



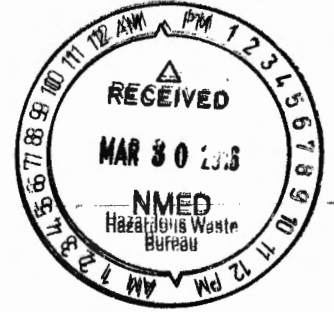
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National Nuclear Security Administration  
Sandia Field Office  
P.O. Box 5400  
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ENTERED



MAR 25 2016



Mr. John E. Kieling  
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Santa Fe, New Mexico 87505

Subject: Submittal of Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2015, Chemical Waste Landfill Post-Closure Care Permit 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 *Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2015*, dated March 2016, to the New Mexico Environment Department. This submittal is required by Part 2, Section 2.6.3, of the Chemical Waste Landfill (CWL) Post-Closure Care Permit.

This document is comprised of a main report and four annexes that provide information for post-closure care activities conducted at the CWL during Calendar Year 2015. The report and supporting documentation satisfy requirements listed in Permit Attachment 1, Sections 1.9 and 1.12.

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

Sincerely,

James W. Todd  
Assistant Manager for Engineering

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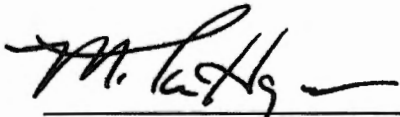
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**Submittal of Chemical Waste Landfill Annual Post-Closure Care Report  
Calendar Year 2015  
Chemical Waste Landfill Post-Closure Care Permit**

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

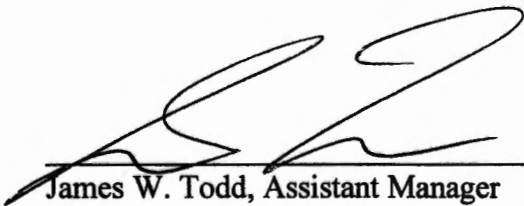
**CERTIFICATION STATEMENT**

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.



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**Sandia  
National  
Laboratories**

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**CHEMICAL WASTE LANDFILL  
ANNUAL POST-CLOSURE CARE REPORT  
CALENDAR YEAR 2015**

**SANDIA NATIONAL LABORATORIES, NEW MEXICO  
LONG-TERM STEWARDSHIP**

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**MARCH 2016**



**U.S. DEPARTMENT OF  
ENERGY**



**United States Department of Energy  
Sandia Field Office**

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**ANNUAL CHEMICAL WASTE LANDFILL  
POST-CLOSURE CARE REPORT  
CALENDAR YEAR 2015**

**Facility:** Chemical Waste Landfill

**Location:** Sandia National Laboratories  
Albuquerque, New Mexico

**EPA ID No.:** NM5890110518

**Permit Basis:** Chemical Waste Landfill Post-Closure Care Permit, issued October 15, 2009, effective June 2, 2011, and subsequently modified.

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#### **Annex**

Annex A	Chemical Waste Landfill CY 2015 Groundwater Monitoring Forms and Reports
Annex B	Chemical Waste Landfill CY 2015 Soil-Gas Monitoring Forms and Reports
Annex C	Chemical Waste Landfill CY 2015 Post-Closure Inspection Forms
Annex D	Chemical Waste Landfill CY 2015 Biology Report

## ACRONYMS AND ABBREVIATIONS

AOP	administrative operating procedure
AR/COC	analysis request chain of custody
bgs	below ground surface
CAMU	Corrective Action Management Unit
CFR	Code of Federal Regulations
Closure Plan	Chemical Waste Landfill Final Closure Plan
CWL	Chemical Waste Landfill
CY	calendar year
DOE	U.S. Department of Energy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ET	evapotranspirative
eV	electron volt
gpm	gallons per minute
KAFB	Kirtland Air Force Base
LCL	lower confidence limit
LE	Landfill Excavation
MDL	method detection limit
µg/L	micrograms per liter
mg/L	milligrams per liter
NMED	New Mexico Environment Department
NTU	nephelometric turbidity units
ORP	oxidation-reduction potential
PCCP	Post-Closure Care Permit
PCE	tetrachloroethene
pH	potential of hydrogen (negative logarithm of the hydrogen ion concentration)
PID	photoionization detector
ppbv	parts per billion by volume
ppmv	parts per million by volume
PQL	practical quantitation limit
QC	quality control
RPD	relative percent difference
Sandia	Sandia Corporation
SAP	sampling and analysis plan
SC	specific conductance
SNL	Sandia National Laboratories
SNL/NM	Sandia National Laboratories, New Mexico
TCE	trichloroethene (also trichloroethylene)
UCL	upper confidence limit
VCM	Voluntary Corrective Measure
VE	Vapor Extraction
VOC	volatile organic compound

## 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.

The Chemical Waste Landfill (CWL) at SNL/New Mexico (SNL/NM) is a remediated hazardous waste landfill that underwent closure in accordance with Title 20, Chapter 4, Part 1 of the New Mexico Administrative Code (20.4.1.600 NMAC), incorporating Title 40, Code of Federal Regulations (CFR), Part 265, (40 CFR 265) Subpart G, and the CWL Final Closure Plan (Closure Plan) (SNL/NM December 1992 and subsequent revisions). The CWL Post-Closure Care Permit (PCCP) (NMED October 2009), which became effective June 2, 2011 (Kieling June 2011) and as modified, defines all post-closure requirements. There were no PCCP modifications in CY 2015. The modification history of the PCCP through calendar year (CY) 2015 is documented in Chapter 7, along with a summary of the submittals associated with the PCCP through CY 2015.

All PCCP monitoring, inspection, and maintenance/repair requirements have been met for CY 2015. This CWL Annual Post-Closure Care Report documents all activities and results as required by the PCCP Attachment 1, Section 1.12. Based upon monitoring, inspection, and maintenance results, the evapotranspirative (ET) Cover is functioning as designed and site conditions remain protective of human health and the environment. No groundwater or soil-vapor monitoring trigger levels were exceeded. Industrial land use is being maintained for the CWL consistent with PCCP requirements.

### 1.1 Purpose and Scope

The purpose of this CWL Annual Post-Closure Care Report is to document monitoring, inspection, maintenance, and repair activities conducted during CY 2015 in accordance with Attachment 1 of the PCCP (NMED October 2009 and subsequent revisions). This annual report documents post-closure care activities conducted from January through December 2015 and fulfills the PCCP requirement for annual reporting to the New Mexico Environment Department (NMED).

The PCCP requires monitoring, inspection, and maintenance/repair activities that must be documented and reported for each CY. Monitoring activities include semi-annual groundwater monitoring for specific volatile organic compounds (VOCs) and metals, and annual vadose zone soil-gas monitoring for specific VOCs. Inspection activities are required for the following components: final cover (vegetation and surface); storm-water diversion structures; monitoring networks and sampling equipment (groundwater and soil-gas); and security fence, locks, gates, signage, and survey monuments. The CWL final cover is a vegetative at-grade soil cover, or ET Cover.

The scope of this report includes documentation of all monitoring and inspection activities for CY 2015. Monitoring and inspections performed include:

- Two semi-annual groundwater monitoring events.
- One annual soil-gas monitoring event.
- Two semi-annual inspections of the groundwater monitoring network and sampling equipment.
- One annual inspection of the soil-gas monitoring network and sampling equipment.
- One annual inspection of final cover vegetation (i.e., biology inspection of the ET Cover).
- Four quarterly inspections of the final cover surface (i.e., physical features and specific biological parameters), storm-water diversion structures, fence, locks, gates, signs, and survey monuments.

This CY 2015 report is organized as follows:

- Chapter 1 presents background information, purpose and scope, and report organization.
- Chapter 2 provides a description of the final cover system, compliance monitoring system (groundwater and soil-gas), storm-water diversion structures, and security fence (fence, locks, gate, signage, and survey monuments).
- Chapter 3 presents monitoring and inspection, maintenance, and repair requirements.
- Chapter 4 presents groundwater monitoring activities and results.
- Chapter 5 presents soil-gas monitoring activities and results.
- Chapter 6 presents inspection, maintenance, and repair activities and results.
- Chapter 7 summarizes regulatory activities.
- Chapter 8 presents a general summary and conclusions for the 2015 reporting period.
- Chapter 9 lists the references cited in this report.

Annexes are provided that include CY 2015 supporting information as follows:

- Annex A – Groundwater Monitoring Forms and Reports
- Annex B – Soil-Gas Monitoring Forms and Reports
- Annex C – Post-Closure Inspection Forms
- Annex D – Chemical Waste Landfill Biology Report



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## **2.0 CHEMICAL WASTE LANDFILL POST-CLOSURE CARE CONDITIONS**

The CWL is a 1.9-acre remediated hazardous waste landfill located in the southeastern corner of SNL/NM Technical Area III (Figures 2-1 and 2-2) undergoing post-closure care in accordance with the PCCP (NMED October 2009 and subsequent revisions). From 1962 until 1981, the CWL was used for the disposal of chemical and solid waste generated by SNL/NM research activities. Additionally, a small amount of radioactive waste was disposed of during the operational years. Disposal of liquid waste in unlined pits and trenches ended in 1981, and after 1982 all liquid waste disposal was terminated. From 1982 through 1985, only solid waste was disposed of at the CWL, and after 1985 all waste disposal ended. The CWL was also used as a hazardous waste drum-storage facility from 1981 to 1989. A summary of the CWL disposal history is presented in the Closure Plan (SNL/NM December 1992) along with a waste inventory based upon available disposal records and information.

### **2.1 Background**

Two voluntary corrective measures (VCMs) were conducted during closure of the CWL. A soil-vapor extraction (VE) VCM was conducted from 1997 through 1998 to reduce the concentrations of VOC soil gas in the vadose zone, to control the VOC soil-gas plume, and to reduce groundwater trichloroethene (TCE) concentrations below the regulatory standard of 5 micrograms per liter ( $\mu\text{g/L}$ ). TCE concentrations in groundwater have been below 5  $\mu\text{g/L}$  since completion of the VE VCM in 1998. Following the VE VCM, the CWL Landfill Excavation (LE) VCM was conducted from September 1998 through February 2002. All former disposal areas were excavated during the LE VCM. The excavation was backfilled and an ET cover was constructed over the CWL.

Additional information on the VCMs, other closure activities, and CWL current conditions can be found in the CWL Final Resource Conservation and Recovery Act Closure Report for the CWL (SNL/NM September 2010), the PCCP (NMED October 2009 and subsequent revisions), the CWL Corrective Measures Study Report (SNL/NM December 2004), and previous annual reports. Detailed information on residual soil contamination at the CWL can be found in Part 3, Section 3.1 and Table 3-1 of the PCCP (NMED October 2009 and subsequent revisions).

### **2.2 Final Cover System**

The CWL final cover is a centrally crowned "at-grade" ET Cover designed to minimize infiltration of moisture into the former disposal area and to minimize long-term maintenance consistent with 40 CFR 264.111(a). The crown of the cover slopes to the north and south at a 1-percent grade, and east to west at a 3-percent grade, to minimize erosion losses and control run-on/run-off. The ET Cover consists of two discrete layers; a 3-foot-thick native soil layer installed from 4 feet below ground surface (bgs) to 1 foot bgs, and a topsoil layer (approximately 1.5-feet thick) installed from 1 foot bgs to the local grade. The topsoil layer was revegetated with native plants

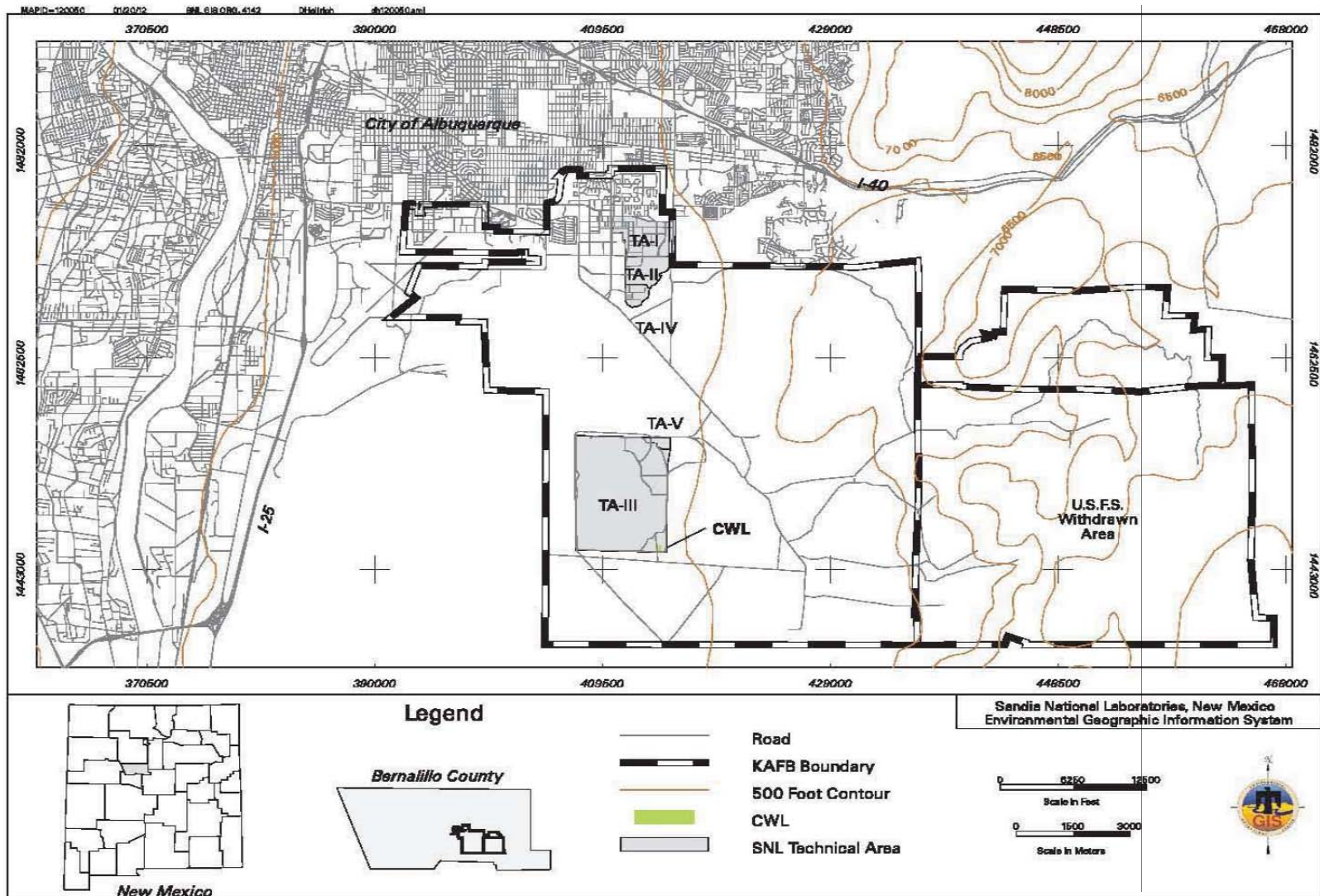


Figure 2-1  
Location of the Chemical Waste Landfill with respect to Kirtland Air Force Base and the City of Albuquerque

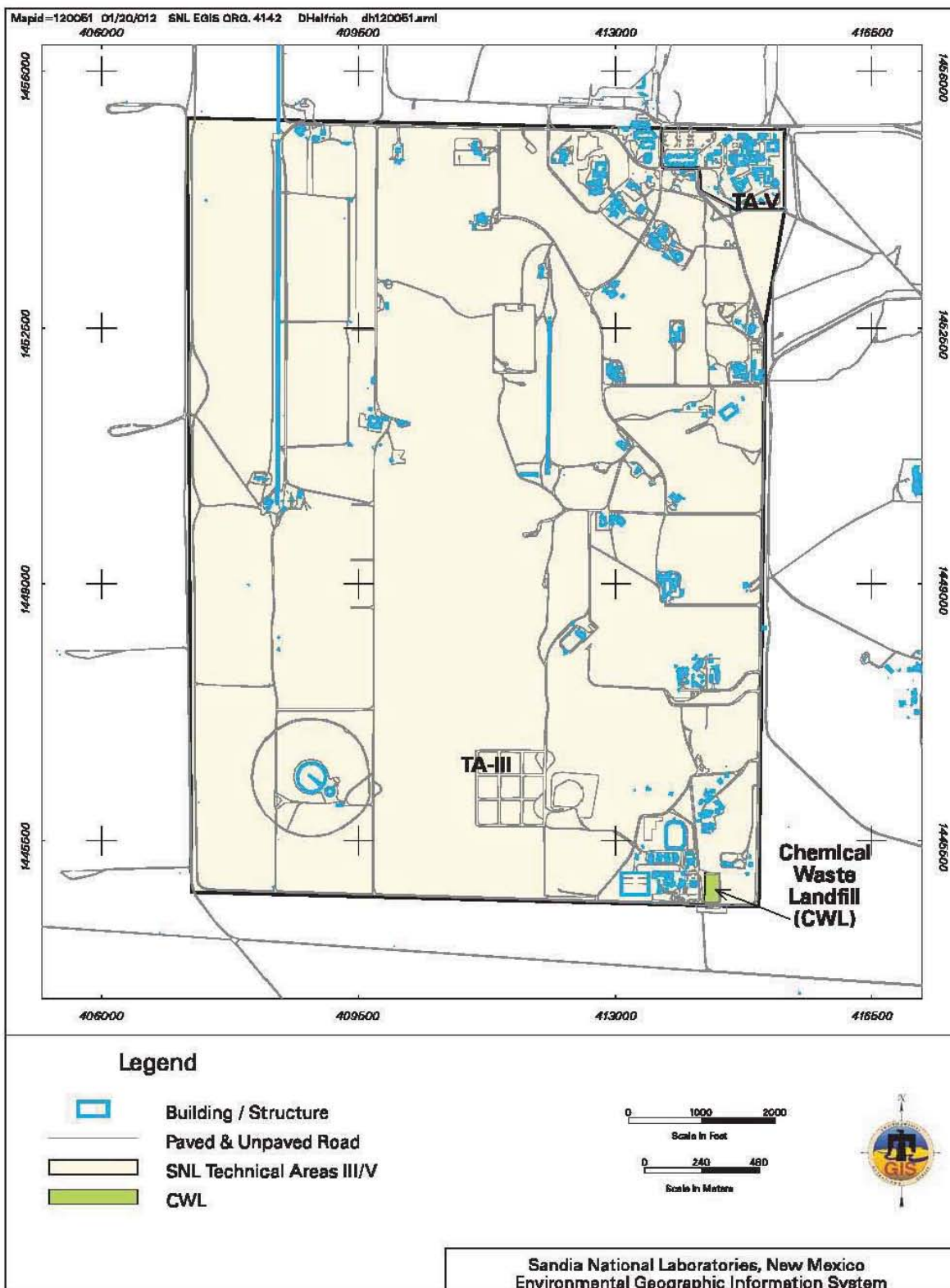


Figure 2-2  
Location of the Chemical Waste Landfill within Technical Area III

according to the specifications contained in the Remedial Action Proposal, Annex I, Corrective Measures Study Report (SNL/NM December 2004). Figure 2-3 shows a conceptual schematic profile of the ET Cover and Figure 2-4 shows the central crown and surface drainage patterns.

## **2.3 Compliance Monitoring System**

The compliance monitoring system includes a groundwater monitoring well network and a soil-gas monitoring well network, which are described in the following sections.

### **2.3.1 Groundwater Monitoring Network**

Groundwater monitoring is performed to ensure the protection of groundwater during the compliance and post-closure care periods. The CWL groundwater monitoring network consists of four NMED-approved monitoring wells that monitor the uppermost part of the regional aquifer in accordance with the requirements of 40 CFR 264.99. The four wells are described below and their locations are shown in Figure 2-4.

- One hydraulically upgradient background well – CWL-BW5, and
- Three hydraulically downgradient compliance wells – CWL-MW9, CWL-MW10, and CWL-MWL11.

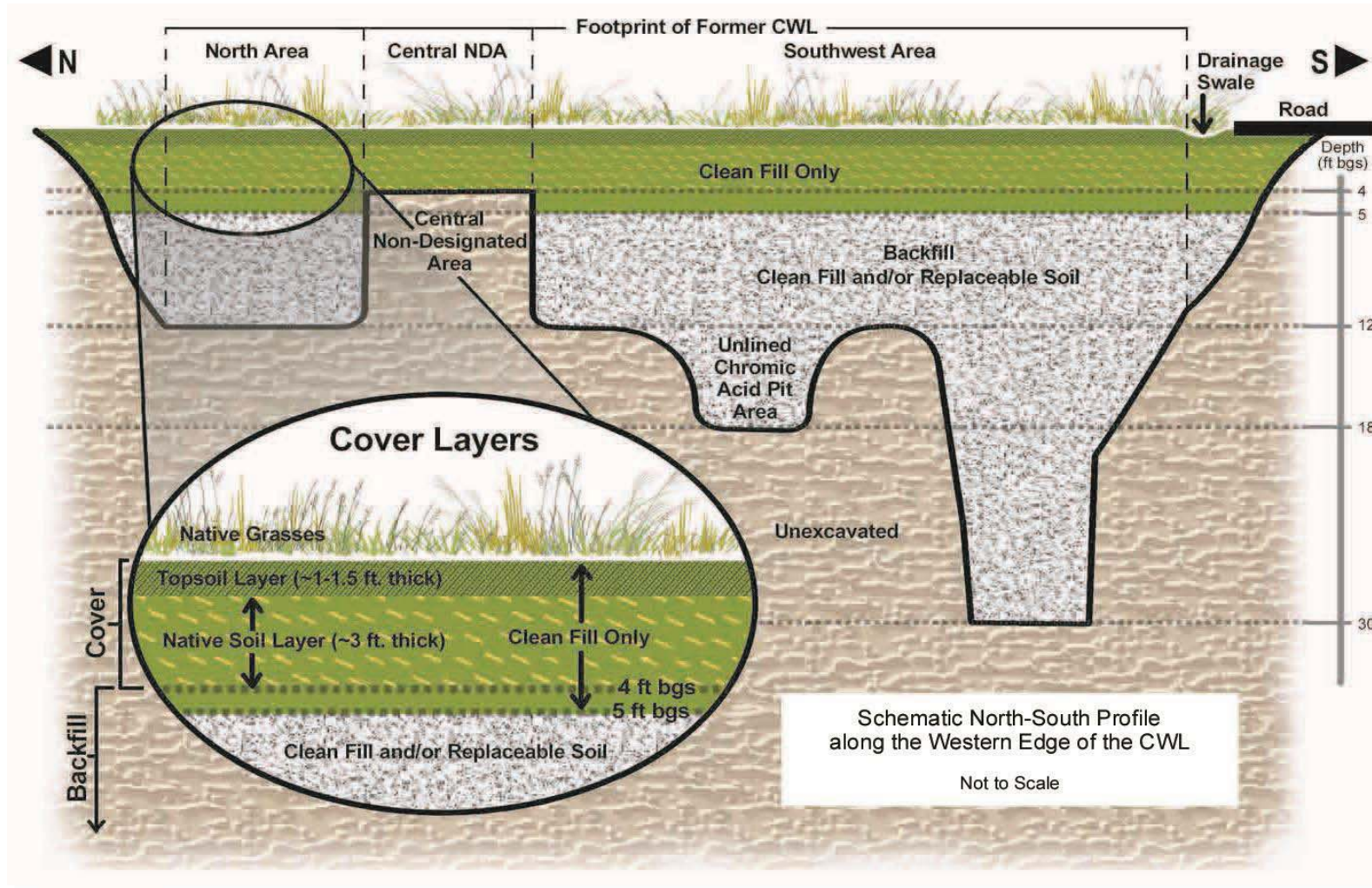
Well-completion diagrams for the groundwater monitoring wells are provided in Attachment 2 of the PCCP (NMED October 2009 and subsequent revisions).

### **2.3.2 Soil-Gas Monitoring Network**

The soil-gas monitoring network is designed to ensure the protection of groundwater quality by providing early detection data to indicate whether the VOC soil-gas plume has the potential to contaminate groundwater at concentrations exceeding regulatory concentration limits. The five multiport wells, shown in Figure 2-4, are designed to monitor the vadose zone at various depths beneath the CWL in the area most contaminated by past disposal of organic liquid waste. The wells and their depth-specific sampling ports are as follows:

- D1 – Sampling Ports at 100, 160, 240, 350, and 470 feet bgs (5 ports)
- D2 – Sampling Ports at 120, 240, 350, 440, and 470 feet bgs (5 ports)
- D3 – Sampling Ports at 120, 170, 350, 440, and 480 feet bgs (5 ports)
- UI1 – Sampling Ports at 40, 80, and 120 feet bgs (3 ports)
- UI2 – Sampling Ports at 36, 76, and 136 feet bgs (3 ports)

Well-completion diagrams for all of the soil-gas monitoring wells are provided in Attachment 3 of the PCCP (NMED October 2009 and subsequent revisions).



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Figure 2-3  
Schematic Profile of the Chemical Waste Landfill Evapotranspirative Cover

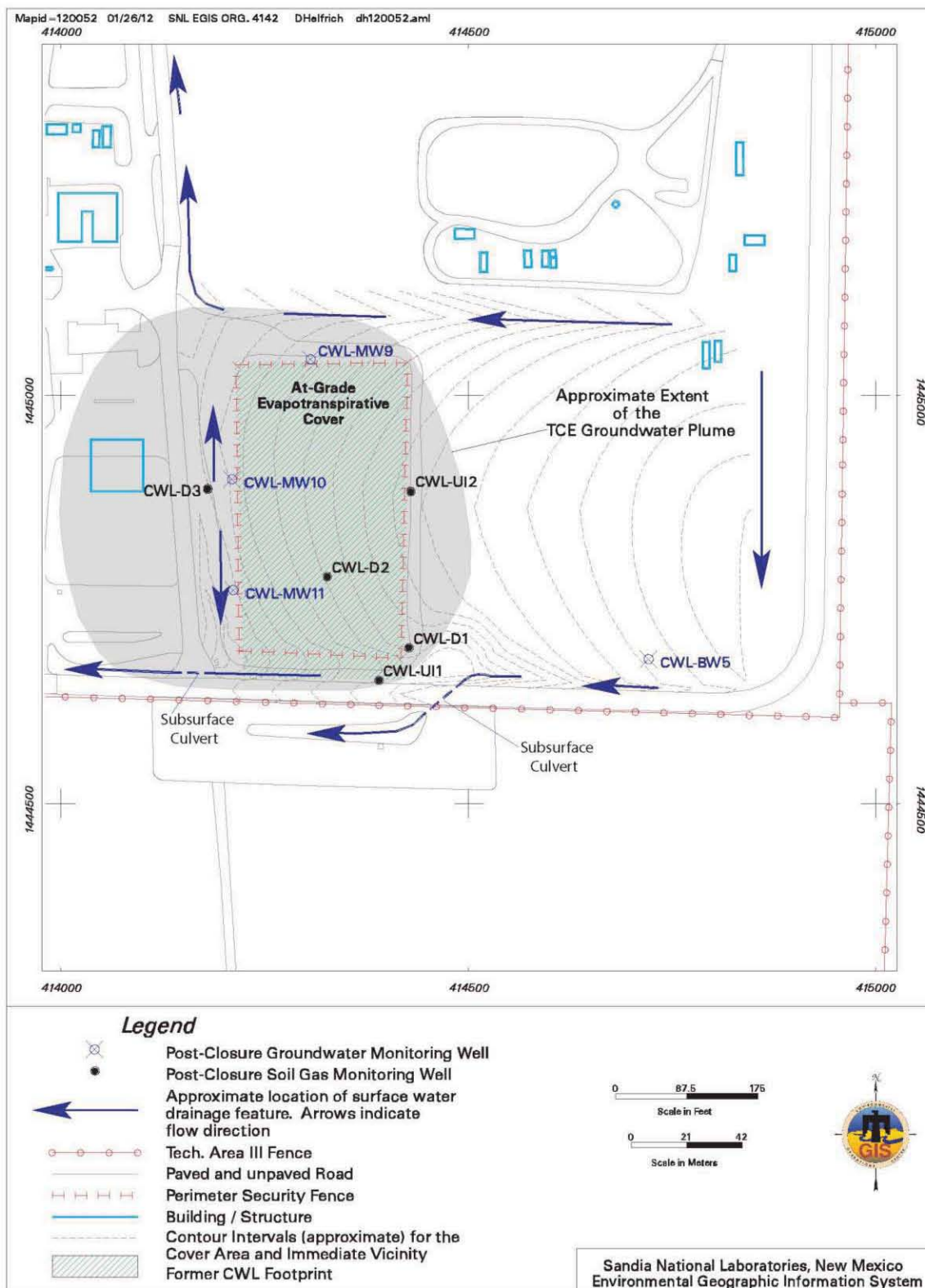


Figure 2-4  
 Chemical Waste Landfill Surface Drainage Patterns and Monitoring Networks

## **2.4 Storm-Water Diversion Structures**

The function of the storm-water diversion features associated with the CWL is to minimize soil erosion caused by storm-water run-on and run-off and to reduce the amount of water that could potentially percolate into the former disposal area. Drainage features are shown in Figure 2-4 and include: ET Cover surface topography/slopes that direct water away from and off the ET Cover surface; road ditches; boundary swales; and two ditch drainage culverts at the southeastern and southwestern corners of the CWL that divert surface-water from the road ditch away from the CWL. The slight northeast and southeast inflection of the surface topography to the east of the ET Cover prevents significant run-on by directing the upgradient surface water toward the northern and southern boundary swales (Figure 2-4). Precipitation that falls directly on the ET Cover is diverted toward the boundary swales that intersect at the northwestern and southwestern corners of the site; its impact is minimized by the native vegetation, the central crown, and gently sloping topography (approximately 3-percent grade from east to west) of the ET Cover surface.

## **2.5 Security Fence**

The location of the perimeter security fence is shown in Figure 2-4. It is a four-strand, barbed-wire fence with two gates. The gates remain locked except during inspections, maintenance, and monitoring activities. The keys to the locks are controlled by authorized personnel. Warning signs are posted on all sides of the CWL fence at 100-foot intervals and at the gates.



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### **3.0 MONITORING AND INSPECTION REQUIREMENTS**

Monitoring, inspection, maintenance, and repair requirements are defined in the PCCP Attachment 1 (NMED October 2009 and subsequent revisions) and briefly summarized in this chapter. Monitoring requirements include groundwater and soil-gas, which generate empirical data that are evaluated to assess site conditions during the compliance and post-closure care periods. Inspection requirements apply to the final cover, storm-water diversion structures, compliance monitoring system, and security fence. Emergency equipment required by the CWL Contingency Plan (PCCP Attachment 6) is also subject to routine inspections. Maintenance and/or repairs are performed based upon the inspection results. Inspection, maintenance, and repair are performed to ensure the adequate performance of the ET Cover, monitoring networks, and surface features throughout the post-closure care period.

Monitoring, inspection, and maintenance/repair activities were conducted in CY 2015 in accordance with PCCP Attachment 1, Sections 1.8 through 1.10. Results of CY 2015 monitoring, inspection, and repair activities are presented in Chapters 4.0, 5.0, and 6.0. The following sections provide information specific to the requirements for each type of monitoring and inspection activity under the PCCP.

#### **3.1 Monitoring Requirements**

The frequency, parameters/constituents of concern, and methods for groundwater and soil-gas monitoring are summarized in Table 3-1. The groundwater and soil-gas monitoring networks are described in Section 2.3.1 and 2.3.2 respectively. The groundwater and soil-gas monitoring requirements are detailed in PCCP Attachment 1, Section 1.8. Sampling and analysis plans (SAPs) in PCCP Attachments 2 and 3, respectively, describe the procedures, methods, and analytical protocols for collecting and analyzing groundwater and soil-gas samples.

For all groundwater monitoring events, environmental samples must be analyzed for TCE, chromium, and nickel. Additionally, during one semi-annual event each year, environmental samples must be analyzed for an enhanced list of VOCs comprised of 1,1,2-trichloro-1,2,2-trifluoroethane (commonly known as Freon 113), tetrachloroethene (PCE), 1,1-dichloroethene (commonly known as 1,1-DCE), chloroform, and trichlorofluoromethane (commonly known as Freon 11). Groundwater surface elevation must be measured each time groundwater is sampled and the groundwater flow rate, hydraulic gradient, and flow direction must be determined annually.

Soil-gas monitoring must be performed annually in accordance with the Soil-Gas SAP (PCCP Attachment 3) using U.S. Environmental Protection Agency (EPA) Compendium Method TO-14 (EPA January 1999a) or equivalent (i.e., such as the newer method TO-15 [EPA January 1999b]) to ensure the collection of data in a manner consistent with historic soil-gas monitoring. Consistency in sampling and analysis is necessary so that results can be evaluated over time to determine changes/trends in soil-gas concentrations. As part of Sandia's commitment to process improvement, EPA Method TO-15 has been used since CY 2013. This method provides lower detection limits and enhanced quality assurance, quality control measures relative to the EPA Method TO-14.

Table 3-1  
 Chemical Waste Landfill Groundwater and  
 Soil-Gas Monitoring Frequency, Parameters, and Methods

Monitoring System	Monitoring Frequency	Monitoring Parameters/ Constituents of Concern	Monitoring Method
Groundwater	Semi-Annual <sup>a</sup>	TCE by EPA Method 8260 <sup>b</sup> and Cr and Ni by EPA Method 6020 <sup>b</sup>	Sampling and Analysis per PCCP Attachment 2
Soil-Gas	Annual	VOCs <sup>c</sup> by EPA Compendium Method TO-15 or equivalent <sup>d</sup>	Sampling and Analysis per PCCP Attachment 3

Notes:

<sup>a</sup>Semi-Annual: An enhanced list of constituents must be analyzed on an annual basis (see Section 1.8.1.1 of PCCP Attachment 1).

<sup>b</sup>EPA November 1986.

<sup>c</sup>See Table 1-5 in PCCP Attachment 1 for the required list of 50 VOCs.

<sup>d</sup>Use of an analytical method TO-15, or equivalent, was approved by NMED in February 2012 as part of a PCCP modification (Kieling February 2012).

Cr = chromium.

EPA = U.S. Environmental Protection Agency.

Ni = nickel.

PCCP = Post-Closure Care Permit.

TCE = trichloroethene (also trichloroethylene).

VOC = volatile organic compound.

### 3.2 Inspection, Maintenance, and Repair Requirements

Inspection requirements for the final cover system, storm-water diversion structures, compliance monitoring system, security fence, and emergency equipment are briefly summarized in this section and detailed in PCCP Attachment 1, Section 1.9. All inspections were performed by personnel who meet the qualification and training requirements of PCCP Attachment 5. The schedule for implementing inspections and prescribed maintenance and/or repairs is provided in PCCP Attachment 1, Section 1.10, Table 1-6. Maintenance and/or repairs are performed as needed based upon the inspection results and in accordance with best management practice.

#### 3.2.1 Final Cover System Inspection/Maintenance/Repair Requirements

Inspection of the final cover includes vegetation inspection and monitoring by the staff biologist (i.e., biology inspection) and cover inspection by a field technician.

##### 3.2.1.1 *Vegetation Inspection and Monitoring*

Achieving and maintaining a sustainable native plant community on the final cover is an important component of overall ET Cover performance. Vegetation minimizes erosion by stabilizing the ET Cover surface and reduces infiltration of surface water by transferring soil moisture from the ET Cover to the atmosphere through transpiration.

Cover vegetation monitoring is to be accomplished in a two-phase approach. The first phase concentrates on establishing the vegetation on the ET Cover from seed to a mature plant

community such that successful revegetation criteria (defined in PCCP Attachment 1 Section 1.9) are met. These criteria are provided 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).

During this first phase of vegetation inspection and monitoring a staff biologist must inspect and document the inventory of the main flora populating the cover on a quarterly basis. These inspections are to be documented on the Biology Inspection Form/Checklist (PCCP Attachment 4 or equivalent) and include inspecting the cover for contiguous areas lacking vegetation in excess of 200 square feet, signs of animal intrusion, and deep-rooted plants. Repairs required as a result of the inspections to address vegetation parameters not meeting PCCP specifications are to be performed as described in Section 3.2.1.3. At the end of each CY, the staff biologist must compile the results of the quarterly inspections, summarize local climate trends, and present recommendations in a summary report to be included in the annual CWL post-closure care report submitted to NMED.

Once successful revegetation criteria are met, the second phase of cover vegetation inspection and monitoring begins. During this phase the staff biologist inspection frequency changes to annual. The biology inspection is to occur near the end of the growing season (August-September) to most accurately determine the coverage of living plants. As with the first phase, the inspection is to be documented on the Biology Inspection Form/Checklist (PCCP Attachment 4 or equivalent), include inspection results for the same parameters, and be documented in a summary report along with a summary of local climate trends and recommendations.

### *3.2.1.2 Cover Inspection Requirements*

Cover inspections are required to be performed by a field technician on a quarterly basis to assess the physical integrity of the ET Cover. Settlement of the cover surface in excess of 6 inches, erosion of the cover soil in excess of 6 inches deep, areas of ponding water, animal intrusion burrows in excess of 4 inches in diameter, contiguous areas lacking vegetation in excess of 200 square feet, and any other conditions that may impact the cover integrity must be documented on the Post-Closure Inspection Form/Inspection Checklist (PCCP Attachment 4 or equivalent). During the first phase of quarterly cover vegetation monitoring described in Section 3.2.1.1, documentation of animal intrusion burrows in excess of 4 inches in diameter and contiguous areas lacking vegetation in excess of 200 square feet are addressed on the Biology Inspection Form/Checklist (or equivalent). During the second phase of annual cover vegetation monitoring, these inspection parameters must be noted by the field technician on the Post-Closure Inspection Form/Checklist (or equivalent).

### 3.2.1.3 *Cover Repairs*

Cover damage exceeding PCCP specifications must be repaired within 60 days to a condition that meets or exceeds the original design. However, repairs to fix inadequate cover vegetation may be delayed until the appropriate growing season if approved by NMED in advance, and if measures are taken as needed to prevent excessive erosion of the ET Cover during the delay period. Repairs to the cover are to be completed using materials consistent with the cover installation specifications in accordance with PCCP Attachment 1, Section 1.9.1.3.

### 3.2.2 Storm-Water Diversion Structure Inspection Requirements

Inspection of the storm-water diversion structures is required on a quarterly basis to verify structural integrity and to ensure adequate performance. These inspections are to be performed at the same time as the cover inspections. Erosion of the channels or sidewalls in excess of 6 inches deep, accumulations of silt greater than 6 inches deep, or debris that blocks more than one-third of the channel width must be documented on the Post-Closure Inspection Form/Inspection Checklist (PCCP Attachment 4 or equivalent). Repairs, if needed, will be completed within 60 days.

### 3.2.3 Monitoring Well Network Inspection Requirements

Inspection of monitoring wells and sampling equipment is required at the same frequency as the associated monitoring, and is to be performed concurrently with all groundwater and soil-gas monitoring events. Inspections must be documented on the Post-Closure Inspection Form/Inspection Checklist (PCCP Attachment 4 or equivalent) and address the condition of the components including protective casings and bollards, wellhead covers/caps/locks, soil-gas sampling ports, well identification markings, and passive venting BaroBalls™ or equivalent devices. Sampling pumps and tubing are inspected during each sampling event (pumps are not dedicated to the wells). Pump replacement and maintenance/repair, and tubing replacement are performed on an as-needed basis based upon pump and tubing performance, inspections, project experience, and review of analytical sampling results. Accumulation of wind-blown plants and debris that would interfere with any of the groundwater or soil-gas monitoring network components will also be documented and the material removed during these inspections, or within 60 days.

### 3.2.4 Security Fence Inspection Requirements

Inspection of the fence, gates, locks, and warning signs at the CWL is required on a quarterly basis and is to be performed concurrently with the cover inspection. The condition of the fence, including fence wires, posts, gates, locks, and warning signs, is to be inspected and documented on the Post-Closure Inspection Form/Inspection Checklist (PCCP Attachment 4 or equivalent). Accumulation of wind-blown plants and debris on the fence that would obscure warning signs or block access to the CWL will be documented during the inspection and the material removed within 60 days. Local survey monuments must also be inspected and excess soil and/or vegetation covering these features will be removed within 60 days.

### 3.2.5 Emergency Equipment Inspection Requirements

Inspection of emergency equipment is required on a quarterly basis. Emergency equipment is maintained at the nearby Corrective Action Management Unit (CAMU) for use at the CWL, if necessary. A list of emergency equipment and its location is provided in PCCP Attachment 6, Table 6-4.

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## 4.0 GROUNDWATER MONITORING RESULTS

This chapter presents groundwater monitoring activities (i.e., sampling and analysis), analytical results, and data evaluation for CY 2015 in accordance with PCCP Attachment 1, Sections 1.8 and 1.12, and Attachment 2 (NMED October 2009 and subsequent revisions). Groundwater sampling field activities are described in Section 4.1, analytical laboratory results and a discussion of data quality are presented in Section 4.2, data evaluation requirements and results are presented in Section 4.3, and hydrogeologic information on the regional aquifer is presented in Section 4.4. A summary of groundwater monitoring activities and results is provided in Section 8.1.

### 4.1 Groundwater Sampling Field Activities

This section describes groundwater monitoring activities conducted at the CWL in conformance with the CWL Groundwater SAP, PCCP Attachment 2 (NMED October 2009 and subsequent revisions), that describes the procedures, methods, and analytical protocols for collecting and analyzing groundwater samples. The data quality objective (DQO) for groundwater monitoring is to collect accurate and defensible data of high quality to determine the concentrations of hazardous constituents in the groundwater in the uppermost aquifer beneath the CWL. Field forms and documentation that address calibration of equipment, well purging and water quality measurements, and equipment decontamination activities are provided in Annex A of this report and filed in the SNL/NM Records Center.

Two semi-annual groundwater sampling events were conducted in CY 2015.

- The first sampling event was conducted January 13-19, 2015. Groundwater samples were collected from monitoring wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11, and a duplicate sample was collected from CWL-MW11. Samples collected from all wells were analyzed for TCE, chromium, nickel, and the enhanced list of VOCs. The enhanced list of VOCs includes 1,1-dichloroethene (1,1-DCE), 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113), chloroform, PCE, and trichlorofluoromethane (Freon 11) in addition to TCE.
- The second sampling event was conducted July 6-13, 2015. Groundwater samples were collected from monitoring wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11, and a duplicate sample was collected from CWL-MW10. Samples collected from all wells were analyzed for TCE, chromium, and nickel.

#### 4.1.1 Well Purging

Purging removes stagnant water from the well so that a representative groundwater sample can be collected. The minimum purge requirement for a portable piston pump is one saturated casing volume (the volume of all static water in the well screen plus the borehole annulus around the saturated screen interval). During groundwater sampling at the CWL, purging continued after meeting the minimum purge volume requirement until four stable field



measurements for temperature, specific conductance (SC), potential of hydrogen (pH), and turbidity were obtained in all monitoring wells that did not purge dry. As specified in PCCP Attachment 2, Section 2.12, groundwater stability is considered acceptable when four successive measurements are less than five nephelometric turbidity units (NTU) for turbidity or within a range of 10 percent for turbidity values greater than 5 NTU, pH is within 0.1 units, temperature is within 1.0 degree Celsius, and SC is within five percent as micromhos per centimeter. Field measurements for water quality parameters were collected using a YSI EXO1 Water Quality Meter and a HACH™ Model 2100Q portable turbidity meter. Additional water quality measurements included oxidation-reduction potential (ORP) and dissolved oxygen.

A portable Bennett Company groundwater sampling system was used to purge and collect groundwater samples from all wells. Consistent with historic monitoring results, minimum purge requirements were satisfied at all monitoring wells except CWL-MW10. In accordance with PCCP Attachment 2, Section 2.12, this monitoring well was purged to dryness, allowed to recover, and then sampled to collect the most representative groundwater sample possible given the low yield of this well. In an effort to decrease flow rate for CWL-MW10, the existing sampling system is equipped with a flow-meter valve located along the discharge line, and with small diameter tubing (i.e., 0.25-inch inside diameter). During the purging process at CWL-MW10, the flow rate was continually adjusted to achieve as low a flow rate as possible without causing the pump to fail. This represents a “best faith effort” to purge the wells at the slowest rate possible, given equipment limitations, as specified in PCCP Attachment 2, Section 2.12.

During January approximately 18 gallons were purged from monitoring well CWL-MW10 prior to the well going dry (purge volume requirement was approximately 28 gallons). The average flow rate was 0.11 gallons per minute (gpm), and the estimated flow rate was 0.10 gpm during the final three gallons (equivalent to 0.42 and 0.38 liters per minute, respectively). During July approximately 16.5 gallons were purged from CWL-MW10 prior to the well going dry (purge volume requirement was approximately 28 gallons). The average flow rate was 0.078 gpm, and the estimated flow rate was 0.073 gpm during the final three gallons (equivalent to 0.30 and 0.28 liters per minute, respectively).

#### 4.1.2 Field Quality Control

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

Duplicate samples were analyzed to estimate the overall reproducibility of the sampling and analysis process and were collected immediately after the original environmental sample to reduce variability caused by time and/or sampling mechanics. Equipment blank (also referred to as rinsate blank) samples were collected prior to collection of an environmental sample, to verify the equipment decontamination process. Trip blank samples are used to evaluate potential contamination by VOCs during sampling, shipment, and the laboratory process. Field blank samples are used to evaluate potential sample contamination by VOCs resulting from ambient field conditions.

The field QC samples were submitted for analysis with the groundwater samples. A brief explanation of the field QC sampling protocol for the January and July sampling events is provided below. Analytical results are presented in Section 4.2.2.

### ***First Semi-Annual Sampling Event – January 13-19, 2015***

A duplicate environmental sample was collected from CWL-MW11. One equipment blank sample was collected prior to sampling CWL-MW11. The samples were submitted for all analyses. A total of five trip blank samples were submitted with the January 2015 groundwater samples and analyzed for the enhanced list of VOCs. Two field blank samples were collected for VOC analysis (enhanced list) by pouring deionized water into sample containers at the CWL-MW9 and CWL-MW10 sample locations to simulate the transfer of environmental samples from the sampling system to the sample container. One additional field blank sample was collected from the deionized water source used for the equipment decontamination process.

### ***Second Semi-Annual Sampling Event – July 6-13, 2015***

A duplicate environmental sample was collected from CWL-MW10. One equipment blank sample was collected prior to sampling CWL-MW10. The samples were submitted for all analyses. A total of five trip blank samples were submitted with the July 2015 groundwater samples and analyzed for TCE. Four field blank samples were collected for TCE analysis by pouring deionized water into sample containers at each CWL monitoring well location to simulate the transfer of environmental samples from the sampling system to the sample container. A fifth field blank sample was collected from the deionized water source used for the equipment decontamination process.

## **4.1.3 Waste Management**

Purge and decontamination water generated from sampling activities were placed into 55-gallon containers and stored at the Environmental Resources Field Office less than 90-day waste accumulation area. Approximately 235 gallons of wastewater were generated during the January sampling event and approximately 251 gallons of wastewater were generated during the July sampling event (total of 486 gallons). Separate waste characterization samples were collected from purge and decontamination water and analyzed for discharge parameters. All wastewater was discharged to the sanitary sewer in accordance with Albuquerque Bernalillo County Water Utility Authority requirements after waste characterization data were compared to discharge limits and determined to meet these requirements.

Personal protective equipment and other solid waste generated during January and July 2015 monitoring activities were packaged into 5-gallon plastic buckets and managed as hazardous waste. This waste was managed at the Hazardous Waste Handling Unit prior to disposal at a permitted off-site facility.

## 4.2 Laboratory Results

Groundwater and field QC samples were submitted to GEL Laboratories for analyses. Samples were analyzed in accordance with applicable EPA analytical methods. For comparison, hazardous constituent concentration limits from the PCCP are included in the analytical results tables. Analytical results that are above the analytical laboratory method detection limit (MDL) but below the practical quantitation limit (PQL) are qualified as estimated values by the analytical laboratory and designated with a “J” qualifier. 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 Records Center.

### 4.2.1 Environmental Sample Results

Table 4-1 summarizes TCE results and Table 4-2 summarizes chromium and nickel results for the January and July 2015 groundwater sampling events. Table 4-3 summarizes results for the additional VOCs (enhanced list) included in the January 2015 event. Table 4-4 summarizes field water quality measurements collected prior to sampling for both events. A summary of the results from the January and July sampling events is provided below. Statistical evaluation and comparison of results to concentration limits specified in the PCCP is provided in Section 4.3.

#### ***First Semi-Annual Sampling Event – January 13-19, 2015***

TCE was detected above the laboratory MDL in the CWL-MW10 sample at a concentration of 0.480 µg/L. Chloroform in the sample from monitoring well CWL-MW10 was qualified as not detected during data validation since chloroform was detected in both the environmental and the associated trip blank samples at similar concentrations. No other VOCs were detected.

Chromium was not detected in any samples. Nickel was detected above the laboratory MDL in the CWL-MW9 and CWL-MW10 groundwater samples at concentrations of 0.000523 and 0.00135 milligrams per liter (mg/L), respectively.

#### ***Second Semi-Annual Sampling Event – July 6-13, 2015***

TCE was detected above the laboratory MDL in the CWL-MW10 sample at a concentration of 0.470 µg/L, and at a concentration of 0.450 µg/L in the CWL-MW10 duplicate sample. There were no other detections of TCE.

Chromium was not detected above the laboratory MDL in any of the groundwater samples. Nickel was detected in all samples at concentrations from 0.00191 mg/L to 0.00267 mg/L.

Table 4-1  
 Summary of Trichloroethene Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Analytical Method SW846-8260B<sup>a</sup>  
 Calendar Year 2015

Well ID	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
<b>January 2015 Sampling Event</b>					
CWL-BW5	ND	0.300	1.00	U	--
CWL-MW9	ND	0.300	1.00	U	--
CWL-MW10	0.480	0.300	1.00	J	--
CWL-MW11	ND	0.300	1.00	U	--
CWL-MW11 (duplicate)	ND	0.300	1.00	U	--
<b>July 2015 Sampling Event</b>					
CWL-BW5	ND	0.300	1.00	U	--
CWL-MW9	ND	0.300	1.00	U	--
CWL-MW10	0.470	0.300	1.00	J	--
CWL-MW10 (Duplicate)	0.450	0.300	1.00	J	--
CWL-MW11	ND	0.300	1.00	U	--

Notes:

<sup>a</sup>U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3<sup>rd</sup> edition.

<sup>b</sup>Laboratory/Validation Qualifier - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples. See explanation for "J" and "U" laboratory qualifiers below.

J = Amount detected is below the 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.

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.

U = Analyte not present or concentration is below the MDL.

Table 4-2  
 Summary of Chromium and Nickel Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Analytical Method SW846-6020<sup>a</sup>  
 Calendar Year 2015

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
<b>January 2015 Sampling Event</b>						
CWL-BW5	Chromium	ND	0.002	0.010	U	--
	Nickel	ND	0.0005	0.002	U	--
CWL-MW9	Chromium	ND	0.002	0.010	U	--
	Nickel	0.000523	0.0005	0.002	J	--
CWL-MW10	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00135	0.0005	0.002	J	J-
CWL-MW11	Chromium	ND	0.002	0.010	U	--
	Nickel	ND	0.0005	0.002	U	--
CWL-MW11 (duplicate)	Chromium	ND	0.002	0.010	U	--
	Nickel	ND	0.0005	0.002	U	--
<b>July 2015 Sampling Event</b>						
CWL-BW5	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00267	0.0005	0.002	--	J-
CWL-MW9	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00249	0.0005	0.002	--	J-
CWL-MW10	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00228	0.0005	0.002	--	--
CWL-MW10 (Duplicate)	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00232	0.0005	0.002	--	--
CWL-MW11	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00191	0.0005	0.002	J	J-

Notes:

<sup>a</sup>U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3<sup>rd</sup> edition.

<sup>b</sup>Laboratory/Validation Qualifier - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted sample. See explanation for "J," "J-," and "U" qualifiers below.

J = Amount detected is below the PQL.

J- = The associated numerical value is an estimated quantity with a suspected negative bias.

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.

U = Analyte is not present or below the MDL, if a number is shown units are mg/L.

Table 4-3  
 Summary of Additional Volatile Organic Compound Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Analytical Method SW846-8260B<sup>a</sup>  
 January 2015

Well ID	Analyte	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-BW5	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	ND	0.300	1.00	U	--
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--
CWL-MW9	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	ND	0.300	1.00	U	--
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--
CWL-MW10	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	0.580	0.300	1.00	J	1.0U
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--
CWL-MW11	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	ND	0.300	1.00	U	--
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--

Refer to footnotes at end of table.

Table 4-3 (Concluded)  
 Summary of Additional Volatile Organic Compound Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Analytical Method SW846-8260B<sup>a</sup>  
 January 2015

Well ID	Analyte	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-MW11 (Duplicate)	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	ND	0.300	1.00	U	--
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--

Notes:

<sup>a</sup>U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3<sup>rd</sup> edition.

<sup>b</sup>Laboratory/Validation Qualifier - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples.

J = Amount detected is below the 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.

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.

U = Analyte not present or concentration is below the MDL (Laboratory Qualifier). If a numerical value is provided, the provided value is the sample quantitation limit as determined by data validation (Validation Qualifier).

Table 4-4  
Summary of Field Water Quality Measurements<sup>a</sup>  
Chemical Waste Landfill Groundwater Monitoring  
Calendar Year 2015

Well ID	Temperature (°C)	SC (µmho/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (% Sat)	DO (mg/L)
<b>January 2015 Sampling Event</b>							
CWL-BW5	13.56	969.7	7.1 <sup>b</sup>	6.93	0.15	72.7	7.41
CWL-MW9	13.82	856.6	-62.5 <sup>b</sup>	7.03	0.08	31.6	3.22
CWL-MW10	16.98	899.9	-60.3 <sup>b</sup>	7.06	3.67	21.9	2.11
CWL-MW11	18.39	1005.5	-53.6 <sup>b</sup>	7.04	0.10	53.6	4.95
<b>July 2015 Sampling Event</b>							
CWL-BW5	22.91	1201.8	304.2	7.20	0.23	82.5	7.03
CWL-MW9	20.78	1029.8	224.4	7.27	0.16	37.7	3.35
CWL-MW10	21.93	1026.0	25.3	7.37	2.41	27.5	2.40
CWL-MW11	22.13	1100.6	304.2	7.27	0.47	63.9	5.28

Notes:

<sup>a</sup>Field measurements collected prior to sampling.

<sup>b</sup>ORP water quality measurements for all of the January monitoring wells are low and do not compare to historic values. The water quality meter was recalibrated each day, and all equipment calibration checks are within the manufacturer's quality control criteria. The manufacturer was contacted and determined the problem may be caused by the stainless steel contacts. The sonde was sent to the manufacturer for service.

°C = degrees Celsius.

% Sat = percent saturation.

DO = dissolved oxygen.

mg/L = milligrams per liter.

µmho/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.

#### 4.2.2 Field Quality Control Sample Results

Table 4-5 summarizes results of duplicate sample analyses and the calculated relative percent difference (RPD) values between the environmental and duplicate sample results for the January (CWL-MW11) and July (CWL-MW10) sample pairs. For the environmental-duplicate sample pair collected at CWL-MW11 in January, no VOCs or metals were detected. Therefore, RPD values were not calculated. For the environmental-duplicate sample pair collected at CWL-MW10 in July, nickel and TCE were the only analytes detected in both environmental-duplicate sample pairs. RPD values for nickel and TCE were 2 and 4, respectively, and show good agreement (i.e., RPD values < 20 for organics and < 35 for metals).

One equipment blank sample was collected in January prior to sampling monitoring well CWL-MW11 and analyzed for all constituents. Chloroform, chromium, and nickel were detected in the equipment blank sample above the associated laboratory MDLs at concentrations of 2.48 µg/L, 0.00205 mg/L, and 0.00118 mg/L, respectively. No corrective action was necessary since the constituents were not detected above laboratory MDLs in the associated environmental or duplicate samples (i.e., CWL-MW11 samples). No constituents were detected in the equipment blank sample collected in July prior to sampling CWL-MW10.



Table 4-5  
 Summary of Duplicate Sample Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Calendar Year 2015

Well ID/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD <sup>a</sup>
<b>July 2015 Sampling Event (CWL-MW10)</b>			
Trichloroethene (µg/L)	0.470	0.450	4
Nickel (mg/L)	0.00228	0.00232	2

Notes:

<sup>a</sup>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<sub>1</sub> = environmental sample result.  
 R<sub>2</sub> = duplicate sample result.

µg/L = microgram(s) per liter.

mg/L = milligram(s) per liter.

Of the two field blank samples associated with the January sampling event collected at the CWL-MW9 and CWL-MW10 locations, only chloroform was detected above the laboratory MDL in the sample associated with the CWL-MW9 location. No corrective action was required since chloroform was not detected in the associated environmental sample. No VOCs were detected above laboratory MDLs in the field blank sample associated with the CWL-MW10 location. For the five field blank samples collected in July at each of the monitoring well locations and at the deionized water source, TCE was not detected above the MDL in any of the samples.

For the five trip blank samples associated with the January VOC environmental samples, only chloroform was detected above the MDL in the trip blank associated with the groundwater sample from CWL-MW10. As a result, the chloroform detection of 0.580 µg/L in the associated CWL-MW10 environmental sample was qualified as not detected during validation because this value was less than five times the concentration reported for the trip blank sample. For the five trip blank samples associated with the July VOC environmental sampling event, TCE was not detected above the laboratory MDL.

#### 4.2.3 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 laboratory control sample results met PCCP requirements (PCCP Attachment 2). All chemical 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 2014).

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 (i.e., technically defensible). Data Validation Reports and Contract Verification Review forms are provided in Annex A of this report and are filed in the SNL/NM Records Center.

#### 4.2.4 Variances and Non-Conformances

No variances or non-conformances were identified during the January and July 2015 semi-annual groundwater sampling events. Two project specific issues from the January sampling event are summarized as follows.

During the January sampling event the ORP water quality measurements for all monitoring wells were low and did not compare to historic values. The water quality meter was recalibrated each day, and all equipment calibration checks were within the manufacture's (YSI) quality control criteria. A YSI representative was contacted and determined that low ORP readings may have resulted from bad stainless steel contacts between the probe and water quality sonde. The SNL/NM monitoring team sent the water quality sonde to YSI for service. In July another sonde was used and the water quality readings were comparable to historical field measurements.

During the January sampling event chloroform was detected at very low concentrations in the equipment blank sample and one field blank sample. Chloroform is a by-product of the deionized water purification process (i.e., chlorination) and is routinely detected in equipment and field blank samples at very low concentrations. Chloroform was also detected in one of the trip blank samples prepared and provided by GEL.

### 4.3 Data Evaluation

Groundwater monitoring is required to determine whether constituent concentrations in the groundwater beneath the CWL are in compliance with the groundwater protection standard under 40 CFR § 264.92 and for the determination of statistical significance under 40 CFR § 264.97(h). In accordance with PCCP Attachment 1, Section 1.8.1.2, statistical evaluation of groundwater monitoring results from new wells is not required until three years of groundwater sampling results have been obtained (i.e., minimum data set for statistical analysis as defined by the NMED is six analytical results). For replacement wells, historic groundwater sampling results are used to augment the data sets and increase the amount of data available for statistical analysis. Historic groundwater data is limited to data obtained no earlier than May 1998 (i.e., near the completion of the VE VCM).

Statistical evaluation of the groundwater data includes results from CWL-BW5 (and historic background well CWL-BW4A), as well as CWL-MW9, CWL-MW10, and CWL-MW11. Wells CWL-MW9, CWL-MW10, and CWL-MW11 are new wells installed in 2010 and have been sampled ten times as of July 2015 (November-December 2010, July-August 2011, January and July 2012, January and July 2013, January and July 2014, January and July 2015). Statistical

evaluation of the results from these wells was first presented in the CY 2013 Annual Report. CWL-BW5 is a replacement well for CWL-BW4A. All results for CWL-BW5 and historic results for CWL-BW4A were used for the statistical evaluation presented in the following sections.

#### 4.3.1 Statistical Assessment Requirements

Groundwater monitoring data are statistically evaluated on a well-by-well basis for each of the three hazardous constituents in accordance with the requirements stated in PCCP Attachment 1, Section 1.8.1.2. The hazardous constituents and their respective concentration limits are listed in Table 4-6. Prediction and confidence intervals are calculated and used to evaluate groundwater monitoring results. In addition, the cumulative percentage of sample results that are greater than the median (i.e., Median Test) is calculated to determine whether there is statistically significant evidence of increased contamination. If a result is below the analytical laboratory detection limits, the MDL for the constituent is used for statistical analysis. For duplicate analyses, only the highest detection is used for statistical analysis. If a detection is qualified as “not detected” during data validation due to blank contamination, the original result reported by the laboratory is used for statistical analysis. More detailed information regarding statistical assessment requirements is provided below. Statistical assessment results for CY 2015 groundwater monitoring data are presented in Section 4.3.2.

Table 4-6  
 Concentration Limits for the Hazardous Constituents of Concern at the Chemical Waste Landfill

Hazardous Constituent	Concentration Limit	Basis of Concentration Limit
Trichloroethene	5 µg/L	EPA MCL, 40 CFR § 264.94(b)
Chromium	0.050 mg/L	Table 1, 40 CFR § 264.94(a)(2)
Nickel	0.028 mg/L	SNL/NM background level, 40 CFR § 264.94(a)(1)

Notes:

- CFR = Code of Federal Regulations.
- EPA = U.S. Environmental Protection Agency.
- MCL = maximum contaminant level.
- µg/L = micrograms per liter.
- mg/L = milligrams per liter.

#### **Prediction and Confidence Intervals**

The probability that each semi-annual sample result for a given hazardous constituent falls within the range of previous sample results is determined using prediction intervals. The prediction interval for a given hazardous constituent is the range between the 95% upper confidence limit (UCL) and the 95% lower confidence limit (LCL) of the mean. Therefore, the probability of a sample result for a given hazardous constituent falling within the range of previous sample results (i.e., between the LCL and the UCL) is 90%. Strictly for comparison, CY 2015 sample results are also compared to the historic range (minimum and maximum result derived from historic results not including CY 2015 results) to determine whether they fall within, below, or above the range of previous sample results.

The 95% LCL is also used to determine statistically significant evidence that the concentration limit for the particular hazardous constituent has been exceeded (NMED October 2009 and subsequent revisions). The calculated 95% LCL is compared to the concentration limit in Table 4-6. If it exceeds the concentration limit, this is considered statistically significant evidence that the concentration limit has been exceeded, and it triggers corrective action in accordance with PCCP Attachment 1, Section 1.8.3. Individual sample results are not directly compared to concentration limits, and if an individual result exceeds the concentration limit this does not constitute an exceedance requiring corrective action.

### ***Median Test***

The median value is calculated using all historic data prior to the sampling event(s) being evaluated. For example, the median values against which the July 2015 CWL-BW5/4A sample results are compared were calculated using all historic results obtained since May 1998 (i.e., completion of the VE VCM) not including the July 2015 sample results. For the next groundwater monitoring event, the median values will be recalculated and will include the July 2015 sample results. If the cumulative percentage of results greater than the median for a given hazardous constituent is 80% or greater, that is considered statistically significant evidence of increased contamination. However, no action is required in the case of statistically significant evidence of increasing contamination unless the 95% LCL of the mean for a given constituent exceeds the respective concentration limit (NMED October 2009 and subsequent revisions).

### **4.3.2 Statistical Assessment Results**

No hazardous waste concentration limits were exceeded and there was no evidence of increasing contamination based on the statistical assessment performed in accordance with the PCCP, Attachment 1, Section 1.8.1. CY 2015 groundwater sampling data and statistical analysis for CWL-BW5/4A, CWL-MW9, CWL-MW10, and CWL-MW11 are discussed in this section. Statistical assessment results are presented in Table 4-7 and shown graphically in Figures 4-1 through 4-9.

The statistical analysis of specific constituents was not performed if all results for the data set are non-detections. The statistical analysis presented for new wells CWL-MW9, CWL-MW10, and CWL-MW11 is significantly impacted by the small data set (each contains ten data points for each constituent), the very low concentrations, and in several cases the large number of non-detect results. Because the evaluation process uses the laboratory MDL in the case of laboratory non-detections, the statistical results are also affected by changes in the MDL over time. In general the laboratory MDLs have decreased over time, which impacts the CWL-BW5/4A statistical evaluation results as the historic data set for this well includes results from 1998 through the present. For laboratory detections that are qualified during the data validation process as “not detected” (i.e., “U” qualified) due to blank contamination, the original result reported by the laboratory is used. Results qualified by the laboratory and/or data validation as estimated (i.e., “J” qualified) are used as reported. Statistical results are presented below for all cases where evaluation was possible. As routine monitoring continues and the data sets increase in size, the evaluation results will improve for detected constituents.

Table 4-7  
 Statistical Assessment Results Summary  
 Chemical Waste Landfill  
 Calendar Year 2015 Sampling Results

Hazardous Constituent <sup>a</sup>	Minimum <sup>b</sup>	Maximum <sup>b</sup>	Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	LCL <sup>c</sup>	UCL <sup>c</sup>	Distribution Type <sup>c</sup>	Median Test <sup>d</sup>	Concentration Limit Exceeded <sup>e</sup> ?
<b>CWL-BW5/4A</b>									
Chromium (mg/L)	0.00038	0.0125	0.00322	0.00304	0.00235	0.00409	Normal	41%	No
Nickel (mg/L)	0.00109	0.049	0.00522	0.00811	0.0029	0.00754	Normal	44%	No
TCE (µg/L)	0.1	0.78	0.347	0.13	0.31	0.384	Normal	3%	No
<b>CWL-MW9</b>									
Chromium (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No
Nickel (mg/L)	0.0015	0.00435	0.00274	0.00125	0.00201	0.00347	Normal	29%	No
TCE (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No
<b>CWL-MW10</b>									
Chromium (mg/L)	0.002	0.00325	0.00225	0.0005187	0.00195	0.00255	Normal	14%	No
Nickel (mg/L)	0.00234	0.00707	0.00325	0.0016	0.00232	0.00418	Normal	14%	No
TCE (µg/L)	1.11	4.68	2.36	1.621	1.421	3.299	Normal	29%	No
<b>CWL-MW11</b>									
Chromium (mg/L)	0.002	0.00304	0.00222	0.00037068	0.00201	0.00254	Normal	29%	No
Nickel (mg/L)	0.00142	0.00449	0.00245	0.00116	0.00178	0.00312	Normal	14%	No
TCE (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No

Notes:

<sup>a</sup>Hazardous Constituents from CWL Permit Attachment 1, Section 1.4.1, Table 1-2 (Table 4-6 of this report).

<sup>b</sup>Minimum and maximum result determined from historic data not including 2015 sample results.

<sup>c</sup>Mean, LCL, UCL, Standard Deviation, and Distribution Type determined using ProUCL statistical program.

<sup>d</sup>Median Test is the cumulative percentage of sample results that are greater than the median.

<sup>e</sup>Exceedance determined by comparing the sample result (Tables 4-1, 4-2, and 4-3) against the concentration limit in CWL Permit Attachment 1, Table 1-2 (Table 4-6 of this report).

CWL = Chemical Waste Landfill

LCL = lower confidence limit.

µg/L = micrograms/liter.

mg/L = milligrams/liter.

NA = Not Applicable; constituent has not been detected in any samples from this monitoring well.

TCE = trichloroethene.

UCL = upper confidence limit.

