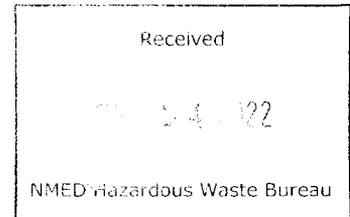




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**Sandia Field Office**  
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**FEB 18 2022**



Mr. Rick Shean  
Chief, Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Bldg. 1  
Santa Fe, New Mexico 87505

**Subject:** Submittal of Chemical Waste Landfill Annual Post-Closure Care Report Calendar Year 2021, Referenced in the Chemical Waste Landfill Post-Closure Care Permit for Sandia National Laboratories, New Mexico, Environmental Protection Agency Identification Number NM5890110518

Dear Mr. Shean,

The Department of Energy, National Nuclear Security Administration, Sandia Field Office, and National Technology & Engineering Solutions of Sandia, submit the Subject document dated March 2022. This submittal is required by Part 2, Section 2.6.3, of the Chemical Waste Landfill (CWL) Post-Closure Care Permit (Permit) and is comprised of a main report and four annexes addressing the CWL post-closure care activities for the calendar year of 2021. The report and supporting documentation satisfy requirements listed in Permit Attachment 1, Sections 1.9 and 1.12.

If you have questions, please contact me at (505) 845-6036 or Dr. Adria Bodour of our staff at (505) 845-6930, or [adria.bodour@nnsa.doe.gov](mailto:adria.bodour@nnsa.doe.gov).

Sincerely,

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NNSA-2022-001255

**Chemical Waste Landfill Annual Post-Closure Care Report  
Calendar Year 2021  
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.

**Paul E.  
Shoemaker**

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Daryl J. Hauck, Ph.D., Manager  
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National Nuclear Security Administration  
Sandia Field Office  
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2/18/22  
\_\_\_\_\_  
Date signed



**Sandia  
National  
Laboratories**

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**CHEMICAL WASTE LANDFILL  
ANNUAL POST-CLOSURE CARE REPORT  
CALENDAR YEAR 2021**

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

---

**MARCH 2022**



**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 2021**

**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 B      Chemical Waste Landfill Calendar Year 2021 Soil-Gas Monitoring Forms and Reports
- Annex C      Chemical Waste Landfill Calendar Year 2021 Post-Closure Inspection Forms
- Annex D      Chemical Waste Landfill Calendar Year 2021 Biology Report

## ACRONYMS AND ABBREVIATIONS

AOP	administrative operating procedure
bgs	below ground surface
CAMU	Corrective Action Management Unit
CFR	Code of Federal Regulations
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
gpm	gallons per minute
KAFB	Kirtland Air Force Base
LCL	lower confidence limit
LE	landfill excavation
MDL	method detection limit
NMAC	New Mexico Administrative Code
µg/L	micrograms per liter
mg/L	milligrams per liter
NNSA	National Nuclear Security Administration
NMED	New Mexico Environment Department
NTESS	National Technology & Engineering Solutions of Sandia, LLC
NTU	nephelometric turbidity units
PCCP	Post-Closure Care Permit
PCE	tetrachloroethene
%	percent
pH	potential of hydrogen (negative logarithm of the hydrogen ion concentration)
ppbv	parts per billion by volume
ppmv	parts per million by volume
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
SAP	sampling and analysis plan
SNL	Sandia National Laboratories
SNL/NM	Sandia National Laboratories/New Mexico
TCE	trichloroethene
UCL	upper confidence limit
VCM	voluntary corrective measure
VE	vapor extraction
VOC	volatile organic compound

## EXECUTIVE SUMMARY

The Chemical Waste Landfill (CWL) at Sandia National Laboratories/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 (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. This eleventh CWL Annual Post-Closure Care Report documents all activities and results as required by the PCCP Attachment 1, Section 1.12.

Two semiannual groundwater monitoring events were conducted in calendar year (CY) 2021. Analytical and statistical assessment results were consistent with previous years. No hazardous constituent concentration limits were exceeded and there was no statistically significant evidence of increasing contamination.

One annual soil-gas monitoring event was conducted in February 2021. There were no variances and there were no exceedances of trigger levels. Analytical and statistical assessment results are consistent with previous years with the exception of four results from CWL-D2 and CWL-D3 soil-gas sampling ports that were anomalously low relative to historical results. Based upon data validation and a review of field and laboratory records, no issues were identified. Ten years of soil-gas monitoring results under the PCCP continue to confirm the residual volatile organic compound soil-gas plume is stable, slowly diffusing in three-dimensions in the vadose zone beneath the CWL, and is not a threat to groundwater.

Inspections of the CWL final cover system, compliance monitoring networks and sampling equipment, storm-water diversion structures, and security fence were performed in accordance with PCCP requirements. Required repairs were minor and were performed during the inspections. All controls are performing as designed.

The Evapotranspirative (ET) Cover continues to meet successful revegetation criteria and is in good condition with even coverage of mature, native perennial grasses. Maintenance was performed in CY 2021 as best practice for ET Cover vegetation. The purpose of ongoing maintenance efforts is to promote the growth and health of the desired native grass species on the ET Cover by reducing competition with weedy species for limited moisture and nutrients.

Regulatory activities in CY 2021 included one submittal of four updated reference documents cited in the PCCP (Harrell February 2021) and submittal of the CWL Annual Post-Closure Care Report, CY 2020 (SNL/NM March 2021).

All PCCP requirements have been met for CY 2021. Industrial land use is being maintained for the CWL consistent with PCCP requirements. Based upon monitoring, inspection, and maintenance results, the ET Cover is performing as designed and site conditions remain protective of human health and the environment.

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## 1.0 INTRODUCTION

Sandia National Laboratories (SNL) is a multimission engineering and science laboratory owned by the U.S. Department of Energy (DOE)/National Nuclear Security Administration (NNSA). SNL is managed and operated by National Technology & Engineering Solutions of Sandia, LLC (NTESS), a wholly owned subsidiary of Honeywell International Inc.

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 (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 calendar year (CY) 2021. The modification history of the PCCP through CY 2021 is documented in Chapter 7 of this report, along with a summary of documents submitted to the New Mexico Environment Department (NMED) associated with the PCCP through CY 2021.

All PCCP monitoring, inspection, and maintenance/repair requirements have been met for CY 2021 and are documented in this eleventh CWL Annual Post-Closure Care Report in accordance with PCCP Attachment 1, Section 1.12. Based upon monitoring, inspection, and maintenance results, the Evapotranspirative (ET) Cover and associated controls are performing as designed and site conditions remain protective of human health and the environment. No groundwater or soil-gas monitoring hazardous constituent and 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 2021 as required by PCCP Attachment 1, Section 1.12 (NMED October 2009 and subsequent revisions). This annual report documents post-closure care activities conducted from January through December 2021 and fulfills the PCCP requirement for annual reporting to the NMED.

The PCCP monitoring, inspection, and maintenance/repair activities that must be documented and reported for each CY are presented in Chapter 3 of this report and are summarized as follows.

- Two semiannual groundwater monitoring events.
- One annual soil-gas monitoring event.
- Two inspections of the groundwater monitoring network and sampling equipment performed in conjunction with semiannual monitoring events.

- One annual inspection of the soil-gas monitoring network and sampling equipment performed in conjunction with the annual monitoring event.
- One annual inspection of final cover vegetation and biological parameters (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, survey monuments, and emergency equipment.
- Maintenance and repair as needed to ensure the ET Cover system and monitoring networks perform as designed.

This CY 2021 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, 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 CY 2021 reporting period.
- Chapter 9 lists the references cited in this report.

Annexes are provided that include CY 2021 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

## **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 CWL Final 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 volatile organic compound (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 then 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 Corrective Measures Study Report (SNL/NM December 2004), the CWL Final Resource Conservation and Recovery Act (RCRA) Closure Report (SNL/NM September 2010), the PCCP, and previous annual reports (CY 2012 through 2020). Detailed information on residual soil contamination at the CWL can be found in the CWL Final RCRA Closure Report and Part 3, Section 3.1 of the PCCP.

### **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% 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

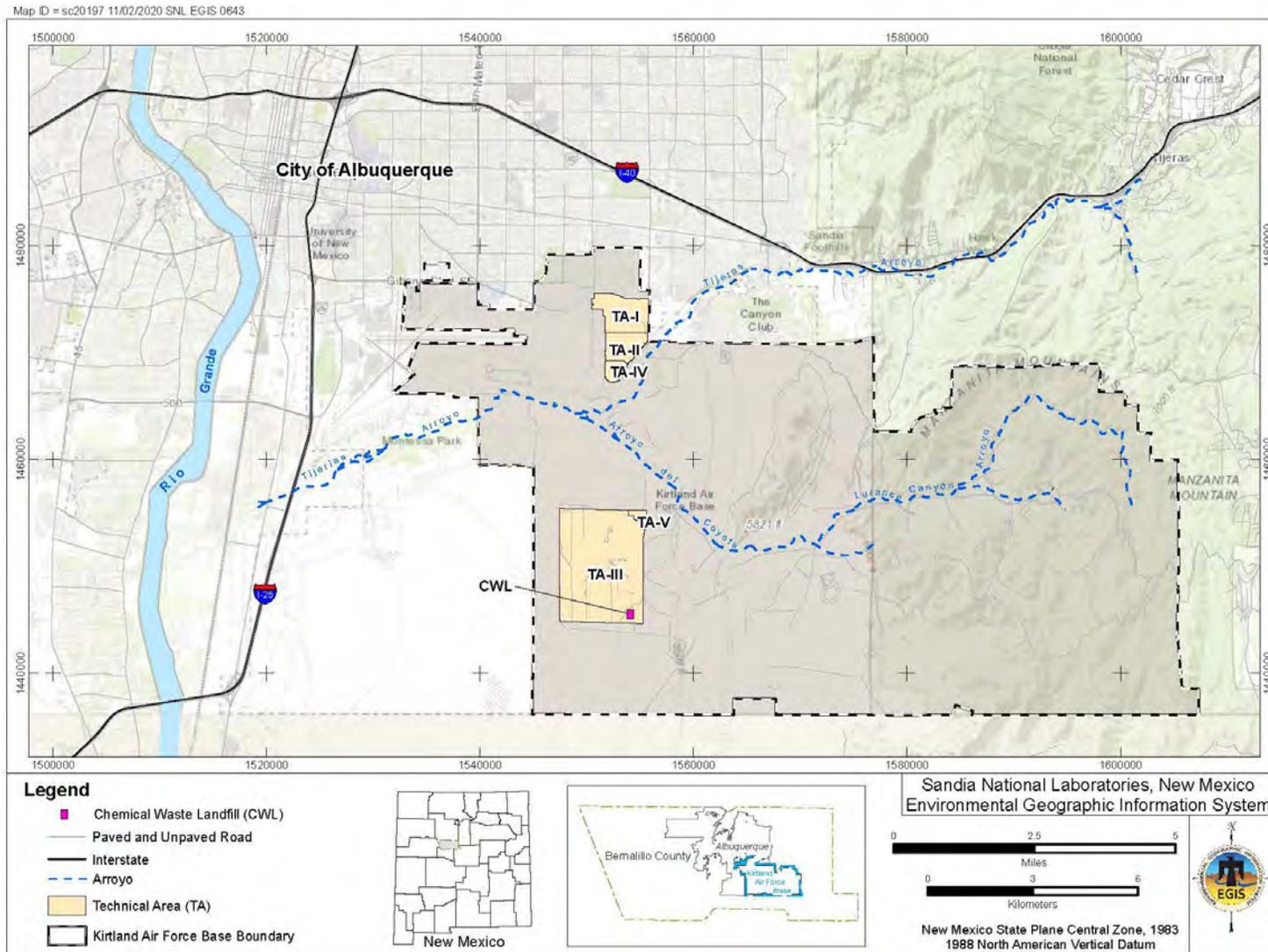


Figure 2-1  
 Location of the Chemical Waste Landfill with Respect to Kirtland Air Force Base and the City of Albuquerque

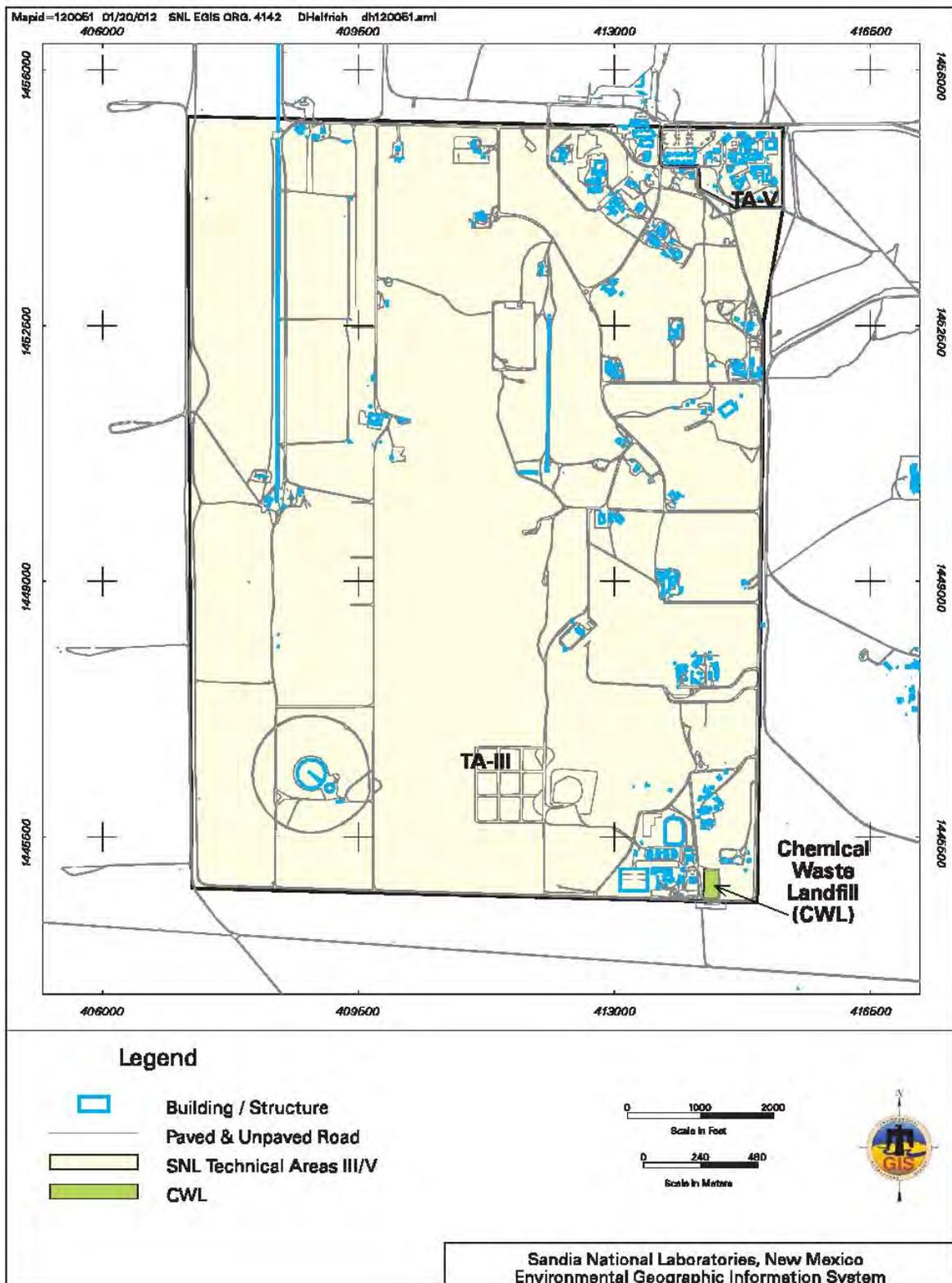


Figure 2-2  
Location of the Chemical Waste Landfill within Technical Area III

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-MW11.

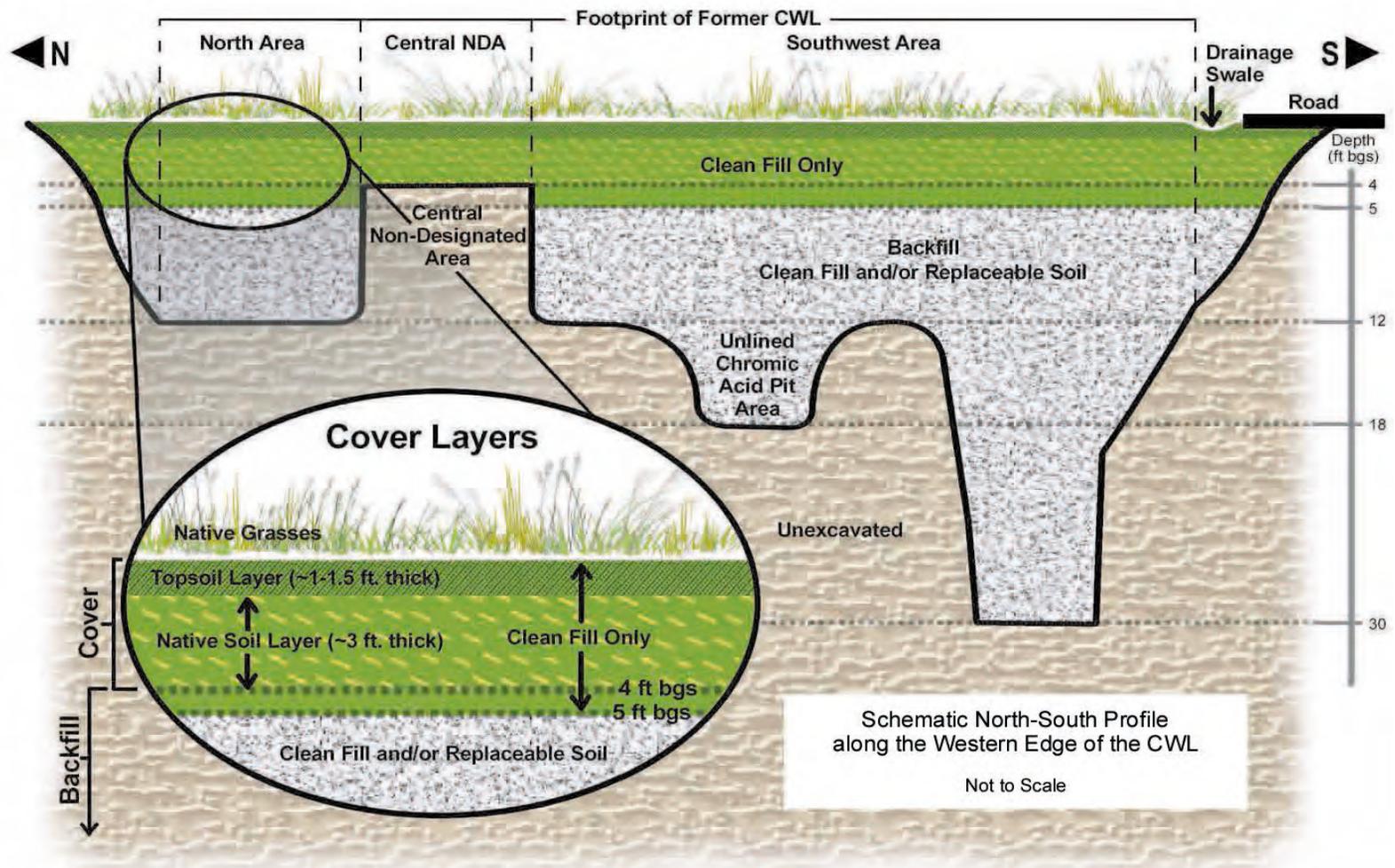
Well-completion diagrams for the groundwater monitoring wells are provided in PCCP Attachment 2.

### **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 PCCP 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:

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

Well-completion diagrams for the soil-gas monitoring wells are provided in PCCP Attachment 3.



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

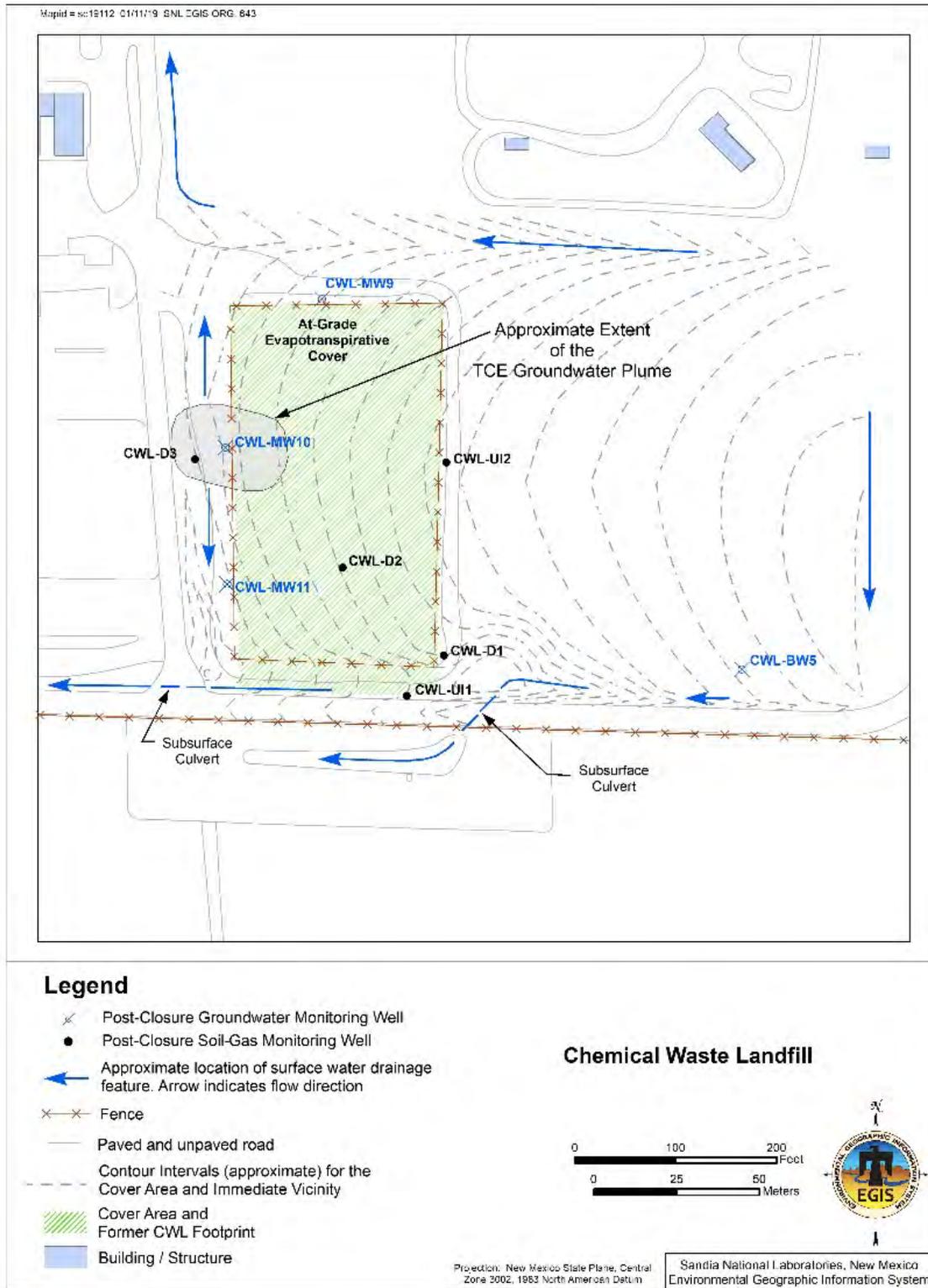


Figure 2-4  
 Chemical Waste Landfill Surface Drainage Patterns and Monitoring Networks

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

The function of the storm-water diversion structures 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% 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 PCCP Attachment 1 (NMED October 2009 and subsequent revisions) and are 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 post-closure care period. Inspection requirements apply to the final cover, storm-water diversion structures, compliance monitoring networks and associated sampling equipment, 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 repairs 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 2021 in accordance with PCCP Attachment 1, Sections 1.8 through 1.10. Results of CY 2021 monitoring, inspection, and repair activities are presented in Chapters 4.0, 5.0, and 6.0 of this report. 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.

Groundwater monitoring must be performed semiannually, or twice a year, in accordance with the Groundwater SAP (PCCP Attachment 2) using U.S. Environmental Protection Agency (EPA) methods. For all groundwater monitoring events, environmental samples must be analyzed for TCE, chromium, and nickel. Additionally, during one semiannual 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, 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 EPA Compendium Method TO-14 (EPA January 1999a) or equivalent (e.g., method TO-15 [EPA January 1999b]) to ensure the collection of data in a manner consistent with historical 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. EPA Method TO-15 has been used since CY 2013. This method provides lower detection limits and enhanced quality assurance/quality control (QC) measures relative to 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	Semiannual <sup>a</sup>	TCE by EPA Method 8260 and Cr and Ni by EPA Method 6020	Sampling and Analysis per PCCP Attachment 2
Soil Gas	Annual	VOCs <sup>b</sup> by EPA Compendium Method TO-15 or equivalent	Sampling and Analysis per PCCP Attachment 3

Notes:

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

Cr = Chromium.

EPA = U.S. Environmental Protection Agency.

Ni = Nickel.

PCCP = Post-Closure Care Permit.

TCE = Trichloroethene.

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 when inspected items exceed or do not meet requirements and in accordance with best practice. Best practice measures are actions and/or improvements not explicitly required by the PCCP that improve performance and/or minimize maintenance.

#### 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.

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

The ET Cover vegetation has met successful revegetation criteria since CY 2011. Since this time, the staff biologist inspects the cover annually near the end of the growing season (August-September) to most accurately determine the coverage of living plants. The inspection is documented on the Biology Inspection Form/Checklist (PCCP Attachment 4 or equivalent) and includes inspecting the cover for contiguous areas lacking vegetation in excess of 200 square feet, signs of animal intrusion, and presence of deep-rooted plants. Repairs required to address vegetation parameters not meeting PCCP specifications documented during the inspections are performed as described in Section 3.2.1.3. At the end of each CY, the staff biologist must compile the results in a report with a summary of local climate trends and recommendations that is included in the CWL Annual Post-Closure Care Report submitted to NMED.

### *3.2.1.2 Cover Inspection Requirements*

Cover inspections are 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).

### *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 must 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 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 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 must 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 prior to 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 windblown 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 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 performed concurrently with the cover inspection. The condition of the fence, including fence wires, posts, gates, locks, and warning signs, is inspected and documented on the Post-Closure Inspection Form/Inspection Checklist (PCCP Attachment 4 or equivalent). Accumulation of windblown 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.

## 4.0 GROUNDWATER MONITORING RESULTS

This chapter presents groundwater monitoring activities (i.e., sampling and analysis), analytical results, and data evaluation for CY 2021 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. Groundwater monitoring well locations are shown in Figure 2-4.

### 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, 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 (i.e., the Regional Aquifer). 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 groundwater sampling events, scheduled semiannually, were conducted in CY 2021.

- The first sampling event was conducted January 19-25, 2021. Groundwater samples were collected from monitoring wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11, and an environmental duplicate sample was collected from CWL-MW10. 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, 1,1,2-trichloro-1,2,2-trifluoroethane (commonly known as Freon 113), chloroform, PCE, and trichlorofluoromethane (commonly known as Freon 11) in addition to TCE.
- The second sampling event was conducted July 20-26, 2021. Groundwater samples were collected from monitoring wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11, and an environmental duplicate sample was collected from CWL-MW11. Samples collected from all wells were analyzed for TCE, chromium, and nickel.

#### 4.1.1 Well Purging and Sampling

Purging removes stagnant water from the well so that a representative groundwater sample can be collected. For the CWL, the minimum purge requirement is one saturated casing volume (the volume of all static water in the well screen plus the borehole annulus around the saturated

screen interval). The purging process continued after meeting the minimum purge volume requirement until four consecutive stable field measurements for temperature, specific conductivity, potential of hydrogen (pH), and turbidity were obtained in all monitoring wells that did not purge dry. After completion of the purging process, the groundwater samples were collected in appropriate containers. As specified in PCCP Attachment 2, Section 2.12, groundwater stability is considered to be acceptable when four successive measurements are less than five nephelometric turbidity units (NTU) for turbidity or within a range of 10% for turbidity values greater than 5 NTU, pH is within 0.1 units, temperature is within 1.0 degree Celsius, and specific conductivity is within 5% as micromhos per centimeter. The January and July 2021 water quality field measurement parameters were collected using an In-Situ Incorporated Aqua TROLL® 600 Multiparameter Water Quality Sonde and a HACH™ Model 2100Q portable turbidity meter. Additional water quality measurements included oxidation-reduction potential and dissolved oxygen.

A portable Bennett Company groundwater sampling system was used to purge and collect groundwater samples from all wells. Prior to purging and sampling each monitoring well, the sampling pump and tubing bundle were decontaminated in accordance with the SNL/NM field operating procedure. The following solutions were pumped through the entire sampling system: 5 gallons of deionized water; 5 gallons of deionized water mixed with 20 milliliters non-phosphate laboratory detergent; and 20 gallons of deionized water. In addition, the outside of the pump tubing was rinsed with deionized water.

Consistent with historical 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 the 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 2021, approximately 13.0 gallons were purged from monitoring well CWL-MW10 prior to the well going dry (purge volume requirement was approximately 22 gallons). The average estimated flow rate was 0.108 gallons per minute (gpm), and the estimated flow rate was 0.111 gpm during the final three gallons (equivalent to 0.409 and 0.420 liters per minute, respectively). During July 2021, approximately 12.5 gallons were purged from CWL-MW10 prior to the well going dry (purge volume requirement was approximately 21 gallons). The average estimated flow rate was 0.175 gpm, and the estimated flow rate was 0.187 gpm during the final three gallons (equivalent to 0.662 and 0.710 liters per minute, respectively).

#### 4.1.2 Field Quality Control

Field QC samples were collected as part of each sampling event and included environmental duplicate, equipment blank, field blank, and trip blank samples. Environmental duplicate samples were collected and analyzed to estimate the overall reproducibility of the sampling and analysis process. The environmental duplicate sample was 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 to verify equipment decontamination prior to installing the equipment in a monitoring well for the purging and environmental sample collection process. Trip blank samples were used to evaluate potential contamination by VOCs during sampling, shipment, and the laboratory process. Field blank samples were 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 2021 sampling events is provided below. Analytical results are presented in Section 4.2.2.

