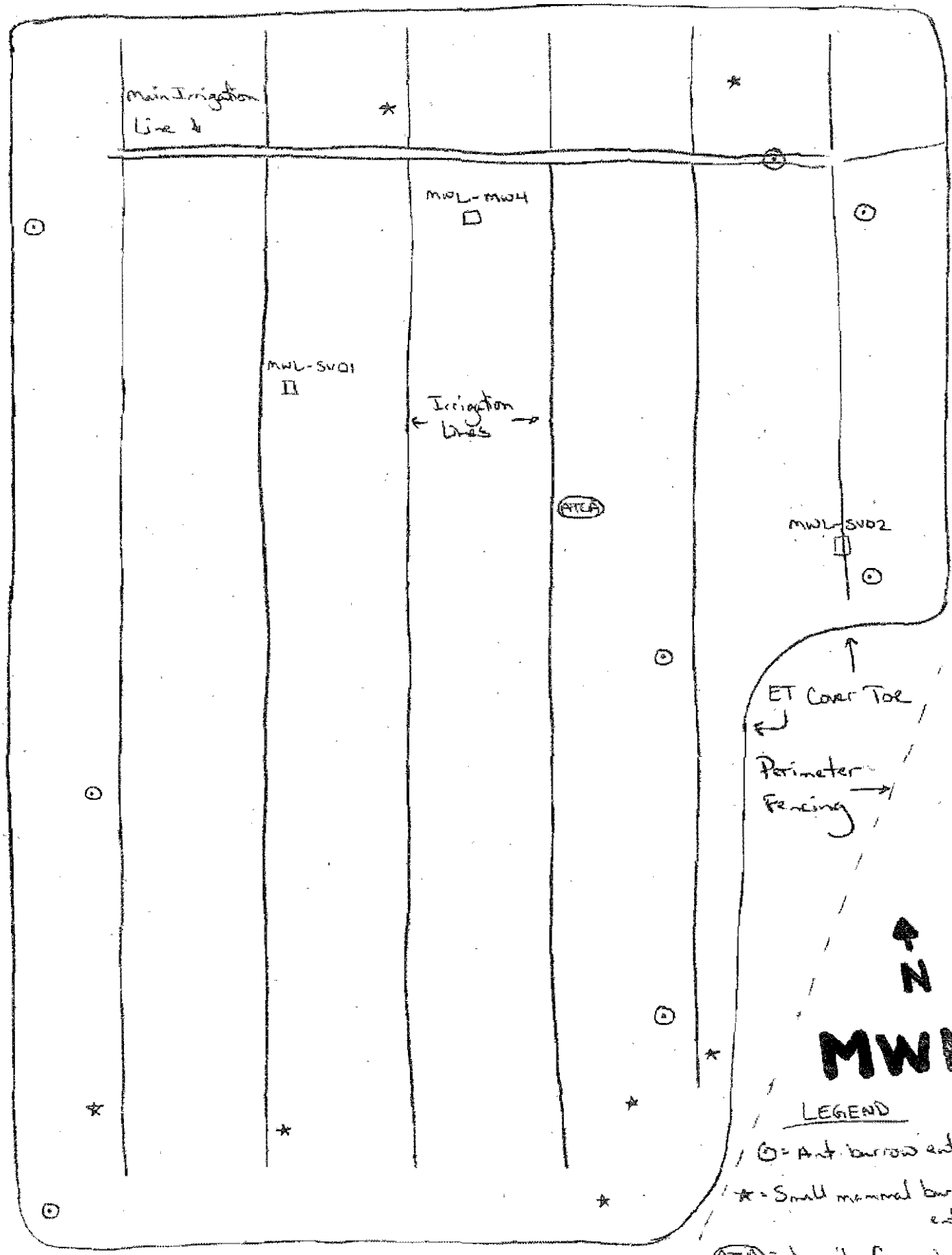
Biological Aspects Map – [note: sketch map to locate specific features described above will be attached as appropriate]