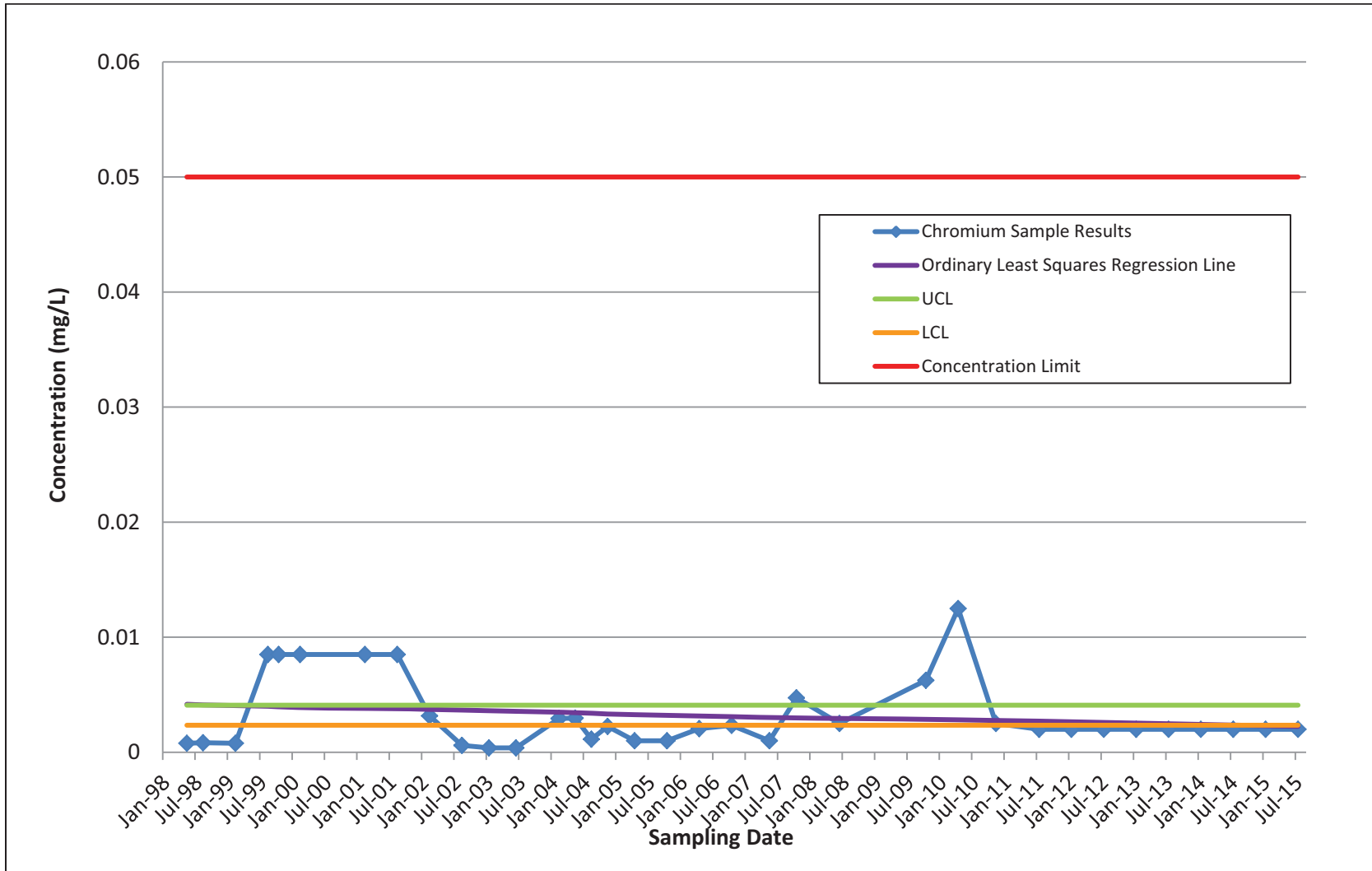


Figure 4-1  
Chromium Control Chart for CWL-BW5/4A

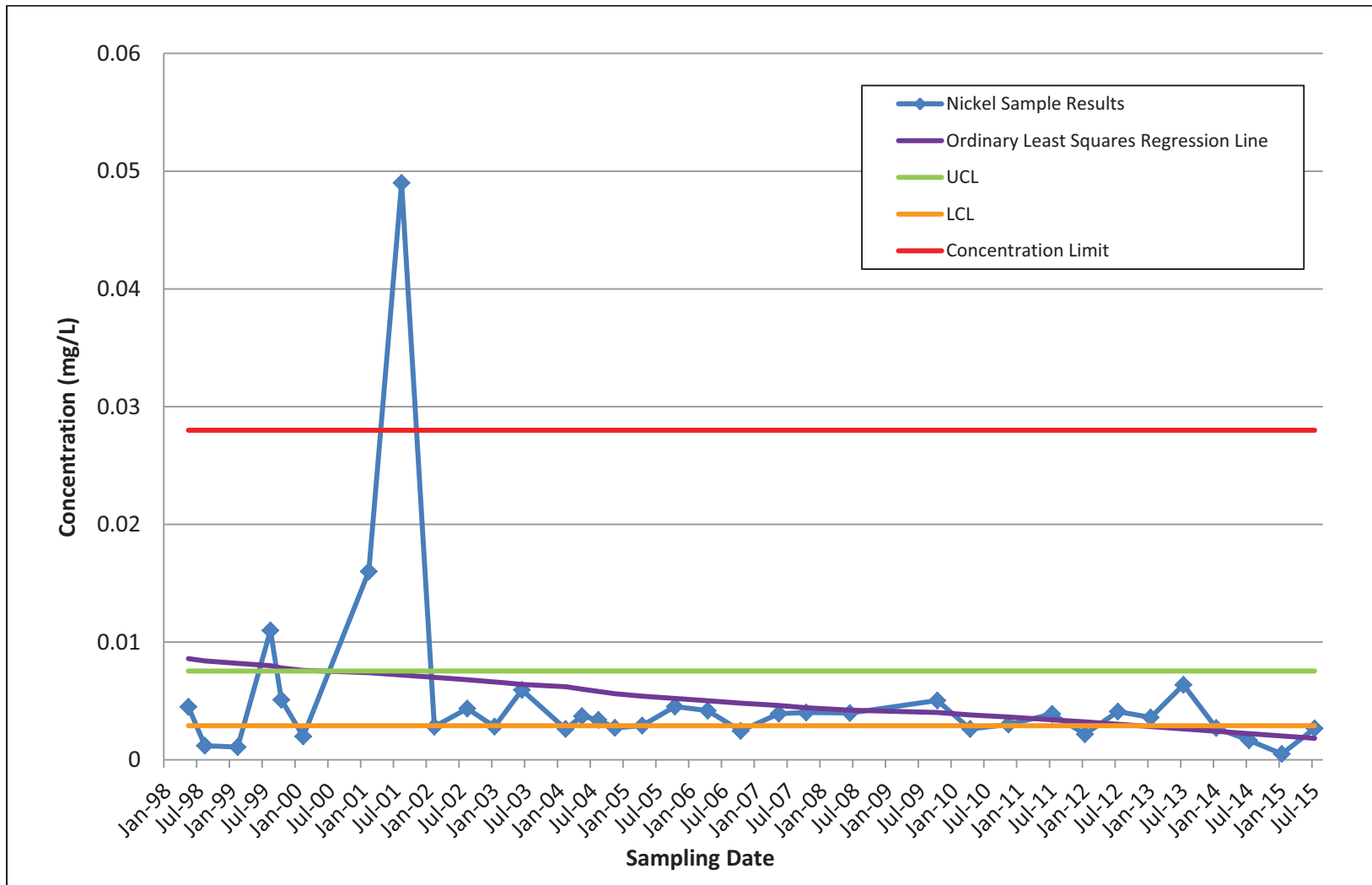


Figure 4-2  
Nickel Control Chart for CWL-BW5/4A

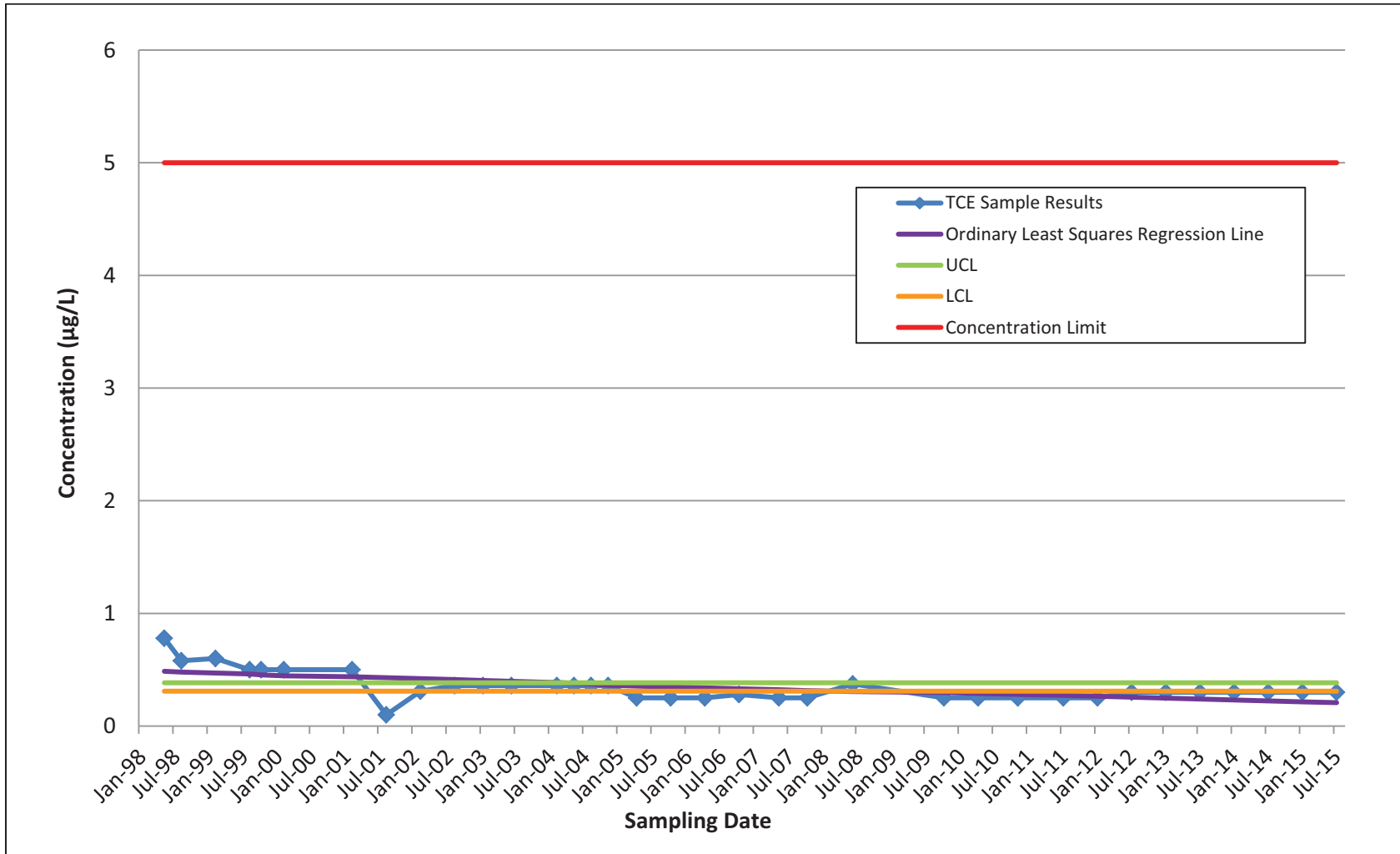


Figure 4-3  
TCE Control Chart for CWL-BW5/4A



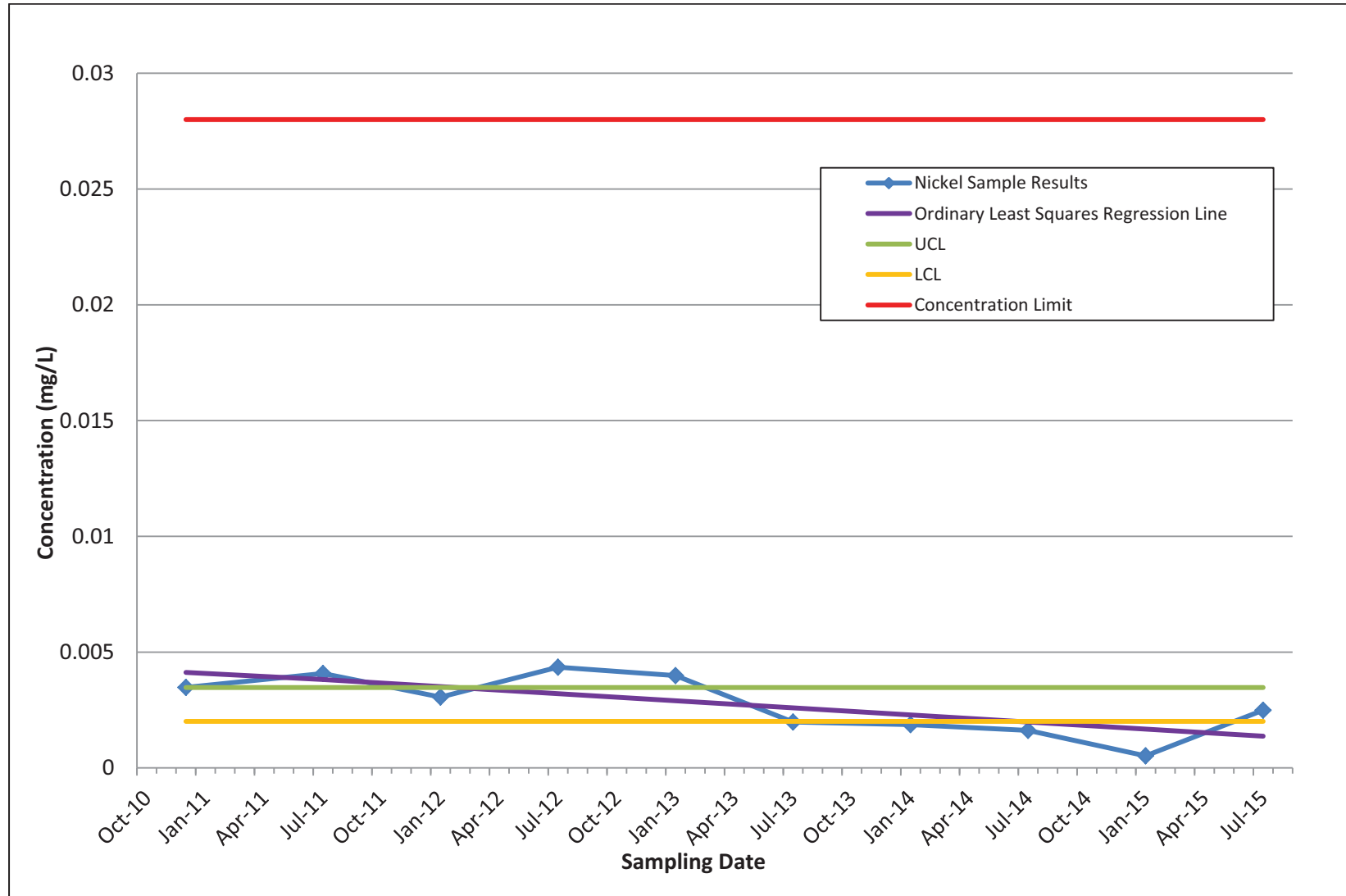


Figure 4-4  
Nickel Control Chart for CWL-MW9

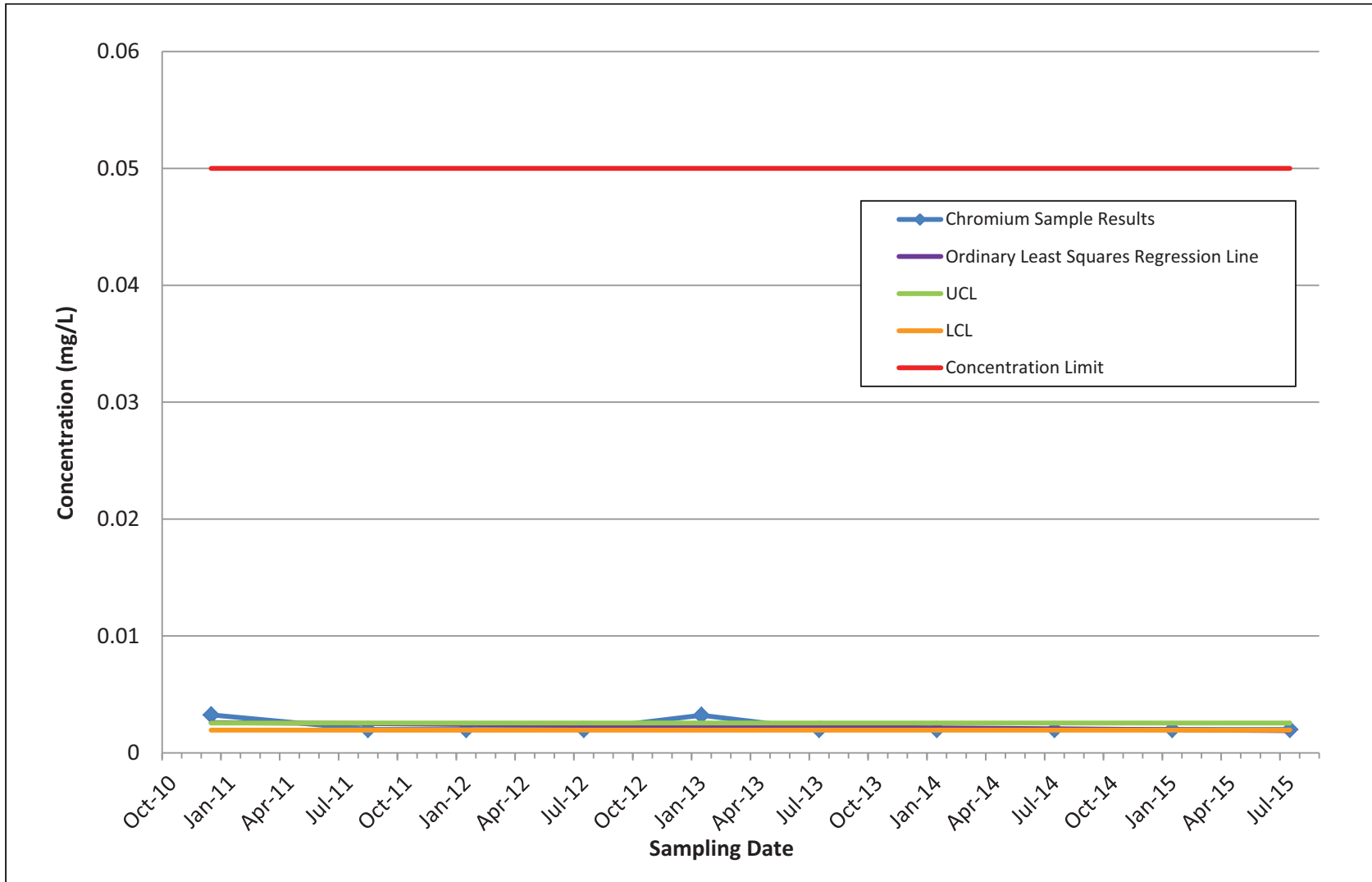


Figure 4-5  
Chromium Control Chart for CWL-MW10

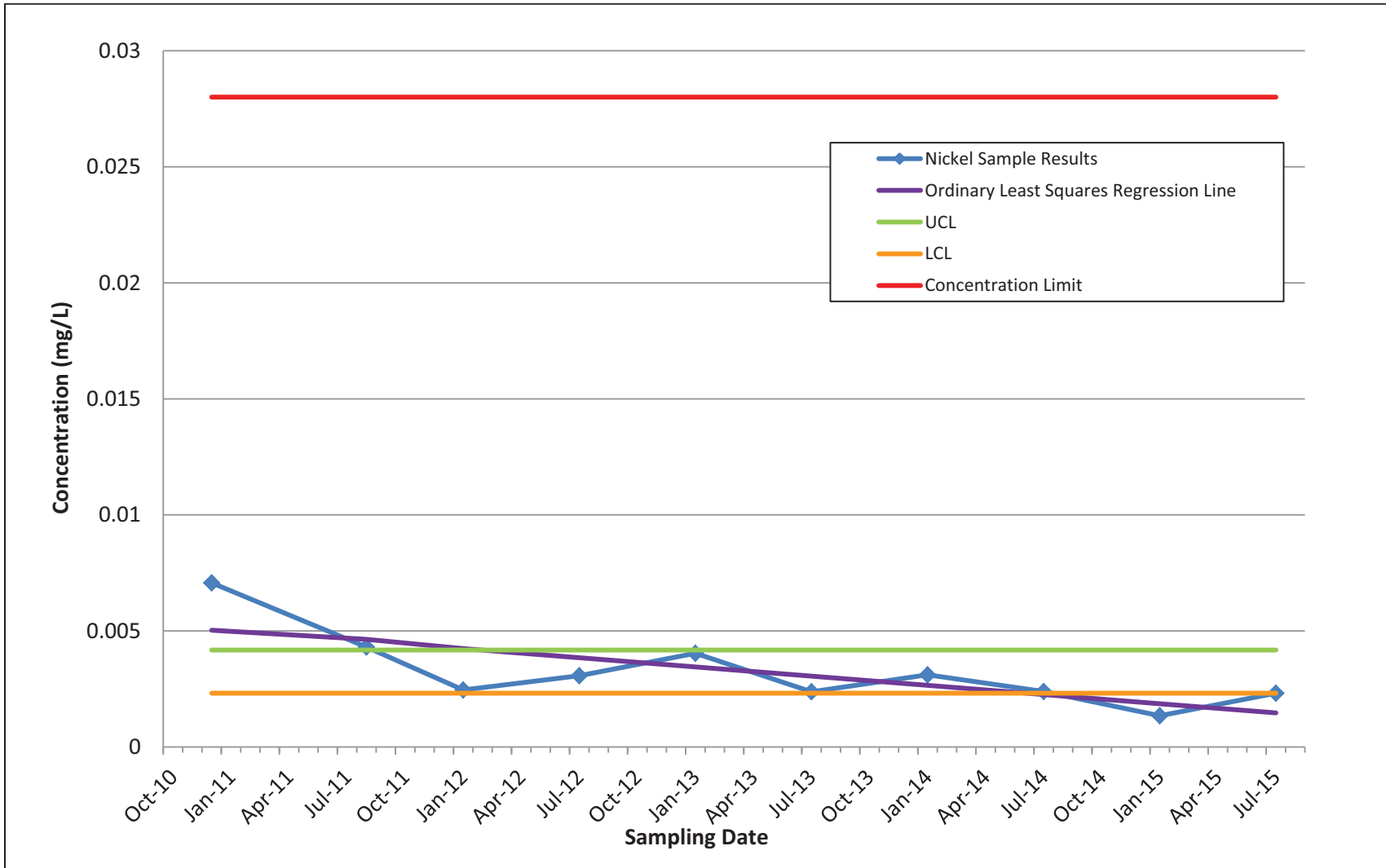


Figure 4-6  
Nickel Control Chart for CWL-MW10

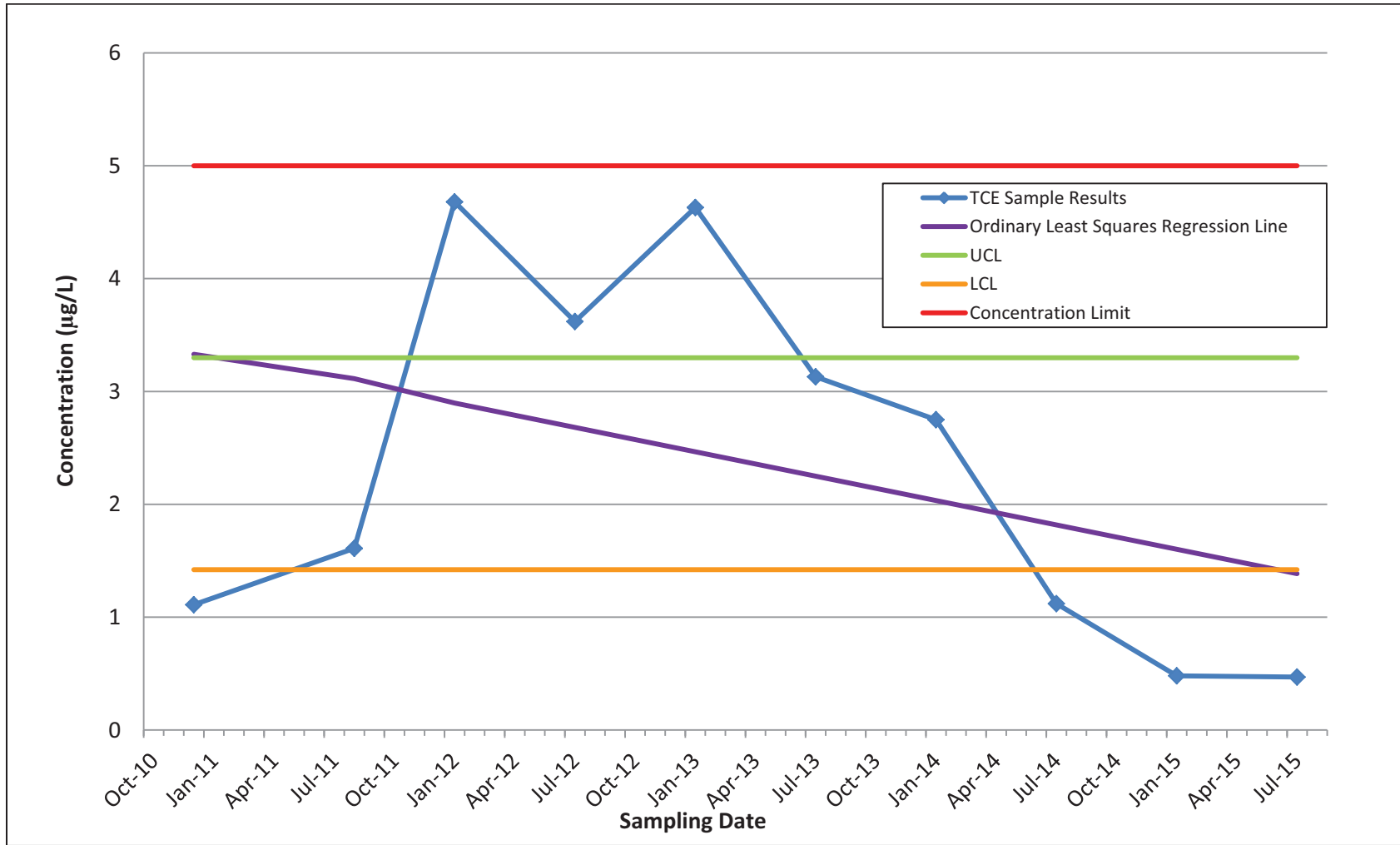


Figure 4-7  
TCE Control Chart for CWL-MW10

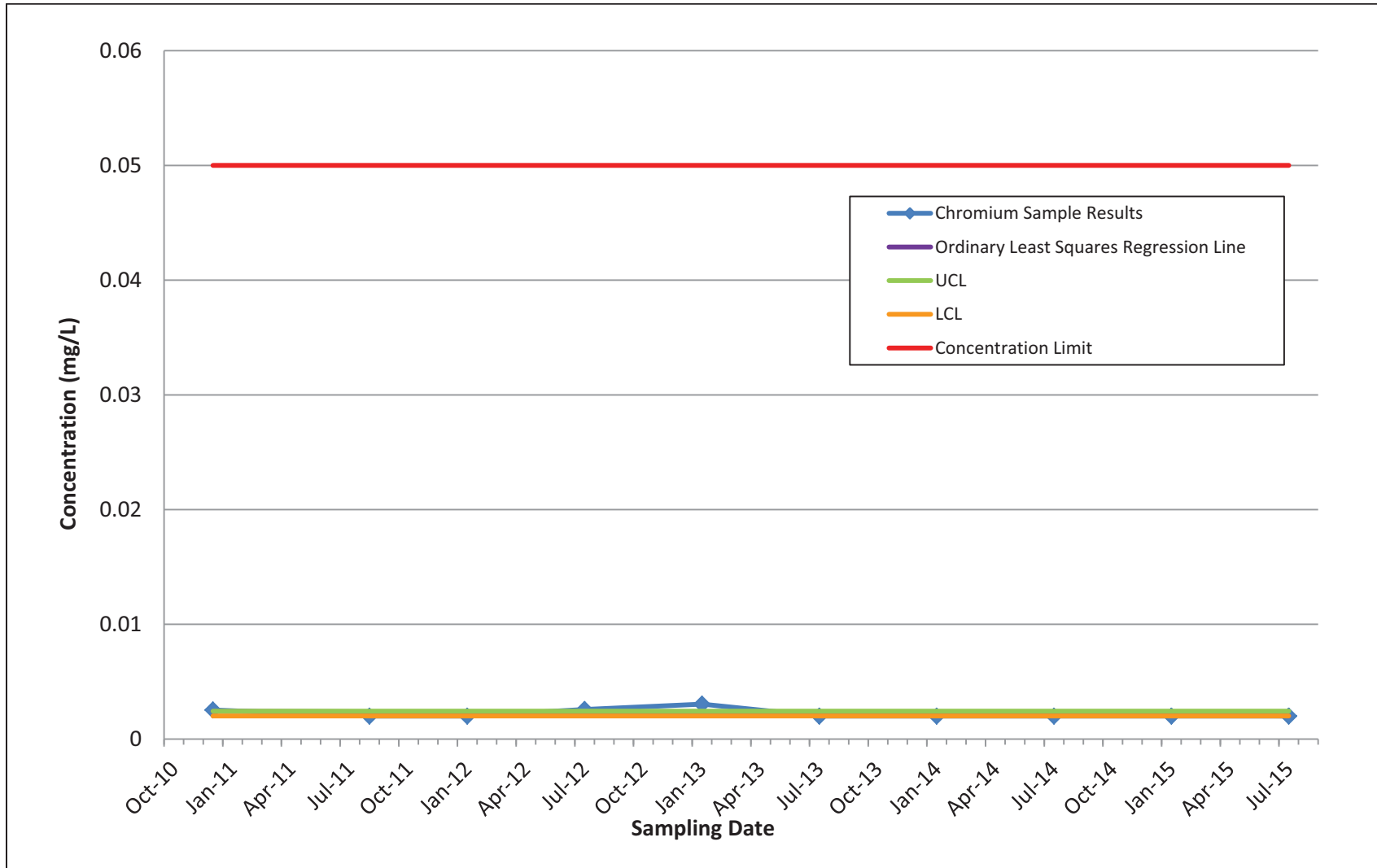


Figure 4-8  
Chromium Control Chart for CWL-MW11

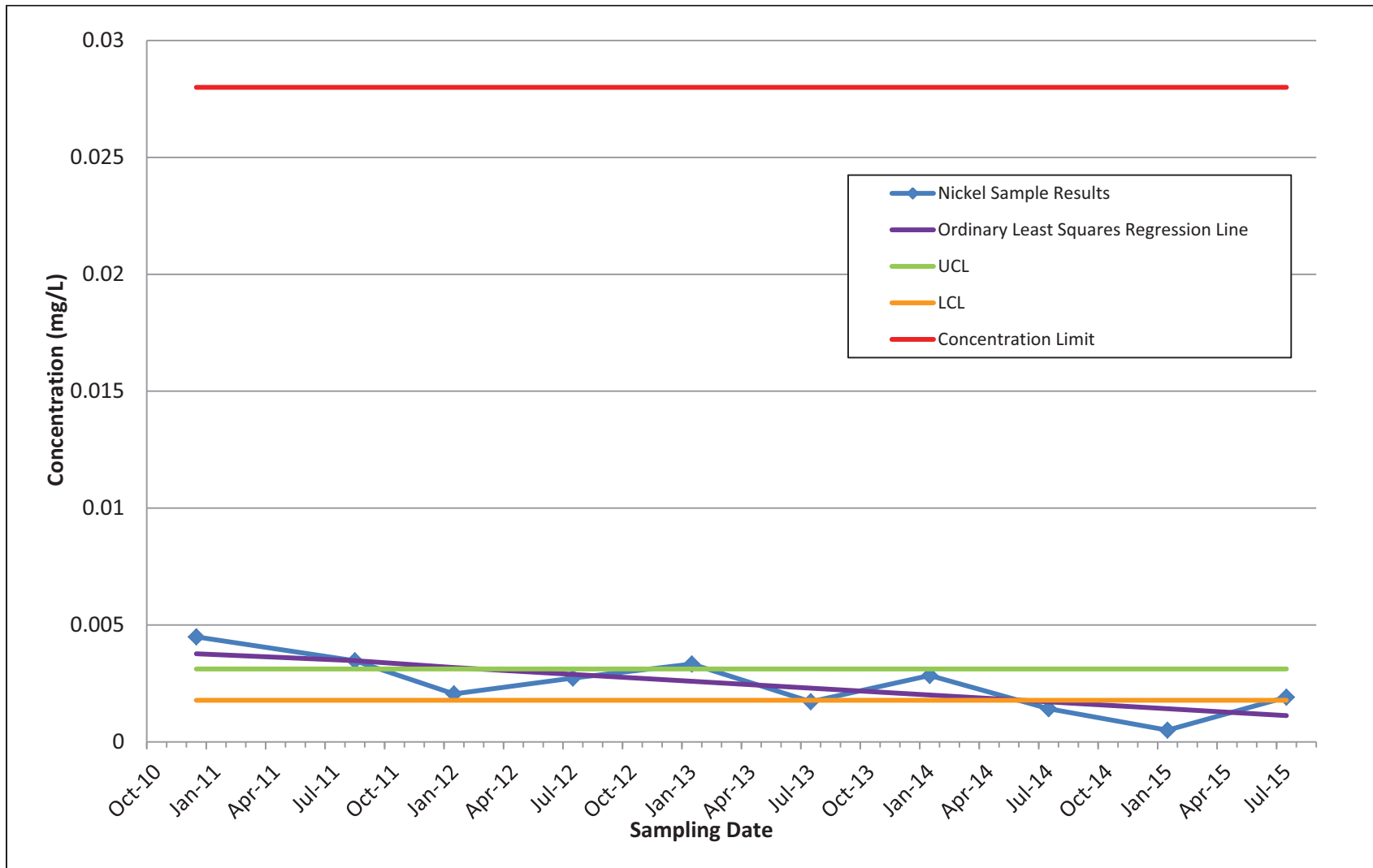


Figure 4-9  
Nickel Control Chart for CWL-MW11

### ***Prediction Intervals***

#### *Monitoring Well CWL-BW5/4A*

CY 2015 CWL-BW5 chromium and TCE sample results were all non-detections, and the corresponding MDLs were lower than their respective 95% LCLs, thus are below the prediction interval (range of 95% LCL to 95% UCL). This is due to the decrease in the laboratory detection limits over time and the fact that chromium and TCE are often not detected (only 13 chromium detections and 4 TCE detections out of 35 sampling events). Likewise, the CY 2015 results for nickel were slightly less than the 95% LCL (one non-detect, one low concentration detection). Results for all three hazardous constituents (using the MDL value for constituents not detected) fell within the historic range.

#### *Monitoring Well CWL-MW9*

Chromium and TCE have not been detected in any CWL-MW9 samples (CY 2010 through 2015, ten environmental and three duplicate samples). Therefore statistical evaluation of these constituents is not presented. The CY 2015 nickel results were detections above the laboratory MDL. One result (January, 0.000523 mg/L) was less than the 95% LCL and less than the historic minimum, while the other result (July, 0.00249 mg/L) fell between the 95% LCL and UCL and was within the historic range.

#### *Monitoring Well CWL-MW10*

CY 2015 CWL-MW10 chromium sample results were both non-detects, but the laboratory MDL (0.002 mg/L) fell within the range of the 95% LCL and 95% UCL. The nickel results for both samples were below the 95% LCL (the July duplicate sample result was equal to the 95% LCL) and all results were less than the historic minimum. For the TCE results, all were below the 95% LCL and were less than the historic minimum.

#### *Monitoring Well CWL-MW11*

CY 2015 CWL-MW11 chromium sample results (2 environmental sample results and one duplicate sample result) were non-detects. The laboratory MDL (0.002 mg/L) was less than the 95% LCL, but equal to the historic minimum. Nickel was only detected in the July environmental sample, and this result was within the range of the 95% LCL and 95% UCL, as well as within the historic range. TCE has not been detected in any CWL-MW11 samples (CY 2010 through 2015, ten environmental and two duplicate samples). Therefore statistical evaluation of TCE is not presented.

### ***Confidence Intervals***

Chromium, nickel, and TCE 95% LCLs and 95% UCLs of the mean are presented for each CWL monitoring well in Table 4-7 and are shown on the associated control charts (Figures 4-1 through 4-9). As previously explained, no statistical evaluation was performed for

constituents that have not been detected in groundwater samples from monitoring wells CWL-MW9 (chromium and TCE) and CWL-MW11 (TCE). All calculated 95% LCLs are below the respective concentration limits; therefore there are no exceedances of any concentration limits.

### **Median Test**

The cumulative percentage of sample results greater than the median (i.e., Median Test) for the three hazardous constituents is below 80% for all detected constituents at all four monitoring wells. Therefore, there is no statistically significant evidence of increasing contamination for any of the hazardous constituents. The highest Median Test result was 44% for nickel (CWL-BW5/4A); the one CY 2015 nickel result that was a detection above the MDL was less than the 95% LCL of the mean. The low median test results for TCE in CWL-BW5/4A (3%) reflects a data set influenced by non-detection results and an analytical laboratory detection limit that has decreased over time.

In addition, the ordinary least squares regression line is shown on Figures 4-1 through 4-9. This line provides a visual representation of the overall trend of the sample results. As shown in Figures 4-1 through 4-9, all three hazardous constituents show a slight decreasing trend, consistent with the Median Test results. The ordinary least squares regression line shown in Figure 4-7 for CWL-MW10 TCE results shows a stronger decreasing trend as a result of the consistent decreases during the last five sampling events (July 2013, January 2014, July 2014, January 2015, and July 2015). The variation shown in Figure 4-7 is typical of very low concentrations (low parts per billion) that are fluctuating over time.

## **4.4 Hydrogeologic Assessment**

The regional aquifer in the area of the CWL is located within the Santa Fe Group alluvial sediments at a depth of approximately 485 to 500 feet bgs. Regional groundwater beneath Kirtland Air Force Base (KAFB) flows generally westward away from the mountains toward the Rio Grande. Pumping by the City of Albuquerque and KAFB have modified the natural groundwater flow regime and resulted in a steady decline of the upper surface of the regional aquifer. Water levels at the CWL have been declining since monitoring began in 1985. The average rate of decline has been somewhat variable over time, but is typically in the range of 0.4 to 0.8 feet per year. The groundwater elevation decline between October 2014 and October 2015 ranged from 0.57 (CWL-MW11) to 0.90 (CWL-BW5) feet, with an average decline rate of 0.72 feet.

In CY 2015, water levels were measured in the groundwater monitoring wells on a quarterly basis, and also during the January and July sampling events. Figure 4-10 depicts the potentiometric surface map of the regional aquifer beneath the CWL based upon the October 2015 water-level measurements. The westward deflection of the potentiometric surface is a localized salient in the potentiometric surface of the regional aquifer. Based on this figure, the local groundwater flow direction varies across the site. However, the overall groundwater flow direction is generally westward in the CWL vicinity, which is consistent with the hydrogeologic



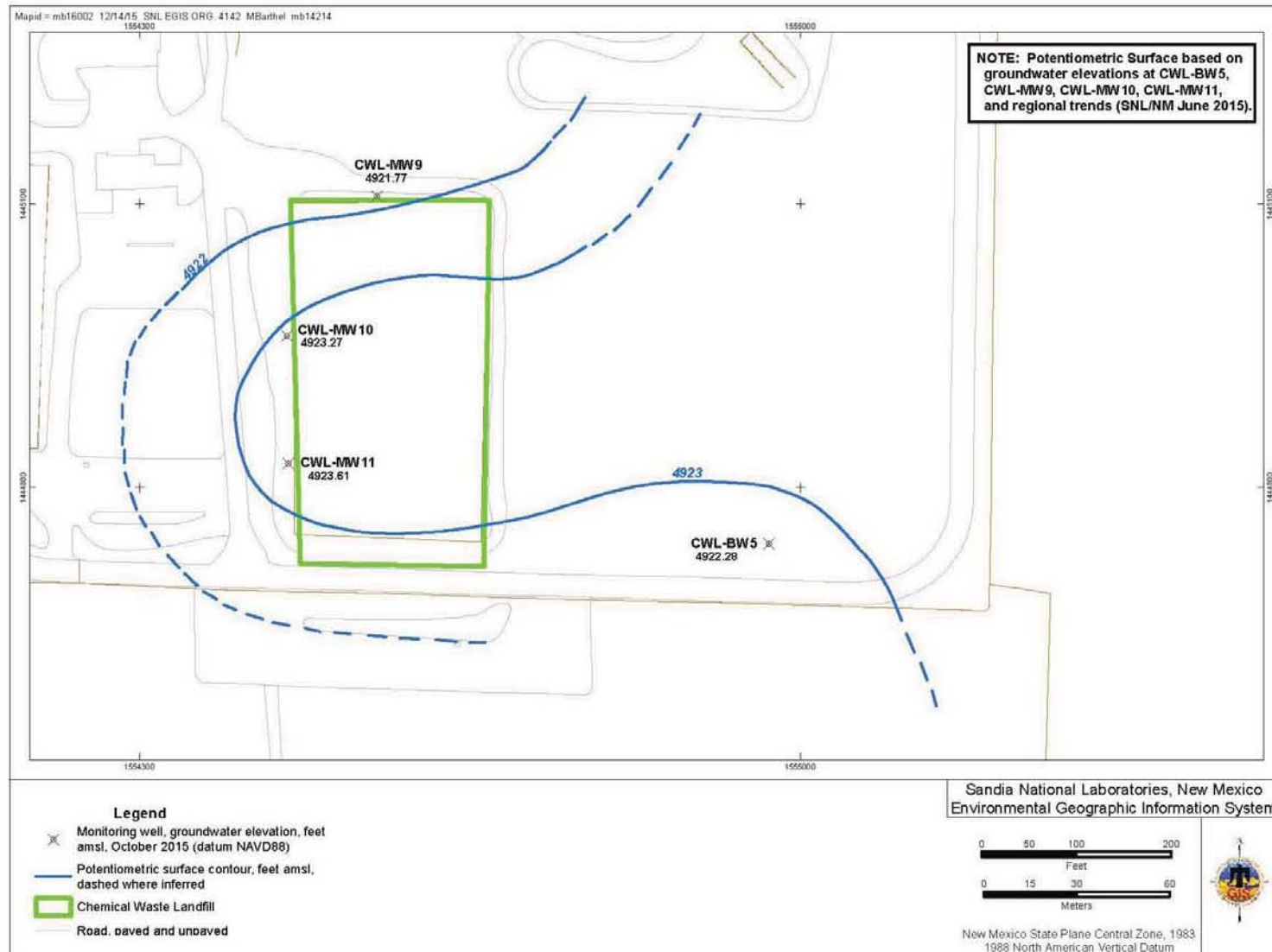


Figure 4-10  
 Potentiometric Surface of the Regional Aquifer at the Chemical Waste Landfill, October 2015

conceptual model for the KAFB area (SNL/NM June 2015). Localized variations in the water table reflect site-specific geologic controls (i.e., vertical and lateral variability in permeability of the saturated Santa Fe Group alluvial sediments). Measured orthogonally from the potentiometric surface contours on Figure 4-10, the horizontal gradient did not change significantly from CY 2014 and is approximately 0.013 feet/feet.

Groundwater velocities were calculated using (a) the current potentiometric surface gradient, (b) the hydraulic conductivity range from the four groundwater monitoring wells (i.e., high and low values from the 2012 slug tests), and (c) a porosity of 29 percent as determined from the laboratory analyses of CWL soil samples (SNL/NM October 1995). The calculated velocities were identical to those reported for CY 2014, and range from approximately  $1.8 \times 10^{-4}$  to  $2.8 \times 10^{-3}$  feet per day (equivalent to  $6.3 \times 10^{-8}$  to  $1.0 \times 10^{-6}$  centimeters per second). The average groundwater velocity is  $1 \times 10^{-3}$  feet per day (equivalent to  $4.1 \times 10^{-7}$  centimeters per second). These very low values are consistent with previous estimates for horizontal groundwater flow at the water table in the CWL vicinity.

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## 5.0 SOIL-GAS MONITORING RESULTS

This chapter presents soil-gas monitoring activities (i.e., sampling and analysis), analytical results, and data evaluation for CY 2015 in accordance with PCCP Attachment 1, Sections 1.8 and 1.12, and Attachment 3 (NMED October 2009 and subsequent revisions). The CY 2015 annual soil-gas sampling event was the fourth performed under the PCCP, which became effective June 2, 2011. Soil-gas sampling 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 requirements and results are presented in Section 5.3.

### 5.1 Soil-Gas Sampling Field Activities

This section describes soil-gas monitoring activities conducted at the CWL in conformance with the CWL Soil-Gas SAP, PCCP Attachment 3 (NMED October 2009 and subsequent revisions) that describes the procedures, methods, and analytical protocols for collecting and analyzing soil-gas samples. The DQO for soil-gas monitoring is to collect accurate and defensible data of high quality to determine the concentrations of hazardous constituents at various depths in the vadose zone at the CWL (i.e., unsaturated soil and sediments above the regional groundwater aquifer). 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 B of this report and filed in the SNL/NM Records Center.

Soil-gas samples were collected from monitoring wells CWL-UI1, CWL-UI2, CWL-D1, CWL-D2, and CWL-D3 on January 21, 2015. On March 31, 2015 the 440-foot bgs sampling port of monitoring well CWL-D2 (i.e., CWL-D2-440) was resampled because specific constituents did not meet RPD requirements in the January environmental-duplicate sample pair. All samples were analyzed using the EPA Method TO-15 (EPA January 1999b) for the 50 VOCs listed in PCCP Attachment 1, Table 1-5. CY 2015 soil-gas sampling activities and results are described in the following sections.

#### 5.1.1 Well Evacuation

Purging removes stagnant air from each monitoring well port and sample tubing, allowing the collection of representative soil gas from the soil pore space surrounding the sampling port in the subsurface. Purging continued after meeting the minimum requirement of three tubing volumes until field measurements for VOC levels stabilized, in accordance with PCCP Attachment 3, Section 3.9.2. VOCs were measured by attaching a VOC monitoring instrument, a photoionization detector (PID), to the exhaust port of the vacuum pump.

The CWL soil-gas sampling equipment includes a vacuum pump, a sampling manifold assembly, and a multiport purging chamber. The multiport purging chamber is equipped with individual valves, fittings, and tubing that can be connected to as many as ten individual sample ports. Valves were connected to each sampling port and purging was performed until minimum purge requirements were satisfied. Upon completion of purging, soil-gas samples were

collected in SUMMA<sup>®</sup> canisters per laboratory protocols and sent to the off-site laboratory for analysis.

### 5.1.2 Field Quality Control

Field QC samples include environmental 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 B.

During the January 2015 monitoring event, duplicate environmental samples were collected immediately after the original environmental sample. When CWL-D2-440 was resampled in March, this same approach was used as well as a new approach using a manifold system that allows for the simultaneous collection of the environmental and duplicate sample. The goal of both approaches is to reduce variability caused by time and/or sampling mechanics. Two duplicate samples were submitted for analysis with the January 2015 environmental samples. Two duplicate samples were submitted for analysis from the March 2015 resampling of CWL-D2-440. These sample results are used to evaluate the reproducibility of the sampling and analytical processes.

Field blank samples are prepared in the field during sampling activities by collecting an ultra-pure grade nitrogen gas sample. Results are used to assess whether contamination of the samples may have resulted from ambient field conditions. A total of six field blank samples were submitted for analysis with CY 2015 environmental samples.

### 5.1.3 Waste Management

Only a small volume of solid waste (personal protective equipment) was generated during the two soil-gas monitoring events. This waste was combined with the groundwater monitoring solid waste and managed as hazardous waste. The waste was submitted to the Hazardous Waste Management Facility for ultimate disposal at a permitted off-site facility.

## 5.2 Laboratory Results

Soil-gas samples were submitted to Test America, Inc. for chemical analyses by EPA Method TO-15 (EPA January 1999b) in accordance with PCCP Attachment 1, Section 1.8. Analytical reports (i.e., certificates of analyses), analytical methods, MDLs, reporting limits, dates of analyses, results of field and laboratory QC analyses, and data validation reports are included in Annex B and filed in the SNL/NM Records Center.

### 5.2.1 Environmental Sample Results

This section summarizes detected VOCs from soil-gas samples collected in January and March 2015. The January 2015 results are presented in Table 5-1.

Table 5-1  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI1-40 21-Jan-15	Acetone	640	36	1000	B, J	--
	2-Butanone	59	40	160	J	--
	Carbon tetrachloride	14	13	160	J	--
	Chloroform	680	19	61	--	--
	Dichlorodifluoromethane	33	29	81	J	--
	1,2-Dichloroethane	26	18	160	J	--
	1,1-Dichloroethene	200	26	160	--	--
	Ethylbenzene	24	13	81	J	--
	Methylene chloride	36	15	81	J	--
	Tetrachloroethene	2200	10	81	--	--
	Toluene	100	10	81	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	710	33	61	--	--
	1,1,1-Trichloroethane	50	13	81	J	--
	Trichloroethene	4200	21	81	--	--
	Trichlorofluoromethane	200	40	81	--	--
	m,p-Xylene	61	20	160	J	--
	o-Xylene	36	11	81	J	--
	Total Organics <sup>c</sup>	9269	NA	NA	NA	NA
CWL-UI1-80 21-Jan-15	Acetone	510	46	1300	B, J	--
	Chloroform	520	25	78	--	--
	Dichlorodifluoromethane	38	38	100	J	--
	1,2-Dichloroethane	34	23	210	J	--
	1,1-Dichloroethene	320	33	210	--	--
	Ethylbenzene	19	16	100	J	--
	Methylene chloride	94	19	100	J	--
	Tetrachloroethene	830	13	100	--	--
	Toluene	82	13	100	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	830	42	100	--	--
	1,1,1-Trichloroethane	51	17	78	J	--
	Trichloroethene	5100	27	100	--	--
	Trichlorofluoromethane	240	51	100	--	--
	m,p-Xylene	52	26	210	J	--
	o-Xylene	24	14	100	J	--
Total Organics <sup>c</sup>	8744	NA	NA	NA	NA	

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI1-120 21-Jan-15	Acetone	900	61	1700	B, J	--
	Benzene	29	27	140	J	--
	Carbon tetrachloride	31	22	280	J	--
	Chloroform	450	33	100	--	--
	Dichlorodifluoromethane	57	50	140	J	--
	1,1-Dichloroethane	28	25	100	J	--
	1,2-Dichloroethane	78	30	280	J	--
	1,1-Dichloroethene	520	44	280	--	--
	1,2-Dichloropropane	100	83	140	J	--
	Ethylbenzene	42	22	140	J	--
	Methylene chloride	300	25	140	--	--
	Styrene	20	20	140	J	--
	Tetrachloroethene	610	18	140	--	--
	Toluene	160	18	140	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1200	56	140	--	--
	1,1,1-Trichloroethane	59	22	100	J	--
	Trichloroethene	8200	36	140	--	--
	Trichlorofluoromethane	340	67	140	--	--
	m,p-Xylene	110	34	280	J	--
	o-Xylene	55	19	140	J	--
Total Organics <sup>c</sup>	13289	NA	NA	NA	NA	

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI2-36 21-Jan-15	Acetone	250	11	300	B, J	--
	Benzene	5.2	4.7	24	J	--
	2-Butanone	70	12	48	--	--
	Carbon disulfide	7.3	4.7	48	J	--
	Carbon tetrachloride	14	3.8	48	J	--
	Chloroform	610	5.7	18	--	--
	Dichlorodifluoromethane	28	8.7	24	--	--
	1,1-Dichloroethane	5.5	4.3	18	J	--
	1,2-Dichloroethane	23	5.3	48	J	--
	1,1-Dichloroethene	49	7.7	48	--	--
	1,2-Dichloropropane	42	14	24	--	--
	Ethylbenzene	9.3	3.8	24	J	--
	Methylene chloride	21	4.3	24	J	--
	Styrene	7.6	3.5	24	J	--
	Tetrachloroethene	160	3.0	24	--	--
	Toluene	240	3.0	24	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	590	9.7	24	--	--
	1,1,1-Trichloroethane	37	3.9	18	--	--
	Trichloroethene	3000	6.3	24	--	--
	Trichlorofluoromethane	170	12	24	--	--
	m,p-Xylene	19	6.0	48	J	--
o-Xylene	7.5	3.2	24	J	--	
Total Organics <sup>c</sup>		5365.4	NA	NA	NA	NA

Refer to footnotes at end of table.



Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI2-76 21-Jan-15	Acetone	230	11	300	B, J	--
	Benzene	6.3	4.7	24	J	--
	2-Butanone	51	12	48	--	--
	Carbon disulfide	9.4	4.7	48	J	--
	Carbon tetrachloride	17	3.8	48	J	--
	Chloroform	620	5.7	18	--	--
	Dichlorodifluoromethane	34	8.7	24	--	--
	1,1-Dichloroethane	8.0	4.3	18	J	--
	1,2-Dichloroethane	21	5.3	48	J	--
	1,1-Dichloroethene	110	7.7	48	--	--
	1,2-Dichloropropane	88	14	24	--	--
	Ethylbenzene	7.8	3.8	24	J	--
	Methylene chloride	23	4.3	24	J	--
	Styrene	8.2	3.5	24	J	--
	Tetrachloroethene	180	3.0	24	--	--
	Toluene	180	3.0	24	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	730	9.7	24	--	--
	1,1,1-Trichloroethane	35	3.9	18	--	--
	Trichloroethene	3700	10	40	--	--
	Trichlorofluoromethane	200	12	24	--	--
m,p-Xylene	17	6.0	48	J	--	
o-Xylene	6.9	3.2	24	J	--	
Total Organics <sup>c</sup>		6282.6	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI2-136 21-Jan-15	Acetone	1000	44	1200	B, J	--
	2-Butanone	50	49	200	J	--
	Carbon tetrachloride	22	16	200	J	--
	Chloroform	480	23	74	--	--
	Dichlorodifluoromethane	40	36	99	J	--
	1,2-Dichloroethane	67	22	200	J	--
	1,1-Dichloroethene	190	32	200	J	--
	1,2-Dichloropropane	160	59	99	--	--
	Ethylbenzene	37	16	99	J	--
	Methylene chloride	79	18	99	J	--
	Styrene	17	15	99	J	--
	Tetrachloroethene	180	13	99	--	--
	Toluene	170	13	99	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	860	40	99	--	--
	1,1,1-Trichloroethane	29	16	74	J	--
	Trichloroethene	5400	26	99	--	--
	Trichlorofluoromethane	240	48	99	--	--
	m,p-Xylene	95	25	200	J	--
	o-Xylene	43	13	99	J	--
	Total Organics <sup>c</sup>	9159	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-100 21-Jan-15	Acetone	1300	52	1500	B, J	--
	Benzene	27	23	120	J	--
	2-Butanone	160	59	240	J	--
	Carbon disulfide	45	23	240	J	--
	Carbon tetrachloride	46	19	240	J	--
	Chloroform	550	28	88	--	--
	Dichlorodifluoromethane	79	43	120	J	--
	1,1-Dichloroethane	34	21	88	J	--
	1,2-Dichloroethane	79	26	240	J	--
	1,1-Dichloroethene	590	38	240	--	--
	1,2-Dichloropropane	140	71	120	--	--
	Ethylbenzene	31	19	120	J	--
	Methylene chloride	77	21	120	J	--
	Styrene	32	17	120	J	--
	Tetrachloroethene	660	15	120	--	--
	Toluene	250	15	120	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1700	48	120	--	--
	1,1,1-Trichloroethane	71	19	88	J	--
	Trichloroethene	11000	31	120	--	--
	Trichlorofluoromethane	430	58	120	--	--
m,p-Xylene	77	29	240	J	--	
o-Xylene	33	16	120	J	--	
Total Organics <sup>c</sup>		17411	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-160 21-Jan-15	Acetone	1100	66	1900	B, J	--
	2-Butanone	130	74	300	J	--
	Carbon tetrachloride	57	24	300	J	--
	Chloroform	500	35	110	--	--
	Dichlorodifluoromethane	95	54	150	J	--
	1,1-Dichloroethane	43	27	110	J	--
	1,2-Dichloroethane	84	33	300	J	--
	1,1-Dichloroethene	920	48	300	--	--
	1,2-Dichloropropane	210	89	150	--	--
	Ethylbenzene	28	23	150	J	--
	Methylene chloride	78	27	150	J	--
	Styrene	28	22	150	J	--
	Tetrachloroethene	520	19	150	--	--
	Toluene	230	19	150	--	--
	1,1,1-Trichloroethane	73	24	110	J	--
	Trichloroethene	16000	39	150	--	--
	Trichlorofluoromethane	590	73	150	--	--
	m,p-Xylene	66	37	300	J	--
	o-Xylene	31	20	150	J	--
	Total Organics <sup>c</sup>	20783	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-240 21-Jan-15	Acetone	2300	110	3100	B, J	--
	Benzene	67	48	250	J	--
	2-Butanone	200	120	490	J	--
	Carbon tetrachloride	73	39	490	J	--
	Chloroform	390	58	180	--	--
	Dichlorodifluoromethane	110	89	250	J	--
	1,2-Dichloroethane	68	54	490	J	--
	1,1-Dichloroethene	1000	79	490	--	--
	1,2-Dichloropropane	160	150	250	J	--
	Ethylbenzene	47	39	250	J	--
	Methylene chloride	590	44	250	--	--
	Tetrachloroethene	420	31	250	--	--
	Toluene	290	31	250	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	2400	100	250	--	--
	1,1,1-Trichloroethane	54	40	180	J	--
	Trichloroethene	17000	64	250	--	--
	Trichlorofluoromethane	680	120	250	--	--
	m,p-Xylene	140	61	490	J	--
	o-Xylene	53	33	250	J	--
	Total Organics <sup>c</sup>	26042	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-350 21-Jan-15	Acetone	1300	57	1600	B, J	--
	Benzene	26	26	130	J	--
	2-Butanone	160	64	260	J	--
	Carbon tetrachloride	49	21	260	J	--
	Chloroform	210	31	97	--	--
	Dichlorodifluoromethane	89	47	130	J	--
	1,1-Dichloroethane	24	23	97	J	--
	1,2-Dichloroethane	63	28	260	J	--
	1,1-Dichloroethene	870	42	260	--	--
	1,2-Dichloropropane	85	78	130	J	--
	Ethylbenzene	30	20	130	J	--
	Methylene chloride	100	23	130	J	--
	Styrene	27	19	130	J	--
	Tetrachloroethene	270	16	130	--	--
	Toluene	300	16	130	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	2000	53	130	--	--
	1,1,1-Trichloroethane	28	21	97	J	--
	Trichloroethene	13000	34	130	--	--
	Trichlorofluoromethane	560	63	130	--	--
	m,p-Xylene	66	32	260	J	--
o-Xylene	29	17	130	J	--	
Total Organics <sup>c</sup>	19286	NA	NA	NA	NA	
CWL-D1-470 21-Jan-15	Acetone	5.3	1.7	48	B, J	--
	Carbon tetrachloride	0.99	0.62	7.7	J	--
	Chloroform	1.2	0.91	2.9	J	--
	Dichlorodifluoromethane	14	1.4	3.9	--	--
	1,1-Dichloroethene	19	1.2	7.7	--	--
	Methylene chloride	2.0	0.69	3.9	J	3.9U
	Tetrachloroethene	4.1	0.49	3.9	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	230	1.6	3.9	--	--
	Trichloroethene	110	1.0	3.9	--	--
	Trichlorofluoromethane	52	1.9	3.9	--	--
Total Organics <sup>c</sup>	436.59	NA	NA	NA	NA	

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-120 21-Jan-15	Acetone	880	100	2800	B, J	--
	Carbon disulfide	73	44	460	J	--
	Carbon tetrachloride	42	36	460	J	--
	Chloroform	620	54	170	--	--
	1,2-Dichloroethane	78	50	460	J	--
	1,1-Dichloroethene	690	73	460	--	--
	1,2-Dichloropropane	240	140	230	--	--
	Methylene chloride	61	41	230	J	--
	Tetrachloroethene	530	29	230	--	--
	Toluene	120	29	230	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1800	93	230	--	--
	1,1,1-Trichloroethane	60	37	170	J	--
	Trichloroethene	13000	60	230	--	--
	Trichlorofluoromethane	500	110	230	--	--
	m,p-Xylene	77	57	460	J	--
	o-Xylene	37	31	230	J	--
	Total Organics <sup>c</sup>	18808	NA	NA	NA	NA
CWL-D2-240 21-Jan-15	Acetone	700	120	3300	B, J	--
	Chloroform	530	63	200	--	--
	1,2-Dichloroethane	66	58	530	J	--
	1,1-Dichloroethene	760	86	530	--	--
	1,2-Dichloropropane	200	160	270	J	--
	Methylene chloride	73	48	270	J	--
	Tetrachloroethene	460	34	270	--	--
	Toluene	120	34	270	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1800	110	270	--	--
	1,1,1-Trichloroethane	44	43	200	J	--
	Trichloroethene	13000	70	270	--	--
	Trichlorofluoromethane	520	130	270	--	--
	Total Organics <sup>c</sup>	18273	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-240 (Duplicate) 21-Jan-15	Acetone	1000	110	3100	B, J	--
	Carbon tetrachloride	43	39	490	J	--
	Chloroform	520	58	180	--	--
	1,2-Dichloroethane	69	54	490	J	--
	1,1-Dichloroethene	770	79	490	--	--
	1,2-Dichloropropane	200	150	240	J	--
	Methylene chloride	75	44	240	J	--
	Tetrachloroethene	450	31	240	--	--
	Toluene	140	31	240	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1800	100	240	--	--
	1,1,1-Trichloroethane	49	40	180	J	--
	Trichloroethene	12000	64	240	--	--
	Trichlorofluoromethane	510	120	240	--	--
	m,p-Xylene	76	61	490	J	--
	o-Xylene	35	33	240	J	--
	Total Organics <sup>c</sup>	17737	NA	NA	NA	NA
CWL-D2-350 21-Jan-15	Acetone	840	65	1800	B, J	--
	Carbon tetrachloride	33	23	290	J	--
	Chloroform	230	35	110	--	--
	Dichlorodifluoromethane	69	53	150	J	--
	1,2-Dichloroethane	41	32	290	J	--
	1,1-Dichloroethene	630	47	290	--	--
	1,2-Dichloropropane	90	88	150	J	--
	Ethylbenzene	33	23	150	J	--
	Methylene chloride	130	26	150	J	--
	Tetrachloroethene	260	19	150	--	--
	Toluene	130	19	150	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1500	60	150	--	--
	Trichloroethene	8100	39	150	--	--
	Trichlorofluoromethane	430	72	150	--	--
	m,p-Xylene	82	37	290	J	--
	o-Xylene	40	20	150	J	--
Total Organics <sup>c</sup>	12638	NA	NA	NA	NA	

Refer to footnotes at end of table.



Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-440 21-Jan-15	Acetone	65	3.7	100	H, J	J
	Benzene	3.0	1.6	8.2	H, J	J
	2-Butanone	6.2	4.1	16	H, J	J
	Carbon tetrachloride	10	1.3	16	H, J	J
	Chloroform	50	2.0	6.2	H	J
	Dichlorodifluoromethane	25	3.0	8.2	H	J
	1,1-Dichloroethene	200	2.7	16	H	J
	1,2-Dichloropropane	17	4.9	8.2	H	J
	Methylene chloride	23	1.5	8.2	H	J
	Tetrachloroethene	86	1.1	8.2	H	J
	Toluene	3.6	1.1	8.2	H, J	J
	1,1,2-Trichloro-1,2,2-trifluoroethane	510	3.4	8.2	H	J
	1,1,1-Trichloroethane	6.1	1.3	6.2	H, J	J
	Trichloroethene	1900	12	48	--	--
	Trichlorofluoromethane	140	4.0	8.0	H	J
	Total Organics <sup>c</sup>	3044.9	NA	NA	NA	NA
CWL-D2-440 (Duplicate) 21-Jan-15	Acetone	14	6.6	190	H, J	J
	Benzene	6.2	2.9	15	H, J	J
	Carbon tetrachloride	9.7	2.4	30	H, J	J
	Chloroform	100	3.5	11	H	J
	Dichlorodifluoromethane	46	5.4	15	H	J
	1,1-Dichloroethane	7.6	2.7	11	H, J	J
	1,1-Dichloroethene	400	4.8	30	H	J
	1,2-Dichloropropane	39	8.9	15	H	J
	Methylene chloride	36	2.7	15	H	J
	Tetrachloroethene	180	1.9	15	H	J
	Toluene	3.0	1.9	15	H, J	J
	1,1,2-Trichloro-1,2,2-trifluoroethane	1100	6.0	15	H	J
	1,1,1-Trichloroethane	13	2.4	11	H	J
	Trichloroethene	3900	19	74	--	--
	Trichlorofluoromethane	300	7.3	15	H	J
	Total Organics <sup>c</sup>	6154.5	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-470 21-Jan-15	Acetone	1200 <sup>d</sup>	44	1200	B	--
	2-Butanone	140	49	200	J	--
	Chloroform	260	23	74	--	--
	1,2-Dichloroethane	63	22	200	J	--
	1,1-Dichloroethene	240	32	200	--	--
	1,2-Dichloropropane	78	59	98	J	--
	Ethylbenzene	24	15	98	J	--
	Methylene chloride	50	18	98	J	--
	Styrene	19	15	98	J	--
	Tetrachloroethene	240	13	98	--	--
	Toluene	240	13	98	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	770 <sup>d</sup>	40	98	--	--
	1,1,1-Trichloroethane	32	16	74	J	--
	Trichloroethene	4500 <sup>d</sup>	26	98	--	--
	Trichlorofluoromethane	200	48	98	--	--
	m,p-Xylene	57	25	200	J	--
	o-Xylene	25	13	98	J	--
Total Organics <sup>c</sup>		8138	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-120 21-Jan-15	Acetone	1100	48	1300	B, J	--
	2-Butanone	120	53	210	J	--
	Carbon tetrachloride	19	17	210	J	--
	Chloroform	200	25	80	--	--
	Dichlorodifluoromethane	45	39	110	J	--
	1,2-Dichloroethane	57	24	210	J	--
	1,1-Dichloroethene	280	35	210	--	--
	1,2-Dichloropropane	120	64	110	--	--
	Ethylbenzene	23	17	110	J	--
	Methylene chloride	60	19	110	J	--
	Styrene	21	16	110	J	--
	Tetrachloroethene	140	14	110	--	--
	Toluene	210	14	110	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	880	44	110	--	--
	1,1,1-Trichloroethane	19	17	80	J	--
	Trichloroethene	5200	28	110	--	--
	Trichlorofluoromethane	250	53	110	--	--
	m,p-Xylene	56	27	210	J	--
	o-Xylene	25	14	110	J	--
	Total Organics <sup>c</sup>	8825	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-170 21-Jan-15	Acetone	1100	49	1400	B, J	--
	2-Butanone	130	54	220	J	--
	Carbon tetrachloride	25	17	220	J	--
	Chloroform	210	26	82	--	--
	Dichlorodifluoromethane	51	40	110	J	--
	1,2-Dichloroethane	80	24	220	J	--
	1,1-Dichloroethene	330	35	220	--	--
	1,2-Dichloropropane	170	66	110	--	--
	Ethylbenzene	22	17	110	J	--
	Methylene chloride	51	20	110	J	--
	Styrene	20	16	110	J	--
	Tetrachloroethene	160	14	110	--	--
	Toluene	240	14	110	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1000	44	110	--	--
	1,1,1-Trichloroethane	18	18	82	J	--
	Trichloroethene	6400	29	110	--	--
	Trichlorofluoromethane	290	54	110	--	--
	m,p-Xylene	57	27	220	J	--
	o-Xylene	24	15	110	J	--
	Total Organics <sup>c</sup>	10378	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-350 21-Jan-15	Acetone	1300	49	1400	B, J	--
	2-Butanone	140	54	220	J	--
	Carbon tetrachloride	25	17	220	J	--
	Chloroform	200	26	82	--	--
	Dichlorodifluoromethane	53	40	110	J	--
	1,2-Dichloroethane	76	24	220	J	--
	1,1-Dichloroethene	340	35	220	--	--
	1,2-Dichloropropane	170	66	110	--	--
	Ethylbenzene	25	17	110	J	--
	Methylene chloride	300	20	110	--	--
	Styrene	20	16	110	J	--
	Tetrachloroethene	180	14	110	--	--
	Toluene	240	14	110	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1100	44	110	--	--
	Trichloroethene	6600	29	110	--	--
	Trichlorofluoromethane	300	54	110	--	--
	m,p-Xylene	55	27	220	J	--
	o-Xylene	26	15	110	J	--
	Total Organics <sup>c</sup>		11150	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-440 21-Jan-15	Acetone	1100	48	1300	B, J	--
	2-Butanone	150	53	210	J	--
	Carbon tetrachloride	27	17	210	J	--
	Chloroform	210	25	80	--	--
	Dichlorodifluoromethane	53	39	110	J	--
	1,2-Dichloroethane	80	24	210	J	--
	1,1-Dichloroethene	370	35	210	--	--
	1,2-Dichloropropane	190	64	110	--	--
	Ethylbenzene	18	17	110	J	--
	Methylene chloride	130	19	110	--	--
	Styrene	17	16	110	J	--
	Tetrachloroethene	160	14	110	--	--
	Toluene	200	14	110	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1200	44	110	--	--
	1,1,1-Trichloroethane	17	17	80	J	--
	Trichloroethene	6800	28	110	--	--
	Trichlorofluoromethane	330	53	110	--	--
	m,p-Xylene	46	27	210	J	--
	o-Xylene	20	14	110	J	--
	Total Organics <sup>c</sup>	11118	NA	NA	NA	NA
CWL-D3-480 21-Jan-15	Chloroform	15	1.3	4.0	--	--
	Dichlorodifluoromethane	4.5	1.9	5.4	J	--
	1,1-Dichloroethene	17	1.7	11	--	--
	1,2-Dichloropropane	3.4	3.2	5.4	J	--
	Methylene chloride	1.7	0.96	5.4	J	--
	Tetrachloroethene	11	0.68	5.4	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	54	2.2	5.4	--	--
	1,1,1-Trichloroethane	2.0	0.87	4.0	J	--
	Trichloroethene	300	1.4	5.4	--	--
	Trichlorofluoromethane	20	2.6	5.4	--	--
	Total Organics <sup>c</sup>	428.6	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (*Concluded*)  
Summary of Detected Volatile Organic Compounds  
Chemical Waste Landfill Soil-Gas Monitoring  
Analytical Method TO-15<sup>a</sup>  
January 2015

Notes:

<sup>a</sup>Analytical Method EPA 1999b, "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.

<sup>b</sup>Laboratory/Validation Qualifier - Blank (--) cell = all quality control samples met acceptance criteria. "B" "H" "J" and "U," see below.

<sup>c</sup>Total Organics -- sum of validated detected organic compounds.

<sup>d</sup>Detected value >500 ppbv threshold concentration that applies only to deepest well ports at CWL-D1, CWL-D2, and CWL-D3. Statistical evaluation presented in Section 5.3.

B = Compound was detected in the associated blank sample.

EPA = U.S. Environmental Protection Agency.

H = Sample was prepared or analyzed beyond the specified holding time.

J = Estimated value. When assigned by the analytical laboratory, the analyte concentration is below the practical quantitation limit or RL and greater than or equal to the MDL.

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).

NA = Not applicable.

ppbv = parts per billion by volume.

RL = Reporting limit. Minimum concentration that can be reported with a statistically established degree of confidence.

U = Analyte is not present and the associated numerical value is the sample quantitation limit as determined by data validation.

### **January 21, 2015 Soil-Gas Results**

In general the January 2015 soil-gas results were consistent with the 2014 data set, although fewer VOCs were detected (22 VOCs versus 33 VOCs in 2014). A total of 22 VOCs were detected in the January 2015 samples collected from the 21 sampling ports (21 environmental samples and 2 duplicate samples), and are listed below.

1,1-Dichloroethane	Chloroform
1,1-Dichloroethene	Dichlorodifluoromethane
1,2-Dichloroethane	Ethyl benzene
1,2-Dichloropropane	Methylene chloride
1,1,2-Trichloro-1,2,2-trifluoroethane	Styrene
1,1,1-Trichloroethane	Tetrachloroethene (PCE)
2-Butanone	Toluene
Acetone	Trichloroethene (TCE)
Benzene	Trichlorofluoromethane
Carbon disulfide	m-, p-Xylene
Carbon tetrachloride	o-Xylene

TCE is the primary VOC of concern at the CWL and was detected in all environmental samples (21 samples plus 2 duplicates, total of 23). TCE concentrations ranged from 110 parts per billion by volume (ppbv) to 17,000 ppbv (CWL-D1-470 and CWL-D1-240, respectively). PCE was also detected in all samples at concentrations ranging from 4.1 parts ppbv to 2,200 ppbv (CWL-D1-470 and CWL-UI1-40, respectively). Other VOCs detected in all samples, generally at lower concentrations, included chloroform, 1,1-dichloroethene, and trichlorofluoromethane. Total VOCs, as the sum of validated detected VOCs, were reported in all environmental samples at concentrations ranging from 428.6 ppbv at CWL-D3 (480 foot bgs sample port) to 26,042 ppbv at CWL-D1 (240 foot bgs sample port). Consistent with historic results, the maximum TCE and total VOC concentrations were reported in samples from the 240 foot bgs sampling port at monitoring well CWL-D1.

Other commonly detected VOCs included acetone (22 detections), carbon tetrachloride (19 detections), dichlorodifluoromethane (19 detections), 1,2-dichloroethane (19 detections), 1,2-dichloropropane (20 detections), toluene (21 detections), 1,1,2-trichloro-1,2,2-trifluoroethane (22 detections), 1,1,1-trichloroethane (20 detections), and o-xylene and m-, p-xylene (both detected 18 times). Methylene chloride was detected in all samples, but one result (CWL-D1-470) was qualified as not detected during data validation (22 detections).

The maximum soil-gas concentration from the three deepest sampling ports (CWL-D1-470, CWL-D2-470, CWL-D3-480) was TCE at a concentration of 4,500 ppbv or 4.5 parts per million by volume (ppmv) from CWL-D2-470. Only three VOCs exceeded 0.5 ppmv at the three deepest sampling ports and all of these detections were from CWL-D2-470. The three VOCs included acetone (1.2 ppmv), TCE (4.5 ppmv), and 1,1,2-trichloro-1,2,2-trifluoroethane (0.77 ppmv).

### **March 31, 2015 Soil-Gas Resample Results**

Limited resampling was performed for the 440-foot bgs sampling port of monitoring well CWL-D2 due to six constituents not meeting the RPD requirements in the January



environmental-duplicate sample pair. In an effort to improve the collection of representative duplicate samples, a manifold sampling system was designed by SNL field personnel to allow for the simultaneous collection of the environmental and duplicate samples (i.e., both SUMMA<sup>®</sup> canisters filled at the same time). An environmental-duplicate sample pair was also collected in series (i.e., environmental sample collected first, then the duplicate sample collected immediately afterwards) for comparison following the approach that has been used for all previous CWL soil-gas monitoring. The March 2015 resample results for CWL-D2-440 are presented in Table 5-2.

Twenty-one VOCs were detected in the March 2015 resamples. The primary VOCs detected in all samples were 1,1,2-trichloro-1,2,2-trifluoroethane; TCE; and trichlorofluoromethane. Other VOCs detected in all samples include 1,1-dichloroethene and PCE. TCE was detected at the highest concentration, ranging from 1,500 ppbv to 2,400 ppbv. The sample pair collected in series contained several VOCs at low concentrations that were not detected in the sample pair collected simultaneously, including 2-butanone, ethylbenzene, styrene, m,p-xylene, and o-xylene. Acetone was also detected at a significantly higher concentration in the sample pair collected in series (2,300 ppbv versus 11 ppbv). Total VOCs, as the sum of validated detected VOCs, were 3258.3 ppbv (environmental) and 3546.0 ppbv (duplicate) in the sample pair collected simultaneously. Total VOCs were 5655.3 ppbv (environmental) and 5003.1 ppbv (duplicate) in the sample pair collected in series.

### 5.2.2 Field Quality Control Sample Results

Table 5-3 presents field duplicate results for environmental-duplicate sample pairs collected in 2015 from sample ports located at 240 and 440 feet bgs at monitoring well CWL-D2. RPD calculations were performed for all detected compounds with concentrations exceeding five times the analytical laboratory reporting limit in both the environmental and duplicate sample. If a detected compound in one sample was not detected in the corresponding duplicate or environmental sample, no RPD was calculated. The duplicate sample results show good agreement in the January CWL-D2-240 sample set (i.e., RPDs less than 50), but for the CWL-D2-440 sample set all 6 VOCs detected at concentrations exceeding five times the analytical laboratory reporting limit had RPDs exceeding 50.

In accordance with the PCCP Attachment 3, resampling of CWL-D2-440 was performed. Two environmental-duplicate sample pairs were collected from CWL-D2-440; one pair collected simultaneously with the manifold sampling system and one pair collected in series without the manifold system. The March duplicate sample results show good agreement, with all RPDs less than 50. In both March resample pairs the corresponding RPDs ranged from 7 to 13. The March resampling results demonstrate the manifold sampling system is an effective approach for the simultaneous collection of environmental and duplicate samples.