### ***First Semiannual Sampling Event – January 19-25, 2021***

An environmental duplicate sample was collected from CWL-MW10. One equipment blank sample was collected prior to sampling monitoring well CWL-MW10. The samples (equipment blank, environmental sample, and environmental duplicate sample) were submitted for all analyses. Two field blank samples were collected for VOC analysis (TCE and enhanced list VOCs) by pouring deionized water into sample containers at the CWL-BW5 and CWL-MW11 sampling locations to simulate the transfer of environmental samples from the sampling system to the sample container. A third field blank sample was collected from the deionized water source used for the equipment decontamination process. A total of six trip blank samples were submitted with the January 2021 groundwater samples and analyzed for TCE and the enhanced list of VOCs.

### ***Second Semiannual Sampling Event – July 20-26, 2021***

An environmental duplicate sample was collected from CWL-MW11. One equipment blank sample was collected prior to sampling CWL-MW11. The samples (equipment blank, environmental sample, and environmental duplicate sample) were submitted for all analyses. Two field blank samples were collected for TCE analysis by pouring deionized water into sample containers at the CWL-BW5 and CWL-MW10 sampling locations to simulate the transfer of environmental samples. A third field blank sample was collected from the deionized water source used for the equipment decontamination process. A total of six trip blank samples were submitted with the July 2021 groundwater samples and analyzed for TCE.

## **4.1.3 Waste Management**

Purge and decontamination water generated from sampling activities were placed into 55-gallon containers and managed at a central accumulation area. Approximately 231 gallons of wastewater were generated during the January 2021 sampling event and approximately 231 gallons of wastewater were generated during the July 2021 sampling event (total of 462 gallons). Separate waste characterization samples were collected from purge and decontamination water and analyzed for Albuquerque Bernalillo County Water Utility Authority discharge parameters. All wastewater was discharged to the sanitary sewer 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 2021 monitoring activities were packaged into 5-gallon plastic buckets and managed as hazardous waste in accordance with all applicable requirements. All hazardous waste was disposed at a permitted off-site facility.

## **4.2 Laboratory Results**

Groundwater and field QC samples were submitted to GEL Laboratories LLC for analyses. Samples were analyzed in accordance with applicable EPA analytical methods. Analytical results that are above the analytical laboratory method detection limit (MDL) but below the practical quantitation limit 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, practical quantitation limits, 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 2021 groundwater monitoring events. Table 4-3 summarizes results for the enhanced list VOCs included in the January 2021 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 2021 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 Semiannual Sampling Event – January 19-25, 2021***

TCE was detected above the MDL in the CWL-MW10 environmental and environmental duplicate environmental samples at concentrations of 0.640 µg/L and 0.680 µg/L, respectively. There were no other detections of TCE or enhanced list VOCs. Chromium and nickel were not detected above the MDL in any of the groundwater samples.

#### ***Second Semiannual Sampling Event – July 20-26, 2021***

TCE was detected above the MDL in the CWL-MW10 environmental sample at a concentration of 0.510 µg/L. There were no other detections of TCE. Chromium and nickel were not detected above the MDL in any of the groundwater samples.

Table 4-1  
 Summary of TCE Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Analytical Method SW846-8260B<sup>a</sup>  
 Calendar Year 2021

Well ID	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
<b>January 2021 Sampling Event</b>					
CWL-BW5	ND	0.300	1.00	U	--
CWL-MW9	ND	0.300	1.00	U	--
CWL-MW10	0.640	0.300	1.00	J	--
CWL-MW10 (Duplicate)	0.680	0.300	1.00	J	--
CWL-MW11	ND	0.300	1.00	U	--
<b>July 2021 Sampling Event</b>					
CWL-BW5	ND	0.333	1.00	U	--
CWL-MW9	ND	0.333	1.00	U	--
CWL-MW10	0.510	0.333	1.00	J	J-
CWL-MW11	ND	0.333	1.00	U	--
CWL-MW11 (Duplicate)	ND	0.333	1.00	U	--

Notes:

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

<sup>b</sup>See explanation for laboratory and validation qualifiers below.

Laboratory Qualifier

J = Amount detected is above the MDL but below the PQL.

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

Validation Qualifier

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

-- = All quality control samples met acceptance criteria with respect to submitted samples.

EPA = U.S. Environmental Protection Agency.

ID = Identification.

MDL = Method detection limit. The minimum concentration or activity that can be measured and reported with 99 percent confidence that the analyte is greater than zero, analyte is matrix-specific.

µg/L = Microgram(s) 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.

TCE = Trichloroethene.

Table 4-2  
 Summary of Chromium and Nickel Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Analytical Method SW846-6020<sup>a</sup>  
 Calendar Year 2021

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
<b>January 2021 Sampling Event</b>						
CWL-BW5	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
CWL-MW9	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
CWL-MW10	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
CWL-MW10 (Duplicate)	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
CWL-MW11	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
<b>July 2021 Sampling Event</b>						
CWL-BW5	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
CWL-MW9	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
CWL-MW10	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
CWL-MW11	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
CWL-MW11 (Duplicate)	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--

Notes:

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

<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 "U" qualifier below.

EPA = U.S. Environmental Protection Agency.

ID = Identification.

MDL = Method detection limit. The minimum concentration or activity that can be measured and reported with 99 percent confidence that the analyte is greater than zero, analyte is matrix-specific.

mg/L = Milligram(s) 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 concentration is below the MDL.

Table 4-3  
 Summary of Additional Volatile Organic Compound Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Analytical Method SW846-8260B<sup>a</sup>  
 January 2021

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	2.00	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	2.00	5.00	U	--
CWL-MW10	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	2.00	5.00	U	--
CWL-MW10 (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	2.00	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	2.00	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 2021

Notes:

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

<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 "U" qualifier below.

EPA = U.S. Environmental Protection Agency.

ID = Identification.

MDL = Method detection limit. The minimum concentration or activity that can be measured and reported with 99 percent confidence that the analyte is greater than zero, analyte is matrix-specific.

µg/L = Microgram(s) 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 concentration is below the MDL.

Table 4-4  
 Summary of Field Water Quality Measurements<sup>a</sup>  
 Chemical Waste Landfill Groundwater Monitoring  
 Calendar Year 2021

Well ID	Temperature (°C)	SC (µmho/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (% Sat)	DO (mg/L)
<b>January 2021 Sampling Event</b>							
CWL-BW5	15.21	986.9	185.9	7.03	1.59	77.11	6.56
CWL-MW9	16.37	908.4	178.0	7.09	0.34	53.01	4.23
CWL-MW10	11.17	800.0	35.6	7.09	2.91	22.12	2.07
CWL-MW11	18.83	1028.6	6.6	7.06	0.65	60.43	5.18
<b>July 2021 Sampling Event</b>							
CWL-BW5	21.90	1130.2	162.8	7.08	0.43	101.33	7.61
CWL-MW9	22.50	1021.1	180.8	7.09	0.38	68.67	5.15
CWL-MW10	20.95	989.4	-11.5	7.17	3.55	28.45	2.06
CWL-MW11	24.21	1123.2	79.6	6.77	1.16	95.90	6.98

Notes:

<sup>a</sup>Field measurements collected prior to sampling. Some values rounded for significant digit consistency.

°C = Degrees Celsius.

% Sat = Percent saturation.

DO = Dissolved oxygen.

ID = Identification.

mg/L = Milligram(s) per liter.

µmho/cm = Micromhos per centimeter.

mV = Millivolt(s).

NTU = Nephelometric turbidity units.

ORP = Oxidation-reduction potential.

pH = Potential of hydrogen (negative logarithm of the hydrogen ion concentration).

SC = Specific conductivity.

#### 4.2.2 Field Quality Control Sample Results

Table 4-5 summarizes results of environmental duplicate sample analyses and the calculated relative percent difference (RPD) between the environmental and duplicate sample results for the January (CWL-MW10) and July (CWL-MW11) sample pairs. For the environmental-duplicate sample pair collected at CWL-MW10 in January 2021, TCE was the only analyte detected in both samples. The RPD value for TCE was 6 and shows good agreement (i.e., RPD value less than 20 for VOCs). For the environmental-duplicate sample pair collected at CWL-MW11 in July 2021, no TCE or metals were reported above MDLs in the CWL-MW11 samples so no RPD was calculated.

Table 4-5  
 Summary of Duplicate Sample Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Calendar Year 2021

Well ID/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD <sup>a</sup>
<b>January 2021 Sampling Event (CWL-MW10)</b>			
TCE (mg/L)	0.640	0.680	6

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.

ID = Identification.  
 mg/L = Milligram(s) per liter.  
 TCE = Trichloroethene (trichloroethylene).

One equipment blank sample was collected in January 2021 prior to sampling monitoring well CWL-MW10 and analyzed for all constituents. Chloroform was detected above the MDL in the equipment blank sample. No corrective action was necessary since this compound was not reported in associated environmental samples. One equipment blank sample was collected in July 2021 prior to sampling monitoring well CWL-MW11 and analyzed for all constituents. No constituents were detected in the equipment blank sample.

Chloroform was detected above the associated MDL in the three field blank samples associated with the January 2021 sampling event. No corrective action was necessary, since chloroform was not reported in the associated environmental samples. TCE was not detected above the MDL in the three field blank samples collected in July 2021.

No VOCs were detected in the six trip blank samples associated with the January 2021 enhanced list VOC environmental samples. For the six trip blank samples associated with the July 2021 TCE environmental samples, TCE was not detected above the 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 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 2020). All laboratory control sample results met PCCP data quality requirements (PCCP Attachment 2). The July 2021 CWL-MW10 TCE result was qualified as an estimated value with a suspected negative bias during data validation because the continuing calibration verification standard did not meet acceptance criteria.

Based upon the data validation and review criteria, all analytical data were determined acceptable. Reported QC sample results were in compliance with analytical method and laboratory procedure requirements. Data Validation Reports and Contract Verification 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

Variances and non-conformances are defined in the PCCP Attachment 2, Section 2.22 for groundwater monitoring. No variances or non-conformances were identified during the January and July 2021 semiannual groundwater sampling events.

### 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 all wells is required after 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, historical groundwater sampling results are used to augment the data sets and increase the amount of data available for statistical analysis. Historical groundwater data are 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, CWL-MW9, CWL-MW10, and CWL-MW11. Wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11 were installed in 2010 and have been sampled 22 times as of July 2021 (November-December 2010, July-August 2011, January and July 2012 through 2021). Statistical evaluation of the results from these wells was first presented in the CWL Annual Post-Closure Care Report, CY 2013 (SNL/NM March 2014). CWL-BW5 is a replacement well for CWL-BW4A; therefore, historical data for CWL-BW4A is included in the statistical evaluation of results from well CWL-BW5 (referred to as CWL-BW5/4A in the following discussion).

#### 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

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 = Microgram(s) per liter.
- mg/L = Milligram(s) per liter.
- SNL/NM = Sandia National Laboratories/New Mexico.

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, although the lower value is included when determining the historical minimum and maximum range. Results qualified by the laboratory and/or data validation as estimated (i.e., “J” qualified) are used as reported. For laboratory detections that are qualified during the data validation process as “not detected” (i.e., “U” qualified) due to blank contamination or some other quality issue, 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 2021 groundwater monitoring data are presented in Section 4.3.2.

**Prediction and Confidence Intervals**

The probability that each semiannual 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 2021 sample results are also compared to the historical range (minimum and maximum result derived from historical results not including CY 2021 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 hazardous constituent has been exceeded, as specified in PCCP Attachment 1, Section 1.8.1.2. The calculated 95% LCL is compared to the applicable 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 for each hazardous constituent using all historical data for that specific monitoring well to determine if there is statistically significant evidence of increasing contamination. For each sampling event the result is compared to the median value calculated using historical data prior to the sampling event being evaluated and determined to be above or below that median value. For example, the median value against which the January 2021 CWL-BW5/4A sample result for a specific constituent is compared is calculated using historical results obtained since May 1998 (i.e., completion of the VE VCM), not including the January 2021 sample result. Then, the January 2021 sample result is compared to the median value and determined to be above or below. For the next groundwater sampling event (i.e., July 2021), the median value is recalculated and includes the January 2021 sample result; and the July 2021 sample result is compared to the recalculated median value. The median values are not presented in Table 4-7.

The cumulative percentage of results exceeding median values is presented in Table 4-7 and reflects how many times the sample result exceeded the median value. For a given hazardous constituent, if the cumulative percentage of results greater than median values is 80% or greater, that is considered statistically significant evidence of increased contamination. However, in accordance with PCCP Attachment 1, Section 1.8.1.2, 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.

#### **4.3.2 Statistical Assessment Results**

No hazardous constituent concentration limits were exceeded and there was no evidence of increasing contamination based on the statistical assessment performed in accordance with PCCP Attachment 1, Section 1.8.1. CY 2021 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 were non-detections. The statistical analysis presented for wells CWL-MW9, CWL-MW10, and CWL-MW11 is significantly impacted by the small data set (each contains 22 data points for each constituent), the very low concentrations, and in most cases, the large number of non-detect results. Because the evaluation process uses the MDL in the case of laboratory non-detections, the statistical results are also affected by changes in the MDL over time. Except for chromium, the MDLs have generally decreased over time, which impacts the CWL-BW5/4A statistical evaluation results as the historical data set for this well includes results from 1998 through the present. The chromium MDL has slightly increased over time for the CY 2010 through 2021 data sets and because of this the Median Test results continue to increase. Statistical results are presented below for all cases where evaluation was possible.

## **Prediction Intervals Results**

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

CY 2021 CWL-BW5 chromium, nickel, and TCE sample results were all non-detections. The MDL for chromium (0.003 milligrams per liter [mg/L]) was within the prediction interval (i.e., range of 95% LCL to 95% UCL) and the historical range (i.e., historical minimum and maximum results not including the CY 2021 results). The MDL for nickel (0.0006 mg/L) was below the prediction interval but within the historical range. The January 2021 MDL for TCE (0.300 µg/L) was below the prediction interval but within the historical range. The July 2021 MDL for TCE (0.333 µg/L) was within the prediction interval and the historical range. The nickel and TCE results are typical of a data set dominated by non-detections and MDLs that have decreased over time. TCE has not been detected in any CWL-BW5 samples (CY 2010 through 2021).

### *Monitoring Well CWL-MW9*

Chromium and TCE have not been detected in any CWL-MW9 samples (CY 2010 through 2021). Therefore, statistical evaluation of these constituents is not presented. The CY 2021 nickel sample results were both non-detections, and the MDL (0.0006 mg/L) was below the prediction interval but within the historical range. The nickel results reflect a slight decrease in the MDL over time.

### *Monitoring Well CWL-MW10*

CY 2021 CWL-MW10 chromium and nickel sample results were all non-detections. The MDL for chromium (0.003 mg/L) was above the prediction interval but within the historical range. The MDL for nickel (0.0006 mg/L) was below the prediction interval but within the historical range and reflects a slight decrease in the MDL over time. TCE results for the January and July 2021 environmental samples (0.640 and 0.510 µg/L, respectively) and the January 2021 environmental duplicate sample (0.680 µg/L) were below the prediction interval but within the historical range. The TCE results are representative of decreasing concentrations over time.

### *Monitoring Well CWL-MW11*

CY 2021 CWL-MW11 sample results were all non-detections. The MDL for chromium (0.003 mg/L) was above the prediction interval but within the historical range and reflects a slight increase in the MDL over time. The MDL for nickel (0.0006 mg/L) was below the prediction interval but within the historical range and reflects a slight decrease in the MDL over time. TCE has not been detected in any CWL-MW11 samples (CY 2010 through 2021); therefore, statistical evaluation of TCE is not presented.

Table 4-7  
Statistical Assessment Results Summary  
Chemical Waste Landfill Groundwater Monitoring  
Calendar Year 2021

Hazardous Constituent <sup>a</sup>	Minimum <sup>b</sup>	Maximum <sup>b</sup>	Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Prediction Interval		Distribution Type <sup>c</sup>	Median Test <sup>d</sup>	Concentration Limit Exceeded <sup>e</sup> ?
					LCL <sup>c</sup>	UCL <sup>c</sup>			
<b>CWL-BW5/4A</b>									
Chromium (mg/L)	0.00038	0.0125	0.00312	0.00263	0.00248	0.00376	Normal	52%	No
Nickel (mg/L)	0.0005	0.049	0.0043	0.00724	0.00253	0.00607	Normal	34%	No
TCE (µg/L)	0.1	0.78	0.336	0.114	0.308	0.364	Normal	7%	No
<b>CWL-MW9</b>									
Chromium (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No
Nickel (mg/L)	0.0005	0.00435	0.0018	0.00133	0.00131	0.00229	Normal	16%	No
TCE (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No
<b>CWL-MW10</b>									
Chromium (mg/L)	0.002	0.00325	0.00257	0.000533	0.00238	0.00276	Normal	53%	No
Nickel (mg/L)	0.000501	0.00707	0.00182	0.0017	0.0012	0.00244	Normal	5%	No
TCE (µg/L)	0.3	4.68	1.39	1.401	0.877	1.903	Normal	11%	No
<b>CWL-MW11</b>									
Chromium (mg/L)	0.002	0.00304	0.00259	0.000477	0.00241	0.00277	Normal	68%	No
Nickel (mg/L)	0.0005	0.00449	0.00155	0.0012	0.00111	0.00199	Normal	11%	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 historical data not including calendar year 2021 sample results.

<sup>c</sup>Mean, Standard Deviation, LCL, UCL, 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 constituent LCL against the concentration limit in Table 4-6 of this report.

% = Percent.

CWL = Chemical Waste Landfill.

LCL = Lower confidence limit.

µg/L = Microgram(s) per liter.

mg/L = Milligram(s) per liter.

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

TCE = Trichloroethene.

UCL = Upper confidence limit.