Inspector's Signature: _____ Date: 8/14/14

Original to: Mixed Waste Landfill Operating Record

Copy to: SNL/NM Records Center

August 14, 2014



ANNEX G

Mixed Waste Landfill Biology Report

April 2014-March 2015

2014-2015 Mixed Waste Landfill Biology Report

1.0 Introduction

As required by the Mixed Waste Landfill (MWL) Long-Term Monitoring and Maintenance Plan (LTMMP) (SNL/NM March 2012, Section 4.2.1), this summary report for the annual reporting period (April 1, 2014-March 31, 2015) presents the results of vegetation inspection and monitoring activities performed by the staff biologist on the MWL evapotranspirative (ET) Cover. The purpose of this report is to provide relevant background information, describe local climate trends over the 2014 growing season and reporting period, expand on the inspection results, if appropriate, and provide recommendations for future ET Cover vegetation monitoring and maintenance. Biology inspections of the ET Cover were conducted on May 15, 2014 and August 14, 2014. The inspection observations are documented on the " Biology Inspection Checklist/Form for the MWL Cover" and included in Annex F of this MWL Annual Long-Term Monitoring and Maintenance (LTMM) Report.

A self-sustaining plant community is an important component of overall ET Cover performance. Vegetation minimizes erosion by stabilizing the ET Cover surface and moves soil moisture from the ET Cover Topsoil and Native Soil Layers to the atmosphere through transpiration. Vegetation species that are native to the area create the optimal, self-sustaining plant community because the species are specifically adapted to the local climate and soil conditions. The MWL is located at an elevation of 5,380 feet in a challenging, semi-arid climate that experiences high temperatures throughout the summer, cold temperatures in the winter, drying winds in the spring, and infrequent precipitation. Perennial native grass species are ideal due to their extensive near-surface root systems that are poised to uptake moisture throughout the year and prevent precipitation from percolating more deeply into the subsurface soil. The deeper, permanent roots of perennial native grasses enable them to best withstand drought conditions, provide soil stabilization, and remove moisture from deeper within the Native Soil Layer relative to non-native or annual species.

2.0 Background Information

To meet the revegetation criteria as required in the MWL LTMMP, Section 4.1, the MWL was seeded in August 2009 after cover construction was completed. The native seed mix was drill-seeded and hand-broadcast uniformly across the cover. To facilitate seed germination and seedling growth, supplemental watering was performed as approved by NMED (Bearzi December 2008). Specific conditions and limits for supplemental watering are addressed in Section 4.2.3 of the LTMMP (SNL/NM March 2012). The MWL LTMMP documents all cover maintenance and supplemental watering activities from 2009 through 2011. ET Cover maintenance and supplemental watering activities performed in 2012 through March 31, 2014 are documented in the MWL Annual Long-Term Monitoring & Maintenance (LTMM) Report, January – March 2014 (SNL/NM June 2014).

ET Cover Biology Inspections were initiated in May 2013 prior to LTMMP approval (on January 8, 2014). The ET Cover has met the LTMMP criteria for successful revegetation as documented in all quarterly inspections. In accordance with the LTMMP, the frequency of Biology Inspections transitioned to an annual frequency after the August 2014 growing

season inspection, which provided confirmation that all successful revegetation criteria had been met.

3.0 Local Climate Trends for 2014 Growing Season

Climate trends for north-central New Mexico are presented in this section as they have a significant impact on the cover vegetation. Since the seeding occurred in August 2009, the local climate has been dominated by an ongoing drought with temperature extremes across the seasons. During the time since reseeding, 2013 has been the only year to receive above average annual precipitation. The last quarter of 2013 was unseasonably warm, followed by very dry winter and spring seasons in 2014. The 2014 summer monsoon season experienced slightly above average monsoonal rains during July and August, but had lower than average annual precipitation. Tables 1 and 2 provide meteorological data from the time of LTMMP approval in January 2014 through the end of this annual reporting period, March 2015.

Precipitation, Relative Humidity and Winds

Drought has been the dominant meteorological trend in the MWL area since 2008. Precipitation in 2013 and 2014 was greater than recent years, but as of March 17, 2015 the area was still in "Moderate Drought" according to the U.S. Drought Monitor (U.S. Drought Monitor March 2015).

From January through June 2014, the MWL received 0.87 inches of precipitation, less than one-third of the average of 2.86 inches for this timeframe. The 2014 summer monsoon season (July-September) provided excellent precipitation; a total of 4.61 inches of precipitation, which is 6% above the monsoon season average. This warm-season moisture facilitated growth of established native vegetation across the MWL ET Cover. From October through December 2014, an additional 2.0 inches of precipitation occurred; close to the 20-year precipitation average for this quarter. 1.28 inches of precipitation occurred from January through March 2015, also close to the quarterly average.