In the five field blank samples associated with the January samples, acetone was detected four times, toluene was detected twice, and methylene chloride was detected once. All detections in the field blank samples were very low concentrations; reported values were less than 1 ppbv except for two acetone detections (3 and 1 ppbv). All four acetone detections were qualified as non-detects during validation due to laboratory contamination detected in associated laboratory method blank samples (i.e., the field blank results were less than ten times the concentration

Table 5-2  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 March Resample 2015

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-440 Resample using manifold (simultaneous) 31-Mar-15	Acetone	11	7.2	200	J	200U
	Benzene	7.4	3.2	16	B, J	16U
	Carbon disulfide	4.8	3.2	33	J	--
	Carbon tetrachloride	10	2.6	33	J	--
	Chloroform	34	3.9	12	--	--
	Dichlorodifluoromethane	27	5.9	16	--	--
	1,1-Dichloroethane	3.0	2.9	12	J	--
	1,1-Dichloroethene	190	5.3	33	--	--
	1,2-Dichloropropane	13	9.8	16	J	--
	Methylene chloride	15	2.9	16	J	16U
	Tetrachloroethene	82	2.1	16	--	--
	Toluene	2.5	2.1	16	B, J	16U
	1,1,2-Trichloro-1,2,2-trifluoroethane	530	6.6	16	--	--
	1,1,1-Trichloroethane	4.5	2.6	12	J	--
	Trichloroethene	2200	4.3	16	--	--
	Trichlorofluoromethane	160	8.0	16	--	--
Total Organics <sup>c</sup>	3258.3	NA	NA	NA	NA	
CWL-D2-440 (Duplicate) Resample using manifold (simultaneous) 31-Mar-15	Acetone	11	7.2	200	J	200U
	Benzene	7.1	3.2	16	B, J	16U
	Carbon tetrachloride	11	2.6	32	J	--
	Chloroform	37	3.9	12	--	--
	Dichlorodifluoromethane	30	5.9	16	--	--
	1,1-Dichloroethane	3.3	2.9	12	J	12U
	1,1-Dichloroethene	210	5.2	32	--	--
	1,2-Dichloropropane	13	9.7	16	J	--
	Methylene chloride	16	2.9	16	--	16U
	Tetrachloroethene	90	2.1	16	--	--
	Toluene	4.9	2.1	16	B, J	16U
	1,1,2-Trichloro-1,2,2-trifluoroethane	570	6.6	16	--	--
	1,1,1-Trichloroethane	5.0	2.6	12	J	--
	Trichloroethene	2400	4.3	16	--	--
	Trichlorofluoromethane	180	8.0	16	--	--
	Total Organics <sup>c</sup>	3546.0	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 March 2015 Resample

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-440 Resample without manifold (in series) 31-Mar-15	Acetone	2300	10	290	--	--
	Benzene	10	4.6	23	B, J	23U
	2-Butanone	100	12	47	--	--
	Carbon disulfide	190	4.6	47	--	--
	Carbon tetrachloride	9.8	3.8	47	J	--
	Chloroform	29	5.6	18	--	--
	Dichlorodifluoromethane	23	8.5	23	--	--
	1,2-Dichloroethane	25	5.2	47	J	--
	1,1-Dichloroethene	170	7.6	47	--	--
	Ethylbenzene	24	3.7	23	--	--
	4-Methyl-2-pentanone	11	7.9	23	J	23U
	Methylene chloride	57	4.2	23	--	--
	Styrene	16	3.5	23	J	--
	Tetrachloroethene	58	3.0	23	--	--
	Toluene	190	3.0	23	B	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	570	9.6	23	--	--
	1,1,1-Trichloroethane	4.5	3.8	18	J	--
	Trichloroethene	1700	6.2	23	--	--
	Trichlorofluoromethane	140	12	23	--	--
	m,p-Xylene	37	5.9	47	B, J	--
o-Xylene	12	3.2	23	J	--	
Total Organics <sup>c</sup>		5655.3	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 March 2015 Resample

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-440 (Duplicate) Resample without manifold (in series) 31-Mar-15	Acetone	2100	10	290	--	--
	Benzene	10	4.6	23	B, J	23U
	2-Butanone	33	12	46	J	--
	Carbon disulfide	200	4.5	46	--	--
	Carbon tetrachloride	8.9	3.7	46	J	--
	Chloroform	26	5.5	17	--	--
	Dichlorodifluoromethane	22	8.4	23	J	--
	1,2-Dichloroethane	23	5.1	46	J	--
	1,1-Dichloroethene	150	7.5	46	--	--
	Ethylbenzene	13	3.6	23	J	--
	4-Methyl-2-pentanone	11	7.8	23	J	23U
	Methylene chloride	55	4.2	23	--	--
	Styrene	16	3.4	23	J	--
	Tetrachloroethene	51	2.9	23	--	--
	Toluene	94	2.9	23	B	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	530	9.4	23	--	--
	1,1,1-Trichloroethane	4.2	3.8	17	J	--
	Trichloroethene	1500	6.1	23	--	--
	Trichlorofluoromethane	130	11	23	--	--
	m,p-Xylene	33	5.8	46	B, J	--
o-Xylene	14	3.1	23	J	--	
Total Organics <sup>c</sup>		5003.1	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-2 (Concluded)  
Summary of Detected Volatile Organic Compounds  
Chemical Waste Landfill Soil-Gas Monitoring  
Analytical Method TO-15<sup>a</sup>  
March 2015 Resample

Notes:

<sup>a</sup>Analytical Method EPA 1999b, "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.

<sup>b</sup>Laboratory/Validation Qualifier - Blank (--) cell = all quality control samples met acceptance criteria. "B" "H" "J" and "U," see below.

<sup>c</sup>Total Organics -- sum of validated detected organic compounds.

<sup>d</sup>Detected value >500 ppbv threshold concentration that applies only to deepest well ports at CWL-D1, CWL-D2, and CWL-D3. Statistical evaluation presented in Section 5.3.

B = Compound was detected in the associated blank sample.

EPA = U.S. Environmental Protection Agency.

J = Estimated value. Analyte detected at a level below the practical quantitation limit or RL and greater than or equal to the MDL.

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).

NA = Not applicable.

ppbv = parts per billion by volume.

RL = Reporting limit. Minimum concentration that can be reported with a statistically established degree of confidence.

U = Analyte not present or concentration is below the MDL.

Table 5-3  
 Summary of January 2015 and March 2015 Duplicate Samples  
 Chemical Waste Landfill Soil-Gas Monitoring

Well ID/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD <sup>a</sup> (%)
	(ppbv)		
<b>January 2015</b>			
<b>CWL-D2-240</b>			
1,1,2-Trichloro-1,2,2-trifluoroethane	1800	1800	<1
Trichloroethene	13000	12000	8
<b>CWL-D2-440</b>			
Chloroform	50	100	67
1,1-Dicloroethene	200	400	67
Tetrachloroethene	86	180	71
1,1,2-Trichloro-1,2,2-trifluoroethane	510	1100	73
Trichloroethene	1900	3900	69
Trichlorofluoromethane	140	300	73
<b>March 2015</b>			
<b>CWL-D2-440 – with manifold, simultaneous</b>			
1,1-Dicloroethene	190	210	10
Tetrachloroethene	82	90	9
1,1,2-Trichloro-1,2,2-trifluoroethane	530	570	7
Trichloroethene	2200	2400	9
Trichlorofluoromethane	160	180	12
<b>CWL-D2-440 – without manifold, in series</b>			
Acetone	2300	2100	9
1,1,2-Trichloro-1,2,2-trifluoroethane	570	530	7
Trichloroethene	1700	1500	13
Trichlorofluoromethane	140	130	7

Notes:

<sup>a</sup>RPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number. Bolded values exceed acceptance criterion of less than 50%.

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

where: R<sub>1</sub> = environmental sample result.  
 R<sub>2</sub> = duplicate sample result.

ppbv = parts per billion by volume.

detected in the method blank sample). The methylene chloride result for CWL-D1-470 was qualified as a non-detect due to the field blank detection (i.e., the CWL-D1-470 result was less than ten times the field blank concentration). No other January results were qualified as non-detects during data validation due to field blank sample results. Acetone, toluene, and methylene chloride are common laboratory contaminants.

In the one field blank sample associated with the March resamples, acetone and methylene chloride were both detected once at very low concentrations (i.e., less than 1 ppbv). Two acetone and two methylene chloride results (CWL-D2-440 sample collected simultaneously with the manifold assembly) were qualified as non-detects during validation due to the field blank detections (i.e., the environmental result was less than ten times the field blank concentration).

### 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, including laboratory control samples (e.g., method blank samples), replicates, matrix spikes, matrix spike duplicates, and surrogate spike samples, were analyzed concurrently with CWL soil-gas samples. The data were reviewed and qualified in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data" (SNL/NM June 2014).

No significant data quality issues were noted for January 2015 data sets. All data were determined to be acceptable and reported quality control measures were in compliance with analytical method and laboratory procedure requirements (i.e., technically defensible). Data Validation Reports and Contract Verification Review forms are provided in Annex B of this report and are filed in the SNL/NM Records Center. Minor issues associated with laboratory QC samples that resulted in qualification of results are summarized below.

For the January samples, no results were qualified as not detected based on laboratory QC results. A total of 28 results associated with the environmental and duplicate samples from CWL-D2-440 were "J" qualified as estimated during validation based on reanalysis at a lower dilution that occurred beyond the holding time, but less than two times the holding time. SNL personnel requested the reanalysis after evaluating the environmental-duplicate pair results and noting RPD exceedances for various detected VOCs. The original samples were diluted due to elevated concentrations of TCE. For the March samples, benzene and toluene were detected in the associated laboratory method blank sample, which resulted in four benzene and two toluene results being qualified as not detected during validation. In addition, two results for 4-methyl-2-pentanone and one result for 1,1-dichloroethane were qualified as not detected during validation because mass spectra criteria were not met during analysis.

### 5.2.4 Variances and Non-Conformances

Two minor variances from PCCP requirements were identified for the January and March 2015 soil-gas monitoring activities. The first variance is that elevation and ambient pressure were not documented on the Analysis Request/Chain of Custody (AR/COC). Per Section 3.9.3 of the PCCP, additional information including elevation and ambient pressure (i.e., vacuum pressure of SUMMA<sup>®</sup> canisters prior to sample collection) shall be included on AR/COC forms submitted

to the laboratory. Copies of field forms, which include elevation and SUMMA<sup>®</sup> canister vacuum pressure measurements, were submitted to the laboratory but were not listed on each AR/COC. The project leader was notified, field team members discussed and reviewed PCCP requirements, and preparation of 2016 field documentation will include elevation and ambient pressure information on the AR/COC, either by reference to included field forms or by providing the measurements on the AR/COC in the comment field. There were no adverse impacts to data quality as the elevation and ambient pressure information does not impact analytical procedures or results, and is not required by the analytical laboratory.

The second variance is associated with the purging process. A PID with an 11.7 electron volts (eV) lamp was used to screen the soil-gas removed during the purging process instead of an 11.8 eV lamp as specified in the PCCP, Attachment 3, Section 3.9. 11.8 eV lamps are not available from the manufacturer or the distributors. The use of an 11.8 eV lamp was originally proposed based on the ionization potential for trichlorofluoromethane and 1,1,2-trichloro-1,2,2-trifluoroethane, two commonly detected VOCs at the CWL that have ionization potentials of 11.77 eV and 11.99, respectively. An 11.7 eV lamp or lower will not detect these VOCs. However, an 11.7 eV lamp will detect the other VOCs that were detected at all sampling ports with ionization potentials that are less than 11.7, including TCE (most prominent and highest concentration VOC), PCE, chloroform, and 1,1-dichloroethene. Of the 50 VOCs tested, only four have an ionization potential exceeding 11.7 eV (1,2-dichloro-1,1,2,2-tetrafluoroethane; dichlorodifluoromethane; trichlorofluoromethane; and 1,1,2-trichloro-1,2,2-trifluoroethane). Because the 11.7 eV lamp is suitable for detecting common VOCs during the purging process, there is no adverse impact to data quality. DOE/Sandia will request a modification to the PCCP in CY 2016 to address this issue.

### **5.3 Data Evaluation**

Soil-gas monitoring is required to determine whether the groundwater beneath the CWL is adequately protected as part of the CWL groundwater monitoring program. In accordance with PCCP Attachment 1, Section 1.8.2.2, statistical evaluation of soil-gas results for specific VOCs that exceed 0.50 ppmv from the three deepest sampling ports of wells CWL-D1 through CWL-D3 (i.e., CWL-D1-470, CWL-D2-470, and CWL-D3-480) are required annually, and include the following:

- calculate the UCL and LCL of the mean at a 95% confidence level using current data and historic data since completion of the VE VCM, and
- compare the LCL to the trigger level of 20 ppmv.

The trigger level of 20 ppmv only applies to the 95% LCL of the mean and not to individual sample results. For the first 5 years after the effective date of the PCCP (June 2, 2011), historic soil-gas monitoring results are to be used to augment the statistical analysis. After June 2, 2016, only soil-gas data collected under the PCCP is to be used. Historic soil-gas data used and presented in Section 5.4 includes results from June 1998, June 1999, August 2001, June 2004, September 2004, and October 2005. Although the VE VCM was not completed until July 1998, the June 1998 data set is included as it is representative of the conditions when the VE system was shut down a month later.



### 5.3.1 Statistical Assessment Requirements

Based upon the soil-gas monitoring results presented in Table 5-1 and discussed in Section 5.2.1, acetone (1.2 ppmv), 1,1,2-trichloro-1,2,2-trifluoroethane (0.77 ppmv), and TCE (4.5 ppmv) in the CWL-D2-470 sample exceeded the 0.5 ppmv threshold. As a result, confidence intervals (UCLs and LCLs) are calculated and used to compare to the trigger level of 20 ppmv. If a result is below the analytical laboratory detection limit, the MDL for the constituent is used for statistical analysis. For duplicate analyses, only the highest detection for the environmental-duplicate sample pair is used for statistical analysis.

### 5.3.2 Statistical Assessment Results

CY 2015 soil-gas statistical assessment results are presented in Table 5-4. The calculated LCLs for acetone; 1,1,2-trichloro-1,2,2-trifluoroethane; and TCE ranged from 0.028 to 2.99 ppmv and are below the trigger level of 20 ppmv.

## 5.4 Historic Data Evaluation

In accordance with PCCP Attachment 1, Section 1.12 and Attachment 3, Section 3.11, current soil-gas monitoring results are compared and evaluated with respect to historic results since completion of the VE VCM. This allows for long-term trends to be defined and provides for more meaningful interpretations of current results with respect to historic data. Tables 5-5 and 5-6 present TCE and total VOCs soil-gas monitoring results, respectively, for the post-closure care monitoring network. Data sets included range from June 1998 (representative of the end of the VE VCM) to January 2015. To be consistent with historic soil-gas monitoring data sets and for a more technically sound historic comparison, the concentrations shown in Tables 5-5 and 5-6 for the 2012, 2013, and 2015 data sets are taken from the January sampling events that included results for all monitoring wells and sampling ports. The much more limited data set associated with resampling in May 2012, March 2013, and March 2015 were not incorporated into Tables 5-5 and 5-6.

Consistent with pre-VE VCM characterization data, the highest concentrations of TCE in soil gas remain in the central part of the vadose zone, approximately 240 feet bgs (CWL-D1 and CWL-D2 results for the 240 foot bgs depth, 17.0 and 13.0 ppmv, respectively). Consistent with the detailed conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004), concentrations in this central portion of the plume are generally decreasing over time as VOC soil gas slowly diffuses in three dimensions (i.e., away from this central “core” of the VOC soil-gas plume). As this slow diffusion occurs, concentrations at other depths will sometimes increase. When the October 2005 TCE results are compared to the January 2015 results for all of the CWL-D1 through CWL-D3 sampling ports (5 sampling ports each, for a total of 15 ports from 100 to 480 feet bgs), seven sampling ports show decreasing levels, whereas eight ports show increasing levels. Two of the three deep sampling ports (CWL-D1-470 and CWL-D3-480) had lower concentrations in January

Table 5-4  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Statistical Assessment Results Summary  
 Calendar Year 2015

Soil-Gas Constituent Exceeding Threshold Concentration <sup>a</sup>	Minimum <sup>b</sup> (ppmv)	Maximum <sup>b</sup> (ppmv)	Mean <sup>c</sup> (ppmv)	Standard Deviation <sup>c</sup>	LCL <sup>c</sup> (ppmv)	UCL <sup>c</sup> (ppmv)	Distribution Type <sup>c</sup>	Trigger Level <sup>a</sup> (ppmv)	Trigger Level Exceeded <sup>d</sup> ?
Acetone (1.2 ppmv)	0.001	5	0.8521	1.507	0.0282	1.676	Normal	20	No
1,1,2-Trichloro-1,2,2-trifluoroethane (0.77 ppmv)	0.001	1.2	0.6765	0.35	0.4853	0.8677	Normal	20	No
Trichloroethene (4.5 ppmv)	0.001	7.1	4.195	2.209	2.988	5.402	Normal	20	No

Notes:

<sup>a</sup>All maximum concentrations are from CWL-D2-470 January environmental sample. CWL Permit Attachment 1, Section 1.8.2.2, defines the threshold concentration (0.50 ppmv) and trigger level (20 ppmv). Both concentration limits apply only to soil-gas constituents detected in the three deepest sampling ports of wells CWL-D1 through CWL-D3.

<sup>b</sup>Minimum and maximum results determined from historic data, including the CY 2015 results.

<sup>c</sup>Mean, standard deviation, LCL, UCL, and Distribution Type determined using ProUCL statistical program.

<sup>d</sup>Exceedance determined by comparing the constituent LCL against the trigger level of 20 ppmv.

CWL = Chemical Waste Landfill.

CY = calendar year.

LCL = lower confidence limit.

ppmv = parts per million by volume.

UCL = upper confidence limit.

Table 5-5  
 Historic Soil-Gas Monitoring Summary – TCE Concentrations<sup>a</sup> (ppmv)  
 Chemical Waste Landfill

Well ID & Sample Port Depth <sup>b</sup>	June 1998	June 1999	August 2001	June 2004	September 2004	October 2005	January <sup>c</sup> 2012	January <sup>c</sup> 2013	January 2014	January <sup>c</sup> 2015
CWL-UI1-40	4.5	16.0	7.9	3.8	4.0	4.5	5.20	7.30	4.80	4.20
CWL-UI1-80	0.19	4.9	6.7	5.9	6.1	6.8	6.50	9.70	6.30	5.10
CWL-UI1-120	3.0	5.9	9.1	6.0	14.0	13.0	7.70	11.00	7.60	8.20
CWL-UI2-36	0.037	0.70	ND	1.6	ND	1.2	3.10	3.50	2.80	3.00
CWL-UI2-76	0.091	1.0	2.4	3.4	4.1	3.7	5.60	7.80	3.70	3.70
CWL-UI2-136	5.5	1.9	4.6	3.0	1.9	3.0	8.50	6.60	6.20	5.4
CWL-D1-100	0.220	2.5	7.1	9.8	13.0	12.0	10.00	12.00	9.90	11.00
CWL-D1-160	120.0	14.0	21.0	25.0	29.0	22.0	14.00	16.00	16.00	16.00
CWL-D1-240	160.0	44.0	44.0	34.0	34.0	24.0	22.00	23.00	19.00	17.00
CWL-D1-350	0.013	11.0	19.0	13.0	22.0	2.8	13.00	13.00	8.50	13.00
CWL-D1-470	0.077	0.17	0.25	0.25	0.27	0.34	0.51	0.08	0.16	0.11
CWL-D2-120	3.1	21.0	20.0	22.0	25.0	16.0	16.00	19.00	13.00	13.00
CWL-D2-240	ND	40.0	38.0	26.0	13.0	17.0	18.00	23.00	16.00	13.00
CWL-D2-350	0.064	12.0	18.0	11.0	17.0	5.0	11.00	13.00	9.90	8.10
CWL-D2-440	0.082	1.0	7.6	2.5	5.9	2.8	1.80	0.11	0.14	3.90
CWL-D2-470	ND	0.94	5.8	3.1	4.6	4.3	4.10	7.00	4.70	4.50
CWL-D3-120	0.009	1.1	4.0	6.0	4.9	4.5	7.00	5.30	4.10	5.20
CWL-D3-170	ND	2.5	9.9	4.5	6.6	4.4	7.90	7.20	5.40	6.40
CWL-D3-350	ND	1.6	2.4	2.2	1.5	1.4	8.80	7.80	5.30	6.60
CWL-D3-440	ND	1.8	0.26	0.75	3.4	3.3	6.80	13.00	8.20	6.80
CWL-D3-480	ND	1.9	1.2	0.2	2.1	4.1	0.21	0.03	0.04	0.30

Notes:

January 2012 – 2015 concentrations have been rounded for significant digit consistency; they may not exactly match the reported concentrations corresponding data tables.

<sup>a</sup>June 1998 through January 2012 are EPA Method TO-14 results. January 2013 – 2015 are EPA Method TO-15 results. If a duplicate sample was collected, the maximum concentration of the environmental-duplicate sample pair is shown.

<sup>b</sup>Port depth is the last number in the Well Identification (ID), and is in feet below ground surface.

<sup>c</sup>Results associated with duplicate resampling conducted in May (2012 data set), March (2013 data set), and March (2015 data set) are not included. CWL-D3-440 results for January 2012 collected in March 2012 due to issues with sampling this port; could not be sampled in January 2012.

ND = not detected.

ppmv = parts per million by volume.

TCE = trichloroethene.

Table 5-6  
 Historic Soil-Gas Monitoring Summary – Total Volatile Organic Compound Concentrations<sup>a</sup> (ppmv)  
 Chemical Waste Landfill

Well ID & Sample Port Depth <sup>b</sup>	June 1998	June 1999	August 2001	June 2004	September 2004	October 2005	January <sup>c</sup> 2012	January <sup>c</sup> 2013	January 2014	January <sup>c</sup> 2015
CWL-UI1-40	112	246	141	11.78	11.47	13.15	11.76	14.68	9.54	9.27
CWL-UI1-80	0.22	9.63	13	10.61	10.67	11.61	10.18	13.74	9.43	8.74
CWL-UI1-120	6.32	9.94	45.42	9.36	21.41	19.18	11.07	14.64	11.20	13.29
CWL-UI2-36	17.6	2117	1800	813.7	850.0	391.78	4.64	5.02	4.81	5.37
CWL-UI2-76	0.126	1.65	4.37	5.52	6.90	5.96	7.85	10.74	6.04	6.28
CWL-UI2-136	10.5	4.21	7.98	4.42	2.85	4.89	11.45	9.12	9.31	9.16
CWL-D1-100	0.248	4.93	11.9	14.59	18.22	17.25	13.84	15.90	14.25	17.41
CWL-D1-160	167	21.4	30.1	33.32	38.41	29.28	18.48	20.33	21.45	20.78
CWL-D1-240	261	78.4	61.5	45.27	44.74	32.60	22.46	28.71	25.32	26.04
CWL-D1-350	0.02	20.7	31.7	18.73	30.53	4.07	16.56	16.31	11.61	19.29
CWL-D1-470	0.105	0.231	0.921	0.612	0.82	0.603	0.87	0.13	0.39	0.44
CWL-D2-120	5.4	33.0	29.4	29.26	34.23	22.31	20.70	24.05	18.49	18.81
CWL-D2-240	0.047	101	52.9	34.72	17.62	22.83	22.90	28.38	22.11	18.27
CWL-D2-350	0.091	22.9	25.9	15.42	23.41	7.50	13.31	16.01	16.04	12.64
CWL-D2-440	0.453	4.38	11.8	3.85	9.29	4.17	2.60	0.15	0.22	6.15
CWL-D2-470	0.058	6.95	8.40	4.17	6.60	6.40	5.78	8.49	10.14	8.14
CWL-D3-120	0.009	2.17	6.20	8.39	7.10	6.23	9.19	6.80	6.92	8.83
CWL-D3-170	0.037	5.01	15.0	6.11	9.40	6.12	10.57	9.18	8.83	10.38
CWL-D3-350	0.106	2.76	3.98	3.39	2.34	2.27	12.90	10.44	9.12	11.15
CWL-D3-440	0.017	4.04	0.519	0.96	5.14	4.64	9.69	17.73	12.60	11.12
CWL-D3-480	0.001	4.47	1.85	0.31	3.30	5.71	0.30	0.06	0.05	0.43

Notes:

January 2012 - 2015 concentrations have been rounded for significant digit consistency; they may not exactly match the reported concentrations corresponding data tables.

<sup>a</sup>The total VOC concentration is the sum of all detected constituents. June 1998 through January 2012 are EPA Method TO-14 results. January 2013 – 2015 are EPA Method TO-15 results. If a duplicate sample was collected, the maximum concentration of the environmental-duplicate sample pair is shown,

<sup>b</sup>Port depth is the last number in the Well Identification (ID), and is in feet below ground surface.

<sup>c</sup>Results associated with duplicate resampling conducted in May (2012 data set), March (2013 data set), and March (2015) are not included. CWL-D3-440 results for January 2012 collected in March 2012 due to issues with sampling this port; could not be sampled in January 2012.

EPA = U.S. Environmental Protection Agency.

ppmv = parts per million by volume.

VOC = volatile organic compound.

2015 relative to October 2005. These trends are similar for the total VOC results. When January 2015 TCE results are compared to January 2014 results, 12 ports show decreasing or consistent concentrations and 9 ports show increases. For total VOC results, 14 ports show increases in concentration, while 7 ports show decreases in concentrations.

Figures 5-1 through 5-5 show the concentration of TCE over time for each sampling port of CWL-UI1, CWL-UI2, CWL-D1, CWL-D2, and CWL-D3, respectively. Figures 5-6 through 5-10 show the concentration of total VOCs over time for each sampling port of CWL-UI1, CWL-UI2, CWL-D1, CWL-D2, and CWL-D3, respectively. The figures are graphical representations of the data presented in Tables 5-5 and 5-6. The total VOC plots for CWL-UI1 and CWL-UI2 (Figures 5-6 and 5-7) look very different than the corresponding TCE plots (Figures 5-1 and 5-2). This is because for these locations and the shallower depths represented (36 to 136 feet bgs), acetone used to occur at very high concentrations, especially at the shallowest two ports (36 and 40 feet bgs) (SNL/NM December 2004). Concentrations of total VOCs have decreased dramatically since August 2001 at the shallowest ports of CWL-UI1 and CWL-UI2, most likely due to upward diffusion to the surface and the LE VCM completed in February 2002. Concentrations of TCE in the shallower soil-gas wells have remained relatively stable, and approximately half of the ports show small increases, as reflected in Table 5-5 and Figures 5-1 and 5-2. These small increases at CWL-UI1 and CWL-UI2 shallow sampling ports are consistent with upward diffusion of TCE soil gas from the former plume "core" located approximately 250 feet bgs.

The majority of the CWL residual soil-gas plume is represented by the CWL-D1 through D3 wells that have significantly deeper sampling ports, ranging from 110 to 480 feet bgs. TCE is the primary VOC of concern, although trichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, PCE, 1,1-dichloroethene, and chloroform were also detected in most of the samples. Together with TCE, these VOCs comprise the majority of the total VOC concentration calculated for each sample. Concentrations are generally steady or decreasing over time (Figures 5-3 and 5-4), except at the CWL-D3 location (Figure 5-5). Relative to June 1999 results, concentrations are generally higher in the CWL-D3 ports except at the 480 foot bgs port, which has decreased. All sampling ports at CWL-D3 show lower TCE concentrations in 2014 relative to 2013, except at the 480 foot bgs port. Over the historic monitoring period, the highest TCE and total VOC concentrations in the deepest ports have been consistently observed at the CWL-D2 location (one to two orders of magnitude higher). It is important to note the vertical scale difference on Figures 5-4 and 5-5 relative to Figure 5-3, as it exaggerates the appearance of minor (ppmv) changes in TCE concentration. This is especially true of Figure 5-5. Again, these trends are also reflected in the total VOC plots shown in Figures 5-8 through 5-10.

TCE in groundwater is currently only being detected in CWL-MW10, which is the closest groundwater monitoring well to CWL-D3 (see Figure 2-4). Because of the concern that VOC soil gas could potentially enter a groundwater well and contaminate groundwater samples through the upper unsaturated portion of the well screen or at casing joints that may not be airtight, passive soil-gas venting devices (i.e., Baroballs™) were installed on all groundwater monitoring wells in March 2012. The Baroball™ devices remained on all groundwater and soil-gas monitoring wells throughout CY 2015 and were inspected during the sampling events. As discussed in Chapter 4, TCE concentrations in groundwater samples from CWL-MW10 have decrease since January 2013 (see Figure 4-7). It is unlikely that the current residual VOC soil-gas plume will directly impact groundwater due to the very low residual VOC soil-gas concentrations and the declining surface of the regional aquifer beneath the CWL (Section 4.4

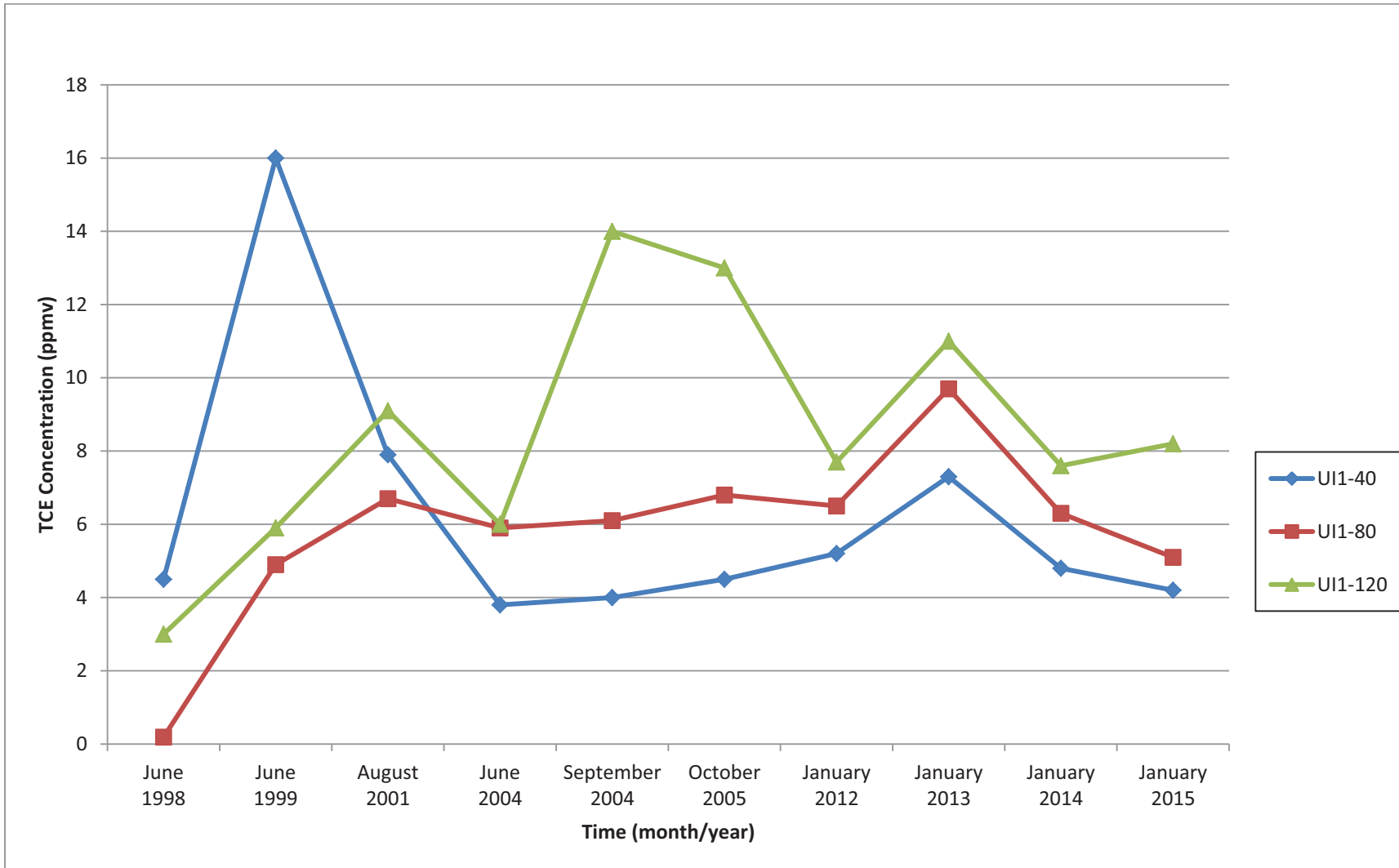


Figure 5-1  
Historic Total TCE Concentrations vs. Time  
Chemical Waste Landfill Well UI-1 Ports

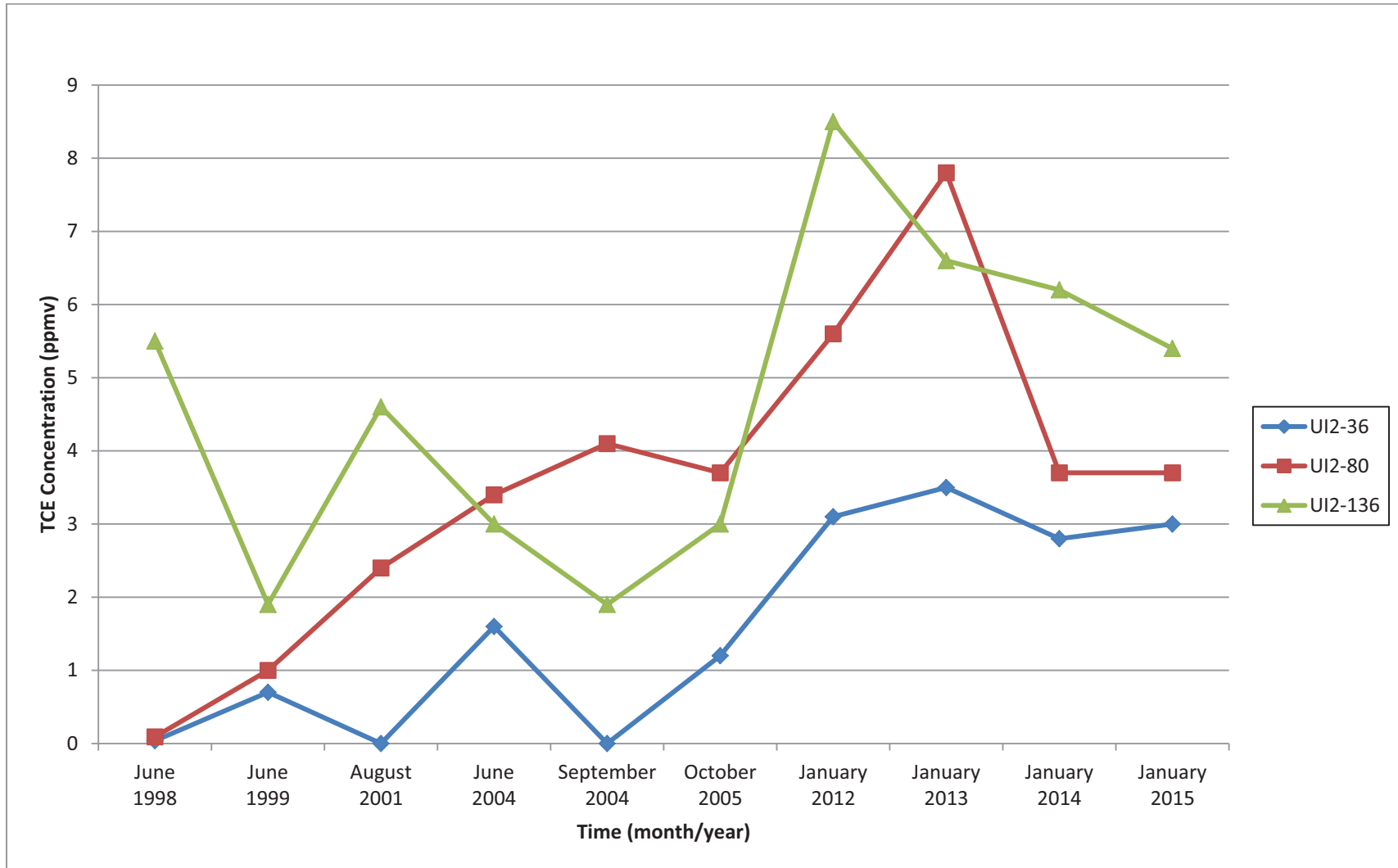


Figure 5-2  
Historic Total TCE Concentrations vs. Time  
Chemical Waste Landfill Well UI-2 Ports

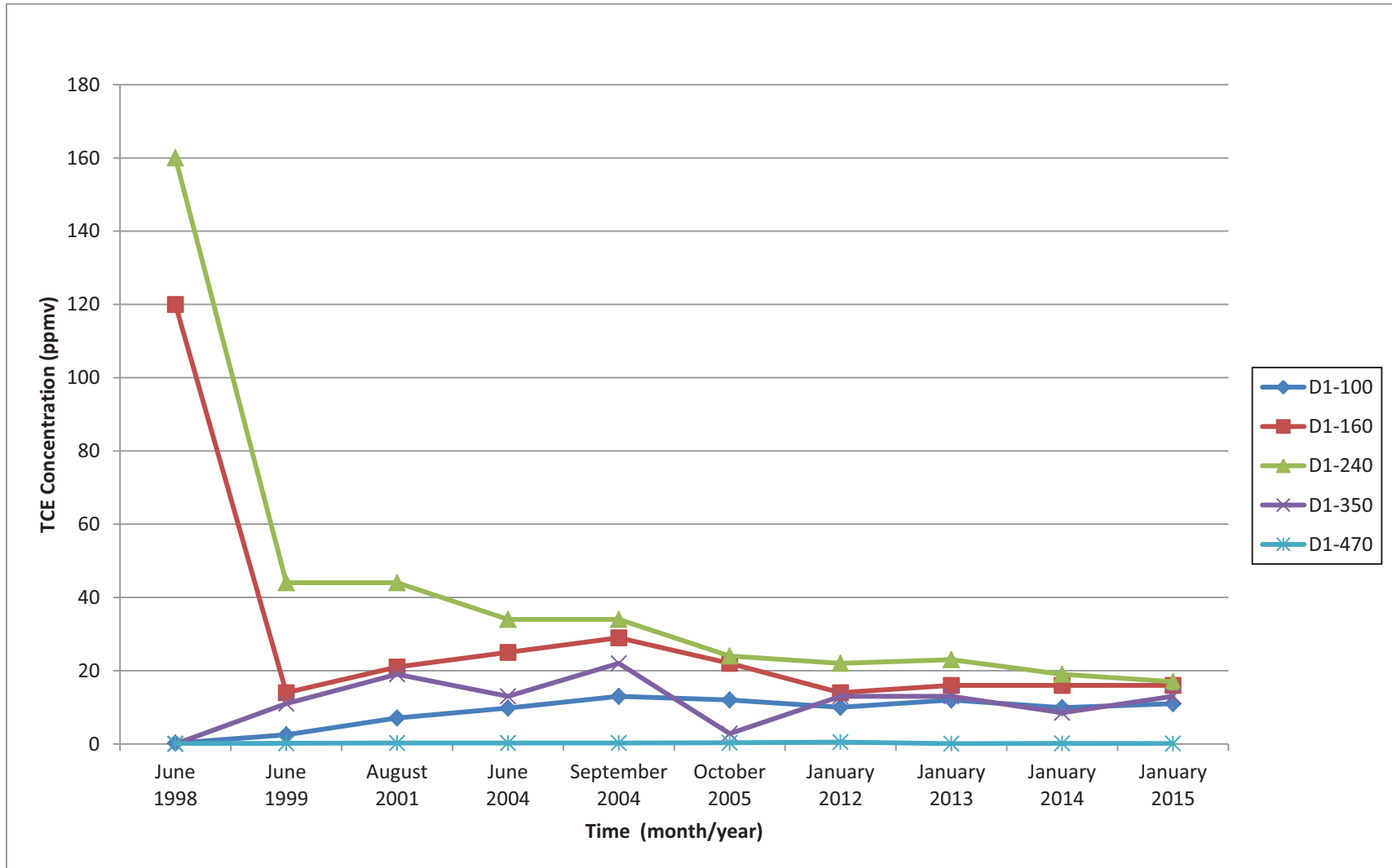


Figure 5-3  
Historic Total TCE Concentrations vs. Time  
Chemical Waste Landfill Well D1 Ports



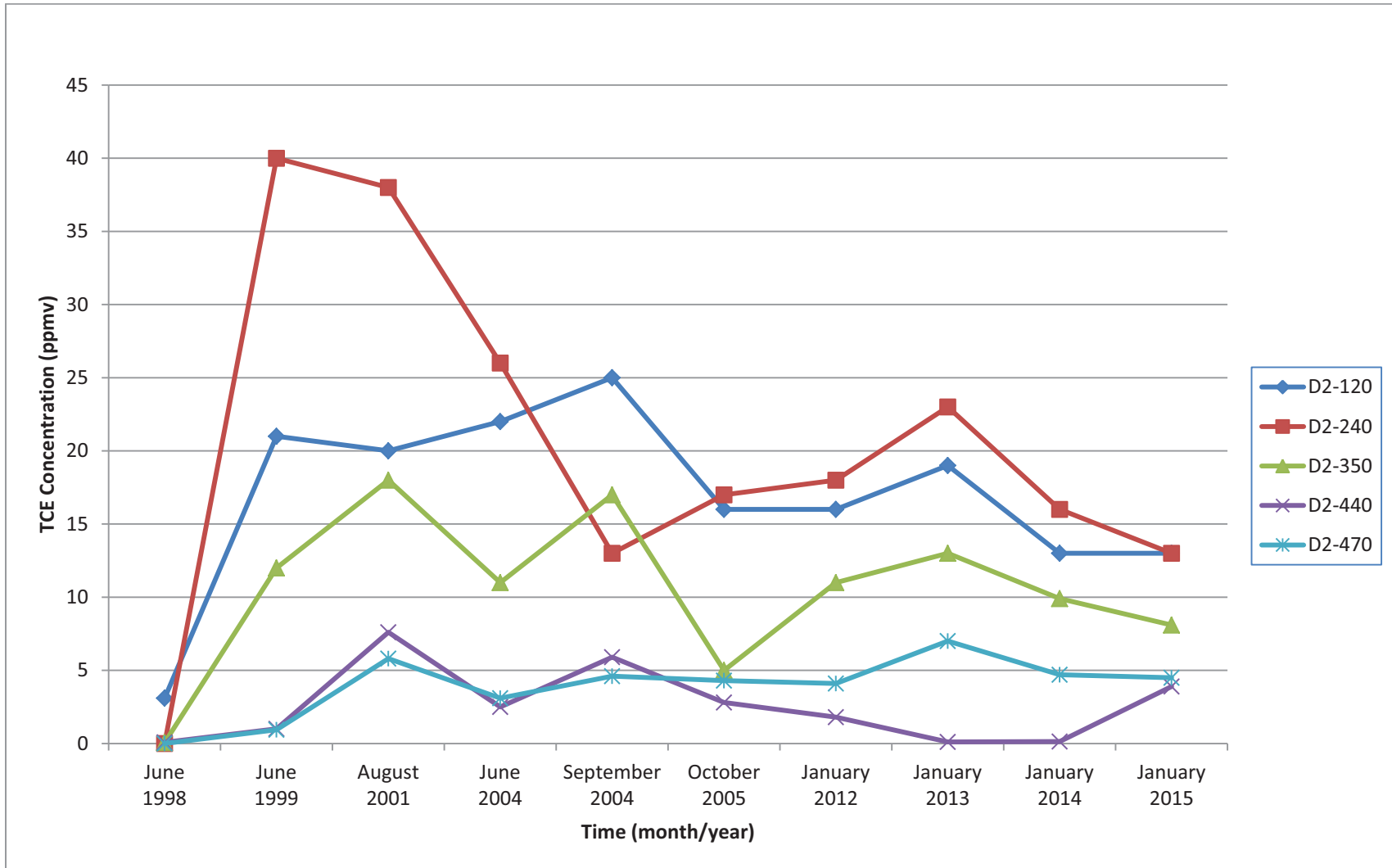


Figure 5-4  
Historic Total TCE Concentrations vs. Time  
Chemical Waste Landfill Well D2 Ports

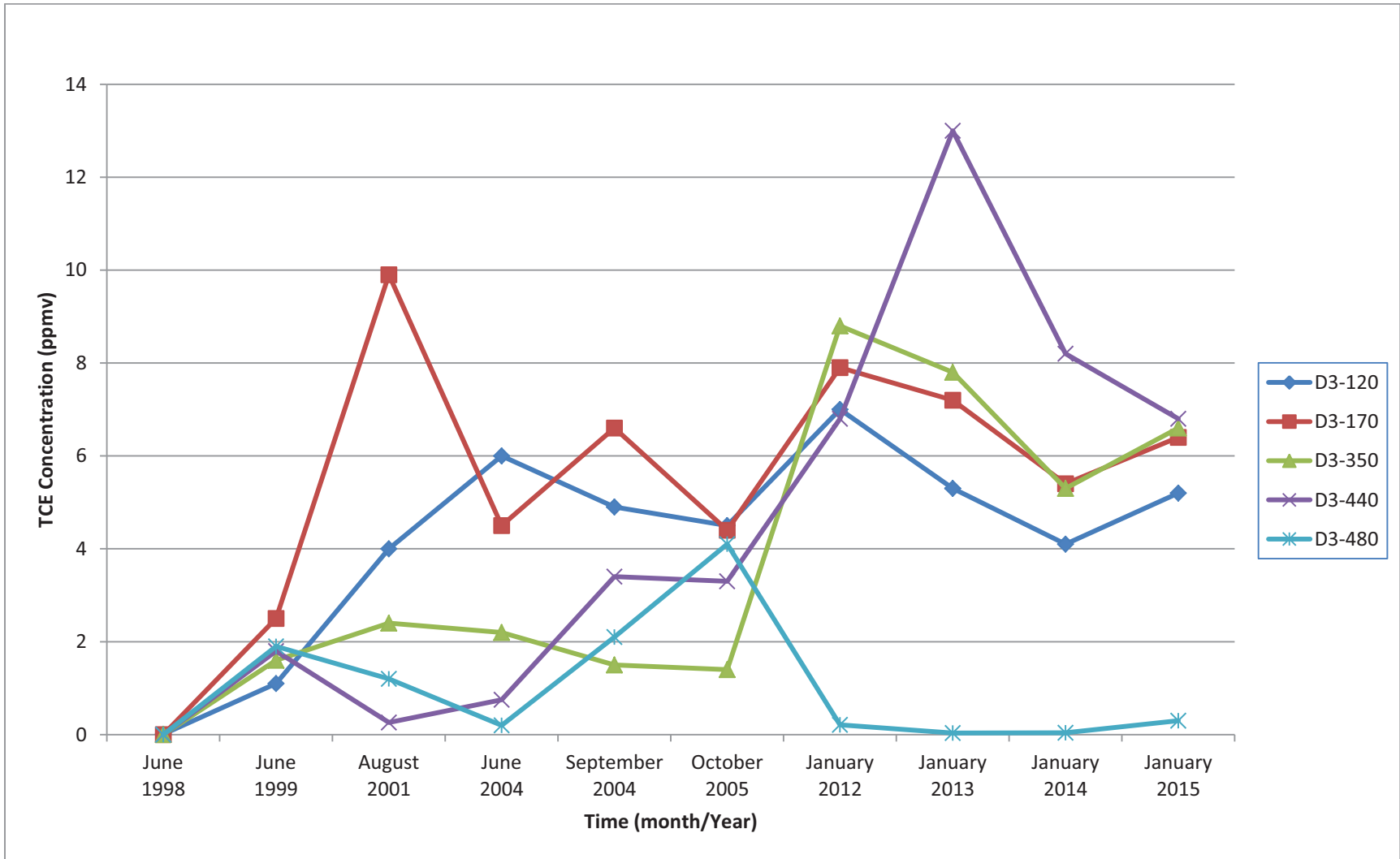


Figure 5-5  
Historic Total TCE Concentrations vs. Time  
Chemical Waste Landfill Well D3 Ports

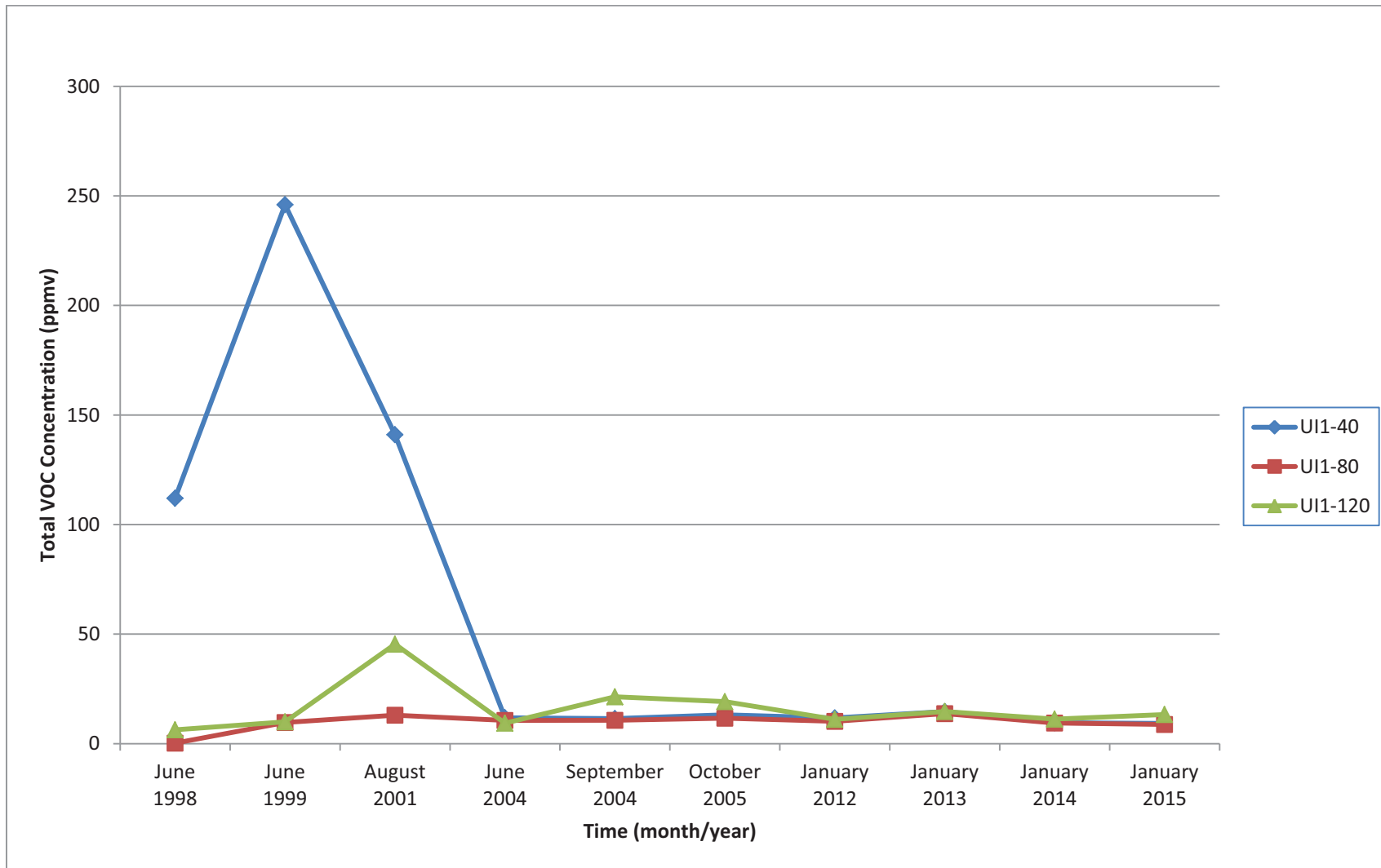


Figure 5-6  
Historic Total VOC Concentrations vs. Time  
Chemical Waste Landfill Well UI-1 Ports

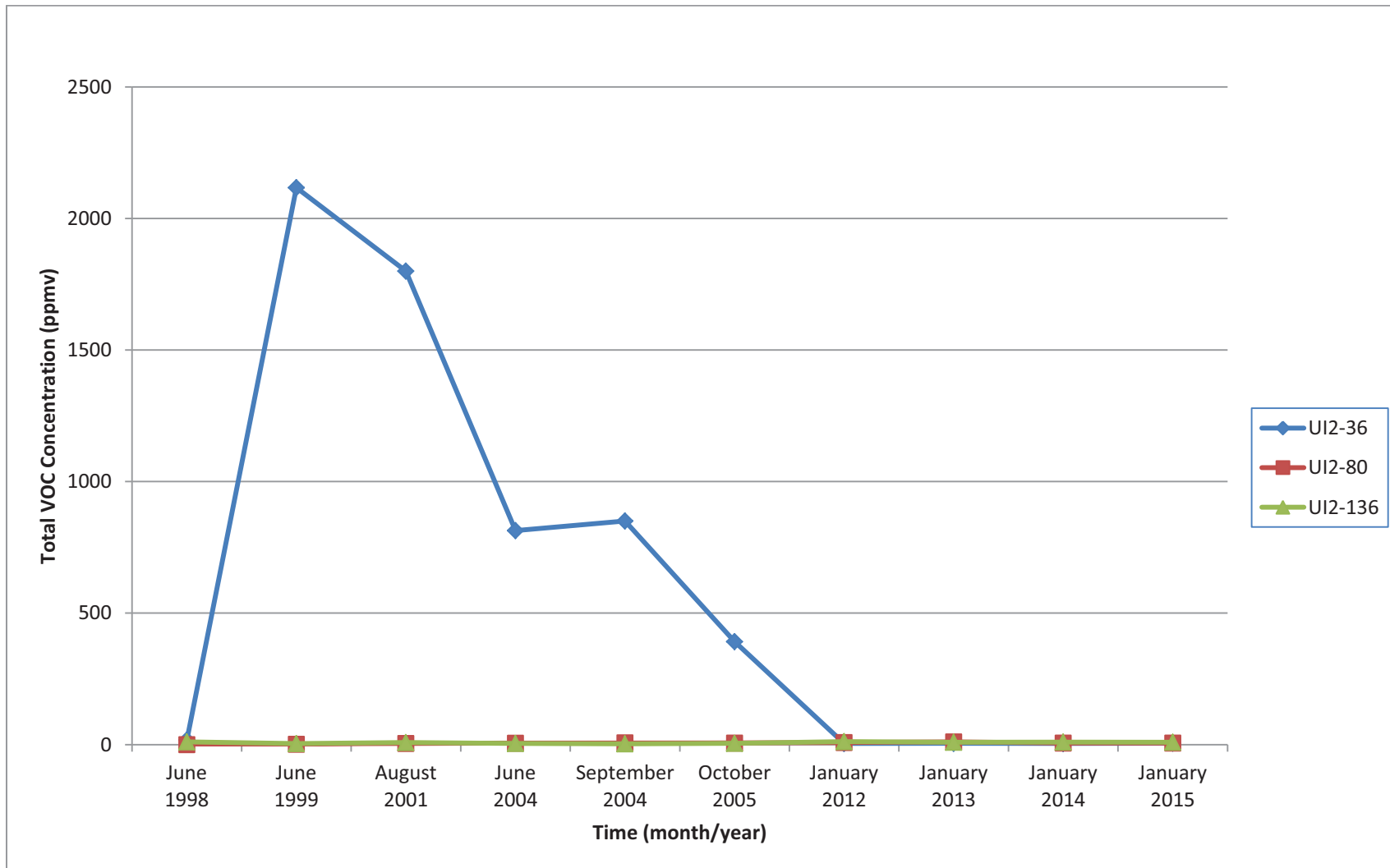


Figure 5-7  
Historic Total VOC Concentrations vs. Time  
Chemical Waste Landfill Well UI-2 Ports

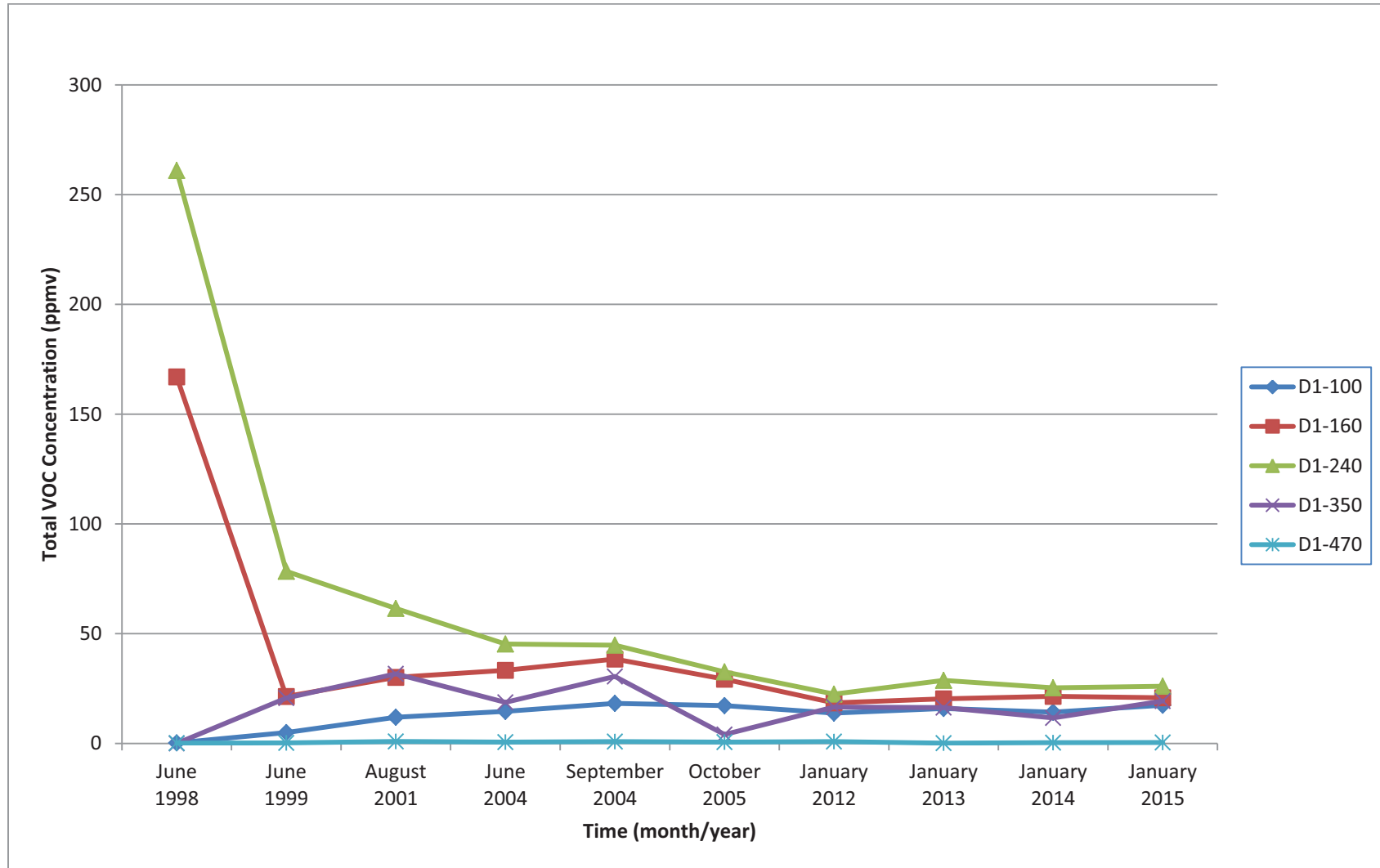


Figure 5-8  
Historic Total VOC Concentrations vs. Time  
Chemical Waste Landfill Well D1 Ports

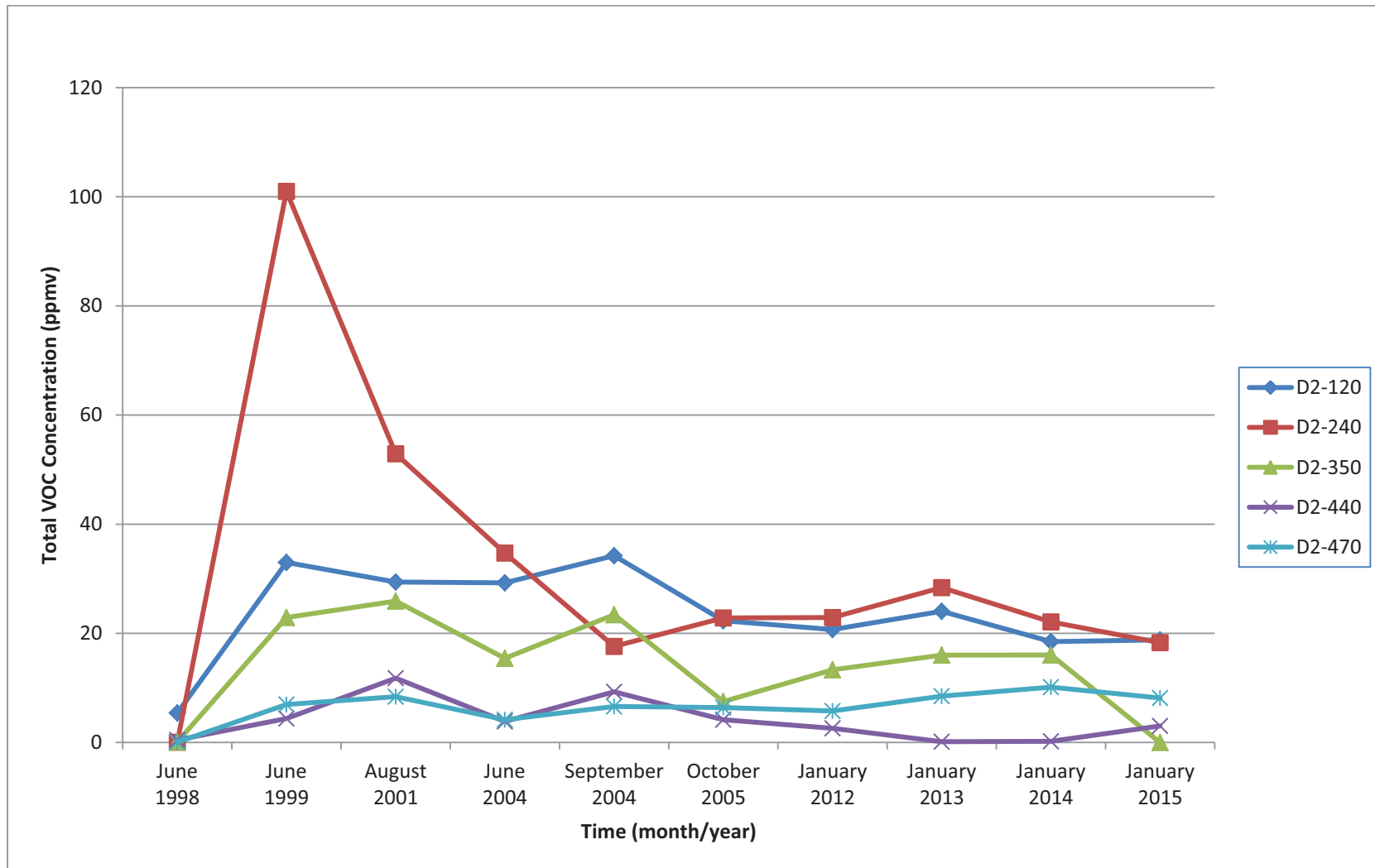


Figure 5-9  
 Historic Total VOC Concentrations vs. Time  
 Chemical Waste Landfill Well D2 Ports

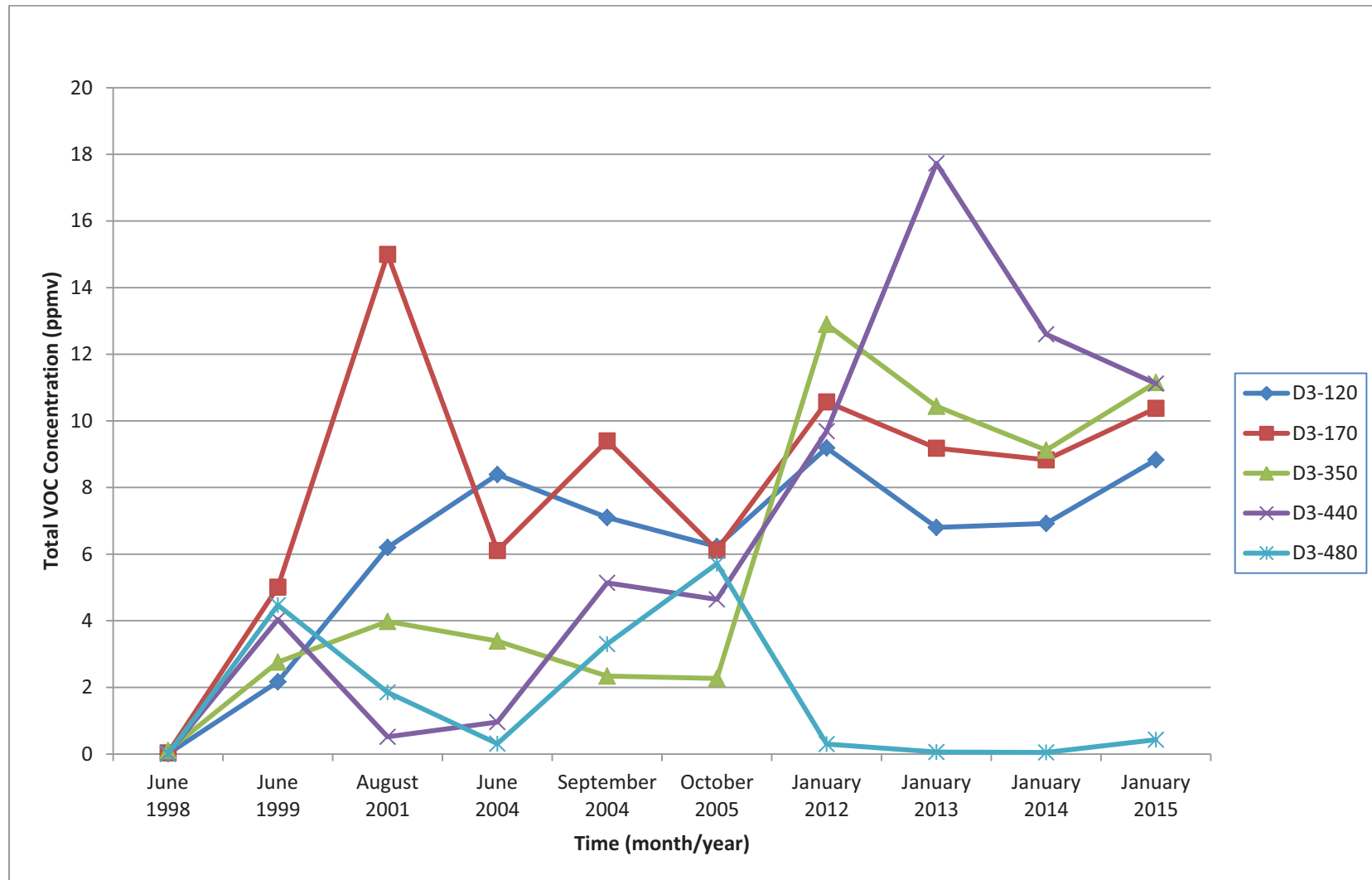


Figure 5-10  
 Historic Total VOC Concentrations vs. Time  
 Chemical Waste Landfill Well D3 Ports

and Annex E of CWL Corrective Measures Study Report [SNL/NM December 2004]). Based upon historic groundwater monitoring results and statistical evaluation of more recent results (Section 4.3), statistically significant evidence of increasing contamination in groundwater has not been observed since completion of the VE VCM in 1998.

Overall, the CY 2015 data set is consistent with historic post-VE VCM soil-gas monitoring results and confirms the residual VOC soil-gas plume beneath the CWL is slowly dissipating in three dimensions through diffusion in the vadose zone. These data and conclusions are consistent with the conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004).



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## **6.0 INSPECTION, MAINTENANCE, AND REPAIR RESULTS**

This chapter presents a summary of CY 2015 inspection, maintenance, and repair activities. Requirements for inspection, maintenance, and repair are presented in Section 3.2 of this report. The CWL post-closure care systems and features that require periodic inspection, maintenance, and/or repair include:

- Final cover system (vegetation and cover)
- Surface-water diversion structures
- Compliance monitoring system (groundwater and soil-gas monitoring networks and sampling equipment)
- Perimeter security fence (including signs, gates, locks, and survey monuments)

A schedule for implementing inspections and prescribed maintenance is provided in PCCP Attachment 1, Section 1.10, Table 1-6. CY 2015 inspections are summarized in Sections 6.1 through 6.5 and results are documented on the CWL Post-Closure Inspection Forms/Checklists provided in Annex C of this report, in conformance with the requirements in PCCP Attachment 1, Section 1.9 and 1.10 (NMED October 2009 and subsequent revisions). ET Cover maintenance and/or repair work performed by the ET Cover maintenance contractor in response to the inspections and as best management practice (i.e., beneficial maintenance and/or repair work not required by the PCCP) is described in Section 6.6.

### **6.1 Final Cover System**

The final cover system includes the ET Cover vegetation and the cover surface. ET Cover vegetation is inspected by the staff biologist annually, documented on the Biology Inspection Form/Checklist for the CWL Cover, and summarized in Section 6.1.1. The ET Cover surface is inspected quarterly by a field technician, documented on the Post-Closure Inspection Form/Inspection Checklist, and summarized in Section 6.1.2. ET Cover maintenance and repairs performed during CY 2015 by the ET Cover maintenance contractor are summarized in Section 6.6 along with supplemental watering activities.

#### **6.1.1 Vegetation Monitoring and Inspection**

Based upon results from ET Cover vegetation inspection conducted in CY 2011, it was determined that the three criteria for successful revegetation had been met (PCCP Attachment 1, Section 1.9). This determination changed the required frequency of cover vegetation inspection to an annual basis. ET Cover vegetation was monitored throughout CY 2015 and cover maintenance activities were performed in February-March and July-August, (Section 6.6).

The annual Biology Inspection of the ET Cover vegetation was conducted on August 4, 2015 by the SNL/NM staff biologist (Inspection Form in Annex C). The inspection was conducted at the end of the New Mexico growing season so an accurate determination of living plants at the site could be performed. The ET Cover foliar coverage and vegetation continue to meet PCCP requirements for successful revegetation, with 48% foliar coverage (requirement is equal to or greater than 20% foliar coverage), with 94% of the total foliar coverage comprised of native species (requirement is 50% or more of the total foliar coverage must be comprised of native species). No barren areas exceeding 200 square feet or large mammal burrows (i.e., greater than four inches in diameter) were observed during the annual biology inspection, but ant hills/burrows and small mammal burrows were observed at frequencies and locations similar to previous inspections. In general the level of weedy plant species present on the cover was very low. Juvenile four-wing saltbush plants (i.e., potentially deep-rooted plants) were identified across the cover but at a low percentage of total foliar coverage.

The foliar coverage based on the August annual inspection was approximately 48%, of which 94% is native vegetation. This is approximately the same as the 2014 inspection results (44% foliar coverage). The successional changes in ET Cover vegetation documented in the CY 2014 Annual Report (SNL/NM March 2015) continue. Sand dropseed was the dominant native grass in August 2015 (24% foliar coverage), and together with blue grama (12% foliar coverage) comprises the majority of the current ET Cover vegetation. Numerous juvenile four-wing saltbush plants (4% foliar coverage) were observed during the August inspection, and were subsequently removed as a best management practice as recommended by the staff biologist. Similar to the 2014 inspection, many weedy species, including weedy grasses, were present on the cover. During the August 4 inspection the grasses were displaying a mix of green, actively photosynthesizing leaves and dried leaves from previous growing seasons.

The 2015 Chemical Waste Landfill Biology Report (Biology Report) is presented in Annex D of this report and provides background information on ET Cover revegetation efforts. This report includes a summary of 2015 cover maintenance activities and local climate trends, additional details on the August biology inspection and the successional development of the native grasses, ET Cover photographs, and recommendations.

### 6.1.2 Cover Inspection

Quarterly cover surface inspections were performed by a field technician in March, June, September, and December of 2015. Minor maintenance and/or repairs performed during or after the inspections based on PCCP requirements are summarized below. No additional inspection items or issues required repairs.

#### ***June Inspection***

No maintenance and/or repairs were required on the ET Cover surface. Live tumbleweeds and juvenile four-wing saltbush shrubs that were noted during the June inspection were removed by the ET Cover maintenance contractor from August 10 - 12 as a best management practice (see Section 6.1.3).

### ***September Inspection***

Follow-up was performed on several small animal burrows identified during the August 2015 biology inspection along the eastern fence line of the ET Cover. A follow-up inspection of the animal burrows was performed by the staff biologist on September 9, who determined the burrows were inactive. No repair was required, but as a best management practice to discourage future burrowing into the ET Cover the burrows were backfilled with local soil on September 10, 2015.

### ***December Inspection***

One small animal burrow approximately 4-inches in diameter at the surface (but significantly narrower beneath the surface) was identified and addressed. A follow-up inspection of the animal burrow was performed by the staff biologist on December 7, who determined the burrow was active. Since the burrow was shallow and likely being used for winter shelter or possible hibernation, the staff biologist recommended follow-up in spring (i.e., the March 2016 inspection) when the burrow will likely no longer be inhabited. Pending results of the March 2016 inspection, the burrow will be backfilled. The project leader approved this course of action versus attempting live trapping and relocation during the winter months to minimize impact to wildlife, given the burrow diameter does not exceed the 4-inch requirement and will not have an adverse impact on the site.

## **6.2 Storm-Water Diversion Structure Inspection**

Quarterly inspections of storm-water diversion structures were performed by a field technician in March, June, September, and December of 2015 at the same time as the cover surface inspections. Minor maintenance and/or repairs performed during or after the inspections based on PCCP requirements are summarized below. No additional inspection items or issues required repairs.

During the March inspection, windblown tumbleweeds were removed from the two drainage culverts along the southern perimeter. In response to the June inspection, tumbleweeds were removed from the storm-water diversion structures (including the two drainage culverts on the southern perimeter) on July 29 as described in Section 6.6. During the December inspection tumbleweeds were again removed from the two drainage culverts.

## **6.3 Monitoring Well Network Inspection**

Semi-annual inspection of the groundwater monitoring network and sampling equipment was performed by a field technician during the January and July 2015 monitoring events. In January the annual inspection for the soil-gas monitoring wells and sampling equipment was also performed. No inspection items or issues required repairs. Baroball™ passive venting devices remain on all soil-gas and groundwater monitoring wells, and are in good condition.

## **6.4 Security Fence Inspection**

Quarterly inspections of the security fence, access controls (gates, locks, signs), and survey monuments were performed by a field technician in March, June, September, and December of 2015 at the same time as the cover surface inspections. Minor maintenance and/or repairs performed during or after the inspections based on PCCP requirements are summarized below. No additional inspection items or issues required repairs.

During the March inspection, windblown tumbleweeds were removed from the perimeter fence and the main gate lock was lubricated. Two survey monuments along the west side of the ET Cover were also cleared of windblown soil and tumbleweeds. In response to the June inspection, tumbleweed debris was again removed from the perimeter fence on July 29 by the ET Cover maintenance contractor as described in Section 6.6. During the September inspection windblown soil and weeds were removed from the four survey monuments. Tumbleweeds were removed from the fence line during the December inspection.