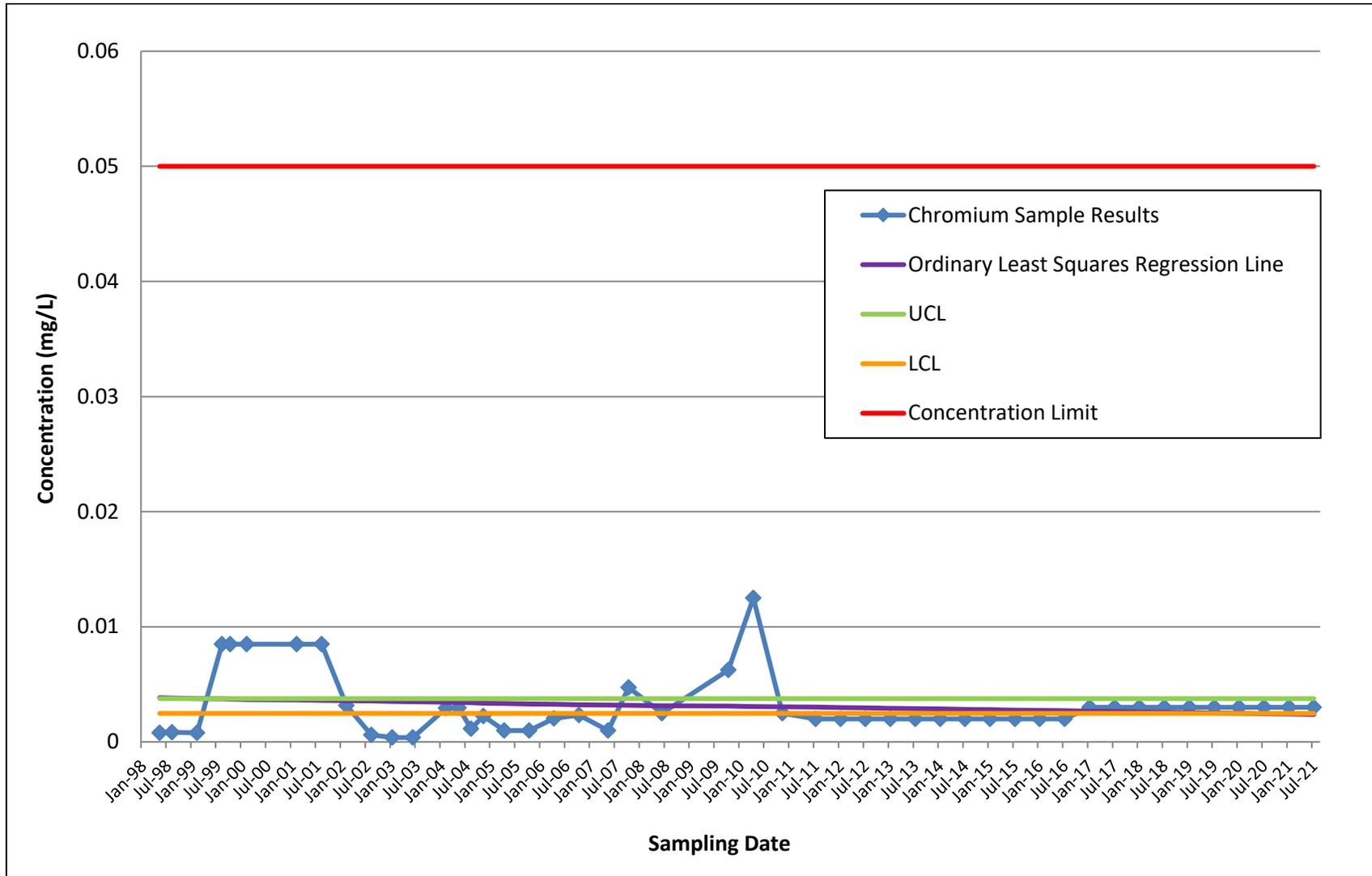


Figure 4-1  
Chromium Control Chart for CWL-BW5/4A

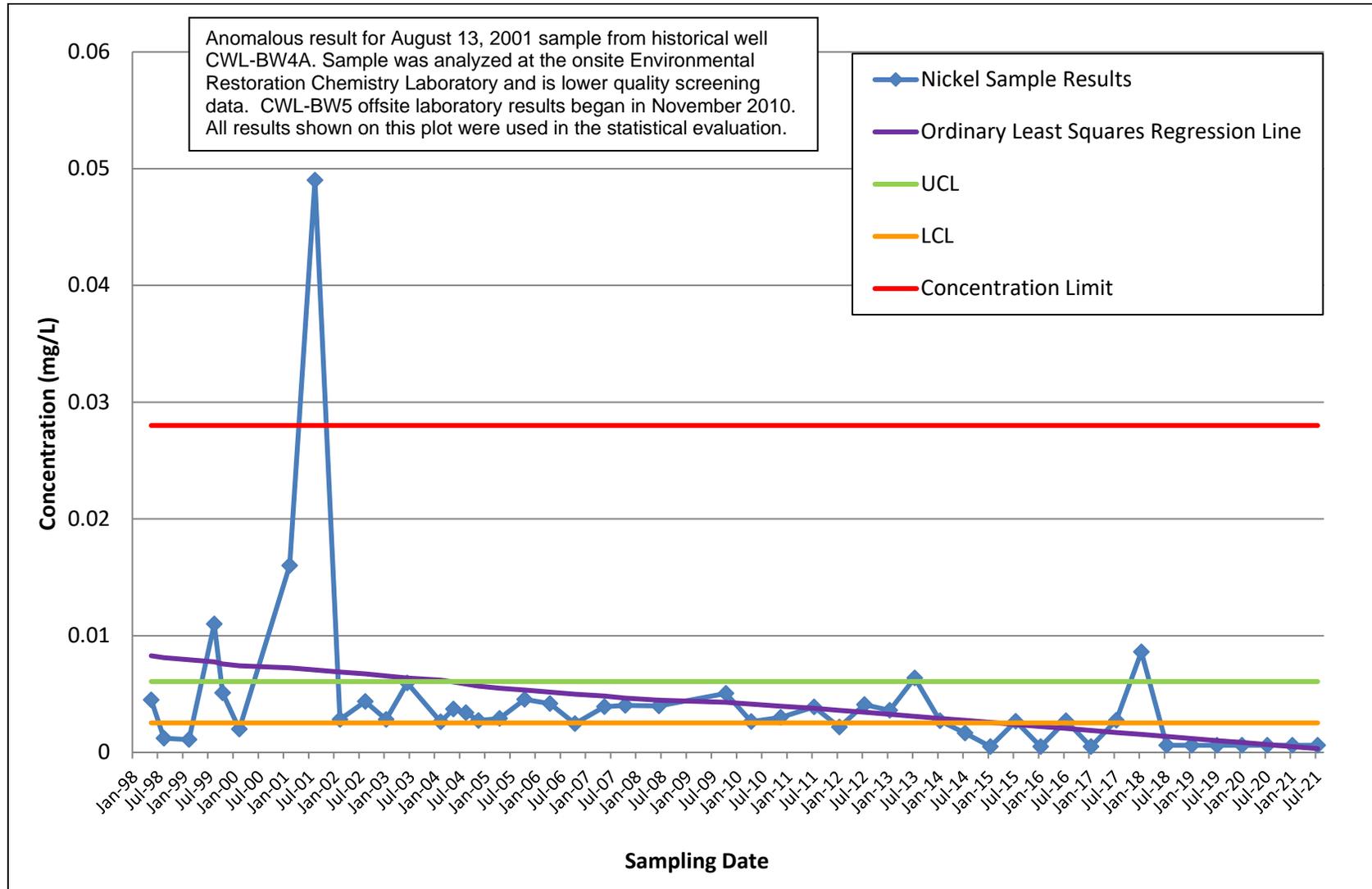


Figure 4-2  
 Nickel Control Chart for CWL-BW5/4A

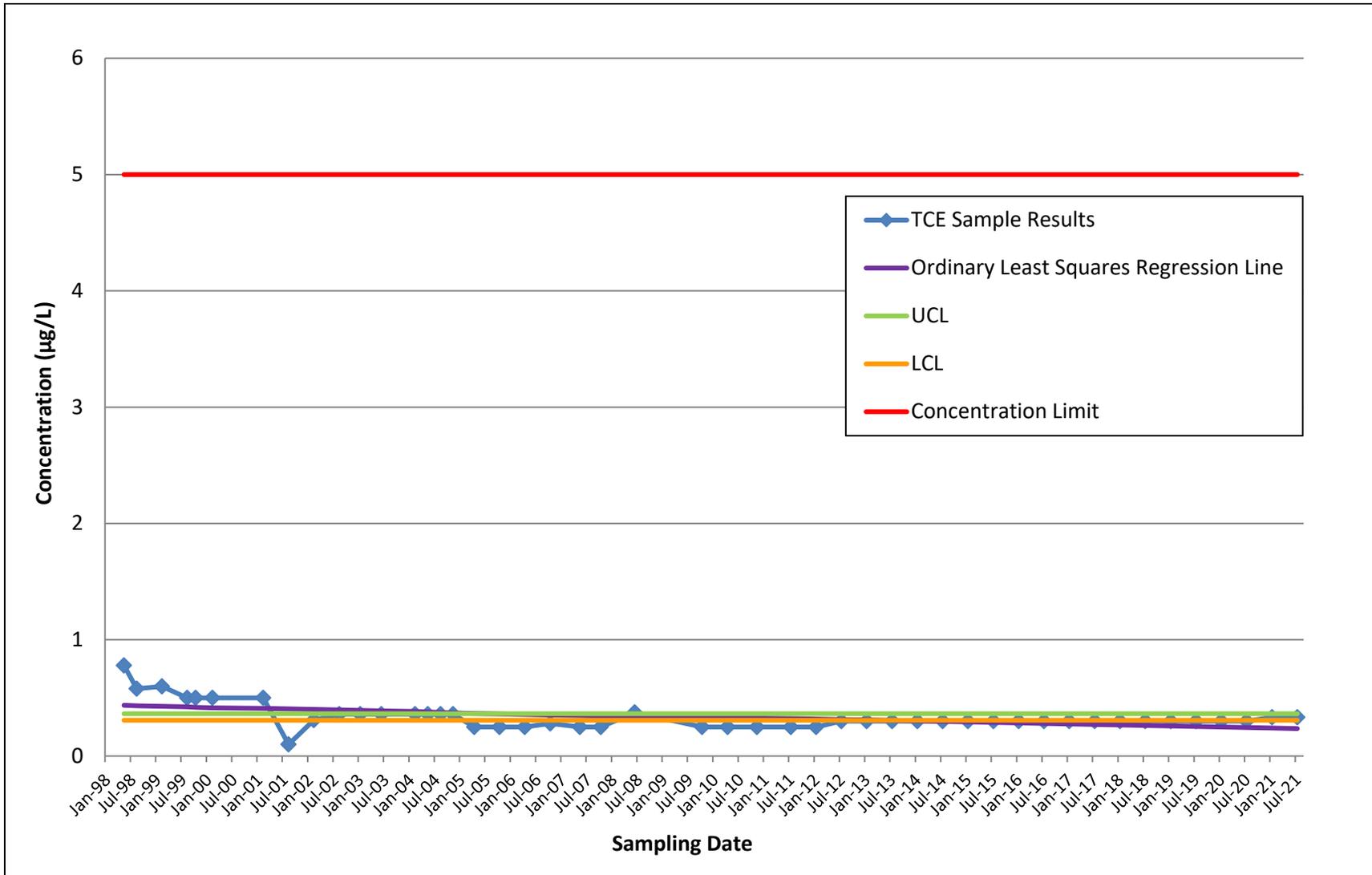


Figure 4-3  
TCE Control Chart for CWL-BW5/4A

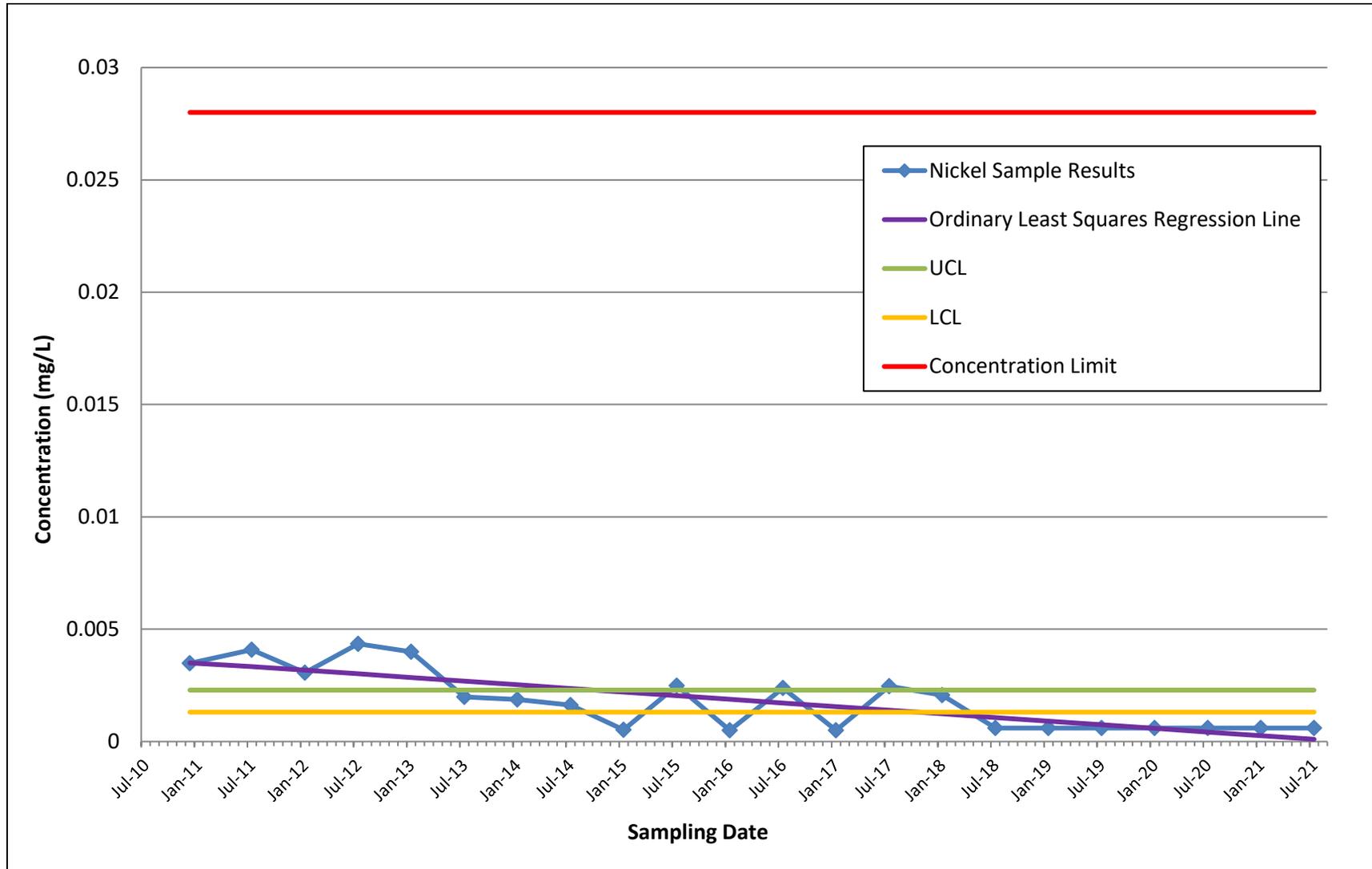


Figure 4-4  
Nickel Control Chart for CWL-MW9

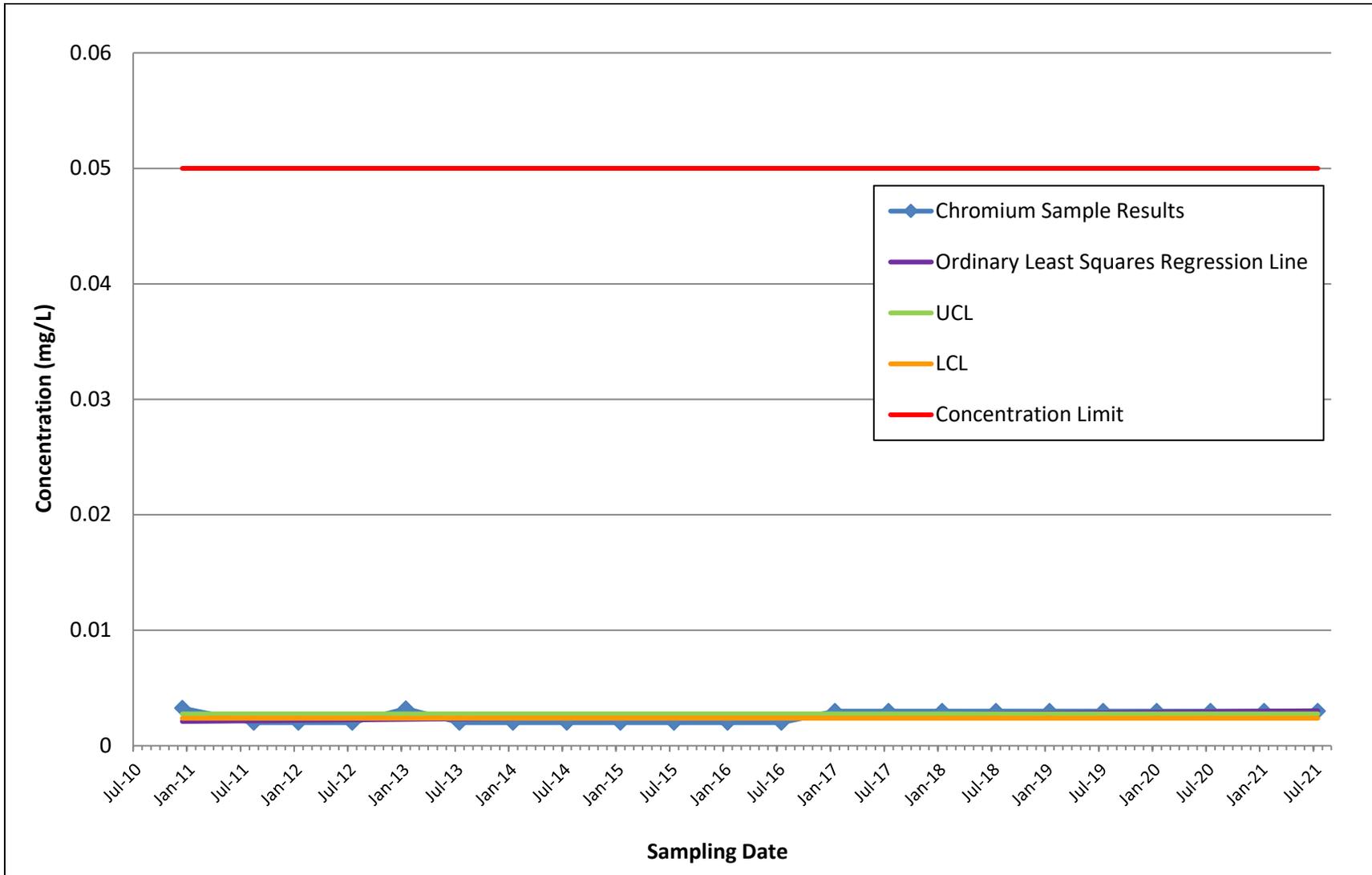


Figure 4-5  
Chromium Control Chart for CWL-MW10

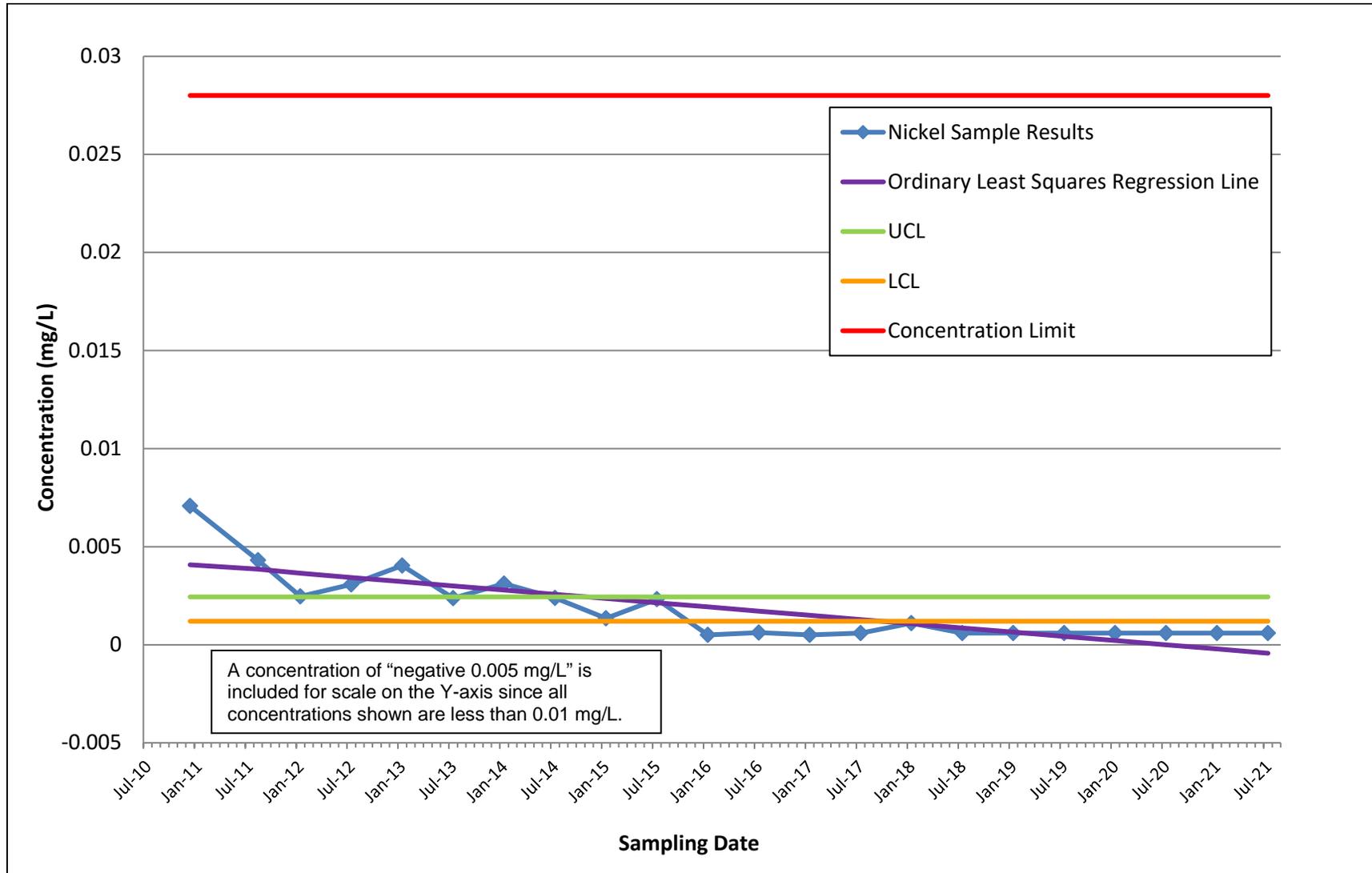


Figure 4-6  
Nickel Control Chart for CWL-MW10

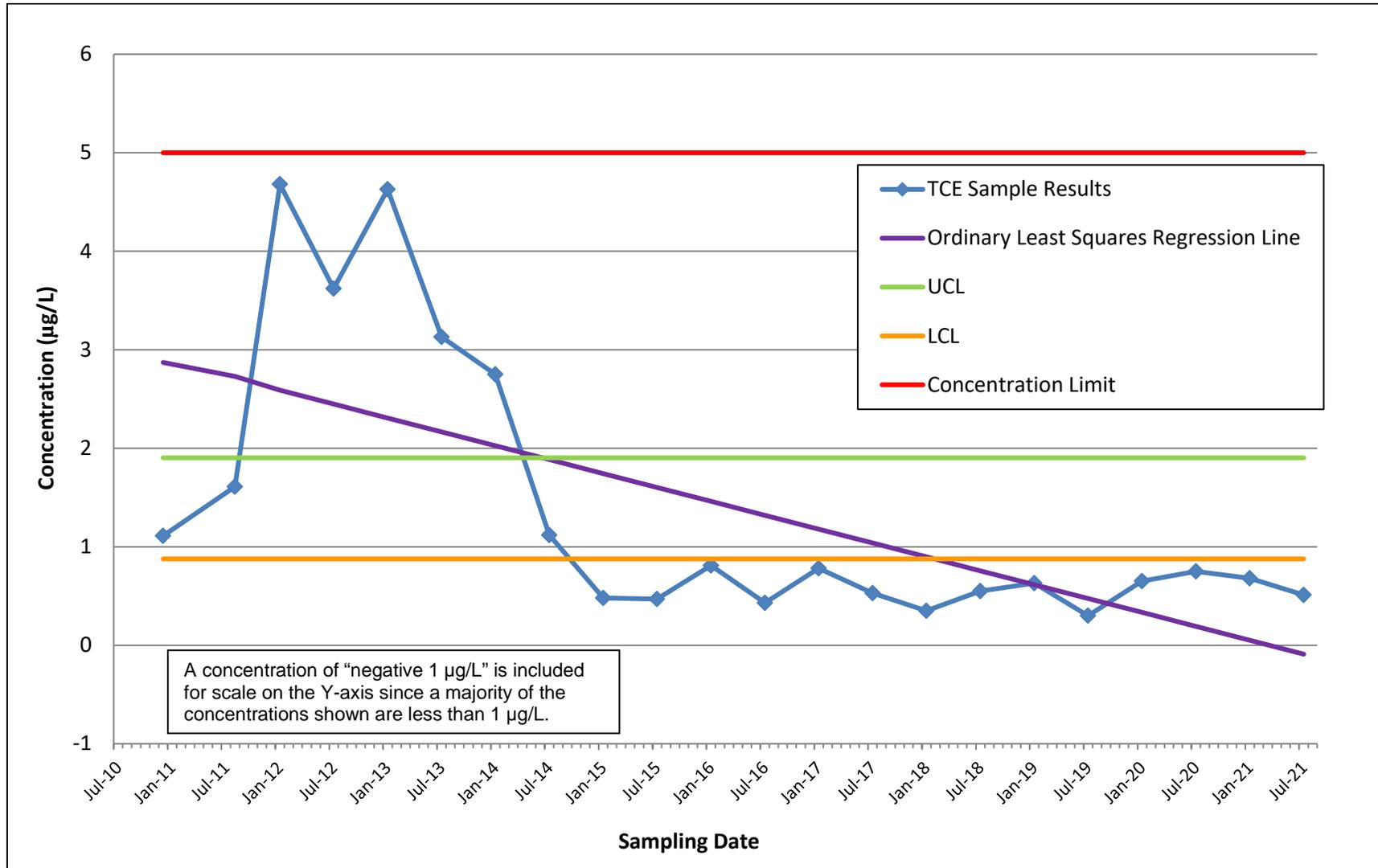


Figure 4-7  
 TCE Control Chart for CWL-MW10

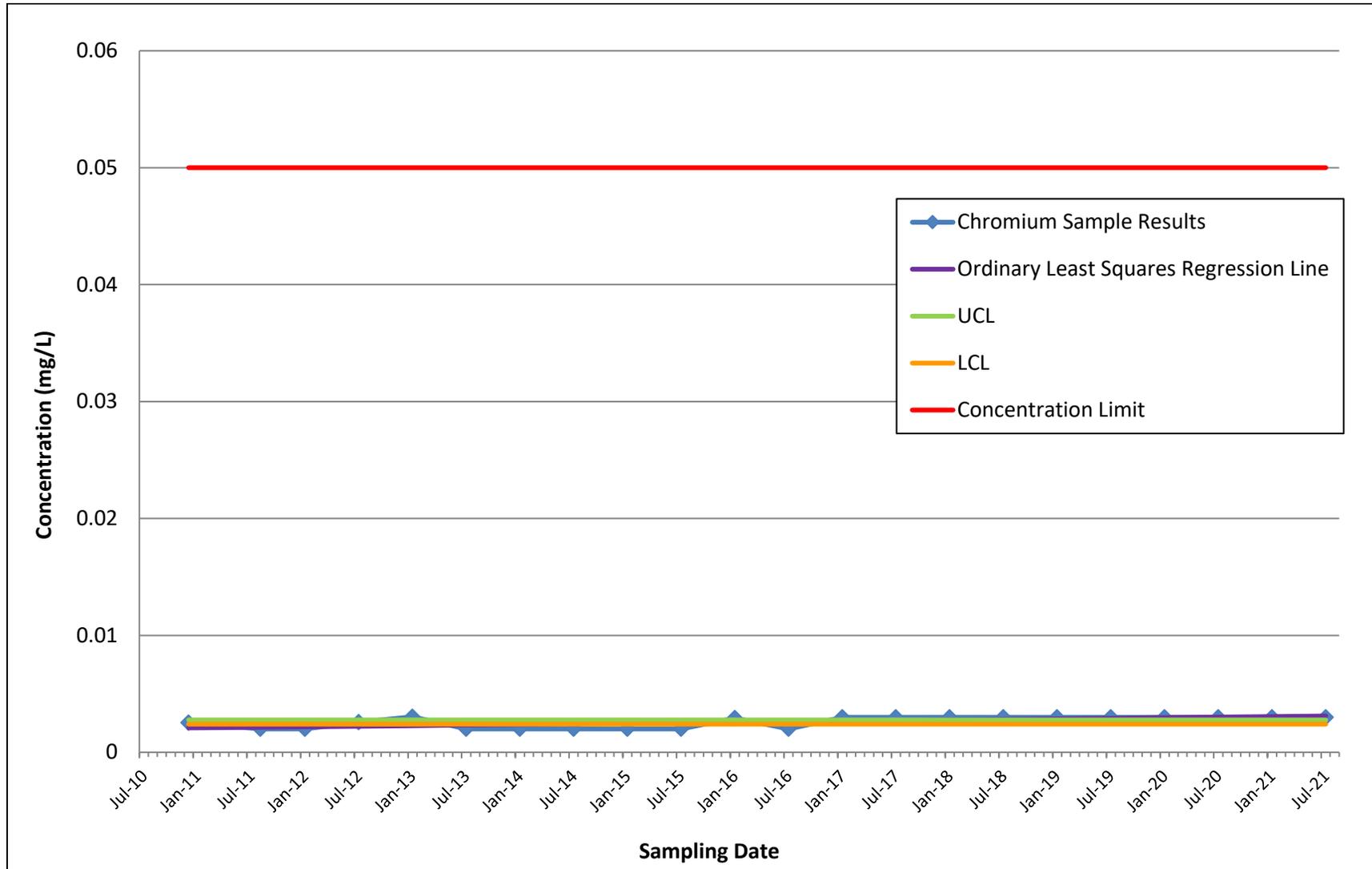


Figure 4-8  
Chromium Control Chart for CWL-MW11

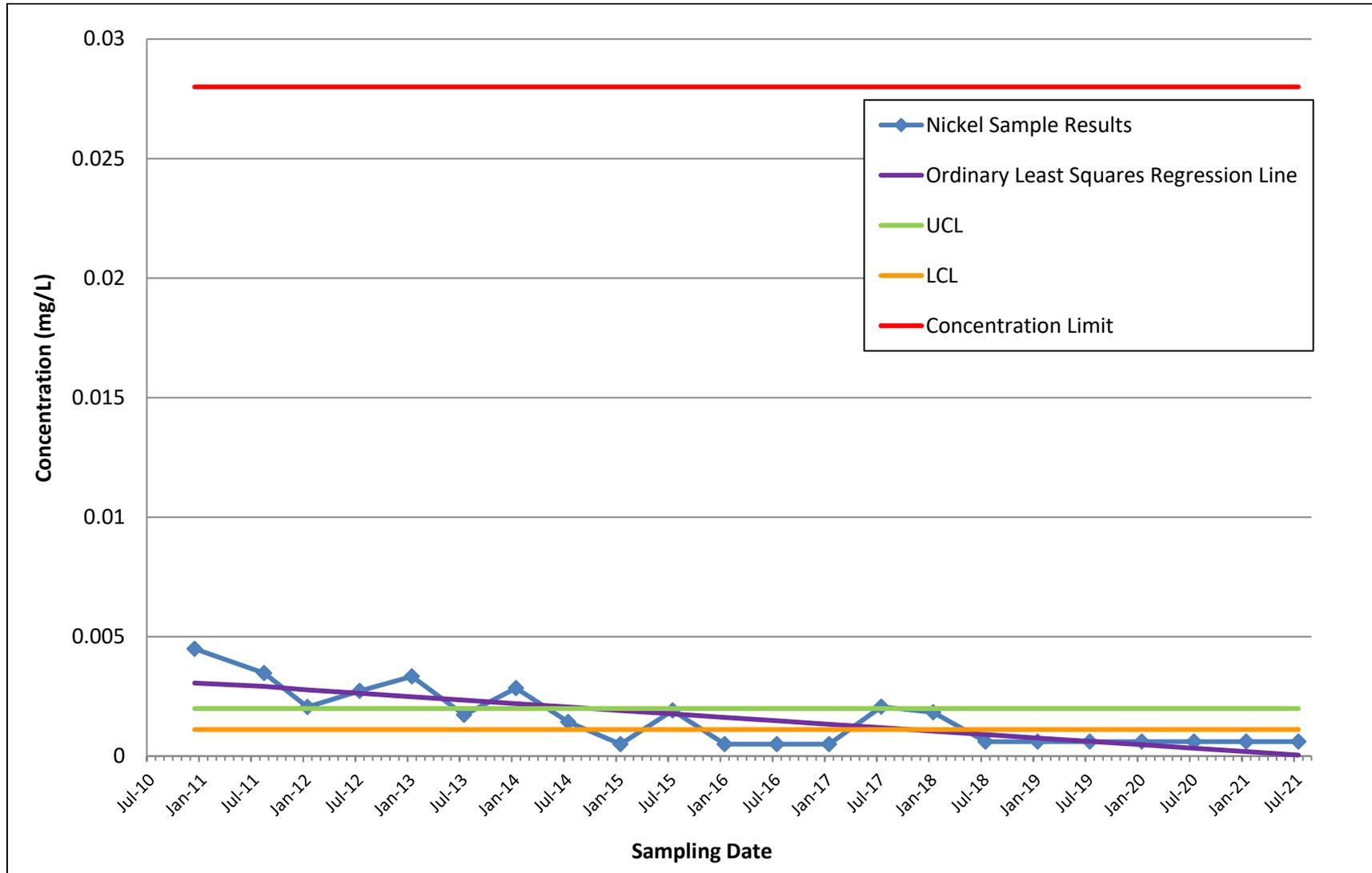


Figure 4-9  
Nickel Control Chart for CWL-MW11

### ***Confidence Intervals Results***

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 Results***

The cumulative percentage of sample results greater than the median (i.e., Median Test) for the three hazardous constituents is below 80% for all 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 68% for chromium (CWL-MW11); all CY 2021 CWL-MW11 chromium results were non-detects. The higher Median Test results for chromium are influenced by the slight increase in the MDL over time (i.e., 0.002 to 0.003 mg/L) and do not reflect an increase in chromium groundwater sample concentrations. The low Median Test results for TCE in CWL-BW5/4A (7%) and nickel in CWL-MW10 (5%) reflects a data set influenced by non-detection results and an MDL that has generally decreased over time. TCE has not been detected in CWL-BW5 (sampling began in 2010 after this well was installed as a replacement well for CWL-BW4A); the only detections are related to the CWL-BW4A historical data set.

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 decreasing or very flat trend in each well, 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 chart scale and decreases during the last 17 sampling events (July 2013 through July 2021). The trend shown in Figure 4-7 indicates the two CWL VCMs were effective in eliminating/reducing sources of TCE impacting groundwater.

## 4.4 Hydrogeologic Assessment

The Regional Aquifer beneath 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 variable over time but has typically been in the range of 0.4 to 0.8 feet per year. More recently the rate of decline has slowed as a result of reduced withdrawals by the City of Albuquerque. The groundwater elevation decline between October 2020 and October 2021 at the four monitoring wells ranged from 0.25 (CWL-MW11) to 0.38 (CWL-BW5) feet. This amount of decline was consistent with and slightly higher than the decline between CY 2019 to 2020, which ranged from 0.19 (CWL-MW11) to 0.30 (CWL-BW5).

In CY 2021, water levels were measured in the groundwater monitoring wells on a quarterly basis and during the January and July 2021 sampling events. Figure 4-10 depicts the potentiometric surface map of the Regional Aquifer beneath the CWL based upon the October 2021 water-level measurements and has changed very little over the past eight years. The westward deflection of the potentiometric surface is a localized salient in the potentiometric surface of the Regional Aquifer that reflects site-specific geologic controls (i.e., vertical and lateral variability in permeability of the saturated Santa Fe Group alluvial sediments). 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 conceptual model for the KAFB area (SNL/NM June 2021).

Measured orthogonally from the potentiometric surface contours on Figure 4-10 across the site, the horizontal gradient did not change significantly from previous years and is approximately 0.013 feet per 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 2012 slug tests), and (c) a porosity of 29% as determined from the laboratory analyses of CWL soil samples (SNL/NM October 1995). The calculated velocities are the same as those reported since 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.

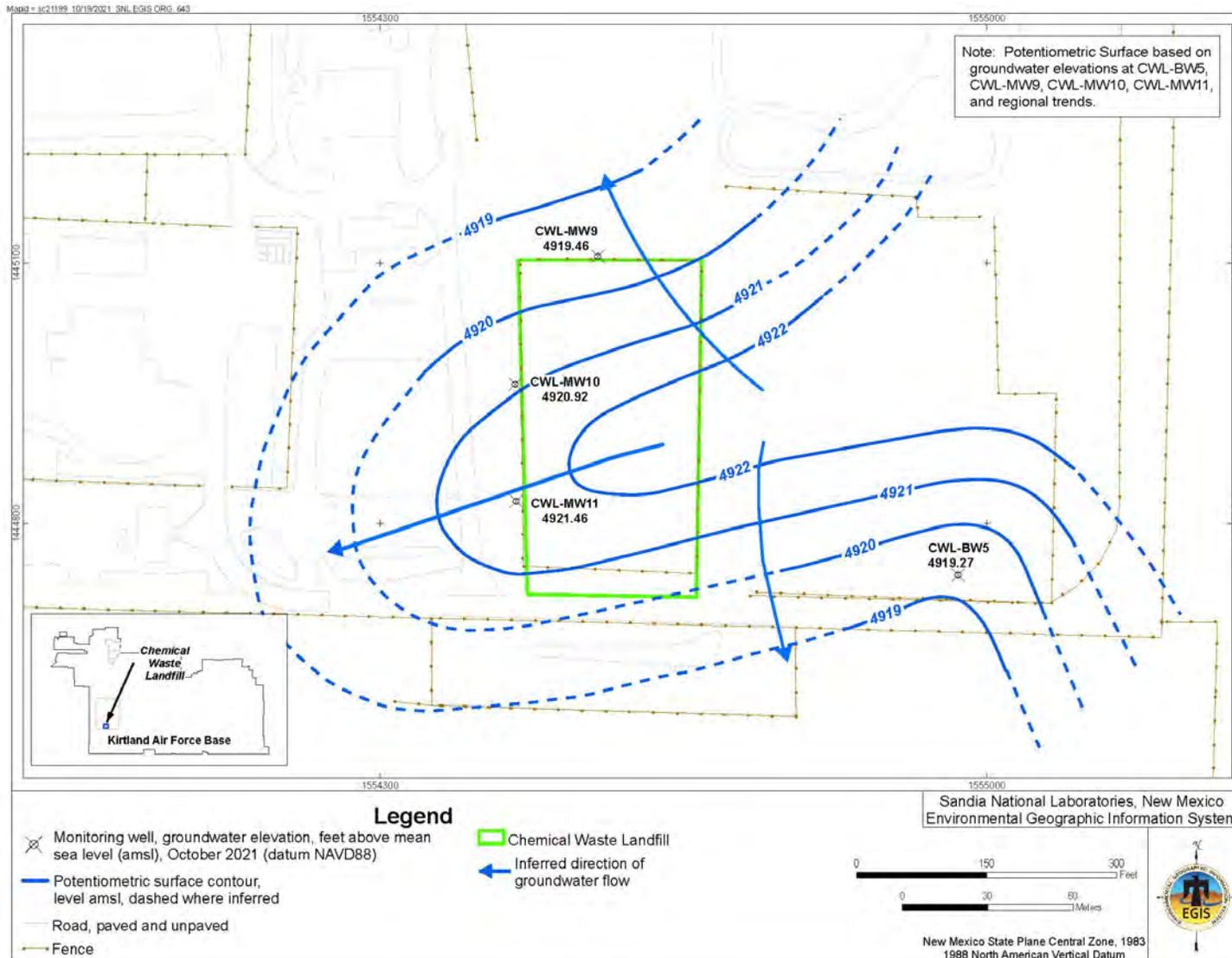


Figure 4-10  
 Potentiometric Surface of the Regional Aquifer at the Chemical Waste Landfill, October 2021

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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 2021 in accordance with PCCP Attachment 1, Sections 1.8 and 1.12, and Attachment 3 (NMED October 2009 and subsequent revisions). The CY 2021 annual soil-gas sampling event was the tenth 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, data evaluation requirements and results are presented in Section 5.3, and a historical data evaluation is presented in Section 5.4. Soil-gas monitoring well locations are shown in Figure 2-4.

### 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 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 sampling forms and documentation that address calibration of equipment, well evacuation, purging flow rates and times, 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 all sampling ports of monitoring wells CWL-UI1, CWL-UI2, CWL-D1, CWL-D2, and CWL-D3 on February 1, 2021. All samples were analyzed using EPA Method TO-15 (EPA January 1999b) to obtain results for the 50 VOCs listed in PCCP Attachment 1, Table 1-5. CY 2021 soil-gas sampling activities and results are described in the following sections.

#### 5.1.1 Well Evacuation and Sampling

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 was performed to remove a minimum of three tubing volumes in accordance with PCCP Attachment 3, Section 3.9.2 prior to sample collection.

The CWL soil-gas sampling equipment includes a vacuum pump, a sampling manifold assembly, a duplicate 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 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 of this report.

During the February 2021 monitoring event, environmental duplicate samples were collected from two CWL-D3 monitoring well sample ports (440 feet bgs and 480 feet bgs ports). The environmental duplicate samples were collected using the manifold system that allows for the simultaneous collection of the environmental and duplicate sample. The two environmental duplicate samples were submitted for analysis with the February 2021 environmental samples. The sample results are used to evaluate the reproducibility and precision 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 in SUMMA<sup>®</sup> canisters at the wellheads. Results are used to assess whether contamination of the samples may have resulted from ambient field conditions. A total of five field blank samples were submitted for analysis with environmental samples for the February 2021 monitoring event.

### 5.1.3 Waste Management

Only a small volume of solid waste (personal protective equipment, less than one cubic foot) was generated during the February 2021 soil-gas monitoring event. This waste was combined with the groundwater monitoring solid waste and managed as hazardous waste in accordance with all applicable requirements. The waste was disposed at a permitted off-site facility.