Overall, relative humidity was close to average for 2014. Relative humidity was 9.1% above normal in July 2014. The only notable low relative humidity month was March 2014 at 10.5% below normal. Winds were average for the reporting period. March 2015 and January 2014 varied most greatly from the monthly average with winds 1.31 mile per hour (mph) or 14.4% below normal and 1.0 mph or 14.5% above normal, respectively.

Temperature

In 2014 the MWL experienced 88 degrees of temperature variability, with a low of 9°F in December and a high of 98°F in June. 2014 temperature means were close to normal throughout the year. Heat stress to plants was not as great during the 2014 growing season as it often is, due to lower maximum temperatures.

Table 1
Summary of 2014 Meteorological Data at the Mixed Waste Landfill[a]

Month	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	
Temperature (°F)													**Annual**
Monthly Mean	39.3	45.55	49	55.48	63.88	77.66	76.09	72.3	69.44	60.84	45.76	38.75	57.84
20-year Temp Means	37.71	41.71	48.78	55.78	66.13	75.45	76.67	74.83	68.94	57.86	46.42	37.02	57.27
Precipitation (Inches)													**Annual**
Monthly Total	0	0.08	0.3	0.14	0.3	0.05	2.07	2.25	0.29	0.45	0.34	1.21	7.48
20-year Precip Means	0.35	0.48	0.6	0.51	0.4	0.52	1.41	1.79	0.9	0.93	0.41	0.57	8.71
Relative Humidity (%)													**Annual**
Monthly Mean	47	40.7	27.1	23.8	20.4	19.3	49.4	44.2	49.7	40.17	40.88	62.59	38.88
20-year RH Means	49.94	44.87	36.41	30.25	26.25	24.89	40.86	44.64	42.62	42.39	44.64	53.78	40.13
Wind (Miles/hour)													**Annual**
Monthly Mean	7.92	7.39	9.07	10.54	9.58	10	9.04	7.5	8.39	7.13	7.35	6.66	8.38
20-year Wind Means	6.94	8.13	9.1	10.47	9.96	9.76	8.42	7.91	7.99	7.81	7.08	6.77	8.37

[a]Information Source: SNL/NM Meteorological Monitoring Program.

Table 2
Summary of January-March 2015 Meteorological Data at the Mixed Waste Landfill[a]

Month	January	February	March
Temperature (°F)			
Monthly Mean	37.05	43.66	52.19
20-year Temp Means	37.71	41.71	48.78
Precipitation (Inches)			
Monthly Total	0.64	0.35	0.29
20-year Precip Means	0.34	0.45	0.56
Relative Humidity (%)			
Monthly Mean	65.59	47.08	38.57
20-year RH Means	49.94	44.87	36.41
Wind (Miles/hour)			
Monthly Mean	6.76	7.96	7.79
20-year Wind Means	6.94	8.13	9.1

[a]Information Source: SNL/NM Meteorological Monitoring Program.

4.0 August 2014 Inspection Results

The successional development of the native grasses on the MWL ET Cover was significant in 2013 and continued in 2014. Native grasses grew from small to modest-sized clumps in May 2013 into much more robust and mature clumps in August 2014.

In 2013 native vegetation development on the ET Cover was primarily assisted by weeding and supplemental watering. As documented during the September 2013 Biology Inspection, the ET Cover had approximately 56% foliar coverage, of which approximately 96% was native grass species.

The August 2014 MWL ET Cover Biology Inspection occurred during the New Mexico growing season (i.e., August), which typically comes to a close in mid-September as evening temperatures begin to fall. The growing season inspections allow the most accurate assessment of living plant coverage because the greatest amount of photosynthesis occurs during this time of the year. Percent foliar coverage is determined by the overall percentage of green vegetation (i.e., photosynthesizing vegetation) on the ET Cover. Also, the cumulative effects of the previous seasons can best be assessed in the later part of the growing season.

The August 2014 MWL ET Cover Biology Inspection results confirmed the ET Cover meets the successful revegetation criteria defined in the MWL LTMMP (SNL/NM March 2012, Section 4.1) and presented as follows. Inspection results are summarized after each criterion.

- Total percent foliar coverage equals 20 % (i.e., 20 percent of the land surface is covered with living plants versus 80 percent bare surface area)

Inspection Results: The approximate vegetative coverage (this is the coverage of living plants, observed as actively photosynthesizing foliar coverage) was determined to be 52%.