## **6.5 Emergency Equipment Inspection**

For the CWL, quarterly inspection of emergency equipment listed in PCCP Attachment 6, Table 6-4, is required. This equipment is shared with the CAMU, and monthly inspections are performed and documented on CAMU inspection forms. Any repairs or replacement of equipment are performed, as necessary, to maintain compliance with requirements for emergency equipment.

## **6.6 Cover and Site Maintenance**

Cover and site maintenance performed during CY 2015 by the ET Cover maintenance contractor is summarized below. Maintenance was performed in response to inspections (annual Biology Inspection and quarterly Cover Inspections) and as preventive, best management practice. In all cases work on the ET Cover was performed manually; no equipment was operated on the ET Cover. Routine minor cover and site maintenance/repairs performed during the quarterly inspections is summarized in Sections 6.1.2, 6.2, and 6.4. Overall, the CY 2015 cover maintenance effort was minimal and less than in 2014.

### ***February 26 – March 4, 2015***

Dead and live weeds were removed from the ET Cover, storm water diversion features, and perimeter fence line. A total of ~ 30 cubic yards of highly compressed weeds were removed from the CWL ET cover surface, fence line, and perimeter area and disposed at the KAFB Landfill.

### ***July 29 – August 12, 2015***

On July 29, tumbleweeds identified long the perimeter fence line and in the storm water diversion features (including the two drainage culverts along the southern perimeter) during the

June Cover Inspection were removed. 164 juvenile four-wing saltbush shrubs growing on the ET Cover were also identified for removal. The four-wing saltbush plants, dead tumbleweeds, and live tumbleweeds were removed from the ET Cover from August 10 – 12 as a best management practice to promote the growth and health of the native grasses. Care was taken to remove the entire plant, including the root system. All removed shrub and weed debris was disposed at the KAFB Landfill. Mowing along the north and west perimeter fence line and between the west fence line and the road was performed on August 10, also as a best management practice for weed control.

***CY 2014 Supplemental Watering***

No supplemental watering was performed in CY 2015 to augment natural precipitation.

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## **7.0 REGULATORY ACTIVITIES**

On June 2, 2011, the NMED approved closure of the CWL and the PCCP took effect (Kieling June 2011). NMED-approved Permit modifications and DOE/Sandia submittals since the PCCP became effective are summarized in Chapter 1. Regulatory activities in CY 2015 consisted of one submittal of two updated reference documents cited in the PCCP and submittal of the Calendar Year 2014 Chemical Waste Landfill Annual Post-Closure Care Report (SNL/NM March 2015). These activities are summarized below in Sections 7.1 through 7.3, respectively.

### **7.1 2015 Permit Modification Requests**

There were no Permit modification requests in CY 2015.

### **7.2 2015 Permit Submittals**

On March 17, 2015, DOE and Sandia submitted the Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2014 to NMED (SNL/NM March 2015).

On February 18, 2015, DOE and Sandia submitted four updated reference documents cited in the PCCP in accordance with requirements of Attachment 2, Section 2.0 of the PCCP (Todd February 2015). 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.

### **7.3 2015 Technical Communication**

There were no technical communications with NMED staff regarding CWL activities in CY 2015.

### **7.4 Permit Modification and Submittal History**

Table 7-1 summarizes the modification history of the PCCP through CY 2015. Table 7-2 summarizes all submittals associated with the PCCP through CY 2015, not including routine annual reports.



Table 7-1  
 Chemical Waste Landfill Post-Closure Care Permit Modification History

Date of Modification <sup>a</sup>	Affected Parts of PCCP	Description of Modification
September 26, 2011	Attachment 6 (Contingency Plan)	Updates to emergency response agreements, equipment, emergency coordinators, and inclusion of an evacuation route and assembly point figure and updated figure list.
November 16, 2011	Attachment 6 (Contingency Plan)	Correction of a typographical error in the telephone number for an emergency coordinator.
February 20, 2012	Attachments 1-5	Allow use of equivalent soil-gas passive venting devices and alternate method for analysis of soil-gas samples; clarification of cover inspection and repair specifications; updates to three figures for well locations; revisions to groundwater purging and stability requirements; inclusion of well completion diagrams for the four groundwater monitoring wells, updates to the list of operating procedures; clarification of soil-gas purging requirements; format updates to inspection forms; and correction of typographical errors.
November 7, 2013	Permit Part 3, Attachments 1-4	Provide clarification that alternative formats may be used to document inspections; provide additional detail regarding soil-gas passive venting devices; remove table and text references to the SNL/NM SOW for Analytical Laboratories, the SMO QAPP, and the Groundwater Monitoring HASP; and clarify data quality requirements for soil-gas samples.

Notes:

<sup>a</sup>Date represents the effective date of modification.

HASP = Health and safety plan.

PCCP = Post-Closure Care Permit.

QAPP = Quality assurance project plan.

SMO = Sample Management Office.

SNL/NM = Sandia National Laboratories/New Mexico.

SOW = Statement of work.

Table 7-2  
 Chemical Waste Landfill Post-Closure Care Permit Document Submittal History<sup>a</sup>

Date of Submittal <sup>b</sup>	PCCP Requirement	Description of Submittal
July 22, 2011	Permit Attachments 2 & 3	Procedures, plans, and documents cited in the PCCP used by SNL/NM personnel for groundwater and soil-gas monitoring.
February 7, 2012	Permit Attachment 2	Four procedures and one plan related to groundwater monitoring activities were updated to include minor changes that do not affect sampling procedures or protocols. Two title changes to procedures incorporated into the November 2011 Class 1 permit modification request.
January 24, 2013	Permit Attachments 2 & 3	Updates to reference document (SNL/NM Statement of Work for Analytical Laboratories) related to groundwater and soil-gas monitoring to reflect ongoing modifications and improvements in industry practices.
December 9, 2013	Permit Attachments 2 & 3	Revisions to three procedures related to sample management, shipping, and data review that were revised to keep the documents current and reflecting ongoing modifications and improvements in industry practices.
July 8, 2014	Permit Attachments 2 & 3	Two operating procedures cited in the PCCP used by SNL/NM personnel to validate analytical data from contract laboratories and conduct activities related to sampling CWL soil-gas wells.
February 18, 2015	Permit Attachment 2	Four operating procedures related to groundwater monitoring activities were updated to include minor changes that do not affect sampling procedures or protocols.

Notes:

<sup>a</sup>This table does not include the submittal.

<sup>b</sup>Date represents the date stamp on the DOE transmittal letter for the submittal.

CWL = Chemical Waste Landfill.

DOE = U.S. Department of Energy.

PCCP = Post-Closure Care Permit.

SNL/NM = Sandia National Laboratories/New Mexico.

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## **8.0 SUMMARY AND CONCLUSIONS**

A summary of CY 2015 activities and results is provided in this chapter, along with conclusions.

### **8.1 Groundwater and Soil-Gas Monitoring**

Two semi-annual groundwater monitoring events were conducted in January and July 2015. Groundwater samples were collected and analyzed in accordance with PCCP Attachment 1, Section 1.8 and Attachment 2 requirements. There were no variances or non-conformances. Two project-specific issues related to the sampling activities were identified from the January sampling event and are summarized in Section 4.2.4.

Statistical assessment was conducted on results from CWL groundwater monitoring wells. There was no statistically significant evidence of increasing contamination and no hazardous constituent 95% LCL of the mean exceeded its respective concentration limit. Groundwater surface elevation, hydraulic gradient, flow direction, and groundwater flow rate have been determined and are consistent with historic results.

One annual soil-gas monitoring event was conducted in January 2015. Samples collected from all wells were analyzed for VOCs by analytical method TO-15 for the second time (TO-14 was used prior to 2013). TCE was detected in all samples at concentrations ranging from 0.11 ppmv at CWL-D1 (470 foot bgs sample port) to 17 ppmv at CWL-D1 (240 foot bgs sample port). The maximum soil-gas concentration from the three deepest sampling ports (CWL-D1-470, CWL-D2-470, and CWL-D3-480) was TCE at a concentration of 4.5 ppmv (CWL-D2-470). In addition, chloroform; 1,1-dichloroethene; methylene chloride; trichlorofluoromethane; and PCE were detected in all samples. The 95% LCL of the mean was calculated and compared to the 20 ppmv trigger level for all VOCs that exceeded the threshold value of 0.5 ppmv from the deepest sampling ports of wells CWL-D1 through CWL-D3. Only three VOCs exceeded 0.5 ppmv at the three deepest sampling ports and all of these detections were from CWL-D2-470. There were no exceedances of the 20 ppmv trigger level. In general, the soil-gas monitoring results continue to indicate the residual VOC soil-gas plume beneath the CWL is slowly dissipating in three dimensions through diffusion in the vadose zone. These data and conclusions are consistent with the conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004).

### **8.2 Inspections and Maintenance**

Inspections of the CWL final cover system, storm-water diversion structures, compliance monitoring system, and security fence were performed in accordance with PCCP requirements. Required repairs were minor and generally performed during the inspections. Repairs included removal of tumbleweeds from the storm water diversion structures and perimeter fence, clearing tumbleweeds and soil from survey monuments, and lubricating the lock on the main gate.

Based upon the August biology inspection, the ET Cover continues to meet successful revegetation criteria. ET Cover maintenance was performed in February and July- August as

best management practice for the ET Cover vegetation, and included removal of juvenile four-wing saltbush shrubs, dead and live weeds, and mowing of the perimeter. Follow-up actions were taken as a best management practice in September and December on small animal burrows identified during inspections.

### **8.3 Regulatory Activities**

Regulatory activities in CY 2015 included submittal of the Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2014 (SNL/NM March 2015) and submittal of updated reference documents cited in the PCCP.

### **8.4 Conclusions**

All PCCP monitoring, inspection, and maintenance/repair requirements have been met for CY 2015. This CWL Annual Post-Closure Care Report documents all activities and results as required by the PCCP Attachment 1, Section 1.12. Based upon monitoring, inspection, and maintenance results, the ET Cover is functioning as designed and site conditions remain protective of human health and the environment. Industrial land use is being maintained for the CWL consistent with PCCP requirements.

## 9.0 REFERENCES

EPA, see U.S. Environmental Protection Agency.

Kieling, J.E., February 2012. "Approval, Class 1 Modification to Chemical Waste Landfill Post-Closure Care Permit for Sandia National Laboratories, November 2011, Sandia National Laboratories, EPA ID No. NM5890110518, HWB-SNL-11-015," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico, February 20, 2012.

Kieling, J.E., June 2011. "Notice of Approval, Closure of Chemical Waste Landfill and Post-Closure Care Permit in Effect, Sandia National Laboratories, EPA ID No. NM5890110518, HWB-SNL-10-013," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico, Jun 2, 2011.

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Sandia National Laboratories/New Mexico (SNL/NM), June 2015. "Calendar Year 2014 Annual Groundwater Monitoring Report," SAND2015-4261 R, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), March 2015. "Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2014," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), June 2014. "Data Validation Procedure for Chemical and Radiochemical Data," (AOP 00-03), Sample Management Office, Sandia National Laboratories, Albuquerque, New Mexico.

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Todd, J. W., February 2015. "Submittal of Updated Reference Documents Cited in the Chemical Waste Landfill Post Closure Care Permit for the Department of Energy National Nuclear Security Administration/Sandia Site Office and Sandia National Laboratories/New Mexico, EPA ID No. NM5890110518," U.S. Department of Energy, February 18, 2015.

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U.S. Environmental Protection Agency (EPA), January 1999b. "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.

U.S. Environmental Protection Agency (EPA), November 1986. "Test Methods for Evaluating Solid Waste," 3<sup>rd</sup> ed., Update 3, SW-846, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

**ANNEX A**  
**Chemical Waste Landfill**  
**CY 2015 Groundwater Monitoring Forms and Reports**

**Field Forms**

**Data Validation Reports**

**Contract Verification Reports**



## FIELD SAMPLING FORMS

### CWL POST-CLOSURE CARE GROUNDWATER MONITORING

<b>Form Title</b>	<b>Corresponding Procedure</b>
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**  
**JANUARY 2015 GROUNDWATER MONITORING**

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-BW 5 Date: 01/13/15 Time: 0808

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: 39.3 °F Wind Speed: 0 MPH Humidity: 60.6 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules 1/14/15  
Other: \_\_\_\_\_

Safety Topics Presented

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

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

Attendees

Robert Lynch  
Printed Name

Robert Lynch  
Signature

William Gibson  
Printed Name

William Gibson  
Signature

ALFRED SANTILLANES  
Printed Name

Alfred Santillanes  
Signature

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Printed Name

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Printed Name

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Signature

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW 9 Date: 1/14/15 Time: 0805

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: 42.6 °F Wind Speed: 0 MPH Humidity: 42.9% Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~High ACCU-VAC ampules~~ 1/14/15  
Other: \_\_\_\_\_

Safety Topics Presented

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

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

Attendees

Robert Lynch  
Printed Name

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Signature

ALFRED SANTILLANES  
Printed Name

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW 11 Date: 01/15/15 Time: 0758

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: 53.2 °F Wind Speed: 0 MPH Humidity: 37.4 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~NaOH ACCLVAC ampules~~ TD 11/19/15  
Other: \_\_\_\_\_

Safety Topics Presented

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

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

Attendees

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW10 Date: 01/16/15 Time: 0800

01/19/15 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: 55.0°F Wind Speed: 0 MPH Humidity: 35.8 % Wind Chill NA°F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampule TA 1/19/15

Other: \_\_\_\_\_

Safety Topics Presented

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

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

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William J. Gibson  
Signature

Robert Lynch  
Printed Name

Robert Lynch  
Signature

William Gibson  
Printed Name

William J. Gibson  
Signature

ALFRED SANTILLANES  
Printed Name

Alfred Santillanes  
Signature

1/19/15

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**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

Project Name: CWL	Project No.: 146422.10.11.03
Well I.D.: CWL-BW5	Date: 01/13/15
Well Condition: Good	Weather Condition: See tailgate form
Method: Portable pump <input checked="" type="checkbox"/> Dedicated pump _____	Pump depth: 521'

**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
511.94	0827	/	START	/	/	/	/	/	/	→
513.97	0900	5	14.56	984.9	1.1	6.91	1.44	73.1	7.40	
514.36	0927	10	14.64	988.2	1.7	6.94	1.42	72.8	7.37	
514.18	1002	15	13.89	969.8	3.9	6.93	0.36	71.5	7.36	
513.99	1020	17	13.95	968.6	9.9	6.92	0.26	70.7	7.42	
514.21	1035	19	13.51	969.5	6.4	6.93	0.17	70.7	7.38	
514.22	1050	21	13.56	969.7	7.1	6.93	0.15	70.7	7.41	
	1051	/	SAMPLING	/	/	/	/	/	/	→
										~ 1.6 gals purged from tubing
										0839

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**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

Project Name: CWL	Project No.: 146422.10.11.03
Well I.D.: CWL-MW9	Date: 01/14/15
Well Condition: Good	Weather Condition: See tailgate form
Method: Portable pump <input checked="" type="checkbox"/> <u>X</u>	Dedicated pump _____ Pump depth: <u>516'</u>

**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
503.87	0816	/	START							→
506.11	0855	5	12.70	810.9	-63.1	7.04	0.14	29.5	3.11	
506.70	0920	10	13.98	837.1	-73.8	7.05	0.08	26.7	2.74	
506.96	0944	15	13.95	851.2	-71.2	7.04	0.12	27.7	2.85	
507.03	0952	17	14.12	857.6	-70.1	7.04	0.10	28.1	2.88	
507.03	1002	19	13.92	858.4	-69.1	7.03	0.07	28.5	2.92	
507.11	1012	21	13.75	856.4	-65.0	7.02	0.09	29.4	3.03	
507.11	1021	23	13.79	856.2	-64.2	7.03	0.07	30.2	3.10	
507.11	1030	25	13.81	856.7	-64.1	7.03	0.10	30.7	3.16	
507.11	1040	27	13.82	856.6	-62.5	7.03	0.08	31.6	3.22	
	1041	/	SAMPLING							→
										~1.6 gals. purged from tubing 0827

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### FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: CWL	Project No.: 146422.10.11.03
Well I.D.: CWL-MW11	Date: 01/15/15
Well Condition: Good	Weather Condition: See tailgate form
Method: Portable pump <u>X</u>	Dedicated pump _____ Pump depth: <u>513'</u>

#### 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
499.28	0813	/	<i>START</i> →							
503.46	0853	5	16.33	959.3	-45.3	7.02	0.21	58.7	5.73	
506.12	0924	10	16.58	965.0	-47.0	7.03	0.50	56.9	5.53	
508.05	0954	15	17.31	979.7	-47.5	7.02	0.23	57.5	5.50	
510.24	1026	20	18.35	1005.0	-51.4	7.04	0.34	56.8	5.32	
510.96	1040	22	18.08	996.8	-52.6	7.03	0.95	54.2	5.10	
511.83	1056	24	18.33	1005.9	-52.9	7.03	0.29	48.5	4.53	
512.05	1120	26	18.36	1005.6	-53.3	7.04	0.21	53.4	4.94	
512.05	1158	28	18.39	1005.5	-53.6	7.04	0.10	53.6	4.95	
	1159	/	<i>SAMPLING</i> →							
										<i>~ 1.6 gals purged from tubing</i>
										<i>0823</i>

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**GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG**      **Page 1 of 2**

SNL/NM Project Name: CWL			SNL/NM Project No.: 146422.10.11.03			
Calibrations done by: R Lynch			Date: 01/13/15			
Make & Model: 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:	0650	4.01	17.6	7.00	17.6	10.00
2. Time:	1120	4.01	18.7	7.00	18.7	10.01
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.: 4AE695			
	Value	Temp	Expiration Date: 5/15			
1. Time:	0649	1224.6	17.6			
2. Time:	1121	1224.9	18.7			
3. Time:						
4. Time:						
ORP Calibration						
Reference Value: 220 mV			Standard Lot No. 4AE189			
	Value	Temp	Expiration Date: 2/15			
1. Time:	0652	220.1	17.6			
2. Time:	1125	220.4	18.7			
3. Time:						
4. Time:						
DO Calibration						
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0648	82.0	24.70			
2. Time:	1119	81.8	24.74			
3. Time:						
4. Time:						

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## GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL		Project No.: 146422.10.11.03		
Calibration done by: R Lynch		Date: 01/13/15		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 21100Q		Serial No. S/N 14060C033238		
Reference Value	RL A/10 1/13/15	20	100	800
Standard Lot No.	A4164 1/13/15	A4211	A4195	A4193
1. Time	RL A/10.1 1/13/15	20.2	99.7	799
2. Time	10.4	20.1	102	802
3. Time				
4. Time				
Comments:				

## GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL			SNL/NM Project No.: 146422.10.11.03				
Calibrations done by: R Lynch			Date: 01/14/15				
Make & Model: EXO1							
YSI 6820 Sonde (S/N) with DO, Ee, pH, ORP, and temperature probes: 13C101166							
YSI 650 MDS (S/N): NA							
<b>pH Calibration</b>							
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:	0630	3.99	18.5	7.00	18.5	10.00	18.5
2. Time:	1108	4.01	18.8	7.00	18.8	10.01	18.8
3. Time:							
4. Time:							
Standard lot no.:		4AE330		4AE635		4AD984	
Expiration date:		5/16		5/16		4/16	
<b>SC Calibration</b>							
Reference Value: 1225 uS			Standard Lot No.: 4AE695				
	Value	Temp	Expiration Date: 5/15				
1. Time:	0629	1225.3	18.5				
2. Time:	1107	1224.9	18.7				
3. Time:							
4. Time:							
<b>ORP Calibration</b>							
Reference Value: 220 mV			Standard Lot No. 4AE189				
	Value	Temp	Expiration Date: 2/15				
1. Time:	0632	219.9	18.5				
2. Time:	1110	220.3	18.8				
3. Time:							
4. Time:							
<b>DO Calibration</b>							
Calibration Value:		81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0628	81.8	24.72				
2. Time:	1106	81.9	24.74				
3. Time:							
4. Time:							

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## GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL		Project No.: 146422.10.11.03		
Calibration done by: R Lynch		Date: 01/14/15		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 21100Q		Serial No. S/N 14060C033238		
Reference Value	20	100	800	
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time	10.2	20.0	102	808
2. Time	10.4	20.1	104	802
3. Time				
4. Time				
Comments:				

**GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG** Page 1 of 2

SNL/NM Project Name: CWL			SNL/NM Project No.: 146422.10.11.03			
Calibrations done by: R Lynch			Date: 01/15/15			
Make & Model: 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:	0635 4.01	19.0	7.00	19.0	10.00	19.0
2. Time:	1247 4.00	19.1	7.00	19.0	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.: 4AE695			
	Value	Temp	Expiration Date: 5/15			
1. Time:	0634 1224.8	19.0				
2. Time:	1246 1225.1	19.2				
3. Time:						
4. Time:						
ORP Calibration						
Reference Value: 220 mV			Standard Lot No. 4AE189			
	Value	Temp	Expiration Date: 2/15			
1. Time:	0637 220.2	19.0				
2. Time:	1249 219.8	19.2				
3. Time:						
4. Time:						
DO Calibration						
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0633 82.1		24.90			
2. Time:	1245 81.8		24.90			
3. Time:						
4. Time:						

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**GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2**

SNL/NM Project Name: CWL		Project No.: 146422.10.11.03		
Calibration done by: R Lynch		Date: 4/15/15		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 21100Q		Serial No. S/N 14060C033238		
Reference Value	9.5 10	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time	0800	19.9	103	799
2. Time	1209	20.1	101	796
3. Time				
4. Time				
Comments:				



**GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG** Page 1 of 2

SNL/NM Project Name: CWL			SNL/NM Project No.: 146422.10.11.03				
Calibrations done by: R Lynch			Date: 01/16/15 01/19/15				
Make & Model: EXO1							
YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101166							
YSI 650 MDS (S/N): NA							
<b>pH Calibration</b>							
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	3.99	19.1	7.00	19.1	10.0	19.2
2. Time:	1333	4.00	19.2	7.00	19.2	10.00	19.2
3. Time:	0638	4.00	18.8	7.01	18.8	9.99	18.8
4. Time:	1028	4.01	18.8	7.00	18.8	10.01	18.8
Standard lot no.:	4AE330		4AE635		4AD984		
Expiration date:	5/16		5/16		4/16		
<b>SC Calibration</b>							
Reference Value: 1225 uS			Standard Lot No.: 4AE695				
	Value	Temp	Expiration Date: 5/15				
1. Time:	0645	1224.7	19.2				
2. Time:	1332	1225.1	19.3				
3. Time:	0637	1224.8	18.8				
4. Time:	1020	1224.6	18.8				
<b>ORP Calibration</b>							
Reference Value: 220 mV			Standard Lot No. 4AE189				
	Value	Temp	Expiration Date: 2/15				
1. Time:	0648	220.2	19.2				
2. Time:	1335	219.8	19.2				
3. Time:	0640	220.4	18.8				
4. Time:	1024	220.5	18.8				
<b>DO Calibration</b>							
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg				
1. Time:	0644	81.8	24.86				
2. Time:	1331	82.0	24.87				
3. Time:	0636	81.9	24.82				
4. Time:	1019	81.9	24.82				

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## GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL		Project No.: 146422.10.11.03		
Calibration done by: R.Lynch		Date: 01/16/15 01/19/15		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 21100Q		Serial No. S/N 14060C033238		
Reference Value	EX 10, 1/16/15	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time 0805	10.1	19.8	103	798
2. Time 1229	9.98	19.9	101	799
3. Time 0812	10.6	20.3	102	802
4. Time 0920	10.2	20.1	104	805
Comments:				

**Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form**

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>BW-5</u>	Date: <u>01-13-15</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>210269</u>
<p><b><u>Personnel Performing Decontamination:</u></b></p> <p>William Gibson _____ <u>WJA</u> Print Name: Initial:</p> <p>Robert Lynch _____ <u>RL</u> Print Name: Initial:</p>	<p><b><u>Personnel Performing Decontamination:</u></b></p> <p>William Gibson _____ <u>WJA</u> Print Name: Initial:</p> <p>Robert Lynch _____ <u>RL</u> Print Name: Initial:</p>

**Condition of Equipment**

Pump: Excellent      Tubing Bundle: Excellent      Water Level Indicator: Good

**List of Decontamination Materials**

<p align="center">Distilled of <u>Deionized</u> (circle one)</p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u><del>121514</del> 11/31/9</u> <u>121514</u></p>	<p align="center"><b>HNO<sub>3</sub></b></p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>ARCROS</u></p> <p>Lot Number: <u>A0316863</u></p>
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**Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form**

<b>Project Name:</b> <u>CWL</u>	<b>Monitoring Well ID #:</b> <u>CWL-MW9</u>	<b>Date:</b> <u>01/14/15</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

<b>Pump and Tubing Bundle ID #:</b> <u>1806-640</u>	<b>Water Level Indicator ID #:</b> <u>210269</u>
---	--

<b><u>Personnel Performing Decontamination:</u></b> <u>Robert Lynch</u> <u>RL</u> Print Name: Initial: <u>Alfred Santillanes</u> <u>AS</u> Print Name: Initial:	<b><u>Personnel Performing Decontamination:</u></b> <u>Robert Lynch</u> <u>RL</u> Print Name: Initial: <u>Alfred Santillanes</u> <u>AS</u> Print Name: Initial:
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**Condition of Equipment**

**Pump:** GOOD      **Tubing Bundle:** GOOD      **Water Level Indicator:** GOOD

**List of Decontamination Materials**

<b>Distilled or <u>Deionized</u> (circle one)</b>  <b>Source:</b> <u>Culligan</u>  <b>Lot Number:</b> <u>121514</u>	<p style="text-align: center;"><b>HNO<sub>3</sub></b></p> <b>Grade:</b> <u>Reagent</u> <b>UN #:</b> <u>2031</u> <b>Manufacturer:</b> <u>ACROC</u> <b>Lot Number:</b> <u>A0316863</u>
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**Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form**

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-MW11</u>	Date: <u>01-15-15</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>210270</u>
<p><b><u>Personnel Performing Decontamination:</u></b></p> <p>William Gibson _____ <u>WJG</u> Print Name: Initial:</p> <p>Alfred Santillanes _____ <u>AS</u> Print Name: Initial:</p>	<p><b><u>Personnel Performing Decontamination:</u></b></p> <p>William Gibson _____ <u>WJG</u> Print Name: Initial:</p> <p>Alfred Santillanes _____ <u>AS</u> Print Name: Initial:</p>

**Condition of Equipment**

**Pump:** Excellent      **Tubing Bundle:** Excellent      **Water Level Indicator:** Good

List of Decontamination Materials

<p align="center"><b>Distilled or <u>Deionized</u> (circle one)</b></p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>12-14-15</u></p>	<p align="center"><b>HNO<sub>3</sub></b></p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>ACROS</u></p> <p>Lot Number: <u>A0316863</u></p>
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**Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form**

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-MW10</u>	Date: <u>01-19-15</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>210270</u>
<p><b>Personnel Performing Decontamination:</b></p> <p>Robert Lynch _____ <u>RL</u> Print Name: Initial:</p> <p>William Gibson _____ <u>WJG</u> Print Name: Initial:</p>	<p><b>Personnel Performing Decontamination:</b></p> <p>Robert Lynch _____ <u>RL</u> Print Name: Initial:</p> <p>William Gibson _____ <u>WJG</u> Print Name: Initial:</p>

**Condition of Equipment**

Pump: Excellent      Tubing Bundle: Good      Water Level Indicator: Good

List of Decontamination Materials

<p align="center">Distilled or <u>Deionized</u> (circle one)</p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>12-15-14</u></p>	<p align="center"><b>HNO<sub>3</sub></b></p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>ARCOS</u></p> <p>Lot Number: <u>A0316863</u></p>
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## **SUMMARY SHEET FOR JANUARY 2015 SAMPLES**

Sample Summary for CWL GWM  
January 2015

Sample ID	Sample Date	ARCOG	Sample Number	Sample Type	Associated Equipment Blank (ARCOG #/Sample #)	Associated Trip Blank (ARCOG # / Sample #)	Associated Field Blank (ARCOG # / Sample #)	Comments
<b>CWL GWM: Project Task # 146422.10.11.03. Service Order # CF 327-15</b>								
<b>Environmental Samples</b>								
CWL-BW5	13-Jan-15	615961	097065	Environmental	n/a	615961 / 097066	n/a	
CWL-MW9	14-Jan-15	615963	097070	Environmental	n/a	615963 / 097071	615963 / 097096	
CWL-MW10	19-Jan-15	615968	097083	Environmental	n/a	615968 / 097084	615968 / 097082	
CWL-MW11	15-Jan-15	615966	097077	Environmental	615965 / 097075	615966 / 097079	n/a	
CWL-MW11	15-Jan-15	615966	097078	Duplicate	615965 / 097075	615966 / 097079	n/a	
CWL-EB1	14-Jan-15	615965	097075	Equipment Blank	n/a	615965 / 097076	n/a	Decon prior to CWL-MW11
CWL-FB1	14-Jan-15	615963	097069	Field Blank	n/a	615963 / 097071	n/a	at CWL-MW9
CWL-FB2	14-Jan-15	615965	097074	DIW-QC	n/a	615965 / 097076	n/a	DI source water - used for EB1
CWL-FB3	19-Jan-15	615968	097082	Field Blank	n/a	615968 / 097084	n/a	at CWL-MW10
<b>Waste Characterization Samples</b>								
CWL-BW5	13-Jan-15	615962	097067	Waste	n/a	615962 / 097068	n/a	No data validation required
CWL-MW9	14-Jan-15	615964	097072	Waste	n/a	615964 / 097073	n/a	No data validation required
CWL-MW10	19-Jan-15	615969	097085	Waste	n/a	615969 / 097086	n/a	No data validation required
CWL-MW11	15-Jan-15	615967	097080	Waste	n/a	615967 / 097081	n/a	No data validation required



**DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**  
**GROUNDWATER MONITORING**  
**JANUARY 2015**

**AR/COC NUMBERS 615961, 615963, 615965 and 615966**

## Memorandum

Date: February 23, 2015  
To: File  
From: Mary Donovan  
Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL GWM/SVM  
AR/COC: 615961, 615963, 615965 and 615966  
SDG: 364982  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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**

Eleven 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.

### **Blanks**

No target analytes were detected in the blanks except as follows. Chloroform was detected at concentrations > the PQL in FB1, sample 364982004 (associated with sample -005) and in EB1, sample -009 (associated with samples -012 and -014). 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. It should be noted that the parent sample for the MS/MSD was an SNL sample of similar matrix from another SDG. No sample data were qualified as a result.

### **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**

Four TBs were submitted, one associated with each ARCO. An FB was submitted with ARCO 615963 and was associated with the samples in that ARCO. An FB was submitted with ARCO 615965 and was not associated with any samples. An EB was submitted with ARCO 615965, and it was associated with samples from 615966. A field duplicate pair was submitted with ARCO 615966. 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:** 02/24/15

## Memorandum

Date: February 23, 2015  
To: File  
From: Mary Donovan  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL GWM/SVM  
AR/COC: 615961, 615963, 615965 and 615966  
SDG: 364982  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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**

Five samples were prepared and analyzed for Cr and Ni 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 properly preserved.

### **ICP-MS Instrument Tune**

The ICP-MS tune 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. Cr and Ni were detected at <PQL in the EB, sample 364982010 which was associated with samples -013 and -015. 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.

### **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)**

The results for the ICSA and ICSAB met acceptance criteria except as follows. The Ca concentrations for all samples *except* -010 were comparable to or above the ICS levels for the ICP-MS analysis. The ICS A results for Cr and Ni met acceptance criteria and no sample data will be qualified.

### **ICP Serial Dilution**

The serial dilutions met all QC acceptance criteria.

### **Other QC**

An EB was submitted with ARCOG 615965, and it was associated with samples from 615966. A field duplicate pair was submitted with ARCOG 615966. 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:** 02/24/15



## Sample Findings Summary



AR/COC: 615961, 615963, 615965, 615966

Page 1 of 1

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

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

## Data Validation Summary Worksheet

AR/COC #: 615961, 615963, 615965 and 615966

Site/Project: CWL GWM/SVM

Validation Date: 02/23/2015

SDG #: 364982

Laboratory: GEL Laboratories, LLC

Validator: Mary Donovan

Matrix: Aqueous

# of Samples: 16

CVR present: Yes

Analysis Type: X Organic X Metals

AR/COC(s) present: Yes

Sample Container Integrity: OK

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 01/13 through 15/2015

Revised 7/2007

Validated By: Mary A. Donovan



### Organic Worksheet (GC/MS)

AR/COC #: 615961, 615963, 615965 and 615966

SDG #: 364982

Matrix: Aqueous

Laboratory Sample IDs: 364982001, -003, -004, -005, -007, -008, -009, -011, -012, -014, and -016

Method/Batch #s: **8260B/1452668**

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 -004	EB1 -009		
	Int.	RF	RSD/ R <sup>2</sup>	CCV (ICV) %D										
chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	3.19	2.48		
Surrogate Recovery Outliers														
Sample ID														
None														
IS Outliers														
Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None														

Comments: HTs OK, ICAL VOAA.I 01/05/15. Samples -001, -003, -004 and -005 were analyzed 01/23/15. Samples -007, -008, -009, -011, -012, -014 and -016 were analyzed 01/27/15.

MS/MSD performed on an SNL sample of similar matrix from another SDG

Revised 7/2007

# Inorganic Metals Worksheet

AR/COC #: 615961, 615963, 615965 and 615966

SDG #: 364982

Matrix: Aqueous

Laboratory Sample IDs: 364982002, -006, -010, -013 and -015

Method/Batch #s: **3005A/6020** (ICP-MS): 1450701(prepare)/1450704

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	EB -010				
	Int.	R <sup>2</sup>	ICV	CCV	ICB	CCB														
Cr	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	0.00205J					
Ni	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	0.00118J					

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 -002

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab		AR/COG <b>615961</b>	
Batch No. <i>n/a</i>	SMO Use		<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Project Name: CWL GWM/SVM	Date Samples Shipped: <i>1/13/15</i>	SMO Authorization: <i>[Signature]</i>	
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>227925</i>	SMO Contact Phone: <i>SMO</i>	
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	
Service Order: CF327-15	Lab Destination: GEL	Send Report to SMO:	
	Contract No.: PO 1303873	Rita Kavanaugh/505-284-2553	

Tech Area:	Building:	Room:	Operational Site:	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 <i>364982</i>
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Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
							Type	Volume					
097065	-001	CWL-BW5	521	1/13/15	10:51	GW	G	3x40ml	HCL	G	SA	VOCs (SW846-8260)(see list below)	001
097065	-015	CWL-BW5	521	1/13/15	10:52	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel ( SW846-6020)	002
097066	-001	CWL-TB1	NA	1/13/15	10:51	DIW	G	3x40ml	HCL	G	TB	VOCs (SW846-8260)(see list below)	003

Last Chain: <input type="checkbox"/> Yes		Sample Tracking		SMO Use		Special Instructions/QC Requirements:			Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:		Entered by:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Background: <input type="checkbox"/> Yes		QC inits.:		Turnaround Time		<input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day				
Confirmatory: <input type="checkbox"/> Yes		Negotiated TAT		Sample Disposal		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab				
Sample Team Members	Name		Signature		Init.		Company/Organization/Phone/Cell		Return Samples By:	
	Robert Lynch		<i>[Signature]</i>		RL		SNL/4142/505-844-4013/505-250-7090		Comments: Send report to Tim Jackson/4142/MS 0729/284-2547 VOCs: Report CWL enhanced list of compounds ( Chloroform, 1,1-DCE, PCE, TCE, Freon 11, and Freon 113 )	
	Alfred Santillanes		<i>[Signature]</i>		AS		SNL/4142/505-844-5130/505-228-0710			
	William Gibson		<i>[Signature]</i>		WG		SNL/4142/505-284-3307/505-239-7367			

1. Relinquished by <i>Alfred Santillanes</i> Org. <i>4142</i> Date <i>1/13/15</i> Time <i>1125</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. <i>4142</i> Date <i>1/13/15</i> Time <i>1125</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. <i>4142</i> Date <i>1/13/15</i> Time <i>1200</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. <i>4142</i> Date <i>1-14-15</i> Time <i>0750</i>	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/COG **615963**

Project Name: CWL GWM/SVM	Date Samples Shipped: <i>1/14/15</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>228340</i>	SMO Contact Phone: <i>920</i>	
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	
Service Order: CF327-15	Lab Destination: GEL	Send Report to SMO: Rita Kavanaugh/505-284-2553	
Contract No.: PO 1303873			

Bill to: Sandia National Laboratories (Accounts Payable),  
 P.O. Box 5800, MS-0154  
 Albuquerque, NM 87185-0154 *364982*

Tech Area:	Building:	Room:	Operational Site:
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Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097069	-001	CWL-FB1	NA	1/14/15 10:41	DIW	G	3x40ml	HCL	G	FB	VOCs (SW846-8260)(see list below)	<i>004</i>
097070	-001	CWL-MW9	516	1/14/15 10:41	GW	G	3x40ml	HCL	G	SA	VOCs (SW846-8260)(see list below)	<i>005</i>
097070	-015	CWL-MW9	516	1/14/15 10:42	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel ( SW846-6020)	<i>006</i>
097071	-001	CWL-TB3	NA	1/14/15 10:41	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260)(see list below)	<i>007</i>

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/4142/505-844-4013/505-250-7090	Return Samples By:
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	SNL/4142/505-844-5130/505-228-0710	
	Gilbert Quintana	<i>[Signature]</i>	<i>GQ</i>	SNL/4143/505-284-3307/505-228-2606	
Comments: Send report to Tim Jackson/4142/MS 0729/284-2547 VOCs: Report CWL enhanced list of compounds ( Chloroform, 1,1-DCE, PCE, TCE, Freon 11, and Freon 113 )					Lab Use

1. Relinquished by <i>[Signature]</i> Org. <i>4142</i> Date <i>1/14/15</i> Time <i>1115</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. <i>4142</i> Date <i>1/14/15</i> Time <i>1115</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. <i>4142</i> Date <i>1/14/15</i> Time <i>1130</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. <i>4142</i> Date <i>1-15-14</i> Time <i>0740</i>	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. *MA*

SMO Use

AR/COC **615965**

Project Name: CWL GWM/SVM	Date Samples Shipped: <i>1/15/15</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>228222</i>	SMO Contact Phone: <i>9MO</i>	<input type="checkbox"/> RMMA
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Service Order: CF327-15	Lab Destination: GEL	Send Report to SMO: Rita Kavanaugh/505-284-2553	
	Contract No.: PO 1303873		

Tech Area: \_\_\_\_\_  
 Building: \_\_\_\_\_ Room: \_\_\_\_\_ Operational Site: \_\_\_\_\_  
 Bill to: Sandia National Laboratories (Accounts Payable),  
 P.O. Box 5800, MS-0154  
 Albuquerque, NM 87185-0154 *364982*

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097074	-001	CWL-FB2	NA	1/14/15 13:30	DIW	G	3x40ml	HCL	G	FB	VOCs (SW846-8260)(see list below)	<i>008</i>
097075	-001	CWL-EB1	NA	1/14/15 13:30	DIW	G	3x40ml	HCL	G	EB	VOCs (SW846-8260)(see list below)	<i>009</i>
097075	-015	CWL-EB1	NA	1/14/15 13:31	DIW	P	500 ml	HNO3	G	EB	Chromium, Nickel ( SW846-6020)	<i>010</i>
097076	-001	CWL-TB5	NA	1/14/15 13:30	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260)(see list below)	<i>011</i>

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/4142/505-844-4013/505-250-7090	Return Samples By: Comments: Send report to Tim Jackson/4142/MS 0729/284-2547 VOCs: Report CWL enhanced list of compounds ( Chloroform, 1,1-DCE, PCE, TCE, Freon 11, and Freon 113 )
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	SNL/4142/505-844-5130/505-228-0710	
Gilbert Quintana	<i>[Signature]</i>	<i>GQ</i>	SNL/4143/505-844-2507/505-228-2606		
					Lab Use

1. Relinquished by <i>Alfred Santillanes</i> Org. 4142 Date <i>1/14/15</i> Time <i>1355</i>	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <i>[Signature]</i> Org. SMO Date <i>1/14/15</i> Time <i>1355</i>	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/15/15</i> Time <i>0745</i>	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <i>[Signature]</i> Org. <i>CL</i> Date <i>1-16-15</i> Time <i>0725</i>	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		<b>AR/COG</b> <span style="border: 1px solid black; padding: 2px;"><b>615966</b></span>	
Batch No. <i>MA</i>	SMO Use	SMO Authorization: <i>[Signature]</i>	
Project Name: CWL GWM/SVM	Date Samples Shipped: <i>1/15/15</i>	SMO Contact Phone: <i>9110</i>	
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>228382</i>	Lorraine Herrera/505-844-3199	
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/803-556-8171	Send Report to SMO: Rita Kavanaugh/505-284-2553	
Service Order: CF327-15	Lab Destination: GEL	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius	
	Contract No.: PO 1303873	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 <i>364982</i>	

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097077	-001	CWL-MW11	513	1/15/15 11:59	GW	G	3x40ml	HCL	G	SA	VOCs (SW846-8260)(see list below)	012
097077	-015	CWL-MW11	513	1/15/15 12:05	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel ( SW846-6020)	013
097078	-001	CWL-MW11	513	1/15/15 11:59	GW	G	3x40ml	HCL	G	DU	VOCs (SW846-8260)(see list below)	014
097078	-015	CWL-MW11	513	1/15/15 12:05	GW	P	500 ml	HNO3	G	DU	Chromium, Nickel ( SW846-6020)	015
097079	-001	CWL-TB6	NA	1/15/15 11:59	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260)(see list below)	016

Last Chain: <input type="checkbox"/> Yes		Sample Tracking		SMO Use		Special Instructions/QC Requirements:			Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day			
Background: <input type="checkbox"/> Yes		Entered by:		Negotiated TAT		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab			
Confirmatory: <input type="checkbox"/> Yes		QC inits.:		Return Samples By:		Comments: Send report to Tim Jackson/4142/MS 0729/284-2547 VOCs: Report CWL enhanced list of compounds ( Chloroform, 1,1-DCE, PCE, TCE, Freon 11, and Freon 113 )			
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell		Lab Use			
	Robert Lynch	<i>[Signature]</i>	RL	SNL/4142/505-844-4013/505-250-7090					
	Alfred Santillanes	<i>[Signature]</i>	AS	SNL/4142/505-844-5130/505-228-0710					
	William Gibson	<i>[Signature]</i>	WG	SNL/4142/505-284-3307/505-239-7367					

1. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/15/15</i> Time <i>12:15</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. 4142 Date <i>1/15/15</i> Time <i>12:15</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/15/15</i> Time <i>12:30</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. <i>CEL</i> Date <i>1-16-15</i> Time <i>07:25</i>	4. Received by	Org.	Date	Time

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

**AR/COC NUMBER 615968**

## Memorandum

Date: February 24, 2015  
To: File  
From: Mary Donovan  
Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL GWM/SVM  
AR/COC: 615968  
SDG: 365395  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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. Chloroform was detected at a concentration < the PQL in the TB, sample 365395004, which was associated with sample -002. The associated sample result was a detect < the PQL and  $\leq 5X$  the blank result and will be **qualified 1.0U,B1** 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 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 CCV %D was >20% but  $\leq 40\%$  with a negative bias for trichlorotrifluoroethane. The associated sample results were non-detects and since no other calibration infractions occurred, will not be qualified.



### **Blanks**

No target analytes were detected in the blanks except as noted above in the Summary section and as follows. Chloroform was detected at a concentration < the PQL in the TB, sample -004, which was associated with sample -001. The associated sample result was a non-detect 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 parent sample for the MS/MSD was an SNL sample of similar matrix from another SDG. No sample data were qualified as a result.

### **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**

One TB was submitted and was associated with the samples in the ARCOG. An FB was also submitted and was associated with the field sample in the ARCOG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Monica Dymerski

**Level I**

**Date:** 02/24/15

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## Memorandum

Date: February 24, 2015  
To: File  
From: Mary Donovan  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL GWM/SVM  
AR/COC: 615968  
SDG: 365395  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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 sample was prepared and analyzed for Cr and Ni 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 Ca concentration in the sample was comparable to or above the ICS level for the ICP-MS analysis. The ICS A result for Ni was negative with an absolute value >2X the MDL. The associated sample result was a detect at <50X the absolute value of the associated ICS A result and will be **qualified J-,CK3** due to a negative ICS A result.

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 properly preserved.

### ICP-MS Instrument Tune

The ICP-MS tune 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.

### **ICP -MS Internal Standards**

The ICP-MS internal standards met QC acceptance criteria.

### **Matrix Spike (MS)**

The MS met all QC acceptance criteria. The parent sample for the MS was an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

### **Laboratory Replicate**

The replicate met all QC acceptance criteria. The parent sample for the replicate was an SNL sample of similar matrix 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)**

The results for the ICSA and ICSAB met acceptance criteria except as noted above in the Summary section.

### **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:** 02/24/15



## Sample Findings Summary



AR/COC: 615968

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
<b>SW846 3005/6020 DOE-AL</b>			
	097083-015/CWL-MW10	Nickel (7440-02-0)	J-, CK3
<b>SW846 8260B DOE-AL</b>			
	097083-001/CWL-MW10	Chloroform (67-66-3)	1.0U, B1

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

## Data Validation Summary Worksheet

AR/COC #: 615968

Site/Project: CWL GWM/SVM

Validation Date: 02/24/2015

SDG #: 365395

Laboratory: GEL Laboratories, LLC

Validator: Mary Donovan

Matrix: Aqueous

# of Samples: 4

CVR present: Yes

Analysis Type: X Organic X Metals

AR/COC(s) present: Yes

Sample Container Integrity: OK

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 01/19/2015

Revised 7/2007

Validated By: Mary A. Donovan

# Organic Worksheet (GC/MS)

AR/COC #: 615968

SDG #: 365395

Matrix: Aqueous

Laboratory Sample IDs: 365395001, -002, and -004

Method/Batch #s: 8260B/1454031

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	TB8 -004	5X TB		
	Int.	RF	RSD/ R <sup>2</sup>	CCV (ICV) %D										
chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.470J	2.35		
trichlorotrifluoroethane	NA	✓	✓	-28.6	✓	NA	✓	✓	✓	✓	✓	✓		
<b>Surrogate Recovery Outliers</b>														
<b>Sample ID</b>														
None														
<b>IS Outliers</b>														
<b>Sample ID</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>
None														

Comments: HTs OK, ICAL VOAA.I 01/05/15. Samples were analyzed 02/02/15.

MS/MSD performed on an SNL sample of similar matrix from another SDG

# Inorganic Metals Worksheet

AR/COC #: 615968

SDG #: 365395

Matrix: Aqueous

Laboratory Sample IDs: 365395003

Method/Batch #s: **3005A/6020** (ICP-MS): 1452471(prepare)/1452472

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 <sup>2</sup>	ICV	CCV	ICB	CCB														
Ni	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	-0.002	✓					

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 SNL sample of similar matrix from another SDG.

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *N/A*

SMO Use

AR/COC **615968**

Project Name: CWL GWM/SVM	Date Samples Shipped: <i>1/19/15</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>228459</i>	SMO Contact Phone: <i>[Signature]</i>	<input type="checkbox"/> RMMA
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Service Order: CF327-15	Lab Destination: GEL	Send Report to SMO: Rita Kavanaugh/505-284-2553	
	Contract No.: PO 1303873		

Tech Area: \_\_\_\_\_  
 Building: \_\_\_\_\_ Room: \_\_\_\_\_ Operational Site: \_\_\_\_\_  
 Bill to: Sandia National Laboratories (Accounts Payable),  
 P.O. Box 5800, MS-0154  
 Albuquerque, NM 87185-0154 *365395*

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097082	-001	CWL-FB3	NA	1/19/15 9:10	DIW	G	3x40ml	HCL	G	FB	VOCs (SW846-8260)(see list below)	<i>001</i>
097083	-001	CWL-MW10	515	1/19/15 9:10	GW	G	3x40ml	HCL	G	SA	VOCs (SW846-8260)(see list below)	<i>002</i>
097083	-015	CWL-MW10	515	1/19/15 9:12	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel ( SW846-6020)	<i>003</i>
097084	-001	CWL-TB8	NA	1/19/15 9:10	DIW	G	3x40ml	HCL	G	TB	VOC (SW846-8260)(see list below)	<i>004</i>

Last Chain: <input checked="" type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.		Company/Organization/Phone/Cell
	Robert Lynch	<i>[Signature]</i>	RL	SNL/4142/505-844-4013/505-250-7090	Return Samples By:
	Alfred Santillanes	<i>[Signature]</i>	AS	SNL/4142/505-844-5130/505-228-0710	Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	William Gibson	<i>[Signature]</i>	WG	SNL/4142/505-284-3307/505-239-7367	VOCs: Report CWL enhanced list of compounds ( Chloroform, 1,1-DCE, PCE, TCE, Freon 11, and Freon 113 )
					Lab Use

1. Relinquished by <i>[Signature]</i> Org. <i>4142</i> Date <i>1/19/15</i> Time <i>0945</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. <i>4142</i> Date <i>1/19/15</i> Time <i>0945</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. <i>4142</i> Date <i>1/19/15</i> Time <i>1015</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. <i>Gel</i> Date <i>1-20-15</i> Time <i>0725</i>	4. Received by	Org.	Date	Time

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



**CONTRACT VERIFICATION REVIEW FORMS**  
**GROUNDWATER MONITORING**  
**JANUARY 2015**

Note: The review forms in this section include AR/COC numbers for environmental samples and additional AR/COC numbers for waste characterization samples.

<b>AR/COC Number</b>	<b>Sample Type</b>
615961	Environmental*
615962	Waste
615963	Environmental*
615964	Waste
615965	Environmental*
615966	Environmental*
615967	Waste
615968	Environmental*
615969	Waste

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

## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL

**Project/Task No.** 146422\_10.11.03

GWM/SVM

**ARCOC No.** 615961, 615962, 615963, 615964, 615965, 615966,  
615967

**Analytical Lab** GEL

**SDG No.** 364975

*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 ARCOG 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	N/A		
2.10	Narrative provided		X	Missing for Gen Chem
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	X		
	a) Laboratory control sample accuracy reported and met for all samples			
	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	X		
	a) Replicate sample precision reported and met for all inorganic and radiochemistry samples			
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5	Blank data	X		
	a) Method or reagent blank data reported and met for all samples			

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Acetone detected in TB2 (097068-001). Chloroform detected in FB1 & EB1 (097069-001, 097075-001))
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	N/A		
3.8	Narrative included, correct, and complete		X	Missing for Gen Chem
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		

Line No.	Item	Yes	No	Comments
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		
4.2	GC/HPLC (8330, 8082, 9070A, and 8010)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	b) Continuing calibration provided	N/A		

Line No.	Item	Yes	No	Comments
	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)	X		
	a) Initial calibration provided			
	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		X	
	a) Instrument run logs provided			

## 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		

Line No.	Item	Yes	No	If no, explain
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## 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
All	Gen Chem	Missing Case Narratives, QC Summaries, Standards, Raw Data, Run Logs

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  and date correction request was submitted: 02-20-2015

Reviewed by: Lorraine R. Herrera Date: 02-20-2015 09:12:00

Were resolutions adequate and data package complete?  Yes  No

Closed by: Lorraine R. Herrera Date: 02-23-2015 12:59:00



## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL GWM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 615968, 615969

**Analytical Lab** GEL

**SDG No.** 365385

*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 ARCOG 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	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		

### 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 Bromomethane (1203254475)
	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 1,2-Dibromo-3-chloropropane, Bromoform, Dibromochloromethane, tert-Butyl methyl ether (1203254476)
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		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Detected in TB8: Chloroform (097084-001)
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	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	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		

Line No.	Item	Yes	No	Comments
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		
4.2	GC/HPLC (8330, 8082, 9070A, and 8010)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	b) Continuing calibration provided	N/A		

Line No.	Item	Yes	No	Comments
	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)	X		
	a) Initial calibration provided			
	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	X		
	a) Instrument run logs provided			

## 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		

Line No.	Item	Yes	No	If no, explain
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## 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: 02-23-2015 13:30:00

Closed by: Lorraine R. Herrera Date: 02-23-2015 13:30:00

**FIELD SAMPLING FORMS**  
**JULY 2015 GROUNDWATER MONITORING**



**TAILGATE SAFETY MEETING FORM**

Dept: 4142 Well Location: CWL-BW5 Date: 07/06/15 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: 78.6 °F Wind Speed: 0-5 MPH Humidity: 55.1 %

Chemicals Used: \_\_\_\_\_  
 Other: \_\_\_\_\_

*Safety Topics Presented*

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

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

*Attendees*

Robert Lynch  
 Printed Name

[Signature]  
 Signature

ALFRED SANTILLANES  
 Printed Name

[Signature]  
 Signature

William Gibson  
 Printed Name

[Signature]  
 Signature

\_\_\_\_\_  
 Printed Name

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Printed Name

\_\_\_\_\_  
 Signature

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### TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-mw 9 Date: 7-7-15 Time: 0801

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: 72.3 °F Wind Speed: 0-5 MPH Humidity: 55.5 %

Chemicals Used: \_\_\_\_\_  
Other: \_\_\_\_\_

#### Safety Topics Presented

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

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

#### Attendees

William Gibson  
Printed Name

William Gibson  
Signature

Robert Lynch  
Printed Name

Robert Lynch  
Signature

ALFRED SANTILLANES  
Printed Name

Alfred Santillanes  
Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

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### TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW11 Date: 07/09/15 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: 76.4 °F Wind Speed: 0-5 MPH Humidity: 52.6 %

Chemicals Used: \_\_\_\_\_

Other: \_\_\_\_\_

#### Safety Topics Presented

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

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

#### Attendees

Robert Lynch  
Printed Name

[Signature]  
Signature

William Gibson  
Printed Name

[Signature]  
Signature

Gilbert L. Quintana  
Printed Name

[Signature]  
Signature

ALFRED SANTILLANES  
Printed Name

[Signature]  
Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CW-MW10 Date: 7/10/15 / 7-13-15 Time: 0820 / 0815

Activities: Purging and sampling groundwater (Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions: Temp: 61.0 °F Wind Speed: 0.0 MPH Humidity: 90 %
68.0 0.0 87

Chemicals Used: Other:

Safety Topics Presented

Table with 2 columns of safety topics, each with a checked checkbox. Topics include: Be aware of slips, trips, and falls; Wear safety boots; Use safe lifting practices; Be aware of pinch points; Be aware of chemical hazards; Wear nitrile or latex gloves; Wear chemical safety goggles; Be aware of environmental conditions; Be aware of electrical hazards; Be aware of pressure hazards; No eating or drinking; Be aware of biohazards; Wear communication device; Avoid spilling purge / decon water.

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

Attendees

William Gibson Printed Name

Signature of William Gibson

Alfred Santillanes Printed Name

Signature of Alfred Santillanes

Signature of Alfred Santillanes Printed Name

Signature of William Gibson

7-13-15 William Gibson Printed Name

Signature of William Gibson

ALFRED SANTILLANES Printed Name

Signature of Alfred Santillanes

Tim Jackson

T = Jackson

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**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

Project Name: CWL		
Well I.D.: CWL-BW5	Date: 07/06/15	
Method: Portable pump <input checked="" type="checkbox"/>	Dedicated pump <input type="checkbox"/>	Pump depth: 521'

**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)
512.22	0812	Start							
514.31	0853	5	21.64	1168.7	315.6	7.22	0.40	81.5	7.15
514.73	0923	10	22.23	1185.0	309.7	7.21	0.43	77.2	6.71
514.88	0944	13	22.46	1190.6	308.7	7.21	0.33	78.9	6.81
514.90	0956	15	22.57	1193.3	306.7	7.20	0.23	80.8	6.97
514.84	1008	17	22.85	1201.7	305.5	7.20	0.22	82.2	7.05
514.81	1015	18	22.88	1201.5	304.6	7.20	0.19	82.4	7.03
514.80	1022	19	22.87	1202.0	304.3	7.20	0.21	81.9	6.99
514.76	1029	20	22.91	1201.8	304.2	7.20	0.23	82.5	7.03
	1030	<del>21</del>							

Comments: ~1.6 gals purged from tubing 0826

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**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

Project Name: CWL		
Well I.D.: CWL-MW 9	Date: 07/07/15	
Method: Portable pump <u>X</u>	Dedicated pump _____	Pump depth: <u>516'</u>

**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)
504.13	0815	Start							
506.51	0849	5	20.14	965.1	258.1	7.30	0.22	36.4	3.30
507.06	0915	10	20.28	973.6	243.3	7.30	0.16	34.5	3.10
507.28	0940	15	20.23	992.3	232.9	7.28	0.19	34.3	3.09
507.29	1005	20	20.59	1018.2	227.6	7.27	0.13	35.5	3.18
507.28	1020	23	20.73	1026.5	226.4	7.27	0.17	36.3	3.24
507.26	1026	24	20.77	1028.7	225.7	7.27	0.12	36.7	3.28
507.26	1031	25	20.78	1029.1	225.2	7.27	0.22	37.1	3.31
507.25	1036	26	20.76	1029.6	224.9	7.27	0.14	37.5	3.34
507.24	1041	27	20.78	1029.8	224.4	7.27	0.16	37.7	3.35
	1042								

Comments: ~1.5 gals purged from tubing 0824

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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: CWL	
Well I.D.: CWL-MW10	Date: 07/10/15 / 07-13-15
Method: Portable pump <input checked="" type="checkbox"/>	Dedicated pump <input type="checkbox"/> Pump depth: 515

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)	
501.23	0835	START							→	
506.05	0955	5	23.47	1038	254.0	7.37	1.18	21.5	1.82	
508.32	1032	8	22.29	1011	141.0	7.38	1.49	17.5	1.52	
509.78	1100	10	22.50	1016	103.3	7.37	1.79	16.1	1.39	
510.55	1115	11	23.10	1028	98.6	7.37	1.54	15.4	1.31	
511.37	1129	12	23.24	1032	86.0	7.37	1.53	14.7	1.25	
512.21	1142	13	23.17	1031	76.5	7.37	1.80	14.2	1.21	
513.10	1155	14	23.42	1037	72.3	7.37	1.79	13.6	1.16	
513.95	1207	15	23.34	1036	67.0	7.37	2.00	13.1	1.11	
514.91	1221	16	24.01	1051	58.9	7.36	2.12	12.8	1.08	
515.19	1230	18.5	23.95	1063	53.9	7.36	2.23	11.3	1.01	
	1231	Dry	→							→
501.76	0829	Start	→							→
503.94	0854	1	21.31	1015	52.3	7.32	2.48	33.6	2.96	
504.64	0902	2	21.93	1026	25.3	7.37	2.41	27.5	2.40	
	0903		sample →							→

Comments: 1.5 gallons 0857 B.#6 6-24-15 DIW  
 7-13-15 → 0841 FB-4 Col# 616223

**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

Project Name: CWL <del>AWOFF</del> <sup>7/9/15</sup> <del>W28</del>		
Well I.D.: CWL-MW 11	Date: 07/09/15	
Method: Portable pump <sup>X</sup>	Dedicated pump	Pump depth: 513'

**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)
499.51	0801	Start							→
503.13	0852	5	20.80	1072.6	299.9	7.26	0.22	63.7	5.69
505.74	0922	10	21.96	1100.1	290.6	7.27	0.40	63.8	5.57
508.03	0952	15	21.69	1093.2	284.6	7.27	0.29	62.7	5.50
510.43	1027	20	21.44	1087.4	284.3	7.27	0.39	61.2	5.39
511.08	1121	24	22.09	1100.4	296.1	7.27	0.73	60.2	5.24
511.16	1138	25	22.07	1099.1	299.7	7.27	0.29	60.4	5.26
511.24	1155	26	22.07	1100.7	303.1	7.28	0.57	61.5	5.26
511.28	1211	27	22.11	1100.9	304.0	7.27	0.52	63.8	5.32
511.31	1228	28	22.13	1100.6	304.2	7.27	0.47	63.9	5.28
	1229								

Comments: ~1.5 gals purged from tubing 0819

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## GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL						
Calibrations done by: R Lynch				Date: 07/06/15		
Make & Model: EXO1						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes. 14H101486						
Other (S/N): NA						
pH Calibration/Check						
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	4.04	20.5	7.00	20.5	10.00
2. Time:	1113	4.02	20.8	7.00	20.8	10.01
3. Time:						
4. Time:						
Standard lot no.:	4AE330		4AE635		4AD984	
Expiration date:	5/16		5/16		4/16	
SC Calibration/Check						
Reference Value: 1225 uS			Standard Lot No.: 4AE659			
	Value	Temp	Expiration Date: 11/15			
1. Time:	0638	1227	20.5			
2. Time:	1112	1229	20.8			
3. Time:						
4. Time:						
ORP Calibration/Check						
Reference Value: 220 mV			Standard Lot No. 4AZ183			
	Value	Temp	Expiration Date: 12/15			
1. Time:	0643	220.1	20.5			
2. Time:	1115	220.4	20.8			
3. Time:						
4. Time:						
DO Calibration/Check						
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0637	81.9	24.70			
2. Time:	1111	82.0	24.71			
3. Time:						
4. Time:						

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL				
Calibration done by: R Lynch			Date: 07/06/15	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 14060C033238	
Reference Value	0.1	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time	0805 .13	20.2	104	797
2. Time	0644 .11	20.3	101	795
3. Time				
4. Time				
Comments:				

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNI/NM Project Name: CWL						
Calibrations done by: R Lynch				Date: 07/07/15		
Make & Model: EX01						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 14H101486						
Other (S/N): NA						
pH Calibration/Check						
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:	0626	4.02	19.7	6.99	19.7	10.00
2. Time:	1142	4.03	20.1	7.00	20.1	10.01
3. Time:						
4. Time:						
Standard lot no.:	4AE330		4AE635		4AD984	
Expiration date:	5/16		5/16		4/16	
SC Calibration/Check						
Reference Value: 1225 uS			Standard Lot No. 4AE659			
	Value	Temp	Expiration Date: 11/15			
1. Time:	0625	1224.8	19.7			
2. Time:	1141	1225.1	20.1			
3. Time:						
4. Time:						
ORP Calibration/Check						
Reference Value: 220 mV			Standard Lot No. 4AZ183			
	Value	Temp	Expiration Date: 12/15			
1. Time:	0629	219.8	19.7			
2. Time:	1144	220.4	20.1			
3. Time:						
4. Time:						
DO Calibration/Check						
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0624	82.1	24.77			
2. Time:	1140	82.2	24.74			
3. Time:						
4. Time:						

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: <b>CWL</b>				
Calibration done by: <b>R Lynch</b>			Date: <b>07/07/15</b>	
TURBIDIMETER				
Make & Model: <b>HACH 2100Q</b>			Serial No. S/N <b>14060C033238</b>	
Reference Value	<b>0.1</b>	20	100	800
Standard Lot No.	<b>A4164</b>	<b>A4211</b>	<b>A4195</b>	<b>A4193</b>
1. Time <b>0806</b>	<b>.14</b>	<b>20.3</b>	<b>99.8</b>	<b>796</b>
2. Time <b>1050</b>	<b>.12</b>	<b>20.2</b>	<b>101</b>	<b>794</b>
3. Time				
4. Time				
Comments:				

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: <b>CWL</b>						
Calibrations done by: <b>R Lynch</b>				Date: <b>07/09/15</b>		
Make & Model: <b>EXO1</b>						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>14H101486</b>						
Other (S/N): <b>NA</b>						
<b>pH Calibration/Check</b>						
pH Calibrated to (std): <b>7.00</b>			pH sloped to (std): <b>10.00</b>			
Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: <b>0622</b>	<b>4.01</b>	<b>19.4</b>	<b>6.99</b>	<b>19.4</b>	<b>10.00</b>	<b>19.4</b>
2. Time: <b>1343</b>	<b>4.03</b>	<b>20.0</b>	<b>7.01</b>	<b>19.9</b>	<b>10.01</b>	<b>19.9</b>
3. Time:						
4. Time:						
Standard lot no.:	4AE330		4AE635		4AD984	
Expiration date:	5/16		5/16		4/16	
<b>SC Calibration/Check</b>						
Reference Value: <b>1225 uS</b>			Standard Lot No.: <b>4AE659</b>			
	Value	Temp	Expiration Date: <b>11/15</b>			
1. Time: <b>0621</b>	<b>1224.7</b>	<b>19.4</b>				
2. Time: <b>1342</b>	<b>1225.2</b>	<b>20.0</b>				
3. Time:						
4. Time:						
<b>ORP Calibration/Check</b>						
Reference Value: <b>220 mV</b>			Standard Lot No. <b>4AZ183</b>			
	Value	Temp	Expiration Date: <b>12/15</b>			
1. Time: <b>0624</b>	<b>219.9</b>	<b>19.4</b>				
2. Time: <b>1345</b>	<b>221.0</b>	<b>19.9</b>				
3. Time:						
4. Time:						
<b>DO Calibration/Check</b>						
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time: <b>0620</b>	<b>82.3</b>		<b>24.72</b>			
2. Time: <b>1340</b>	<b>82.1</b>		<b>24.70</b>			
3. Time:						
4. Time:						

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL				
Calibration done by: R Lynch			Date: 07/09/15	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 14060C033238	
Reference Value	0.1	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time	0802 .11	19.9	102	797
2. Time	1234 .12	20.1	104	799
3. Time				
4. Time				
Comments:				

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## GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL						
Calibrations done by: W. Gibson				Date: 07/10/15 / 07-13-15		
Make & Model: EXO 1						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 14H101486						
Other (S/N): N/A						
pH Calibration/Check						
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:	0739	4.03	20.5	7.00	20.5	10.00
2. Time:	1327	4.01	20.8	7.07	20.9	10.00
3. Time:	0801	4.02	20.4	7.07	20.4	10.00
4. Time:	1330	4.07	20.8	7.01	20.8	10.00
Standard lot no.:	4AE330		4AE635		4AD984	
Expiration date:	5/16		5/16		4/16	
SC Calibration/Check						
Reference Value: 1225 uS			Standard Lot No.: 4AE659			
	Value	Temp	Expiration Date: 11/15			
1. Time:	0735	1226	20.5			
2. Time:	1323	1226	20.9			
3. Time:	0804	1226	20.4			
4. Time:	1326	1226	20.8			
ORP Calibration/Check						
Reference Value: 220 mV			Standard Lot No. 4AZ183			
	Value	Temp	Expiration Date: 12/15			
1. Time:	0732	220.1	20.5			
2. Time:	1320	220.1	20.9			
3. Time:	0807	220.2	20.4			
4. Time:	1320	220.1	20.8			
DO Calibration/Check						
Calibration Value:		81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg		
1. Time:	0727	81.8	24.74			
2. Time:	1315	81.7	24.69			
3. Time:	0823	81.6	24.80			
4. Time:	1313	81.7	24.81			

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## GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL				
Calibration done by: W. Gibson			Date: 07/10/15 / 7-13-15	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 14060C033238	
Reference Value	0.1	20	100	800
Standard Lot No.	A4164	A4211	A4195	A4193
1. Time 0845	0.12	<del>20.8</del> 20.8	101	803
2. Time 1330	0.11	20.7	101	799
7/13/15 3. Time 0826	0.11	20.6	101	801
4. Time 1335	0.11	20.5	99.7	798
Comments:				

**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), 4100 Controlled Documents home page.



Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-BW5</u>	Date: <u>07-06-15</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>62187</u>
--	--

Personnel Performing Decontamination:

Robert Lynch

Print Name:

RL

Initial:

Alfred Santillanes

Print Name:

AS

Initial:

Condition of Equipment

Pump: Excellent Tubing Bundle: Excellent Water Level Indicator: Good

List of Decontamination Materials

<p>Deionized Water</p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>06-24-15</u></p>	<p><b>HNO<sub>3</sub></b></p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>ARCOS</u></p> <p>Lot Number: <u>A0316863</u></p>
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Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-MW9</u>	Date: <u>07-07-15</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>87162</u>
--	--

**Personnel Performing Decontamination:**

William Gibson

Print Name:

WJG  
Initial:

Robert Lynch

Print Name:

RL  
Initial:

Condition of Equipment

Pump: Excellent    Tubing Bundle: Excellent    Water Level Indicator: Good

List of Decontamination Materials

<b>Deionized Water</b>	<b>HNO<sub>3</sub></b>
Source: <u>Culligan</u>	Grade: <u>Reagent</u>
Lot Number: <u>06-24-15</u>	UN #: <u>2031</u>
	Manufacturer: <u>ARCOS</u>
	Lot Number: <u>A0316863</u>

**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), 4100 Controlled Documents home page.

Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form

CWL - GWM

Project Name: <u><del>GWL-gwm</del> WJA 7/15</u>	Monitoring Well ID #: <u>CWL-MW11</u>	Date: <u>07-09-15</u>
--	---------------------------------------	-----------------------

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>62187</u>
--	--

Personnel Performing Decontamination:

Robert Lynch

Print Name:

RL

Initial:

Alfred Santillanes

Print Name:

AS

Initial:

Condition of Equipment

Pump: Excellent Tubing Bundle: Excellent Water Level Indicator: Good

List of Decontamination Materials

<p>Deionized Water</p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>06-24-15</u></p>	<p>HNO<sub>3</sub></p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>ARCOS</u></p> <p>Lot Number: <u>A0316863</u></p>
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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), 4100 Controlled Documents home page.

Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-MW10</u>	Date: <u>07-13-15</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>62187</u>
--	--

**Personnel Performing Decontamination:**

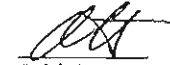
William Gibson

Print Name:

  
Initial:

Alfred Santillanes

Print Name:

  
Initial:

**Condition of Equipment**

Pump: Excellent      Tubing Bundle: Excellent      Water Level Indicator: Good

**List of Decontamination Materials**

<p style="text-align: center;"><b>Deionized Water</b></p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>06-24-15</u></p>	<p style="text-align: center;"><b>HNO<sub>3</sub></b></p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>ACROS</u></p> <p>Lot Number: <u>A0316863</u></p>
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**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), 4100 Controlled Documents home page.

## **SUMMARY SHEET FOR JULY 2015 SAMPLES**

Sample Summary for CWL GWM  
July 2015

Sample ID	Sample Date	ARCOG	Sample Number	Sample Type	Associated Equipment Blank (ARCOG #/Sample #)	Associated Trip Blank (ARCOG # / Sample #)	Associated Field Blank (ARCOG # / Sample #)	Comments
<b>CWL GWM: Project Task # 146422.10.11.03. Service Order # CF 327-15</b>								
<b>Environmental Samples</b>								
CWL-BW5	6-Jul-15	616216	097932	Environmental	n/a	616216 / 097933	616216 / 097931	
CWL-MW9	7-Jul-15	616218	097937	Environmental	n/a	616218 / 097938	616218 / 097936	
CWL-MW10	13-Jul-15	616223	097950	Environmental	616222 / 097947	616223 / 097952	616223 / 097949	
CWL-MW10	13-Jul-15	616223	097951	Duplicate	616222 / 097947	616223 / 097952	616223 / 097949	
CWL-MW11	9-Jul-15	616220	097942	Environmental	n/a	616220 / 097943	616220 / 097941	
CWL-EB1	9-Jul-15	616222	097947	Equipment Blank	n/a	616222 / 097948	n/a	Decon prior to CWL-MW10
CWL-FB1	6-Jul-15	616216	097931	Field Blank	n/a	616216 / 097933	n/a	at CWL-BW5
CWL-FB2	7-Jul-15	616218	097936	Field Blank	n/a	616218 / 097938	n/a	at CWL-MW9
CWL-FB3	9-Jul-15	616220	097941	Field Blank	n/a	616220 / 097943	n/a	at CWL-MW11
CWL-FB4	13-Jul-15	616223	097949	Field Blank	n/a	616223 / 097952	n/a	at CWL-MW10
CWL-QC-DIW	9-Jul-15	616222	097946	QC-DIW	n/a	616222 / 097948	n/a	DI source water - used for EB1
<b>Waste Characterization Samples</b>								
CWL-BW5	6-Jul-15	616217	097934	Waste	n/a	616217 / 097935	n/a	No data validation required
CWL-MW9	7-Jul-15	616219	097939	Waste	n/a	616219 / 097940	n/a	No data validation required
CWL-MW10	13-Jul-15	616224	097953	Waste	n/a	616224 / 097954	n/a	No data validation required
CWL-MW11	9-Jul-15	616221	097944	Waste	n/a	616221 / 097945	n/a	No data validation required

**DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**

**GROUNDWATER MONITORING**

**JULY 2015**

**AR/COC NUMBERS 616216 and 616218**



## Memorandum

Date: August 26, 2015  
To: File  
From: Mary Donovan  
Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL GWM/SVM  
AR/COC: 616216 and 616218  
SDG: 376245  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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 for trichloroethylene only 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.

### **Blanks**

No target analytes were detected in the blanks.

### **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 parent sample for the MS/MSD was an SNL sample of similar matrix from another SDG. No sample data were qualified as a result.

**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**

Two TBs were submitted, one associated with each ARCO. Two FBs were submitted, one associated with each ARCO.

No other specific issues that affect data quality were identified.