## 5.2 Laboratory Results

Soil-gas samples were submitted to Eurofins TestAmerica Laboratories, Inc. in Knoxville Tennessee 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 of this report 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 February 2021. The 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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI1-40 01-Feb-21	Benzene	5.2	3.1	31	J	--
	Carbon disulfide	6.6	4.3	78	B, J	78U
	Carbon tetrachloride	7.7	2.7	31	J	--
	Chloroform	330	2.7	31	--	--
	Dichlorodifluoromethane	15	5.4	31	J	--
	1,1-Dichloroethane	7.9	2.7	31	J	--
	1,1-Dichloroethene	83	3.1	31	--	--
	1,2-Dichloropropane	38	3.9	31	--	--
	Tetrachloroethene	1800	2.7	31	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	350	3.1	31	--	--
	1,1,1-Trichloroethane	18	14	31	J	--
	1,1,2-Trichloroethane	5.0	2.7	31	J	--
	Trichloroethene	3100	2.3	16	--	--
	Trichlorofluoromethane	92	4.3	31	--	--
	Total Organics <sup>c</sup>	5851.8	NA	NA	NA	NA
CWL-UI1-80 01-Feb-21	Benzene	4.8	2.5	25	J	--
	Carbon disulfide	5.6	3.4	62	B, J	62U
	Carbon tetrachloride	9.6	2.2	25	J	--
	Chlorobenzene	2.0	1.9	25	J	25U
	Chloroform	290	2.2	25	--	--
	Dichlorodifluoromethane	19	4.4	25	J	--
	1,1-Dichloroethane	8.6	2.2	25	J	--
	1,2-Dichloroethane	10	3.1	25	J	--
	1,1-Dichloroethene	160	2.5	25	--	--
	1,2-Dichloropropane	57	3.1	25	--	--
	Tetrachloroethene	630	2.2	25	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	450	2.5	25	--	--
	1,1,1-Trichloroethane	17	12	25	J	--
	1,1,2-Trichloroethane	4.5	2.2	25	J	--
	Trichloroethene	4200	1.9	12	--	--
Trichlorofluoromethane	120	3.4	25	--	--	
Total Organics <sup>c</sup>	5980.5	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI1-120 01-Feb-21	Benzene	3.9	3.3	33	J	--
	Carbon disulfide	7.1	4.5	83	B, J	83U
	Carbon tetrachloride	11	2.9	33	J	--
	Chlorobenzene	3.3	2.5	33	J	33U
	Chloroform	240	2.9	33	--	--
	1,2-Dibromoethane	3.3	2.9	33	J	--
	Dichlorodifluoromethane	18	5.8	33	J	--
	1,1-Dichloroethane	10	2.9	33	J	--
	1,2-Dichloroethane	19	4.1	33	J	--
	1,1-Dichloroethene	170	3.3	33	--	--
	1,2-Dichloropropane	66	4.1	33	--	--
	Tetrachloroethene	420	2.9	33	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	450	3.3	33	--	--
	1,1,2-Trichloroethane	5.0	2.9	33	J	--
	Trichloroethene	4500	2.5	17	--	--
	Trichlorofluoromethane	110	4.5	33	--	--
Total Organics <sup>c</sup>	6026.2	NA	NA	NA	NA	
CWL-UI2-36 01-Feb-21	Benzene	3.3	3.0	30	J	--
	Carbon disulfide	6.8	4.1	74	B, J	74U
	Carbon tetrachloride	4.7	2.6	30	J	--
	Chloroform	270	2.6	30	--	--
	Dichlorodifluoromethane	11	5.2	30	J	--
	1,1-Dichloroethane	3.3	2.6	30	J	--
	1,1-Dichloroethene	19	3.0	30	J	--
	1,2-Dichloropropane	36	3.7	30	--	--
	Tetrachloroethene	85	2.6	30	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	210	3.0	30	--	--
	Trichloroethene	1800	2.2	15	--	--
	Trichlorofluoromethane	59	4.1	30	--	--
	Total Organics <sup>c</sup>	2501.3	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI2-76 01-Feb-21	Benzene	2.7	2.3	23	J	--
	Carbon disulfide	5.9	3.1	57	B, J	57U
	Carbon tetrachloride	9.6	2.0	23	J	--
	Chloroform	400	2.0	23	--	--
	Dichlorodifluoromethane	16	4.0	23	J	--
	1,1-Dichloroethane	5.1	2.0	23	J	--
	1,1-Dichloroethene	58	2.3	23	--	--
	1,2-Dichloropropane	74	2.9	23	--	--
	Tetrachloroethene	130	2.0	23	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	390	2.3	23	--	--
	1,1,1-Trichloroethane	12	11	23	J	--
	1,1,2-Trichloroethane	2.8	2.0	23	J	--
	Trichloroethene	3200	1.7	11	--	--
	Trichlorofluoromethane	100	3.1	23	--	--
	Total Organics <sup>c</sup>	4400.2	NA	NA	NA	NA
CWL-UI2-136 01-Feb-21	Carbon disulfide	5.7	3.7	67	B, J	67U
	Carbon tetrachloride	8.9	2.4	27	J	--
	Chlorobenzene	2.5	2.0	27	J	27U
	Chloroform	330	2.4	27	--	--
	Dichlorodifluoromethane	16	4.7	27	J	--
	1,2-Dichloroethane	12	3.4	27	J	--
	1,1-Dichloroethene	68	2.7	27	--	--
	1,2-Dichloropropane	100	3.4	27	--	--
	Tetrachloroethene	120	2.4	27	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	380	2.7	27	--	--
	1,1,2-Trichloroethane	3.7	2.4	27	J	--
	Trichloroethene	3500	2.0	13	--	--
	Trichlorofluoromethane	100	3.7	27	--	--
	Total Organics <sup>c</sup>	4638.6	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-100 01-Feb-21	Benzene	4.7	3.3	33	J	--
	Carbon disulfide	7.5	4.5	82	B, J	82U
	Carbon tetrachloride	8.3	2.9	33	J	--
	Chloroform	190	2.9	33	--	--
	Dichlorodifluoromethane	15	5.7	33	J	--
	1,1-Dichloroethane	7.0	2.9	33	J	--
	1,2-Dichloroethane	9.1	4.1	33	J	--
	1,1-Dichloroethene	110	3.3	33	--	--
	1,2-Dichloropropane	60	4.1	33	--	--
	Tetrachloroethene	350	2.9	33	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	360	3.3	33	--	--
	1,1,2-Trichloroethane	3.1	2.9	33	J	--
	Trichloroethene	3500	2.5	16	--	--
	Trichlorofluoromethane	90	4.5	33	--	--
	Total Organics <sup>c</sup>	4707.2	NA	NA	NA	NA
CWL-D1-160 01-Feb-21	Benzene	6.8	3.9	39	J	--
	Carbon disulfide	8.6	5.3	97	B, J	97U
	Carbon tetrachloride	15	3.4	39	J	--
	Chloroform	250	3.4	39	--	--
	Dichlorodifluoromethane	23	6.8	39	J	--
	1,1-Dichloroethane	12	3.4	39	J	--
	1,2-Dichloroethane	18	4.8	39	J	--
	1,1-Dichloroethene	220	3.9	39	--	--
	1,2-Dichloropropane	100	4.8	39	--	--
	Tetrachloroethene	310	3.4	39	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	630	3.9	39	--	--
	1,1,2-Trichloroethane	4.5	3.4	39	J	--
	Trichloroethene	6200	2.9	19	--	--
	Trichlorofluoromethane	160	5.3	39	--	--
	Total Organics <sup>c</sup>	7949.3	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-240 01-Feb-21	Benzene	9.1	5.0	50	J	--
	Carbon disulfide	11	6.9	130	B, J	130U
	Carbon tetrachloride	27	4.4	50	J	--
	Chlorobenzene	5.2	3.8	50	J	--
	Chloroform	300	4.4	50	--	--
	Dichlorodifluoromethane	39	8.8	50	J	--
	1,1-Dichloroethane	19	4.4	50	J	--
	1,2-Dichloroethane	21	6.3	50	J	--
	1,1-Dichloroethene	430	5.0	50	--	--
	1,2-Dichloropropane	160	6.3	50	--	--
	Tetrachloroethene	310	4.4	50	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1100	5.0	50	--	--
	Trichloroethene	12000	7.6	50	--	--
	Trichlorofluoromethane	270	6.9	50	--	--
	Total Organics <sup>c</sup>	14690.3	NA	NA	NA	NA
CWL-D1-350 01-Feb-21	Benzene	6.6	3.6	36	J	--
	Carbon disulfide	7.6	4.9	89	B, J	89U
	Carbon tetrachloride	15	3.1	36	J	--
	Chloroform	96	3.1	36	--	--
	Dichlorodifluoromethane	23	6.2	36	J	--
	1,1-Dichloroethane	9.0	3.1	36	J	--
	1,1-Dichloroethene	240	3.6	36	--	--
	1,2-Dichloropropane	58	4.5	36	--	--
	Tetrachloroethene	120	3.1	36	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	580	3.6	36	--	--
	Trichloroethene	4900	2.7	18	--	--
	Trichlorofluoromethane	150	4.9	36	--	--
	Total Organics <sup>c</sup>	6197.6	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-470 01-Feb-21	Benzene	0.53	0.15	1.5	J	--
	Carbon disulfide	0.42	0.21	3.8	B, J	3.8U
	Carbon tetrachloride	1.7	0.13	1.5	--	--
	Chloroform	1.4	0.13	1.5	J	--
	Dichlorodifluoromethane	8.3	0.27	1.5	--	--
	1,1-Dichloroethane	0.17	0.13	1.5	J	--
	1,1-Dichloroethene	24	0.15	1.5	--	--
	1,2-Dichloropropane	0.31	0.19	1.5	J	--
	Tetrachloroethene	7.0	0.13	1.5	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	130	0.15	1.5	--	--
	Trichloroethene	160	0.11	0.76	--	--
	Trichlorofluoromethane	38	0.21	1.5	--	--
	Total Organics <sup>c</sup>	371.41	NA	NA	NA	NA
CWL-D2-120 01-Feb-21	Benzene	8.3	4.1	41	J	--
	Carbon disulfide	8.2	5.6	100	B, J	100U
	Carbon tetrachloride	22	3.5	41	J	--
	Chlorobenzene	4.0	3.0	41	J	--
	Chloroform	470	3.5	41	--	--
	Dichlorodifluoromethane	34	7.1	41	J	--
	1,1-Dichloroethane	17	3.5	41	J	--
	1,2-Dichloroethane	39	5.1	41	J	--
	1,1-Dichloroethene	300	4.1	41	--	--
	1,2-Dichloropropane	190	5.1	41	--	--
	Tetrachloroethene	400	3.5	41	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	850	4.1	41	--	--
	1,1,1-Trichloroethane	22	19	41	J	--
	1,1,2-Trichloroethane	6.9	3.5	41	J	--
	Trichloroethene	9300	7.6	51	--	--
	Trichlorofluoromethane	220	5.6	41	--	--
Total Organics <sup>c</sup>	11883.2	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-240 01-Feb-21	Benzene	5.9	4.1	41	J	--
	Carbon disulfide	9.1	5.7	100	B, J	100U
	Carbon tetrachloride	21	3.6	41	J	--
	Chlorobenzene	3.9	3.1	41	J	--
	Chloroform	360	3.6	41		--
	Dichlorodifluoromethane	34	7.2	41	J	--
	1,1-Dichloroethane	18	3.6	41	J	--
	1,2-Dichloroethane	28	5.2	41	J	--
	1,1-Dichloroethene	330	4.1	41	--	--
	1,2-Dichloropropane	160	5.2	41	--	--
	Tetrachloroethene	290	3.6	41	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	860	4.1	41	--	--
	1,1,2-Trichloroethane	3.9	3.6	41	J	--
	Trichloroethene	8200	3.1	21	--	--
	Trichlorofluoromethane	220	5.7	41	--	--
	Total Organics <sup>c</sup>	10534.7	NA	NA	NA	NA
CWL-D2-350 01-Feb-21	Benzene	5.7	3.3	33	J	--
	Carbon disulfide	8.2	4.5	81	B, J	81U
	Carbon tetrachloride	14	2.9	33	J	--
	Chloroform	190	2.9	33	--	--
	Dichlorodifluoromethane	23	5.7	33	J	--
	1,1-Dichloroethane	10	2.9	33	J	--
	1,2-Dichloroethane	12	4.1	33	J	--
	1,1-Dichloroethene	220	3.3	33	--	--
	1,2-Dichloropropane	80	4.1	33	--	--
	Tetrachloroethene	210	2.9	33	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	530	3.3	33	--	--
	Trichloroethene	5000	2.4	16	--	--
	Trichlorofluoromethane	150	4.5	33	--	--
	Total Organics <sup>c</sup>	6444.7	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-440 01-Feb-21	Acetone	7.1	0.66	2.3	--	--
	Benzene	0.020	0.0092	0.092	J	--
	2-Butanone	0.088	0.084	0.46	J	--
	Carbon disulfide	0.033	0.013	0.23	J	--
	Carbon tetrachloride	0.017	0.0081	0.092	J	--
	Chloroethane	0.77	0.033	0.092	--	--
	Chloroform	0.69	0.0081	0.092	--	--
	Chloromethane	0.58	0.076	0.23	--	--
	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.016	0.014	0.092	J	--
	Dichlorodifluoromethane	0.46	0.016	0.092	--	--
	1,1-Dichloroethane	0.048	0.0081	0.092	J	--
	1,2-Dichloroethane	0.048	0.012	0.092	J	--
	1,1-Dichloroethene	1.5	0.0092	0.092	--	--
	trans-1,2-Dichloroethene	0.12	0.0081	0.092	--	--
	1,2-Dichloropropane	0.039	0.012	0.092	J	--
	Methylene chloride	0.62	0.45	0.46	--	0.62U
	Tetrachloroethene	0.065	0.0081	0.092	J	0.092U
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.82	0.0092	0.092	--	--
	Trichloroethene	1.6	0.0069	0.046	--	--
	Trichlorofluoromethane	1.2	0.013	0.092	--	--
Total Organics <sup>c</sup>	15.149	NA	NA	NA	NA	
CWL-D2-470 01-Feb-21	Benzene	3.4	3.0	30	J	J
	Carbon tetrachloride	5.8	2.6	30	J	J
	Chlorobenzene	2.3	2.2	30	J	J
	Chloroform	230	2.6	30	--	J
	Dichlorodifluoromethane	9.6	5.2	30	J	J
	1,1-Dichloroethane	7.9	2.6	30	J	J
	1,2-Dichloroethane	13	3.7	30	J	J
	1,1-Dichloroethene	83	3.0	30	--	J
	1,2-Dichloropropane	80	3.7	30	--	J
	Tetrachloroethene	190	2.6	30	--	J
	1,1,2-Trichloro-1,2,2-trifluoroethane	200	3.0	30	--	J
	1,1,2-Trichloroethane	4.0	2.6	30	J	J
	Trichloroethene	3200	2.2	15	--	J
	Trichlorofluoromethane	64	4.1	30	--	J
	Total Organics <sup>c</sup>	4093.0	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-120 01-Feb-21	Benzene	3.2	2.8	28	J	28UJ
	Carbon tetrachloride	6.9	2.5	28	J	J
	Chloroform	140	2.5	28	--	J
	Dichlorodifluoromethane	16	5.0	28	J	J
	1,1-Dichloroethane	6.6	2.5	28	J	J
	1,2-Dichloroethane	18	3.6	28	J	J
	1,1-Dichloroethene	110	2.8	28	--	J
	1,2-Dichloropropane	78	3.6	28	--	J
	Tetrachloroethene	89	2.5	28	--	J
	1,1,2-Trichloro-1,2,2-trifluoroethane	340	2.8	28	--	J
	1,1,2-Trichloroethane	2.9	2.5	28	J	J
	Trichloroethene	3100	2.1	14	--	J
	Trichlorofluoromethane	100	3.9	28	--	J
	Total Organics <sup>c</sup>	4007.4	NA	NA	NA	NA
CWL-D3-170 01-Feb-21	Benzene	1.2	0.45	4.5	J	4.5UJ
	Carbon tetrachloride	3.7	0.39	4.5	J	J
	Chlorobenzene	0.40	0.33	4.5	J	4.5UJ
	Chloroform	57	0.39	4.5	--	J
	Dichlorodifluoromethane	7.9	0.78	4.5	--	J
	1,1-Dichloroethane	2.8	0.39	4.5	J	J
	1,2-Dichloroethane	7.2	0.56	4.5	--	J
	1,1-Dichloroethene	57	0.45	4.5	--	J
	1,2-Dichloropropane	37	0.56	4.5	--	J
	Tetrachloroethene	41	0.39	4.5	--	J
	1,1,2-Trichloro-1,2,2-trifluoroethane	160	0.45	4.5	--	J
	1,1,2-Trichloroethane	0.83	0.39	4.5	J	J
	Trichloroethene	1400	1.1	7.4	--	--
	Trichlorofluoromethane	48	0.61	4.5	--	J
Total Organics <sup>c</sup>	1822.43	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-350 01-Feb-21	Benzene	0.19	0.038	0.38	J	0.38U
	Carbon tetrachloride	0.089	0.033	0.38	J	--
	Chloroform	1.2	0.033	0.38	--	--
	Dichlorodifluoromethane	0.51	0.067	0.38	--	--
	1,1-Dichloroethane	0.048	0.033	0.38	J	--
	1,2-Dichloroethane	0.18	0.048	0.38	J	--
	1,1-Dichloroethene	0.57	0.038	0.38	--	--
	1,2-Dichloropropane	0.63	0.048	0.38	--	--
	Tetrachloroethene	1.6	0.033	0.38	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.4	0.038	0.38	--	--
	1,1,2-Trichloroethane	0.042	0.033	0.38	J	--
	Trichloroethene	23	0.029	0.19	--	--
	Trichlorofluoromethane	0.65	0.052	0.38	--	--
	Total Organics <sup>c</sup>	29.919	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-440 01-Feb-21	Acetone	2.9	0.62	2.2	--	J+
	Benzene	0.23	0.0087	0.087	--	--
	Bromoform	0.0097	0.0097	0.087	J	--
	Bromomethane	0.030	0.024	0.087	J	--
	2-Butanone	0.36	0.079	0.43	J	0.43U
	Carbon disulfide	0.027	0.012	0.22	J	--
	Carbon tetrachloride	0.068	0.0076	0.087	J	--
	Chlorobenzene	0.033	0.0065	0.087	J	0.087U
	Chloroethane	0.035	0.031	0.087	J	--
	Chloroform	0.089	0.0076	0.087	--	--
	Chloromethane	0.58	0.071	0.22	--	--
	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.017	0.013	0.087	J	--
	Dichlorodifluoromethane	0.33	0.015	0.087	--	--
	1,2-Dichloroethane	0.025	0.011	0.087	J	--
	1,1-Dichloroethene	0.035	0.0087	0.087	J	--
	1,2-Dichloropropane	0.034	0.011	0.087	J	--
	Ethylbenzene	0.072	0.014	0.087	J	--
	2-Hexanone	0.027	0.017	0.22	J	0.22U
	4-Methyl-2-pentanone	0.25	0.058	0.22	--	J+
	Methylene chloride	3.3	0.42	0.43	--	--
	Tetrachloroethene	0.085	0.0076	0.087	J	--
	Toluene	0.63	0.084	0.13	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.15	0.0087	0.087	--	--
	1,1,2-Trichloroethane	0.011	0.0076	0.087	J	--
	Trichloroethene	1.1	0.0065	0.043	--	--
	Trichlorofluoromethane	0.26	0.012	0.087	--	--
	1,2,4-Trimethylbenzene	0.039	0.022	0.087	J	--
	m,p-Xylene	0.18	0.031	0.087	--	--
	o-Xylene	0.070	0.016	0.087	J	--
	Total Organics <sup>c</sup>	10.5567	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-440 (Duplicate) 01-Feb-21	Acetone	3.2	0.62	2.2	--	J+
	Benzene	0.25	0.0087	0.087	--	--
	Bromoform	0.011	0.0097	0.087	J	--
	Bromomethane	0.11	0.024	0.087	--	--
	2-Butanone	0.44	0.079	0.43	--	J+
	Carbon disulfide	0.33	0.012	0.22	--	--
	Carbon tetrachloride	0.076	0.0076	0.087	J	--
	Chlorobenzene	0.013	0.0065	0.087	J	0.087U
	Chloroethane	0.21	0.031	0.087	--	--
	Chloroform	0.11	0.0076	0.087	--	--
	Chloromethane	1.5	0.071	0.22	--	--
	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.019	0.013	0.087	J	--
	Dichlorodifluoromethane	0.34	0.015	0.087	--	--
	1,1-Dichloroethane	0.011	0.0076	0.087	J	--
	1,2-Dichloroethane	0.040	0.011	0.087	J	--
	1,1-Dichloroethene	0.039	0.0087	0.087	J	--
	1,2-Dichloropropane	0.037	0.011	0.087	J	--
	Ethylbenzene	0.071	0.014	0.087	J	--
	2-Hexanone	0.040	0.017	0.22	J	0.22U
	Methylene chloride	0.59	0.42	0.43	--	--
	Tetrachloroethene	0.12	0.0076	0.087	--	--
	Toluene	0.45	0.084	0.13	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.17	0.0087	0.087	--	--
	Trichloroethene	1.2	0.0065	0.043	--	--
	Trichlorofluoromethane	0.26	0.012	0.087	--	--
	1,2,4-Trimethylbenzene	0.041	0.022	0.087	J	--
	Vinyl chloride	0.044	0.028	0.043	--	--
	m,p-Xylene	0.17	0.031	0.087	--	--
	o-Xylene	0.065	0.016	0.087	J	--
	Total Organics <sup>c</sup>	9.904	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-480 01-Feb-21	Acetone	2.9	0.61	2.1	--	J+
	Benzene	0.24	0.0085	0.085	--	--
	Bromoform	0.011	0.0096	0.085	J	
	2-Butanone	0.39	0.078	0.43	J	0.43U
	Carbon disulfide	0.014	0.012	0.21	J	--
	Carbon tetrachloride	0.072	0.0074	0.085	J	--
	Chlorobenzene	0.0081	0.0064	0.085	J	0.085U
	Chloroform	0.10	0.0074	0.085	--	--
	Chloromethane	0.55	0.070	0.21	--	--
	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.018	0.013	0.085	J	--
	Dichlorodifluoromethane	0.34	0.015	0.085	--	--
	1,2-Dichloroethane	0.022	0.011	0.085	J	--
	1,1-Dichloroethene	0.047	0.0085	0.085	J	--
	1,2-Dichloropropane	0.033	0.011	0.085	J	--
	Ethylbenzene	0.072	0.014	0.085	J	--
	4-Ethyltoluene	0.033	0.022	0.17	J	--
	2-Hexanone	0.043	0.017	0.21	J	0.21U
	Tetrachloroethene	0.051	0.0074	0.085	J	--
	Toluene	0.43	0.083	0.13	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	0.0085	0.085	--	--
	Trichloroethene	1.1	0.0064	0.043	--	--
	Trichlorofluoromethane	0.27	0.012	0.085	--	--
	1,2,4-Trimethylbenzene	0.041	0.021	0.085	J	--
m,p-Xylene	0.17	0.031	0.085	--	--	
o-Xylene	0.067	0.016	0.085	J	--	
Total Organics <sup>c</sup>	6.781	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>  
 February 2021

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-480 (Duplicate) 01-Feb-21	Acetone	2.0	0.63	2.2	J	2.2U
	Benzene	0.24	0.0089	0.089	--	--
	Bromoform	0.011	0.010	0.089	J	--
	2-Butanone	0.17	0.081	0.45	J	0.45U
	Carbon tetrachloride	0.074	0.0078	0.089	J	--
	Chloroform	0.11	0.0078	0.089	--	--
	Chloromethane	0.50	0.073	0.22	--	--
	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.020	0.013	0.089	J	--
	Dichlorodifluoromethane	0.36	0.016	0.089	--	--
	1,2-Dichloroethane	0.022	0.011	0.089	J	--
	1,1-Dichloroethene	0.052	0.0089	0.089	J	--
	1,2-Dichloropropane	0.036	0.011	0.089	J	--
	Ethylbenzene	0.075	0.014	0.089	J	--
	4-Ethyltoluene	0.040	0.023	0.18	J	--
	Tetrachloroethene	0.12	0.0078	0.089	--	--
	Toluene	0.44	0.087	0.13	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.22	0.0089	0.089	--	--
	Trichloroethene	1.2	0.0067	0.045	--	--
	Trichlorofluoromethane	0.29	0.012	0.089	--	--
	1,2,4-Trimethylbenzene	0.043	0.022	0.089	J	--
m,p-Xylene	0.17	0.032	0.089	--	--	
o-Xylene	0.066	0.017	0.089	J	--	
Total Organics <sup>c</sup>	4.089	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>  
February 2021

Notes:

<sup>a</sup>EPA January 1999b.

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

Laboratory Qualifier

B = Compound was found in the blank and sample.

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Validation Qualifier

J = The associated value is an estimated quantity.

J+ = The associated numerical value is an estimated quantity with a suspected positive bias.

U = The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.

UJ = The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

<sup>c</sup>Total Organics - sum of validated detected organic compounds (i.e., results for analytes reported as detections by the laboratory but qualified during data validation as not detected are not included in the Total Organics value).

EPA = U.S. Environmental Protection Agency.

ID = Identification.

MDL = Method detection limit. The minimum concentration that can be measured and reported with 99 percent confidence that the analyte is greater than zero, analyte is matrix specific.

NA = Not applicable.

ppbv = Parts per billion by volume.

RL = Reporting limit. The minimum concentration that can be reported with a specified degree of confidence.

## February 1, 2021 Soil-Gas Results

Twenty-three samples were collected from the 21 sampling ports (21 environmental samples and 2 environmental duplicate samples). In general, the February 2021 soil-gas results were consistent with the CY 2020 data set. A total of 34 VOCs were detected in the CY 2021 data set compared to 25 VOCs detected in the CY 2020 data set. The VOC 2-hexanone was not included because it was qualified during data validation as not detected. The detected VOCs are listed below.

1,1-Dichloroethane	Carbon disulfide
1,1-Dichloroethene	Carbon tetrachloride
1,1,1-Trichloroethane	Chlorobenzene
1,1,2-Trichloroethane	Chloroethane
1,1,2-Trichloro-1,2,2-trifluoroethane	Chloroform
1,2-Dibromoethane	Chloromethane
1,2-Dichloroethane	Dichlorodifluoromethane
1,2-Dichloropropane	Ethylbenzene
1,2-Dichloro-1,1,2,2-tetrafluoroethane	Methylene chloride
1,2,4-Trimethylbenzene	Tetrachloroethene
2-Butanone	Toluene
4-Ethyltoluene	Trichloroethene
4-Methyl-2-pentanone	Trichlorofluoromethane
Acetone	Vinyl chloride
Benzene	m,p-Xylene
Bromoform	o-Xylene
Bromomethane	trans-1,2-Dichloroethene

TCE is the primary VOC of concern at the CWL and was detected in all 23 samples. TCE concentrations ranged from 1.1 parts per billion by volume (ppbv) (CWL-D3-440 and CWL-D3-480 environmental samples) to 12,000 ppbv (CWL-D1-240). PCE was also detected in all samples except in CWL-D2-440 (PCE reported but qualified as not detected during data validation due to field blank results). PCE concentrations ranged from 0.051 ppbv (CWL-D3-480, environmental sample) to 1,800 ppbv (CWL-UI1-40). Other VOCs detected in all samples, generally at lower concentrations, included carbon tetrachloride; chloroform; dichlorodifluoromethane; 1,1-dichloroethene; 1,2-dichloropropane; 1,1,2-trichloro-1,2,2-trifluoroethane; and trichlorofluoromethane. Total VOCs, as the sum of validated detected VOCs, were reported in all environmental samples at concentrations ranging from 4.089 ppbv (CWL-D3-480, environmental duplicate sample) to 14,690.3 ppbv (CWL-D1-240). The maximum TCE and Total VOC concentrations were reported in the sample from CWL-D1-240.

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 3,200 ppbv or 3.2 parts per million by volume (ppmv) from CWL-D2-470.

### 5.2.2 Field Quality Control Sample Results

Table 5-2 presents field duplicate results for environmental-duplicate sample pairs collected from CWL-D3-440 and CWL-D3-480. In accordance with PCCP Attachment 3, Section 3.6, RPD calculations were performed for all detected compounds with concentrations exceeding five

Table 5-2  
 Summary of February 2021 Duplicate Samples  
 Chemical Waste Landfill Soil-Gas Monitoring

Well ID/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD <sup>a</sup> (%)
	(ppbv)		
<b>CWL-D3-440</b>			
Trichloroethene	1.1	1.2	9
<b>CWL-D3-480</b>			
Trichloroethene	1.1	1.2	9

Notes:

<sup>a</sup>RPD = Relative percent difference is calculated with the following equation and rounded to 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.

% = Percent.  
 ID = Identification.  
 ppbv = Parts per billion by volume.

times the reporting limit in both the environmental and duplicate sample. The environmental duplicate sample results show good agreement (i.e., RPDs less than 50), with RPDs of 9.

A total of five field blank samples were submitted with the CY 2021 samples. VOCs detected above MDLs in field blank samples included acetone (3 samples), benzene (1 sample; note benzene was detected in the other four field blank samples but qualified as not detected during data validation due to associated laboratory method blank contamination – see Section 5.2.3), 2-butanone (3 samples), carbon disulfide (2 samples; note carbon disulfide was detected in one other field blank sample but qualified as not detected during data validation due to associated laboratory method blank contamination – see Section 5.2.3), chlorobenzene (3 samples), 2-hexanone (1 sample), 4-ethyltoluene (1 sample), ethylbenzene (1 sample), 4-methyl-2-pentanone (1 sample), methylene chloride (2 samples), PCE (2 samples), toluene (3 samples), trichlorofluoromethane (1 sample), 1,2,4-trimethylbenzene (1 sample), 1,3,5-trimethylbenzene (1 sample), m,p-xylene (2 samples), and o-xylene (1 sample). Acetone, benzene, 2-butanone, carbon disulfide, chlorobenzene, 2-hexanone, methylene chloride, and PCE in various samples from all wells were qualified as not detected during data validation since both field QC and environmental sample results were less than the reporting limit.

### 5.2.3 Data Quality

Field QC sample results met the sampling DQOs and validated the adequacy of the field sampling procedures and protocol. Internal laboratory QC samples were analyzed concurrently with all environmental samples in accordance with laboratory procedures and the EPA method.

These samples included laboratory control samples, method blanks, replicates, matrix spikes, matrix spike duplicates, and surrogate spike samples. Laboratory method blank samples were used to determine potential contamination introduced by the laboratory processes and methodologies and laboratory spike samples were used to determine the accuracy and precision of the analytical method.

Benzene was detected in the laboratory method blank samples associated with four of the five field blank samples (FB1 through FB4). As a result, the associated field blank sample benzene results were qualified as not detected during data validation (they were detections less than the reporting limit) and were not applied to the associated environmental sample results. Carbon disulfide was detected in the laboratory method blank samples associated with environmental samples from CWL-UI1 (all samples), CWL-UI2 (all samples), CWL-D1 (all samples), CWL-D2 (120, 240, and 350 feet bgs sample port samples), and the field blank sample (FB5) associated with CWL-D3 environmental and environmental duplicate samples. For all of these samples, carbon disulfide was reported at concentrations below the reporting limit and was qualified as not detected during data validation. In addition, the field blank sample carbon disulfide result was not applied to the associated CWL-D3 environmental and environmental duplicate samples.