- Of the 20 percent total foliar coverage, 50 percent or greater comprises native perennial species, and 50 percent or less comprises annual species;

Inspection Results: The vegetative coverage was composed of approximately 99% native perennial species and 1% annual species.

- No contiguous bare spots greater than 200 square feet (approximately 14 by 14 feet) are present.

Inspection Results: No contiguous bare vegetation areas greater than 200 square feet were present.

Foliar coverage of each species across the site is determined by dividing the cover into smaller sections of approximately 35 meters by 35 meters. The percent cover of each species is determined based upon visual inspection of each section, then averaged overall for the entire cover. Coverage for species that are present in very low numbers are recorded as “trace” when the percent cover is less than one-half of one-percent. Species that are present between one-half and one percent are recorded as “1%.”

James' galleta was the dominant grass species present, and along with other native grasses, comprised the majority of the ET Cover vegetation. Green mature native perennial clump grasses dominated the ET Cover vegetation. Very low levels of weedy species were present on the cover at the time of the inspection.

The native grass coverage at the northwest corner of the ET Cover improved significantly from previous years. In 2013 this area had the lowest density of vegetation on the ET Cover, but by the time of the August 2014 inspection, this area had significantly filled in with native grasses.

The percent foliar coverage of the various native grass species varied slightly from previous inspections. As the cover continues to change into a more fully mature plant community, the foliar coverage and native species composition will continue to change.

Figure 1 includes photographs of the ET Cover vegetation taken during the August 2014 inspection. The large size of the perennial native bunchgrasses is evident in these photographs, which visually document the successful establishment of native grasses on the ET Cover.

Few burrows were observed on the MWL ET Cover during the August 2014 inspection. Seven small mammal and eight ant burrows were located on or adjacent to the ET Cover side-slopes, distributed across all sides of the cover. All animal burrows had entrances smaller than 4-inches in diameter and no burrow appeared to be that of a species able to burrow six feet or greater in depth. Only one small potentially deep-rooted plant (a juvenile fourwing saltbush) was observed.

Biota sampling locations were identified for anthills, animal burrows, and potentially deep-rooted plants during the August 2014 Biology Inspection. Two anthills, two animal burrows, and the one small juvenile fourwing saltbush were marked in the field and surveyed during the August inspection. The burrow sampling locations were selected based on signs of current small mammal and ant activity. Some of the burrows appeared inactive and are likely abandoned (i.e., no longer in use). These locations are shown on the biological inspection map (Figure 2) along three active mourning dove nests that were identified during the August Biology Inspection. Biota sampling activities and results are presented in Chapter 8 of this MWL Annual LTMM Report.

5.0 Cover Maintenance

Maintenance activities performed on the MWL ET Cover during the 2014 – 2015 reporting period are summarized in Section 9.1.3 of this MWL Annual LTMM Report. Most of the maintenance effort involved clearing the perimeter fence of windblown tumbleweeds and the removal of live tumbleweeds from the ET Cover during the growing season.

Weed removal maintenance was performed in March-April, June, August, and October 2014; and in March 2015. All work was done by hand and no vehicle traffic was allowed on the ET Cover. This work continues to reduce the ET Cover tumbleweed seed bank and allows the native grasses to out-compete the annual weedy species, reducing the future

growth of annual weedy species on the cover. As a result of these ongoing ET Cover vegetation maintenance efforts, the number of live, annual weedy species growing on the cover during the 2014 growing season was relatively small, and has declined considerably since ET Cover installation in 2009.

6.0 Supplemental Watering

Supplemental watering activities performed on the MWL ET Cover during the 2014 – 2015 reporting period are summarized in Section 9.1.3 of this MWL Annual LTMM Report. Supplemental watering was conducted during the reporting period at the direction of the staff biologist to augment natural precipitation and facilitate the healthy growth and establishment of the native grasses. Based on experience gained at the Chemical Waste Landfill and Corrective Action Management Unit ET Covers, native grasses are very susceptible to drought conditions until they are established as mature, robust, large clumps. Manual weeding and supplemental watering have proven to be effective actions for accelerating this natural process that can take 50 or more years.