**Reviewed by:** Monica Dymerski

**Level I**

**Date:** 08/27/15

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## Memorandum

Date: August 26, 2015  
To: File  
From: Mary Donivan  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL GWM/SVM  
AR/COC: 616216 and 616218  
SDG: 376245  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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 samples were prepared and analyzed for Cr and Ni 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 Ca concentrations for both samples were comparable to or above the ICS levels for the ICP-MS analysis. The ICS A result for Ni was negative with an absolute value  $>$  the MDL but  $\leq 2X$  the MDL. The associated sample results were detects at  $< 50X$  the absolute value of the associated ICS A result and will be **qualified J-,CK3** due to a negative ICS A result.

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.

### ICP-MS Instrument Tune

The ICP-MS tune 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.

### **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)**

The results for the ICSA and ICSAB met acceptance criteria except as noted above in the Summary section.

### **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:** 08/27/15



## Sample Findings Summary



AR/COC: 616216, 616218

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL			
	097932-015/CWL-BW5	Nickel (7440-02-0)	J-, CK3
	097937-015/CWL-MW9	Nickel (7440-02-0)	J-, CK3

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

### Sandia Data Validation Summary Worksheet

ARCOG#: 616216 and 616218	Site/Project: CWL GWM/SVM	Validation Date: 08/26/15
SDG #: 376245	Laboratory: GEL Laboratories, Inc.	Validator: Mary Donovan
Matrix: Aqueous	# of Samples: 8	CVR present: Yes
ARCOG(s) present: Yes	Sample Container Integrity: OK	
Analysis Type: <input checked="" type="checkbox"/> Organic <input checked="" type="checkbox"/> Metals <input type="checkbox"/> Genchem <input type="checkbox"/> Rad		

Requested Analyses Not Reported			
Client Sample ID	Lab Sample ID	Analysis	Comments
None			

Hold Time/Preservation Outliers								
Client Sample ID	Lab Sample ID	Analysis	Pres.	Collection Date	Preparation Date	Analysis Date	Analysis <2X HT	Analysis ≥2X HT
None								

Comments: Collected: 07/06 and 07/2015

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Validated by:

*Mary A. Donovan*

## Sandia Organic Worksheet (GC/MS VOC)

ARCO #: 616216 and 616218	SDG: 376245	Matrix: Aqueous
Laboratory Sample IDs: 376245001, -002, -004, -005, -006 and -008		
Method/Batch #s: <b>8260B</b> /1492681	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	FBs -001, -005	TBs -004, -008		
	Int.	RF/ Slope	RSD/r <sup>2</sup>	(ICV)/ CCV %D										
None														

### Surrogate Recovery Outliers

Sample ID	1,2-DCA-d4 %R	Toluene-d8 %R	BFB %R		Sample ID	1,2-DCA-d4 %R	Toluene-d8 %R	BFB %R	
None									

### IS Outliers

Sample ID	FBZ		Chl-d5		1,4-DCB-d4							
	Area	RT	Area	RT	Area	RT						
None												

Comments: HTs OK. ICAL VOA6.I 06/23/15. MS/MSD performed on an SNL sample from another SDG.

### Sandia Inorganic Metals Worksheet

ARCO # (s): 616216 and 616218	SDG # (s): 376245	Matrix: Aqueous
Laboratory Sample IDs: 376245003 and -007		
Method/Batch #s: <b>3005A/6020</b> 1491792/1491793		

ICPMS Mass Cal:  Pass  Fail  NA    ICPMS %RSD:  Pass  Fail  NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank (5X MDL) mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ±MDL ug/L (x50)	CRI %R				
	Int. mg/L	R <sup>2</sup>	ICV	CCV	ICB ug/L	CCB ug/L													
Ni	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	-0.63(31.5)	✓					

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



# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *N/A*

SMO Use

AR/COC **616216**

Project Name: CWL GWM	Date Samples Shipped: <i>7/6/15</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>235538</i>	SMO Contact Phone: <i>SMO</i>	
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/843-556-8171	Wendy Palencia/505-844-3132	
Service Order: CF327-15	Lab Destination: GEL	Send Report to SMO: Stephanie Montano/505-284-2553	
Contract No.: PO 1303873			

Tech Area: \_\_\_\_\_  
 Building: \_\_\_\_\_ Room: \_\_\_\_\_ Operational Site: \_\_\_\_\_  
 Bill to: Sandia National Laboratories (Accounts Payable),  
 P.O. Box 5800, MS-0154  
 Albuquerque, NM 87185-0154 *376245*

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097931	-001	CWL-FB1	NA	7/6/15 10:30	DIW	G	3x40 ml	HCL	G	FB	TCE (SW846-8260)	001
097932	-001	CWL-BW5	521	7/6/15 10:30	GW	G	3x40 ml	HCL	G	SA	TCE (SW846-8260)	002
097932	-015	CWL-BW5	521	7/6/15 10:31	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel (SW846-6020)	003
097933	-001	CWL-TB1	NA	7/6/15 10:30	DIW	G	3x40 ml	HCL	G	TB	TCE (SW846-8260)	004

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
<b>Sample Team Members</b>	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<i>[Signature]</i>	RL	SNL/4142/505-844-4013/505-250-7090	Return Samples By: Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	Alfred Santillanes	<i>[Signature]</i>	AS	SNL/4142/505-284-6870/505-228-0710	
	William Gibson	<i>[Signature]</i>	WG	SNL/4142/505-284-3307/505-239-7367	
Lab Use					

1. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>7/6/15</i> Time 1104	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <i>[Signature]</i> Org. 4142 Date <i>7/6/15</i> Time 1104	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>7/6/15</i> Time 1120	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <i>[Signature]</i> Org. _____ Date <i>07/07/15</i> Time 0845	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. *MA*

SMO Use

AR/COC **616218**

Project Name: CWL GWM	Date Samples Shipped: <i>7/7/15</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>235683</i>	SMO Contact Phone: <i>9MD</i>	<input type="checkbox"/> RMMA
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/843-556-8171	Wendy Palencia/505-844-3132	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Service Order: CF327-15	Lab Destination: GEL	Send Report to SMO: Stephanie Montano/505-284-2553	
	Contract No.: PO 1303873		

Bill to: Sandia National Laboratories (Accounts Payable),  
P.O. Box 5800, MS-0154  
Albuquerque, NM 87185-0154 *376245*

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097936	-001	CWL-FB2	NA	7/7/15 10:42	DIW	G	3x40 ml	HCL	G	FB	TCE (SW846-8260)	005
097937	-001	CWL-MW9	516	7/7/15 10:42	GW	G	3x40 ml	HCL	G	SA	TCE (SW846-8260)	006
097937	-015	CWL-MW9	516	7/7/15 10:43	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel (SW846-6020)	007
097938	-001	CWL-TB3	NA	7/7/15 10:42	DIW	G	3x40 ml	HCL	G	TB	TCE (SW846-8260)	008

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<i>[Signature]</i>	RL	SNL/4142/505-844-4013/505-250-7090	Return Samples By: Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	Alfred Santillanes	<i>[Signature]</i>	AS	SNL/4142/505-284-6870/505-228-0710	
William Gibson	<i>[Signature]</i>	WG	SNL/4142/505-284-3307/505-239-7367		

1. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>7/7/15</i> Time <i>1125</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. 4142 Date <i>7/7/15</i> Time <i>1125</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>7/7/15</i> Time <i>1140</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. <i>GEL</i> Date <i>7-8-15</i> Time <i>0840</i>	4. Received by	Org.	Date	Time

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

**AR/COC NUMBERS 616220 and 616222**

## Memorandum

Date: August 25, 2015  
To: File  
From: Mary Donovan  
Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL GWM/SVM  
AR/COC: 616220 and 616222  
SDG: 376987  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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 for trichloroethylene only 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.

### **Blanks**

No target analytes were detected in the blanks.

### **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 parent sample for the MS/MSD was an SNL sample of similar matrix from another SDG. No sample data were qualified as a result.

**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**

Two TBs were submitted, one associated with each ARCOC. An FB was submitted with ARCOC 616220 and was associated with the samples in that ARCOC. A DI source water sample was submitted with ARCOC 616222 and was not associated with any samples. An EB was submitted with ARCOC 616222, and it was associated with samples from ARCOC 616223 which was not submitted with this SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Monica Dymerski

**Level I**

**Date:** 08/26/15

## Memorandum

Date: August 25, 2015  
To: File  
From: Mary Donovan  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL GWM/SVM  
AR/COC: 616220 and 616222  
SDG: 376987  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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 samples were prepared and analyzed for Cr and Ni 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 Ca concentration for sample 376987003 was comparable to or above the ICS levels for the ICP-MS analysis. The ICS A result for Ni was negative with an absolute value  $>$  the MDL but  $\leq 2X$  the MDL. The associated sample result was a detect at  $< 50X$  the absolute value of the associated ICS A result and will be **qualified J-,CK3** due to a negative ICS A result.

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.

### ICP-MS Instrument Tune

The ICP-MS tune 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.

### **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)**

The results for the ICSA and ICSAB met acceptance criteria except as noted above in the Summary section. Results of the ICS A and AB analyses were not evaluated for sample -007 because the sample concentrations of Al, Ca, Mg and Fe were < that in the ICS solution.

### **ICP Serial Dilution**

The serial dilutions met all QC acceptance criteria.

### **Other QC**

An EB was submitted with ARCOG 616222, and it was associated with samples from ARCOG 616223 which was not submitted with this SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Monica Dymerski

**Level I**

**Date:** 08/26/15



## Sample Findings Summary



AR/COC: 616220, 616222

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL	097942-015/CWL-MW11	Nickel (7440-02-0)	J-, CK3

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



## Sandia Data Validation Summary Worksheet

ARCOG#: 616220 and 616222	Site/Project: CWL GWM/SVM	Validation Date: 08/25/15
SDG #: 376987	Laboratory: GEL Laboratories, Inc.	Validator: Mary Donovan
Matrix: Aqueous	# of Samples: 8	CVR present: Yes
ARCOG(s) present: Yes	Sample Container Integrity: OK	
Analysis Type: <input checked="" type="checkbox"/> Organic <input checked="" type="checkbox"/> Metals <input type="checkbox"/> Genchem <input type="checkbox"/> Rad		

Requested Analyses Not Reported			
Client Sample ID	Lab Sample ID	Analysis	Comments
None			

Hold Time/Preservation Outliers								
Client Sample ID	Lab Sample ID	Analysis	Pres.	Collection Date	Preparation Date	Analysis Date	Analysis <2X HT	Analysis ≥2X HT
None								

Comments: Collected: 07/09/2015

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Validated by:

*Mary A. Donovan*

## Sandia Organic Worksheet (GC/MS VOC)

ARCOG #:616220 and 616222	SDG: 376987	Matrix: Aqueous
Laboratory Sample IDs: 376987001, -002, -004, -005, -006 and -008		
Method/Batch #s: <b>8260B</b> /1494622	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	TBs -004, -008	EB -006
	Int.	RF/ Slope	RSD/r <sup>2</sup>	(ICV)/ CCV %D									
None													

### Surrogate Recovery Outliers

Sample ID	1,2-DCA-d4 %R	Toluene-d8 %R	BFB %R		Sample ID	1,2-DCA-d4 %R	Toluene-d8 %R	BFB %R
None								

### IS Outliers

Sample ID	FBZ		Chl-d5		1,4-DCB-d4						
	Area	RT	Area	RT	Area	RT					
None											

Comments: HTs OK. ICAL VOA4.I 07/17/15. MS/MSD performed on an SNL sample from another SDG

## Sandia Inorganic Metals Worksheet

ARCO #s: 616220 and 616222	SDG #(s): 376987	Matrix: Aqueous
Laboratory Sample IDs: 376987003 and -007		
Method/Batch #s: <b>3005A/6020</b> 1492023/1492024		

ICPMS Mass Cal:  Pass  Fail  NA    ICPMS %RSD:  Pass  Fail  NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank (5X MDL) mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ±MDL ug/L (x50)	CRI %R				
	Int. mg/L	R <sup>2</sup>	ICV	CCV	ICB ug/L	CCB ug/L													
Ni	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	-0.94(47)	✓					

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

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. #1A

SMO Use

AR/COC 616220

Project Name: CWL GWM	Date Samples Shipped: 7/10/15	SMO Authorization: [Signature]	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Project/Task Manager: Tim Jackson	Carrier/Waybill No. 235808	SMO Contact Phone: Wendy Palencia/505-844-3132	
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/843-556-8171	Send Report to SMO: Stephanie Montano/505-284-2553	
Service Order: CF327-15	Lab Destination: GEL	Contract No.: PO 1303873	

Bill to: Sandia National Laboratories (Accounts Payable),  
 P.O. Box 5800, MS-0154  
 Albuquerque, NM 87185-0154 376987

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097941	-001	CWL-FB3	NA	7/9/15 12:29	DIW	G	3x40 ml	HCL	G	FB	TCE (SW846-8260)	001
097942	-001	CWL-MW11	513	7/9/15 12:29	GW	G	3x40 ml	HCL	G	SA	TCE (SW846-8260)	002
097942	-015	CWL-MW11	513	7/9/15 12:32	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel (SW846-6020)	003
097943	-001	CWL-TB5	NA	7/9/15 12:29	DIW	G	3x40 ml	HCL	G	TB	TCE (SW846-8260)	004

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:	Entered by:	EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Background: <input type="checkbox"/> Yes	QC inits.:	Negotiated TAT	Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day	
Confirmatory: <input type="checkbox"/> Yes	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	Return Samples By:	Comments: Send report to Tim Jackson/4142/MS 0729/284-2547	

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/4142/505-284-6870/505-228-0710
	William Gibson	[Signature]	WG	SNL/4142/505-284-3307/505-239-7367
	Gilbert Quintana	[Signature]	GQ	SNL/4143/505-284-2547/505/228-2606

1. Relinquished by [Signature] Org. 4142 Date 7/9/15 Time 1305	3. Relinquished by	Org.	Date	Time
1. Received by [Signature] Org. 4142 Date 7/9/15 Time 1305	3. Received by	Org.	Date	Time
2. Relinquished by [Signature] Org. 4142 Date 7/10/15 Time 0730	4. Relinquished by	Org.	Date	Time
2. Received by [Signature] Org. GEL Date 7-11-15 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

Internal Lab

Batch No. MA

SMO Use

AR/COC **616222**

Project Name: <u>CWL GWM</u>	Date Samples Shipped: <u>7/10/15</u>	SMO Authorization: <u>[Signature]</u>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: <u>Tim Jackson</u>	Carrier/Waybill No.: <u>235808</u>	SMO Contact Phone: <u>[Signature]</u>	<input type="checkbox"/> RMMA
Project/Task Number: <u>146422.10.11.03</u>	Lab Contact: <u>Edie Kent/843-556-8171</u>	Wendy Palencia/505-844-3132	<input type="checkbox"/> Released by COC No.
Service Order: <u>CF327-15</u>	Lab Destination: <u>GEL</u>	Send Report to SMO:	<input checked="" type="checkbox"/> 4° Celsius
	Contract No.: <u>PO 1303873</u>	Stephanie Montano/505-284-2553	

Bill to: Sandia National Laboratories (Accounts Payable),  
P.O. Box 5800, MS-0154  
Albuquerque, NM 87185-0154 376987

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097946	-001	CWL-QC DIW	NA	7/9/15 13:48	DIW	G	3x40 ml	HCL	G	FB	TCE (SW846-8260)	005
097947	-001	CWL-EB1	NA	7/9/15 13:48	DIW	G	3x40 ml	HCL	G	EB	TCE (SW846-8260)	006
097947	-015	CWL-EB1	NA	7/9/15 13:50	DIW	P	500 ml	HNO3	G	EB	Chromium, Nickel (SW846-6020)	007
097948	-001	CWL-TB7	NA	7/9/15 13:48	DIW	G	3x40 ml	HCL	G	TB	TCE (SW846-8260)	008

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	[Signature]	RL	SNL/4142/505-844-4013/505-250-7090	Return Samples By:
	Alfred Santillanes	[Signature]	AS	SNL/4142/505-284-6870/505-228-0710	
	William Gibson	[Signature]	WG	SNL/4142/505-284-3307/505-239-7367	
					Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

1. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>7/9/15</u> Time <u>1441</u>	3. Relinquished by	Org.	Date	Time
1. Received by <u>[Signature]</u> Org. <u>4142</u> Date <u>7/9/15</u> Time <u>1441</u>	3. Received by	Org.	Date	Time
2. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>7/10/15</u> Time <u>0730</u>	4. Relinquished by	Org.	Date	Time
2. Received by <u>[Signature]</u> Org. <u>Gen</u> Date <u>7-11-15</u> Time <u>0900</u>	4. Received by	Org.	Date	Time

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

**AR/COC NUMBER 616223**

## Memorandum

Date: August 13, 2015  
To: File  
From: Linda Thal  
Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL GWM  
AR/COC: 616223  
SDG: 377111  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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**

Four samples were prepared and analyzed with accepted procedures for trichloroethylene using method SW846 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.

### **Blanks**

No target analytes were detected in the blanks.

### **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. Data will not be qualified.

#### **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 TB and a FB were submitted with ARCOG 616223. An EB associated with the samples from ARCOG 616223 was submitted with ARCOG 616220, and was analyzed in SDG 376987. A field duplicate pair was submitted with ARCOG 616223. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified.

No other specific issues that affect data quality were identified.

**Reviewed by:** Monica Dymerski

**Level I**

**Date:** 08/26/15



## Memorandum

Date: August 13, 2015  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL GWM  
AR/COC: 616223  
SDG: 377111  
Laboratory: GEL  
Project/Task: 146422.10.11.03  
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 samples were prepared and analyzed with approved procedures for Ni and Cr using method SW846 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 properly preserved.

### **ICP-MS Instrument Tune**

The instrument tune met QC acceptance criteria.

### **Calibration**

All initial and continuing calibration criteria met QC acceptance criteria.

### **Reporting Limit Verification**

All CRA/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 analyte was detected in the blanks.

### **ICP -MS Internal Standards**

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, Al and Fe were < that in the ICS solution.

### **ICP Serial Dilution**

The serial dilution met all QC acceptance criteria.

### **Other QC**

An EB associated with the samples from ARCOG 616223 was submitted with ARCOG 616220, and was analyzed in SDG 376987. A field duplicate pair was submitted with ARCOG 616223. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified.

No other specific issues that affect data quality were identified.

**Reviewed by:** Monica Dymerski

**Level I**

**Date:** 08/26/15

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## Sample Findings Summary



AR/COC: 616223

Page 1 of 1

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

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

### Sandia Data Validation Summary Worksheet

ARCOG#: 616223	Site/Project: CWL GWM	Validation Date: 08/13/2015
SDG #:377111	Laboratory: GEL	Validator: Linda Thal
Matrix: Aqueous	# of Samples: 6	CVR present: Yes
ARCOG(s) present: Yes	Sample Container Integrity: OK	
Analysis Type: <input checked="" type="checkbox"/> Organic <input checked="" type="checkbox"/> Metals <input type="checkbox"/> Genchem <input type="checkbox"/> Rad		

Requested Analyses Not Reported			
Client Sample ID	Lab Sample ID	Analysis	Comments
none			

Hold Time/Preservation Outliers								
Client Sample ID	Lab Sample ID	Analysis	Pres.	Collection Date	Preparation Date	Analysis Date	Analysis <2X HT	Analysis ≥2X HT
none							Yes	No
							No	Yes

Comments: Sampled 07/13/2015

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Validated by: *L. Thal*

### Sandia Organic Worksheet (GC/MS VOC)

ARCO #:616223	SDG:377111	Matrix: Aqueous
Laboratory Sample IDs:377111001, -002, -004, -006		
Method/Batch #:SW846 8260B/1494905	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	TB -006	X5 (X10)	FB -001	X5 (X10)
	Int.	RF/ Slope	RSD/r <sup>2</sup>	(ICV)/CC V %D										
none														

Surrogate Recovery Outliers									
Sample ID	1,2-DCA-d4 %R	Toluene-d8 %R	BFB %R		Sample ID	1,2-DCA-d4 %R	Toluene-d8 %R	BFB %R	
none									

IS Outliers									
Sample ID	FBZ		Chl-d5		1,4-DCB-d4				
	Area	RT	Area	RT	Area	RT			
none									

Comments: TCE only; HTs OK; MS/MSD on another SNL SDG; VOA9.I 07/08/2015

## Sandia Inorganic Metals Worksheet

ARCOG #(s):616223	SDG #(s):377111	Matrix: Aqueous
Laboratory Sample IDs:377111003, -005		
Method/Batch #:SW846 3005A/6020/1492801(prepare)/1492802		

ICPMS Mass Cal:  Pass  Fail  NA    ICPMS %RSD:  Pass  Fail  NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank (5X MDL) mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ±MDL ug/L (x50)	CRA CRI %R				
	Int. mg/L	R <sup>2</sup>	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				none			

Comments: HTs OK; Matrix QC -003  
ICS NA

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. <i>N/A</i>	SMO Use	AR/COC	<b>616223</b>
Project Name: CWL GWM	Date Samples Shipped: <i>7/13/15</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius	
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>235937</i>		
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/843-556-8171		
Service Order: CF327-15	Lab Destination: GEL		
	Contract No.: PO 1303873	Send Report to SMO: Stephanie Montano/505-284-2553	

Tech Area:	Operational Site:	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 <span style="float: right;"><i>377111</i></span>
Building:	Room:	

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097949	-001	CWL-FB4	NA	7/13/15 9:03	DIW	G	3x40 ml	HCL	G	FB	TCE (SW846-8260)	<i>001</i>
097950	-001	CWL-MW10	515	7/13/15 9:03	GW	G	3x40 ml	HCL	G	SA	TCE (SW846-8260)	<i>002</i>
097950	-015	CWL-MW10	515	7/13/15 9:05	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel (SW846-6020)	<i>003</i>
097951	-001	CWL-MW10	515	7/13/15 9:03	GW	G	3x40 ml	HCL	G	DU	TCE (SW846-8260)	<i>004</i>
097951	-015	CWL-MW10	515	7/13/15 9:05	GW	P	500 ml	HNO3	G	DU	Chromium, Nickel (SW846-6020)	<i>005</i>
097952	-001	CWL-TB8	NA	7/13/15 9:03	DIW	G	3x40 ml	HCL	G	TB	TCE (SW846-8260)	<i>006</i>

Last Chain: <input checked="" type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt																			
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																				
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day																				
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Sample Team Members</th> <th>Name</th> <th>Signature</th> <th>Init.</th> <th>Company/Organization/Phone/Cell</th> </tr> <tr> <td></td> <td>Tim Jackson</td> <td><i>TJ</i></td> <td><i>TJ</i></td> <td>SNL/4142/505-284-2547/505-263-6639</td> </tr> <tr> <td></td> <td>Alfred Santillanes</td> <td><i>AS</i></td> <td><i>AS</i></td> <td>SNL/4142/505-284-6870/505-228-0710</td> </tr> <tr> <td></td> <td>William Gibson</td> <td><i>WG</i></td> <td><i>WG</i></td> <td>SNL/4142/505-284-3307/505-239-7367</td> </tr> </table>	Sample Team Members	Name	Signature		Init.	Company/Organization/Phone/Cell		Tim Jackson	<i>TJ</i>	<i>TJ</i>	SNL/4142/505-284-2547/505-263-6639		Alfred Santillanes	<i>AS</i>	<i>AS</i>	SNL/4142/505-284-6870/505-228-0710		William Gibson	<i>WG</i>	<i>WG</i>	SNL/4142/505-284-3307/505-239-7367	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	Return Samples By:
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell																			
	Tim Jackson	<i>TJ</i>	<i>TJ</i>	SNL/4142/505-284-2547/505-263-6639																			
	Alfred Santillanes	<i>AS</i>	<i>AS</i>	SNL/4142/505-284-6870/505-228-0710																			
	William Gibson	<i>WG</i>	<i>WG</i>	SNL/4142/505-284-3307/505-239-7367																			

1. Relinquished by <i>TJ</i> Org. <i>4142</i> Date <i>7/13/15</i> Time <i>0950</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>Wendy Palencia</i> Org. <i>4142</i> Date <i>7/13/15</i> Time <i>0950</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>Wendy Palencia</i> Org. <i>4142</i> Date <i>7-13-15</i> Time <i>11:11</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>Stephanie Montano</i> Org. <i>CEL</i> Date <i>7-14-15</i> Time <i>0850</i>	4. Received by	Org.	Date	Time

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

**CONTRACT VERIFICATION REVIEW FORMS**  
**GROUNDWATER MONITORING**  
**JULY 2015**

Note: The review forms in this section include AR/COC numbers for environmental samples and additional AR/COC numbers for waste characterization samples.

<b>AR/COC Number</b>	<b>Sample Type</b>
616216	Environmental*
616217	Waste
616218	Environmental*
616219	Waste
616220	Environmental*
616221	Waste
616222	Environmental*
616223	Environmental*
616224	Waste

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



## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL GWM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 616216, 616217, 616218 & 616219

**Analytical Lab** GEL

**SDG No.** 376239

*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 ARCOG 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	Vinyl chloride failed recovery limits for VOC ms/msd.
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	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		

### 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	X		
	a) Laboratory control sample accuracy reported and met for all samples			
	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	X		
	a) Replicate sample precision reported and met for all inorganic and radiochemistry samples			
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5	Blank data		X	Vanadium detected in metals blank (QC1203351876). Chloride detected in anion blank (QC1203352407).
	a) Method or reagent blank data reported and met for all samples			
	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)	X		
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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)	X		
	a) Initial calibration provided			
	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	X		
	a) Instrument run logs provided			

## 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
097934-009 & 097939-009	TAL metals	Method blank statement incorrect
097932-015 & 097937-015	Nickel & chromium	Method blank statement incorrect
097934-009 & 097939-009	TAL metals	'N' qualifier used incorrectly on calcium and sodium

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  and date correction request was submitted: 08-10-2015

Reviewed by: Wendy Palencia Date: 08-10-2015 10:23:00

Were resolutions adequate and data package complete?  Yes  No

Closed by: Wendy Palencia Date: 08-27-2015 06:46:00

## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL GWM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 616220, 616221 & 616222

**Analytical Lab** GEL

**SDG No.** 376986

*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 ARCOG 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	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		

### 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	X		
	a) Laboratory control sample accuracy reported and met for all samples			
	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	X		
	a) Replicate sample precision reported and met for all inorganic and radiochemistry samples			
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5	Blank data		X	Methylene chloride detected in blank (QC1203359415). Vanadium detected in metals blank (QC1203352458). Chloride detected in blank (QC1203352407).
	a) Method or reagent blank data reported and met for all samples			
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Methylene chloride detected in CWL-TB6

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)	X		
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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)	X		
	a) Initial calibration provided			
	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	X		
	a) Instrument run logs provided			

## 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
097944-009	TAL metals	Method blank statement incorrect
.		

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  and date correction request was submitted: 08-11-2015

Reviewed by: Wendy Palencia Date: 08-11-2015 09:55:00

Were resolutions adequate and data package complete?  Yes  No

Closed by: Wendy Palencia Date: 08-19-2015 09:00:00

## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL GWM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 616223

**Analytical Lab** GEL

**SDG No.** 377111

*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 ARCOG 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	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		

### 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	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		

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)	X		
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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)	X		
	a) Initial calibration provided			
	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	N/A		
	a) Instrument run logs provided			

## 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: 08-13-2015 14:20:00

Closed by: Wendy Palencia Date: 08-13-2015 14:20:00

**ANNEX B  
Chemical Waste Landfill  
CY 2015 Soil-Gas Monitoring Forms and Reports**

**Field Forms**

**Data Validation Reports**

**Contract Verification Reports**

**Certificates of Analysis – provided on CD in plastic sleeve insert**

**FIELD SAMPLING FORMS**  
**CWL POST-CLOSURE CARE SOIL-GAS MONITORING**

<b>Form Title</b>	<b>Corresponding Procedure</b>
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**  
**JANUARY 2015 SOIL-GAS MONITORING**



TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL Date: 1/21/15 Time: 0800

Activities: Groundwater Monitoring and Sampling / soil vapor monitoring  
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:

Temp: 35 °F Wind Speed: >10 MPH Humidity: >30% Wind Chill      °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules TR 1/26/15  
Other:     

Safety Topics Presented

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

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

Attendees

Tim Jackson  
Printed Name

T. Jackson  
Signature

ALFRED SANTILLANES  
Printed Name

Alfred Santillanes  
Signature

Robert Lynch  
Printed Name

Robert Lynch  
Signature

William Gibson  
Printed Name

William Gibson  
Signature

Printed Name

Signature

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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
3400 1275	1/16/15	1/21/15	-26	1/21/15	-8	1/21/15
0482			-25		-8	
0917			-16		NA	
0485			-27		-8	
0379			-27		-8	
0178			-25		-8	
0270			-27		-8	
0477			-27		-8	
1294			-24		-8	
1408			-24		-8	
0384			-27		-8	
1043			-25		-8	
0417			-27		-8	
0821			-27		-8	
0416			-27		-8	
1442			-26		-8	
0881			-27		-8	
0870			-27		-8	
0849			-27		-8	
1370			-27		-8	
0264			-23		-8	
0851			-27		-8	
1168			-27		-8	
0083			-25		-8	
0274			-27		-8	
0004			-27		-8	
1527			-27		-8	
1303			-25		-8	
1664			-27		-8	

SUMMA® Canister Log completed by:

Tim Jackson

Printed Name

T. Jackson

Signature

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-VI2-FB	12/1/15	822	34001275	NA	-26	-6	
CWL-VI2-36		824	NA	0.0	NA	NA	
↓		827	34000482	NA	-25	-8	
CWL-VI2-76		828	NA	0.0	NA	NA	
↓			34000977	NA	-16	NA	not used
		833	34000485	NA	-24	-8	
CWL-VI2-136		835	NA	0.0	NA	NA	
↓		836	34000379	NA	-24	-8	
CWL-D1-FB		847	34000170	NA	-25	-8	
CWL-D1-100		853	<del>34000270</del> <sup>12-15</sup>	0.0	NA	NA	
		855	34000270	NA	-24	-8	
CWL-D1-160		858	NA	0.0	NA	NA	
		859	34000477	NA	-24	-8	
CWL-D1-240		901	NA	0.0	NA	NA	
		904	34001294	NA	-24	-8	
CWL-D1-350		906	NA	0.0	NA	NA	
↓		907	NA	0.0	NA	NA	
		909	34001408	NA	-24	-8	
CWL-D1-470		911	NA	0.0	NA	NA	
↓		912	NA	0.0	NA	NA	
		914	34000384	NA	-24	-8	
CWL-VI1-FB		923	34001043	NA	-25	-8	
CWL-VI1-40		927	NA	0.0	NA	NA	
↓		928	34000414	NA	-24	-8	
CWL-VI1-80		930	NA	0.0	NA	NA	
↓		931	34000821	NA	-24	-8	
CWL-VI1-120		932	NA	0.0	NA	NA	
↓		934	34000416	NA	-24	-8	

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
LWL-D2-FB	1/21/15	945	34001442	NA	-26	-8	
LWL-D2-120		958	NA	0.0	NA	NA	
↓		959	34000821	NA	-24	-8	
LWL-D2-270		1001	NA		NA	NA	
↓		1007	34000870		-24	-8	
↓		1004	34000849		-24	-8	Duplicate
LWL-D2-350		1006	NA		NA	NA	
↓		1008	34001370		-24	-8	
LWL-D2-440		1010	NA		NA	NA	
↓		1012	NA		NA	NA	
↓		1013	34000264	NA	-23	-8	
↓		1015	34000851	NA	-24	-8	Duplicate
LWL-D2-470		1018	NA		NA	NA	
↓		1021	34001168	NA	-24	-8	
LWL-D3-FB		1038	34000083	NA	-25	-8	
LWL-D3-120		1042	NA		NA	NA	D3 Well - no ball
↓		1044	34000274	NA	-24	-8	releasing vapor @ surface
LWL-D3-170		1046	NA	0.0	NA	NA	
↓		1048	34000004	NA	-24	-8	
LWL-D3-350		1049	NA		NA	NA	
↓		1051	34001527	NA	-24	-8	
LWL-D3-480		1054	NA	0.0	NA	NA	
↓		1055	NA	0.0	NA	NA	
↓		1058	34001303	NA	-25	-8	
LWL-D3-440		1059	NA	0.0	NA	NA	
↓		1105	34001664	NA	-24	-8	slow sample collection

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

**SUMMARY SHEET FOR JANUARY 2015 SAMPLES**

**Sample Summary for CWL Soil Vapor Monitoring  
FY15**

Well ID	Sample Date	Sample ID / Port	SUMMA Number	ARCOC	Sample Number	Sample Type	Associated Equipment Blank (ARCOC #/Sample #)	Associated Trip Blank (ARCOC #/Sample #)	Associated Field Blank (ARCOC #/Sample #)	Comments
<b>Chemical Waste Landfill Soil Vapor Monitoring: Project Task Number 146422.10.11.03 / Service Order Number CF 327-15</b>										
CWL-UI1	21-Jan-15	CWL-UI1-40	34000414	615971	097093	Environmental	n/a	n/a	615971 / 097096	
		CWL-UI1-80	34000821		097094	Environmental				
		CWL-UI1-120	34000416		097095	Environmental				
		CWL-SV-FB1	34001043		097096	Field QC				
CWL-UI2	21-Jan-15	CWL-UI2-36	34000482	615972	097097	Environmental	n/a	n/a	615972 / 097100	
		CWL-UI2-76	34000485		097098	Environmental				
		CWL-UI2-136	34000379		097099	Environmental				
		CWL-SV-FB2	34001275		097100	Field QC				
CWL-D1	21-Jan-15	CWL-D1-100	34000270	615973	097101	Environmental	n/a	n/a	615973 / 097106	
		CWL-D1-160	34000477		097102	Environmental				
		CWL-D1-240	34001294		097103	Environmental				
		CWL-D1-350	34001408		097104	Environmental				
		CWL-D1-470	34000384		097105	Environmental				
		CWL-SV-FB3	34000178		097106	Field QC				
CWL-D2	21-Jan-15	CWL-D2-120	34000881	615974	097107	Environmental	n/a	n/a	615974 / 097114	
		CWL-D2-240	34000870		097108	Environmental				
		CWL-D2-240	34000849		097109	Duplicate				
		CWL-D2-350	34001370		097110	Environmental				
		CWL-D2-440	34000264		097111	Environmental				
		CWL-D2-440	34000851		097112	Duplicate				
		CWL-D2-470	34001168		097113	Environmental				
		CWL-SV-FB4	34001442		097114	Field QC				
CWL-D3	21-Jan-15	CWL-D3-120	34000274	615975	097115	Environmental	n/a	n/a	615975 / 097120	
		CWL-D3-170	34000004		097116	Environmental				
		CWL-D3-350	34001527		097117	Environmental				
		CWL-D3-440	34001664		097118	Environmental				
		CWL-D3-480	34001303		097119	Environmental				
		CWL-SV-FB5	34000083		097120	Field QC				

# **DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**

**AR/COC NUMBERS 615971, 615972, 615973, 615974, 615975**



## Memorandum

Date: March 6, 2015

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL SVM  
AR/COC: 615971, 615972, 615973, 615974 and 615975  
SDG: 320-11418-1, 320-11417-1, 320-11420-1, 320-11419-1 and 320-11423-1  
Laboratory: TestAmerica Laboratories, Inc. – West Sacramento  
Project/Task: 146422.10.11.03  
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-eight samples were prepared and analyzed with accepted procedures using method EPA TO-15 (VOCs in Ambient Air). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. Samples 11419-5 and -6 were reanalyzed beyond HT but within 2X the method-specified HT due to client request to analyze the samples at lower dilutions for all analytes *except* trichloroethene. The associated sample results which were detects will be **qualified J,H1** and those which were non-detects will be **qualified UJ,H1**.
2. Acetone was detected at a concentration < the PQL in the MB associated with samples 11418-1 through -4, 11417-1 through -4 and 11419-1 through 4, -5DL, -6DL, -7 and -8 (Batch 65875). The associated result for samples 11418-4 (FB1), 11417-4 (FB2) and 11419-8 (FB4) were detects < the PQL and  $\leq 10X$  the MB concentration and will be **qualified 5.0U,B, 5.0U,B and 12U,B**, respectively, at the PQLs.
3. Acetone was detected at a concentration < the PQL in the MB associated with samples 11420-1 through -6 and 11423-1 through -6 (Batch 66088). The associated result for sample 11420-6 (FB3) was a detect < the PQL and  $\leq 10X$  the MB concentration and will be **qualified 5.0U,B** at the PQL.
4. Methylene chloride was detected at a concentration > the PQL in FB3 (sample 11420-6) which was associated with the field samples in SDG 11420. The associated result for sample 11420-5 was a detect < the PQL and  $\leq 10X$  the FB concentration and will be **qualified 3.9U,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 except as noted above in the Summary section.

### **Instrument Tune**

All instrument tune requirements were met.

### **Calibration**

The initial calibration and continuing calibration data met QC acceptance criteria except as follows. The %D for the ICV associated with all samples *except* 11419-5 and -6 was >30% with positive bias for 2-hexanone. All associated sample results were NDs and will not be qualified.

The %D for the ICV associated with samples 11419-5 and -6 was >30% with a negative bias for 2-hexanone. The associated sample results were non-detects and since no other calibration infractions occurred, will not be qualified.

### **Blanks**

No target analytes were detected in the blanks except as noted above in the Summary section and as follows. Acetone was detected at a concentration < the PQL in the MB associated with samples 11418-1 through -4, 11417-1 through -4 and 11419-1 through 4, -5DL, -6DL, -7 and -8 (Batch 65875). The associated result for all samples *except* 11418-4, 11417-4 and 11419-8 were detects >10X the MB concentration and will not be qualified.

Acetone was detected at a concentration < the PQL in the MB associated with samples 11420-1 through -6 and 11423-1 through -6 (Batch 66088). The associated result for all samples *except* sample 11420-6 were either detects >10X the MB concentration or non-detects and will not be qualified.

Acetone was detected at concentrations < the PQL in FB1 (associated with SDG 11418), FB2 (associated with 11417), FB3 (associated with SDG 11420) and FB4 (associated with SDG 11419). The acetone results for the FBs were qualified U due to MB contamination and will not be applied to field sample results.

Toluene was detected at a concentration < the PQL in FB2 (sample 11417-4 associated with field samples -1 through -3). The associated field sample results were detects >10X the FB concentration and will not be qualified.

Methylene chloride was detected at a concentration > the PQL and toluene was detected at a concentration < the PQL in FB3 (sample 11420-6) which was associated with the field samples in SDG 11420. The associated results for samples 11420-1 through -4 were detects >10X the FB concentrations and will not be qualified. The toluene result for sample 11420-5 was a non-detect 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 2-hexanone and 4-methyl-2-pentanone for the LCS associated with samples 11418-1 through -4, 11417-1 through -4 and 11419-1 through 4, -5DL, -6DL, -7 and -8 (Batch 65875). The %R was > the upper acceptance limit for 2-hexanone for the LCS associated with samples 11420-1 through -6 and 11423-1 through -6 (Batch 66088). Three recoveries per LCS batch 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 samples 11417-2, 11419-5, 11419-6 to bring over range analytes into calibration range.

Samples 11419-8 and 11423-6 were received at pressure <6 psia. The samples were then pressurized as normal which resulted in dilution factors greater than 3X the default volume. No sample data will be qualified as a result.

### **Tentatively Identified Compounds (TICs)**

TIC reports were not required.

### **Other QC**

Five FBs were submitted, one for each ARCO. Two field duplicate pairs were submitted with ARCO 615974. 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:** 03/17/15



## Sample Findings Summary



AR/COC: 615971, 615972, 615973, 615974, 615975

Page 1 of 5

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
<b>TO15</b>			
	097096-001/CWL-SV FB1	ACETONE (67-64-1)	5.0U, B
	097100-001/CWL-SV-FB2	ACETONE (67-64-1)	5.0U, B
	097105-001/CWL-D1-470	METHYLENE CHLORIDE (75-09-2)	3.9U, B2
	097106-001/CWL-SV FB3	ACETONE (67-64-1)	5.0U, B
	097111-001/CWL-D2-440	1,1,1-TRICHLOROETHANE (71-55-6)	J, H1
	097111-001/CWL-D2-440	1,1,2,2-TETRACHLOROETHANE (79-34-5)	UJ, H1
	097111-001/CWL-D2-440	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	J, H1
	097111-001/CWL-D2-440	1,1,2-TRICHLOROETHANE (79-00-5)	UJ, H1
	097111-001/CWL-D2-440	1,1-DICHLOROETHANE (75-34-3)	UJ, H1
	097111-001/CWL-D2-440	1,1-DICHLOROETHENE (75-35-4)	J, H1
	097111-001/CWL-D2-440	1,2,4-TRICHLOROBENZENE (120-82-1)	UJ, H1
	097111-001/CWL-D2-440	1,2,4-TRIMETHYLBENZENE (95-63-6)	UJ, H1
	097111-001/CWL-D2-440	1,2-DIBROMOETHANE (EDB) (106-93-4)	UJ, H1
	097111-001/CWL-D2-440	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (76-14-2)	UJ, H1
	097111-001/CWL-D2-440	1,2-DICHLOROBENZENE (95-50-1)	UJ, H1
	097111-001/CWL-D2-440	1,2-DICHLOROETHANE (107-06-2)	UJ, H1
	097111-001/CWL-D2-440	1,2-DICHLOROPROPANE (78-87-5)	J, H1
	097111-001/CWL-D2-440	1,3,5-TRIMETHYLBENZENE (108-67-8)	UJ, H1
	097111-001/CWL-D2-440	1,3-DICHLOROBENZENE (541-73-1)	UJ, H1
	097111-001/CWL-D2-440	1,4-DICHLOROBENZENE (106-46-7)	UJ, H1
	097111-001/CWL-D2-440	2-BUTANONE (MEK) (78-93-3)	J, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	097111-001/CWL-D2-440	2-HEXANONE (591-78-6)	UJ, H1
	097111-001/CWL-D2-440	4-ETHYLTOLUENE (622-96-8)	UJ, H1
	097111-001/CWL-D2-440	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	UJ, H1
	097111-001/CWL-D2-440	ACETONE (67-64-1)	J, H1
	097111-001/CWL-D2-440	BENZENE (71-43-2)	J, H1
	097111-001/CWL-D2-440	BENZYL CHLORIDE (100-44-7)	UJ, H1
	097111-001/CWL-D2-440	BROMODICHLOROMETHANE (75- 27-4)	UJ, H1
	097111-001/CWL-D2-440	BROMOFORM (75-25-2)	UJ, H1
	097111-001/CWL-D2-440	BROMOMETHANE (74-83-9)	UJ, H1
	097111-001/CWL-D2-440	CARBON DISULFIDE (75-15-0)	UJ, H1
	097111-001/CWL-D2-440	CARBON TETRACHLORIDE (56-23-5)	J, H1
	097111-001/CWL-D2-440	CHLOROBENZENE (108-90-7)	UJ, H1
	097111-001/CWL-D2-440	CHLOROETHANE (75-00-3)	UJ, H1
	097111-001/CWL-D2-440	CHLOROFORM (67-66-3)	J, H1
	097111-001/CWL-D2-440	CHLOROMETHANE (74-87-3)	UJ, H1
	097111-001/CWL-D2-440	CIS-1,2-DICHLOROETHENE (156-59- 2)	UJ, H1
	097111-001/CWL-D2-440	CIS-1,3-DICHLOROPROPENE (10061- 01-5)	UJ, H1
	097111-001/CWL-D2-440	DIBROMOCHLOROMETHANE (124- 48-1)	UJ, H1
	097111-001/CWL-D2-440	DICHLORODIFLUOROMETHANE (75- 71-8)	J, H1
	097111-001/CWL-D2-440	ETHYLBENZENE (100-41-4)	UJ, H1
	097111-001/CWL-D2-440	HEXACHLOROBUTADIENE (87-68-3)	UJ, H1
	097111-001/CWL-D2-440	M,P-XYLENE (179601-23-1)	UJ, H1
	097111-001/CWL-D2-440	METHYLENE CHLORIDE (75-09-2)	J, H1
	097111-001/CWL-D2-440	O-XYLENE (95-47-6)	UJ, H1
	097111-001/CWL-D2-440	STYRENE (100-42-5)	UJ, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	097111-001/CWL-D2-440	TETRACHLOROETHENE (127-18-4)	J, H1
	097111-001/CWL-D2-440	TOLUENE (108-88-3)	J, H1
	097111-001/CWL-D2-440	TRANS-1,2-DICHLOROETHENE (156-60-5)	UJ, H1
	097111-001/CWL-D2-440	TRANS-1,3-DICHLOROPROPENE (10061-02-6)	UJ, H1
	097111-001/CWL-D2-440	TRICHLOROFLUOROMETHANE (75-69-4)	J, H1
	097111-001/CWL-D2-440	VINYL ACETATE (108-05-4)	UJ, H1
	097111-001/CWL-D2-440	VINYL CHLORIDE (75-01-4)	UJ, H1
	097112-001/CWL-D2-440	1,1,1-TRICHLOROETHANE (71-55-6)	J, H1
	097112-001/CWL-D2-440	1,1,2,2-TETRACHLOROETHANE (79-34-5)	UJ, H1
	097112-001/CWL-D2-440	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	J, H1
	097112-001/CWL-D2-440	1,1,2-TRICHLOROETHANE (79-00-5)	UJ, H1
	097112-001/CWL-D2-440	1,1-DICHLOROETHANE (75-34-3)	J, H1
	097112-001/CWL-D2-440	1,1-DICHLOROETHENE (75-35-4)	J, H1
	097112-001/CWL-D2-440	1,2,4-TRICHLOROBENZENE (120-82-1)	UJ, H1
	097112-001/CWL-D2-440	1,2,4-TRIMETHYLBENZENE (95-63-6)	UJ, H1
	097112-001/CWL-D2-440	1,2-DIBROMOETHANE (EDB) (106-93-4)	UJ, H1
	097112-001/CWL-D2-440	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (76-14-2)	UJ, H1
	097112-001/CWL-D2-440	1,2-DICHLOROBENZENE (95-50-1)	UJ, H1
	097112-001/CWL-D2-440	1,2-DICHLOROETHANE (107-06-2)	UJ, H1
	097112-001/CWL-D2-440	1,2-DICHLOROPROPANE (78-87-5)	J, H1
	097112-001/CWL-D2-440	1,3,5-TRIMETHYLBENZENE (108-67-8)	UJ, H1
	097112-001/CWL-D2-440	1,3-DICHLOROBENZENE (541-73-1)	UJ, H1
	097112-001/CWL-D2-440	1,4-DICHLOROBENZENE (106-46-7)	UJ, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	097112-001/CWL-D2-440	2-BUTANONE (MEK) (78-93-3)	UJ, H1
	097112-001/CWL-D2-440	2-HEXANONE (591-78-6)	UJ, H1
	097112-001/CWL-D2-440	4-ETHYLTOLUENE (622-96-8)	UJ, H1
	097112-001/CWL-D2-440	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	UJ, H1
	097112-001/CWL-D2-440	ACETONE (67-64-1)	J, H1
	097112-001/CWL-D2-440	BENZENE (71-43-2)	J, H1
	097112-001/CWL-D2-440	BENZYL CHLORIDE (100-44-7)	UJ, H1
	097112-001/CWL-D2-440	BROMODICHLOROMETHANE (75- 27-4)	UJ, H1
	097112-001/CWL-D2-440	BROMOFORM (75-25-2)	UJ, H1
	097112-001/CWL-D2-440	BROMOMETHANE (74-83-9)	UJ, H1
	097112-001/CWL-D2-440	CARBON DISULFIDE (75-15-0)	UJ, H1
	097112-001/CWL-D2-440	CARBON TETRACHLORIDE (56-23-5)	J, H1
	097112-001/CWL-D2-440	CHLOROBENZENE (108-90-7)	UJ, H1
	097112-001/CWL-D2-440	CHLOROETHANE (75-00-3)	UJ, H1
	097112-001/CWL-D2-440	CHLOROFORM (67-66-3)	J, H1
	097112-001/CWL-D2-440	CHLOROMETHANE (74-87-3)	UJ, H1
	097112-001/CWL-D2-440	CIS-1,2-DICHLOROETHENE (156-59- 2)	UJ, H1
	097112-001/CWL-D2-440	CIS-1,3-DICHLOROPROPENE (10061- 01-5)	UJ, H1
	097112-001/CWL-D2-440	DIBROMOCHLOROMETHANE (124- 48-1)	UJ, H1
	097112-001/CWL-D2-440	DICHLORODIFLUOROMETHANE (75- 71-8)	J, H1
	097112-001/CWL-D2-440	ETHYLBENZENE (100-41-4)	UJ, H1
	097112-001/CWL-D2-440	HEXACHLOROBUTADIENE (87-68-3)	UJ, H1
	097112-001/CWL-D2-440	M,P-XYLENE (179601-23-1)	UJ, H1
	097112-001/CWL-D2-440	METHYLENE CHLORIDE (75-09-2)	J, H1
	097112-001/CWL-D2-440	O-XYLENE (95-47-6)	UJ, H1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	097112-001/CWL-D2-440	STYRENE (100-42-5)	UJ, H1
	097112-001/CWL-D2-440	TETRACHLOROETHENE (127-18-4)	J, H1
	097112-001/CWL-D2-440	TOLUENE (108-88-3)	J, H1
	097112-001/CWL-D2-440	TRANS-1,2-DICHLOROETHENE (156-60-5)	UJ, H1
	097112-001/CWL-D2-440	TRANS-1,3-DICHLOROPROPENE (10061-02-6)	UJ, H1
	097112-001/CWL-D2-440	TRICHLOROFLUOROMETHANE (75-69-4)	J, H1
	097112-001/CWL-D2-440	VINYL ACETATE (108-05-4)	UJ, H1
	097112-001/CWL-D2-440	VINYL CHLORIDE (75-01-4)	UJ, H1
	097114-001/CWL-SV FB4	ACETONE (67-64-1)	12U, B

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



## Data Validation Summary Worksheet

AR/COC #: 615971, 615972, 615973, 615974 and 615975

Site/Project: CWL SVM

Validation Date: 03/06/15

SDG #: 320-11418-1, 320-11417-1, 320-11420-1, 320-11419-1, and 320-11423-1

Laboratory: TestAmerica Laboratories, Inc. West Sacramento

Validator: Mary Donovan

Matrix: Air

# of Samples: 28

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
097111-001*	320-11419-5	TO-15	NA	01/21/15	NA	02/28/15	yes	no
097112-001*	320-11419-6	TO-15	NA	01/21/15	NA	02/28/15	yes	no

Comments: Samples collected 1/21/15. \* Samples were reanalyzed beyond HT due to client request to analyze the samples at lower dilutions.

Revised 7/2007

Validated By: Mary A. Donovan

## Organic Worksheet (GC/MS)

AR/COC #: 615971, 615972, 615973, 615974 and 615975 SDG #:320-11418-1, 320-11417-1, 320-11420-1, 320-11419-1, and 320-11423-1 Matrix: Air

Laboratory Sample IDs: 320-11418-1 through -4, 320-11417-1 through -4, 320-11420-1 through -6, 320-11419-1 through -8 and 320-11423-1 through -6

Method/Batch #s: EPA TO-15: <sup>A</sup>65875, <sup>B</sup>66088, <sup>C</sup>66907

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	5X (10X) FB			
	Int.	RF	RSD/R <sup>2</sup>	CCV (ICV) %D										
acetone	NA	✓	✓	✓	0.434J <sup>A</sup>	(4.34)	✓	✓	✓	1.0J*	(10.0)	*NA		
2-hexanone	NA	✓	✓	(47) <sup>1</sup>	✓	✓	175 <sup>A</sup>	167 <sup>A</sup>	✓	✓	✓			
4-methyl-2-pentanone	NA	✓	✓	✓	✓	NA	135 <sup>A</sup>	✓	✓	✓	✓			
										<b>FB2</b>	<b>5X (10X) FB</b>			
acetone	NA	✓	✓	✓	0.434J <sup>A</sup>	(4.34)	✓	✓	✓	0.43J*	(4.3)	*NA		
toluene	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.065J	(0.65)			
2-hexanone	NA	✓	✓	(47) <sup>1</sup>	✓	✓	175 <sup>A</sup>	167 <sup>A</sup>	✓	✓	✓			
4-methyl-2-pentanone	NA	✓	✓	✓	✓	NA	135 <sup>A</sup>	✓	✓	✓	✓			
										<b>FB3</b>	<b>5X (10X) FB</b>			
acetone	NA	✓	✓	✓	0.448J <sup>B</sup>	(4.48)	✓	✓	✓	0.33J*	(3.3)	*NA		
methylene chloride	NA	✓	✓	✓	✓	✓	✓	✓	✓	0.43	(4.3)			
toluene	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.24J	(2.4)			
2-hexanone	NA	✓	✓	(47) <sup>1</sup>	✓	NA	130	163	✓	✓	✓			
										<b>FB4</b>	<b>5X (10X) FB</b>			
acetone	NA	✓	✓	✓	0.434J <sup>A</sup>	(4.34)	✓	✓	✓	3.0J*	(30.0)	*NA		
2-hexanone	NA	✓	✓	(47) <sup>1</sup> (-42.2) <sup>2</sup>	✓	✓	175 <sup>A</sup>	167 <sup>A</sup>	✓	✓	✓			
4-methyl-2-pentanone	NA	✓	✓	✓	✓	NA	135 <sup>A</sup>	✓	✓	✓	✓			
										<b>FB5</b>	<b>5X (10X) FB</b>			
acetone	NA	✓	✓	✓	0.448J <sup>B</sup>	(4.48)	✓	✓	✓	✓	✓			
2-hexanone	NA	✓	✓	(47) <sup>1</sup>	✓	✓	130	163	✓	✓	✓			
<b>Surrogate Recovery Outliers</b>														
<b>Sample ID</b>														
NA														
<b>IS Outliers</b>														
<b>Sample ID</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>
None														

Comments: HTs OK except for samples 11419-5 and -6. See Summary WS. <sup>1</sup>ICAL ATMS2 02/13-14/15. <sup>A</sup>Batch 65875 (02/19/15): samples 11418-1 through -4, 11417-1 through -4 and 11419-1 through 4, -5 DL, -6DL, -7 and -8. <sup>B</sup>Batch 66088 (02/19-20/15): samples 11420-1 through -6 and 11423-1 through -6. <sup>2</sup>ICAL ATMS5 02/22-23/15.

<sup>C</sup>Batch 66907: samples 11419-5 and -6 (02/28/15). \*Qualified U in the FB sample. FB result not applied to associated field samples.

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *N/A*

SMO Use

**AR/COC 615971**

Project Name: CWL-SVM	Date Samples Shipped: <i>1/22/15</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input type="checkbox"/> 4° Celsius
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>228122</i>	SMO Contact Phone: <i>SMO</i>	
Project/Task Number: 146422.10.11.03	Lab Contact:	Wendy Palencia/505-844-3132	
Service Order: CF327-15	Lab Destination: TA/West Sacramento	Send Report to SMO:	
	Contract No.: PO 691437	Wendy Palencia/505-844-3132	

Bill to: Sandia National Laboratories (Accounts Payable),  
P.O. Box 5800, MS-0154  
Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097093	-001	CWL-UI1-40		1/21/15 9:28	SG	SC	6 L	None	G	SA	VOC-TO15	
097094	-001	CWL-UI1-80		1/21/15 9:31	SG	SC	6 L	None	G	SA	VOC-TO15	
097095	-001	CWL-UI1-120		1/21/15 9:34	SG	SC	6 L	None	G	SA	VOC-TO15	
097096	-001	CWL-SV FB1		1/21/15 9:23	UPN	SC	6 L	None	G	FB	VOC-TO15	



Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
<b>Sample Team Members</b>	Name	Signature	Init.		Company/Organization/Phone/Cell
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/4142/505-844-4013/505-250-7090	Return Samples By: Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	SNL/4142/505-844-5130/505-228-0710	
	William Gibson	<i>[Signature]</i>	<i>WG</i>	SNL/4142/505-284-3307/505-239-7367	
Tim Jackson	<i>[Signature]</i>	<i>TJ</i>	SNL/4142/505-284-2547/505-263-6639		

1. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/21/15</i> Time <i>1430</i>	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <i>[Signature]</i> Org. 4142 Date <i>1/21/15</i> Time <i>1430</i>	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/22/15</i> Time <i>0700</i>	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <i>[Signature]</i> Org. _____ Date <i>1/22/15</i> Time <i>930</i>	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 \_\_\_\_\_ AR/COG **615972**

Project Name: CWL-SVM	Date Samples Shipped: <u>1/22/15</u>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input type="checkbox"/> 4° Celsius
Project/Task Manager: Tim Jackson	Carrier/Waybill No: <u>228122</u>	SMO Contact Phone: <u>9MO</u>	
Project/Task Number: 146422.10.11.03	Lab Contact: _____	Wendy Palencia/505-844-3132	
Service Order: CF327-15	Lab Destination: TA/West Sacramento	Send Report to SMO: Wendy Palencia/505-844-3132	
	Contract No. PO 691437		

Bill to: Sandia National Laboratories (Accounts Payable),  
P.O. Box 5800, MS-0154  
Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097097	-001	CWL-UI2-36		1/21/15 8:27	SG	SC	6 L	None	G	SA	VOC-TO15	
097098	-001	CWL-UI2-76		1/21/15 8:33	SG	SC	6 L	None	G	SA	VOC-TO15	
097099	-001	CWL-UI2-136		1/21/15 8:36	SG	SC	6 L	None	G	SA	VOC-TO15	
097100	-001	CWL-SV FB2		1/21/15 8:22	UPN	SC	6 L	None	G	FB	VOC-TO15	



Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC initials:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<i>[Signature]</i>	RL	SNL/4142/505-844-4013/505-250-7090	Return Samples By: _____ Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	Alfred Santillanes	<i>[Signature]</i>	AS	SNL/4142/505-844-5130/505-228-0710	
	William Gibson	<i>[Signature]</i>	WG	SNL/4142/505-284-3307/505-239-7367	
Tim Jackson	<i>[Signature]</i>	TJ	SNL/4142/505-284-2547/505-263-6639		
1. Relinquished by <i>[Signature]</i> Org. <u>4142</u> Date <u>1/21/15</u> Time <u>1430</u>	3. Relinquished by _____ Org. _____ Date _____ Time _____				
2. Received by <i>[Signature]</i> Org. <u>4142</u> Date <u>1/21/15</u> Time <u>1430</u>	4. Received by _____ Org. _____ Date _____ Time _____				
3. Relinquished by <i>[Signature]</i> Org. <u>4142</u> Date <u>1/22/15</u> Time <u>0700</u>	5. Relinquished by _____ Org. _____ Date _____ Time _____				
4. Received by <i>[Signature]</i> Org. _____ Date <u>1/27/15</u> Time <u>930</u>	6. Received by _____ Org. _____ Date _____ Time _____				

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

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

02/23/2015

Internal Lab

Batch No. <i>N/A</i>	SMO Use	AR/COC	<b>615973</b>
Project Name: CWL-SVM	Date Samples Shipped: <i>1/22/15</i>	SMO Authorization: <i>[Signature]</i>	
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>228122</i>	SMO Contact Phone: <i>gmo</i>	
Project/Task Number: 146422.10.11.03	Lab Contact:	Wendy Palencia/505-844-3132	
Service Order: CF327-15	Lab Destination: TA/West Sacramento	Send Report to SMO:	
	Contract No.: PO 691437	Wendy Palencia/505-844-3132	

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

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097101	-001	CWL-D1-100		1/21/15 8:55	SG	SC	6 L	None	G	SA	VOC-TO15	
097102	-001	CWL-D1-160		1/21/15 8:59	SG	SC	6 L	None	G	SA	VOC-TO15	
097103	-001	CWL-D1-240		1/21/15 9:04	SG	SC	6 L	None	G	SA	VOC-TO15	
097104	-001	CWL-D1-350		1/21/15 9:09	SG	SC	6 L	None	G	SA	VOC-TO15	
097105	-001	CWL-D1-470		1/21/15 9:14	SG	SC	6 L	None	G	SA	VOC-TO15	
097106	-001	CWL-SV FB3		1/21/15 8:47	UPN	SC	6 L	None	G	FB	VOC-TO15	



Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>
<b>Sample Team Members</b> Name   Signature   Init.   Company/Organization/Phone/Cell	Robert Lynch	<i>[Signature]</i>	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	<i>[Signature]</i>	SNL/4142/505-844-5130/505-228-0710
	William Gibson	<i>[Signature]</i>	SNL/4142/505-284-3307/505-239-7367
	Tim Jackson	<i>[Signature]</i>	SNL/4142/505-284-2547/505-263-6639
Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab		Return Samples By:	
Comments: Send report to Tim Jackson/4142/MS 0729/284-2547			

1. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/21/15</i> Time <i>1430</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. 4142 Date <i>1/21/15</i> Time <i>1430</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/22/15</i> Time <i>0700</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. Date <i>1/27/15</i> Time <i>930</i>	4. Received by	Org.	Date	Time

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

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# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY



320-11419 Chain of Custody

03/03/2015

Internal Lab

Batch No. <i>N/A</i>	SMO Use	AR/COC	615974
Project Name: CWL-SVM	Date Samples Shipped: <i>1/22/15</i>	SMO Authorization: <i>[Signature]</i>	
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>228122</i>	SMO Contact Phone: <i>9110</i>	
Project/Task Number: 146422.10.11.03	Lab Contact:	Wendy Palencia/505-844-3132	
Service Order: CF327-15	Lab Destination: TAWest Sacramento	Send Report to SMO:	
	Contract No.: PO 691437	Wendy Palencia/505-844-3132	

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

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097107	-001	CWL-D2-120		1/21/15 9:59	SG	SC	6 L	None	G	SA	VOC-TO15	
097108	-001	CWL-D2-240		1/21/15 10:03	SG	SC	6 L	None	G	SA	VOC-TO15	
097109	-001	CWL-D2-240		1/21/15 10:04	SG	SC	6 L	None	G	DU	VOC-TO15	
097110	-001	CWL-D2-350		1/21/15 10:08	SG	SC	6 L	None	G	SA	VOC-TO15	
097111	-001	CWL-D2-440		1/21/15 10:13	SG	SC	6 L	None	G	SA	VOC-TO15	
097112	-001	CWL-D2-440		1/21/15 10:15	SG	SC	6 L	None	G	DU	VOC-TO15	
097113	-001	CWL-D2-470		1/21/15 10:21	SG	SC	6 L	None	G	SA	VOC-TO15	
097114	-001	CWL-SV FB4		1/21/15 9:45	UPN	SC	6 L	None	G	FB	VOC-TO15	

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
<b>Sample Team Members</b>	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/4142/505-844-4013/505-250-7090	Return Samples By:  Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	SNL/4142/505-844-5130/505-228-0710	
	William Gibson	<i>[Signature]</i>	<i>WG</i>	SNL/4142/505-284-3307/505-239-7367	
Tim Jackson	<i>[Signature]</i>	<i>TJ</i>	SNL/4142/505-284-2547/505-263-6639		

1. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/21/15</i> Time <i>1430</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. 4142 Date <i>1/21/15</i> Time <i>1430</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/22/15</i> Time <i>0700</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. Date <i>1/22/15</i> Time <i>930</i>	4. Received by	Org.	Date	Time

\*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. *N/A*

SMO Use

AR/COC **615975**

Project Name: CWL-SVM	Date Samples Shipped: <i>1/22/15</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>228122</i>	SMO Contact Phone: <i>SMO</i>	<input type="checkbox"/> RMMA
Project/Task Number: 146422.10.11.03	Lab Contact:	Wendy Palencia/505-844-3132	<input type="checkbox"/> Released by COC No. <input type="checkbox"/> 4° Celsius
Service Order: CF327-15	Lab Destination: TA/West Sacramento	Send Report to SMO: Wendy Palencia/505-844-3132	
	Contract No.: PO 691437		

Tech Area: \_\_\_\_\_  
 Building: \_\_\_\_\_ Room: \_\_\_\_\_ Operational Site: \_\_\_\_\_  
 Bill to: Sandia National Laboratories (Accounts Payable),  
 P.O. Box 5800, MS-0154  
 Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097115	-001	CWL-D3-120		1/21/15 10:44	SG	SC	6 L	None	G	SA	VOC-TO15	
097116	-001	CWL-D3-170		1/21/15 10:48	SG	SC	6 L	None	G	SA	VOC-TO15	
097117	-001	CWL-D3-350		1/21/15 10:51	SG	SC	6 L	None	G	SA	VOC-TO15	
097118	-001	CWL-D3-440		1/21/15 11:05	SG	SC	6 L	None	G	SA	VOC-TO15	
097119	-001	CWL-D3-480		1/21/15 10:58	SG	SC	6 L	None	G	SA	VOC-TO15	
097120	-001	CWL-SV FB5		1/21/15 10:38	UPN	SC	6 L	None	G	FB	VOC-TO15	



Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Req.	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/4142/505-844-4013/505-250-7090	Return Samples By: Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	SNL/4142/505-844-5130/505-228-0710	
	William Gibson	<i>[Signature]</i>	<i>WG</i>	SNL/4142/505-284-3307/505-239-7367	
Tim Jackson	<i>[Signature]</i>	<i>TJ</i>	SNL/4142/505-284-2547/505-263-6639		

1. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/21/15</i> Time <i>1430</i>	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <i>[Signature]</i> Org. 4142 Date <i>1/21/15</i> Time <i>1430</i>	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/22/15</i> Time <i>0700</i>	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <i>[Signature]</i> Org. _____ Date <i>1/27/15</i> Time <i>930</i>	4. Received by _____ Org. _____ Date _____ Time _____

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

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02/23/2015

## CONTRACT VERIFICATION REVIEW FORMS

Note: The review forms in this section include AR/COC numbers for environmental samples and additional AR/COC numbers for waste characterization samples.

<b>AR/COC Number</b>	<b>Sample Type</b>
615971	Environmental*
615972	Environmental*
615973	Environmental*
615974	Environmental*
615975	Environmental*

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



## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL SVM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 615971

**Analytical Lab** TAL-WS

**SDG No.** 320-11418-1

*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?		If no, explain
		Yes	No	
1.1	All items on ARCOG 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	N/A		
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	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		

### 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	2-Hexanone and 4-Methyl-2-pentanone outside recovery limits for LCS 2-Hexanone outside recovery limits for LCSD
	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 method blank (Batch 65875)
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Acetone detected in FB1

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)	X		
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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	N/A		
	a) Instrument run logs provided			

## 5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
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 has been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
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Were deficiencies unresolved?  Yes  No

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

Reviewed by: Wendy Palencia Date: 02-25-2015 09:37:00

Closed by: Wendy Palencia Date: 02-25-2015 09:37:00

## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL SVM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 615972

**Analytical Lab** TAL-WS

**SDG No.** 320-11417-1

*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?		If no, explain
		Yes	No	
1.1	All items on ARCOG 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	N/A		
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	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		

### 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	2-Hexanone and 4-Methyl-2-pentanone outside recovery limits for LCS 2-Hexanone outside recovery limits for LCSD
	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 method blank (Batch 65875)
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Acetone and toluene detected in FB2

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)	X		
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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	X		
	a) Instrument run logs provided			

## 5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
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 has been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
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Were deficiencies unresolved?  Yes  No

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

Reviewed by: Wendy Palencia Date: 02-25-2015 15:28:00

Closed by: Wendy Palencia Date: 02-25-2015 15:28:00

## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL SVM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 615973

**Analytical Lab** TAL-WS

**SDG No.** 320-11420-1

*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?		If no, explain
		Yes	No	
1.1	All items on ARCOG 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	N/A		
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	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		

### 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	2-Hexanone outside recovery limits for LCS and LCSD
	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 method blank (Batch 66088)
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Acetone, methylene chloride and toluene detected in FB3

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)	X		
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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	N/A		
	a) Instrument run logs provided			

## 5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
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 has been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
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Were deficiencies unresolved?  Yes  No

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

Reviewed by: Wendy Palencia Date: 02-26-2015 07:09:00

Closed by: Wendy Palencia Date: 02-26-2015 07:09:00

## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL SVM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 615974

**Analytical Lab** TAL-WS

**SDG No.** 320-11419-1

*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?		If no, explain
		Yes	No	
1.1	All items on ARCOG 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		Sample 097114-001 was received at pressure lower than 6 psia
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	N/A		
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	N/A		
2.10	Narrative provided	X		
2.11	TAT met	X		
2.12	Holding times met	X		Samples 097111-001 and 097112-001 reanalyzed past holding time
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	2-Hexanone and 4-Methyl-2-pentanone outside recovery limits for LCS 2-Hexanone outside recovery limits for LCSD
	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 method blank (Batch 65875)
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Acetone detected in FB4



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)	X		
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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	N/A		
	a) Instrument run logs provided			

## 5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
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		Lab requested to rerun samples 097111-001 and 097112-001 at lower dilutions

## 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
097111-001 & 097112-001	TO-15	Rerun samples at a lower dilution

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  and date correction request was submitted: 02-26-2015

Reviewed by: Wendy Palencia Date: 02-26-2015 08:17:00

Were resolutions adequate and data package complete?  Yes  No

Closed by: Wendy Palencia Date: 03-04-2015 15:01:00

## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL SVM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 615975

**Analytical Lab** TAL-WS

**SDG No.** 320-11423-1

*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?		If no, explain
		Yes	No	
1.1	All items on ARCOG 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	Sample 097120-001 was received at pressure lower than 6 psia
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	N/A		
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	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		

### 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	2-Hexanone outside recovery limits for LCS/LCSD
	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 method blank (Batch 66088)
	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)	X		
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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	N/A		
	a) Instrument run logs provided			

## 5.0 Data Anomaly Report

Line No.	Item	Yes	No	If no, explain
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 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: 02-26-2015 10:29:00

Closed by: Wendy Palencia Date: 02-26-2015 10:29:00

**FIELD SAMPLING FORMS**  
**MARCH 2015 SOIL-GAS MONITORING**

**TAILGATE SAFETY MEETING FORM**

Dept: 4142 Well Location: CWL-D2 Date: 03/31/15 Time: 0840

Activities: SOIL VAPOR SAMPLING  
 (Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:  
 Temp: 63 °F Wind Speed: 45 MPH Humidity: 24 %

Chemicals Used: NA  
 Other: \_\_\_\_\_

*Safety Topics Presented*

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

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

*Attendees*

William Gibson  
 Printed Name

William Gibson  
 Signature

Robert Lynch  
 Printed Name

Robert Lynch  
 Signature

Tim Jackson  
 Printed Name

Tim Jackson  
 Signature

ALFRED SANTILLANOS  
 Printed Name

Alfred Santillanos  
 Signature

Printed Name

Signature

**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), 4100 Controlled Documents home page.



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
34000821	3/30/15	<del>3/30/15</del> 3/31/15	-26	3/31/15	-8	3/31/15
34000343	↓	↓	-24	↓	-8	↓
34000131	↓	↓	-24	↓	-8	↓
34000477	↓	↓	-26	↓	-8	↓
34002013	↓	↓	-24	↓	-8	↓

SUMMA® Canister Log completed by:

Tim Jackson  
Printed Name

Tim Jackson  
Signature

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

**SUMMARY SHEET FOR MARCH 2015 SAMPLES**



**Sample Summary for CWL Soil Vapor Monitoring  
FY15 Resample Event**

Well ID	Sample Date	Sample ID / Port	SUMMA Number	ARCOC	Sample Number	Sample Type	Associated Equipment Blank (ARCOC #/Sample #)	Associated Trip Blank (ARCOC #/Sample #)	Associated Field Blank (ARCOC #/Sample #)	Comments
<b>Chemical Waste Landfill Soil Vapor Monitoring: Project Task Number 146422.10.11.03 / Service Order Number CF 327-15</b>										
CWL-D2	31-Mar-15	CWL-D2-440	34000393	616093	097572	Environmental	n/a	n/a	616093 / 097576	collected with duplicate sample manifold.
		CWL-D2-440	34000131		097573	Duplicate				collected with duplicate sample manifold.
		CWL-D2-440	34000477		097574	Environmental				
		CWL-D2-440	34002013		097575	Duplicate				
		CWL-SV-FB1	34000821		097576	Field QC				n/a

# **DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**

**AR/COC NUMBER 616093**

## Memorandum

Date: May 1, 2015  
To: File  
From: Linda Thal  
Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL-SVM  
AR/COC: 616093  
SDG: 320-12394-1  
Laboratory: TestAmerica Laboratories, Inc. -West Sacramento  
Project/Task: 146422.10.11.03  
Analysis: VOCs by method TO-15

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

Five samples were prepared and analyzed with accepted procedures using method EPA TO-15 (Determination of VOCs in Air collected in specially prepared canisters and analyzed by GC-MS). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The mass spectra criteria were not met for -1,1-dichloroethane in sample 320-12394-2, and for 4-methyl-2-pentanone for samples -3 and -4. The associated sample results were **qualified U,FR6** at the PQL based on professional judgment.
2. Benzene and toluene were detected at < the PQL in the MB. The associated benzene results for samples -1 through -4, and the associated toluene results for samples -1 and -2 were detects < the PQL and  $\leq 5X/10X$  the MB concentration, and will be **qualified U,B** at the PQL.
3. Acetone and methylene chloride were detected at < the PQL in FB sample -5. The associated results for samples -1 and -2 were detects < the PQL and  $\leq 10X$  the FB concentrations 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 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 follows. Acetone and methylene chloride were detected at < the PQL in the FB, sample 320-12394-5. The associated results for samples -3 and -4 were detects 10X > the FB results and will not be qualified.

Benzene, toluene and m,p-xylene were detected at < the PQL in the MB. All associated results for sample -5, and the associated m,p-xylene results for samples -1 and -2 were non-detects and will not be qualified. The toluene and m,p-xylene results for samples -3 and -4 were detects >5X/10X the MB concentration and will not be qualified.