As noted in Section 5.4, results for sample ports CWL-D2-440, CWL-D3-350, CWL-D3-440 (environmental and environmental duplicate samples) and CWL-D3-480 (environmental and environmental duplicate samples) were significantly lower than historical results from these sample ports. After initial review of the results in March 2021, SNL/NM personnel requested the analytical laboratory review and confirm all calculations and dilutions for these samples. The analytical laboratory personnel reviewed the sample results and confirmed all related calculations and dilutions. There were no issues identified during field collection or the analytical laboratory process.

Laboratory QC samples verified the accuracy and precision of the analytical method. The data were reviewed and qualified in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data" (SNL/NM June 2020). All data were determined as acceptable and reported QC measures met QC acceptance criteria. Data Validation Reports and Contract Verification Forms are provided in Annex B of this report and are filed in the SNL/NM Records Center.

#### 5.2.4 Variances

There were no variances from PCCP requirements for the February 2021 soil-gas monitoring activities.

### 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) is required annually, and includes the following:

- Calculate the UCL and LCL of the mean at a 95% confidence level using current data since implementation of the PCCP, 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 five years after the effective date of the PCCP (June 2, 2011), historical soil-gas monitoring results were used to augment the statistical analysis. In accordance with PCCP Attachment 1, Section 1.8.2.2, historical data collected prior to implementation of the PCCP are no longer used for statistical analysis because six or more data sets collected under the PCCP are available.

### 5.3.1 Statistical Assessment Requirements

Only the CWL-D2-470 environmental sample TCE result of 3.2 ppmv exceeded the 0.50 ppmv threshold for statistical assessment from the three deepest sampling ports of wells CWL-D1 through CWL-D3. In accordance with the PCCP Attachment 1, Section 1.8.2.2, confidence intervals (UCLs and LCLs) were calculated and the LCL was used to compare to the trigger level of 20 ppmv. If a result was below the analytical laboratory detection limit, the MDL for the constituent was used for statistical analysis. For duplicate analyses, only the highest detection for the environmental-duplicate sample pair was used for statistical analysis.

### 5.3.2 Statistical Assessment Results

CY 2021 soil-gas statistical assessment results are presented in Table 5-3. The calculated LCL for TCE (CWL-D2-470) is below the trigger level of 20 ppmv. The calculated LCL was 3.784 ppmv for TCE from CWL-D2-470.

## 5.4 Historical 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 historical 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 historical data. Historical soil-gas data includes results from June 1999, August 2001, June 2004, September 2004, and October 2005 (post-VE VCM monitoring), as well as results from monitoring under the PCCP (January 2012 through February 2021). The June 1998 data set was included in previous reports but is no longer needed since so much post-VE VCM data are available.

Tables 5-4 and 5-5 present TCE and Total VOCs soil-gas monitoring results, respectively, for the post-closure care monitoring network. Data sets included in the analysis range from June 1999 (representative of the end of the VE VCM) to February 2021 (most current data set).

Consistent with pre-VE VCM characterization data and the detailed conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004), the highest CY 2021 concentrations of TCE in soil gas remain in the central part of the

Table 5-3  
 Statistical Assessment Results Summary  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Calendar Year 2021

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 (ppmv)	Trigger Level Exceeded <sup>d</sup>
Trichloroethene (3.2 ppmv from CWL-D2-470, environmental sample)	3.1	7.1	4.423	1.102	3.784	5.062	Normal	20	No

Notes:

<sup>a</sup>The CWL-D2-470 trichloroethene (TCE) result of 3.2 ppmv, was the only constituent detected in samples from the three deepest sampling ports of wells CWL-D1 through CWL-D3 that exceeded the 0.50 ppmv threshold for statistical assessment. Therefore, this table only summarizes statistical assessment of TCE results from CWL-D2-470. 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 historical data (CY 2012 through 2021, environmental and environmental duplicate sample results, including any resample results) and include the CY 2021 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 5-4  
 Historical Soil-Gas Monitoring Summary – TCE Concentrations  
 Chemical Waste Landfill

Well ID & Sample Port Depth <sup>b</sup>	EPA Method TO-14 <sup>a</sup>						EPA Method TO-15 <sup>a</sup>								
	June 1999	Aug 2001	June 2004	Sept 2004	Oct 2005	Jan <sup>c</sup> 2012	Jan <sup>c</sup> 2013	Jan 2014	Jan <sup>c</sup> 2015	Jan 2016	Jan 2017	Jan 2018	Jan 2019	Jan 2020	Feb 2021
CWL-UI1-40	16.0	7.9	3.8	4.0	4.5	5.20	7.30	4.80	4.20	4.70	5.68	8.30	4.40	4.60	3.10
CWL-UI1-80	4.9	6.7	5.9	6.1	6.8	6.50	9.70	6.30	5.10	5.80	7.23	6.20	5.30	5.20	4.20
CWL-UI1-120	5.9	9.1	6.0	14.0	13.0	7.70	11.00	7.60	8.20	7.30	7.82	5.30	6.60	8.80	4.50
CWL-UI2-36	0.70	ND	1.6	ND	1.2	3.10	3.50	2.80	3.00	5.20	3.72	2.30	2.50	2.30	1.80
CWL-UI2-76	1.0	2.4	3.4	4.1	3.7	5.60	7.80	3.70	3.70	5.60	5.32	4.70	4.10	4.60	3.20
CWL-UI2-136	1.9	4.6	3.0	1.9	3.0	8.50	6.60	6.20	5.40	7.30	6.76	6.70	4.60	5.00 <sup>e</sup>	3.50
CWL-D1-100	2.5	7.1	9.8	13.0	12.0	10.00	12.00	9.90	11.00	12.00	8.04	6.10	5.90	7.10	3.50
CWL-D1-160	14.0	21.0	25.0	29.0	22.0	14.00	16.00	16.00	16.00	21.00	15.60	10.00	10.00	16.00	6.20
CWL-D1-240	44.0	44.0	34.0	34.0	24.0	22.00	23.00	19.00	17.00	27.00	20.40	11.00	12.00	21.00	12.00
CWL-D1-350	11.0	19.0	13.0	22.0	2.8	13.00	13.00	8.50	13.00	12.00	10.00	4.20	13.00 <sup>d</sup>	9.10	4.90
CWL-D1-470	0.17	0.25	0.25	0.27	0.34	0.51	0.08	0.16	0.11	0.20	0.17	0.19	0.13	0.33	0.16
CWL-D2-120	21.0	20.0	22.0	25.0	16.0	16.00	19.00	13.00	13.00	11.00	14.3	7.70	9.10	13.00	9.30
CWL-D2-240	40.0	38.0	26.0	13.0	17.0	18.00	23.00	16.00	13.00	14.00	14.8	9.70	11.00	10.00	8.20
CWL-D2-350	12.0	18.0	11.0	17.0	5.0	11.00	13.00	9.90	8.10	10.00	9.85	6.40	7.40	9.00	5.00
CWL-D2-440	1.0	7.6	2.5	5.9	2.8	1.80	0.11	0.14	3.90	0.10	0.07	0.12	0.08	2.80	0.002
CWL-D2-470	0.94	5.8	3.1	4.6	4.3	4.10	7.00	4.70	4.50	4.40	4.33	4.80	4.00	3.10	3.20
CWL-D3-120	1.1	4.0	6.0	4.9	4.5	7.00	5.30	4.10	5.20	4.10	5.77	3.50	3.00	6.10	3.10
CWL-D3-170	2.5	9.9	4.5	6.6	4.4	7.90	7.20	5.40	6.40	8.50	6.36	4.70	3.40	4.40	1.40
CWL-D3-350	1.6	2.4	2.2	1.5	1.4	8.80	7.80	5.30	6.60	7.80	5.61	4.50	1.10 <sup>d</sup>	3.60	0.02
CWL-D3-440	1.8	0.26	0.75	3.4	3.3	6.80	13.00	8.20	6.80	6.30	8.09	4.80	4.30	4.70	0.001
CWL-D3-480	1.9	1.2	0.2	2.1	4.1	0.21	0.03	0.04	0.30	0.02	0.11	0.03	0.04	0.04	0.001

<sup>a</sup>All results are in ppmv. If an environmental duplicate sample was collected, the maximum concentration of the environmental-duplicate sample pair is shown. January 2012 through February 2021 concentrations have been rounded for significant digit consistency; they may not exactly match the concentrations in corresponding data tables. June 1999 through January 2012 are EPA Method TO-14 results (EPA January 1999a). January 2013 – February 2021 are EPA Method TO-15 results (EPA January 1999b).

<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 were collected in March 2012 due to issues with sampling this port; could not be sampled in January 2012.

<sup>d</sup>March 2019 resample result used due to data quality issues with the corresponding January 2019 sample.

<sup>e</sup>March 2020 resample result used due to data quality issues with the corresponding January 2020 sample.

CWL = Chemical Waste Landfill. EPA = U.S. Environmental Protection Agency. ppmv = Parts per million by volume.  
 ND = Not detected. TCE = Trichloroethene.

Table 5-5  
 Historical Soil-Gas Monitoring Summary – Total Volatile Organic Compound Concentrations  
 Chemical Waste Landfill

Well ID & Sample Port Depth <sup>b</sup>	EPA Method TO-14 <sup>a</sup>						EPA Method TO-15 <sup>a</sup>									
	June 1999	Aug 2001	June 2004	Sept 2004	Oct 2005	Jan <sup>c</sup> 2012	Jan <sup>c</sup> 2013	Jan 2014	Jan <sup>c</sup> 2015	Jan 2016	Jan 2017	Jan 2018	Jan 2019	Jan 2020	Feb 2021	
CWL-UI1-40	246	141	11.78	11.47	13.15	11.76	14.68	9.54	9.27	9.14	11.31	11.46	8.82	8.78	5.85	
CWL-UI1-80	9.63	13	10.61	10.67	11.61	10.18	13.74	9.43	8.74	8.63	10.69	8.91	7.75	7.52	5.98	
CWL-UI1-120	9.94	45.42	9.36	21.41	19.18	11.07	14.64	11.20	13.29	10.15	10.83	10.50	9.11	11.89	6.03	
CWL-UI2-36	2117	1800	813.7	850.0	391.78	4.64	5.02	4.81	5.37	7.63	5.47	3.24	3.57	3.36	2.50	
CWL-UI2-76	1.65	4.37	5.52	6.90	5.96	7.85	10.74	6.04	6.28	8.32	7.52	6.39	5.63	6.28	4.40	
CWL-UI2-136	4.21	7.98	4.42	2.85	4.89	11.45	9.12	9.31	9.16	9.89	9.24	8.69	6.09	7.11 <sup>e</sup>	4.64	
CWL-D1-100	4.93	11.9	14.59	18.22	17.25	13.84	15.90	14.25	17.41	16.36	11.21	8.42	8.11	9.33	4.71	
CWL-D1-160	21.4	30.1	33.32	38.41	29.28	18.48	20.33	21.45	20.78	27.27	20.62	13.00	12.98	20.18	7.95	
CWL-D1-240	78.4	61.5	45.27	44.74	32.60	22.46	28.71	25.32	26.04	34.14	26.60	13.76	15.22	26.17	14.69	
CWL-D1-350	20.7	31.7	18.73	30.53	4.07	16.56	16.31	11.61	19.29	15.44	12.94	5.65	16.24 <sup>d</sup>	12.20	6.20	
CWL-D1-470	0.231	0.921	0.612	0.82	0.603	0.87	0.13	0.39	0.44	0.63	0.52	0.43	0.40	1.10	0.37	
CWL-D2-120	33.0	29.4	29.26	34.23	22.31	20.70	24.05	18.49	18.81	15.37	19.41	10.17	11.93	16.76	11.88	
CWL-D2-240	101	52.9	34.72	17.62	22.83	22.90	28.38	22.11	18.27	19.08	19.52	12.47	14.17	13.32	10.53	
CWL-D2-350	22.9	25.9	15.42	23.41	7.50	13.31	16.01	16.04	12.64	13.86	12.70	8.33	9.70	11.78	6.44	
CWL-D2-440	4.38	11.8	3.85	9.29	4.17	2.60	0.15	0.22	6.15	0.15	0.12	0.16	0.12	4.11	0.02	
CWL-D2-470	6.95	8.40	4.17	6.60	6.40	5.78	8.49	10.14	8.14	5.90	5.77	6.18	5.29	4.27	4.09	
CWL-D3-120	2.17	6.20	8.39	7.10	6.23	9.19	6.80	6.92	8.83	5.55	7.63	4.59	3.94	7.84	4.01	
CWL-D3-170	5.01	15.0	6.11	9.40	6.12	10.57	9.18	8.83	10.38	11.25	8.43	6.11	4.43	5.69	1.82	
CWL-D3-350	2.76	3.98	3.39	2.34	2.27	12.90	10.44	9.12	11.15	10.40	7.48	5.86	1.40 <sup>d</sup>	4.95	0.03	
CWL-D3-440	4.04	0.519	0.96	5.14	4.64	9.69	17.73	12.60	11.12	8.59	10.69	6.22	5.55	6.38	0.01	
CWL-D3-480	4.47	1.85	0.31	3.30	5.71	0.30	0.06	0.05	0.43	0.34	0.15	0.03	0.05	0.05	0.007	

<sup>a</sup>All results are in ppmv. The Total VOC concentration is the sum of all validated detected constituents. If an environmental duplicate sample was collected, the maximum concentration of the environmental-duplicate sample pair is shown. June 1999 through January 2012 are EPA Method TO-14 results (EPA January 1999a). January 2013 through February 2021 are EPA Method TO-15 results (EPA January 1999b). January 2012 through February 2021 concentrations have been rounded for significant digit consistency; they may not exactly match the concentrations in corresponding data tables.

<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 were collected in March 2012 due to issues with sampling this port; could not be sampled in January 2012.

<sup>d</sup>March 2019 resample result used due to data quality issues with the corresponding January 2019 sample.

<sup>e</sup>March 2020 resample result used due to data quality issues with the corresponding January 2020 sample.

CWL = Chemical Waste Landfill. EPA = U.S. Environmental Protection Agency. VOC = Volatile organic compound. ppmv = Parts per million by volume.

vadose zone, from approximately 120 to 350 feet bgs. CWL-D1 results for the depths of 160, 240, and 350 feet bgs ranged from 4.90 to 12.00 ppmv, with the highest result from the depth of 240 feet bgs. CWL-D2 results for the depth of 120 to 350 feet bgs ranged from 5.00 to 9.30 ppmv, with the highest result from the depth of 120 feet bgs. The results for sample ports CWL-D2-440, CWL-D3-350, CWL-D3-440 and CWL-D3-480 were significantly lower than historical results from these sample ports and are addressed in Section 5.2.3.

In general, TCE and Total VOC concentrations are relatively stable and slowly decreasing throughout the vadose zone (Tables 5-4 and 5-5). When compared to the January 2012 and January 2020 results, all February 2021 TCE and Total VOC results show a decrease, with the TCE result for CWL-D2-470 being the only exception (a 0.01 ppmv increase from the January 2020 result but a 0.90 ppmv decrease from the January 2012 result). All CY 2021 TCE and Total VOC results below 350 feet bgs are low concentrations ranging from 3.20 ppmv (CWL-D2-470) to 0.001 ppmv (CWL-D3-440 and CWL-D3-480) for TCE, and 4.09 ppmv (CWL-D2-470) to 0.007 ppmv (CWL-D3-480) for Total VOCs.

Figures 5-1 through 5-5 show the concentration of TCE over time for each sampling port of each well. Figures 5-6 through 5-10 show the concentration of Total VOCs over time for each sampling port of each well. The figures are graphical representations of the data presented in Tables 5-4 and 5-5. 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 the LE VCM completed in February 2002.

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 100 to 480 feet bgs. TCE is the primary VOC of concern, although other VOCs were also detected in all the February 2021 samples (see Section 5.2.1). Together with TCE, these VOCs comprise the majority of the Total VOC concentration calculated for each sample. TCE concentrations are generally stable or decreasing over time (Figures 5-3 and 5-4), including at the CWL-D3 location (Figure 5-5) that shows more fluctuations. However, results collected at CWL-D3 since the PCCP was implemented (January 2012 through February 2021 results) are generally stable with all ports showing CY 2021 concentrations that are less than 2012 and 2020 concentrations for both TCE and Total VOCs. Over the historical monitoring period, the highest TCE and Total VOC concentrations in the deepest ports (CWL-D1-470, CWL-D2-470, and CWL-D3-480) have been consistently observed at the CWL-D2-470 port.

TCE in groundwater has only been 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 air-tight, passive soil-gas venting devices (i.e., BaroBalls™) were installed on all groundwater monitoring wells in March 2012. These venting devices have been on all soil-gas monitoring wells since completion of the VE VCM in 1998. The BaroBall™ devices remained on all groundwater and soil-gas monitoring wells throughout CY 2021 and were inspected during the sampling events. As discussed in Chapter 4 of this report, TCE concentrations in groundwater samples from