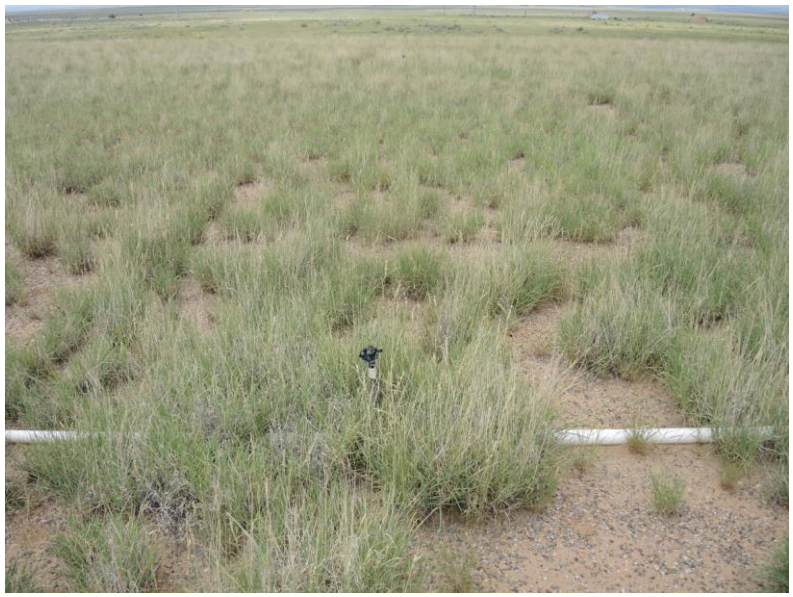
Water was applied using the temporary irrigation system installed on top of the ET Cover surface in 2011 (SNL/NM March 2012, Appendix B). For each watering event, the equivalent of a 0.5-inch rain event was applied to the ET Cover and side slopes. Supplemental watering activities were performed in May (two events), June (one event), and October (2 events) of 2014. No supplemental watering activities were performed from January 1 through March 31, 2015. The 2014 calendar year total precipitation (supplemental water applied plus natural precipitation) was 9.98 inches (2.5 inches of supplemental water + 7.48 inches of natural precipitation).

7.0 Recommendations

The MWL ET Cover Biology Inspections will continue on an annual frequency and be conducted during the height of the New Mexico growing season (i.e., August -September) to allow for the most accurate assessment of living plant coverage. Weed removal events will likely be needed during the 2015 – 2016 reporting period to maintain the MWL ET Cover and keep the perimeter fence clear of tumbleweeds based on LTMMP inspection requirements. If present, other annual weedy species on the MWL ET Cover should also be removed during the growing season weed removal events. Fourwing saltbush, tumbleweeds, and any other potentially deep-rooted plants will be pulled by hand, clipped at the ground surface, or removed for biota sampling.

Supplemental watering may be needed in the autumn of 2015 if the monsoon rains and previous 12-month precipitation are significantly below normal (i.e., severe drought conditions). The mature native plant community documented on the cover in 2014 should be able to survive moderate drought conditions without supplemental water.