### **Surrogates**

All surrogate acceptance criteria were met.

### **Internal Standards**

All internal standards met QC acceptance criteria.

### **Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

An MS/MSD was not performed.

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

The LCS/LCSD met all QC acceptance criteria.

### **Detection Limits/Dilutions**

All detection limits were properly reported. The samples were not diluted except as follows.

Sample -1 was diluted 40.7X.

Sample -2 was diluted 40.6X.

Sample -3 was diluted 58.7X and reanalyzed at the same dilution for acetone.

Sample -4 was diluted 57.8X and reanalyzed at the same dilution for acetone.

### **Tentatively Identified Compounds (TICs)**

TIC reports were not required.

### **Other QC**

Mass spectra acceptability was verified during data validation and met QC acceptance criteria except as noted above in the Summary section.

A FB was submitted with the AR/COC.

No other specific issues that affect data quality were identified.

**Reviewed by:** Monica Dymerski

**Level I**

**Date:** 05/05/15

---



## Sample Findings Summary



AR/COC: 616093

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
TO15			
	097572-001/CWL-D2-440 W/M	ACETONE (67-64-1)	200U, B2
	097572-001/CWL-D2-440 W/M	BENZENE (71-43-2)	16U, B
	097572-001/CWL-D2-440 W/M	METHYLENE CHLORIDE (75-09-2)	16U, B2
	097572-001/CWL-D2-440 W/M	TOLUENE (108-88-3)	16U, B
	097573-001/CWL-D2-440 W/M	1,1-DICHLOROETHANE (75-34-3)	12U, FR6
	097573-001/CWL-D2-440 W/M	ACETONE (67-64-1)	200U, B2
	097573-001/CWL-D2-440 W/M	BENZENE (71-43-2)	16U, B
	097573-001/CWL-D2-440 W/M	METHYLENE CHLORIDE (75-09-2)	16U, B2
	097573-001/CWL-D2-440 W/M	TOLUENE (108-88-3)	16U, B
	097574-001/CWL-D2-440 WO/M	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	23U, FR6
	097574-001/CWL-D2-440 WO/M	BENZENE (71-43-2)	23U, B
	097575-001/CWL-D2-440 WO/M	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	23U, FR6
	097575-001/CWL-D2-440 WO/M	BENZENE (71-43-2)	23U, B

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

## Data Validation Summary Worksheet

AR/COC #: 616093

Site/Project: CWL-SVM

Validation Date: 04/30/2015

SDG #: 320-12394-1

Laboratory: TA West Sacramento, CA

Validator: Linda Thal

Matrix: Air

# of Samples: 5 CVR present: Yes

Analysis Type:  Organic  Metals

AR/COC(s) present: Yes

Sample Container Integrity: OK

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: Collected 03/31/2015

Validated by: 



# Organic Worksheet (GC/MS)

AR/COC #: 616093

SDG #: 320-12394-1

Matrix: Air

Laboratory Sample IDs: 320-12394-1 through -5

Method/Batch #s: TO15:71540, 71674


Tuning (pass/fail): Pass    TICs Required? (yes/no): NA

Analyte (outliers)	Calibration				Method Blank	5X (10X) MB	LCS %R	LCSD %R	LCS LCSD RPD	FB -5	5X (10X) FB			
	Int.	RF	RSD/ R <sup>2</sup>	(ICV) CCV %D										
71540 -1 thru -5														
Benzene	NA	✓	✓	✓	.114J	.57	✓	✓	✓	✓	NA			
Toluene	NA	✓	✓	✓	.0866J	(.866)	✓	✓	✓	✓	NA			
m,p-Xylene	NA	✓	✓	✓	.113J	.565	✓	✓	✓	✓	NA			
Acetone	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.62J	(6.2)			
Methylene chloride	NA	✓	✓	✓	✓	NA	✓	✓	✓	.089J	(.89)			
71674 -3 DL and -4 DL Acetone ONLY														
Toluene	NA	✓	✓	✓	.0825J	(.825)	✓	✓	✓					
1,2,3-Trichlorobenzene	NA	✓	✓	32	✓	NA	✓	✓	✓					
<b>Surrogate Recovery Outliers</b>														
<b>Sample ID</b>														
None														
<b>IS Outliers</b>														
<b>Sample ID</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>	<b>Area</b>	<b>RT</b>
None														

Comments: HTs OK. Mass spectra validated. MDLs and RLS reported. Samples spiked with 3 surrogates. Instrument ATMS 2 ICAL 03/18/2015. LCS/LCSD both batches. Canister Certifications were provided in the data package.

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab		<b>AR/COC</b> <span style="border: 1px solid black; padding: 2px;"><b>616093</b></span>	
Batch No. <i>MA</i>	SMO Use	<input type="checkbox"/> Waste Characterization	
Project Name: CWL-SVM	Date Samples Shipped: <i>3/31/15</i>	<input type="checkbox"/> RMMA	
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>231646</i>	<input type="checkbox"/> Released by COC No. <input type="checkbox"/> 4° Celsius	
Project/Task Number: 146422.10.11.03	Lab Contact: Beth Riley/916-373-5600	Bill to Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154	
Service Order: CF327-15	Lab Destination: TA/West Sacramento	Send Report to SMO: <input type="checkbox"/> 4° Celsius	
	Contract No.: PO 691437	Rita Kavanaugh/505-284-2553	

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
097572	-001	CWL-D2-440 W/M		3/31/15 9:29	SG	SC	6 L	None	G	SA	VOC-TO-15	
097573	-001	CWL-D2-440 W/M		3/31/15 9:29	SG	SC	6 L	None	G	DU	VOC-TO-15	
097574	-001	CWL-D2-440 WO/M		3/31/15 9:34	SG	SC	6 L	None	G	SA	VOC-TO-15	
097575	-001	CWL-D2-440 WO/M		3/31/15 9:36	SG	SC	6 L	None	G	DU	VOC-TO-15	
097576	-001	CWL-SV-FB1		3/31/15 8:52	UPN	SC	6 L	None	G	FB	VOC-TO-15	
 320-12394 Chain of Custody												

Last Chain: <input type="checkbox"/> Yes		Sample Tracking		SMO Use		Special Instructions/QC Requirements:		Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day			
Background: <input type="checkbox"/> Yes		Entered by:		Negotiated TAT		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab			
Confirmatory: <input type="checkbox"/> Yes		QC inits.:		Return Samples By:		Comments: Send report to Tim Jackson/4142/MS 0729/284-2547			
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell		Lab Use			
	Robert Lynch	<i>[Signature]</i>	<i>[Init]</i>	SNL/4142/505-844-4013/505-250-7090					
	Alfred Santillanes	<i>[Signature]</i>	<i>[Init]</i>	SNL/4142/505-284-6870/505-228-0710					
	William Gibson	<i>[Signature]</i>	<i>[Init]</i>	SNL/4142/505-284-3307/505-239-7367					
	Tim Jackson	<i>[Signature]</i>	<i>[Init]</i>	SNL/4142/505-284-2547/505-263-6639					

1. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>3/31/15</i> Time <i>10:10</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. 4142 Date <i>3/31/15</i> Time <i>10:10</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>3/31/15</i> Time <i>11:00</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. Date <i>4/2/15</i> Time <i>9:00</i>	4. Received by	Org.	Date	Time

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

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05/08/2015

## CONTRACT VERIFICATION REVIEW FORMS

Note: The review forms in this section include AR/COC numbers for environmental samples and additional AR/COC numbers for waste characterization samples.

<b>AR/COC Number</b>	<b>Sample Type</b>
616093	Environmental*

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

## Contract Verification Form (CVR)

**Project Leader** Jackson

**Project Name** CWL SVM

**Project/Task No.** 146422\_10.11.03

**ARCOC No.** 616093

**Analytical Lab** TA - West Sacramento

**SDG No.** 320-12394-1

*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?		If no, explain
		Yes	No	
1.1	All items on ARCOG 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	N/A		
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	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		

### 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	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	Benzene, toluene and m&p-xylene detected in method blank (batch 71540). Toluene detected in method blank (batch 71674).
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Acetone and methylene chloride detected in FB1

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)	X		
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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)	N/A		
	a) Initial calibration provided			
	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	N/A		
	a) Instrument run logs provided			

## 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: 04-27-2015 08:18:00

Closed by: Wendy Palencia Date: 04-27-2015 08:18:00

**SOIL-GAS SAMPLING RESULTS  
CERTIFICATES OF ANALYSIS**

**Chemical Waste Landfill**

**January and March 2015 – Soil-Gas Samples**

Note: Certificates of Analysis are provided on compact disc only,  
for printed copies of this report.

**SOIL-GAS SAMPLING RESULTS  
CERTIFICATES OF ANALYSIS**

**Chemical Waste Landfill**

**January 2015 – Soil-Gas Samples**

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11418-1

**Client Sample ID: 097093-001/CWL-UI1-40**

**Lab Sample ID: 320-11418-1**

**Date Collected: 01/21/15 09:28**

**Matrix: Air**

**Date Received: 01/27/15 09:30**

**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
<b>Acetone</b>	<b>640</b>	<b>J B</b>	1000	36	ppb v/v			02/19/15 02:33	203
Benzene	ND		81	16	ppb v/v			02/19/15 02:33	203
Benzyl chloride	ND		160	33	ppb v/v			02/19/15 02:33	203
Bromodichloromethane	ND		61	13	ppb v/v			02/19/15 02:33	203
Bromoform	ND		81	14	ppb v/v			02/19/15 02:33	203
Bromomethane	ND		160	68	ppb v/v			02/19/15 02:33	203
<b>2-Butanone (MEK)</b>	<b>59</b>	<b>J</b>	160	40	ppb v/v			02/19/15 02:33	203
Carbon disulfide	ND		160	16	ppb v/v			02/19/15 02:33	203
<b>Carbon tetrachloride</b>	<b>14</b>	<b>J</b>	160	13	ppb v/v			02/19/15 02:33	203
Chlorobenzene	ND		61	13	ppb v/v			02/19/15 02:33	203
Chloroethane	ND		160	63	ppb v/v			02/19/15 02:33	203
<b>Chloroform</b>	<b>680</b>		61	19	ppb v/v			02/19/15 02:33	203
Chloromethane	ND		160	40	ppb v/v			02/19/15 02:33	203
Dibromochloromethane	ND		81	16	ppb v/v			02/19/15 02:33	203
1,2-Dibromoethane (EDB)	ND		160	15	ppb v/v			02/19/15 02:33	203
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		81	31	ppb v/v			02/19/15 02:33	203
1,2-Dichlorobenzene	ND		81	26	ppb v/v			02/19/15 02:33	203
1,3-Dichlorobenzene	ND		81	22	ppb v/v			02/19/15 02:33	203
1,4-Dichlorobenzene	ND		81	30	ppb v/v			02/19/15 02:33	203
<b>Dichlorodifluoromethane</b>	<b>33</b>	<b>J</b>	81	29	ppb v/v			02/19/15 02:33	203
1,1-Dichloroethane	ND		61	15	ppb v/v			02/19/15 02:33	203
<b>1,2-Dichloroethane</b>	<b>26</b>	<b>J</b>	160	18	ppb v/v			02/19/15 02:33	203
<b>1,1-Dichloroethene</b>	<b>200</b>		160	26	ppb v/v			02/19/15 02:33	203
cis-1,2-Dichloroethene	ND		81	18	ppb v/v			02/19/15 02:33	203
trans-1,2-Dichloroethene	ND		81	20	ppb v/v			02/19/15 02:33	203
1,2-Dichloropropane	ND		81	49	ppb v/v			02/19/15 02:33	203
cis-1,3-Dichloropropene	ND		81	21	ppb v/v			02/19/15 02:33	203
trans-1,3-Dichloropropene	ND		81	18	ppb v/v			02/19/15 02:33	203
<b>Ethylbenzene</b>	<b>24</b>	<b>J</b>	81	13	ppb v/v			02/19/15 02:33	203
4-Ethyltoluene	ND		81	38	ppb v/v			02/19/15 02:33	203
Hexachlorobutadiene	ND		410	88	ppb v/v			02/19/15 02:33	203
2-Hexanone	ND *		81	18	ppb v/v			02/19/15 02:33	203
4-Methyl-2-pentanone (MIBK)	ND *		81	27	ppb v/v			02/19/15 02:33	203
<b>Methylene Chloride</b>	<b>36</b>	<b>J</b>	81	15	ppb v/v			02/19/15 02:33	203
Styrene	ND		81	12	ppb v/v			02/19/15 02:33	203
1,1,2,2-Tetrachloroethane	ND		81	14	ppb v/v			02/19/15 02:33	203
<b>Tetrachloroethene</b>	<b>2200</b>		81	10	ppb v/v			02/19/15 02:33	203
<b>Toluene</b>	<b>100</b>		81	10	ppb v/v			02/19/15 02:33	203
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>710</b>		81	33	ppb v/v			02/19/15 02:33	203
1,2,4-Trichlorobenzene	ND		410	88	ppb v/v			02/19/15 02:33	203
<b>1,1,1-Trichloroethane</b>	<b>50</b>	<b>J</b>	61	13	ppb v/v			02/19/15 02:33	203
1,1,2-Trichloroethane	ND		81	14	ppb v/v			02/19/15 02:33	203
<b>Trichloroethene</b>	<b>4200</b>		81	21	ppb v/v			02/19/15 02:33	203
<b>Trichlorofluoromethane</b>	<b>200</b>		81	40	ppb v/v			02/19/15 02:33	203
1,2,4-Trimethylbenzene	ND		160	33	ppb v/v			02/19/15 02:33	203
1,3,5-Trimethylbenzene	ND		81	25	ppb v/v			02/19/15 02:33	203
Vinyl acetate	ND		160	29	ppb v/v			02/19/15 02:33	203

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11418-1

**Client Sample ID: 097093-001/CWL-UI1-40**

**Lab Sample ID: 320-11418-1**

Date Collected: 01/21/15 09:28

Matrix: Air

Date Received: 01/27/15 09:30

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		81	24	ppb v/v			02/19/15 02:33	203
<b>m,p-Xylene</b>	<b>61</b>	<b>J</b>	160	20	ppb v/v			02/19/15 02:33	203
<b>o-Xylene</b>	<b>36</b>	<b>J</b>	81	11	ppb v/v			02/19/15 02:33	203
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		70 - 130					02/19/15 02:33	203
1,2-Dichloroethane-d4 (Surr)	102		70 - 130					02/19/15 02:33	203
Toluene-d8 (Surr)	100		70 - 130					02/19/15 02:33	203

**Client Sample ID: 097094-001/CWL-UI1-80**

**Lab Sample ID: 320-11418-2**

Date Collected: 01/21/15 09:31

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>510</b>	<b>J B</b>	1300	46	ppb v/v			02/19/15 03:14	259
Benzene	ND		100	20	ppb v/v			02/19/15 03:14	259
Benzyl chloride	ND		210	42	ppb v/v			02/19/15 03:14	259
Bromodichloromethane	ND		78	17	ppb v/v			02/19/15 03:14	259
Bromoform	ND		100	18	ppb v/v			02/19/15 03:14	259
Bromomethane	ND		210	87	ppb v/v			02/19/15 03:14	259
2-Butanone (MEK)	ND		210	52	ppb v/v			02/19/15 03:14	259
Carbon disulfide	ND		210	20	ppb v/v			02/19/15 03:14	259
Carbon tetrachloride	ND		210	17	ppb v/v			02/19/15 03:14	259
Chlorobenzene	ND		78	17	ppb v/v			02/19/15 03:14	259
Chloroethane	ND		210	80	ppb v/v			02/19/15 03:14	259
<b>Chloroform</b>	<b>520</b>		78	25	ppb v/v			02/19/15 03:14	259
Chloromethane	ND		210	51	ppb v/v			02/19/15 03:14	259
Dibromochloromethane	ND		100	20	ppb v/v			02/19/15 03:14	259
1,2-Dibromoethane (EDB)	ND		210	19	ppb v/v			02/19/15 03:14	259
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		100	40	ppb v/v			02/19/15 03:14	259
1,2-Dichlorobenzene	ND		100	34	ppb v/v			02/19/15 03:14	259
1,3-Dichlorobenzene	ND		100	28	ppb v/v			02/19/15 03:14	259
1,4-Dichlorobenzene	ND		100	39	ppb v/v			02/19/15 03:14	259
<b>Dichlorodifluoromethane</b>	<b>38</b>	<b>J</b>	100	38	ppb v/v			02/19/15 03:14	259
1,1-Dichloroethane	ND		78	19	ppb v/v			02/19/15 03:14	259
<b>1,2-Dichloroethane</b>	<b>34</b>	<b>J</b>	210	23	ppb v/v			02/19/15 03:14	259
<b>1,1-Dichloroethene</b>	<b>320</b>		210	33	ppb v/v			02/19/15 03:14	259
cis-1,2-Dichloroethene	ND		100	23	ppb v/v			02/19/15 03:14	259
trans-1,2-Dichloroethene	ND		100	26	ppb v/v			02/19/15 03:14	259
1,2-Dichloropropane	ND		100	62	ppb v/v			02/19/15 03:14	259
cis-1,3-Dichloropropene	ND		100	27	ppb v/v			02/19/15 03:14	259
trans-1,3-Dichloropropene	ND		100	23	ppb v/v			02/19/15 03:14	259
<b>Ethylbenzene</b>	<b>19</b>	<b>J</b>	100	16	ppb v/v			02/19/15 03:14	259
4-Ethyltoluene	ND		100	48	ppb v/v			02/19/15 03:14	259
Hexachlorobutadiene	ND		520	110	ppb v/v			02/19/15 03:14	259
2-Hexanone	ND	*	100	23	ppb v/v			02/19/15 03:14	259
4-Methyl-2-pentanone (MIBK)	ND	*	100	35	ppb v/v			02/19/15 03:14	259

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11418-1

**Client Sample ID: 097094-001/CWL-UI1-80**

**Lab Sample ID: 320-11418-2**

Date Collected: 01/21/15 09:31

Matrix: Air

Date Received: 01/27/15 09:30

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	94	J	100	19	ppb v/v			02/19/15 03:14	259
Styrene	ND		100	15	ppb v/v			02/19/15 03:14	259
1,1,2,2-Tetrachloroethane	ND		100	18	ppb v/v			02/19/15 03:14	259
Tetrachloroethene	830		100	13	ppb v/v			02/19/15 03:14	259
Toluene	82	J	100	13	ppb v/v			02/19/15 03:14	259
1,1,2-Trichloro-1,2,2-trifluoroethane	830		100	42	ppb v/v			02/19/15 03:14	259
1,2,4-Trichlorobenzene	ND		520	110	ppb v/v			02/19/15 03:14	259
1,1,1-Trichloroethane	51	J	78	17	ppb v/v			02/19/15 03:14	259
1,1,2-Trichloroethane	ND		100	17	ppb v/v			02/19/15 03:14	259
Trichloroethene	5100		100	27	ppb v/v			02/19/15 03:14	259
Trichlorofluoromethane	240		100	51	ppb v/v			02/19/15 03:14	259
1,2,4-Trimethylbenzene	ND		210	42	ppb v/v			02/19/15 03:14	259
1,3,5-Trimethylbenzene	ND		100	32	ppb v/v			02/19/15 03:14	259
Vinyl acetate	ND		210	38	ppb v/v			02/19/15 03:14	259
Vinyl chloride	ND		100	31	ppb v/v			02/19/15 03:14	259
m,p-Xylene	52	J	210	26	ppb v/v			02/19/15 03:14	259
o-Xylene	24	J	100	14	ppb v/v			02/19/15 03:14	259
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	101		70 - 130					02/19/15 03:14	259
1,2-Dichloroethane-d4 (Surr)	105		70 - 130					02/19/15 03:14	259
Toluene-d8 (Surr)	102		70 - 130					02/19/15 03:14	259

**Client Sample ID: 097095-001/CWL-UI1-120**

**Lab Sample ID: 320-11418-3**

Date Collected: 01/21/15 09:34

Matrix: Air

Date Received: 01/27/15 09:30

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	900	J B	1700	61	ppb v/v			02/19/15 03:54	344
Benzene	29	J	140	27	ppb v/v			02/19/15 03:54	344
Benzyl chloride	ND		280	56	ppb v/v			02/19/15 03:54	344
Bromodichloromethane	ND		100	23	ppb v/v			02/19/15 03:54	344
Bromoform	ND		140	24	ppb v/v			02/19/15 03:54	344
Bromomethane	ND		280	120	ppb v/v			02/19/15 03:54	344
2-Butanone (MEK)	ND		280	68	ppb v/v			02/19/15 03:54	344
Carbon disulfide	ND		280	27	ppb v/v			02/19/15 03:54	344
Carbon tetrachloride	31	J	280	22	ppb v/v			02/19/15 03:54	344
Chlorobenzene	ND		100	22	ppb v/v			02/19/15 03:54	344
Chloroethane	ND		280	110	ppb v/v			02/19/15 03:54	344
Chloroform	450		100	33	ppb v/v			02/19/15 03:54	344
Chloromethane	ND		280	68	ppb v/v			02/19/15 03:54	344
Dibromochloromethane	ND		140	27	ppb v/v			02/19/15 03:54	344
1,2-Dibromoethane (EDB)	ND		280	26	ppb v/v			02/19/15 03:54	344
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		140	53	ppb v/v			02/19/15 03:54	344
1,2-Dichlorobenzene	ND		140	45	ppb v/v			02/19/15 03:54	344
1,3-Dichlorobenzene	ND		140	38	ppb v/v			02/19/15 03:54	344

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11418-1

**Client Sample ID: 097095-001/CWL-UI1-120**

**Lab Sample ID: 320-11418-3**

Date Collected: 01/21/15 09:34

Matrix: Air

Date Received: 01/27/15 09:30

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
1,4-Dichlorobenzene	ND		140	51	ppb v/v			02/19/15 03:54	344
Dichlorodifluoromethane	57	J	140	50	ppb v/v			02/19/15 03:54	344
1,1-Dichloroethane	28	J	100	25	ppb v/v			02/19/15 03:54	344
1,2-Dichloroethane	78	J	280	30	ppb v/v			02/19/15 03:54	344
1,1-Dichloroethene	520		280	44	ppb v/v			02/19/15 03:54	344
cis-1,2-Dichloroethene	ND		140	31	ppb v/v			02/19/15 03:54	344
trans-1,2-Dichloroethene	ND		140	34	ppb v/v			02/19/15 03:54	344
1,2-Dichloropropane	100	J	140	83	ppb v/v			02/19/15 03:54	344
cis-1,3-Dichloropropene	ND		140	36	ppb v/v			02/19/15 03:54	344
trans-1,3-Dichloropropene	ND		140	30	ppb v/v			02/19/15 03:54	344
Ethylbenzene	42	J	140	22	ppb v/v			02/19/15 03:54	344
4-Ethyltoluene	ND		140	64	ppb v/v			02/19/15 03:54	344
Hexachlorobutadiene	ND		690	150	ppb v/v			02/19/15 03:54	344
2-Hexanone	ND	*	140	30	ppb v/v			02/19/15 03:54	344
4-Methyl-2-pentanone (MIBK)	ND	*	140	46	ppb v/v			02/19/15 03:54	344
Methylene Chloride	300		140	25	ppb v/v			02/19/15 03:54	344
Styrene	20	J	140	20	ppb v/v			02/19/15 03:54	344
1,1,1,2-Tetrachloroethane	ND		140	24	ppb v/v			02/19/15 03:54	344
Tetrachloroethene	610		140	18	ppb v/v			02/19/15 03:54	344
Toluene	160		140	18	ppb v/v			02/19/15 03:54	344
1,1,2-Trichloro-1,2,2-trifluoroethane	1200		140	56	ppb v/v			02/19/15 03:54	344
1,2,4-Trichlorobenzene	ND		690	150	ppb v/v			02/19/15 03:54	344
1,1,1-Trichloroethane	59	J	100	22	ppb v/v			02/19/15 03:54	344
1,1,2-Trichloroethane	ND		140	23	ppb v/v			02/19/15 03:54	344
Trichloroethene	8200		140	36	ppb v/v			02/19/15 03:54	344
Trichlorofluoromethane	340		140	67	ppb v/v			02/19/15 03:54	344
1,2,4-Trimethylbenzene	ND		280	56	ppb v/v			02/19/15 03:54	344
1,3,5-Trimethylbenzene	ND		140	43	ppb v/v			02/19/15 03:54	344
Vinyl acetate	ND		280	50	ppb v/v			02/19/15 03:54	344
Vinyl chloride	ND		140	41	ppb v/v			02/19/15 03:54	344
m,p-Xylene	110	J	280	34	ppb v/v			02/19/15 03:54	344
o-Xylene	55	J	140	19	ppb v/v			02/19/15 03:54	344
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	99		70 - 130					02/19/15 03:54	344
1,2-Dichloroethane-d4 (Surr)	101		70 - 130					02/19/15 03:54	344
Toluene-d8 (Surr)	99		70 - 130					02/19/15 03:54	344

**Client Sample ID: 097096-001/CWL-SV FB1**

**Lab Sample ID: 320-11418-4**

Date Collected: 01/21/15 09:23

Matrix: Air

Date Received: 01/27/15 09:30

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	1.0	J B	5.0	0.18	ppb v/v			02/19/15 04:41	1
Benzene	ND		0.40	0.079	ppb v/v			02/19/15 04:41	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			02/19/15 04:41	1

TestAmerica Sacramento



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11418-1

**Client Sample ID: 097096-001/CWL-SV FB1**

**Lab Sample ID: 320-11418-4**

Date Collected: 01/21/15 09:23

Matrix: Air

Date Received: 01/27/15 09:30

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
Bromodichloromethane	ND		0.30	0.066	ppb v/v			02/19/15 04:41	1
Bromoform	ND		0.40	0.070	ppb v/v			02/19/15 04:41	1
Bromomethane	ND		0.80	0.34	ppb v/v			02/19/15 04:41	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			02/19/15 04:41	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			02/19/15 04:41	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			02/19/15 04:41	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			02/19/15 04:41	1
Chloroethane	ND		0.80	0.31	ppb v/v			02/19/15 04:41	1
Chloroform	ND		0.30	0.095	ppb v/v			02/19/15 04:41	1
Chloromethane	ND		0.80	0.20	ppb v/v			02/19/15 04:41	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			02/19/15 04:41	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			02/19/15 04:41	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			02/19/15 04:41	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			02/19/15 04:41	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			02/19/15 04:41	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			02/19/15 04:41	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			02/19/15 04:41	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			02/19/15 04:41	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			02/19/15 04:41	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			02/19/15 04:41	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			02/19/15 04:41	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			02/19/15 04:41	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			02/19/15 04:41	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			02/19/15 04:41	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			02/19/15 04:41	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			02/19/15 04:41	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			02/19/15 04:41	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			02/19/15 04:41	1
2-Hexanone	ND *		0.40	0.087	ppb v/v			02/19/15 04:41	1
4-Methyl-2-pentanone (MIBK)	ND *		0.40	0.14	ppb v/v			02/19/15 04:41	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			02/19/15 04:41	1
Styrene	ND		0.40	0.059	ppb v/v			02/19/15 04:41	1
1,1,1,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			02/19/15 04:41	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			02/19/15 04:41	1
Toluene	ND		0.40	0.051	ppb v/v			02/19/15 04:41	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			02/19/15 04:41	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			02/19/15 04:41	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			02/19/15 04:41	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			02/19/15 04:41	1
Trichloroethene	ND		0.40	0.11	ppb v/v			02/19/15 04:41	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			02/19/15 04:41	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			02/19/15 04:41	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			02/19/15 04:41	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			02/19/15 04:41	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			02/19/15 04:41	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			02/19/15 04:41	1
o-Xylene	ND		0.40	0.054	ppb v/v			02/19/15 04:41	1

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11418-1

**Client Sample ID: 097096-001/CWL-SV FB1**

**Lab Sample ID: 320-11418-4**

**Date Collected: 01/21/15 09:23**

**Matrix: Air**

**Date Received: 01/27/15 09:30**

**Sample Container: Summa Canister 6L**

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
4-Bromofluorobenzene (Surr)	92		70 - 130		02/19/15 04:41	1
1,2-Dichloroethane-d4 (Surr)	96		70 - 130		02/19/15 04:41	1
Toluene-d8 (Surr)	102		70 - 130		02/19/15 04:41	1

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11417-1

**Client Sample ID: 097097-001/CWL-UI2-36**

**Lab Sample ID: 320-11417-1**

Date Collected: 01/21/15 08:27

Matrix: Air

Date Received: 01/27/15 09:30

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	250	J B	300	11	ppb v/v			02/18/15 22:04	59.7
Benzene	5.2	J	24	4.7	ppb v/v			02/18/15 22:04	59.7
Benzyl chloride	ND		48	9.7	ppb v/v			02/18/15 22:04	59.7
Bromodichloromethane	ND		18	3.9	ppb v/v			02/18/15 22:04	59.7
Bromoform	ND		24	4.2	ppb v/v			02/18/15 22:04	59.7
Bromomethane	ND		48	20	ppb v/v			02/18/15 22:04	59.7
2-Butanone (MEK)	70		48	12	ppb v/v			02/18/15 22:04	59.7
Carbon disulfide	7.3	J	48	4.7	ppb v/v			02/18/15 22:04	59.7
Carbon tetrachloride	14	J	48	3.8	ppb v/v			02/18/15 22:04	59.7
Chlorobenzene	ND		18	3.8	ppb v/v			02/18/15 22:04	59.7
Chloroethane	ND		48	18	ppb v/v			02/18/15 22:04	59.7
Chloroform	610		18	5.7	ppb v/v			02/18/15 22:04	59.7
Chloromethane	ND		48	12	ppb v/v			02/18/15 22:04	59.7
Dibromochloromethane	ND		24	4.7	ppb v/v			02/18/15 22:04	59.7
1,2-Dibromoethane (EDB)	ND		48	4.5	ppb v/v			02/18/15 22:04	59.7
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		24	9.3	ppb v/v			02/18/15 22:04	59.7
1,2-Dichlorobenzene	ND		24	7.8	ppb v/v			02/18/15 22:04	59.7
1,3-Dichlorobenzene	ND		24	6.6	ppb v/v			02/18/15 22:04	59.7
1,4-Dichlorobenzene	ND		24	8.9	ppb v/v			02/18/15 22:04	59.7
Dichlorodifluoromethane	28		24	8.7	ppb v/v			02/18/15 22:04	59.7
1,1-Dichloroethane	5.5	J	18	4.3	ppb v/v			02/18/15 22:04	59.7
1,2-Dichloroethane	23	J	48	5.3	ppb v/v			02/18/15 22:04	59.7
1,1-Dichloroethene	49		48	7.7	ppb v/v			02/18/15 22:04	59.7
cis-1,2-Dichloroethene	ND		24	5.3	ppb v/v			02/18/15 22:04	59.7
trans-1,2-Dichloroethene	ND		24	6.0	ppb v/v			02/18/15 22:04	59.7
1,2-Dichloropropane	42		24	14	ppb v/v			02/18/15 22:04	59.7
cis-1,3-Dichloropropene	ND		24	6.2	ppb v/v			02/18/15 22:04	59.7
trans-1,3-Dichloropropene	ND		24	5.3	ppb v/v			02/18/15 22:04	59.7
Ethylbenzene	9.3	J	24	3.8	ppb v/v			02/18/15 22:04	59.7
4-Ethyltoluene	ND		24	11	ppb v/v			02/18/15 22:04	59.7
Hexachlorobutadiene	ND		120	26	ppb v/v			02/18/15 22:04	59.7
2-Hexanone	ND *		24	5.2	ppb v/v			02/18/15 22:04	59.7
4-Methyl-2-pentanone (MIBK)	ND *		24	8.1	ppb v/v			02/18/15 22:04	59.7
Methylene Chloride	21	J	24	4.3	ppb v/v			02/18/15 22:04	59.7
Styrene	7.6	J	24	3.5	ppb v/v			02/18/15 22:04	59.7
1,1,2,2-Tetrachloroethane	ND		24	4.1	ppb v/v			02/18/15 22:04	59.7
Tetrachloroethene	160		24	3.0	ppb v/v			02/18/15 22:04	59.7
Toluene	240		24	3.0	ppb v/v			02/18/15 22:04	59.7
1,1,2-Trichloro-1,2,2-trifluoroethane	590		24	9.7	ppb v/v			02/18/15 22:04	59.7
1,2,4-Trichlorobenzene	ND		120	26	ppb v/v			02/18/15 22:04	59.7
1,1,1-Trichloroethane	37		18	3.9	ppb v/v			02/18/15 22:04	59.7
1,1,2-Trichloroethane	ND		24	4.0	ppb v/v			02/18/15 22:04	59.7
Trichloroethene	3000		24	6.3	ppb v/v			02/18/15 22:04	59.7
Trichlorofluoromethane	170		24	12	ppb v/v			02/18/15 22:04	59.7
1,2,4-Trimethylbenzene	ND		48	9.7	ppb v/v			02/18/15 22:04	59.7
1,3,5-Trimethylbenzene	ND		24	7.5	ppb v/v			02/18/15 22:04	59.7
Vinyl acetate	ND		48	8.7	ppb v/v			02/18/15 22:04	59.7

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11417-1

**Client Sample ID: 097097-001/CWL-UI2-36**

**Lab Sample ID: 320-11417-1**

Date Collected: 01/21/15 08:27

Matrix: Air

Date Received: 01/27/15 09:30

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		24	7.2	ppb v/v			02/18/15 22:04	59.7
<b>m,p-Xylene</b>	<b>19</b>	<b>J</b>	48	6.0	ppb v/v			02/18/15 22:04	59.7
<b>o-Xylene</b>	<b>7.5</b>	<b>J</b>	24	3.2	ppb v/v			02/18/15 22:04	59.7
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		70 - 130					02/18/15 22:04	59.7
1,2-Dichloroethane-d4 (Surr)	103		70 - 130					02/18/15 22:04	59.7
Toluene-d8 (Surr)	99		70 - 130					02/18/15 22:04	59.7

**Client Sample ID: 097098-001/CWL-UI2-76**

**Lab Sample ID: 320-11417-2**

Date Collected: 01/21/15 08:33

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>230</b>	<b>J B</b>	300	11	ppb v/v			02/18/15 22:56	59.7
<b>Benzene</b>	<b>6.3</b>	<b>J</b>	24	4.7	ppb v/v			02/18/15 22:56	59.7
Benzyl chloride	ND		48	9.7	ppb v/v			02/18/15 22:56	59.7
Bromodichloromethane	ND		18	3.9	ppb v/v			02/18/15 22:56	59.7
Bromoform	ND		24	4.2	ppb v/v			02/18/15 22:56	59.7
Bromomethane	ND		48	20	ppb v/v			02/18/15 22:56	59.7
<b>2-Butanone (MEK)</b>	<b>51</b>		48	12	ppb v/v			02/18/15 22:56	59.7
<b>Carbon disulfide</b>	<b>9.4</b>	<b>J</b>	48	4.7	ppb v/v			02/18/15 22:56	59.7
<b>Carbon tetrachloride</b>	<b>17</b>	<b>J</b>	48	3.8	ppb v/v			02/18/15 22:56	59.7
Chlorobenzene	ND		18	3.8	ppb v/v			02/18/15 22:56	59.7
Chloroethane	ND		48	18	ppb v/v			02/18/15 22:56	59.7
<b>Chloroform</b>	<b>620</b>		18	5.7	ppb v/v			02/18/15 22:56	59.7
Chloromethane	ND		48	12	ppb v/v			02/18/15 22:56	59.7
Dibromochloromethane	ND		24	4.7	ppb v/v			02/18/15 22:56	59.7
1,2-Dibromoethane (EDB)	ND		48	4.5	ppb v/v			02/18/15 22:56	59.7
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		24	9.3	ppb v/v			02/18/15 22:56	59.7
1,2-Dichlorobenzene	ND		24	7.8	ppb v/v			02/18/15 22:56	59.7
1,3-Dichlorobenzene	ND		24	6.6	ppb v/v			02/18/15 22:56	59.7
1,4-Dichlorobenzene	ND		24	8.9	ppb v/v			02/18/15 22:56	59.7
<b>Dichlorodifluoromethane</b>	<b>34</b>		24	8.7	ppb v/v			02/18/15 22:56	59.7
<b>1,1-Dichloroethane</b>	<b>8.0</b>	<b>J</b>	18	4.3	ppb v/v			02/18/15 22:56	59.7
<b>1,2-Dichloroethane</b>	<b>21</b>	<b>J</b>	48	5.3	ppb v/v			02/18/15 22:56	59.7
<b>1,1-Dichloroethene</b>	<b>110</b>		48	7.7	ppb v/v			02/18/15 22:56	59.7
cis-1,2-Dichloroethene	ND		24	5.3	ppb v/v			02/18/15 22:56	59.7
trans-1,2-Dichloroethene	ND		24	6.0	ppb v/v			02/18/15 22:56	59.7
<b>1,2-Dichloropropane</b>	<b>88</b>		24	14	ppb v/v			02/18/15 22:56	59.7
cis-1,3-Dichloropropene	ND		24	6.2	ppb v/v			02/18/15 22:56	59.7
trans-1,3-Dichloropropene	ND		24	5.3	ppb v/v			02/18/15 22:56	59.7
<b>Ethylbenzene</b>	<b>7.8</b>	<b>J</b>	24	3.8	ppb v/v			02/18/15 22:56	59.7
4-Ethyltoluene	ND		24	11	ppb v/v			02/18/15 22:56	59.7
Hexachlorobutadiene	ND		120	26	ppb v/v			02/18/15 22:56	59.7
2-Hexanone	ND	*	24	5.2	ppb v/v			02/18/15 22:56	59.7
4-Methyl-2-pentanone (MIBK)	ND	*	24	8.1	ppb v/v			02/18/15 22:56	59.7

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11417-1

**Client Sample ID: 097098-001/CWL-UI2-76**

**Lab Sample ID: 320-11417-2**

Date Collected: 01/21/15 08:33

Matrix: Air

Date Received: 01/27/15 09:30

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	23	J	24	4.3	ppb v/v			02/18/15 22:56	59.7
Styrene	8.2	J	24	3.5	ppb v/v			02/18/15 22:56	59.7
1,1,2,2-Tetrachloroethane	ND		24	4.1	ppb v/v			02/18/15 22:56	59.7
Tetrachloroethene	180		24	3.0	ppb v/v			02/18/15 22:56	59.7
Toluene	180		24	3.0	ppb v/v			02/18/15 22:56	59.7
1,1,2-Trichloro-1,2,2-trifluoroethane	730		24	9.7	ppb v/v			02/18/15 22:56	59.7
1,2,4-Trichlorobenzene	ND		120	26	ppb v/v			02/18/15 22:56	59.7
1,1,1-Trichloroethane	35		18	3.9	ppb v/v			02/18/15 22:56	59.7
1,1,2-Trichloroethane	ND		24	4.0	ppb v/v			02/18/15 22:56	59.7
Trichlorofluoromethane	200		24	12	ppb v/v			02/18/15 22:56	59.7
1,2,4-Trimethylbenzene	ND		48	9.7	ppb v/v			02/18/15 22:56	59.7
1,3,5-Trimethylbenzene	ND		24	7.5	ppb v/v			02/18/15 22:56	59.7
Vinyl acetate	ND		48	8.7	ppb v/v			02/18/15 22:56	59.7
Vinyl chloride	ND		24	7.2	ppb v/v			02/18/15 22:56	59.7
m,p-Xylene	17	J	48	6.0	ppb v/v			02/18/15 22:56	59.7
o-Xylene	6.9	J	24	3.2	ppb v/v			02/18/15 22:56	59.7

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		70 - 130		02/18/15 22:56	59.7
1,2-Dichloroethane-d4 (Surr)	101		70 - 130		02/18/15 22:56	59.7
Toluene-d8 (Surr)	100		70 - 130		02/18/15 22:56	59.7

**Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	3700		40	10	ppb v/v			02/19/15 00:25	99.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		70 - 130		02/19/15 00:25	99.5
1,2-Dichloroethane-d4 (Surr)	101		70 - 130		02/19/15 00:25	99.5
Toluene-d8 (Surr)	101		70 - 130		02/19/15 00:25	99.5

**Client Sample ID: 097099-001/CWL-UI2-136**

**Lab Sample ID: 320-11417-3**

Date Collected: 01/21/15 08:36

Matrix: Air

Date Received: 01/27/15 09:30

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	1000	J B	1200	44	ppb v/v			02/19/15 01:06	247
Benzene	ND		99	20	ppb v/v			02/19/15 01:06	247
Benzyl chloride	ND		200	40	ppb v/v			02/19/15 01:06	247
Bromodichloromethane	ND		74	16	ppb v/v			02/19/15 01:06	247
Bromoform	ND		99	17	ppb v/v			02/19/15 01:06	247
Bromomethane	ND		200	83	ppb v/v			02/19/15 01:06	247
2-Butanone (MEK)	50	J	200	49	ppb v/v			02/19/15 01:06	247
Carbon disulfide	ND		200	19	ppb v/v			02/19/15 01:06	247
Carbon tetrachloride	22	J	200	16	ppb v/v			02/19/15 01:06	247
Chlorobenzene	ND		74	16	ppb v/v			02/19/15 01:06	247
Chloroethane	ND		200	76	ppb v/v			02/19/15 01:06	247

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11417-1

**Client Sample ID: 097099-001/CWL-UI2-136**

**Lab Sample ID: 320-11417-3**

Date Collected: 01/21/15 08:36

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Chloroform</b>	<b>480</b>		74	23	ppb v/v			02/19/15 01:06	247
Chloromethane	ND		200	49	ppb v/v			02/19/15 01:06	247
Dibromochloromethane	ND		99	20	ppb v/v			02/19/15 01:06	247
1,2-Dibromoethane (EDB)	ND		200	19	ppb v/v			02/19/15 01:06	247
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		99	38	ppb v/v			02/19/15 01:06	247
1,2-Dichlorobenzene	ND		99	32	ppb v/v			02/19/15 01:06	247
1,3-Dichlorobenzene	ND		99	27	ppb v/v			02/19/15 01:06	247
1,4-Dichlorobenzene	ND		99	37	ppb v/v			02/19/15 01:06	247
<b>Dichlorodifluoromethane</b>	<b>40 J</b>		99	36	ppb v/v			02/19/15 01:06	247
1,1-Dichloroethane	ND		74	18	ppb v/v			02/19/15 01:06	247
<b>1,2-Dichloroethane</b>	<b>67 J</b>		200	22	ppb v/v			02/19/15 01:06	247
<b>1,1-Dichloroethene</b>	<b>190 J</b>		200	32	ppb v/v			02/19/15 01:06	247
cis-1,2-Dichloroethene	ND		99	22	ppb v/v			02/19/15 01:06	247
trans-1,2-Dichloroethene	ND		99	25	ppb v/v			02/19/15 01:06	247
<b>1,2-Dichloropropane</b>	<b>160</b>		99	59	ppb v/v			02/19/15 01:06	247
cis-1,3-Dichloropropene	ND		99	26	ppb v/v			02/19/15 01:06	247
trans-1,3-Dichloropropene	ND		99	22	ppb v/v			02/19/15 01:06	247
<b>Ethylbenzene</b>	<b>37 J</b>		99	16	ppb v/v			02/19/15 01:06	247
4-Ethyltoluene	ND		99	46	ppb v/v			02/19/15 01:06	247
Hexachlorobutadiene	ND		490	110	ppb v/v			02/19/15 01:06	247
2-Hexanone	ND *		99	21	ppb v/v			02/19/15 01:06	247
4-Methyl-2-pentanone (MIBK)	ND *		99	33	ppb v/v			02/19/15 01:06	247
<b>Methylene Chloride</b>	<b>79 J</b>		99	18	ppb v/v			02/19/15 01:06	247
<b>Styrene</b>	<b>17 J</b>		99	15	ppb v/v			02/19/15 01:06	247
1,1,2,2-Tetrachloroethane	ND		99	17	ppb v/v			02/19/15 01:06	247
<b>Tetrachloroethene</b>	<b>180</b>		99	13	ppb v/v			02/19/15 01:06	247
<b>Toluene</b>	<b>170</b>		99	13	ppb v/v			02/19/15 01:06	247
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>860</b>		99	40	ppb v/v			02/19/15 01:06	247
1,2,4-Trichlorobenzene	ND		490	110	ppb v/v			02/19/15 01:06	247
<b>1,1,1-Trichloroethane</b>	<b>29 J</b>		74	16	ppb v/v			02/19/15 01:06	247
1,1,2-Trichloroethane	ND		99	17	ppb v/v			02/19/15 01:06	247
<b>Trichloroethene</b>	<b>5400</b>		99	26	ppb v/v			02/19/15 01:06	247
<b>Trichlorofluoromethane</b>	<b>240</b>		99	48	ppb v/v			02/19/15 01:06	247
1,2,4-Trimethylbenzene	ND		200	40	ppb v/v			02/19/15 01:06	247
1,3,5-Trimethylbenzene	ND		99	31	ppb v/v			02/19/15 01:06	247
Vinyl acetate	ND		200	36	ppb v/v			02/19/15 01:06	247
Vinyl chloride	ND		99	30	ppb v/v			02/19/15 01:06	247
<b>m,p-Xylene</b>	<b>95 J</b>		200	25	ppb v/v			02/19/15 01:06	247
<b>o-Xylene</b>	<b>43 J</b>		99	13	ppb v/v			02/19/15 01:06	247

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		70 - 130		02/19/15 01:06	247
1,2-Dichloroethane-d4 (Surr)	104		70 - 130		02/19/15 01:06	247
Toluene-d8 (Surr)	102		70 - 130		02/19/15 01:06	247

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11417-1

**Client Sample ID: 097100-001/CWL-SV-FB2**

**Lab Sample ID: 320-11417-4**

Date Collected: 01/21/15 08:22

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>0.43</b>	<b>J B</b>	5.0	0.18	ppb v/v			02/19/15 01:52	1
Benzene	ND		0.40	0.079	ppb v/v			02/19/15 01:52	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			02/19/15 01:52	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			02/19/15 01:52	1
Bromoform	ND		0.40	0.070	ppb v/v			02/19/15 01:52	1
Bromomethane	ND		0.80	0.34	ppb v/v			02/19/15 01:52	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			02/19/15 01:52	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			02/19/15 01:52	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			02/19/15 01:52	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			02/19/15 01:52	1
Chloroethane	ND		0.80	0.31	ppb v/v			02/19/15 01:52	1
Chloroform	ND		0.30	0.095	ppb v/v			02/19/15 01:52	1
Chloromethane	ND		0.80	0.20	ppb v/v			02/19/15 01:52	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			02/19/15 01:52	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			02/19/15 01:52	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			02/19/15 01:52	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			02/19/15 01:52	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			02/19/15 01:52	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			02/19/15 01:52	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			02/19/15 01:52	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			02/19/15 01:52	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			02/19/15 01:52	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			02/19/15 01:52	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			02/19/15 01:52	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			02/19/15 01:52	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			02/19/15 01:52	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			02/19/15 01:52	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			02/19/15 01:52	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			02/19/15 01:52	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			02/19/15 01:52	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			02/19/15 01:52	1
2-Hexanone	ND *		0.40	0.087	ppb v/v			02/19/15 01:52	1
4-Methyl-2-pentanone (MIBK)	ND *		0.40	0.14	ppb v/v			02/19/15 01:52	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			02/19/15 01:52	1
Styrene	ND		0.40	0.059	ppb v/v			02/19/15 01:52	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			02/19/15 01:52	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			02/19/15 01:52	1
<b>Toluene</b>	<b>0.065</b>	<b>J</b>	0.40	0.051	ppb v/v			02/19/15 01:52	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			02/19/15 01:52	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			02/19/15 01:52	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			02/19/15 01:52	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			02/19/15 01:52	1
Trichloroethene	ND		0.40	0.11	ppb v/v			02/19/15 01:52	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			02/19/15 01:52	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			02/19/15 01:52	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			02/19/15 01:52	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			02/19/15 01:52	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			02/19/15 01:52	1

# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL-SVM

TestAmerica Job ID: 320-11417-1

**Client Sample ID: 097100-001/CWL-SV-FB2**

**Lab Sample ID: 320-11417-4**

**Date Collected: 01/21/15 08:22**

**Matrix: Air**

**Date Received: 01/27/15 09:30**

**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		0.80	0.10	ppb v/v			02/19/15 01:52	1
o-Xylene	ND		0.40	0.054	ppb v/v			02/19/15 01:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		70 - 130		02/19/15 01:52	1
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/19/15 01:52	1
Toluene-d8 (Surr)	102		70 - 130		02/19/15 01:52	1



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11420-1

**Client Sample ID: 097101-001/CWL-D1-100**

**Lab Sample ID: 320-11420-1**

Date Collected: 01/21/15 08:55

Matrix: Air

Date Received: 01/27/15 09:30

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	1300	J B	1500	52	ppb v/v			02/19/15 21:39	294
Benzene	27	J	120	23	ppb v/v			02/19/15 21:39	294
Benzyl chloride	ND		240	48	ppb v/v			02/19/15 21:39	294
Bromodichloromethane	ND		88	19	ppb v/v			02/19/15 21:39	294
Bromoform	ND		120	21	ppb v/v			02/19/15 21:39	294
Bromomethane	ND		240	98	ppb v/v			02/19/15 21:39	294
2-Butanone (MEK)	160	J	240	59	ppb v/v			02/19/15 21:39	294
Carbon disulfide	45	J	240	23	ppb v/v			02/19/15 21:39	294
Carbon tetrachloride	46	J	240	19	ppb v/v			02/19/15 21:39	294
Chlorobenzene	ND		88	19	ppb v/v			02/19/15 21:39	294
Chloroethane	ND		240	91	ppb v/v			02/19/15 21:39	294
Chloroform	550		88	28	ppb v/v			02/19/15 21:39	294
Chloromethane	ND		240	58	ppb v/v			02/19/15 21:39	294
Dibromochloromethane	ND		120	23	ppb v/v			02/19/15 21:39	294
1,2-Dibromoethane (EDB)	ND		240	22	ppb v/v			02/19/15 21:39	294
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		120	46	ppb v/v			02/19/15 21:39	294
1,2-Dichlorobenzene	ND		120	38	ppb v/v			02/19/15 21:39	294
1,3-Dichlorobenzene	ND		120	32	ppb v/v			02/19/15 21:39	294
1,4-Dichlorobenzene	ND		120	44	ppb v/v			02/19/15 21:39	294
Dichlorodifluoromethane	79	J	120	43	ppb v/v			02/19/15 21:39	294
1,1-Dichloroethane	34	J	88	21	ppb v/v			02/19/15 21:39	294
1,2-Dichloroethane	79	J	240	26	ppb v/v			02/19/15 21:39	294
1,1-Dichloroethene	590		240	38	ppb v/v			02/19/15 21:39	294
cis-1,2-Dichloroethene	ND		120	26	ppb v/v			02/19/15 21:39	294
trans-1,2-Dichloroethene	ND		120	29	ppb v/v			02/19/15 21:39	294
1,2-Dichloropropane	140		120	71	ppb v/v			02/19/15 21:39	294
cis-1,3-Dichloropropene	ND		120	31	ppb v/v			02/19/15 21:39	294
trans-1,3-Dichloropropene	ND		120	26	ppb v/v			02/19/15 21:39	294
Ethylbenzene	31	J	120	19	ppb v/v			02/19/15 21:39	294
4-Ethyltoluene	ND		120	55	ppb v/v			02/19/15 21:39	294
Hexachlorobutadiene	ND		590	130	ppb v/v			02/19/15 21:39	294
2-Hexanone	ND *		120	26	ppb v/v			02/19/15 21:39	294
4-Methyl-2-pentanone (MIBK)	ND		120	40	ppb v/v			02/19/15 21:39	294
Methylene Chloride	77	J	120	21	ppb v/v			02/19/15 21:39	294
Styrene	32	J	120	17	ppb v/v			02/19/15 21:39	294
1,1,2,2-Tetrachloroethane	ND		120	20	ppb v/v			02/19/15 21:39	294
Tetrachloroethene	660		120	15	ppb v/v			02/19/15 21:39	294
Toluene	250		120	15	ppb v/v			02/19/15 21:39	294
1,1,2-Trichloro-1,2,2-trifluoroethane	1700		120	48	ppb v/v			02/19/15 21:39	294
1,2,4-Trichlorobenzene	ND		590	130	ppb v/v			02/19/15 21:39	294
1,1,1-Trichloroethane	71	J	88	19	ppb v/v			02/19/15 21:39	294
1,1,2-Trichloroethane	ND		120	20	ppb v/v			02/19/15 21:39	294
Trichloroethene	11000		120	31	ppb v/v			02/19/15 21:39	294
Trichlorofluoromethane	430		120	58	ppb v/v			02/19/15 21:39	294
1,2,4-Trimethylbenzene	ND		240	48	ppb v/v			02/19/15 21:39	294
1,3,5-Trimethylbenzene	ND		120	37	ppb v/v			02/19/15 21:39	294
Vinyl acetate	ND		240	43	ppb v/v			02/19/15 21:39	294

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11420-1

**Client Sample ID: 097101-001/CWL-D1-100**

**Lab Sample ID: 320-11420-1**

Date Collected: 01/21/15 08:55

Matrix: Air

Date Received: 01/27/15 09:30

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		120	35	ppb v/v			02/19/15 21:39	294
<b>m,p-Xylene</b>	<b>77</b>	<b>J</b>	240	29	ppb v/v			02/19/15 21:39	294
<b>o-Xylene</b>	<b>33</b>	<b>J</b>	120	16	ppb v/v			02/19/15 21:39	294
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	99		70 - 130					02/19/15 21:39	294
1,2-Dichloroethane-d4 (Surr)	106		70 - 130					02/19/15 21:39	294
Toluene-d8 (Surr)	101		70 - 130					02/19/15 21:39	294

**Client Sample ID: 097102-001/CWL-D1-160**

**Lab Sample ID: 320-11420-2**

Date Collected: 01/21/15 08:59

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>1100</b>	<b>J B</b>	1900	66	ppb v/v			02/19/15 22:19	371
Benzene	ND		150	29	ppb v/v			02/19/15 22:19	371
Benzyl chloride	ND		300	60	ppb v/v			02/19/15 22:19	371
Bromodichloromethane	ND		110	24	ppb v/v			02/19/15 22:19	371
Bromoform	ND		150	26	ppb v/v			02/19/15 22:19	371
Bromomethane	ND		300	120	ppb v/v			02/19/15 22:19	371
<b>2-Butanone (MEK)</b>	<b>130</b>	<b>J</b>	300	74	ppb v/v			02/19/15 22:19	371
Carbon disulfide	ND		300	29	ppb v/v			02/19/15 22:19	371
<b>Carbon tetrachloride</b>	<b>57</b>	<b>J</b>	300	24	ppb v/v			02/19/15 22:19	371
Chlorobenzene	ND		110	24	ppb v/v			02/19/15 22:19	371
Chloroethane	ND		300	110	ppb v/v			02/19/15 22:19	371
<b>Chloroform</b>	<b>500</b>		110	35	ppb v/v			02/19/15 22:19	371
Chloromethane	ND		300	73	ppb v/v			02/19/15 22:19	371
Dibromochloromethane	ND		150	29	ppb v/v			02/19/15 22:19	371
1,2-Dibromoethane (EDB)	ND		300	28	ppb v/v			02/19/15 22:19	371
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		150	58	ppb v/v			02/19/15 22:19	371
1,2-Dichlorobenzene	ND		150	48	ppb v/v			02/19/15 22:19	371
1,3-Dichlorobenzene	ND		150	41	ppb v/v			02/19/15 22:19	371
1,4-Dichlorobenzene	ND		150	55	ppb v/v			02/19/15 22:19	371
<b>Dichlorodifluoromethane</b>	<b>95</b>	<b>J</b>	150	54	ppb v/v			02/19/15 22:19	371
<b>1,1-Dichloroethane</b>	<b>43</b>	<b>J</b>	110	27	ppb v/v			02/19/15 22:19	371
<b>1,2-Dichloroethane</b>	<b>84</b>	<b>J</b>	300	33	ppb v/v			02/19/15 22:19	371
<b>1,1-Dichloroethene</b>	<b>920</b>		300	48	ppb v/v			02/19/15 22:19	371
cis-1,2-Dichloroethene	ND		150	33	ppb v/v			02/19/15 22:19	371
trans-1,2-Dichloroethene	ND		150	37	ppb v/v			02/19/15 22:19	371
<b>1,2-Dichloropropane</b>	<b>210</b>		150	89	ppb v/v			02/19/15 22:19	371
cis-1,3-Dichloropropene	ND		150	39	ppb v/v			02/19/15 22:19	371
trans-1,3-Dichloropropene	ND		150	33	ppb v/v			02/19/15 22:19	371
<b>Ethylbenzene</b>	<b>28</b>	<b>J</b>	150	23	ppb v/v			02/19/15 22:19	371
4-Ethyltoluene	ND		150	69	ppb v/v			02/19/15 22:19	371
Hexachlorobutadiene	ND		740	160	ppb v/v			02/19/15 22:19	371
2-Hexanone	ND *		150	32	ppb v/v			02/19/15 22:19	371
4-Methyl-2-pentanone (MIBK)	ND		150	50	ppb v/v			02/19/15 22:19	371

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11420-1

**Client Sample ID: 097102-001/CWL-D1-160**

**Lab Sample ID: 320-11420-2**

Date Collected: 01/21/15 08:59

Matrix: Air

Date Received: 01/27/15 09:30

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	78	J	150	27	ppb v/v			02/19/15 22:19	371
Styrene	28	J	150	22	ppb v/v			02/19/15 22:19	371
1,1,2,2-Tetrachloroethane	ND		150	26	ppb v/v			02/19/15 22:19	371
Tetrachloroethene	520		150	19	ppb v/v			02/19/15 22:19	371
Toluene	230		150	19	ppb v/v			02/19/15 22:19	371
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		150	60	ppb v/v			02/19/15 22:19	371
1,2,4-Trichlorobenzene	ND		740	160	ppb v/v			02/19/15 22:19	371
1,1,1-Trichloroethane	73	J	110	24	ppb v/v			02/19/15 22:19	371
1,1,2-Trichloroethane	ND		150	25	ppb v/v			02/19/15 22:19	371
Trichloroethene	16000		150	39	ppb v/v			02/19/15 22:19	371
Trichlorofluoromethane	590		150	73	ppb v/v			02/19/15 22:19	371
1,2,4-Trimethylbenzene	ND		300	60	ppb v/v			02/19/15 22:19	371
1,3,5-Trimethylbenzene	ND		150	46	ppb v/v			02/19/15 22:19	371
Vinyl acetate	ND		300	54	ppb v/v			02/19/15 22:19	371
Vinyl chloride	ND		150	45	ppb v/v			02/19/15 22:19	371
m,p-Xylene	66	J	300	37	ppb v/v			02/19/15 22:19	371
o-Xylene	31	J	150	20	ppb v/v			02/19/15 22:19	371
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	100		70 - 130					02/19/15 22:19	371
1,2-Dichloroethane-d4 (Surr)	105		70 - 130					02/19/15 22:19	371
Toluene-d8 (Surr)	102		70 - 130					02/19/15 22:19	371

**Client Sample ID: 097103-001/CWL-D1-240**

**Lab Sample ID: 320-11420-3**

Date Collected: 01/21/15 09:04

Matrix: Air

Date Received: 01/27/15 09:30

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	2300	J B	3100	110	ppb v/v			02/19/15 23:26	613
Benzene	67	J	250	48	ppb v/v			02/19/15 23:26	613
Benzyl chloride	ND		490	100	ppb v/v			02/19/15 23:26	613
Bromodichloromethane	ND		180	40	ppb v/v			02/19/15 23:26	613
Bromoform	ND		250	43	ppb v/v			02/19/15 23:26	613
Bromomethane	ND		490	210	ppb v/v			02/19/15 23:26	613
2-Butanone (MEK)	200	J	490	120	ppb v/v			02/19/15 23:26	613
Carbon disulfide	ND		490	48	ppb v/v			02/19/15 23:26	613
Carbon tetrachloride	73	J	490	39	ppb v/v			02/19/15 23:26	613
Chlorobenzene	ND		180	39	ppb v/v			02/19/15 23:26	613
Chloroethane	ND		490	190	ppb v/v			02/19/15 23:26	613
Chloroform	390		180	58	ppb v/v			02/19/15 23:26	613
Chloromethane	ND		490	120	ppb v/v			02/19/15 23:26	613
Dibromochloromethane	ND		250	48	ppb v/v			02/19/15 23:26	613
1,2-Dibromoethane (EDB)	ND		490	46	ppb v/v			02/19/15 23:26	613
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		250	95	ppb v/v			02/19/15 23:26	613
1,2-Dichlorobenzene	ND		250	80	ppb v/v			02/19/15 23:26	613
1,3-Dichlorobenzene	ND		250	67	ppb v/v			02/19/15 23:26	613
1,4-Dichlorobenzene	ND		250	91	ppb v/v			02/19/15 23:26	613

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11420-1

**Client Sample ID: 097103-001/CWL-D1-240**

**Lab Sample ID: 320-11420-3**

Date Collected: 01/21/15 09:04

Matrix: Air

Date Received: 01/27/15 09:30

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	110	J	250	89	ppb v/v			02/19/15 23:26	613
1,1-Dichloroethane	ND		180	44	ppb v/v			02/19/15 23:26	613
1,2-Dichloroethane	68	J	490	54	ppb v/v			02/19/15 23:26	613
1,1-Dichloroethene	1000		490	79	ppb v/v			02/19/15 23:26	613
cis-1,2-Dichloroethene	ND		250	55	ppb v/v			02/19/15 23:26	613
trans-1,2-Dichloroethene	ND		250	61	ppb v/v			02/19/15 23:26	613
1,2-Dichloropropane	160	J	250	150	ppb v/v			02/19/15 23:26	613
cis-1,3-Dichloropropene	ND		250	64	ppb v/v			02/19/15 23:26	613
trans-1,3-Dichloropropene	ND		250	54	ppb v/v			02/19/15 23:26	613
Ethylbenzene	47	J	250	39	ppb v/v			02/19/15 23:26	613
4-Ethyltoluene	ND		250	110	ppb v/v			02/19/15 23:26	613
Hexachlorobutadiene	ND		1200	260	ppb v/v			02/19/15 23:26	613
2-Hexanone	ND *		250	53	ppb v/v			02/19/15 23:26	613
4-Methyl-2-pentanone (MIBK)	ND		250	83	ppb v/v			02/19/15 23:26	613
Methylene Chloride	590		250	44	ppb v/v			02/19/15 23:26	613
Styrene	ND		250	36	ppb v/v			02/19/15 23:26	613
1,1,1,2-Tetrachloroethane	ND		250	42	ppb v/v			02/19/15 23:26	613
Tetrachloroethene	420		250	31	ppb v/v			02/19/15 23:26	613
Toluene	290		250	31	ppb v/v			02/19/15 23:26	613
1,1,2-Trichloro-1,2,2-trifluoroethane	2400		250	100	ppb v/v			02/19/15 23:26	613
1,2,4-Trichlorobenzene	ND		1200	270	ppb v/v			02/19/15 23:26	613
1,1,1-Trichloroethane	54	J	180	40	ppb v/v			02/19/15 23:26	613
1,1,2-Trichloroethane	ND		250	41	ppb v/v			02/19/15 23:26	613
Trichloroethene	17000		250	64	ppb v/v			02/19/15 23:26	613
Trichlorofluoromethane	680		250	120	ppb v/v			02/19/15 23:26	613
1,2,4-Trimethylbenzene	ND		490	99	ppb v/v			02/19/15 23:26	613
1,3,5-Trimethylbenzene	ND		250	77	ppb v/v			02/19/15 23:26	613
Vinyl acetate	ND		490	89	ppb v/v			02/19/15 23:26	613
Vinyl chloride	ND		250	74	ppb v/v			02/19/15 23:26	613
m,p-Xylene	140	J	490	61	ppb v/v			02/19/15 23:26	613
o-Xylene	53	J	250	33	ppb v/v			02/19/15 23:26	613

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		70 - 130		02/19/15 23:26	613
1,2-Dichloroethane-d4 (Surr)	101		70 - 130		02/19/15 23:26	613
Toluene-d8 (Surr)	102		70 - 130		02/19/15 23:26	613

**Client Sample ID: 097104-001/CWL-D1-350**

**Lab Sample ID: 320-11420-4**

Date Collected: 01/21/15 09:09

Matrix: Air

Date Received: 01/27/15 09:30

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	1300	J B	1600	57	ppb v/v			02/20/15 00:07	323
Benzene	26	J	130	26	ppb v/v			02/20/15 00:07	323
Benzyl chloride	ND		260	53	ppb v/v			02/20/15 00:07	323
Bromodichloromethane	ND		97	21	ppb v/v			02/20/15 00:07	323

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11420-1

**Client Sample ID: 097104-001/CWL-D1-350**

**Lab Sample ID: 320-11420-4**

**Date Collected: 01/21/15 09:09**

**Matrix: Air**

**Date Received: 01/27/15 09:30**

**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		130	23	ppb v/v			02/20/15 00:07	323
Bromomethane	ND		260	110	ppb v/v			02/20/15 00:07	323
<b>2-Butanone (MEK)</b>	<b>160</b>	<b>J</b>	260	64	ppb v/v			02/20/15 00:07	323
Carbon disulfide	ND		260	25	ppb v/v			02/20/15 00:07	323
<b>Carbon tetrachloride</b>	<b>49</b>	<b>J</b>	260	21	ppb v/v			02/20/15 00:07	323
Chlorobenzene	ND		97	21	ppb v/v			02/20/15 00:07	323
Chloroethane	ND		260	99	ppb v/v			02/20/15 00:07	323
<b>Chloroform</b>	<b>210</b>		97	31	ppb v/v			02/20/15 00:07	323
Chloromethane	ND		260	64	ppb v/v			02/20/15 00:07	323
Dibromochloromethane	ND		130	26	ppb v/v			02/20/15 00:07	323
1,2-Dibromoethane (EDB)	ND		260	24	ppb v/v			02/20/15 00:07	323
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	50	ppb v/v			02/20/15 00:07	323
1,2-Dichlorobenzene	ND		130	42	ppb v/v			02/20/15 00:07	323
1,3-Dichlorobenzene	ND		130	36	ppb v/v			02/20/15 00:07	323
1,4-Dichlorobenzene	ND		130	48	ppb v/v			02/20/15 00:07	323
<b>Dichlorodifluoromethane</b>	<b>89</b>	<b>J</b>	130	47	ppb v/v			02/20/15 00:07	323
<b>1,1-Dichloroethane</b>	<b>24</b>	<b>J</b>	97	23	ppb v/v			02/20/15 00:07	323
<b>1,2-Dichloroethane</b>	<b>63</b>	<b>J</b>	260	28	ppb v/v			02/20/15 00:07	323
<b>1,1-Dichloroethene</b>	<b>870</b>		260	42	ppb v/v			02/20/15 00:07	323
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/20/15 00:07	323
trans-1,2-Dichloroethene	ND		130	32	ppb v/v			02/20/15 00:07	323
<b>1,2-Dichloropropane</b>	<b>85</b>	<b>J</b>	130	78	ppb v/v			02/20/15 00:07	323
cis-1,3-Dichloropropene	ND		130	34	ppb v/v			02/20/15 00:07	323
trans-1,3-Dichloropropene	ND		130	28	ppb v/v			02/20/15 00:07	323
<b>Ethylbenzene</b>	<b>30</b>	<b>J</b>	130	20	ppb v/v			02/20/15 00:07	323
4-Ethyltoluene	ND		130	60	ppb v/v			02/20/15 00:07	323
Hexachlorobutadiene	ND		650	140	ppb v/v			02/20/15 00:07	323
2-Hexanone	ND *		130	28	ppb v/v			02/20/15 00:07	323
4-Methyl-2-pentanone (MIBK)	ND		130	44	ppb v/v			02/20/15 00:07	323
<b>Methylene Chloride</b>	<b>100</b>	<b>J</b>	130	23	ppb v/v			02/20/15 00:07	323
<b>Styrene</b>	<b>27</b>	<b>J</b>	130	19	ppb v/v			02/20/15 00:07	323
1,1,1,2-Tetrachloroethane	ND		130	22	ppb v/v			02/20/15 00:07	323
<b>Tetrachloroethene</b>	<b>270</b>		130	16	ppb v/v			02/20/15 00:07	323
<b>Toluene</b>	<b>300</b>		130	16	ppb v/v			02/20/15 00:07	323
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>2000</b>		130	53	ppb v/v			02/20/15 00:07	323
1,2,4-Trichlorobenzene	ND		650	140	ppb v/v			02/20/15 00:07	323
<b>1,1,1-Trichloroethane</b>	<b>28</b>	<b>J</b>	97	21	ppb v/v			02/20/15 00:07	323
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/20/15 00:07	323
<b>Trichloroethene</b>	<b>13000</b>		130	34	ppb v/v			02/20/15 00:07	323
<b>Trichlorofluoromethane</b>	<b>560</b>		130	63	ppb v/v			02/20/15 00:07	323
1,2,4-Trimethylbenzene	ND		260	52	ppb v/v			02/20/15 00:07	323
1,3,5-Trimethylbenzene	ND		130	40	ppb v/v			02/20/15 00:07	323
Vinyl acetate	ND		260	47	ppb v/v			02/20/15 00:07	323
Vinyl chloride	ND		130	39	ppb v/v			02/20/15 00:07	323
<b>m,p-Xylene</b>	<b>66</b>	<b>J</b>	260	32	ppb v/v			02/20/15 00:07	323
<b>o-Xylene</b>	<b>29</b>	<b>J</b>	130	17	ppb v/v			02/20/15 00:07	323

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11420-1

**Client Sample ID: 097104-001/CWL-D1-350**

**Lab Sample ID: 320-11420-4**

Date Collected: 01/21/15 09:09

Matrix: Air

Date Received: 01/27/15 09:30

Sample Container: Summa Canister 6L

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		70 - 130		02/20/15 00:07	323
1,2-Dichloroethane-d4 (Surr)	104		70 - 130		02/20/15 00:07	323
Toluene-d8 (Surr)	102		70 - 130		02/20/15 00:07	323

**Client Sample ID: 097105-001/CWL-D1-470**

**Lab Sample ID: 320-11420-5**

Date Collected: 01/21/15 09:14

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>5.3</b>	<b>J B</b>	48	1.7	ppb v/v			02/20/15 00:48	9.63
Benzene	ND		3.9	0.76	ppb v/v			02/20/15 00:48	9.63
Benzyl chloride	ND		7.7	1.6	ppb v/v			02/20/15 00:48	9.63
Bromodichloromethane	ND		2.9	0.64	ppb v/v			02/20/15 00:48	9.63
Bromoform	ND		3.9	0.67	ppb v/v			02/20/15 00:48	9.63
Bromomethane	ND		7.7	3.2	ppb v/v			02/20/15 00:48	9.63
2-Butanone (MEK)	ND		7.7	1.9	ppb v/v			02/20/15 00:48	9.63
Carbon disulfide	ND		7.7	0.75	ppb v/v			02/20/15 00:48	9.63
<b>Carbon tetrachloride</b>	<b>0.99</b>	<b>J</b>	7.7	0.62	ppb v/v			02/20/15 00:48	9.63
Chlorobenzene	ND		2.9	0.62	ppb v/v			02/20/15 00:48	9.63
Chloroethane	ND		7.7	3.0	ppb v/v			02/20/15 00:48	9.63
<b>Chloroform</b>	<b>1.2</b>	<b>J</b>	2.9	0.91	ppb v/v			02/20/15 00:48	9.63
Chloromethane	ND		7.7	1.9	ppb v/v			02/20/15 00:48	9.63
Dibromochloromethane	ND		3.9	0.76	ppb v/v			02/20/15 00:48	9.63
1,2-Dibromoethane (EDB)	ND		7.7	0.72	ppb v/v			02/20/15 00:48	9.63
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		3.9	1.5	ppb v/v			02/20/15 00:48	9.63
1,2-Dichlorobenzene	ND		3.9	1.3	ppb v/v			02/20/15 00:48	9.63
1,3-Dichlorobenzene	ND		3.9	1.1	ppb v/v			02/20/15 00:48	9.63
1,4-Dichlorobenzene	ND		3.9	1.4	ppb v/v			02/20/15 00:48	9.63
<b>Dichlorodifluoromethane</b>	<b>14</b>		3.9	1.4	ppb v/v			02/20/15 00:48	9.63
1,1-Dichloroethane	ND		2.9	0.69	ppb v/v			02/20/15 00:48	9.63
1,2-Dichloroethane	ND		7.7	0.85	ppb v/v			02/20/15 00:48	9.63
<b>1,1-Dichloroethene</b>	<b>19</b>		7.7	1.2	ppb v/v			02/20/15 00:48	9.63
cis-1,2-Dichloroethene	ND		3.9	0.86	ppb v/v			02/20/15 00:48	9.63
trans-1,2-Dichloroethene	ND		3.9	0.96	ppb v/v			02/20/15 00:48	9.63
1,2-Dichloropropane	ND		3.9	2.3	ppb v/v			02/20/15 00:48	9.63
cis-1,3-Dichloropropene	ND		3.9	1.0	ppb v/v			02/20/15 00:48	9.63
trans-1,3-Dichloropropene	ND		3.9	0.85	ppb v/v			02/20/15 00:48	9.63
Ethylbenzene	ND		3.9	0.61	ppb v/v			02/20/15 00:48	9.63
4-Ethyltoluene	ND		3.9	1.8	ppb v/v			02/20/15 00:48	9.63
Hexachlorobutadiene	ND		19	4.2	ppb v/v			02/20/15 00:48	9.63
2-Hexanone	ND *		3.9	0.84	ppb v/v			02/20/15 00:48	9.63
4-Methyl-2-pentanone (MIBK)	ND		3.9	1.3	ppb v/v			02/20/15 00:48	9.63
<b>Methylene Chloride</b>	<b>2.0</b>	<b>J</b>	3.9	0.69	ppb v/v			02/20/15 00:48	9.63
Styrene	ND		3.9	0.57	ppb v/v			02/20/15 00:48	9.63
1,1,2,2-Tetrachloroethane	ND		3.9	0.66	ppb v/v			02/20/15 00:48	9.63
<b>Tetrachloroethene</b>	<b>4.1</b>		3.9	0.49	ppb v/v			02/20/15 00:48	9.63
Toluene	ND		3.9	0.49	ppb v/v			02/20/15 00:48	9.63