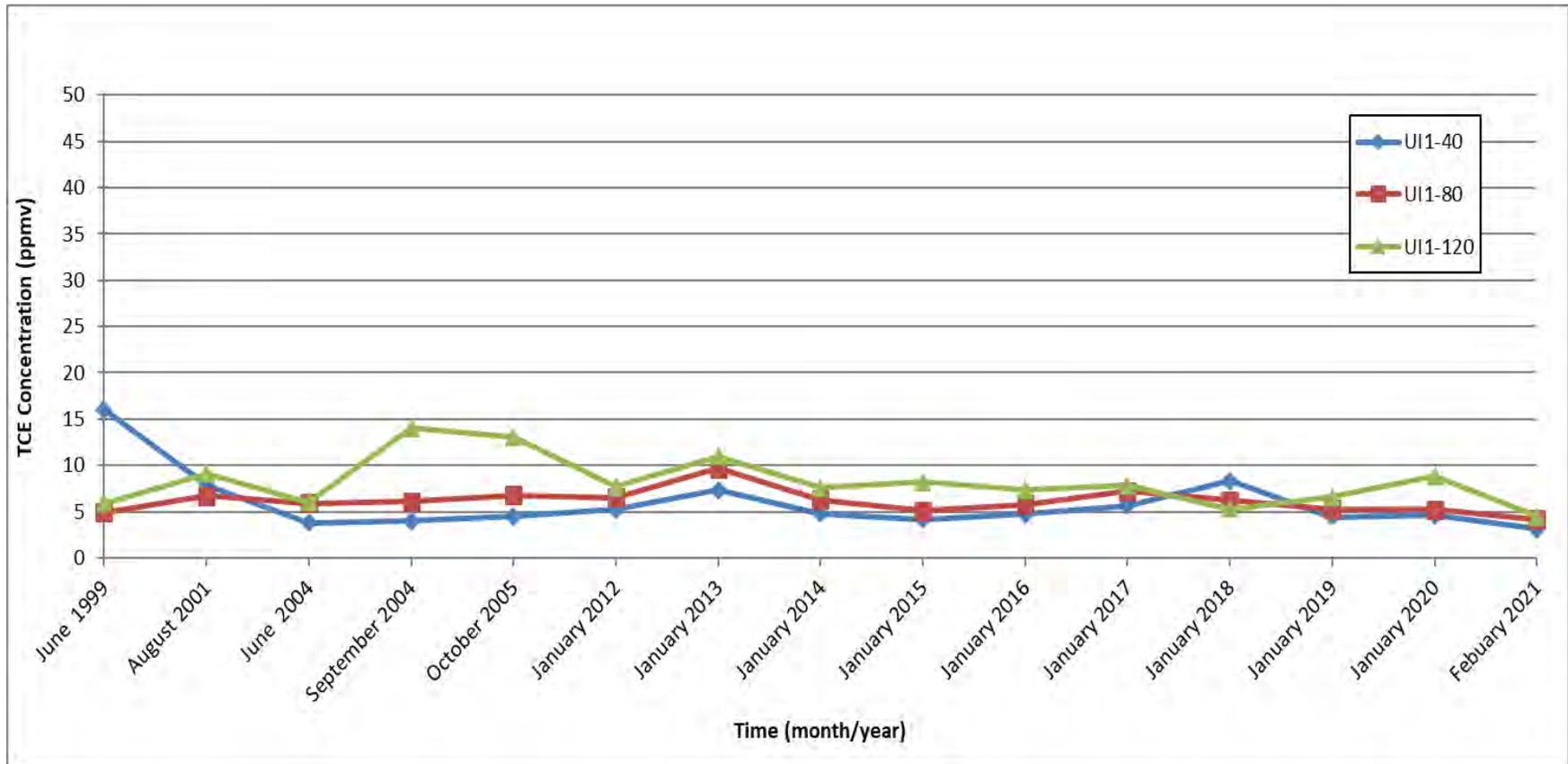


Figure 5-1  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well UI1 Ports

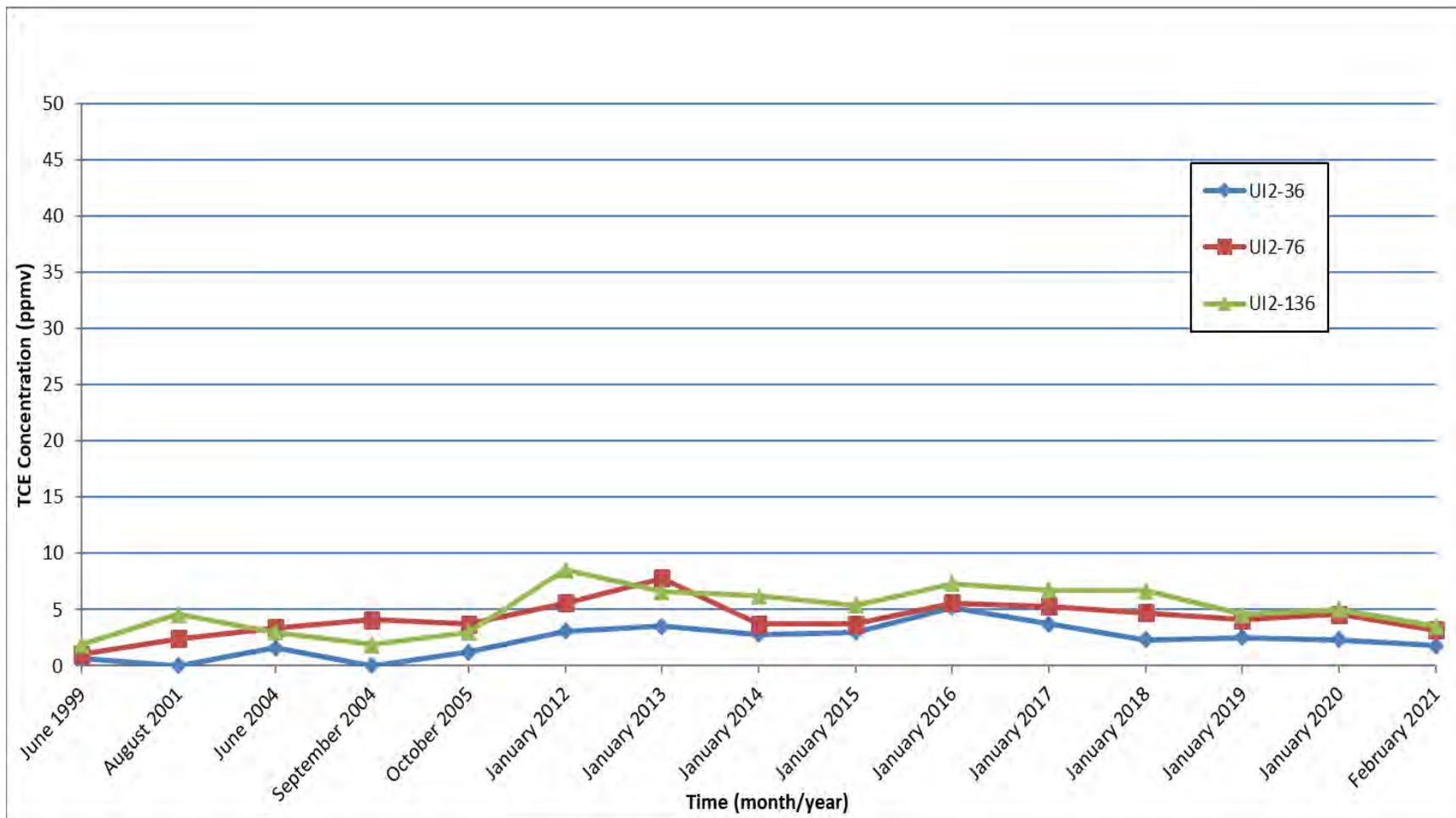


Figure 5-2  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well UI2 Ports

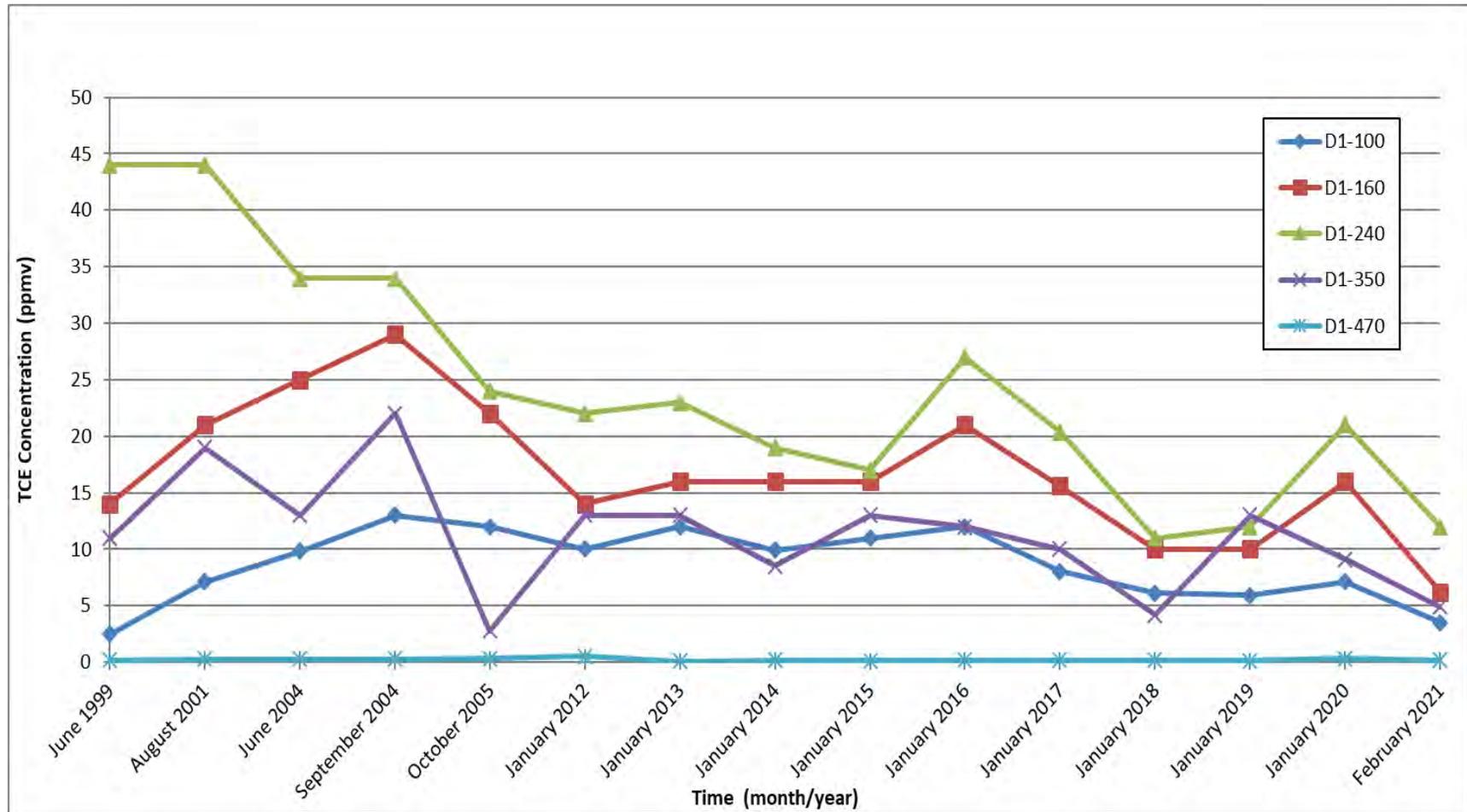


Figure 5-3  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well D1 Ports

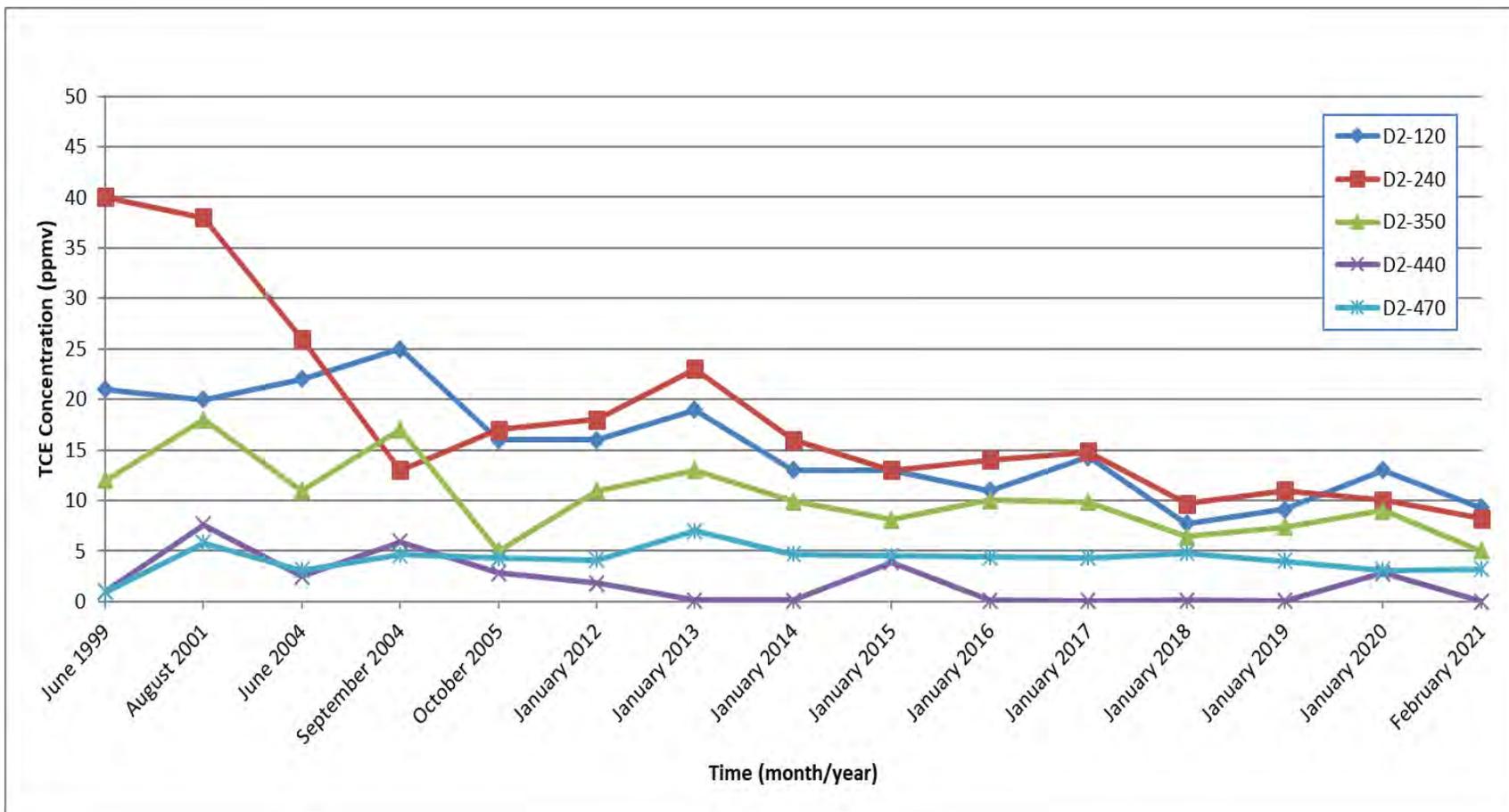


Figure 5-4  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well D2 Ports

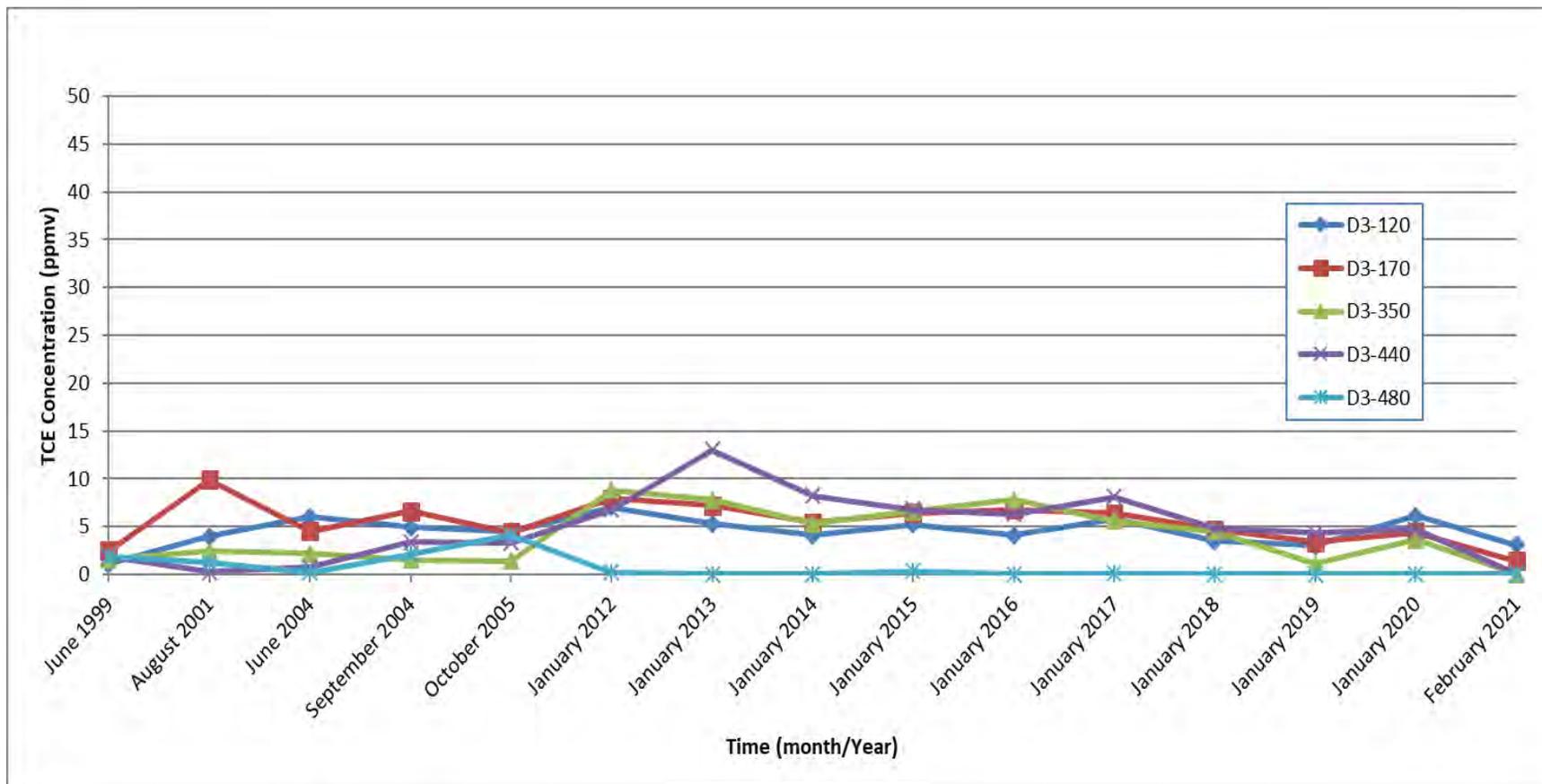


Figure 5-5  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well D3 Ports

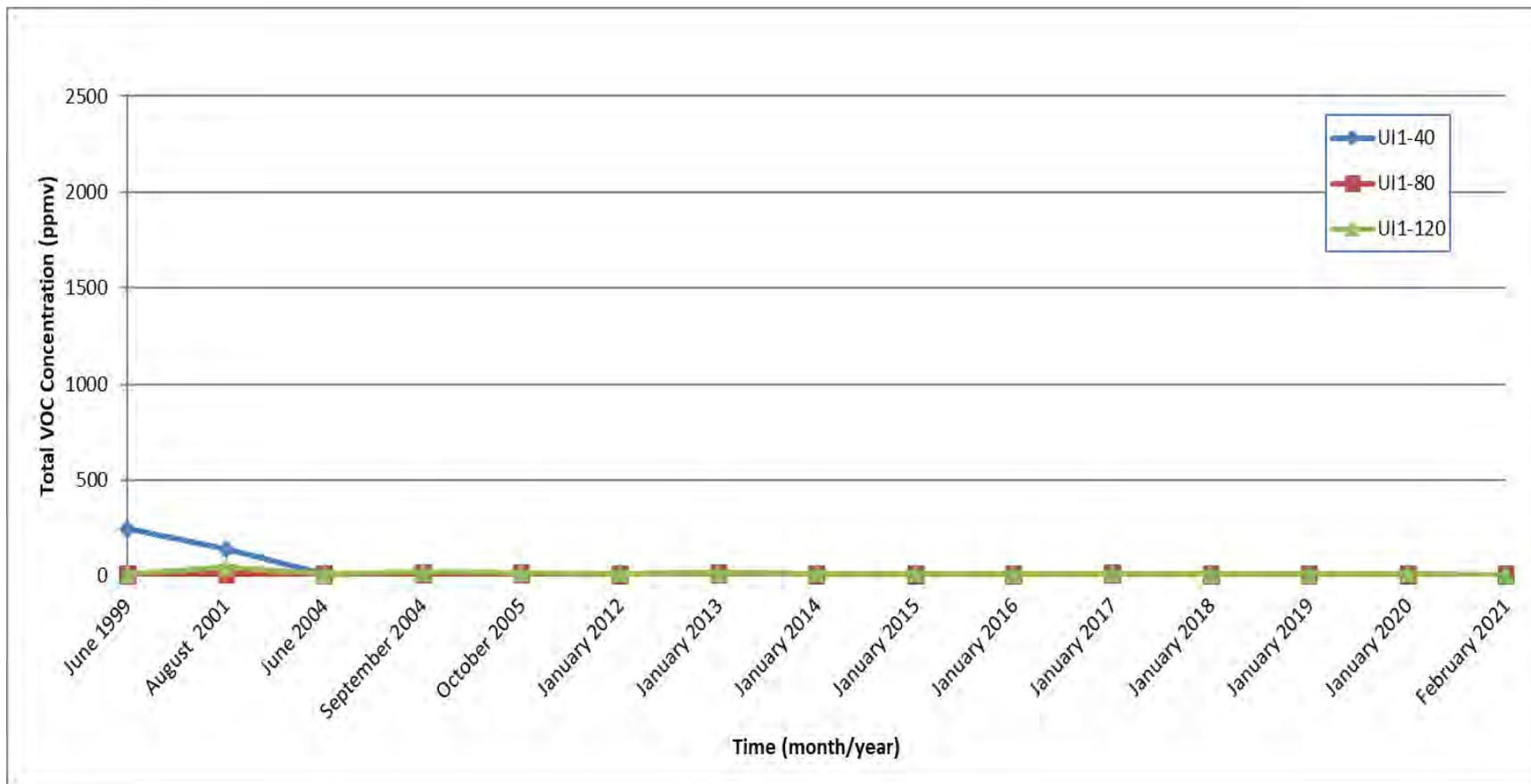


Figure 5-6  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well UI1 Ports

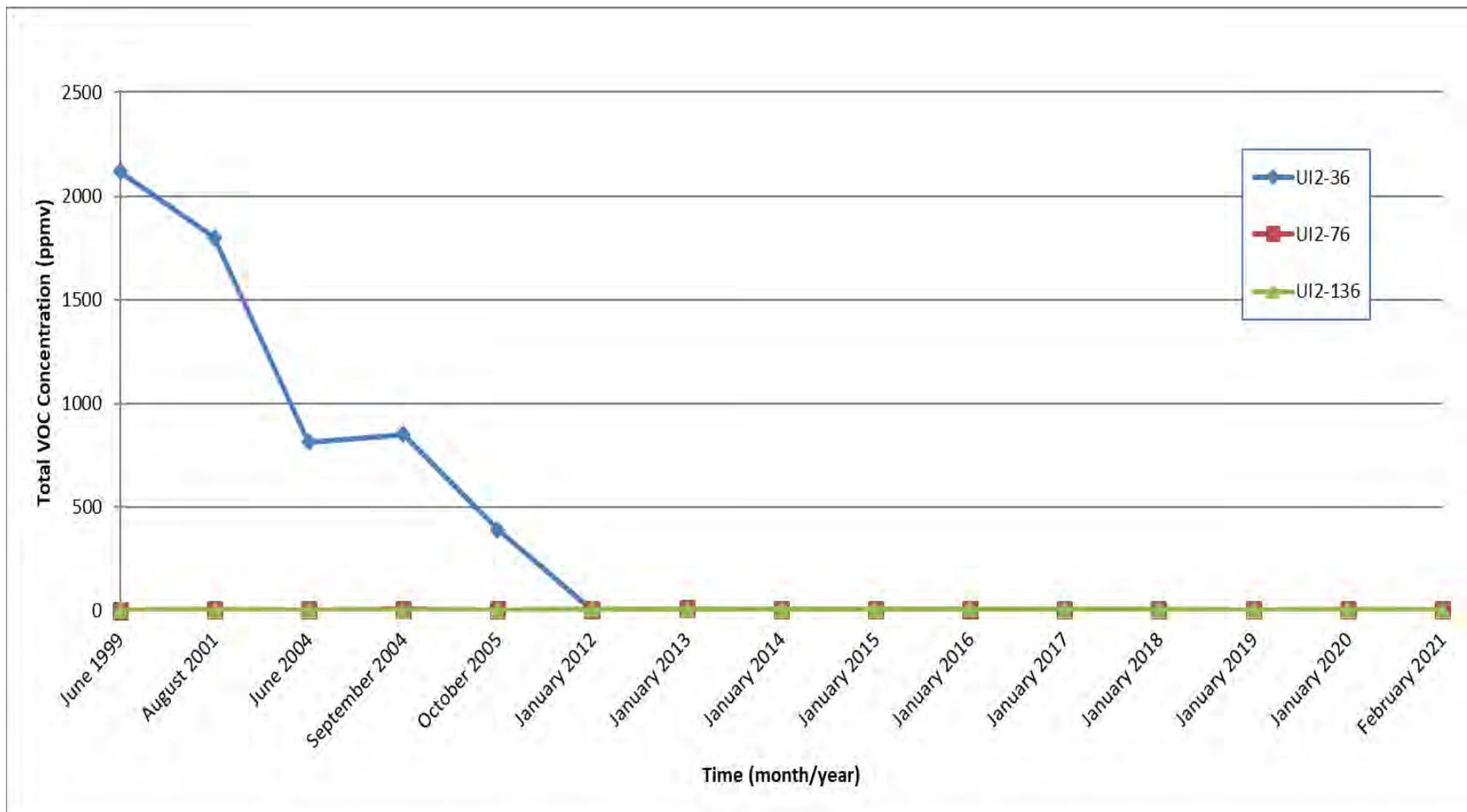


Figure 5-7  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well UI2 Ports

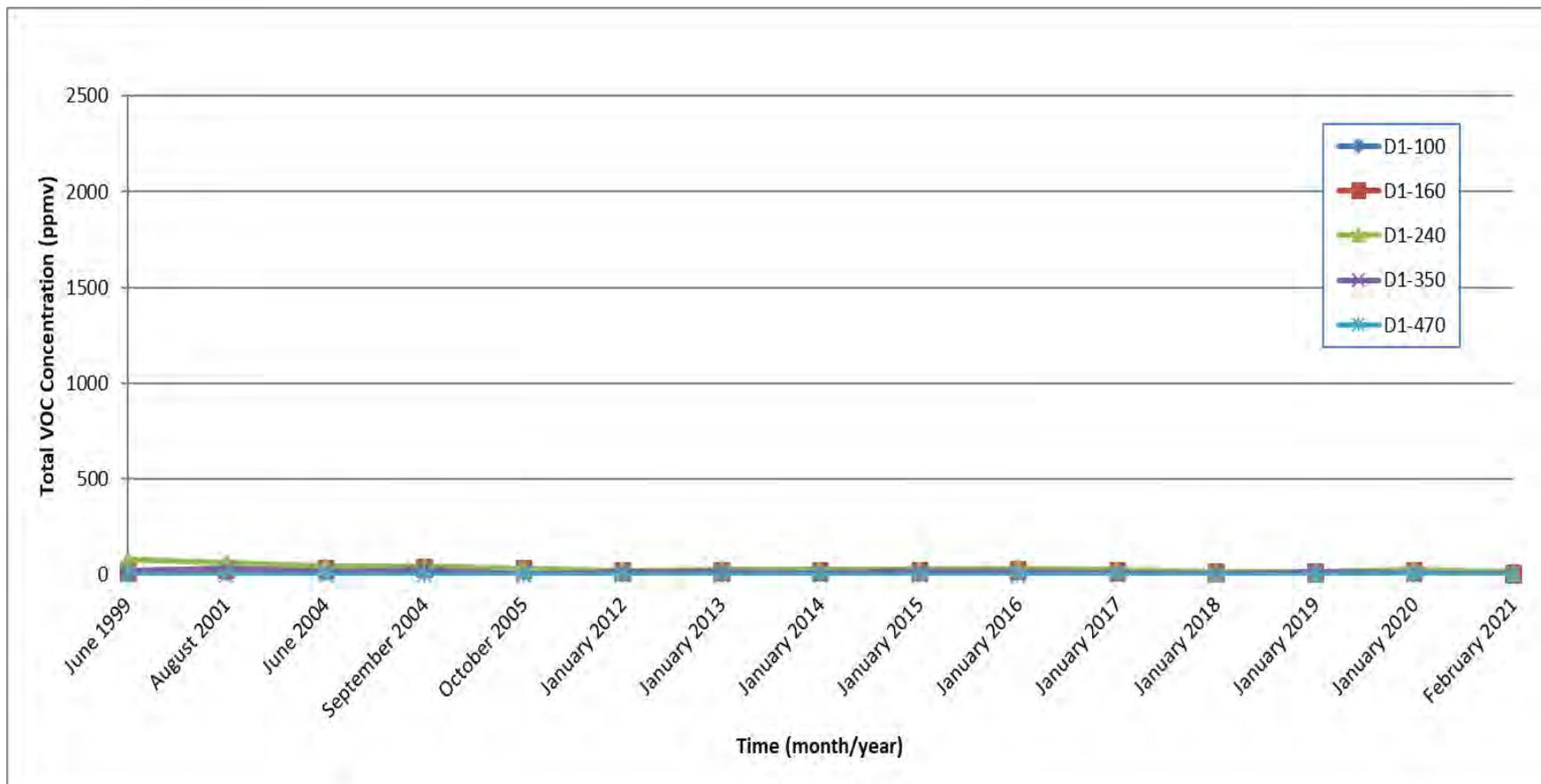


Figure 5-8  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well D1 Ports

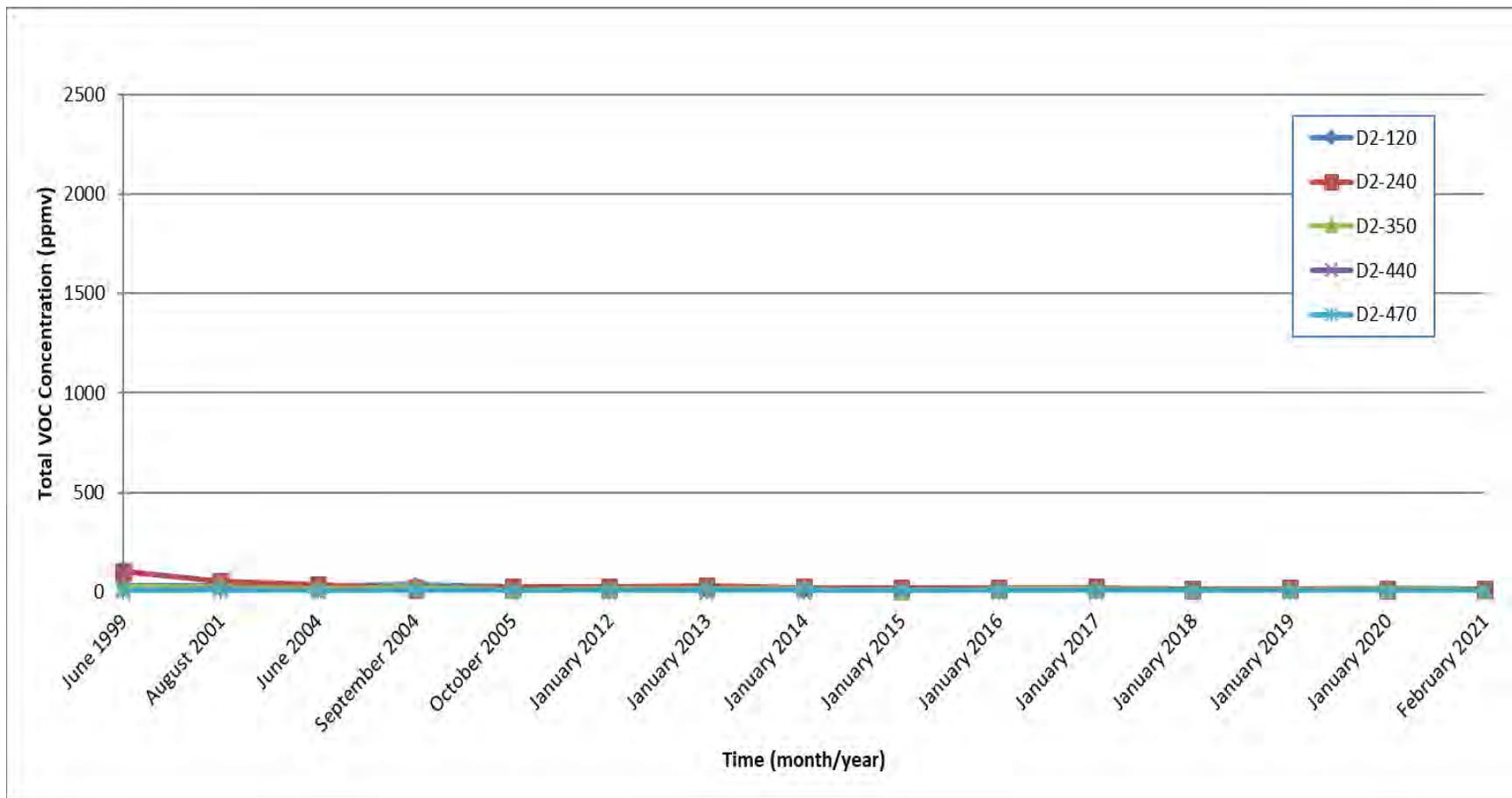


Figure 5-9  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well D2 Ports

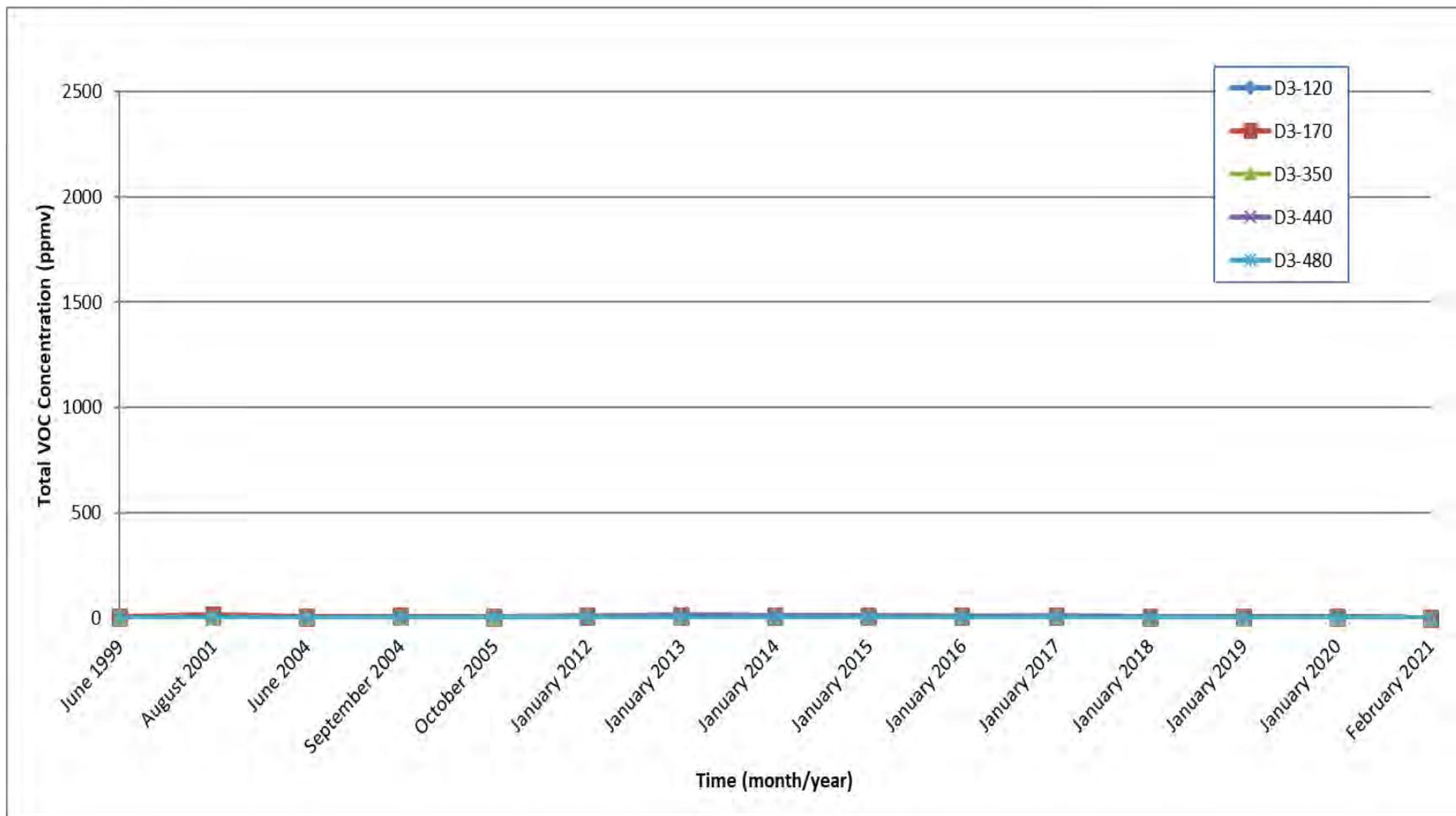


Figure 5-10  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well D3 Ports

CWL-MW10 have decreased since January 2013 and have remained below 1.0 µg/L since January 2015 (see Figure 4-7).

Twenty-three years of soil-gas monitoring since completion of the VE VCM in July 1998, including ten years of soil-gas monitoring under the PCCP (CY 2012 through 2021), confirm the residual VOC soil-gas plume beneath the CWL is stable and slowly dissipating in three dimensions through diffusion in the vadose zone. The current residual VOC soil-gas plume will not impact groundwater due to the very low residual VOC soil-gas concentrations, the capillary fringe barrier above the Regional Aquifer, and the declining surface of the Regional Aquifer beneath the CWL (Section 4.4 of this report and Annex E of the CWL Corrective Measures Study Report [SNL/NM December 2004]). These conclusions are based upon historical and current soil-gas and groundwater monitoring results and are consistent with the conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004).

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

This chapter presents a summary of CY 2021 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);
- Storm-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); and
- Emergency equipment.

A schedule for implementing inspections and prescribed maintenance is provided in PCCP Attachment 1, Section 1.10, Table 1-6. CY 2021 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 SNL/NM ET Cover maintenance contractor in response to the inspections and/or as best 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/Checklist, and summarized in Section 6.1.2.

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

The annual Biology Inspection of the ET Cover vegetation was conducted on August 17, 2021 by the SNL/NM staff biologist (Inspection Form/Checklist in Annex C of this report). The inspection was conducted at the end of the New Mexico growing season for an accurate determination of living plants. The ET Cover continues to meet PCCP requirements for successful revegetation, with 38% total foliar coverage, of which 99% is comprised of native species. In general, the level of weedy plant species present on the ET Cover was very low. The PCCP requirement is 20% total foliar coverage, of which 50% or more 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. Ant hills/burrows were observed at frequencies and locations similar to previous inspections.

The CY 2021 CWL Biology Report is presented in Annex D of this report and includes a summary of local climate trends, the successional development of the native grasses, ET Cover photographs, a summary of CY 2021 observations, and staff biologist recommendations.

### 6.1.2 Cover Inspection

Quarterly ET Cover surface inspections were performed by a field technician on March 1, June 1, September 23, and December 1, 2021. During all but the September inspection, a staff biologist also performed a supplemental quarterly biology inspection as best practice. During August, the more detailed annual ET Cover biology inspection was performed as described in the previous section. Based on the quarterly inspections, the ET Cover surface and vegetation was in good condition throughout CY 2021 and no maintenance and/or repairs were required. Cover and site maintenance performed during CY 2021 by the ET Cover maintenance contractor is summarized in Section 6.6.

## 6.2 Storm-Water Diversion Structure Inspection

Quarterly inspections of storm-water diversion structures were performed by a field technician on March 1, June 1, September 23, and December 1, 2021 at the same time as the cover surface inspections. Minor maintenance performed during or after the inspections based on PCCP requirements is summarized below. No additional storm-water diversion structure inspection items or issues required repairs.

During the March, June, September, and December inspections, windblown tumbleweeds were identified in the drainage culverts along the southern perimeter. Removal was performed by the field technician at the time of the inspections and documented on the respective inspection forms, except in March the tumbleweeds were removed by the ET Cover maintenance contractor two days after the inspection.

## 6.3 Monitoring Well Network Inspection

Semiannual inspection of the groundwater monitoring network and sampling equipment was performed by a field technician during the January and July 2021 monitoring events. In February 2021, the annual inspection for the soil-gas monitoring wells and sampling equipment was also performed. No inspection items or issues required repairs based on these inspections. BaroBall™ passive venting devices remain on all soil-gas and groundwater monitoring wells and are in good condition.

Additional groundwater monitoring equipment inspections were performed prior to and after sampling each monitoring well during both semiannual events; there were no observations or follow-up actions associated with these additional inspections.

## **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 on March 1, June 1, September 23, and December 1, 2021 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, June, September, and December inspections, windblown tumbleweeds were identified on the perimeter fence. Removal was performed by the field technician at the time of the inspections and documented on the respective inspection forms, except in March the tumbleweeds were removed by the ET Cover maintenance contractor two days after the inspection. Windblown weeds (primarily tumbleweeds) and sediment partially covering the survey monuments were removed by the field technician during the March, June, September, and December inspections.

## **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 2021 by the ET Cover maintenance contractor is summarized below. ET Cover maintenance continued in CY 2021 with the long-range goal of maintaining healthy, self-sustaining native grasses on the CWL ET Cover and perimeter areas by reducing competition with weedy species for limited moisture and nutrients. Removal of live and dead weed material helps reduce the availability of weed seeds, future weed growth, and future maintenance efforts.

Maintenance is performed in response to inspections, general site conditions, and recommendations by the staff biologist. Inspection-required maintenance was minor and is described in the previous sections; it involved manually clearing the perimeter fence and storm-water diversion structures of windblown weeds (primarily tumbleweeds) and the survey monuments of accumulated sediment and plant debris. The four maintenance events conducted in March, May, July, and October 2021 are described below and represented best practice maintenance to minimize the presence of invasive weed species on the ET Cover. This work included removal of live and dead weeds from the ET Cover, perimeter fence, and perimeter areas, as well as applying preventive herbicides; all targeted on invasive weed control.

### ***March 3-15, 2021***

Windblown weeds (primarily tumbleweeds) were removed from the perimeter fence and all storm-water diversion structures by hand and/or using hand tools. In addition, windblown and

live weeds were removed from the ET Cover using the same methods. A total of approximately eight cubic yards of compressed weeds were removed and disposed at the KAFB Landfill.

After weed removal a pre-emergent herbicide (Esplanade-water mixture) was applied following manufacturer's instructions to the entire ET Cover, three-foot area outside the perimeter fence, and perimeter area from the western perimeter fence to the road. The application was performed using a hand-sprayer (i.e., a spray gun with adjustable nozzle to ensure the proper droplet size for Esplanade application) attached to a hose from the mix tank mounted on a Kubota four-wheeler to ensure discrete application around and in between the native grass clumps on the ET Cover and perimeter areas. Enough hose was used to allow the Kubota spray rig to remain outside the perimeter fence; driving on the ET Cover was not necessary.