North portion of the cover from approximate center of ET cover



West portion of the cover from approximate center of ET cover

South portion of the cover from approximate center of ET cover

East portion of the cover from approximate center of ET cover

Figure 1 August 14, 2014 MWL ET Cover Photographs

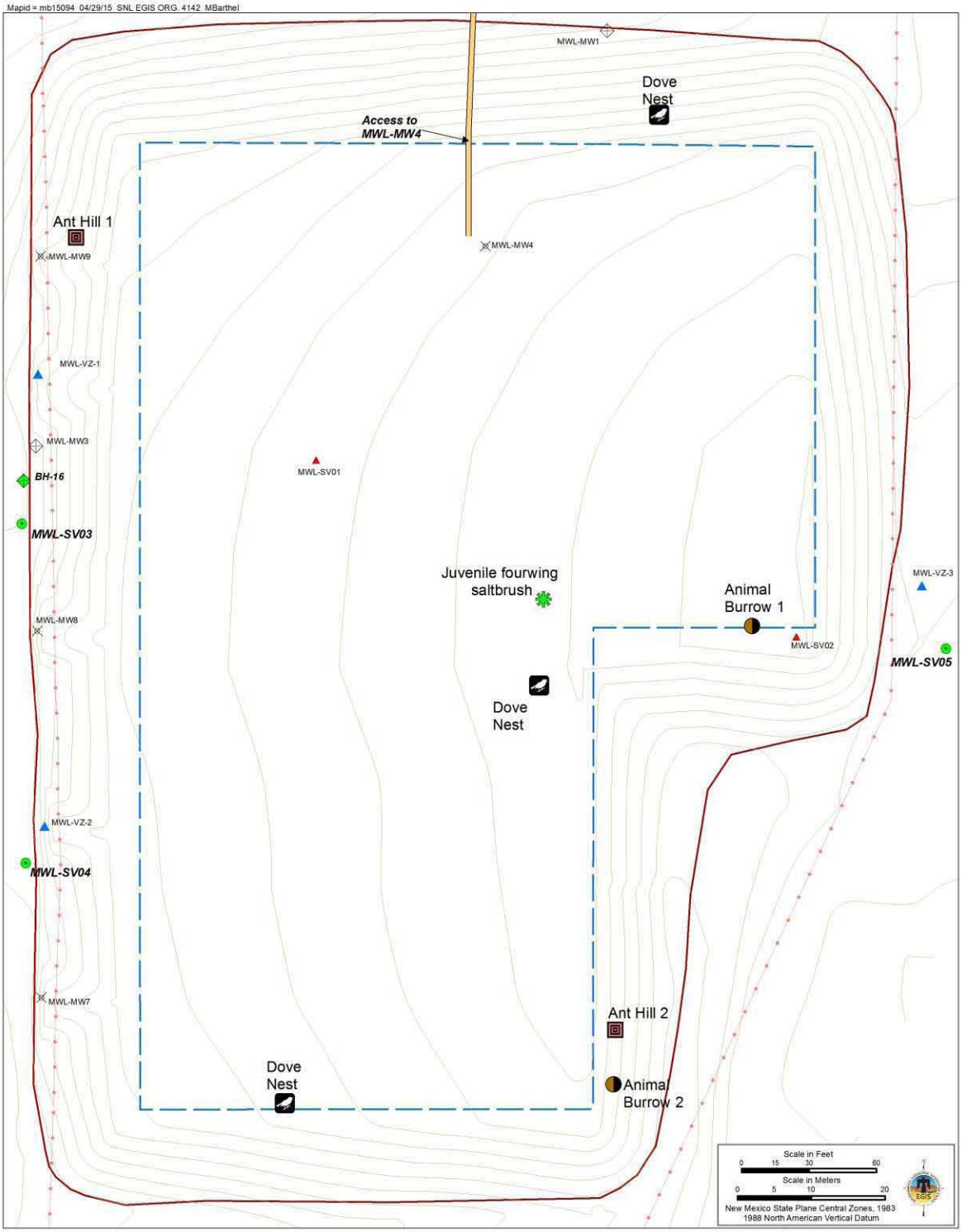

Mapid = mb15094 04/29/15 SNL EGIS ORG. 4142 MBarthel
MWL-MW1
Dove Nest
Access to MWL-MW4
Ant Hill 1
MWL-MW4
MWL-MW9
MWL-VZ-1
MWL-MW3
MWL-SV01
BH-16
MWL-SV03
Juvenile fourwing saltbrush
Animal Burrow 1
MWL-VZ-3
MWL-MW8
MWL-SV02
MWL-SV05
Dove Nest
MWL-VZ-2
MWL-SV04
MWL-MW7
Ant Hill 2
Dove Nest
Animal Burrow 2
Scale in Feet
0 15 30 60
Scale in Meters
0 5 10 20
New Mexico State Plane Central Zones, 1983
1988 North American Vertical Datum
EGIS

Figure 2. August 14, 2014 MWL ET Cover Biological Inspection Map

References

Sandia National Laboratories/New Mexico (SNL/NM), March 2012. "Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill," Environmental Restoration Operations, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), June 2014. "Mixed Waste Landfill Annual Long-Term Monitoring and Maintenance Report, January – March 2014," Sandia National Laboratories, Albuquerque, New Mexico.

U. S. Drought Monitor (March 2015)
Accessed March 2015.
http://droughtmonitor.unl.edu/

June 15,2015

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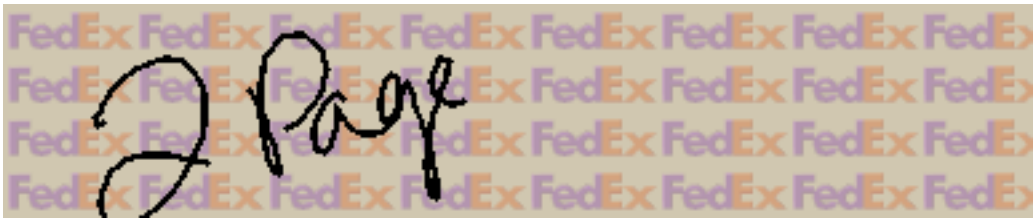

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