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11420-1

**Client Sample ID: 097105-001/CWL-D1-470**

**Lab Sample ID: 320-11420-5**

Date Collected: 01/21/15 09:14

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>230</b>		3.9	1.6	ppb v/v			02/20/15 00:48	9.63
1,2,4-Trichlorobenzene	ND		19	4.2	ppb v/v			02/20/15 00:48	9.63
1,1,1-Trichloroethane	ND		2.9	0.63	ppb v/v			02/20/15 00:48	9.63
1,1,2-Trichloroethane	ND		3.9	0.65	ppb v/v			02/20/15 00:48	9.63
<b>Trichloroethene</b>	<b>110</b>		3.9	1.0	ppb v/v			02/20/15 00:48	9.63
<b>Trichlorofluoromethane</b>	<b>52</b>		3.9	1.9	ppb v/v			02/20/15 00:48	9.63
1,2,4-Trimethylbenzene	ND		7.7	1.6	ppb v/v			02/20/15 00:48	9.63
1,3,5-Trimethylbenzene	ND		3.9	1.2	ppb v/v			02/20/15 00:48	9.63
Vinyl acetate	ND		7.7	1.4	ppb v/v			02/20/15 00:48	9.63
Vinyl chloride	ND		3.9	1.2	ppb v/v			02/20/15 00:48	9.63
m,p-Xylene	ND		7.7	0.96	ppb v/v			02/20/15 00:48	9.63
o-Xylene	ND		3.9	0.52	ppb v/v			02/20/15 00:48	9.63
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	98		70 - 130					02/20/15 00:48	9.63
1,2-Dichloroethane-d4 (Surr)	101		70 - 130					02/20/15 00:48	9.63
Toluene-d8 (Surr)	100		70 - 130					02/20/15 00:48	9.63

**Client Sample ID: 097106-001/CWL-SV FB3**

**Lab Sample ID: 320-11420-6**

Date Collected: 01/21/15 08:47

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>0.33</b>	<b>J B</b>	5.0	0.18	ppb v/v			02/20/15 01:32	1
Benzene	ND		0.40	0.079	ppb v/v			02/20/15 01:32	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			02/20/15 01:32	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			02/20/15 01:32	1
Bromoform	ND		0.40	0.070	ppb v/v			02/20/15 01:32	1
Bromomethane	ND		0.80	0.34	ppb v/v			02/20/15 01:32	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			02/20/15 01:32	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			02/20/15 01:32	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			02/20/15 01:32	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			02/20/15 01:32	1
Chloroethane	ND		0.80	0.31	ppb v/v			02/20/15 01:32	1
Chloroform	ND		0.30	0.095	ppb v/v			02/20/15 01:32	1
Chloromethane	ND		0.80	0.20	ppb v/v			02/20/15 01:32	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			02/20/15 01:32	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			02/20/15 01:32	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			02/20/15 01:32	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			02/20/15 01:32	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			02/20/15 01:32	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			02/20/15 01:32	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			02/20/15 01:32	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			02/20/15 01:32	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			02/20/15 01:32	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			02/20/15 01:32	1

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11420-1

**Client Sample ID: 097106-001/CWL-SV FB3**

**Lab Sample ID: 320-11420-6**

Date Collected: 01/21/15 08:47

Matrix: Air

Date Received: 01/27/15 09:30

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	ND		0.40	0.089	ppb v/v			02/20/15 01:32	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			02/20/15 01:32	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			02/20/15 01:32	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			02/20/15 01:32	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			02/20/15 01:32	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			02/20/15 01:32	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			02/20/15 01:32	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			02/20/15 01:32	1
2-Hexanone	ND	*	0.40	0.087	ppb v/v			02/20/15 01:32	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			02/20/15 01:32	1
<b>Methylene Chloride</b>	<b>0.43</b>		0.40	0.072	ppb v/v			02/20/15 01:32	1
Styrene	ND		0.40	0.059	ppb v/v			02/20/15 01:32	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			02/20/15 01:32	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			02/20/15 01:32	1
<b>Toluene</b>	<b>0.24</b>	<b>J</b>	0.40	0.051	ppb v/v			02/20/15 01:32	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			02/20/15 01:32	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			02/20/15 01:32	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			02/20/15 01:32	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			02/20/15 01:32	1
Trichloroethene	ND		0.40	0.11	ppb v/v			02/20/15 01:32	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			02/20/15 01:32	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			02/20/15 01:32	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			02/20/15 01:32	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			02/20/15 01:32	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			02/20/15 01:32	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			02/20/15 01:32	1
o-Xylene	ND		0.40	0.054	ppb v/v			02/20/15 01:32	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	92		70 - 130					02/20/15 01:32	1
1,2-Dichloroethane-d4 (Surr)	99		70 - 130					02/20/15 01:32	1
Toluene-d8 (Surr)	103		70 - 130					02/20/15 01:32	1



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097107-001/CWL-D2-120**

**Lab Sample ID: 320-11419-1**

**Date Collected: 01/21/15 09:59**

**Matrix: Air**

**Date Received: 01/27/15 09:30**

**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
<b>Acetone</b>	<b>880</b>	<b>J B</b>	2800	100	ppb v/v			02/19/15 05:21	569
Benzene	ND		230	45	ppb v/v			02/19/15 05:21	569
Benzyl chloride	ND		460	93	ppb v/v			02/19/15 05:21	569
Bromodichloromethane	ND		170	38	ppb v/v			02/19/15 05:21	569
Bromoform	ND		230	40	ppb v/v			02/19/15 05:21	569
Bromomethane	ND		460	190	ppb v/v			02/19/15 05:21	569
2-Butanone (MEK)	ND		460	110	ppb v/v			02/19/15 05:21	569
<b>Carbon disulfide</b>	<b>73</b>	<b>J</b>	460	44	ppb v/v			02/19/15 05:21	569
<b>Carbon tetrachloride</b>	<b>42</b>	<b>J</b>	460	36	ppb v/v			02/19/15 05:21	569
Chlorobenzene	ND		170	36	ppb v/v			02/19/15 05:21	569
Chloroethane	ND		460	180	ppb v/v			02/19/15 05:21	569
<b>Chloroform</b>	<b>620</b>		170	54	ppb v/v			02/19/15 05:21	569
Chloromethane	ND		460	110	ppb v/v			02/19/15 05:21	569
Dibromochloromethane	ND		230	45	ppb v/v			02/19/15 05:21	569
1,2-Dibromoethane (EDB)	ND		460	43	ppb v/v			02/19/15 05:21	569
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		230	88	ppb v/v			02/19/15 05:21	569
1,2-Dichlorobenzene	ND		230	74	ppb v/v			02/19/15 05:21	569
1,3-Dichlorobenzene	ND		230	63	ppb v/v			02/19/15 05:21	569
1,4-Dichlorobenzene	ND		230	85	ppb v/v			02/19/15 05:21	569
Dichlorodifluoromethane	ND		230	83	ppb v/v			02/19/15 05:21	569
1,1-Dichloroethane	ND		170	41	ppb v/v			02/19/15 05:21	569
<b>1,2-Dichloroethane</b>	<b>78</b>	<b>J</b>	460	50	ppb v/v			02/19/15 05:21	569
<b>1,1-Dichloroethene</b>	<b>690</b>		460	73	ppb v/v			02/19/15 05:21	569
cis-1,2-Dichloroethene	ND		230	51	ppb v/v			02/19/15 05:21	569
trans-1,2-Dichloroethene	ND		230	57	ppb v/v			02/19/15 05:21	569
<b>1,2-Dichloropropane</b>	<b>240</b>		230	140	ppb v/v			02/19/15 05:21	569
cis-1,3-Dichloropropene	ND		230	59	ppb v/v			02/19/15 05:21	569
trans-1,3-Dichloropropene	ND		230	50	ppb v/v			02/19/15 05:21	569
Ethylbenzene	ND		230	36	ppb v/v			02/19/15 05:21	569
4-Ethyltoluene	ND		230	110	ppb v/v			02/19/15 05:21	569
Hexachlorobutadiene	ND		1100	250	ppb v/v			02/19/15 05:21	569
2-Hexanone	ND *		230	50	ppb v/v			02/19/15 05:21	569
4-Methyl-2-pentanone (MIBK)	ND *		230	77	ppb v/v			02/19/15 05:21	569
<b>Methylene Chloride</b>	<b>61</b>	<b>J</b>	230	41	ppb v/v			02/19/15 05:21	569
Styrene	ND		230	34	ppb v/v			02/19/15 05:21	569
1,1,2,2-Tetrachloroethane	ND		230	39	ppb v/v			02/19/15 05:21	569
<b>Tetrachloroethene</b>	<b>530</b>		230	29	ppb v/v			02/19/15 05:21	569
<b>Toluene</b>	<b>120</b>	<b>J</b>	230	29	ppb v/v			02/19/15 05:21	569
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>1800</b>		230	93	ppb v/v			02/19/15 05:21	569
1,2,4-Trichlorobenzene	ND		1100	250	ppb v/v			02/19/15 05:21	569
<b>1,1,1-Trichloroethane</b>	<b>60</b>	<b>J</b>	170	37	ppb v/v			02/19/15 05:21	569
1,1,2-Trichloroethane	ND		230	38	ppb v/v			02/19/15 05:21	569
<b>Trichloroethene</b>	<b>13000</b>		230	60	ppb v/v			02/19/15 05:21	569
<b>Trichlorofluoromethane</b>	<b>500</b>		230	110	ppb v/v			02/19/15 05:21	569
1,2,4-Trimethylbenzene	ND		460	92	ppb v/v			02/19/15 05:21	569
1,3,5-Trimethylbenzene	ND		230	71	ppb v/v			02/19/15 05:21	569
Vinyl acetate	ND		460	83	ppb v/v			02/19/15 05:21	569

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097107-001/CWL-D2-120**

**Lab Sample ID: 320-11419-1**

Date Collected: 01/21/15 09:59

Matrix: Air

Date Received: 01/27/15 09:30

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		230	68	ppb v/v			02/19/15 05:21	569
<b>m,p-Xylene</b>	<b>77</b>	<b>J</b>	460	57	ppb v/v			02/19/15 05:21	569
<b>o-Xylene</b>	<b>37</b>	<b>J</b>	230	31	ppb v/v			02/19/15 05:21	569
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	99		70 - 130					02/19/15 05:21	569
1,2-Dichloroethane-d4 (Surr)	103		70 - 130					02/19/15 05:21	569
Toluene-d8 (Surr)	99		70 - 130					02/19/15 05:21	569

**Client Sample ID: 097108-001/CWL-D2-240**

**Lab Sample ID: 320-11419-2**

Date Collected: 01/21/15 10:03

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>700</b>	<b>J B</b>	3300	120	ppb v/v			02/19/15 06:02	664
Benzene	ND		270	52	ppb v/v			02/19/15 06:02	664
Benzyl chloride	ND		530	110	ppb v/v			02/19/15 06:02	664
Bromodichloromethane	ND		200	44	ppb v/v			02/19/15 06:02	664
Bromoform	ND		270	46	ppb v/v			02/19/15 06:02	664
Bromomethane	ND		530	220	ppb v/v			02/19/15 06:02	664
2-Butanone (MEK)	ND		530	130	ppb v/v			02/19/15 06:02	664
Carbon disulfide	ND		530	52	ppb v/v			02/19/15 06:02	664
Carbon tetrachloride	ND		530	42	ppb v/v			02/19/15 06:02	664
Chlorobenzene	ND		200	42	ppb v/v			02/19/15 06:02	664
Chloroethane	ND		530	200	ppb v/v			02/19/15 06:02	664
<b>Chloroform</b>	<b>530</b>		200	63	ppb v/v			02/19/15 06:02	664
Chloromethane	ND		530	130	ppb v/v			02/19/15 06:02	664
Dibromochloromethane	ND		270	52	ppb v/v			02/19/15 06:02	664
1,2-Dibromoethane (EDB)	ND		530	50	ppb v/v			02/19/15 06:02	664
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		270	100	ppb v/v			02/19/15 06:02	664
1,2-Dichlorobenzene	ND		270	86	ppb v/v			02/19/15 06:02	664
1,3-Dichlorobenzene	ND		270	73	ppb v/v			02/19/15 06:02	664
1,4-Dichlorobenzene	ND		270	99	ppb v/v			02/19/15 06:02	664
Dichlorodifluoromethane	ND		270	96	ppb v/v			02/19/15 06:02	664
1,1-Dichloroethane	ND		200	48	ppb v/v			02/19/15 06:02	664
<b>1,2-Dichloroethane</b>	<b>66</b>	<b>J</b>	530	58	ppb v/v			02/19/15 06:02	664
<b>1,1-Dichloroethene</b>	<b>760</b>		530	86	ppb v/v			02/19/15 06:02	664
cis-1,2-Dichloroethene	ND		270	59	ppb v/v			02/19/15 06:02	664
trans-1,2-Dichloroethene	ND		270	66	ppb v/v			02/19/15 06:02	664
<b>1,2-Dichloropropane</b>	<b>200</b>	<b>J</b>	270	160	ppb v/v			02/19/15 06:02	664
cis-1,3-Dichloropropene	ND		270	69	ppb v/v			02/19/15 06:02	664
trans-1,3-Dichloropropene	ND		270	58	ppb v/v			02/19/15 06:02	664
Ethylbenzene	ND		270	42	ppb v/v			02/19/15 06:02	664
4-Ethyltoluene	ND		270	120	ppb v/v			02/19/15 06:02	664
Hexachlorobutadiene	ND		1300	290	ppb v/v			02/19/15 06:02	664
2-Hexanone	ND *		270	58	ppb v/v			02/19/15 06:02	664
4-Methyl-2-pentanone (MIBK)	ND *		270	90	ppb v/v			02/19/15 06:02	664

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097108-001/CWL-D2-240**

**Lab Sample ID: 320-11419-2**

Date Collected: 01/21/15 10:03

Matrix: Air

Date Received: 01/27/15 09:30

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	73	J	270	48	ppb v/v			02/19/15 06:02	664
Styrene	ND		270	39	ppb v/v			02/19/15 06:02	664
1,1,2,2-Tetrachloroethane	ND		270	46	ppb v/v			02/19/15 06:02	664
Tetrachloroethene	460		270	34	ppb v/v			02/19/15 06:02	664
Toluene	120	J	270	34	ppb v/v			02/19/15 06:02	664
1,1,2-Trichloro-1,2,2-trifluoroethane	1800		270	110	ppb v/v			02/19/15 06:02	664
1,2,4-Trichlorobenzene	ND		1300	290	ppb v/v			02/19/15 06:02	664
1,1,1-Trichloroethane	44	J	200	43	ppb v/v			02/19/15 06:02	664
1,1,2-Trichloroethane	ND		270	44	ppb v/v			02/19/15 06:02	664
Trichloroethene	13000		270	70	ppb v/v			02/19/15 06:02	664
Trichlorofluoromethane	520		270	130	ppb v/v			02/19/15 06:02	664
1,2,4-Trimethylbenzene	ND		530	110	ppb v/v			02/19/15 06:02	664
1,3,5-Trimethylbenzene	ND		270	83	ppb v/v			02/19/15 06:02	664
Vinyl acetate	ND		530	96	ppb v/v			02/19/15 06:02	664
Vinyl chloride	ND		270	80	ppb v/v			02/19/15 06:02	664
m,p-Xylene	ND		530	66	ppb v/v			02/19/15 06:02	664
o-Xylene	ND		270	36	ppb v/v			02/19/15 06:02	664
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	99		70 - 130					02/19/15 06:02	664
1,2-Dichloroethane-d4 (Surr)	103		70 - 130					02/19/15 06:02	664
Toluene-d8 (Surr)	99		70 - 130					02/19/15 06:02	664

**Client Sample ID: 097109-001/CWL-D2-240**

**Lab Sample ID: 320-11419-3**

Date Collected: 01/21/15 10:04

Matrix: Air

Date Received: 01/27/15 09:30

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	1000	J B	3100	110	ppb v/v			02/19/15 06:43	611
Benzene	ND		240	48	ppb v/v			02/19/15 06:43	611
Benzyl chloride	ND		490	100	ppb v/v			02/19/15 06:43	611
Bromodichloromethane	ND		180	40	ppb v/v			02/19/15 06:43	611
Bromoform	ND		240	43	ppb v/v			02/19/15 06:43	611
Bromomethane	ND		490	200	ppb v/v			02/19/15 06:43	611
2-Butanone (MEK)	ND		490	120	ppb v/v			02/19/15 06:43	611
Carbon disulfide	ND		490	48	ppb v/v			02/19/15 06:43	611
Carbon tetrachloride	43	J	490	39	ppb v/v			02/19/15 06:43	611
Chlorobenzene	ND		180	39	ppb v/v			02/19/15 06:43	611
Chloroethane	ND		490	190	ppb v/v			02/19/15 06:43	611
Chloroform	520		180	58	ppb v/v			02/19/15 06:43	611
Chloromethane	ND		490	120	ppb v/v			02/19/15 06:43	611
Dibromochloromethane	ND		240	48	ppb v/v			02/19/15 06:43	611
1,2-Dibromoethane (EDB)	ND		490	46	ppb v/v			02/19/15 06:43	611
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		240	95	ppb v/v			02/19/15 06:43	611
1,2-Dichlorobenzene	ND		240	79	ppb v/v			02/19/15 06:43	611
1,3-Dichlorobenzene	ND		240	67	ppb v/v			02/19/15 06:43	611

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097109-001/CWL-D2-240**

**Lab Sample ID: 320-11419-3**

Date Collected: 01/21/15 10:04

Matrix: Air

Date Received: 01/27/15 09:30

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
1,4-Dichlorobenzene	ND		240	91	ppb v/v			02/19/15 06:43	611
Dichlorodifluoromethane	ND		240	89	ppb v/v			02/19/15 06:43	611
1,1-Dichloroethane	ND		180	44	ppb v/v			02/19/15 06:43	611
<b>1,2-Dichloroethane</b>	<b>69</b>	<b>J</b>	490	54	ppb v/v			02/19/15 06:43	611
<b>1,1-Dichloroethene</b>	<b>770</b>		490	79	ppb v/v			02/19/15 06:43	611
cis-1,2-Dichloroethene	ND		240	54	ppb v/v			02/19/15 06:43	611
trans-1,2-Dichloroethene	ND		240	61	ppb v/v			02/19/15 06:43	611
<b>1,2-Dichloropropane</b>	<b>200</b>	<b>J</b>	240	150	ppb v/v			02/19/15 06:43	611
cis-1,3-Dichloropropene	ND		240	64	ppb v/v			02/19/15 06:43	611
trans-1,3-Dichloropropene	ND		240	54	ppb v/v			02/19/15 06:43	611
Ethylbenzene	ND		240	38	ppb v/v			02/19/15 06:43	611
4-Ethyltoluene	ND		240	110	ppb v/v			02/19/15 06:43	611
Hexachlorobutadiene	ND		1200	260	ppb v/v			02/19/15 06:43	611
2-Hexanone	ND *		240	53	ppb v/v			02/19/15 06:43	611
4-Methyl-2-pentanone (MIBK)	ND *		240	82	ppb v/v			02/19/15 06:43	611
<b>Methylene Chloride</b>	<b>75</b>	<b>J</b>	240	44	ppb v/v			02/19/15 06:43	611
Styrene	ND		240	36	ppb v/v			02/19/15 06:43	611
1,1,2,2-Tetrachloroethane	ND		240	42	ppb v/v			02/19/15 06:43	611
<b>Tetrachloroethene</b>	<b>450</b>		240	31	ppb v/v			02/19/15 06:43	611
<b>Toluene</b>	<b>140</b>	<b>J</b>	240	31	ppb v/v			02/19/15 06:43	611
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>1800</b>		240	100	ppb v/v			02/19/15 06:43	611
1,2,4-Trichlorobenzene	ND		1200	260	ppb v/v			02/19/15 06:43	611
<b>1,1,1-Trichloroethane</b>	<b>49</b>	<b>J</b>	180	40	ppb v/v			02/19/15 06:43	611
1,1,2-Trichloroethane	ND		240	41	ppb v/v			02/19/15 06:43	611
<b>Trichloroethene</b>	<b>12000</b>		240	64	ppb v/v			02/19/15 06:43	611
<b>Trichlorofluoromethane</b>	<b>510</b>		240	120	ppb v/v			02/19/15 06:43	611
1,2,4-Trimethylbenzene	ND		490	99	ppb v/v			02/19/15 06:43	611
1,3,5-Trimethylbenzene	ND		240	76	ppb v/v			02/19/15 06:43	611
Vinyl acetate	ND		490	89	ppb v/v			02/19/15 06:43	611
Vinyl chloride	ND		240	73	ppb v/v			02/19/15 06:43	611
<b>m,p-Xylene</b>	<b>76</b>	<b>J</b>	490	61	ppb v/v			02/19/15 06:43	611
<b>o-Xylene</b>	<b>35</b>	<b>J</b>	240	33	ppb v/v			02/19/15 06:43	611
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		70 - 130					02/19/15 06:43	611
1,2-Dichloroethane-d4 (Surr)	104		70 - 130					02/19/15 06:43	611
Toluene-d8 (Surr)	101		70 - 130					02/19/15 06:43	611

**Client Sample ID: 097110-001/CWL-D2-350**

**Lab Sample ID: 320-11419-4**

Date Collected: 01/21/15 10:08

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>840</b>	<b>J B</b>	1800	65	ppb v/v			02/19/15 07:23	367
Benzene	ND		150	29	ppb v/v			02/19/15 07:23	367
Benzyl chloride	ND		290	60	ppb v/v			02/19/15 07:23	367

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097110-001/CWL-D2-350**

**Lab Sample ID: 320-11419-4**

Date Collected: 01/21/15 10:08

Matrix: Air

Date Received: 01/27/15 09:30

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
Bromodichloromethane	ND		110	24	ppb v/v			02/19/15 07:23	367
Bromoform	ND		150	26	ppb v/v			02/19/15 07:23	367
Bromomethane	ND		290	120	ppb v/v			02/19/15 07:23	367
2-Butanone (MEK)	ND		290	73	ppb v/v			02/19/15 07:23	367
Carbon disulfide	ND		290	29	ppb v/v			02/19/15 07:23	367
<b>Carbon tetrachloride</b>	<b>33</b>	<b>J</b>	290	23	ppb v/v			02/19/15 07:23	367
Chlorobenzene	ND		110	23	ppb v/v			02/19/15 07:23	367
Chloroethane	ND		290	110	ppb v/v			02/19/15 07:23	367
<b>Chloroform</b>	<b>230</b>		110	35	ppb v/v			02/19/15 07:23	367
Chloromethane	ND		290	72	ppb v/v			02/19/15 07:23	367
Dibromochloromethane	ND		150	29	ppb v/v			02/19/15 07:23	367
1,2-Dibromoethane (EDB)	ND		290	28	ppb v/v			02/19/15 07:23	367
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		150	57	ppb v/v			02/19/15 07:23	367
1,2-Dichlorobenzene	ND		150	48	ppb v/v			02/19/15 07:23	367
1,3-Dichlorobenzene	ND		150	40	ppb v/v			02/19/15 07:23	367
1,4-Dichlorobenzene	ND		150	55	ppb v/v			02/19/15 07:23	367
<b>Dichlorodifluoromethane</b>	<b>69</b>	<b>J</b>	150	53	ppb v/v			02/19/15 07:23	367
1,1-Dichloroethane	ND		110	26	ppb v/v			02/19/15 07:23	367
<b>1,2-Dichloroethane</b>	<b>41</b>	<b>J</b>	290	32	ppb v/v			02/19/15 07:23	367
<b>1,1-Dichloroethene</b>	<b>630</b>		290	47	ppb v/v			02/19/15 07:23	367
cis-1,2-Dichloroethene	ND		150	33	ppb v/v			02/19/15 07:23	367
trans-1,2-Dichloroethene	ND		150	37	ppb v/v			02/19/15 07:23	367
<b>1,2-Dichloropropane</b>	<b>90</b>	<b>J</b>	150	88	ppb v/v			02/19/15 07:23	367
cis-1,3-Dichloropropene	ND		150	38	ppb v/v			02/19/15 07:23	367
trans-1,3-Dichloropropene	ND		150	32	ppb v/v			02/19/15 07:23	367
<b>Ethylbenzene</b>	<b>33</b>	<b>J</b>	150	23	ppb v/v			02/19/15 07:23	367
4-Ethyltoluene	ND		150	69	ppb v/v			02/19/15 07:23	367
Hexachlorobutadiene	ND		730	160	ppb v/v			02/19/15 07:23	367
2-Hexanone	ND	*	150	32	ppb v/v			02/19/15 07:23	367
4-Methyl-2-pentanone (MIBK)	ND	*	150	50	ppb v/v			02/19/15 07:23	367
<b>Methylene Chloride</b>	<b>130</b>	<b>J</b>	150	26	ppb v/v			02/19/15 07:23	367
Styrene	ND		150	22	ppb v/v			02/19/15 07:23	367
1,1,2,2-Tetrachloroethane	ND		150	25	ppb v/v			02/19/15 07:23	367
<b>Tetrachloroethene</b>	<b>260</b>		150	19	ppb v/v			02/19/15 07:23	367
<b>Toluene</b>	<b>130</b>	<b>J</b>	150	19	ppb v/v			02/19/15 07:23	367
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>1500</b>		150	60	ppb v/v			02/19/15 07:23	367
1,2,4-Trichlorobenzene	ND		730	160	ppb v/v			02/19/15 07:23	367
1,1,1-Trichloroethane	ND		110	24	ppb v/v			02/19/15 07:23	367
1,1,2-Trichloroethane	ND		150	25	ppb v/v			02/19/15 07:23	367
<b>Trichloroethene</b>	<b>8100</b>		150	39	ppb v/v			02/19/15 07:23	367
<b>Trichlorofluoromethane</b>	<b>430</b>		150	72	ppb v/v			02/19/15 07:23	367
1,2,4-Trimethylbenzene	ND		290	59	ppb v/v			02/19/15 07:23	367
1,3,5-Trimethylbenzene	ND		150	46	ppb v/v			02/19/15 07:23	367
Vinyl acetate	ND		290	53	ppb v/v			02/19/15 07:23	367
Vinyl chloride	ND		150	44	ppb v/v			02/19/15 07:23	367
<b>m,p-Xylene</b>	<b>82</b>	<b>J</b>	290	37	ppb v/v			02/19/15 07:23	367
<b>o-Xylene</b>	<b>40</b>	<b>J</b>	150	20	ppb v/v			02/19/15 07:23	367

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097110-001/CWL-D2-350**

**Lab Sample ID: 320-11419-4**

Date Collected: 01/21/15 10:08

Matrix: Air

Date Received: 01/27/15 09:30

Sample Container: Summa Canister 6L

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		70 - 130		02/19/15 07:23	367
1,2-Dichloroethane-d4 (Surr)	105		70 - 130		02/19/15 07:23	367
Toluene-d8 (Surr)	101		70 - 130		02/19/15 07:23	367

**Client Sample ID: 097111-001/CWL-D2-440**

**Lab Sample ID: 320-11419-5**

Date Collected: 01/21/15 10:13

Matrix: Air

Date Received: 01/27/15 09:30

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	65	J H	100	3.7	ppb v/v			02/28/15 06:07	20.6
Benzene	3.0	J H	8.2	1.6	ppb v/v			02/28/15 06:07	20.6
Benzyl chloride	ND	H	16	3.4	ppb v/v			02/28/15 06:07	20.6
Bromodichloromethane	ND	H	6.2	1.4	ppb v/v			02/28/15 06:07	20.6
Bromoform	ND	H	8.2	1.4	ppb v/v			02/28/15 06:07	20.6
Bromomethane	ND	H	16	6.9	ppb v/v			02/28/15 06:07	20.6
2-Butanone (MEK)	6.2	J H	16	4.1	ppb v/v			02/28/15 06:07	20.6
Carbon disulfide	ND	H	16	1.6	ppb v/v			02/28/15 06:07	20.6
Carbon tetrachloride	10	J H	16	1.3	ppb v/v			02/28/15 06:07	20.6
Chlorobenzene	ND	H	6.2	1.3	ppb v/v			02/28/15 06:07	20.6
Chloroethane	ND	H	16	6.3	ppb v/v			02/28/15 06:07	20.6
Chloroform	50	H	6.2	2.0	ppb v/v			02/28/15 06:07	20.6
Chloromethane	ND	H	16	4.1	ppb v/v			02/28/15 06:07	20.6
Dibromochloromethane	ND	H	8.2	1.6	ppb v/v			02/28/15 06:07	20.6
1,2-Dibromoethane (EDB)	ND	H	16	1.5	ppb v/v			02/28/15 06:07	20.6
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	H	8.2	3.2	ppb v/v			02/28/15 06:07	20.6
1,2-Dichlorobenzene	ND	H	8.2	2.7	ppb v/v			02/28/15 06:07	20.6
1,3-Dichlorobenzene	ND	H	8.2	2.3	ppb v/v			02/28/15 06:07	20.6
1,4-Dichlorobenzene	ND	H	8.2	3.1	ppb v/v			02/28/15 06:07	20.6
Dichlorodifluoromethane	25	H	8.2	3.0	ppb v/v			02/28/15 06:07	20.6
1,1-Dichloroethane	ND	H	6.2	1.5	ppb v/v			02/28/15 06:07	20.6
1,2-Dichloroethane	ND	H	16	1.8	ppb v/v			02/28/15 06:07	20.6
1,1-Dichloroethene	200	H	16	2.7	ppb v/v			02/28/15 06:07	20.6
cis-1,2-Dichloroethene	ND	H	8.2	1.8	ppb v/v			02/28/15 06:07	20.6
trans-1,2-Dichloroethene	ND	H	8.2	2.1	ppb v/v			02/28/15 06:07	20.6
1,2-Dichloropropane	17	H	8.2	4.9	ppb v/v			02/28/15 06:07	20.6
cis-1,3-Dichloropropene	ND	H	8.2	2.1	ppb v/v			02/28/15 06:07	20.6
trans-1,3-Dichloropropene	ND	H	8.2	1.8	ppb v/v			02/28/15 06:07	20.6
Ethylbenzene	ND	H	8.2	1.3	ppb v/v			02/28/15 06:07	20.6
4-Ethyltoluene	ND	H	8.2	3.9	ppb v/v			02/28/15 06:07	20.6
Hexachlorobutadiene	ND	H	41	8.9	ppb v/v			02/28/15 06:07	20.6
2-Hexanone	ND	H	8.2	1.8	ppb v/v			02/28/15 06:07	20.6
4-Methyl-2-pentanone (MIBK)	ND	H	8.2	2.8	ppb v/v			02/28/15 06:07	20.6
Methylene Chloride	23	H	8.2	1.5	ppb v/v			02/28/15 06:07	20.6
Styrene	ND	H	8.2	1.2	ppb v/v			02/28/15 06:07	20.6
1,1,2,2-Tetrachloroethane	ND	H	8.2	1.4	ppb v/v			02/28/15 06:07	20.6
Tetrachloroethene	86	H	8.2	1.1	ppb v/v			02/28/15 06:07	20.6
Toluene	3.6	J H	8.2	1.1	ppb v/v			02/28/15 06:07	20.6

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097111-001/CWL-D2-440**

**Lab Sample ID: 320-11419-5**

Date Collected: 01/21/15 10:13

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>510</b>	<b>H</b>	8.2	3.4	ppb v/v			02/28/15 06:07	20.6
1,2,4-Trichlorobenzene	ND	H	41	8.9	ppb v/v			02/28/15 06:07	20.6
<b>1,1,1-Trichloroethane</b>	<b>6.1</b>	<b>J H</b>	6.2	1.3	ppb v/v			02/28/15 06:07	20.6
1,1,2-Trichloroethane	ND	H	8.2	1.4	ppb v/v			02/28/15 06:07	20.6
<b>Trichlorofluoromethane</b>	<b>140</b>	<b>H</b>	8.2	4.0	ppb v/v			02/28/15 06:07	20.6
1,2,4-Trimethylbenzene	ND	H	16	3.3	ppb v/v			02/28/15 06:07	20.6
1,3,5-Trimethylbenzene	ND	H	8.2	2.6	ppb v/v			02/28/15 06:07	20.6
Vinyl acetate	ND	H	16	3.0	ppb v/v			02/28/15 06:07	20.6
Vinyl chloride	ND	H	8.2	2.5	ppb v/v			02/28/15 06:07	20.6
m,p-Xylene	ND	H	16	2.1	ppb v/v			02/28/15 06:07	20.6
o-Xylene	ND	H	8.2	1.1	ppb v/v			02/28/15 06:07	20.6
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	95		70 - 130					02/28/15 06:07	20.6
1,2-Dichloroethane-d4 (Surr)	104		70 - 130					02/28/15 06:07	20.6
Toluene-d8 (Surr)	100		70 - 130					02/28/15 06:07	20.6

**Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Trichloroethene</b>	<b>1900</b>		48	12	ppb v/v			02/19/15 08:04	119
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	98		70 - 130					02/19/15 08:04	119
1,2-Dichloroethane-d4 (Surr)	101		70 - 130					02/19/15 08:04	119
Toluene-d8 (Surr)	101		70 - 130					02/19/15 08:04	119

**Client Sample ID: 097112-001/CWL-D2-440**

**Lab Sample ID: 320-11419-6**

Date Collected: 01/21/15 10:15

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>14</b>	<b>J H</b>	190	6.6	ppb v/v			02/28/15 06:55	37.1
<b>Benzene</b>	<b>6.2</b>	<b>J H</b>	15	2.9	ppb v/v			02/28/15 06:55	37.1
Benzyl chloride	ND	H	30	6.0	ppb v/v			02/28/15 06:55	37.1
Bromodichloromethane	ND	H	11	2.4	ppb v/v			02/28/15 06:55	37.1
Bromoform	ND	H	15	2.6	ppb v/v			02/28/15 06:55	37.1
Bromomethane	ND	H	30	12	ppb v/v			02/28/15 06:55	37.1
2-Butanone (MEK)	ND	H	30	7.4	ppb v/v			02/28/15 06:55	37.1
Carbon disulfide	ND	H	30	2.9	ppb v/v			02/28/15 06:55	37.1
<b>Carbon tetrachloride</b>	<b>9.7</b>	<b>J H</b>	30	2.4	ppb v/v			02/28/15 06:55	37.1
Chlorobenzene	ND	H	11	2.4	ppb v/v			02/28/15 06:55	37.1
Chloroethane	ND	H	30	11	ppb v/v			02/28/15 06:55	37.1
<b>Chloroform</b>	<b>100</b>	<b>H</b>	11	3.5	ppb v/v			02/28/15 06:55	37.1
Chloromethane	ND	H	30	7.3	ppb v/v			02/28/15 06:55	37.1
Dibromochloromethane	ND	H	15	2.9	ppb v/v			02/28/15 06:55	37.1
1,2-Dibromoethane (EDB)	ND	H	30	2.8	ppb v/v			02/28/15 06:55	37.1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	H	15	5.8	ppb v/v			02/28/15 06:55	37.1

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097112-001/CWL-D2-440**

**Lab Sample ID: 320-11419-6**

Date Collected: 01/21/15 10:15

Matrix: Air

Date Received: 01/27/15 09:30

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-Dichlorobenzene	ND	H	15	4.8	ppb v/v			02/28/15 06:55	37.1
1,3-Dichlorobenzene	ND	H	15	4.1	ppb v/v			02/28/15 06:55	37.1
1,4-Dichlorobenzene	ND	H	15	5.5	ppb v/v			02/28/15 06:55	37.1
<b>Dichlorodifluoromethane</b>	<b>46</b>	<b>H</b>	15	5.4	ppb v/v			02/28/15 06:55	37.1
<b>1,1-Dichloroethane</b>	<b>7.6</b>	<b>J H</b>	11	2.7	ppb v/v			02/28/15 06:55	37.1
1,2-Dichloroethane	ND	H	30	3.3	ppb v/v			02/28/15 06:55	37.1
<b>1,1-Dichloroethene</b>	<b>400</b>	<b>H</b>	30	4.8	ppb v/v			02/28/15 06:55	37.1
cis-1,2-Dichloroethene	ND	H	15	3.3	ppb v/v			02/28/15 06:55	37.1
trans-1,2-Dichloroethene	ND	H	15	3.7	ppb v/v			02/28/15 06:55	37.1
<b>1,2-Dichloropropane</b>	<b>39</b>	<b>H</b>	15	8.9	ppb v/v			02/28/15 06:55	37.1
cis-1,3-Dichloropropene	ND	H	15	3.9	ppb v/v			02/28/15 06:55	37.1
trans-1,3-Dichloropropene	ND	H	15	3.3	ppb v/v			02/28/15 06:55	37.1
Ethylbenzene	ND	H	15	2.3	ppb v/v			02/28/15 06:55	37.1
4-Ethyltoluene	ND	H	15	6.9	ppb v/v			02/28/15 06:55	37.1
Hexachlorobutadiene	ND	H	74	16	ppb v/v			02/28/15 06:55	37.1
2-Hexanone	ND	H	15	3.2	ppb v/v			02/28/15 06:55	37.1
4-Methyl-2-pentanone (MIBK)	ND	H	15	5.0	ppb v/v			02/28/15 06:55	37.1
<b>Methylene Chloride</b>	<b>36</b>	<b>H</b>	15	2.7	ppb v/v			02/28/15 06:55	37.1
Styrene	ND	H	15	2.2	ppb v/v			02/28/15 06:55	37.1
1,1,2,2-Tetrachloroethane	ND	H	15	2.6	ppb v/v			02/28/15 06:55	37.1
<b>Tetrachloroethene</b>	<b>180</b>	<b>H</b>	15	1.9	ppb v/v			02/28/15 06:55	37.1
<b>Toluene</b>	<b>3.0</b>	<b>J H</b>	15	1.9	ppb v/v			02/28/15 06:55	37.1
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>1100</b>	<b>H</b>	15	6.0	ppb v/v			02/28/15 06:55	37.1
1,2,4-Trichlorobenzene	ND	H	74	16	ppb v/v			02/28/15 06:55	37.1
<b>1,1,1-Trichloroethane</b>	<b>13</b>	<b>H</b>	11	2.4	ppb v/v			02/28/15 06:55	37.1
1,1,2-Trichloroethane	ND	H	15	2.5	ppb v/v			02/28/15 06:55	37.1
<b>Trichlorofluoromethane</b>	<b>300</b>	<b>H</b>	15	7.3	ppb v/v			02/28/15 06:55	37.1
1,2,4-Trimethylbenzene	ND	H	30	6.0	ppb v/v			02/28/15 06:55	37.1
1,3,5-Trimethylbenzene	ND	H	15	4.6	ppb v/v			02/28/15 06:55	37.1
Vinyl acetate	ND	H	30	5.4	ppb v/v			02/28/15 06:55	37.1
Vinyl chloride	ND	H	15	4.5	ppb v/v			02/28/15 06:55	37.1
m,p-Xylene	ND	H	30	3.7	ppb v/v			02/28/15 06:55	37.1
o-Xylene	ND	H	15	2.0	ppb v/v			02/28/15 06:55	37.1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		70 - 130					02/28/15 06:55	37.1
1,2-Dichloroethane-d4 (Surr)	104		70 - 130					02/28/15 06:55	37.1
Toluene-d8 (Surr)	99		70 - 130					02/28/15 06:55	37.1

**Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Trichloroethene</b>	<b>3900</b>		74	19	ppb v/v			02/19/15 08:45	185
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		70 - 130					02/19/15 08:45	185
1,2-Dichloroethane-d4 (Surr)	104		70 - 130					02/19/15 08:45	185
Toluene-d8 (Surr)	101		70 - 130					02/19/15 08:45	185



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097113-001/CWL-D2-470**

**Lab Sample ID: 320-11419-7**

Date Collected: 01/21/15 10:21

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>1200</b>	<b>B</b>	1200	44	ppb v/v			02/19/15 09:26	246
Benzene	ND		98	19	ppb v/v			02/19/15 09:26	246
Benzyl chloride	ND		200	40	ppb v/v			02/19/15 09:26	246
Bromodichloromethane	ND		74	16	ppb v/v			02/19/15 09:26	246
Bromoform	ND		98	17	ppb v/v			02/19/15 09:26	246
Bromomethane	ND		200	82	ppb v/v			02/19/15 09:26	246
<b>2-Butanone (MEK)</b>	<b>140</b>	<b>J</b>	200	49	ppb v/v			02/19/15 09:26	246
Carbon disulfide	ND		200	19	ppb v/v			02/19/15 09:26	246
Carbon tetrachloride	ND		200	16	ppb v/v			02/19/15 09:26	246
Chlorobenzene	ND		74	16	ppb v/v			02/19/15 09:26	246
Chloroethane	ND		200	76	ppb v/v			02/19/15 09:26	246
<b>Chloroform</b>	<b>260</b>		74	23	ppb v/v			02/19/15 09:26	246
Chloromethane	ND		200	48	ppb v/v			02/19/15 09:26	246
Dibromochloromethane	ND		98	19	ppb v/v			02/19/15 09:26	246
1,2-Dibromoethane (EDB)	ND		200	18	ppb v/v			02/19/15 09:26	246
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		98	38	ppb v/v			02/19/15 09:26	246
1,2-Dichlorobenzene	ND		98	32	ppb v/v			02/19/15 09:26	246
1,3-Dichlorobenzene	ND		98	27	ppb v/v			02/19/15 09:26	246
1,4-Dichlorobenzene	ND		98	37	ppb v/v			02/19/15 09:26	246
Dichlorodifluoromethane	ND		98	36	ppb v/v			02/19/15 09:26	246
1,1-Dichloroethane	ND		74	18	ppb v/v			02/19/15 09:26	246
<b>1,2-Dichloroethane</b>	<b>63</b>	<b>J</b>	200	22	ppb v/v			02/19/15 09:26	246
<b>1,1-Dichloroethene</b>	<b>240</b>		200	32	ppb v/v			02/19/15 09:26	246
cis-1,2-Dichloroethene	ND		98	22	ppb v/v			02/19/15 09:26	246
trans-1,2-Dichloroethene	ND		98	25	ppb v/v			02/19/15 09:26	246
<b>1,2-Dichloropropane</b>	<b>78</b>	<b>J</b>	98	59	ppb v/v			02/19/15 09:26	246
cis-1,3-Dichloropropene	ND		98	26	ppb v/v			02/19/15 09:26	246
trans-1,3-Dichloropropene	ND		98	22	ppb v/v			02/19/15 09:26	246
<b>Ethylbenzene</b>	<b>24</b>	<b>J</b>	98	15	ppb v/v			02/19/15 09:26	246
4-Ethyltoluene	ND		98	46	ppb v/v			02/19/15 09:26	246
Hexachlorobutadiene	ND		490	110	ppb v/v			02/19/15 09:26	246
2-Hexanone	ND *		98	21	ppb v/v			02/19/15 09:26	246
4-Methyl-2-pentanone (MIBK)	ND *		98	33	ppb v/v			02/19/15 09:26	246
<b>Methylene Chloride</b>	<b>50</b>	<b>J</b>	98	18	ppb v/v			02/19/15 09:26	246
<b>Styrene</b>	<b>19</b>	<b>J</b>	98	15	ppb v/v			02/19/15 09:26	246
1,1,1,2-Tetrachloroethane	ND		98	17	ppb v/v			02/19/15 09:26	246
<b>Tetrachloroethene</b>	<b>240</b>		98	13	ppb v/v			02/19/15 09:26	246
<b>Toluene</b>	<b>240</b>		98	13	ppb v/v			02/19/15 09:26	246
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>770</b>		98	40	ppb v/v			02/19/15 09:26	246
1,2,4-Trichlorobenzene	ND		490	110	ppb v/v			02/19/15 09:26	246
<b>1,1,1-Trichloroethane</b>	<b>32</b>	<b>J</b>	74	16	ppb v/v			02/19/15 09:26	246
1,1,2-Trichloroethane	ND		98	16	ppb v/v			02/19/15 09:26	246
<b>Trichloroethene</b>	<b>4500</b>		98	26	ppb v/v			02/19/15 09:26	246
<b>Trichlorofluoromethane</b>	<b>200</b>		98	48	ppb v/v			02/19/15 09:26	246
1,2,4-Trimethylbenzene	ND		200	40	ppb v/v			02/19/15 09:26	246
1,3,5-Trimethylbenzene	ND		98	31	ppb v/v			02/19/15 09:26	246
Vinyl acetate	ND		200	36	ppb v/v			02/19/15 09:26	246
Vinyl chloride	ND		98	30	ppb v/v			02/19/15 09:26	246

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097113-001/CWL-D2-470**

**Lab Sample ID: 320-11419-7**

Date Collected: 01/21/15 10:21

Matrix: Air

Date Received: 01/27/15 09:30

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	57	J	200	25	ppb v/v			02/19/15 09:26	246
o-Xylene	25	J	98	13	ppb v/v			02/19/15 09:26	246
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	101		70 - 130					02/19/15 09:26	246
1,2-Dichloroethane-d4 (Surr)	103		70 - 130					02/19/15 09:26	246
Toluene-d8 (Surr)	101		70 - 130					02/19/15 09:26	246

**Client Sample ID: 097114-001/CWL-SV FB4**

**Lab Sample ID: 320-11419-8**

Date Collected: 01/21/15 09:45

Matrix: Air

Date Received: 01/27/15 09:30

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	3.0	J B	12	0.43	ppb v/v			02/19/15 10:13	2.42
Benzene	ND		0.97	0.19	ppb v/v			02/19/15 10:13	2.42
Benzyl chloride	ND		1.9	0.39	ppb v/v			02/19/15 10:13	2.42
Bromodichloromethane	ND		0.73	0.16	ppb v/v			02/19/15 10:13	2.42
Bromoform	ND		0.97	0.17	ppb v/v			02/19/15 10:13	2.42
Bromomethane	ND		1.9	0.81	ppb v/v			02/19/15 10:13	2.42
2-Butanone (MEK)	ND		1.9	0.48	ppb v/v			02/19/15 10:13	2.42
Carbon disulfide	ND		1.9	0.19	ppb v/v			02/19/15 10:13	2.42
Carbon tetrachloride	ND		1.9	0.15	ppb v/v			02/19/15 10:13	2.42
Chlorobenzene	ND		0.73	0.15	ppb v/v			02/19/15 10:13	2.42
Chloroethane	ND		1.9	0.75	ppb v/v			02/19/15 10:13	2.42
Chloroform	ND		0.73	0.23	ppb v/v			02/19/15 10:13	2.42
Chloromethane	ND		1.9	0.48	ppb v/v			02/19/15 10:13	2.42
Dibromochloromethane	ND		0.97	0.19	ppb v/v			02/19/15 10:13	2.42
1,2-Dibromoethane (EDB)	ND		1.9	0.18	ppb v/v			02/19/15 10:13	2.42
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.97	0.38	ppb v/v			02/19/15 10:13	2.42
1,2-Dichlorobenzene	ND		0.97	0.31	ppb v/v			02/19/15 10:13	2.42
1,3-Dichlorobenzene	ND		0.97	0.27	ppb v/v			02/19/15 10:13	2.42
1,4-Dichlorobenzene	ND		0.97	0.36	ppb v/v			02/19/15 10:13	2.42
Dichlorodifluoromethane	ND		0.97	0.35	ppb v/v			02/19/15 10:13	2.42
1,1-Dichloroethane	ND		0.73	0.17	ppb v/v			02/19/15 10:13	2.42
1,2-Dichloroethane	ND		1.9	0.21	ppb v/v			02/19/15 10:13	2.42
1,1-Dichloroethene	ND		1.9	0.31	ppb v/v			02/19/15 10:13	2.42
cis-1,2-Dichloroethene	ND		0.97	0.22	ppb v/v			02/19/15 10:13	2.42
trans-1,2-Dichloroethene	ND		0.97	0.24	ppb v/v			02/19/15 10:13	2.42
1,2-Dichloropropane	ND		0.97	0.58	ppb v/v			02/19/15 10:13	2.42
cis-1,3-Dichloropropene	ND		0.97	0.25	ppb v/v			02/19/15 10:13	2.42
trans-1,3-Dichloropropene	ND		0.97	0.21	ppb v/v			02/19/15 10:13	2.42
Ethylbenzene	ND		0.97	0.15	ppb v/v			02/19/15 10:13	2.42
4-Ethyltoluene	ND		0.97	0.45	ppb v/v			02/19/15 10:13	2.42
Hexachlorobutadiene	ND		4.8	1.0	ppb v/v			02/19/15 10:13	2.42
2-Hexanone	ND *		0.97	0.21	ppb v/v			02/19/15 10:13	2.42
4-Methyl-2-pentanone (MIBK)	ND *		0.97	0.33	ppb v/v			02/19/15 10:13	2.42
Methylene Chloride	ND		0.97	0.17	ppb v/v			02/19/15 10:13	2.42

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL-SVM

TestAmerica Job ID: 320-11419-1

**Client Sample ID: 097114-001/CWL-SV FB4**

**Lab Sample ID: 320-11419-8**

Date Collected: 01/21/15 09:45

Matrix: Air

Date Received: 01/27/15 09:30

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		0.97	0.14	ppb v/v			02/19/15 10:13	2.42
1,1,2,2-Tetrachloroethane	ND		0.97	0.17	ppb v/v			02/19/15 10:13	2.42
Tetrachloroethene	ND		0.97	0.12	ppb v/v			02/19/15 10:13	2.42
Toluene	ND		0.97	0.12	ppb v/v			02/19/15 10:13	2.42
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.97	0.39	ppb v/v			02/19/15 10:13	2.42
1,2,4-Trichlorobenzene	ND		4.8	1.0	ppb v/v			02/19/15 10:13	2.42
1,1,1-Trichloroethane	ND		0.73	0.16	ppb v/v			02/19/15 10:13	2.42
1,1,2-Trichloroethane	ND		0.97	0.16	ppb v/v			02/19/15 10:13	2.42
Trichloroethene	ND		0.97	0.25	ppb v/v			02/19/15 10:13	2.42
Trichlorofluoromethane	ND		0.97	0.47	ppb v/v			02/19/15 10:13	2.42
1,2,4-Trimethylbenzene	ND		1.9	0.39	ppb v/v			02/19/15 10:13	2.42
1,3,5-Trimethylbenzene	ND		0.97	0.30	ppb v/v			02/19/15 10:13	2.42
Vinyl acetate	ND		1.9	0.35	ppb v/v			02/19/15 10:13	2.42
Vinyl chloride	ND		0.97	0.29	ppb v/v			02/19/15 10:13	2.42
m,p-Xylene	ND		1.9	0.24	ppb v/v			02/19/15 10:13	2.42
o-Xylene	ND		0.97	0.13	ppb v/v			02/19/15 10:13	2.42
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	92		70 - 130					02/19/15 10:13	2.42
1,2-Dichloroethane-d4 (Surr)	100		70 - 130					02/19/15 10:13	2.42
Toluene-d8 (Surr)	102		70 - 130					02/19/15 10:13	2.42

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11423-1

**Client Sample ID: 097115-001/CWL-D3-120**

**Lab Sample ID: 320-11423-1**

**Date Collected: 01/21/15 10:44**

**Matrix: Air**

**Date Received: 01/27/15 09:30**

**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
<b>Acetone</b>	<b>1100</b>	<b>J B</b>	1300	48	ppb v/v			02/20/15 02:13	268
Benzene	ND		110	21	ppb v/v			02/20/15 02:13	268
Benzyl chloride	ND		210	44	ppb v/v			02/20/15 02:13	268
Bromodichloromethane	ND		80	18	ppb v/v			02/20/15 02:13	268
Bromoform	ND		110	19	ppb v/v			02/20/15 02:13	268
Bromomethane	ND		210	90	ppb v/v			02/20/15 02:13	268
<b>2-Butanone (MEK)</b>	<b>120</b>	<b>J</b>	210	53	ppb v/v			02/20/15 02:13	268
Carbon disulfide	ND		210	21	ppb v/v			02/20/15 02:13	268
<b>Carbon tetrachloride</b>	<b>19</b>	<b>J</b>	210	17	ppb v/v			02/20/15 02:13	268
Chlorobenzene	ND		80	17	ppb v/v			02/20/15 02:13	268
Chloroethane	ND		210	83	ppb v/v			02/20/15 02:13	268
<b>Chloroform</b>	<b>200</b>		80	25	ppb v/v			02/20/15 02:13	268
Chloromethane	ND		210	53	ppb v/v			02/20/15 02:13	268
Dibromochloromethane	ND		110	21	ppb v/v			02/20/15 02:13	268
1,2-Dibromoethane (EDB)	ND		210	20	ppb v/v			02/20/15 02:13	268
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	42	ppb v/v			02/20/15 02:13	268
1,2-Dichlorobenzene	ND		110	35	ppb v/v			02/20/15 02:13	268
1,3-Dichlorobenzene	ND		110	29	ppb v/v			02/20/15 02:13	268
1,4-Dichlorobenzene	ND		110	40	ppb v/v			02/20/15 02:13	268
<b>Dichlorodifluoromethane</b>	<b>45</b>	<b>J</b>	110	39	ppb v/v			02/20/15 02:13	268
1,1-Dichloroethane	ND		80	19	ppb v/v			02/20/15 02:13	268
<b>1,2-Dichloroethane</b>	<b>57</b>	<b>J</b>	210	24	ppb v/v			02/20/15 02:13	268
<b>1,1-Dichloroethene</b>	<b>280</b>		210	35	ppb v/v			02/20/15 02:13	268
cis-1,2-Dichloroethene	ND		110	24	ppb v/v			02/20/15 02:13	268
trans-1,2-Dichloroethene	ND		110	27	ppb v/v			02/20/15 02:13	268
<b>1,2-Dichloropropane</b>	<b>120</b>		110	64	ppb v/v			02/20/15 02:13	268
cis-1,3-Dichloropropene	ND		110	28	ppb v/v			02/20/15 02:13	268
trans-1,3-Dichloropropene	ND		110	24	ppb v/v			02/20/15 02:13	268
<b>Ethylbenzene</b>	<b>23</b>	<b>J</b>	110	17	ppb v/v			02/20/15 02:13	268
4-Ethyltoluene	ND		110	50	ppb v/v			02/20/15 02:13	268
Hexachlorobutadiene	ND		540	120	ppb v/v			02/20/15 02:13	268
2-Hexanone	ND *		110	23	ppb v/v			02/20/15 02:13	268
4-Methyl-2-pentanone (MIBK)	ND		110	36	ppb v/v			02/20/15 02:13	268
<b>Methylene Chloride</b>	<b>60</b>	<b>J</b>	110	19	ppb v/v			02/20/15 02:13	268
<b>Styrene</b>	<b>21</b>	<b>J</b>	110	16	ppb v/v			02/20/15 02:13	268
1,1,2,2-Tetrachloroethane	ND		110	18	ppb v/v			02/20/15 02:13	268
<b>Tetrachloroethene</b>	<b>140</b>		110	14	ppb v/v			02/20/15 02:13	268
<b>Toluene</b>	<b>210</b>		110	14	ppb v/v			02/20/15 02:13	268
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>880</b>		110	44	ppb v/v			02/20/15 02:13	268
1,2,4-Trichlorobenzene	ND		540	120	ppb v/v			02/20/15 02:13	268
<b>1,1,1-Trichloroethane</b>	<b>19</b>	<b>J</b>	80	17	ppb v/v			02/20/15 02:13	268
1,1,2-Trichloroethane	ND		110	18	ppb v/v			02/20/15 02:13	268
<b>Trichloroethene</b>	<b>5200</b>		110	28	ppb v/v			02/20/15 02:13	268
<b>Trichlorofluoromethane</b>	<b>250</b>		110	53	ppb v/v			02/20/15 02:13	268
1,2,4-Trimethylbenzene	ND		210	43	ppb v/v			02/20/15 02:13	268
1,3,5-Trimethylbenzene	ND		110	34	ppb v/v			02/20/15 02:13	268
Vinyl acetate	ND		210	39	ppb v/v			02/20/15 02:13	268

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11423-1

**Client Sample ID: 097115-001/CWL-D3-120**

**Lab Sample ID: 320-11423-1**

Date Collected: 01/21/15 10:44

Matrix: Air

Date Received: 01/27/15 09:30

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		110	32	ppb v/v			02/20/15 02:13	268
<b>m,p-Xylene</b>	<b>56</b>	<b>J</b>	210	27	ppb v/v			02/20/15 02:13	268
<b>o-Xylene</b>	<b>25</b>	<b>J</b>	110	14	ppb v/v			02/20/15 02:13	268
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		70 - 130					02/20/15 02:13	268
1,2-Dichloroethane-d4 (Surr)	104		70 - 130					02/20/15 02:13	268
Toluene-d8 (Surr)	100		70 - 130					02/20/15 02:13	268

**Client Sample ID: 097116-001/CWL-D3-170**

**Lab Sample ID: 320-11423-2**

Date Collected: 01/21/15 10:48

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>1100</b>	<b>J B</b>	1400	49	ppb v/v			02/20/15 02:53	273
Benzene	ND		110	22	ppb v/v			02/20/15 02:53	273
Benzyl chloride	ND		220	44	ppb v/v			02/20/15 02:53	273
Bromodichloromethane	ND		82	18	ppb v/v			02/20/15 02:53	273
Bromoform	ND		110	19	ppb v/v			02/20/15 02:53	273
Bromomethane	ND		220	91	ppb v/v			02/20/15 02:53	273
<b>2-Butanone (MEK)</b>	<b>130</b>	<b>J</b>	220	54	ppb v/v			02/20/15 02:53	273
Carbon disulfide	ND		220	21	ppb v/v			02/20/15 02:53	273
<b>Carbon tetrachloride</b>	<b>25</b>	<b>J</b>	220	17	ppb v/v			02/20/15 02:53	273
Chlorobenzene	ND		82	17	ppb v/v			02/20/15 02:53	273
Chloroethane	ND		220	84	ppb v/v			02/20/15 02:53	273
<b>Chloroform</b>	<b>210</b>		82	26	ppb v/v			02/20/15 02:53	273
Chloromethane	ND		220	54	ppb v/v			02/20/15 02:53	273
Dibromochloromethane	ND		110	22	ppb v/v			02/20/15 02:53	273
1,2-Dibromoethane (EDB)	ND		220	20	ppb v/v			02/20/15 02:53	273
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	42	ppb v/v			02/20/15 02:53	273
1,2-Dichlorobenzene	ND		110	35	ppb v/v			02/20/15 02:53	273
1,3-Dichlorobenzene	ND		110	30	ppb v/v			02/20/15 02:53	273
1,4-Dichlorobenzene	ND		110	41	ppb v/v			02/20/15 02:53	273
<b>Dichlorodifluoromethane</b>	<b>51</b>	<b>J</b>	110	40	ppb v/v			02/20/15 02:53	273
1,1-Dichloroethane	ND		82	20	ppb v/v			02/20/15 02:53	273
<b>1,2-Dichloroethane</b>	<b>80</b>	<b>J</b>	220	24	ppb v/v			02/20/15 02:53	273
<b>1,1-Dichloroethene</b>	<b>330</b>		220	35	ppb v/v			02/20/15 02:53	273
cis-1,2-Dichloroethene	ND		110	24	ppb v/v			02/20/15 02:53	273
trans-1,2-Dichloroethene	ND		110	27	ppb v/v			02/20/15 02:53	273
<b>1,2-Dichloropropane</b>	<b>170</b>		110	66	ppb v/v			02/20/15 02:53	273
cis-1,3-Dichloropropene	ND		110	28	ppb v/v			02/20/15 02:53	273
trans-1,3-Dichloropropene	ND		110	24	ppb v/v			02/20/15 02:53	273
<b>Ethylbenzene</b>	<b>22</b>	<b>J</b>	110	17	ppb v/v			02/20/15 02:53	273
4-Ethyltoluene	ND		110	51	ppb v/v			02/20/15 02:53	273
Hexachlorobutadiene	ND		550	120	ppb v/v			02/20/15 02:53	273
2-Hexanone	ND *		110	24	ppb v/v			02/20/15 02:53	273
4-Methyl-2-pentanone (MIBK)	ND		110	37	ppb v/v			02/20/15 02:53	273

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11423-1

**Client Sample ID: 097116-001/CWL-D3-170**

**Lab Sample ID: 320-11423-2**

Date Collected: 01/21/15 10:48

Matrix: Air

Date Received: 01/27/15 09:30

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	51	J	110	20	ppb v/v			02/20/15 02:53	273
Styrene	20	J	110	16	ppb v/v			02/20/15 02:53	273
1,1,2,2-Tetrachloroethane	ND		110	19	ppb v/v			02/20/15 02:53	273
Tetrachloroethene	160		110	14	ppb v/v			02/20/15 02:53	273
Toluene	240		110	14	ppb v/v			02/20/15 02:53	273
1,1,2-Trichloro-1,2,2-trifluoroethane	1000		110	44	ppb v/v			02/20/15 02:53	273
1,2,4-Trichlorobenzene	ND		550	120	ppb v/v			02/20/15 02:53	273
1,1,1-Trichloroethane	18	J	82	18	ppb v/v			02/20/15 02:53	273
1,1,2-Trichloroethane	ND		110	18	ppb v/v			02/20/15 02:53	273
Trichloroethene	6400		110	29	ppb v/v			02/20/15 02:53	273
Trichlorofluoromethane	290		110	54	ppb v/v			02/20/15 02:53	273
1,2,4-Trimethylbenzene	ND		220	44	ppb v/v			02/20/15 02:53	273
1,3,5-Trimethylbenzene	ND		110	34	ppb v/v			02/20/15 02:53	273
Vinyl acetate	ND		220	40	ppb v/v			02/20/15 02:53	273
Vinyl chloride	ND		110	33	ppb v/v			02/20/15 02:53	273
m,p-Xylene	57	J	220	27	ppb v/v			02/20/15 02:53	273
o-Xylene	24	J	110	15	ppb v/v			02/20/15 02:53	273
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	99		70 - 130					02/20/15 02:53	273
1,2-Dichloroethane-d4 (Surr)	101		70 - 130					02/20/15 02:53	273
Toluene-d8 (Surr)	100		70 - 130					02/20/15 02:53	273

**Client Sample ID: 097117-001/CWL-D3-350**

**Lab Sample ID: 320-11423-3**

Date Collected: 01/21/15 10:51

Matrix: Air

Date Received: 01/27/15 09:30

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	1300	J B	1400	49	ppb v/v			02/20/15 09:11	273
Benzene	ND		110	22	ppb v/v			02/20/15 09:11	273
Benzyl chloride	ND		220	44	ppb v/v			02/20/15 09:11	273
Bromodichloromethane	ND		82	18	ppb v/v			02/20/15 09:11	273
Bromoform	ND		110	19	ppb v/v			02/20/15 09:11	273
Bromomethane	ND		220	91	ppb v/v			02/20/15 09:11	273
2-Butanone (MEK)	140	J	220	54	ppb v/v			02/20/15 09:11	273
Carbon disulfide	ND		220	21	ppb v/v			02/20/15 09:11	273
Carbon tetrachloride	25	J	220	17	ppb v/v			02/20/15 09:11	273
Chlorobenzene	ND		82	17	ppb v/v			02/20/15 09:11	273
Chloroethane	ND		220	84	ppb v/v			02/20/15 09:11	273
Chloroform	200		82	26	ppb v/v			02/20/15 09:11	273
Chloromethane	ND		220	54	ppb v/v			02/20/15 09:11	273
Dibromochloromethane	ND		110	22	ppb v/v			02/20/15 09:11	273
1,2-Dibromoethane (EDB)	ND		220	20	ppb v/v			02/20/15 09:11	273
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	42	ppb v/v			02/20/15 09:11	273
1,2-Dichlorobenzene	ND		110	35	ppb v/v			02/20/15 09:11	273
1,3-Dichlorobenzene	ND		110	30	ppb v/v			02/20/15 09:11	273

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11423-1

**Client Sample ID: 097117-001/CWL-D3-350**

**Lab Sample ID: 320-11423-3**

Date Collected: 01/21/15 10:51

Matrix: Air

Date Received: 01/27/15 09:30

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
1,4-Dichlorobenzene	ND		110	41	ppb v/v			02/20/15 09:11	273
<b>Dichlorodifluoromethane</b>	<b>53</b>	<b>J</b>	110	40	ppb v/v			02/20/15 09:11	273
1,1-Dichloroethane	ND		82	20	ppb v/v			02/20/15 09:11	273
<b>1,2-Dichloroethane</b>	<b>76</b>	<b>J</b>	220	24	ppb v/v			02/20/15 09:11	273
<b>1,1-Dichloroethene</b>	<b>340</b>		220	35	ppb v/v			02/20/15 09:11	273
cis-1,2-Dichloroethene	ND		110	24	ppb v/v			02/20/15 09:11	273
trans-1,2-Dichloroethene	ND		110	27	ppb v/v			02/20/15 09:11	273
<b>1,2-Dichloropropane</b>	<b>170</b>		110	66	ppb v/v			02/20/15 09:11	273
cis-1,3-Dichloropropene	ND		110	28	ppb v/v			02/20/15 09:11	273
trans-1,3-Dichloropropene	ND		110	24	ppb v/v			02/20/15 09:11	273
<b>Ethylbenzene</b>	<b>25</b>	<b>J</b>	110	17	ppb v/v			02/20/15 09:11	273
4-Ethyltoluene	ND		110	51	ppb v/v			02/20/15 09:11	273
Hexachlorobutadiene	ND		550	120	ppb v/v			02/20/15 09:11	273
2-Hexanone	ND *		110	24	ppb v/v			02/20/15 09:11	273
4-Methyl-2-pentanone (MIBK)	ND		110	37	ppb v/v			02/20/15 09:11	273
<b>Methylene Chloride</b>	<b>300</b>		110	20	ppb v/v			02/20/15 09:11	273
<b>Styrene</b>	<b>20</b>	<b>J</b>	110	16	ppb v/v			02/20/15 09:11	273
1,1,1,2-Tetrachloroethane	ND		110	19	ppb v/v			02/20/15 09:11	273
<b>Tetrachloroethene</b>	<b>180</b>		110	14	ppb v/v			02/20/15 09:11	273
<b>Toluene</b>	<b>240</b>		110	14	ppb v/v			02/20/15 09:11	273
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>1100</b>		110	44	ppb v/v			02/20/15 09:11	273
1,2,4-Trichlorobenzene	ND		550	120	ppb v/v			02/20/15 09:11	273
1,1,1-Trichloroethane	ND		82	18	ppb v/v			02/20/15 09:11	273
1,1,2-Trichloroethane	ND		110	18	ppb v/v			02/20/15 09:11	273
<b>Trichloroethene</b>	<b>6600</b>		110	29	ppb v/v			02/20/15 09:11	273
<b>Trichlorofluoromethane</b>	<b>300</b>		110	54	ppb v/v			02/20/15 09:11	273
1,2,4-Trimethylbenzene	ND		220	44	ppb v/v			02/20/15 09:11	273
1,3,5-Trimethylbenzene	ND		110	34	ppb v/v			02/20/15 09:11	273
Vinyl acetate	ND		220	40	ppb v/v			02/20/15 09:11	273
Vinyl chloride	ND		110	33	ppb v/v			02/20/15 09:11	273
<b>m,p-Xylene</b>	<b>55</b>	<b>J</b>	220	27	ppb v/v			02/20/15 09:11	273
<b>o-Xylene</b>	<b>26</b>	<b>J</b>	110	15	ppb v/v			02/20/15 09:11	273
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	100		70 - 130					02/20/15 09:11	273
1,2-Dichloroethane-d4 (Surr)	104		70 - 130					02/20/15 09:11	273
Toluene-d8 (Surr)	101		70 - 130					02/20/15 09:11	273

**Client Sample ID: 097118-001/CWL-D3-440**

**Lab Sample ID: 320-11423-4**

Date Collected: 01/21/15 11:05

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>Acetone</b>	<b>1100</b>	<b>J B</b>	1300	48	ppb v/v			02/20/15 09:52	268
Benzene	ND		110	21	ppb v/v			02/20/15 09:52	268
Benzyl chloride	ND		210	44	ppb v/v			02/20/15 09:52	268

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11423-1

**Client Sample ID: 097118-001/CWL-D3-440**

**Lab Sample ID: 320-11423-4**

Date Collected: 01/21/15 11:05

Matrix: Air

Date Received: 01/27/15 09:30

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
Bromodichloromethane	ND		80	18	ppb v/v			02/20/15 09:52	268
Bromoform	ND		110	19	ppb v/v			02/20/15 09:52	268
Bromomethane	ND		210	90	ppb v/v			02/20/15 09:52	268
<b>2-Butanone (MEK)</b>	<b>150</b>	<b>J</b>	210	53	ppb v/v			02/20/15 09:52	268
Carbon disulfide	ND		210	21	ppb v/v			02/20/15 09:52	268
<b>Carbon tetrachloride</b>	<b>27</b>	<b>J</b>	210	17	ppb v/v			02/20/15 09:52	268
Chlorobenzene	ND		80	17	ppb v/v			02/20/15 09:52	268
Chloroethane	ND		210	83	ppb v/v			02/20/15 09:52	268
<b>Chloroform</b>	<b>210</b>		80	25	ppb v/v			02/20/15 09:52	268
Chloromethane	ND		210	53	ppb v/v			02/20/15 09:52	268
Dibromochloromethane	ND		110	21	ppb v/v			02/20/15 09:52	268
1,2-Dibromoethane (EDB)	ND		210	20	ppb v/v			02/20/15 09:52	268
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	42	ppb v/v			02/20/15 09:52	268
1,2-Dichlorobenzene	ND		110	35	ppb v/v			02/20/15 09:52	268
1,3-Dichlorobenzene	ND		110	29	ppb v/v			02/20/15 09:52	268
1,4-Dichlorobenzene	ND		110	40	ppb v/v			02/20/15 09:52	268
<b>Dichlorodifluoromethane</b>	<b>53</b>	<b>J</b>	110	39	ppb v/v			02/20/15 09:52	268
1,1-Dichloroethane	ND		80	19	ppb v/v			02/20/15 09:52	268
<b>1,2-Dichloroethane</b>	<b>80</b>	<b>J</b>	210	24	ppb v/v			02/20/15 09:52	268
<b>1,1-Dichloroethene</b>	<b>370</b>		210	35	ppb v/v			02/20/15 09:52	268
cis-1,2-Dichloroethene	ND		110	24	ppb v/v			02/20/15 09:52	268
trans-1,2-Dichloroethene	ND		110	27	ppb v/v			02/20/15 09:52	268
<b>1,2-Dichloropropane</b>	<b>190</b>		110	64	ppb v/v			02/20/15 09:52	268
cis-1,3-Dichloropropene	ND		110	28	ppb v/v			02/20/15 09:52	268
trans-1,3-Dichloropropene	ND		110	24	ppb v/v			02/20/15 09:52	268
<b>Ethylbenzene</b>	<b>18</b>	<b>J</b>	110	17	ppb v/v			02/20/15 09:52	268
4-Ethyltoluene	ND		110	50	ppb v/v			02/20/15 09:52	268
Hexachlorobutadiene	ND		540	120	ppb v/v			02/20/15 09:52	268
2-Hexanone	ND *		110	23	ppb v/v			02/20/15 09:52	268
4-Methyl-2-pentanone (MIBK)	ND		110	36	ppb v/v			02/20/15 09:52	268
<b>Methylene Chloride</b>	<b>130</b>		110	19	ppb v/v			02/20/15 09:52	268
<b>Styrene</b>	<b>17</b>	<b>J</b>	110	16	ppb v/v			02/20/15 09:52	268
1,1,2,2-Tetrachloroethane	ND		110	18	ppb v/v			02/20/15 09:52	268
<b>Tetrachloroethene</b>	<b>160</b>		110	14	ppb v/v			02/20/15 09:52	268
<b>Toluene</b>	<b>200</b>		110	14	ppb v/v			02/20/15 09:52	268
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>1200</b>		110	44	ppb v/v			02/20/15 09:52	268
1,2,4-Trichlorobenzene	ND		540	120	ppb v/v			02/20/15 09:52	268
<b>1,1,1-Trichloroethane</b>	<b>17</b>	<b>J</b>	80	17	ppb v/v			02/20/15 09:52	268
1,1,2-Trichloroethane	ND		110	18	ppb v/v			02/20/15 09:52	268
<b>Trichloroethene</b>	<b>6800</b>		110	28	ppb v/v			02/20/15 09:52	268
<b>Trichlorofluoromethane</b>	<b>330</b>		110	53	ppb v/v			02/20/15 09:52	268
1,2,4-Trimethylbenzene	ND		210	43	ppb v/v			02/20/15 09:52	268
1,3,5-Trimethylbenzene	ND		110	34	ppb v/v			02/20/15 09:52	268
Vinyl acetate	ND		210	39	ppb v/v			02/20/15 09:52	268
Vinyl chloride	ND		110	32	ppb v/v			02/20/15 09:52	268
<b>m,p-Xylene</b>	<b>46</b>	<b>J</b>	210	27	ppb v/v			02/20/15 09:52	268
<b>o-Xylene</b>	<b>20</b>	<b>J</b>	110	14	ppb v/v			02/20/15 09:52	268