According to the manufacturer's specifications a minimum 0.25-inch precipitation event is necessary within several weeks of application to activate the Esplanade. Due to the unpredictable nature of New Mexico weather, approximately 3,600 gallons of non-potable water was evenly applied to the western perimeter area (approximately 0.5 acres) over a three-hour period using a trailer-mounted, 500-gallon water tank equipped with a pump and spray bar to simulate a 0.25-inch precipitation event. For the ET Cover area (approximately 1.7 acres), approximately 22,800 gallons of non-potable water was applied using a large sprinkler (approximately 70-foot wetting radius) positioned at six locations spaced evenly across the cover to simulate a 0.5-inch precipitation event instead of the minimum 0.25-inch event. The large sprinkler was manually moved to each location where approximately 3,800 gallons were applied prior to moving to the next location. The ET Cover supplemental watering event took approximately 5 hours to complete. The supplemental water applied to activate the Esplanade also provided benefit to the native grasses that experienced below normal rainfall over the prior six months.

#### ***May 4, 2021***

Windblown weeds (primarily tumbleweeds) were removed from the ET Cover, perimeter fence, and all storm-water diversion structures by hand and/or using hand tools. Live weeds were also removed from the ET Cover, 3-foot area outside the fence, and area between the fence and road on the west side of the ET Cover using the same methods. A total of approximately four cubic yards of compressed weeds were removed and disposed at the KAFB Landfill.

#### ***July 6, 2021***

Windblown weeds (primarily tumbleweeds) and live weeds were removed from the ET Cover, perimeter fence, 3-foot area outside the fence, the area between the fence and road on the west side of the ET Cover, and all storm-water diversion structures by hand and/or using hand tools. A total of approximately four cubic yards of compressed weeds were removed and disposed at the KAFB Landfill.

#### ***October 25, 2021***

Windblown weeds (primarily tumbleweeds) were removed from the perimeter fence and all storm-water diversion structures by hand and/or using hand tools. In addition, windblown and

live weeds (primarily tumbleweeds and late growing Russian thistle) were removed from the ET Cover, 3-foot area outside the fence, and the area between the fence and road on the west side of the ET Cover using the same methods. A total of approximately eight cubic yards of compressed weeds were removed and disposed at the KAFB Landfill.

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## **7.0 REGULATORY ACTIVITIES**

On June 2, 2011, the NMED approved closure of the CWL and the PCCP took effect (Kielsing June 2011). Regulatory activities in CY 2021 consisted of one submittal of four updated reference documents cited in the PCCP and the submittal of the CWL Annual Post-Closure Care Report, CY 2020. These activities are summarized below in Section 7.2. NMED-approved permit modifications and other regulatory submittals since the PCCP became effective are summarized in Section 7.4.

### **7.1 2021 Permit Modification Requests**

There were no modifications to the CWL PCCP in the CY 2021 reporting period.

### **7.2 2021 Permit Submittals**

On February 9, 2021, DOE/NNSA and NTESS submitted four updated reference documents cited in the PCCP in accordance with the requirements of Attachment 2 (Section 2.0) of the PCCP (Harrell February 2021). This submittal included four updated reference documents related to groundwater monitoring that were revised to keep current and to incorporate improvements. The revised reference documents became effective on January 23, 2021 and were submitted to the NMED within 30 days of the effective date.

DOE/NNSA and NTESS submitted the CWL Annual Post-Closure Care Report, CY 2020 (SNL/NM March 2021) to NMED in March 2021. NMED approved the report in May 2021 (Pierard May 2021).

### **7.3 2021 Technical Communication**

There were no technical communications with NMED staff regarding CWL activities in CY 2021.

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

Table 7-1 summarizes the modification history of the PCCP through CY 2021. Table 7-2 summarizes all submittals associated with the PCCP through CY 2021, 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.
February 23, 2017	Permit Parts 1 and 2, Permit Attachments 1, 2, 3, and 6	Revise, from two to one, the number of copies of submittals to be made to NMED; update the list of agencies with whom SNL/NM has coordination agreements; update reference test methods and revisions to certain laboratory quality control requirements in the groundwater sampling and analysis plan; revise the soil-gas sampling and analysis plan; and revise text in the Contingency Plan.
May 1, 2017	Permit Parts 1 and 2, Permit Attachments 1 and 6	Revise name of the Operator at SNL/NM from Sandia Corporation to National Technology & Engineering Solutions of Sandia, LLC (NTESS).
November 24, 2020 <sup>b</sup>	Entire Permit	Application to renew the Chemical Waste Landfill PCCP.

Notes:

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

<sup>b</sup>Date is the date stamp on the U.S. Department of Energy transmittal letter; submittal mailed out on Nov. 25, 2020.

HASP = Health and Safety Plan.

SMO = Sample Management Office.

NMED = New Mexico Environment Department.

SNL/NM = Sandia National Laboratories/New Mexico.

PCCP = Post-Closure Care Permit.

SOW = Statement of Work.

QAPP = Quality Assurance Project Plan.

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.
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.
May 20, 2016	Permit Attachments 2 & 3	Two operating procedures cited in the PCCP used by SNL/NM personnel to package and ship CWL monitoring event samples and to complete contract verification reviews of laboratory analytical results.
November 4, 2016	Permit Attachments 2 & 3	Two operating procedures cited in the PCCP used by SNL/NM personnel to conduct activities related to sampling at the CWL and process soil-gas and groundwater samples.
July 11, 2017	Permit Attachments 2 & 3	One operating procedure cited in the PCCP used by SNL/NM personnel to validate analytical data from contract laboratories.
February 8, 2018	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.
May 8, 2019	Permit Attachments 2 & 3	Two operating procedures related to groundwater and soil-vapor monitoring activities were updated to include minor changes that do not affect sampling procedures or protocols.

Refer to footnotes at end of table.

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

Date of Submittal <sup>b</sup>	PCCP Requirement	Description of Submittal
November 8, 2019	Permit Attachments 2 & 3	Two operating procedures related to groundwater and soil-vapor monitoring activities were updated to include minor changes that do not affect sampling procedures or protocols.
June 26, 2020	Permit Attachments 2 & 3	One operating procedure cited in the PCCP used by SNL/NM personnel to validate analytical data from contract laboratories.
February 9, 2021	Permit Attachment 2	Four operating procedures related to groundwater monitoring activities were updated to include minor changes to keep current and incorporate improvements that do not affect sampling procedures or protocols.

Notes:

<sup>a</sup>This table does not include the submittal of routine CWL Annual Post-Closure Care Reports.

<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.

## **8.0 SUMMARY AND CONCLUSIONS**

A summary of CY 2021 activities and results is provided in this chapter, along with conclusions.

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

Semiannual groundwater monitoring events were conducted in January and July 2021. There were no variances or non-conformances. Analytical and statistical assessment results are consistent with previous years. There was no statistically significant evidence of increasing contamination and no hazardous constituent concentration limits were exceeded. Groundwater surface elevation, hydraulic gradient, flow direction, and groundwater flow rate were determined and are consistent with previous year's results.

One annual soil-gas monitoring event was conducted in February 2021. There were no variances and there were no exceedances of trigger levels. Analytical and statistical assessment results are consistent with previous years with the exception of four results from CWL-D2 and CWL-D3 soil-gas sampling ports that were anomalously low relative to historical results. Based upon data validation and a review of field and laboratory records, no issues were identified. Ten years of soil-gas monitoring under the PCCP and previous historical monitoring conducted since completion of the VE VCM in July 1998 continue to confirm the residual VOC soil-gas plume beneath the CWL is stable, slowly dissipating in three dimensions through diffusion in the vadose zone, and is not a threat to groundwater.

### **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 were performed during or shortly after the inspections. Repairs included removal of windblown weeds (primarily tumbleweeds) from the storm-water diversion structures and the perimeter fence, along with clearing tumbleweeds and soil from survey monuments.

The ET Cover continues to meet successful revegetation criteria. As documented in the August 2021 annual inspection, the ET Cover is in good condition with even coverage of mature, native perennial grasses.

CY 2021 ET Cover maintenance was performed in March, May, July, and October as best practice for ET Cover vegetation. CY 2021 ET Cover maintenance included selective herbicide application and removal of dead and live weeds from the ET Cover, perimeter areas, security fence, and all storm-water diversion structures. The March maintenance event included the application of the pre-emergent herbicide, Esplanade, to the entire ET Cover, 3-foot area outside the perimeter fence, and perimeter area from the western perimeter fence to the road. As recommended by the manufacturer, a minimum 0.25-inch precipitation event was simulated using a supplemental watering approach after application to ensure activation of the herbicide. This new pre-emergent herbicide was tested in CY 2020 and appears to be more effective at minimizing invasive weed growth than previously used pre-emergent herbicides with no adverse

effects based on results observed so far. The purpose of ongoing maintenance is to promote the growth and health of the desired native grass species on the ET Cover and surrounding area by controlling invasive weeds that compete with the desired native grasses for limited moisture and nutrients. The best practice maintenance efforts reduce the availability of weed seeds, future weed growth, and future maintenance efforts.

### **8.3 Regulatory Activities**

Regulatory activities in CY 2021 included one submittal of four updated reference documents cited in the PCCP (Harrell February 2021) and submittal of the CWL Annual Post-Closure Care Report, CY 2020 (SNL/NM March 2021).

### **8.4 Conclusions**

All PCCP monitoring, inspection, and maintenance/repair requirements have been met for CY 2021. This eleventh CWL Annual Post-Closure Care Report documents all activities and results as required by PCCP Attachment 1, Section 1.12. Based upon monitoring, inspection, and maintenance results, the ET Cover is performing 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.

Harrell, J.P., February 2021. "Submittal of Updated Reference Documents Cited in the Chemical Waste Landfill Post-Closure Care Permit, Sandia National Laboratories, New Mexico, Environmental Protection Agency Identification Number NM5890110518," U.S. Department of Energy, February 9, 2021.

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, June 2, 2011.

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.

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Sandia National Laboratories/New Mexico (SNL/NM), June 2021. "Calendar Year 2020 Annual Groundwater Monitoring Report," Sandia National Laboratories, Albuquerque, New Mexico.

SNL/NM, see Sandia National Laboratories/New Mexico.

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.

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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.

**ANNEX A**

**Chemical Waste Landfill  
Calendar Year 2021  
Groundwater Monitoring Forms and Reports**

**Field Forms**

**Data Validation Reports**

**Contract Verification Forms**

**FIELD SAMPLING FORMS**  
**CHEMICAL WASTE LANDFILL**  
**POST-CLOSURE CARE GROUNDWATER MONITORING**

<b>Form Title</b>	<b>Corresponding Procedure</b>
Field Measurement Log For Groundwater Sample Collection	FOP 05-01
Groundwater Sample Collection Field Equipment Check Log	FOP 05-02
Portable Pump and Tubing/Water Level Indicator Decontamination Log Form	FOP 05-03
Analysis Request and Chain of Custody*	LOP 94-03

\*Completed AR/COC forms are provided in the Data Validation Reports in this Annex.

**FIELD SAMPLING FORMS**  
**JANUARY 2021**  
**GROUNDWATER MONITORING**





**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL PCCP	
Well ID: CWL-MW10	Date: 01/22/21      Date: 01/25/21
Pump Method: Portable	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)
503.30	0910	Start							
506.09	0937	2	14.69	856.71	180.7	7.09	2.59	27.80	2.43
507.60	0951	4	14.60	861.90	147.2	6.97	0.63	28.18	2.47
508.33	1007	5	14.91	873.78	117.6	6.95	0.38	26.74	2.33
509.04	1017	6	15.07	876.47	105.1	6.95	0.75	25.51	2.21
509.76	1027	7	15.45	877.23	88.1	6.94	0.65	23.79	2.05
510.46	1036	8	15.83	885.90	73.1	6.95	0.81	22.71	1.94
511.21	1045	9	16.21	890.94	64.1	6.96	0.98	22.35	1.89
511.99	1055	10	16.41	890.77	56.7	6.98	1.67	22.62	1.91
512.79	1104	11	16.72	897.99	48.6	7.03	1.95	23.12	1.94
513.76	1113	12	16.82	899.85	41.0	7.08	2.25	22.89	1.91
514.63	1122	13	17.13	906.48	37.9	7.12	2.80	22.65	1.88
515.06	1126	Well Dry	→						
1/25/21 503.76	0846	START	→						
505.51	0858	0.5	10.86	670.87	78.0	7.21	2.84	81.13	7.03
505.76	0901	1	10.90	1034.6	42.5	7.12	2.78	30.75	2.86
506.21	0903	1.5	11.17	799.96	35.6	7.09	2.91	22.12	2.07
—	0904	SAMPLING	→						

Comments:

-1.5 gals Purged from tubing @ 0922  
1/25/21 @ 0856

Sequoia spraying herbicide around CWL-mw10 on 012221

**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL PCCP		
Well ID: CWL-MW11	Date: 01/21/21	Date:
Pump Method: Portable	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)
501.56	0824	Start	-----	-----	-----	-----	-----	-----	-----
503.95	0854	2	15.89	952.47	201.0	7.07	0.19	65.22	5.93
505.04	0912	4	17.55	1003.8	191.0	7.05	0.38	66.27	5.83
506.09	0932	6	18.08	1010.1	185.0	7.06	0.34	66.27	5.76
507.02	0949	8	18.38	1016.7	178.9	7.05	0.65	65.80	5.69
507.92	1009	10	16.90	969.73	177.4	7.06	0.60	64.04	5.71
508.81	1030	12	17.18	994.35	177.3	7.05	0.73	63.85	5.66
509.63	1051	14	18.58	1028.1	176.6	7.05	0.59	65.05	5.60
510.31	1116	16	17.66	1005.7	177.4	7.07	0.96	63.50	5.57
510.57	1131	17	18.19	1015.8	173.3	7.06	0.86	64.22	5.57
510.81	1146	18	18.61	1020.4	19.1	7.07	0.65	62.21	5.35
510.96	1205	19	18.42	1014.5	-16.5	7.07	0.91	59.78	5.16
511.20	1220	20	18.56	1021.4	-11.9	7.06	0.79	59.61	5.13
511.56	1234	21	18.83	1028.6	6.6	7.06	0.65	60.43	5.18
-----	1235	SAMPLING							

Comments:  
 -1.5 gals purged from tubing @ 0837

FB BOT # 121420

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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>01/19/21</b>		
Make & Model: <b>In-Situ Aqua Troll 600</b>						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>743841</b>				Other (SN): <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 (24 hr):	<b>0624</b> <b>4.00</b>	<b>20.75</b>	<b>7.02</b> <b>7.01</b>	<b>20.96</b> <b>21.40</b>	<b>10.04</b> <b>10.04</b>	<b>21.19</b> <b>21.64</b>
2. Time (24 hr):	<b>1231</b> <b>4.00</b>	<b>21.57</b>				
3. Time (24 hr):						
4. Time (24 hr):						
Standard Lot No.:	<b>OGI001</b>		<b>OGI113</b>		<b>OGH940</b>	
Expiration Date.:	<b>SEP/22</b>		<b>SEP/22</b>		<b>AUG/22</b>	
<b>SC Calibration/Check</b>			<b>ORP Calibration/Check</b>			
Reference Value:	<b>1413 uS/cm @ 25 C</b>			Reference Value: <b>220 mV</b>		
	Value	Temp		Value	Temp	
1. Time (24 hr):	<b>0631</b> <b>1314.1</b>	<b>21.45</b>	1. Time (24 hr):	<b>0624</b> <b>220.0</b>	<b>23.74</b>	
2. Time (24 hr):	<b>1226</b> <b>1358.8</b>	<b>21.49</b>	2. Time (24 hr):	<b>1228</b> <b>224.2</b>	<b>21.68</b>	
3. Time (24 hr):			3. Time (24 hr):			
4. Time (24 hr):			4. Time (24 hr):			
Standard Lot No.:	<b>OGI1008</b>		Expiration Date.:	<b>SEP/21</b>		
			Standard Lot No.:	<b>OGJ297</b>		Expiration Date.:
				<b>JUL/21</b>		
<b>DO Calibration/Check</b>						
Calibration Value: <b>100%</b>	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time (24 hr):	<b>0623</b> <b>86.3</b>		<b>24.97</b>			
2. Time (24 hr):	<b>1225</b> <b>94.62</b>		<b>24.57</b>			
3. Time (24 hr):						
4. Time (24 hr):						

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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>01/19/21</b>	
<b>TURBIDIMETER</b>				
Make & Model: <b>HACH 2100Q</b>			Serial No. S/N <b>19050C076301</b>	
Reference Value	<b>10</b>	<b>20</b>	<b>100</b>	<b>800</b>
Standard Lot No.	<b>A0288</b>	<b>A0295</b>	<b>A0276</b>	<b>A0279</b>
1. Time (24 hr): <i>0626</i>	<i>10.5</i>	<i>21.0</i>	<i>104</i>	<i>803</i>
2. Time (24 hr): <i>1237</i>	<i>10.5</i>	<i>20.9</i>	<i>105</i>	<i>805</i>
3. Time (24 hr):				
4. Time (24 hr):				
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>Z. Tenorio</b>				Date: <b>01/20/21</b>		
Make & Model: <b>In Situ AT600</b>						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>743841</b>						
Other (SN): <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 (24 hr):	<b>0621</b>	<b>3.99</b>	<b>20.63</b>	<b>6.99</b>	<b>21.60</b>	<b>10.01</b>
2. Time (24 hr):	<b>1253</b>	<b>4.01</b>	<b>20.25</b>	<b>7.01</b>	<b>20.22</b>	<b>10.05</b>
3. Time (24 hr):						
4. Time (24 hr):						
Standard Lot No.:	<b>0GI001</b>		<b>0GI113</b>		<b>0GH940</b>	
Expiration Date.:	<b>SEP/22</b>		<b>SEP/22</b>		<b>AUG/22</b>	
<b>SC Calibration/Check</b>			<b>ORP Calibration/Check</b>			
Reference Value:	<b>1413 uS/cm @ 25 c</b>			Reference Value:	<b>220mV</b>	
	Value	Temp		Value	Temp	
1. Time (24 hr):	<b>0624</b>	<b>1329.4</b>	<b>21.02</b>	1. Time (24 hr):	<b>0626</b>	<b>220.7</b>
2. Time (24 hr):	<b>1247</b>	<b>1316.4</b>	<b>21.29</b>	2. Time (24 hr):	<b>1249</b>	<b>226.6</b>
3. Time (24 hr):				3. Time (24 hr):		
4. Time (24 hr):				4. Time (24 hr):		
Standard Lot No.:	<b>0GI1008</b>		Expiration Date.:	<b>JUL/21</b>		Standard Lot No.:
						<b>0GI287</b>
						Expiration Date.:
						<b>JUL/21</b>
<b>DO Calibration/Check</b>						
Calibration Value: <b>100%</b>	<b>81% air saturation @ 5200 ft.</b>			<b>Atmospheric Pressure in Hg</b>		
1. Time (24 hr):	<b>0631</b>	<b>95.80</b>		<b>24.57</b>		
2. Time (24 hr):	<b>1244</b>	<b>95.33</b>		<b>24.59</b>		
3. Time (24 hr):						
4. Time (24 hr):						

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

SNL/NM Project Name: CWL				
Calibration done by: Z.Tenorio			Date: 1/20/21	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 19050C076301	
Reference Value	10	20	100	800
Standard Lot No.	A0288	A0295	A0276	A0279
1. Time (24 hr):	6635 10.5	20.9	106	804
2. Time (24 hr):	1300 103	21.3	106	800
3. Time (24 hr):				
4. Time (24 hr):				
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>Z. Tenorio</b>				Date: <b>01/21/21</b>		
Make & Model: <b>Insitu AT600</b>						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>743841</b>						
Other (SN): <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 (24 hr):	<b>0611</b>	<b>4.01</b>	<b>20.99</b>	<b>6.98</b>	<b>22.68</b>	<b>21.35</b>
2. Time (24 hr):	<b>1556</b>	<b>4.01</b>	<b>21.43</b>	<b>7.01</b>	<b>21.26</b>	<b>21.27</b>
3. Time (24 hr):						
4. Time (24 hr):						
Standard Lot No.:	<b>0GI001</b>		<b>0GI113</b>		<b>0GH940</b>	
Expiration Date.:	<b>SEP/22</b>		<b>SEP/22</b>		<b>AUG/22</b>	
<b>SC Calibration/Check</b>			<b>ORP Calibration/Check</b>			
Reference Value:	<b>1413 uS/cm @ 25 c</b>			Reference Value:	<b>220mV</b>	
	Value	Temp		Value	Temp	
1. Time (24 hr):	<b>0616</b>	<b>1364.9</b>	<b>21.07</b>	1. Time (24 hr):	<b>0619</b>	<b>220.1</b>
2. Time (24 hr):	<b>1550</b>	<b>1368.8</b>	<b>21.43</b>	2. Time (24 hr):	<b>1553</b>	<b>219.3</b>
3. Time (24 hr):				3. Time (24 hr):		
4. Time (24 hr):				4. Time (24 hr):		
Standard Lot No.:	<b>0GI1008</b>		Expiration Date.:	<b>JUL/21</b>		Standard Lot No.:
				<b>0GI297</b>		Expiration Date.:
				<b>JUL/21</b>		
<b>DO Calibration/Check</b>						
Calibration Value:	<b>100%</b>	<b>81% air saturation @ 5200 ft.</b>		<b>Atmospheric Pressure in Hg</b>		
1. Time (24 hr):	<b>0621</b>	<b>91.43</b>		<b>25.43</b>		
2. Time (24 hr):	<b>1547</b>	<b>88.75</b>		<b>25.96</b>		
3. Time (24 hr):						
4. Time (24 hr):						

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

SNL/NM Project Name: CWL				
Calibration done by: Z.Tenorio			Date: 1/21/21	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 19050C076301	
Reference Value	10	20	100	800
Standard Lot No.	A0288	A0295	A0276	A0279
1. Time (24 hr):	0609 10.5	21.0	105	802
2. Time (24 hr):	1600 10.5	21.0	105	809
3. Time (24 hr):				
4. Time (24 hr):				
Comments:				
ORP Values high calibrated ORP Probe.				

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

SNL/NM Project Name: <u>CWL</u>						
Calibrations done by: <u>Z. Tenorio</u>			Date: <u>01/22/21</u>		<u>01/25/21</u>	
Make & Model: <u>Insitu AT600</u>						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <u>743841</u>						
Other (SN): <u>na</u>						
<b>pH Calibration/Check</b>						
pH Calibrated to (std): <u>7.00</u>			pH sloped to (std): <u>10.00</u>			
Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time (24 hr):	<u>0645</u>	<u>4.01</u>	<u>21.35</u>	<u>7.01</u>	<u>20.77</u>	<u>10.00</u>
2. Time (24 hr):	<u>1349</u>	<u>4.01</u>	<u>19.90</u>	<u>7.01</u>	<u>21.05</u>	<u>10.05</u>
3. Time (24 hr):	<u>0631</u>	<u>3.99</u>	<u>20.10</u>	<u>6.99</u>	<u>20.85</u>	<u>10.03</u>
4. Time (24 hr):	<u>1244</u>	<u>4.01</u>	<u>21.00</u>	<u>7.01</u>	<u>21.09</u>	<u>10.05</u>
Standard Lot No.:	<u>OGI001</u>		<u>OGI113</u>		<u>DGH940</u>	
Expiration Date.:	<u>SEP/22</u>		<u>SEP/22</u>		<u>AUG/22</u>	
<b>SC Calibration/Check</b>			<b>ORP Calibration/Check</b>			
Reference Value:	<u>1413 uS/cm @ 25 c</u>			Reference Value:	<u>220mV</u>	
	Value	Temp		Value	Temp	
1. Time (24 hr):	<u>0650</u>	<u>1333.1</u>	<u>20.73</u>	1. Time (24 hr):	<u>0653</u>	<u>220.3</u>
2. Time (24 hr):	<u>1343</u>	<u>1345.3</u>	<u>20.45</u>	2. Time (24 hr):	<u>1345</u>	<u>218.4</u>
3. Time (24 hr):	<u>0635</u>	<u>1313.2</u>	<u>20.18</u>	3. Time (24 hr):	<u>0640</u>	<u>222.5</u>
4. Time (24 hr):	<u>1239</u>	<u>1325.5</u>	<u>21.40</u>	4. Time (24 hr):	<u>1241</u>	<u>219.8</u>
Standard Lot No.:	<u>OGI1008</u>		Expiration Date.:	<u>JUL/21</u>		Standard Lot No.:
				<u>OGI297</u>		Expiration Date.:
				<u>JUL/21</u>		
<b>DO Calibration/Check</b>						
Calibration Value: <u>100%</u>	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time (24 hr):	<u>0649</u>	<u>89.09</u>	<u>25.96</u>			
2. Time (24 hr):	<u>1341</u>	<u>91.17</u>	<u>25.74</u>			
3. Time (24 hr):	<u>0633</u>	<u>88.81</u>	<u>24.61</u>			
4. Time (24 hr):	<u>1237</u>	<u>89.49</u>	<u>25.71</u>			

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

SNL/NM Project Name: CWL				
Calibration done by: Z.Tenorio			Date: 1/22/21	1/25/21
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 19050C076301	
Reference Value	10	20	100	800
Standard Lot No.	A0288	A0295	A0276	A0279
1. Time (24 hr): 0640	10.4	21.0	106	808
2. Time (24 hr): 1355	10.0	19.9	99.6	801
3. Time (24 hr): 0625	10.4	21.0	104	803
4. Time (24 hr): 1235	10.5	21.0	105	806
Comments:				

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Portable Pump and Tubing / Water Level Indicator Decontamination Log Form

SNL/NM Project Name: <u>CWL</u>		Monitoring Well ID #: <u>Pre Decon</u>	Date: <u>1/18/2021</u> Date: _____
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>362617</u>	
<b>Personnel Performing Decontamination:</b>			
William Gibson Print Name: _____		<u>WJG</u> Initial:	
Denisha Sanchez Print Name: _____		<u>DS</u> Initial:	
<b>Condition of Equipment</b>			
Pump: <u>Good</u>	Tubing Bundle: <u>Good</u>	Water Level Indicator: <u>Good</u>	
<b>List of Decontamination Materials</b>			
<b>Deionized Water</b>	<b>HNO<sub>3</sub></b>	<b>Detergent</b>	
Source: <u>Culligan</u>	Grade: <u>NA</u>	Manufacturer: <u>Liquinox</u>	
Lot Number: <u>12/15/2020</u>	UN #: <u>NA</u>	Lot Number: <u>L1F9</u>	
_____	Manufacturer: <u>NA</u>	Expiration Date: <u>06/21</u>	
_____	Lot Number: <u>NA</u>		

IMPORTANT NOTICE: A printed (and uncompleted) copy of this form may not be the most current form. The official version is located in the Long-Term Stewardship (LTS) ARAS document library, for which access is required. Upon completion, this document becomes record.

Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form

Project Name: <u>CWL</u>	Monitoring Well ID #: <u>CWL-BW5</u>	Date: <u>1/19/2021</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>362617</u>
--	---

**Personnel Performing Decontamination:**

Robert Lynch  
Print Name: \_\_\_\_\_

Zach Tenorio  
Print Name: \_\_\_\_\_

  
Initial: \_\_\_\_\_

  
Initial: \_\_\_\_\_

<b>Condition of Equipment</b>		
Pump: <u>Good</u>	Tubing Bundle: <u>Good</u>	Water Level Indicator: <u>Good</u>

<b>List of Decontamination Materials</b>	
<b>Deionized Water</b>	<b>HNO<sub>3</sub></b>
Source: <u>Culligan</u>	Grade: <u>NA</u>
Lot Number: <u>12/15/20 - 1/04/21</u>	UN #: <u>NA</u>
	Manufacturer: <u>NA</u>
	Lot Number: <u>NA</u>

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Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form

Project Name: <u>CWL</u>	Monitoring Well ID #: <u>CWL-MW9</u>	Date: <u>1/20/2021</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>362617</u>
--	---

Personnel Performing Decontamination:

William Gibson

Print Name:

  
Initial:

Robert Lynch

Print Name:

  
Initial:

Condition of Equipment

Pump: **Good**

Tubing Bundle: **Good**

Water Level Indicator: **Good**

List of Decontamination Materials

<p><b>Deionized Water</b></p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>12/15/20 - 1/04/21 - 1/05/21</u></p>	<p><b>HNO<sub>3</sub></b></p> <p>Grade: <u>NA</u></p> <p>UN #: <u>NA</u></p> <p>Manufacturer: <u>NA</u></p> <p>Lot Number: <u>NA</u></p>
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Portable Pump and Tubing / Water Level Indicator  
Decontamination Log Form

Project Name: <u>CWL</u>	Monitoring Well ID #: <u>CWL-MW10</u>	Date: <u>1/25/2021</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>362617</u>
--	---

**Personnel Performing Decontamination:**

William Gibson

Print Name:

WJG  
Initial:

Zach Tenorio

Print Name:

ZT  
Initial:

Condition of Equipment

Pump: Good

Tubing Bundle: Good

Water Level Indicator: Good

List of Decontamination Materials

<p><b>Deionized Water</b></p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>12/14/20 - 12/15/20</u></p>	<p><b>HNO<sub>3</sub></b></p> <p>Grade: <u>NA</u></p> <p>UN #: <u>NA</u></p> <p>Manufacturer: <u>NA</u></p> <p>Lot Number: <u>NA</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-MW11</u>	<b>Date:</b> <u>1/21/2021</u>
---------------------------------	--	-------------------------------

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>362617</u>
---	--

**Personnel Performing Decontamination:**

<b>Zach Tenorio</b>	
Print Name:	 Initial: _____
<b>Denisha Sanchez</b>	
Print Name:	 Initial: _____

<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Good</u>	<b>Tubing Bundle:</b> <u>Good</u>	<b>Water Level Indicator:</b> <u>Good</u>

<b>List of Decontamination Materials</b>	
<p align="center"><b>Deionized Water</b></p> <p><b>Source:</b> <u>Culligan</u></p> <p><b>Lot Number:</b> <u>12/14/20 - 12/15/20</u></p>	<p align="center"><b>HNO<sub>3</sub></b></p> <p><b>Grade:</b> <u>NA</u></p> <p><b>UN #:</b> <u>NA</u></p> <p><b>Manufacturer:</b> <u>NA</u></p> <p><b>Lot Number:</b> <u>NA</u></p>

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**SUMMARY SHEET FOR JANUARY 2021 SAMPLES**

**Sample Summary for Chemical Waste Landfill Groundwater Monitoring  
January 2021**

<b>Sample ID</b>	<b>Sample Date</b>	<b>ARCOG</b>	<b>Sample Number</b>	<b>Sample Type</b>	<b>Associated Equipment Blank (ARCOG #/Sample #)</b>	<b>Associated Trip Blank (ARCOG # / Sample #)</b>	<b>Associated Field Blank (ARCOG # / Sample #)</b>	<b>Comments</b>
<b>CWL GWM: Project Task # 195122.10.11.03. Service Order # CF 327-21</b>								
<b>Environmental Samples</b>								
CWL-BW5	19-Jan-21	621697	114184	Environmental	n/a	621697 / 114185	621697 / 114183	
CWL-MW9	20-Jan-21	621700	114192	Environmental	n/a	621700 / 114193	n/a	
CWL-MW10	25-Jan-21	621706	114212	Environmental	621704 / 114205	621706 / 114214	n/a	
CWL-MW10	25-Jan-21	621706	114213	Duplicate	621704 / 114205	621706 / 114214	n/a	
CWL-MW11	21-Jan-21	621703	114203	Environmental	n/a	621703 / 114204	621703 / 114202	
CWL-PCCP EB-1	21-Jan-21	621704	114205	Equipment Blank	n/a	621704 / 114206	n/a	Decon prior to CWL-MW10
CWL-FB 1	19-Jan-21	621697	114183	Field Blank	n/a	621697 / 114185	n/a	at CWL-BW5
CWL-PCCP FB 2	21-Jan-21	621703	114202	Field Blank	n/a	621703 / 114204	n/a	at CWL-MW11
CWL DIW QC	20-Jan-21	621701	114196	QC-DIW	n/a	621701 / 114197	n/a	DI Source for equipment decontamination
<b>Waste Characterization Samples</b>								
CWL-BW5	19-Jan-21	621698	114188	Waste	n/a	621698 / 114189	n/a	No data validation required
CWL-MW9	20-Jan-21	621699	114190	Waste	n/a	621699 / 114191	n/a	No data validation required
CWL-MW10	22-Jan-21	621705	114210	Waste	n/a	621705 / 114211	n/a	No data validation required
CWL-MW11	21-Jan-21	621702	114198	Waste	n/a	621702 / 114199	n/a	No data validation required

**DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**

**CHEMICAL WASTE LANDFILL**

**GROUNDWATER MONITORING**

**JANUARY 2021**

**AR/COC NUMBER 621697**

## Memorandum

Date: February 22, 2021

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 621697  
SDG: 532455  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Three samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

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

### **Instrument Tune**

All instrument tune requirements were met.