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11423-1

**Client Sample ID: 097118-001/CWL-D3-440**

**Lab Sample ID: 320-11423-4**

Date Collected: 01/21/15 11:05

Matrix: Air

Date Received: 01/27/15 09:30

Sample Container: Summa Canister 6L

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		70 - 130		02/20/15 09:52	268
1,2-Dichloroethane-d4 (Surr)	104		70 - 130		02/20/15 09:52	268
Toluene-d8 (Surr)	99		70 - 130		02/20/15 09:52	268

**Client Sample ID: 097119-001/CWL-D3-480**

**Lab Sample ID: 320-11423-5**

Date Collected: 01/21/15 10:58

Matrix: Air

Date Received: 01/27/15 09:30

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		67	2.4	ppb v/v			02/20/15 05:03	13.4
Benzene	ND		5.4	1.1	ppb v/v			02/20/15 05:03	13.4
Benzyl chloride	ND		11	2.2	ppb v/v			02/20/15 05:03	13.4
Bromodichloromethane	ND		4.0	0.88	ppb v/v			02/20/15 05:03	13.4
Bromoform	ND		5.4	0.94	ppb v/v			02/20/15 05:03	13.4
Bromomethane	ND		11	4.5	ppb v/v			02/20/15 05:03	13.4
2-Butanone (MEK)	ND		11	2.7	ppb v/v			02/20/15 05:03	13.4
Carbon disulfide	ND		11	1.0	ppb v/v			02/20/15 05:03	13.4
Carbon tetrachloride	ND		11	0.86	ppb v/v			02/20/15 05:03	13.4
Chlorobenzene	ND		4.0	0.86	ppb v/v			02/20/15 05:03	13.4
Chloroethane	ND		11	4.1	ppb v/v			02/20/15 05:03	13.4
<b>Chloroform</b>	<b>15</b>		4.0	1.3	ppb v/v			02/20/15 05:03	13.4
Chloromethane	ND		11	2.6	ppb v/v			02/20/15 05:03	13.4
Dibromochloromethane	ND		5.4	1.1	ppb v/v			02/20/15 05:03	13.4
1,2-Dibromoethane (EDB)	ND		11	1.0	ppb v/v			02/20/15 05:03	13.4
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		5.4	2.1	ppb v/v			02/20/15 05:03	13.4
1,2-Dichlorobenzene	ND		5.4	1.7	ppb v/v			02/20/15 05:03	13.4
1,3-Dichlorobenzene	ND		5.4	1.5	ppb v/v			02/20/15 05:03	13.4
1,4-Dichlorobenzene	ND		5.4	2.0	ppb v/v			02/20/15 05:03	13.4
<b>Dichlorodifluoromethane</b>	<b>4.5 J</b>		5.4	1.9	ppb v/v			02/20/15 05:03	13.4
1,1-Dichloroethane	ND		4.0	0.96	ppb v/v			02/20/15 05:03	13.4
1,2-Dichloroethane	ND		11	1.2	ppb v/v			02/20/15 05:03	13.4
<b>1,1-Dichloroethene</b>	<b>17</b>		11	1.7	ppb v/v			02/20/15 05:03	13.4
cis-1,2-Dichloroethene	ND		5.4	1.2	ppb v/v			02/20/15 05:03	13.4
trans-1,2-Dichloroethene	ND		5.4	1.3	ppb v/v			02/20/15 05:03	13.4
<b>1,2-Dichloropropane</b>	<b>3.4 J</b>		5.4	3.2	ppb v/v			02/20/15 05:03	13.4
cis-1,3-Dichloropropene	ND		5.4	1.4	ppb v/v			02/20/15 05:03	13.4
trans-1,3-Dichloropropene	ND		5.4	1.2	ppb v/v			02/20/15 05:03	13.4
Ethylbenzene	ND		5.4	0.84	ppb v/v			02/20/15 05:03	13.4
4-Ethyltoluene	ND		5.4	2.5	ppb v/v			02/20/15 05:03	13.4
Hexachlorobutadiene	ND		27	5.8	ppb v/v			02/20/15 05:03	13.4
2-Hexanone	ND *		5.4	1.2	ppb v/v			02/20/15 05:03	13.4
4-Methyl-2-pentanone (MIBK)	ND		5.4	1.8	ppb v/v			02/20/15 05:03	13.4
<b>Methylene Chloride</b>	<b>1.7 J</b>		5.4	0.96	ppb v/v			02/20/15 05:03	13.4
Styrene	ND		5.4	0.79	ppb v/v			02/20/15 05:03	13.4
1,1,2,2-Tetrachloroethane	ND		5.4	0.92	ppb v/v			02/20/15 05:03	13.4
<b>Tetrachloroethene</b>	<b>11</b>		5.4	0.68	ppb v/v			02/20/15 05:03	13.4
Toluene	ND		5.4	0.68	ppb v/v			02/20/15 05:03	13.4

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11423-1

**Client Sample ID: 097119-001/CWL-D3-480**

**Lab Sample ID: 320-11423-5**

Date Collected: 01/21/15 10:58

Matrix: Air

Date Received: 01/27/15 09:30

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
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>54</b>		5.4	2.2	ppb v/v			02/20/15 05:03	13.4
1,2,4-Trichlorobenzene	ND		27	5.8	ppb v/v			02/20/15 05:03	13.4
<b>1,1,1-Trichloroethane</b>	<b>2.0</b>	<b>J</b>	4.0	0.87	ppb v/v			02/20/15 05:03	13.4
1,1,2-Trichloroethane	ND		5.4	0.90	ppb v/v			02/20/15 05:03	13.4
<b>Trichloroethene</b>	<b>300</b>		5.4	1.4	ppb v/v			02/20/15 05:03	13.4
<b>Trichlorofluoromethane</b>	<b>20</b>		5.4	2.6	ppb v/v			02/20/15 05:03	13.4
1,2,4-Trimethylbenzene	ND		11	2.2	ppb v/v			02/20/15 05:03	13.4
1,3,5-Trimethylbenzene	ND		5.4	1.7	ppb v/v			02/20/15 05:03	13.4
Vinyl acetate	ND		11	1.9	ppb v/v			02/20/15 05:03	13.4
Vinyl chloride	ND		5.4	1.6	ppb v/v			02/20/15 05:03	13.4
m,p-Xylene	ND		11	1.3	ppb v/v			02/20/15 05:03	13.4
o-Xylene	ND		5.4	0.72	ppb v/v			02/20/15 05:03	13.4
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	94		70 - 130					02/20/15 05:03	13.4
1,2-Dichloroethane-d4 (Surr)	102		70 - 130					02/20/15 05:03	13.4
Toluene-d8 (Surr)	96		70 - 130					02/20/15 05:03	13.4

**Client Sample ID: 097120-001/CWL-SV FB5**

**Lab Sample ID: 320-11423-6**

Date Collected: 01/21/15 10:38

Matrix: Air

Date Received: 01/27/15 09:30

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		8.8	0.31	ppb v/v			02/20/15 05:47	1.75
Benzene	ND		0.70	0.14	ppb v/v			02/20/15 05:47	1.75
Benzyl chloride	ND		1.4	0.29	ppb v/v			02/20/15 05:47	1.75
Bromodichloromethane	ND		0.53	0.12	ppb v/v			02/20/15 05:47	1.75
Bromoform	ND		0.70	0.12	ppb v/v			02/20/15 05:47	1.75
Bromomethane	ND		1.4	0.59	ppb v/v			02/20/15 05:47	1.75
2-Butanone (MEK)	ND		1.4	0.35	ppb v/v			02/20/15 05:47	1.75
Carbon disulfide	ND		1.4	0.14	ppb v/v			02/20/15 05:47	1.75
Carbon tetrachloride	ND		1.4	0.11	ppb v/v			02/20/15 05:47	1.75
Chlorobenzene	ND		0.53	0.11	ppb v/v			02/20/15 05:47	1.75
Chloroethane	ND		1.4	0.54	ppb v/v			02/20/15 05:47	1.75
Chloroform	ND		0.53	0.17	ppb v/v			02/20/15 05:47	1.75
Chloromethane	ND		1.4	0.34	ppb v/v			02/20/15 05:47	1.75
Dibromochloromethane	ND		0.70	0.14	ppb v/v			02/20/15 05:47	1.75
1,2-Dibromoethane (EDB)	ND		1.4	0.13	ppb v/v			02/20/15 05:47	1.75
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.70	0.27	ppb v/v			02/20/15 05:47	1.75
1,2-Dichlorobenzene	ND		0.70	0.23	ppb v/v			02/20/15 05:47	1.75
1,3-Dichlorobenzene	ND		0.70	0.19	ppb v/v			02/20/15 05:47	1.75
1,4-Dichlorobenzene	ND		0.70	0.26	ppb v/v			02/20/15 05:47	1.75
Dichlorodifluoromethane	ND		0.70	0.25	ppb v/v			02/20/15 05:47	1.75
1,1-Dichloroethane	ND		0.53	0.13	ppb v/v			02/20/15 05:47	1.75
1,2-Dichloroethane	ND		1.4	0.15	ppb v/v			02/20/15 05:47	1.75
1,1-Dichloroethene	ND		1.4	0.23	ppb v/v			02/20/15 05:47	1.75

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-11423-1

**Client Sample ID: 097120-001/CWL-SV FB5**

**Lab Sample ID: 320-11423-6**

Date Collected: 01/21/15 10:38

Matrix: Air

Date Received: 01/27/15 09:30

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	ND		0.70	0.16	ppb v/v			02/20/15 05:47	1.75
trans-1,2-Dichloroethene	ND		0.70	0.18	ppb v/v			02/20/15 05:47	1.75
1,2-Dichloropropane	ND		0.70	0.42	ppb v/v			02/20/15 05:47	1.75
cis-1,3-Dichloropropene	ND		0.70	0.18	ppb v/v			02/20/15 05:47	1.75
trans-1,3-Dichloropropene	ND		0.70	0.15	ppb v/v			02/20/15 05:47	1.75
Ethylbenzene	ND		0.70	0.11	ppb v/v			02/20/15 05:47	1.75
4-Ethyltoluene	ND		0.70	0.33	ppb v/v			02/20/15 05:47	1.75
Hexachlorobutadiene	ND		3.5	0.76	ppb v/v			02/20/15 05:47	1.75
2-Hexanone	ND	*	0.70	0.15	ppb v/v			02/20/15 05:47	1.75
4-Methyl-2-pentanone (MIBK)	ND		0.70	0.24	ppb v/v			02/20/15 05:47	1.75
Methylene Chloride	ND		0.70	0.13	ppb v/v			02/20/15 05:47	1.75
Styrene	ND		0.70	0.10	ppb v/v			02/20/15 05:47	1.75
1,1,2,2-Tetrachloroethane	ND		0.70	0.12	ppb v/v			02/20/15 05:47	1.75
Tetrachloroethene	ND		0.70	0.089	ppb v/v			02/20/15 05:47	1.75
Toluene	ND		0.70	0.089	ppb v/v			02/20/15 05:47	1.75
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.70	0.29	ppb v/v			02/20/15 05:47	1.75
1,2,4-Trichlorobenzene	ND		3.5	0.76	ppb v/v			02/20/15 05:47	1.75
1,1,1-Trichloroethane	ND		0.53	0.11	ppb v/v			02/20/15 05:47	1.75
1,1,2-Trichloroethane	ND		0.70	0.12	ppb v/v			02/20/15 05:47	1.75
Trichloroethene	ND		0.70	0.18	ppb v/v			02/20/15 05:47	1.75
Trichlorofluoromethane	ND		0.70	0.34	ppb v/v			02/20/15 05:47	1.75
1,2,4-Trimethylbenzene	ND		1.4	0.28	ppb v/v			02/20/15 05:47	1.75
1,3,5-Trimethylbenzene	ND		0.70	0.22	ppb v/v			02/20/15 05:47	1.75
Vinyl acetate	ND		1.4	0.25	ppb v/v			02/20/15 05:47	1.75
Vinyl chloride	ND		0.70	0.21	ppb v/v			02/20/15 05:47	1.75
m,p-Xylene	ND		1.4	0.18	ppb v/v			02/20/15 05:47	1.75
o-Xylene	ND		0.70	0.095	ppb v/v			02/20/15 05:47	1.75
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		70 - 130					02/20/15 05:47	1.75
1,2-Dichloroethane-d4 (Surr)	98		70 - 130					02/20/15 05:47	1.75
Toluene-d8 (Surr)	102		70 - 130					02/20/15 05:47	1.75

**SOIL-GAS SAMPLING RESULTS  
CERTIFICATES OF ANALYSIS**

**Chemical Waste Landfill**

**March 2015 – Soil-Gas Samples**

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-12394-1

**Client Sample ID: 097572-001/CWL-D2-440 W/M**

**Lab Sample ID: 320-12394-1**

**Date Collected: 03/31/15 09:29**

**Matrix: Air**

**Date Received: 04/03/15 09:00**

**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	11	J	200	7.2	ppb v/v			04/20/15 20:23	40.7
Benzene	7.4	J B	16	3.2	ppb v/v			04/20/15 20:23	40.7
Benzyl chloride	ND		33	6.6	ppb v/v			04/20/15 20:23	40.7
Bromodichloromethane	ND		12	2.7	ppb v/v			04/20/15 20:23	40.7
Bromoform	ND		16	2.8	ppb v/v			04/20/15 20:23	40.7
Bromomethane	ND		33	14	ppb v/v			04/20/15 20:23	40.7
2-Butanone (MEK)	ND		33	8.1	ppb v/v			04/20/15 20:23	40.7
Carbon disulfide	4.8	J	33	3.2	ppb v/v			04/20/15 20:23	40.7
Carbon tetrachloride	10	J	33	2.6	ppb v/v			04/20/15 20:23	40.7
Chlorobenzene	ND		12	2.6	ppb v/v			04/20/15 20:23	40.7
Chloroethane	ND		33	13	ppb v/v			04/20/15 20:23	40.7
Chloroform	34		12	3.9	ppb v/v			04/20/15 20:23	40.7
Chloromethane	ND		33	8.0	ppb v/v			04/20/15 20:23	40.7
Dibromochloromethane	ND		16	3.2	ppb v/v			04/20/15 20:23	40.7
1,2-Dibromoethane (EDB)	ND		33	3.1	ppb v/v			04/20/15 20:23	40.7
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		16	6.3	ppb v/v			04/20/15 20:23	40.7
1,2-Dichlorobenzene	ND		16	5.3	ppb v/v			04/20/15 20:23	40.7
1,3-Dichlorobenzene	ND		16	4.5	ppb v/v			04/20/15 20:23	40.7
1,4-Dichlorobenzene	ND		16	6.1	ppb v/v			04/20/15 20:23	40.7
Dichlorodifluoromethane	27		16	5.9	ppb v/v			04/20/15 20:23	40.7
1,1-Dichloroethane	3.0	J	12	2.9	ppb v/v			04/20/15 20:23	40.7
1,2-Dichloroethane	ND		33	3.6	ppb v/v			04/20/15 20:23	40.7
1,1-Dichloroethene	190		33	5.3	ppb v/v			04/20/15 20:23	40.7
cis-1,2-Dichloroethene	ND		16	3.6	ppb v/v			04/20/15 20:23	40.7
trans-1,2-Dichloroethene	ND		16	4.1	ppb v/v			04/20/15 20:23	40.7
1,2-Dichloropropane	13	J	16	9.8	ppb v/v			04/20/15 20:23	40.7
cis-1,3-Dichloropropene	ND		16	4.2	ppb v/v			04/20/15 20:23	40.7
trans-1,3-Dichloropropene	ND		16	3.6	ppb v/v			04/20/15 20:23	40.7
Ethylbenzene	ND		16	2.6	ppb v/v			04/20/15 20:23	40.7
4-Ethyltoluene	ND		16	7.6	ppb v/v			04/20/15 20:23	40.7
Hexachlorobutadiene	ND		81	18	ppb v/v			04/20/15 20:23	40.7
2-Hexanone	ND		16	3.5	ppb v/v			04/20/15 20:23	40.7
4-Methyl-2-pentanone (MIBK)	ND		16	5.5	ppb v/v			04/20/15 20:23	40.7
Methylene Chloride	15	J	16	2.9	ppb v/v			04/20/15 20:23	40.7
Styrene	ND		16	2.4	ppb v/v			04/20/15 20:23	40.7
1,1,2,2-Tetrachloroethane	ND		16	2.8	ppb v/v			04/20/15 20:23	40.7
Tetrachloroethene	82		16	2.1	ppb v/v			04/20/15 20:23	40.7
Toluene	2.5	J B	16	2.1	ppb v/v			04/20/15 20:23	40.7
1,1,2-Trichloro-1,2,2-trifluoroethane	530		16	6.6	ppb v/v			04/20/15 20:23	40.7
1,2,4-Trichlorobenzene	ND		81	18	ppb v/v			04/20/15 20:23	40.7
1,1,1-Trichloroethane	4.5	J	12	2.6	ppb v/v			04/20/15 20:23	40.7
1,1,2-Trichloroethane	ND		16	2.7	ppb v/v			04/20/15 20:23	40.7
Trichloroethene	2200		16	4.3	ppb v/v			04/20/15 20:23	40.7
Trichlorofluoromethane	160		16	8.0	ppb v/v			04/20/15 20:23	40.7
1,2,4-Trimethylbenzene	ND		33	6.6	ppb v/v			04/20/15 20:23	40.7
1,3,5-Trimethylbenzene	ND		16	5.1	ppb v/v			04/20/15 20:23	40.7
Vinyl acetate	ND		33	5.9	ppb v/v			04/20/15 20:23	40.7

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-12394-1

**Client Sample ID: 097572-001/CWL-D2-440 W/M**

**Lab Sample ID: 320-12394-1**

Date Collected: 03/31/15 09:29

Matrix: Air

Date Received: 04/03/15 09:00

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		16	4.9	ppb v/v			04/20/15 20:23	40.7
m,p-Xylene	ND		33	4.1	ppb v/v			04/20/15 20:23	40.7
o-Xylene	ND		16	2.2	ppb v/v			04/20/15 20:23	40.7
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		70 - 130					04/20/15 20:23	40.7
1,2-Dichloroethane-d4 (Surr)	93		70 - 130					04/20/15 20:23	40.7
Toluene-d8 (Surr)	97		70 - 130					04/20/15 20:23	40.7

**Client Sample ID: 097573-001/CWL-D2-440 W/M**

**Lab Sample ID: 320-12394-2**

Date Collected: 03/31/15 09:29

Matrix: Air

Date Received: 04/03/15 09:00

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	11	J	200	7.2	ppb v/v			04/20/15 21:05	40.6
Benzene	7.1	J B	16	3.2	ppb v/v			04/20/15 21:05	40.6
Benzyl chloride	ND		32	6.6	ppb v/v			04/20/15 21:05	40.6
Bromodichloromethane	ND		12	2.7	ppb v/v			04/20/15 21:05	40.6
Bromoform	ND		16	2.8	ppb v/v			04/20/15 21:05	40.6
Bromomethane	ND		32	14	ppb v/v			04/20/15 21:05	40.6
2-Butanone (MEK)	ND		32	8.1	ppb v/v			04/20/15 21:05	40.6
Carbon disulfide	ND		32	3.2	ppb v/v			04/20/15 21:05	40.6
Carbon tetrachloride	11	J	32	2.6	ppb v/v			04/20/15 21:05	40.6
Chlorobenzene	ND		12	2.6	ppb v/v			04/20/15 21:05	40.6
Chloroethane	ND		32	13	ppb v/v			04/20/15 21:05	40.6
Chloroform	37		12	3.9	ppb v/v			04/20/15 21:05	40.6
Chloromethane	ND		32	8.0	ppb v/v			04/20/15 21:05	40.6
Dibromochloromethane	ND		16	3.2	ppb v/v			04/20/15 21:05	40.6
1,2-Dibromoethane (EDB)	ND		32	3.0	ppb v/v			04/20/15 21:05	40.6
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		16	6.3	ppb v/v			04/20/15 21:05	40.6
1,2-Dichlorobenzene	ND		16	5.3	ppb v/v			04/20/15 21:05	40.6
1,3-Dichlorobenzene	ND		16	4.5	ppb v/v			04/20/15 21:05	40.6
1,4-Dichlorobenzene	ND		16	6.0	ppb v/v			04/20/15 21:05	40.6
Dichlorodifluoromethane	30		16	5.9	ppb v/v			04/20/15 21:05	40.6
1,1-Dichloroethane	3.3	J	12	2.9	ppb v/v			04/20/15 21:05	40.6
1,2-Dichloroethane	ND		32	3.6	ppb v/v			04/20/15 21:05	40.6
1,1-Dichloroethene	210		32	5.2	ppb v/v			04/20/15 21:05	40.6
cis-1,2-Dichloroethene	ND		16	3.6	ppb v/v			04/20/15 21:05	40.6
trans-1,2-Dichloroethene	ND		16	4.1	ppb v/v			04/20/15 21:05	40.6
1,2-Dichloropropane	13	J	16	9.7	ppb v/v			04/20/15 21:05	40.6
cis-1,3-Dichloropropene	ND		16	4.2	ppb v/v			04/20/15 21:05	40.6
trans-1,3-Dichloropropene	ND		16	3.6	ppb v/v			04/20/15 21:05	40.6
Ethylbenzene	ND		16	2.6	ppb v/v			04/20/15 21:05	40.6
4-Ethyltoluene	ND		16	7.6	ppb v/v			04/20/15 21:05	40.6
Hexachlorobutadiene	ND		81	18	ppb v/v			04/20/15 21:05	40.6
2-Hexanone	ND		16	3.5	ppb v/v			04/20/15 21:05	40.6
4-Methyl-2-pentanone (MIBK)	ND		16	5.5	ppb v/v			04/20/15 21:05	40.6

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-12394-1

**Client Sample ID: 097573-001/CWL-D2-440 W/M**

**Lab Sample ID: 320-12394-2**

Date Collected: 03/31/15 09:29

Matrix: Air

Date Received: 04/03/15 09:00

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	16		16	2.9	ppb v/v			04/20/15 21:05	40.6
Styrene	ND		16	2.4	ppb v/v			04/20/15 21:05	40.6
1,1,2,2-Tetrachloroethane	ND		16	2.8	ppb v/v			04/20/15 21:05	40.6
Tetrachloroethene	90		16	2.1	ppb v/v			04/20/15 21:05	40.6
Toluene	4.9	J B	16	2.1	ppb v/v			04/20/15 21:05	40.6
1,1,2-Trichloro-1,2,2-trifluoroethane	570		16	6.6	ppb v/v			04/20/15 21:05	40.6
1,2,4-Trichlorobenzene	ND		81	18	ppb v/v			04/20/15 21:05	40.6
1,1,1-Trichloroethane	5.0	J	12	2.6	ppb v/v			04/20/15 21:05	40.6
1,1,2-Trichloroethane	ND		16	2.7	ppb v/v			04/20/15 21:05	40.6
Trichloroethene	2400		16	4.3	ppb v/v			04/20/15 21:05	40.6
Trichlorofluoromethane	180		16	8.0	ppb v/v			04/20/15 21:05	40.6
1,2,4-Trimethylbenzene	ND		32	6.6	ppb v/v			04/20/15 21:05	40.6
1,3,5-Trimethylbenzene	ND		16	5.1	ppb v/v			04/20/15 21:05	40.6
Vinyl acetate	ND		32	5.9	ppb v/v			04/20/15 21:05	40.6
Vinyl chloride	ND		16	4.9	ppb v/v			04/20/15 21:05	40.6
m,p-Xylene	ND		32	4.1	ppb v/v			04/20/15 21:05	40.6
o-Xylene	ND		16	2.2	ppb v/v			04/20/15 21:05	40.6
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	86		70 - 130					04/20/15 21:05	40.6
1,2-Dichloroethane-d4 (Surr)	93		70 - 130					04/20/15 21:05	40.6
Toluene-d8 (Surr)	96		70 - 130					04/20/15 21:05	40.6

**Client Sample ID: 097574-001/CWL-D2-440 WO/M**

**Lab Sample ID: 320-12394-3**

Date Collected: 03/31/15 09:34

Matrix: Air

Date Received: 04/03/15 09:00

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
Benzene	10	J B	23	4.6	ppb v/v			04/20/15 21:48	58.7
Benzyl chloride	ND		47	9.6	ppb v/v			04/20/15 21:48	58.7
Bromodichloromethane	ND		18	3.9	ppb v/v			04/20/15 21:48	58.7
Bromoform	ND		23	4.1	ppb v/v			04/20/15 21:48	58.7
Bromomethane	ND		47	20	ppb v/v			04/20/15 21:48	58.7
2-Butanone (MEK)	100		47	12	ppb v/v			04/20/15 21:48	58.7
Carbon disulfide	190		47	4.6	ppb v/v			04/20/15 21:48	58.7
Carbon tetrachloride	9.8	J	47	3.8	ppb v/v			04/20/15 21:48	58.7
Chlorobenzene	ND		18	3.8	ppb v/v			04/20/15 21:48	58.7
Chloroethane	ND		47	18	ppb v/v			04/20/15 21:48	58.7
Chloroform	29		18	5.6	ppb v/v			04/20/15 21:48	58.7
Chloromethane	ND		47	12	ppb v/v			04/20/15 21:48	58.7
Dibromochloromethane	ND		23	4.6	ppb v/v			04/20/15 21:48	58.7
1,2-Dibromoethane (EDB)	ND		47	4.4	ppb v/v			04/20/15 21:48	58.7
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		23	9.1	ppb v/v			04/20/15 21:48	58.7
1,2-Dichlorobenzene	ND		23	7.6	ppb v/v			04/20/15 21:48	58.7
1,3-Dichlorobenzene	ND		23	6.5	ppb v/v			04/20/15 21:48	58.7
1,4-Dichlorobenzene	ND		23	8.7	ppb v/v			04/20/15 21:48	58.7

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-12394-1

**Client Sample ID: 097574-001/CWL-D2-440 WO/M**

**Lab Sample ID: 320-12394-3**

Date Collected: 03/31/15 09:34

Matrix: Air

Date Received: 04/03/15 09:00

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	23		23	8.5	ppb v/v			04/20/15 21:48	58.7
1,1-Dichloroethane	ND		18	4.2	ppb v/v			04/20/15 21:48	58.7
1,2-Dichloroethane	25	J	47	5.2	ppb v/v			04/20/15 21:48	58.7
1,1-Dichloroethene	170		47	7.6	ppb v/v			04/20/15 21:48	58.7
cis-1,2-Dichloroethene	ND		23	5.2	ppb v/v			04/20/15 21:48	58.7
trans-1,2-Dichloroethene	ND		23	5.9	ppb v/v			04/20/15 21:48	58.7
1,2-Dichloropropane	ND		23	14	ppb v/v			04/20/15 21:48	58.7
cis-1,3-Dichloropropene	ND		23	6.1	ppb v/v			04/20/15 21:48	58.7
trans-1,3-Dichloropropene	ND		23	5.2	ppb v/v			04/20/15 21:48	58.7
Ethylbenzene	24		23	3.7	ppb v/v			04/20/15 21:48	58.7
4-Ethyltoluene	ND		23	11	ppb v/v			04/20/15 21:48	58.7
Hexachlorobutadiene	ND		120	25	ppb v/v			04/20/15 21:48	58.7
2-Hexanone	ND		23	5.1	ppb v/v			04/20/15 21:48	58.7
4-Methyl-2-pentanone (MIBK)	11	J	23	7.9	ppb v/v			04/20/15 21:48	58.7
Methylene Chloride	57		23	4.2	ppb v/v			04/20/15 21:48	58.7
Styrene	16	J	23	3.5	ppb v/v			04/20/15 21:48	58.7
1,1,1,2-Tetrachloroethane	ND		23	4.1	ppb v/v			04/20/15 21:48	58.7
Tetrachloroethene	58		23	3.0	ppb v/v			04/20/15 21:48	58.7
Toluene	190	B	23	3.0	ppb v/v			04/20/15 21:48	58.7
1,1,2-Trichloro-1,2,2-trifluoroethane	570		23	9.6	ppb v/v			04/20/15 21:48	58.7
1,2,4-Trichlorobenzene	ND		120	25	ppb v/v			04/20/15 21:48	58.7
1,1,1-Trichloroethane	4.5	J	18	3.8	ppb v/v			04/20/15 21:48	58.7
1,1,2-Trichloroethane	ND		23	3.9	ppb v/v			04/20/15 21:48	58.7
Trichloroethene	1700		23	6.2	ppb v/v			04/20/15 21:48	58.7
Trichlorofluoromethane	140		23	12	ppb v/v			04/20/15 21:48	58.7
1,2,4-Trimethylbenzene	ND		47	9.5	ppb v/v			04/20/15 21:48	58.7
1,3,5-Trimethylbenzene	ND		23	7.3	ppb v/v			04/20/15 21:48	58.7
Vinyl acetate	ND		47	8.5	ppb v/v			04/20/15 21:48	58.7
Vinyl chloride	ND		23	7.0	ppb v/v			04/20/15 21:48	58.7
m,p-Xylene	37	J B	47	5.9	ppb v/v			04/20/15 21:48	58.7
o-Xylene	12	J	23	3.2	ppb v/v			04/20/15 21:48	58.7

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		70 - 130		04/20/15 21:48	58.7
1,2-Dichloroethane-d4 (Surr)	93		70 - 130		04/20/15 21:48	58.7
Toluene-d8 (Surr)	98		70 - 130		04/20/15 21:48	58.7

**Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	2300		290	10	ppb v/v			04/22/15 00:02	58.7

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		70 - 130		04/22/15 00:02	58.7
1,2-Dichloroethane-d4 (Surr)	94		70 - 130		04/22/15 00:02	58.7
Toluene-d8 (Surr)	96		70 - 130		04/22/15 00:02	58.7



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-12394-1

**Client Sample ID: 097575-001/CWL-D2-440 WO/M**

**Lab Sample ID: 320-12394-4**

Date Collected: 03/31/15 09:36

Matrix: Air

Date Received: 04/03/15 09:00

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
<b>Benzene</b>	<b>10</b>	<b>J B</b>	23	4.6	ppb v/v			04/20/15 22:31	57.8
Benzyl chloride	ND		46	9.4	ppb v/v			04/20/15 22:31	57.8
Bromodichloromethane	ND		17	3.8	ppb v/v			04/20/15 22:31	57.8
Bromoform	ND		23	4.0	ppb v/v			04/20/15 22:31	57.8
Bromomethane	ND		46	19	ppb v/v			04/20/15 22:31	57.8
<b>2-Butanone (MEK)</b>	<b>33</b>	<b>J</b>	46	12	ppb v/v			04/20/15 22:31	57.8
<b>Carbon disulfide</b>	<b>200</b>		46	4.5	ppb v/v			04/20/15 22:31	57.8
<b>Carbon tetrachloride</b>	<b>8.9</b>	<b>J</b>	46	3.7	ppb v/v			04/20/15 22:31	57.8
Chlorobenzene	ND		17	3.7	ppb v/v			04/20/15 22:31	57.8
Chloroethane	ND		46	18	ppb v/v			04/20/15 22:31	57.8
<b>Chloroform</b>	<b>26</b>		17	5.5	ppb v/v			04/20/15 22:31	57.8
Chloromethane	ND		46	11	ppb v/v			04/20/15 22:31	57.8
Dibromochloromethane	ND		23	4.6	ppb v/v			04/20/15 22:31	57.8
1,2-Dibromoethane (EDB)	ND		46	4.3	ppb v/v			04/20/15 22:31	57.8
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		23	9.0	ppb v/v			04/20/15 22:31	57.8
1,2-Dichlorobenzene	ND		23	7.5	ppb v/v			04/20/15 22:31	57.8
1,3-Dichlorobenzene	ND		23	6.4	ppb v/v			04/20/15 22:31	57.8
1,4-Dichlorobenzene	ND		23	8.6	ppb v/v			04/20/15 22:31	57.8
<b>Dichlorodifluoromethane</b>	<b>22</b>	<b>J</b>	23	8.4	ppb v/v			04/20/15 22:31	57.8
1,1-Dichloroethane	ND		17	4.2	ppb v/v			04/20/15 22:31	57.8
<b>1,2-Dichloroethane</b>	<b>23</b>	<b>J</b>	46	5.1	ppb v/v			04/20/15 22:31	57.8
<b>1,1-Dichloroethene</b>	<b>150</b>		46	7.5	ppb v/v			04/20/15 22:31	57.8
cis-1,2-Dichloroethene	ND		23	5.1	ppb v/v			04/20/15 22:31	57.8
trans-1,2-Dichloroethene	ND		23	5.8	ppb v/v			04/20/15 22:31	57.8
1,2-Dichloropropane	ND		23	14	ppb v/v			04/20/15 22:31	57.8
cis-1,3-Dichloropropene	ND		23	6.0	ppb v/v			04/20/15 22:31	57.8
trans-1,3-Dichloropropene	ND		23	5.1	ppb v/v			04/20/15 22:31	57.8
<b>Ethylbenzene</b>	<b>13</b>	<b>J</b>	23	3.6	ppb v/v			04/20/15 22:31	57.8
4-Ethyltoluene	ND		23	11	ppb v/v			04/20/15 22:31	57.8
Hexachlorobutadiene	ND		120	25	ppb v/v			04/20/15 22:31	57.8
2-Hexanone	ND		23	5.0	ppb v/v			04/20/15 22:31	57.8
<b>4-Methyl-2-pentanone (MIBK)</b>	<b>11</b>	<b>J</b>	23	7.8	ppb v/v			04/20/15 22:31	57.8
<b>Methylene Chloride</b>	<b>55</b>		23	4.2	ppb v/v			04/20/15 22:31	57.8
<b>Styrene</b>	<b>16</b>	<b>J</b>	23	3.4	ppb v/v			04/20/15 22:31	57.8
1,1,1,2-Tetrachloroethane	ND		23	4.0	ppb v/v			04/20/15 22:31	57.8
<b>Tetrachloroethene</b>	<b>51</b>		23	2.9	ppb v/v			04/20/15 22:31	57.8
<b>Toluene</b>	<b>94</b>	<b>B</b>	23	2.9	ppb v/v			04/20/15 22:31	57.8
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>530</b>		23	9.4	ppb v/v			04/20/15 22:31	57.8
1,2,4-Trichlorobenzene	ND		120	25	ppb v/v			04/20/15 22:31	57.8
<b>1,1,1-Trichloroethane</b>	<b>4.2</b>	<b>J</b>	17	3.8	ppb v/v			04/20/15 22:31	57.8
1,1,2-Trichloroethane	ND		23	3.9	ppb v/v			04/20/15 22:31	57.8
<b>Trichloroethene</b>	<b>1500</b>		23	6.1	ppb v/v			04/20/15 22:31	57.8
<b>Trichlorofluoromethane</b>	<b>130</b>		23	11	ppb v/v			04/20/15 22:31	57.8
1,2,4-Trimethylbenzene	ND		46	9.4	ppb v/v			04/20/15 22:31	57.8
1,3,5-Trimethylbenzene	ND		23	7.2	ppb v/v			04/20/15 22:31	57.8
Vinyl acetate	ND		46	8.4	ppb v/v			04/20/15 22:31	57.8
Vinyl chloride	ND		23	6.9	ppb v/v			04/20/15 22:31	57.8
<b>m,p-Xylene</b>	<b>33</b>	<b>J B</b>	46	5.8	ppb v/v			04/20/15 22:31	57.8

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-12394-1

**Client Sample ID: 097575-001/CWL-D2-440 WO/M**

**Lab Sample ID: 320-12394-4**

Date Collected: 03/31/15 09:36

Matrix: Air

Date Received: 04/03/15 09:00

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
<i>o</i> -Xylene	14	J	23	3.1	ppb v/v			04/20/15 22:31	57.8

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		70 - 130		04/20/15 22:31	57.8
1,2-Dichloroethane-d4 (Surr)	94		70 - 130		04/20/15 22:31	57.8
Toluene-d8 (Surr)	97		70 - 130		04/20/15 22:31	57.8

**Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	2100		290	10	ppb v/v			04/22/15 00:45	57.8

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		70 - 130		04/22/15 00:45	57.8
1,2-Dichloroethane-d4 (Surr)	92		70 - 130		04/22/15 00:45	57.8
Toluene-d8 (Surr)	97		70 - 130		04/22/15 00:45	57.8

**Client Sample ID: 097576-001/CWL-SV-FB1**

**Lab Sample ID: 320-12394-5**

Date Collected: 03/31/15 08:52

Matrix: Air

Date Received: 04/03/15 09:00

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	0.62	J	5.0	0.18	ppb v/v			04/20/15 23:19	1
Benzene	ND		0.40	0.079	ppb v/v			04/20/15 23:19	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			04/20/15 23:19	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			04/20/15 23:19	1
Bromoform	ND		0.40	0.070	ppb v/v			04/20/15 23:19	1
Bromomethane	ND		0.80	0.34	ppb v/v			04/20/15 23:19	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			04/20/15 23:19	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			04/20/15 23:19	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			04/20/15 23:19	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			04/20/15 23:19	1
Chloroethane	ND		0.80	0.31	ppb v/v			04/20/15 23:19	1
Chloroform	ND		0.30	0.095	ppb v/v			04/20/15 23:19	1
Chloromethane	ND		0.80	0.20	ppb v/v			04/20/15 23:19	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			04/20/15 23:19	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			04/20/15 23:19	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			04/20/15 23:19	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			04/20/15 23:19	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			04/20/15 23:19	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			04/20/15 23:19	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			04/20/15 23:19	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			04/20/15 23:19	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			04/20/15 23:19	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			04/20/15 23:19	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			04/20/15 23:19	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			04/20/15 23:19	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			04/20/15 23:19	1

TestAmerica Sacramento

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL-SVM

TestAmerica Job ID: 320-12394-1

**Client Sample ID: 097576-001/CWL-SV-FB1**

**Lab Sample ID: 320-12394-5**

Date Collected: 03/31/15 08:52

Matrix: Air

Date Received: 04/03/15 09:00

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-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			04/20/15 23:19	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			04/20/15 23:19	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			04/20/15 23:19	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			04/20/15 23:19	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			04/20/15 23:19	1
2-Hexanone	ND		0.40	0.087	ppb v/v			04/20/15 23:19	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			04/20/15 23:19	1
<b>Methylene Chloride</b>	<b>0.089</b>	<b>J</b>	0.40	0.072	ppb v/v			04/20/15 23:19	1
Styrene	ND		0.40	0.059	ppb v/v			04/20/15 23:19	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			04/20/15 23:19	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			04/20/15 23:19	1
Toluene	ND		0.40	0.051	ppb v/v			04/20/15 23:19	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			04/20/15 23:19	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			04/20/15 23:19	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			04/20/15 23:19	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			04/20/15 23:19	1
Trichloroethene	ND		0.40	0.11	ppb v/v			04/20/15 23:19	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			04/20/15 23:19	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			04/20/15 23:19	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			04/20/15 23:19	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			04/20/15 23:19	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			04/20/15 23:19	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			04/20/15 23:19	1
o-Xylene	ND		0.40	0.054	ppb v/v			04/20/15 23:19	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	84		70 - 130					04/20/15 23:19	1
1,2-Dichloroethane-d4 (Surr)	93		70 - 130					04/20/15 23:19	1
Toluene-d8 (Surr)	90		70 - 130					04/20/15 23:19	1

**ANNEX C**  
**Chemical Waste Landfill**  
**CY 2015 Post-Closure Inspection Forms**

## **COVER/SITE INSPECTIONS**

## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 3/9/15
2. Time of Inspection 1045
3. Name of Inspector Robert Zick

**Mandatory requirement:**

The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: (Inspector must initial box before proceeding with the inspection.)

Training records maintained at CAMU Administrative Trailer.

Ry

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. COVER SYSTEM [Quarterly]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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 CWL cover surface in excess of 100 square feet.	yes	No	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	
E. Contiguous areas of no vegetation greater than 200 ft <sup>2</sup> . Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	

<b>II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	yes	1

**Chemical Waste Landfill  
 Post-Closure Inspection Form  
 Checklist for Cover System / Surface-Water / Security Fence (continued)**

<b>III. SECURITY FENCE [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	yes	2
E. Warning signs in need of repair or replacement.	yes	No	
F. Survey monuments in vicinity of CWL visible.	yes	yes	3

<b>IV. PREVIOUS DEFICIENCIES</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.	NA	NA	

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

**NOTES**

Note Number	Description
1.	Tumble weeds need to be removed from drainage culverts on southern side of the site.
2.	Man gate lock needs lubrication.
3.	Two western most survey marks have sediment and tumble weed accumulation.



**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 1 assigned to Robert Zick Date action completed 3/9/15

Action (Note Number) 2 assigned to Robert Zick Date action completed 3/9/15

Action (Note Number) 3 assigned to Robert Zick Date action completed 3/9/15

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

1. Tumble weeds removed from drainage culvert  
at time of inspection.

2. Man gate lock was lubricated at time of  
inspection.

3. Two western most survey markers were  
cleared of soil accumulation. Tumble weeds  
were removed. Completed at time of inspection.

Inspector's Signature Robert Zick


Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 6/1/15  
 2. Time of Inspection 08:40  
 3. Name of Inspector Robert Zöck

**Mandatory requirement:**  
 The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: *(Inspector must initial box before proceeding with the inspection.)*  
 Training records maintained at CAMU Administrative Trailer.



Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. COVER SYSTEM [Quarterly]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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 CWL cover surface in excess of 100 square feet.	yes	No	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	
E. Contiguous areas of no vegetation greater than 200 ft <sup>2</sup> . Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	

<b>II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	yes	1

**Chemical Waste Landfill  
 Post-Closure Inspection Form  
 Checklist for Cover System / Surface-Water / Security Fence (continued)**

<b>III. SECURITY FENCE [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Accumulation of wind-blown plants and debris.	yes	yes	2
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 CWL visible.	yes	No	

<b>IV. PREVIOUS DEFICIENCIES</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.	NA	NA	

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

NOTES

Note Number	Description
1.	<i>Drainage culverts on south side of site need to be cleared of tumbleweed debris.</i>
2.	<i>Some accumulation of tumbleweed debris along the north, south, east, and west fence line.</i>

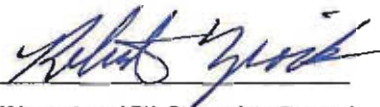
**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 1 assigned to Robert Zock Date action completed 7/31/15  
Action (Note Number) 2 assigned to Robert Zock Date action completed 7/29/15  
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:**

Invasive plants that have the potential to develop deep  
root systems were identified growing on the CWL cover.  
They consist of Russian Thistle plants located mostly  
along the perimeter fence, and a few snakeweed  
and four-wing saltbush plants identified sporadically  
across the CWL Cover. These plants will be removed  
during routine maintenance of the CWL cover  
scheduled for sometime in July 2015.

Inspector's Signature



Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 9/8/2015
2. Time of Inspection 10:09 - 11:05
3. Name of Inspector Robert Zick

**Mandatory requirement:**

The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: RZ  
 (Inspector must initial box before proceeding with the inspection.)

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. COVER SYSTEM [Quarterly]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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 CWL cover surface in excess of 100 square feet.	yes	No	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	1
E. Contiguous areas of no vegetation greater than 200 ft <sup>2</sup> . Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	

<b>II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	

**Chemical Waste Landfill  
 Post-Closure Inspection Form  
 Checklist for Cover System / Surface-Water / Security Fence (continued)**

<b>III. SECURITY FENCE [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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 CWL visible.	yes	yes	2

<b>IV. PREVIOUS DEFICIENCIES</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.	NA	NA	

**Chemical Waste Landfill  
 Post-Closure Inspection Form  
 Checklist for Cover System / Surface-Water / Security Fence (continued)**

NOTES

Note Number	Description
1	<p>No animal intrusion burrows in excess of 4 inches in diameter were identified during the inspection. The eleven small mammal burrows identified during the August biology inspection were still present along the inside of the western perimeter fence. As a best management practice to discourage future occupation of the burrows, they were backfilled on September 10, 2015 after it was verified by a biologist that the burrows were inactive. See attached e-mail.</p>
2	<p>The four survey monuments are covered with soil and vegetation debris. They were cleared of soil and vegetation debris during the inspection.</p>





**Ziock, Robert**

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**From:** Fahy, Evan Francis  
**Sent:** Wednesday, September 09, 2015 12:51 PM  
**To:** Ziock, Robert  
**Cc:** Mitchell, Mike M; Little, Bonnie Colleen  
**Subject:** CWL Burrow Inspection

For your records:

Robert,

I went out and inspected the flagged burrows along the eastern fence of the CWL. The burrows located in the center of the fence line (running north-south) were deemed inactive upon inspection. These burrows were mostly collapsed and filled with spider webs. No downhole camera inspections were required for this assessment. The burrows located on the south end of the fence line belong to kangaroo rats. These burrows were also deemed inactive, however an active mound was located east and outside of the fence line. The kangaroo rats may, at some point, try and reestablish this old burrow system.

There are no biological concerns associated with backfilling these burrows. This work may proceed. Please contact me with any other questions or concerns.

Evan Fahy  
Sandia Biologist

## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 12/2/15
2. Time of Inspection 11:55 - 12:30
3. Name of Inspector Robert Ziack

**Mandatory requirement:**

The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training:  
 (Inspector must initial box before proceeding with the inspection.)

*RZ*

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. COVER SYSTEM [Quarterly]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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 CWL cover surface in excess of 100 square feet.	yes	No	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	yes	1
E. Contiguous areas of no vegetation greater than 200 ft <sup>2</sup> . Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	

<b>II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	yes	2

**Chemical Waste Landfill  
 Post-Closure Inspection Form  
 Checklist for Cover System / Surface-Water / Security Fence (continued)**

<b>III. SECURITY FENCE [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Accumulation of wind-blown plants and debris.	yes	yes	3
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 CWL visible.	yes	No	

<b>IV. PREVIOUS DEFICIENCIES</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.	NA	NA	

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

**NOTES**

Note Number	Description
1	One animal burrow with ~4 inch diameter entrance located ~3 feet off east fence line (midway).
2	Some tumbleweed debris in drainage culverts located on south side of site. The debris was removed at time of the inspection.
3	Two tumbleweeds on the fence line were removed at time of the inspection.

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 1 assigned to Robert Zöck Date action completed \_\_\_\_\_

Action (Note Number) 2 assigned to Robert Zöck Date action completed 12/2/15

Action (Note Number) 3 assigned to Robert Zöck Date action completed 12/2/15

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

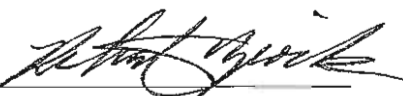
Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

#2 - Tumbleweed debris in drainage culverts  
was removed at time of the inspection.

#3 - Two tumbleweeds on the fence line were  
removed at time of the inspection.

#1 - See attached e-mail for course of  
action regarding animal burrow

Inspector's Signature 

Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

**Ziock, Robert**

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**From:** Mitchell, Mike M  
**Sent:** Wednesday, December 09, 2015 2:16 PM  
**To:** Ziock, Robert  
**Cc:** Fahy, Evan Francis; Baumann, Matthew  
**Subject:** RE: Follow up to the animal burrow noted on the CWL quarterly cover inspection performed on December 2, 2015

Robert;

Thanks for the follow-up on the burrow at the CWL. As we discussed previously this week, this is a shallow burrow near the perimeter, has a diameter narrower than 4-inches below the surface opening, and will have no adverse impact to the site. Given all the information, please proceed as recommended by the staff biologist and reinvestigate with our staff biologist during your March 2016 inspection. At that time we can determine the appropriate course of action to ensure this burrow is backfilled without adverse impact to the wildlife.

Thanks.

Mike Mitchell  
CWL Project Leader  
845-8045

**From:** Ziock, Robert  
**Sent:** Wednesday, December 09, 2015 1:24 PM  
**To:** Mitchell, Mike M  
**Cc:** Fahy, Evan Francis; Baumann, Matthew  
**Subject:** Follow up to the animal burrow noted on the CWL quarterly cover inspection performed on December 2, 2015

Mike,

A video inspection was made of the animal burrow on December 7, 2015 by a staff biologist. The video inspection revealed a cache of food and droppings, however, no animal was sighted. It should be noted that the camera was unable to navigate and inspect the entire burrow. Limited tracks outside the burrow, and the food cache and droppings inside the burrow, indicate that it is being used as a winter shelter and possible hibernation. Because of Sandia's commitment to wildlife, the biologist recommends that it is best not disturb the animal during the winter/hibernation months and reinvestigate the burrow in March during the next quarterly inspection. The burrow has been marked for reinvestigation. If the burrow is determined to still be active, at that time an attempt will be made to relocate the animal and backfill the burrow.

*Robert Ziock*  
*Sandia National Laboratories*  
*Long-Term Stewardship Department 4142*  
*505-845-0485*  
[rziock@sandia.gov](mailto:rziock@sandia.gov)

## **GROUNDWATER/SOIL-VAPOR EQUIPMENT INSPECTIONS**



## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Groundwater Monitoring Locations / Sampling Equipment

1. Date of Inspection 01/13/15
2. Time of Inspection 0738
3. Name of Inspector Robert Lynch

**Mandatory requirement:**

The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: RL  
(Inspector must initial box before proceeding with the inspection.)

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. GROUNDWATER MONITORING LOCATIONS [Semi-annually]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	YES	NO	
B. Well cover caps (e.g., PVC caps, J-Plug, or equivalent) in need of repair/maintenance.	YES	NO	1
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	

<b>II. GROUNDWATER SAMPLING EQUIPMENT [Semi-annually]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	





**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Soil-Gas Monitoring Locations / Sampling Equipment**

1. Date of Inspection 01/21/15  
 2. Time of Inspection 0750  
 3. Name of Inspector Robert Lynch

**Mandatory requirement:**

The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: *(Inspector must initial box before proceeding with the inspection.)*

RL

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. SOIL-GAS MONITORING LOCATIONS [Annually]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	YES	NO	
B. Well cover caps (e.g., PVC caps, J-Plug, Swagelok® dust caps, passive venting Baroballs™, or equivalent) 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.	NO	NA	1

<b>II. SAMPLING EQUIPMENT [Annually]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Soil-Gas Monitoring Locations / Sampling Equipment  
(continued)**

<b>III. PREVIOUS DEFICIENCIES</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.	NA	NA	

**NOTES**

<b>Note Number</b>	<b>Description</b>
1	No locks - Vapor Well Design

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Soil-Gas Monitoring Locations / Sampling Equipment  
(continued)**

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

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**Additional Comments:**

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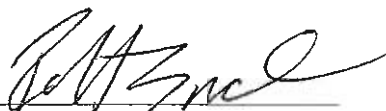
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Inspector's Signature 

Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Soil-Gas Monitoring Locations / Sampling Equipment**

1. Date of Inspection 03/31/15  
 2. Time of Inspection 0840  
 3. Name of Inspector Robert Lynch

**Mandatory requirement:**

The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: (Inspector must initial box before proceeding with the inspection.)

*RL*

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. SOIL-GAS MONITORING LOCATIONS [Annually]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	YES	NO	
B. Well cover caps (e.g., PVC caps, J-Plug, Swagelok® dust caps, passive venting Baroballs™, or equivalent) 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.	NO	NA	1

<b>II. SAMPLING EQUIPMENT [Annually]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	







## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Groundwater Monitoring Locations / Sampling Equipment

1. Date of Inspection 07/06/15
2. Time of Inspection 0740
3. Name of Inspector Robert Lynch

<p><b>Mandatory requirement:</b> The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: <span style="float: right; border: 1px solid black; padding: 2px;">RL</span> <i>(Inspector must initial box before proceeding with the inspection.)</i></p> <p>Training records maintained at CAMU Administrative Trailer.</p>
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Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. GROUNDWATER MONITORING LOCATIONS [Semi-annually]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	YES	NO	
B. Well cover caps (e.g., PVC caps, J-Plug, or equivalent) in need of repair/maintenance.	YES	NO	1
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	

<b>II. GROUNDWATER SAMPLING EQUIPMENT [Semi-annually]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	



**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Groundwater Monitoring Locations / Sampling Equipment  
(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 \_\_\_\_\_
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- Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

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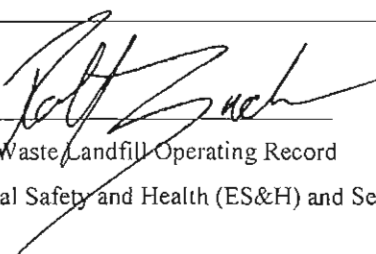
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Inspector's Signature   
Original to: Chemical Waste Landfill Operating Record  
Copy to: Environmental Safety and Health (ES&H) and Security Records Center

## **BIOLOGY INSPECTION**

**Chemical Waste Landfill  
 Post-Closure Inspection Form  
 Biology Inspection Checklist for the CWL Cover**

<p><b><u>Mandatory requirement:</u></b></p> <p>The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training:  <i>(Inspector must initial box before proceeding with the inspection.)</i></p>	
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Approximate vegetative coverage (i.e., living plants): 48%<sup>1</sup>

Approximate percent native vegetation of the total vegetative cover: 94%

Listed below are the main plant species identified growing on the CWL cover and the approximate percent cover for each species.

<u>Scientific Name</u>	<u>Common Name (optional)</u>	<u>%Total cover</u>
<u>Bouteloua gracilis</u>	<u>Blue grama</u>	<u>12%</u>
<u>Pleuraphis jamesii</u>	<u>Galleta grass</u>	<u>3%</u>
<u>Sporobolus cryptandrus</u>	<u>Sand dropseed</u>	<u>24%</u>
<u>Gutierrezia sarothrae</u>	<u>Broom snakeweed</u>	<u>1%</u>
<u>Sporobolus contractus</u>	<u>Spike dropseed</u>	<u>1%</u>
<u>Atriplex canescens</u>	<u>Four-wing saltbush</u>	<u>4%</u>
<u>Salsola tragus</u>	<u>Russian thistle</u>	<u>3%</u>
<u>Amaranthus species</u>	<u>Pigweed</u>	<u>&lt;0.5%</u>
<u>Chamaesyce species</u>	<u>Spurge</u>	<u>&lt;0.5%</u>
<u>Achnatherum hymenoides</u>	<u>Indian ricegrass</u>	<u>&lt;0.5%</u>
<u>Sphaeralcea species</u>	<u>Globemallow</u>	<u>&lt;0.5%</u>
<u>Kochia scoparia</u>	<u>Burningbush</u>	<u>&lt;0.5%</u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>

Note: <sup>1</sup>All species observed to be present at less than one-half of one-percent are not calculated into the total vegetative coverage

## Chemical Waste Landfill Biology Inspection Checklist for the CWL Cover (Continued)

### Permit Requirements:

- 1) Is the total foliar coverage (i.e., land surface covered with living plants) greater than or equal to 20%? Yes If "No," explain below.

Notes: \_\_\_\_\_

- 2) Of the 20% total foliar coverage, is 50% or greater comprised of native perennial species, and 50% or less comprised of annual species? Yes If "No," explain below.

Notes: \_\_\_\_\_

- 3) Are there any contiguous areas of no vegetation greater than 200 square feet (approximately 14 x14 ft.)? No If "Yes," mark such areas on a map and attach to this checklist. Describe area(s) and plans to actively improve/repair area(s) as detailed in Permit Attachment 1, Section 1.9.1.3 below.

Notes: \_\_\_\_\_

- 4) Are there any animal burrow entrances on the cover in excess of 4 inches in diameter? No If "Yes," mark such areas on a map and provide additional information below.

Notes: \_\_\_\_\_

### General Cover Information:

Are any burrows smaller than 4 inches in diameter present on the cover? Yes

Does any burrow(s) appear to be active? Yes

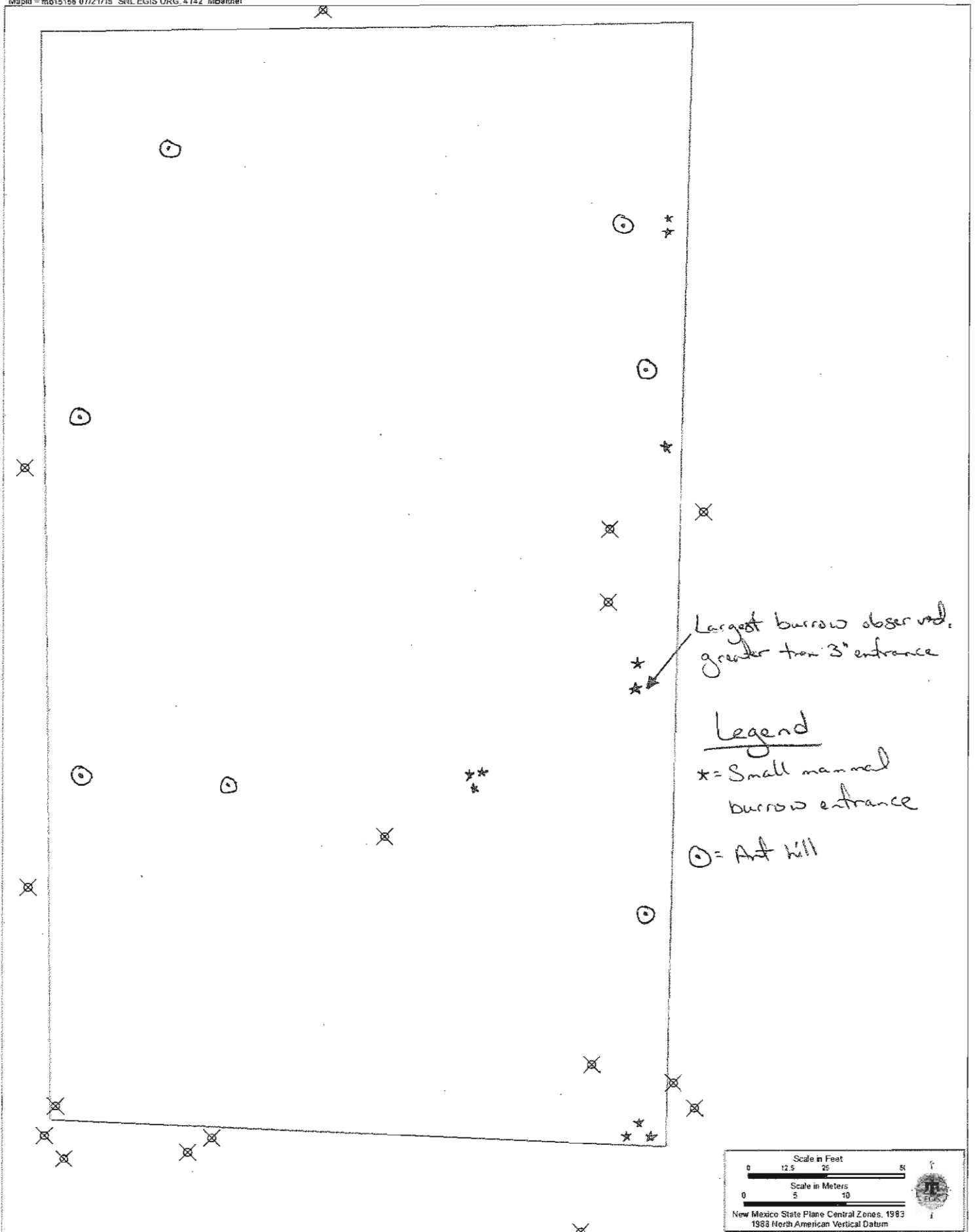
Animal Burrow Notes: Eleven small mammal burrow entrances were observed, primarily along the eastern portion of the cover. Seven ant burrows were observed, distributed fairly evenly across the cover. All of these features are shown on the attached inspection map. No repair is required. However, as a best management practice to discourage future burrowing into the ET Cover, these burrows were filled with local soil on September 10, 2015 after inspection and the determination that they were not currently inhabited/active.

Are there any potentially deep-rooted plants (roots greater than 8 feet deep at maturity) or other undesirable plants (i.e., weeds) present on the cover? Yes If "Yes," describe below.

Plant Notes: Many juvenile four-wing saltbush are present across the cover. This shrub species can develop deep root systems at maturity, but the current individuals present on the cover have not yet developed deep root systems. The shrubs and weedy species (i.e., Russian thistle) present on the cover were removed on August 10-12, 2015 as a best management practice (there is no requirement to remove potentially deep-rooted plants or weedy species in Permit Attachment 1, Section 1.9.1).







CWL 2015 Biological Inspection Map - August

2015 CWL Biology Inspection Photos



CWL: Northwest portion of the cover



CWL: Southwest portion of the cover

2015 CWL Biology Inspection Photos



CWL: Southeast portion of the cover



CWL: Northeast portion of the cover

2015 CWL Biology Inspection Photos



CWL: Looking north from the center of the cover



CWL: Looking east from the center of the cover

2015 CWL Biology Inspection Photos



CWL: Looking south from the center of the cover



CWL: Looking west from the center of the cover

**ANNEX D**  
**CY 2015 Chemical Waste Landfill Biology Report**

# 2015 Chemical Waste Landfill Biology Report

## Introduction

As required by the Chemical Waste Landfill (CWL) Post-Closure Care Permit (PCCP) (NMED October 2009), Attachment 1, Section 1.9.1.1, this summary report for Calendar Year (CY) 2015 presents the results of vegetation inspection and monitoring activities performed by the staff biologist on the CWL evapotranspirative (ET) Cover. The purpose of this report is to provide relevant background information, describe local climate trends over the 2015 growing season, expand on the inspection results, and provide recommendations for future ET Cover vegetation monitoring and maintenance. The annual CWL Biology Inspection of the ET Cover (Biology Inspection) for CY 2015 was conducted on August 4, 2015. The inspection observations are documented on the "Chemical Waste Landfill Post-Closure Inspection Form Biology Inspection Checklist for the CWL Cover" (Annex C). The inspection was conducted during the 2015 growing season to most accurately determine the coverage of living plants.

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 CWL is located at a relatively high elevation and 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 provide the best ET Cover performance due to their extensive near-surface root systems that 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 additional soil stabilization, and remove moisture from deeper soil layers of the ET Cover relative to non-native or annual species.

## Background Information

The CWL ET Cover was first seeded in September 2005 after cover construction was completed. To meet the criteria for successful revegetation in the timeframe specified in the PCCP (i.e., within 5 years of the PCCP becoming effective), the CWL was weeded, reseeded, and supplemental watering was conducted for approximately two months during the end of the 2009 growing season. The September 2011 CWL Biology Inspection, presented in the CY 2011 CWL Annual Post-Closure Care Report (SNL/NM March 2012), determined the ET Cover met the criteria for successful revegetation as defined in Attachment 1, Section 1.9 of the PCCP (NMED October 2009).

The 2012-2014 CWL Biology Inspections have documented cover conditions that continued to meet the criteria for successful revegetation. CWL cover vegetation during the 2012 and 2013 inspections was characterized by small and tightly spaced native juvenile clump grasses, with an increased diversity of native grasses in 2013. As the cover has developed into a more mature plant community, the native species composition has

## 2015 Chemical Waste Landfill Biology Report

gradually changed from blue grama as the dominant grass species to sand dropseed becoming the dominant grass species in 2014.

As documented in the September 2014 CWL Biology Inspection, the ET Cover was densely populated with many green, nearly fully-mature native perennial clump grasses, as well as some juvenile native grasses. The native grass coverage at the northwest corner of the ET Cover improved significantly in 2014 from previous years. This is the only access point to the ET Cover, so sparser coverage in this area is anticipated and not of concern from an ET Cover performance standpoint.

### Local Climate Trends for 2015 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 reseeding effort in August 2009, the local climate has primarily been dominated by below average precipitation with temperature extremes across the seasons. During the time since reseeding, 2013 and 2015 have been the only years to receive above average annual precipitation.

Vegetation during the growing season is directly affected by the summer meteorological conditions, and it is also strongly influenced by the conditions during the preceding autumn, winter and spring. Soil moisture during the dormant seasons can significantly stress or assist the root systems, which compose the bulk of each native plant. An extended period of very low soil moisture can severely injure root systems during the dormant season, whereas ample soil moisture during the dormant season can promote vigorous above ground growth during the growing season.

The winter and spring preceding the 2015 growing season experienced a few favorable months that provided good soil moisture and bolstered vegetative root health. December 2014 had above average precipitation and May 2015 received nearly nine times the average precipitation for May. This substantial spring rainfall in combination with below average spring and summer winds and above average spring relative humidity, set the stage for healthy plant growth during the 2015 growing season.

Table 1 provides meteorological data for the 3-month period preceding CY 2015. Table 2 provides the meteorological data for CY 2015. The mean monthly meteorological data is expanded and updated from what was previously available for this CWL Biology Report. A 20-year data set (1995-2014) has replaced the previous 17-year data set. This change alters the monthly means, in some cases significantly, as the inclusion or exclusion of El Nino years affects local climate averages. The 1995-2014 data will be the reference mean data set until 2019, when a 25-year data set will be created for the 1994-2018 time period.

### *Precipitation, Relative Humidity and Winds*

Drought has been the dominant meteorological trend in the CWL area since 2008. However, total annual precipitation for the 2015 growing season and preceding winter-to-



2015 Chemical Waste Landfill Biology Report

**Table 1**  
**October-December 2014 Meteorological Data Summary for the Chemical Waste Landfill<sup>a</sup>**

Month	October	November	December	3-Month Avg
<b>Temperature (°F)</b>				
Monthly Mean	60.8	45.8	38.7	48.4
20-year Temp Means	57.9	46.4	37.0	47.1
<b>Precipitation (Inches)</b>				3-Month Total
Monthly Total	0.21	0.34	1.21	1.76
20-year Precip Means	0.93	0.41	0.57	1.91
<b>Relative Humidity (%)</b>				3-Month Avg
Monthly Mean	40.2	40.9	62.6	47.9
20-year RH Means	42.4	44.6	53.8	46.9
<b>Wind (Miles/hour)</b>				3-Month Avg
Monthly Mean	7.1	7.3	6.7	7.0
20-year Wind Means	7.81	7.08	6.77	7.2

<sup>a</sup>Information Source: SNL/NM Meteorological Monitoring Program.

## 2015 Chemical Waste Landfill Biology Report

**Table 2  
2015 Meteorological Data Summary for the Chemical Waste Landfill<sup>a</sup>**

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual <sup>b</sup>
<b>Temperature (°F)</b>													Annual <sup>b</sup>
Monthly Mean	37.0	43.7	52.2	56.4	60.0	75.9	73.3	76.3	71.9	59.7	44.6	35.9	57.3
20-year Temp Means	37.7	41.7	48.8	55.8	66.1	75.4	76.7	74.8	68.9	57.9	46.4	37.0	57.3
<b>Precipitation (Inches)</b>													Annual <sup>c</sup>
Monthly Total	0.64	0.35	0.29	0.43	2.29	0.35	2.30	0.49	0.74	1.29	0.84	1.16	11.17
20-year Precip Means	0.34	0.45	0.56	0.50	0.26	0.49	1.64	1.57	1.00	0.93	0.41	0.57	8.72
<b>Relative Humidity (%)</b>													Annual <sup>b</sup>
Monthly Mean	65.6	47.1	38.6	29.5	44.3	33.1	50.2	38.7	41.4	51.8	53.1	56.1	45.8
20-year RH Means	49.9	44.9	36.4	30.3	26.3	24.9	40.9	44.6	45.6	46.6	47.6	48.6	40.6
<b>Wind (Miles/hour)</b>													Annual <sup>b</sup>
Monthly Mean	6.8	8.0	7.8	9.3	9.6	8.1	6.6	7.8	7.7	8.1	8.2	6.8	7.9
20-year Wind Means	6.94	8.13	9.10	10.47	9.96	9.76	8.42	7.91	7.99	7.81	7.08	6.77	8.36

<sup>a</sup>Information Source: SNL/NM Meteorological Monitoring Program.

<sup>b</sup>Values provided are averages of the monthly data.

<sup>c</sup>Values provided are totals of the monthly data.

## 2015 Chemical Waste Landfill Biology Report

spring timeframe (October 2014-September 2015) was 9.64 inches. This is 10% above the 20-year annual precipitation average of 8.71 inches for this time period. Precipitation in 2014 and 2015 was greater than recent years, but as of September 30, 2015 the area was still “Abnormally Dry” according to the U.S. Drought Monitor (October 2015). However, the last 3 months of CY 2015 were all well above the 20-year monthly precipitation reference data, and “wetter-than-normal” conditions are predicted through early 2016. Total annual precipitation for 2015 exceeded the 20-year average by 2.45 inches.

From October 2014-March 2015, the CWL received 3.04 inches of precipitation, approximately the average of 3.26 inches for this 6-month period. In the second quarter of 2015 the CWL received 3.07 inches of precipitation, over twice the average of 1.25 inches for this quarter. This was due to 2.29 inches of rain in May, just over two inches above the monthly average of 0.26 inches. During the 2015 monsoon season (July-September), there was a total of 3.53 inches of precipitation, below the monsoon season average of 4.21 inches. Most of the monsoon season moisture occurred in July, when the rainfall totaled 2.30 inches, 40% above the monthly mean.

Relative humidity was above average for the growing season and preceding period. Five months (December, January, May, June, and July) experienced relative humidity that was 8 to 18 percentage points greater than the respective monthly mean humidity for the same months.

Winds were slightly below average for the growing season and preceding period. Four months (March, April, June, and July) recorded average wind speeds that were 1.2 to 1.8 miles per hour lower than their respective monthly means.

### *Temperature*

The CWL experienced ninety-two degrees of temperature variability, with a low of 9.5°F in December 2014 and a high of 101.7°F in June 2015. Monthly mean temperatures were normal for the year.

### Cover Development and Maintenance

The successional development of the native grasses on the CWL ET Cover has been significant in the past few growing seasons. Less robust individual native grass clumps died in 2013, creating barren interspaces for the remaining, more resilient grass clumps to expand their root systems and grow. In 2014 native vegetation development on the CWL ET Cover was assisted by weeding and supplemental watering.

Maintenance activities performed on the CWL ET Cover in 2015 are summarized in Section 6.6 of the 2015 CWL Annual Post-Closure Care Report. No supplemental watering was performed in CY 2015.

## 2015 Chemical Waste Landfill Biology Report

### August 2015 Inspection Results

The August biology inspection determined the CWL ET Cover to be in compliance with all permit requirements: foliar coverage equal to or greater than 20% and, of this coverage, 50% or greater is comprised of native perennial species, no areas devoid of vegetation greater than 200 square feet, and no animal burrows in excess of 4 inches in diameter.

The CWL ET Cover foliar coverage was approximately 48%, approximately 94% of which was native vegetation (Figure 1). Sand dropseed was the dominant grass species, and along with other native grasses comprised the majority of the ET Cover vegetation. Good, even coverage of mature native perennial clump grasses were present across the cover, as well as developing clump grasses. Low levels of weedy species were present on the cover at the time of the inspection. Many juvenile four-wing saltbush shrubs were present at the time of the inspection. All of the shrubs and weedy species (i.e., Russian thistle) present on the ET Cover were removed on August 10-12 as a best management practice (there is no requirement to remove potentially deep-rooted plants or weedy species in Permit Attachment 1, Section 1.9.1).

The native grass coverage at the northwest corner of the ET Cover continued to improve (Figure 1). This is the only access point to the ET Cover so sparser coverage in this area is anticipated and not of concern from an ET Cover performance standpoint.

Foliar coverage of the various native grass species varied slightly from previous years. As the cover changes into a mature plant community, the native species composition will likely continue to gradually change.

Eleven small mammal burrow entrances were observed, primarily along the eastern portion of the cover. Seven ant burrows were observed, distributed fairly evenly across the cover. All of the small mammal burrow entrances were less than 4 inches in diameter and no repair was required under the permit. However, as a best management practice to discourage future burrowing into the ET Cover, these non-active burrows were backfilled with local soil.

### Recommendations

Weeding events should be conducted in 2016 if weeds are present at a greater abundance relative to the natural surroundings.

Late spring and/or autumn of 2016 supplemental watering should be considered pending winter precipitation and 2016 monsoon precipitation.

2015 Chemical Waste Landfill Biology Report



Southwest portion of the cover



Northwest portion of the cover



Southeast portion of the cover



Northeast portion of the cover

Figure 1 August 4, 2015 CWL ET Cover Photos

## 2015 Chemical Waste Landfill Biology Report

### References

New Mexico Environment Department (NMED), October 2009. "Resource Conservation and Recovery Act, Post Closure Care Permit, EPA ID No. NM5890110518, to the U.S. Department of Energy/Sandia Corporation, for the Sandia National Laboratories Chemical Waste Landfill," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico, October 15, 2009.

Sandia National Laboratories/New Mexico (SNL/NM), March 2013. "Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2012," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), March 2012. "Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2011," Sandia National Laboratories, Albuquerque, New Mexico.

U. S. Drought Monitor (October 2015)  
<http://droughtmonitor.unl.edu/>

## 2015 Chemical Waste Landfill Biology Report

### References

New Mexico Environment Department (NMED), October 2009. "Resource Conservation and Recovery Act, Post Closure Care Permit, EPA ID No. NM5890110518, to the U.S. Department of Energy/Sandia Corporation, for the Sandia National Laboratories Chemical Waste Landfill," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico, October 15, 2009.

Sandia National Laboratories/New Mexico (SNL/NM), March 2013. "Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2012," Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), March 2012. "Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2011," Sandia National Laboratories, Albuquerque, New Mexico.

U. S. Drought Monitor (October 2015)  
<http://droughtmonitor.unl.edu/>