### **Calibration**

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

### **Blanks**

No target analytes were detected in any of 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 recoveries and RPDs met QC acceptance criteria.

It should be noted that the MS/MSD analyses were performed on an SNL sample of similar matrix from another SDG. No data will 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 was submitted with the ARCO. FB1 was submitted with ARCO 621697 and was associated with the sample on the same ARCO.

No other specific issues that affect data quality were identified.

**Reviewed by:** Linda Thal

**Level:** I

**Date:** 02/22/2021

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## Memorandum

Date: February 22, 2021  
To: File  
From: Mary Donovan  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 621697  
SDG: 532455  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
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 SMO Procedure AOP 00-03 Rev 06.

### **Summary**

One sample was prepared and analyzed with approved procedures using method EPA 6020B (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

The sample was prepared and analyzed within the prescribed holding times and was properly preserved.

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

The ICP-MS tune met QC acceptance criteria.

### **Calibration**

All initial and continuing calibration criteria met QC acceptance criteria.

### **Reporting Limit Verification**

All LLCCV recoveries met QC acceptance criteria.

### **Blanks**

No target analytes were detected in any of 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.

It should be noted that the MS analysis was performed on an SNL sample of similar matrix from the same SDG. No data will be qualified.

### **Laboratory Replicate**

The replicate met all QC acceptance criteria.

It should be noted that the replicate analysis was performed on an SNL sample of similar matrix from the same SDG. No data will be qualified.

### **Laboratory Control Sample (LCS)**

The LCS met all QC acceptance criteria.

### **Detection Limits/Dilutions**

All detection limits were properly reported. The sample was not diluted.

### **ICP Interference Check Sample (ICS A and AB)**

Results of the ICS A and AB analyses were evaluated for sample 532455009 because the sample concentration for Ca was > those in the ICS A and AB solutions. All QC acceptance criteria were met.

### **ICP Serial Dilution**

The serial dilution met all QC acceptance criteria. It should be noted that the serial dilution analysis was performed on an SNL sample of similar matrix from the same SDG. No data will be qualified.

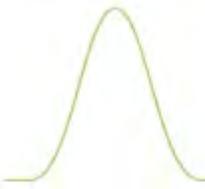
### **Other QC**

No other specific issues that affect data quality were identified.

**Reviewed by:** Linda Thal

**Level:** I

**Date:** 02/22/2021



## Sample Findings Summary



AR/COC: 621697

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#: 621697	Site/Project: CWL PCCP	Validation Date: 02/22/2021
SDG #: 532455	Laboratory: GEL Laboratories, LLC	Validator: Mary Donovan
Matrix: Aqueous	# of Samples: 4	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: 01/19/2021

The ARCOG noted that the trip blank vials were received from the lab with headspace.  
 ARCOG 621698 was submitted on the same SDG by was not validated per client request.

Validated by:

*Mary A. Donovan*



## Sandia Inorganic Metals Worksheet

ARCO #:(s): 621697	SDG #(s): 532455	Matrix: Aqueous
Laboratory Sample IDs: 532455009		
Method/Batch #s: <b>3005A/6020B</b> :2083480/2083481		

ICPMS Mass Cal:  Pass  Fail  NA    ICPMS Resolution:  Pass  Fail  NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ±MDL ug/L (x50)	LLCCV %R		
	Int. ug/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; DUP/MS/SD performed on SNL sample 532455002 (Sample was submitted on same SDG but not for validation.)  
 Ca >100ppm for sample -009; ICS A < MDL

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.	SMO Use	AR/COG	<b>621697</b>
Project Name: CWL PCCP	Date Samples Shipped: 1/19/21	SMO Authorization:	
Project/Task Manager: Timmie Jackson	Carrier/Waybill No: 32446	SMO Contact Phone: Wendy Palencia/505-844-3132	
Project/Task Number: 195122.10.11.03	Lab Contact: Edie Kent/843-769-7385	Send Report to SMO: Stephanie Montaño/505-284-2553	
Service Order: CF327-21	Lab Destination: GEL	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius	
Contract No.: 1983530			

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

Tech Area:	Operational Site:
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					
114183	001	CWL-FB 1	NA	1/19/21 09:21	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE, FREON 113, PCE, 1,1-DCE, CHLOROFORM, FREON 11 (SW846-826B) (CWL PCCP)	007
114184	001	CWL-BW5	522	1/19/21 09:29	GW	G	3x40 ml	HCl	G	SA	VOC-TCE, FREON 113, PCE, 1,1-DCE, CHLOROFORM, FREON 11 (SW846-826B) (CWL PCCP)	008
114184	002	CWL-BW5	522	1/19/21 09:30	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	009
114185	001	CWL-TB 1	NA	1/19/21 09:21	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE, FREON 113, PCE, 1,1-DCE, CHLOROFORM, FREON 11 (SW846-826B) (CWL PCCP)	010

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						
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		Name		Signature		Init.		Company/Organization/Phone/Cell			Negotiated TAT <input type="checkbox"/>	
Sample Team Members		Robert Lynch				SNL/08888/505-844-4013/505-250-7090		Sample Disposal			<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	
		William Gibson				SNL/08888/505-284-3307/505-239-7367		Return Samples By:		Comments: Received trip blanks from lab with head space.		
		Zachary Tenorio				SNL/08888/505-845-8636/505-259-5765						
		Denisha Sanchez				SNL/08888/505-845-7829/505-208-1375						

Relinquished by	Org. 8898	Date 1/19/21	Time 1007	Relinquished by	Org.	Date	Time
Received by	Org. 0628	Date 1/19/21	Time 1007	Received by	Org.	Date	Time
Relinquished by	Org. 0628	Date 1/19/21	Time 1115	Relinquished by	Org.	Date	Time
Received by	Org.	Date 1 20 21	Time 740	Received by	Org.	Date	Time

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

745 4/21/21

**AR/COC NUMBERS 621700, 621701**

## Memorandum

Date: February 23, 2021

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 621700 and 621701  
SDG: 532557  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 06.

### Summary

Four 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 and Preservation

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

### Instrument Tune

All instrument tune requirements were met.

### Calibration

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

### Blanks

No target analytes were detected in any of the blanks except as follows. Chloroform was detected at > the PQL in the DIW QC sample, sample 532557010, submitted on ARCOG 621701 and not associated with any field samples. No sample results will 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 recoveries and RPDs met QC acceptance criteria.

It should be noted that the MS/MSD analyses were performed on an SNL sample of similar matrix from another SDG. No data will 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**

Two TBs were submitted, one for each ARCO. A DIWQC sample was submitted on ARCO 621701 and was the DIW decontamination source for this sampling event.

No other specific issues that affect data quality were identified.

**Reviewed by:** Linda Thal

**Level:** I

**Date:** 02/24/2021

## Memorandum

Date: February 23, 2021  
To: File  
From: Mary Donovan  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 621700 and 621701  
SDG: 532557  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
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 SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Two samples were prepared and analyzed with approved procedures using method EPA 6020B (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

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

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

The ICP-MS tune met QC acceptance criteria.

### **Calibration**

All initial and continuing calibration criteria met QC acceptance criteria.

### **Reporting Limit Verification**

All LLCCV recoveries met QC acceptance criteria.

### **Blanks**

No target analytes were detected in any of 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.

It should be noted that the MS analysis was performed on an SNL sample of similar matrix from the same SDG. No data will be qualified.

### **Laboratory Replicate**

The replicate met all QC acceptance criteria.

It should be noted that the replicate analysis was performed on an SNL sample of similar matrix from the same SDG. No data will be qualified.

### **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 evaluated for sample 532557008 because the sample concentration for Ca was > those in the ICS A and AB solutions. All QC acceptance criteria were met.

### **ICP Serial Dilution**

The serial dilution met all QC acceptance criteria. It should be noted that the serial dilution analysis was performed on an SNL sample of similar matrix from the same SDG. No data will be qualified.

### **Other QC**

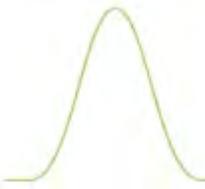
A DIWQC sample was submitted on ARCOG 621701 and was the DIW decontamination source for this sampling event.

No other specific issues that affect data quality were identified.

**Reviewed by:** Linda Thal

**Level:** I

**Date:** 02/24/2021



## Sample Findings Summary



AR/COC: 621700, 621701

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#: 621700 and 621701	Site/Project: CWL PCCP	Validation Date: 02/23/2021
SDG #: 532557	Laboratory: GEL Laboratories, LLC	Validator: Mary Donovan
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								

Comments: Collected: 01/20/2021

The ARCOGs noted that the trip blank vials were received from the lab with headspace.  
 ARCOG 621699 was submitted on the same SDG by was not validated per client request.

Validated by:

*Mary A. Donovan*





# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No.		SMO Use				<b>AR/COC</b>		<b>621700</b>				
Project Name: CWL PCCP		Date Samples Shipped: 1/20/21		SMO Authorization:		<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius						
Project/Task Manager: Timmie Jackson		Carrier/Waybill No. 324548		SMO Contact Phone: Wendy Palencia/505-844-3132								
Project/Task Number: 195122.10.11.03		Lab Contact: Edie Kent/843-769-7385		Send Report to SMO: Stephanie Montaño/505-284-2553								
Service Order: CF327-21		Lab Destination: GEL		Contract No.: 1983530								
Tech Area:		Operational Site:				Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154						
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					
114192	001	CWL-MW9	517	1/20/21 10:02	GW	G	3x40 ml	HCl	G	SA	VOC-TCE,FREON 113,PCE,1,1-DCE,CHLOROFORM,FREON 11(SW846-82609) (CWL PCCP)	007
114192	002	CWL-MW9	517	1/20/21 10:03	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	008
114193	001	CWL-PCCP TB-4	NA	1/20/21 10:02	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE,FREON 113,PCE,1,1-DCE,CHLOROFORM,FREON 11(SW846-82609) (CWL PCCP)	009
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						
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		Lab Use	
	Robert Lynch				RL		SNL/08888/505-844-4013/505-250-7090		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab			
	William Gibson				WG		SNL/08888/505-284-3307/505-239-7367		Return Samples By:			
	Zachary Tenorio				ZT		SNL/08888/505-845-8636/505-259-5765		Comments: Received trip blanks from lab with head space.			
	Denisha Sanchez				DS		SNL/08888/505-845-7829/505-208-1375					
Relinquished by		Org. 8888		Date 1/20/21		Time 1042		Relinquished by		Org. Date Time		
Received by		Org. 0628		Date 1/20/21		Time 1042		Received by		Org. Date Time		
Relinquished by		Org. 0628		Date 1/20/21		Time 1223		Relinquished by		Org. Date Time		
Received by		Org.		Date 1/21/21		Time 920		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

Page 1 of 1

Batch No.	SMO Use	AR/COC	<b>621701</b>
Project Name: CWL PCCP	Date Samples Shipped: 1/20/21	SMO Authorization:	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Project/Task Manager: Timmie Jackson	Carrier/Waybill No: 324548	SMO Contact Phone: Wendy Palencia/505-844-3132	
Project/Task Number: 195122.10.11.03	Lab Contact: Edie Kent/843-769-7385	Send Report to SMO: Stephanie Montaño/505-284-2553	
Service Order: CF327-21	Lab Destination: GEL		
	Contract No.: 1983530		

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

Tech Area:		Operational Site:											
Building:	Room:												
Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID	
114196	001	CWL DIW QC	NA	1/20/21 09:35	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE,FREON 113,PCE,1,1-DCE,CHLOROFORM,FREON 11(SWB46-8200B) [CWL PCCP]	010	
114196	002	CWL DIW QC	NA	1/20/21 09:36	DIW	P	500 ml	HNO3	G	FB	CHROMIUM, NICKEL (SWB46-6020)	011	
114197	001	CWL-PCCP TB 5	NA	1/20/21 09:35	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE,FREON 113,PCE,1,1-DCE,CHLOROFORM,FREON 11(SWB46-8200B) [CWL PCCP]	012	

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			
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"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab			
<b>Sample Team Members</b>	Name	Signature	Init.	Company/Organization/Phone/Cell		Sample Disposal			Lab Use
	Robert Lynch			SNL/08888/505-844-4013/505-250-7090		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab			
	William Gibson			SNL/08888/505-284-3307/505-239-7367		Return Samples By:			
	Zachary Tenorio			SNL/08888/505-845-8636/505-259-5765		Comments: Received trip blanks from lab with head space.			
	Denisha Sanchez			SNL/08888/505-845-7829/505-208-1375					

Relinquished by	Org. 8838	Date 1/20/21	Time 1039	Relinquished by	Org.	Date	Time
Received by	Org. 0628	Date 1/20/21	Time 1039	Received by	Org.	Date	Time
Relinquished by	Org. 0628	Date 1/20/21	Time 1223	Relinquished by	Org.	Date	Time
Received by	Org.	Date 1/21/21	Time 920	Received by	Org.	Date	Time

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

**AR/COC NUMBERS 621703, 621704**

## Memorandum

Date: February 23, 2021

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 621703 and 621704  
SDG: 532873  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 06.

### Summary

Five 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 and Preservation

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

### Instrument Tune

All instrument tune requirements were met.

### Calibration

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

### Blanks

No target analytes were detected in any of the blanks except as follows. Chloroform was detected at > the PQL in FB 2, sample 532873007, submitted on ARCOG 621703 and associated with sample -008. The associated sample result was non-detect and not be qualified.

Chloroform was detected at > the PQL in EB-1, sample -011 submitted on ARCOG 621704 and associated with samples on ARCOG 621706 submitted in another SDG. No sample results in this SDG will 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 recoveries and RPDs met QC acceptance criteria.

It should be noted that the MS/MSD analyses were performed on an SNL sample of similar matrix from the same SDG. No data will 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**

Two TBs were submitted, one with each ARCOG. FB 2 was submitted with ARCOG 621703 and was associated with the sample on the same ARCOG. EB-1 was submitted with ARCOG 621704 and was associated with the samples on ARCOG 621706, submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Linda Thal

**Level:** I

**Date:** 02/24/2021

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## Memorandum

Date: February 23, 2021  
To: File  
From: Mary Donovan  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 621703 and 621704  
SDG: 532873  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
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 SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Two samples were prepared and analyzed with approved procedures using method EPA 6020B (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

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

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

The ICP-MS tune met QC acceptance criteria.

### **Calibration**

All initial and continuing calibration criteria met QC acceptance criteria.

### **Reporting Limit Verification**

All LLCCV recoveries met QC acceptance criteria.

### **Blanks**

No target analytes were detected in any of 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.

It should be noted that the MS analysis was performed on an SNL sample of similar matrix from the same SDG. No data will be qualified.

### **Laboratory Replicate**

The replicate met all QC acceptance criteria.

It should be noted that the replicate analysis was performed on an SNL sample of similar matrix from the same SDG. No data will be qualified.

### **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 evaluated for sample 532873009 because the sample concentration for Ca was > those in the ICS A and AB solutions. All QC acceptance criteria were met.

### **ICP Serial Dilution**

The serial dilution met all QC acceptance criteria. It should be noted that the serial dilution analysis was performed on an SNL sample of similar matrix from the same SDG. No data will be qualified.

### **Other QC**

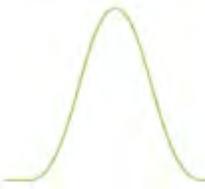
EB-1 was submitted with ARCOG 621704 and was associated with the samples on ARCOG 621706, submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Linda Thal

**Level:** I

**Date:** 02/24/2021



## Sample Findings Summary



AR/COC: 621703, 621704

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#: 621703 and 621704	Site/Project: CWL PCCP	Validation Date: 02/23/2021
SDG #: 532873	Laboratory: GEL Laboratories, LLC	Validator: Mary Donovan
Matrix: Aqueous	# of Samples: 7	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: 01/21/2021

The ARCOGs noted that the trip blank vials were received from the lab with headspace.  
 The Case Narrative noted that one of three vials for sample 114204-001(532873010 TB-7) was received with headspace.  
 ARCOG 621702 was submitted on the same SDG by was not validated per client request.  
 ARCOG 621704 included EB-1 and was associated with the samples on ARCOG 621706 submitted in another SDG.

Validated by:

*Mary A. Donovan*



## Sandia Inorganic Metals Worksheet

ARCO #:(s):621703 and 621704	SDG #(s):532873	Matrix:Aqueous
Laboratory Sample IDs:532873009,-012		
Method/Batch #s: <b>3005A/6020B</b> :2085167/2085168		

ICPMS Mass Cal:  Pass    Fail    NA   ICPMS Resolution:  Pass    Fail    NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ±MDL ug/L (x50)	LLCCV %R	EB-1 -012
	Int. ug/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; DUP/MS/SD performed on SNL sample 532873002 (Sample was submitted on same SDG but not for validation.)  
 Ca >100ppm for sample -009; ICS A < MDL

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. <i>N/A</i>		SMO Use		AR/COG <b>621703</b>								
Project Name: CWL PCCP		Date Samples Shipped: <i>1/22/2021</i>		SMO Authorization: <i>[Signature]</i>								
Project/Task Manager: Timmie Jackson		Carrier/Waybill No. <i>324612</i>		SMO Contact Phone: Wendy Palencia/505-844-3132								
Project/Task Number: 195122.10.11.03		Lab Contact: Edie Kent/843-769-7385		Send Report to SMO: Stephanie Montaño/505-284-2553								
Service Order: CF327-21		Lab Destination: GEL		Contract No.: 1983530								
Tech Area:		Building:		Room:								
Operational Site:		Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154		<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius								
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					
114202	001	CWL-PCCP FB 2	NA	1/21/21 12:20	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE, FREON 113, PCE, 1,1-DCE, CHLOROFORM, FREON 11 (SW846-8260B) [CWL PCCP]	<i>007</i>
114203	001	CWL-MW11	513	1/21/21 12:35	GW	G	3x40 ml	HCl	G	SA	VOC-TCE, FREON 113, PCE, 1,1-DCE, CHLOROFORM, FREON 11 (SW846-8260B) [CWL PCCP]	<i>008</i>
114203	002	CWL-MW11	513	1/21/21 12:35	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	<i>009</i>
114204	001	CWL-PCCP TB-7	NA	1/21/21 12:20	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE, FREON 113, PCE, 1,1-DCE, CHLOROFORM, FREON 11 (SW846-8260B) [CWL PCCP]	<i>010</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:		Entered by:		EDD <input checked="" type="checkbox"/> Yes						
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:						
	Denisha Sanchez	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-7829/505-208-1375		Comments: Received trip blanks from lab with head space.						
	William Gibson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-3307/505-239-7367								
	Zachary Tenorio	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-8636/505-259-5765								
Relinquished by <i>[Signature]</i> Org. <i>08888</i> Date <i>1/21/21</i> Time <i>1300</i>		Relinquished by		Org.		Date		Time		Lab Use		
Received by <i>[Signature]</i> Org. <i>0628</i> Date <i>1/21/21</i> Time <i>1300</i>		Received by		Org.		Date		Time				
Relinquished by <i>[Signature]</i> Org. <i>0628</i> Date <i>1/22/21</i> Time <i>0930</i>		Relinquished by		Org.		Date		Time				
Received by <i>[Signature]</i> Org. Date <i>1/25/21</i> Time <i>925</i>		Received by		Org.		Date		Time				

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

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 7 of 365

Internal Lab		Page 1 of 1											
Batch No. <i>N/A</i>		<b>AR/COC 621704</b>											
Project Name: CWL PCCP		Date Samples Shipped: <i>1/22/2021</i>											
Project/Task Manager: Timmie Jackson		Carrier/Waybill No. <i>324612</i>											
Project/Task Number: 195122.10.11.03		Lab Contact: Edie Kent/843-769-7385											
Service Order: CF327-21		Lab Destination: GEL											
		Contract No.: 1983530											
Tech Area:		SMO Authorization: <i>[Signature]</i>											
Building:		SMO Contact Phone: Wendy Palencia/505-844-3132											
Room:		Send Report to SMO: Stephanie Montaño/505-284-2553											
Operational Site:		<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>											
		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					
114205	001	CWL-PCCP EB-1	NA	1/21/21	14:12	DIW	G	3x40 ml	HCl	G	EB	VOC-TCE,FREON 113,PCE,1,1-DCE,CHLOROFORM,FREON 11(SWB45-8260B) [CWL PCCP]	<i>011</i>
114205	002	CWL-PCCP EB-1	NA	1/21/21	14:13	DIW	P	500 ml	HNO3	G	EB	CHROMIUM, NICKEL (SWB46-6020)	<i>012</i>
114206	001	CWL-PCCP TB-8	NA	1/21/21	14:12	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE,FREON 113,PCE,1,1-DCE,CHLOROFORM,FREON 11(SWB45-8260B) [CWL PCCP]	<i>013</i>
Last Chain: <input type="checkbox"/> Yes		Sample Tracking											
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:											
Background: <input type="checkbox"/> Yes		Entered by:											
Confirmatory: <input type="checkbox"/> Yes		QC initials:											
Special Instructions/QC Requirements:		SMO Use											
EDD <input checked="" type="checkbox"/> Yes		Turnaround Time <input type="checkbox"/> 7-Day* <input type="checkbox"/> 15-Day* <input checked="" type="checkbox"/> 30-Day											
Negotiated TAT		Sample Disposal <input checked="" type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab											
Return Samples By:		Comments: Received trip blanks from lab with head space.											
Conditions on Receipt		Lab Use											
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell									
	William Gibson	<i>[Signature]</i>	<i>WG</i>	SNL/08888/505-284-3307/505-239-7367									
	Zachary Tenorio	<i>[Signature]</i>	<i>ZT</i>	SNL/08888/505-845-8636/505-259-5765									
	Denisha Sanchez	<i>[Signature]</i>	<i>DS</i>	SNL/08888/505-845-7829/505-208-1375									
Relinquished by	Org. <i>5888</i>	Date <i>1/22/21</i>	Time <i>1445</i>	Relinquished by									
Received by	Org. <i>0628</i>	Date <i>1/21/21</i>	Time <i>1445</i>	Received by									
Relinquished by	Org. <i>0628</i>	Date <i>1/22/21</i>	Time <i>0930</i>	Relinquished by									
Received by	Org.	Date <i>1/25/21</i>	Time <i>925</i>	Received by									

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

**AR/COC NUMBER 621706**

## Memorandum

Date: February 26, 2021

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 621706  
SDG: 532959  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Three samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

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

### **Instrument Tune**

All instrument tune requirements were met.

### **Calibration**

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

### **Blanks**

No target analytes were detected in any of the blanks except as follows. Chloroform was detected at > the PQL in EB-1, sample 532873011 submitted on ARCOG 621704 in another SDG and associated with samples 532959007 and -009. The associated sample results were 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 recoveries and RPDs met QC acceptance criteria.

It should be noted that the MS/MSD analyses were performed on an SNL sample of similar matrix from another SDG. No data will 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**

One TB was submitted with the ARCO. EB-1 was submitted with ARCO 621704 in another SDG and was associated with the samples on ARCO 621706. A field duplicate pair was submitted with ARCO 621706. 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:** Linda Thal

**Level:** I

**Date:** 03/01/2021

## Memorandum

Date: February 26, 2021

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 621706  
SDG: 532959  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Three samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

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

### **Instrument Tune**

All instrument tune requirements were met.

### **Calibration**

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

### **Blanks**

No target analytes were detected in any of the blanks except as follows. Chloroform was detected at > the PQL in EB-1, sample 532873011 submitted on ARCOG 621704 in another SDG and associated with samples 532959007 and -009. The associated sample results were 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 recoveries and RPDs met QC acceptance criteria.

It should be noted that the MS/MSD analyses were performed on an SNL sample of similar matrix from another SDG. No data will 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**

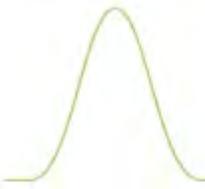
One TB was submitted with the ARCO. EB-1 was submitted with ARCO 621704 in another SDG and was associated with the samples on ARCO 621706. A field duplicate pair was submitted with ARCO 621706. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

**Reviewed by:** Linda Thal

**Level:** I

**Date:** 03/01/2021



## Sample Findings Summary



AR/COC: 621706

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#: 621706	Site/Project: CWL PCCP	Validation Date: 02/26/2021
SDG #: 532959	Laboratory: GEL Laboratories, LLC	Validator: Mary Donovan
Matrix: Aqueous	# of Samples: 5	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: 01/25/2021

The ARCOG noted that the trip blank vials were received from the lab with headspace.

ARCOG 621705 was submitted in the same SDG by was not validated per client request.

ARCOG 621704 included EB-1 submitted in another SDG and was associated with the samples on ARCOG 621706.

Validated by:

*Mary A. Donovan*



## Sandia Inorganic Metals Worksheet

ARCO # (s): 621706	SDG # (s): 532959	Matrix: Aqueous
Laboratory Sample IDs: 532959008, -010		
Method/Batch #s: <b>3005A/6020B</b> : 2085401/2085402		

ICPMS Mass Cal:  Pass    Fail    NA   ICPMS Resolution:  Pass    Fail    NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ±MDL ug/L (x50)	LLCCV %R	EB-1 532873 -012
	Int. ug/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; DUP/MS/SD performed on SNL sample 532959002 (Sample was submitted on same SDG but not for validation.)  
 Ca >100 ppm for samples -008 and -010; ICS A < MDL

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. <i>N/A</i>	<b>SMO Use</b>	<b>AR/COC</b>	<b>621706</b>
Project Name: CWL PCCP	Date Samples Shipped: <i>1/25/2021</i>	SMO Authorization: <i>[Signature]</i>	
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <i>324668</i>	SMO Contact Phone: Wendy Palencia/505-844-3132	
Project/Task Number: 195122.10.11.03	Lab Contact: Edie Kent/843-769-7385	Send Report to SMO: Stephanie Montaño/505-284-2553	
Service Order: CF327-21	Lab Destination: GEL	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>	
Contract No.: 1983530			

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

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					
114212	001	CWL-MW10	515	1/25/21 09:04	GW	G	3x40 ml	HCl	G	SA	VOC-TCE, FREON 113, PCE, 1,1-DCE, CHLOROFORM, FREON 11 (SW846-8260B) (CWL PCCP)	<i>007</i>
114212	002	CWL-MW10	515	1/25/21 09:06	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	<i>008</i>
114213	001	CWL-MW10	515	1/25/21 09:05	GW	G	3x40 ml	HCl	G	DU	VOC-TCE, FREON 113, PCE, 1,1-DCE, CHLOROFORM, FREON 11 (SW846-8260B) (CWL PCCP)	<i>009</i>
114213	002	CWL-MW10	515	1/25/21 09:07	GW	P	500 ml	HNO3	G	DU	CHROMIUM, NICKEL (SW846-6020)	<i>010</i>
114214	001	CWL-PCCP TB-10	NA	1/25/21 09:04	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE, FREON 113, PCE, 1,1-DCE, CHLOROFORM, FREON 11 (SW846-8260B) (CWL PCCP)	<i>Y011</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		
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"/>		
<b>Sample Team Members</b>	Name	Signature	Init.		Company/Organization/Phone/Cell
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/08888/505-844-4013/505-250-7090	Return Samples By: Comments: Received trip blanks from lab with head space.
	William Gibson	<i>[Signature]</i>	<i>WG</i>	SNL/08888/505-284-3307/505-239-7367	
	Zachary Tenorio	<i>[Signature]</i>	<i>ZT</i>	SNL/08888/505-845-8636/505-259-5765	
Denisha Sanchez	<i>[Signature]</i>	<i>DS</i>	SNL/08888/505-845-7829/505-208-1375		

Relinquished by <i>Denisha Sanchez</i> Org. <del>8888</del> Date <i>1/25/21</i> Time <i>6:35</i>	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i> Org. <i>0628</i> Date <i>1/25/21</i> Time <i>09:35</i>	Received by	Org.	Date	Time
Relinquished by <i>[Signature]</i> Org. <i>0628</i> Date <i>1/25/21</i> Time <i>1:30</i>	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i> Org. Date <i>1/26/21</i> Time <i>7:55</i>	Received by	Org.	Date	Time

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

**CONTRACT VERIFICATION FORMS**  
**CHEMICAL WASTE LANDFILL**  
**GROUNDWATER MONITORING**  
**JANUARY 2021**

<b>AR/COC Number</b>	<b>Sample Type</b>
621697	Environmental & Quality Control
621700	Environmental & Quality Control
621701	Quality Control
621703	Environmental & Quality Control
621704	Quality Control
621706	Environmental & Quality Control

Note: The forms in this section include AR/COC numbers for environmental and quality control samples; the AR/COC forms are provided in the Data Validation Reports in this annex. AR/COCs for waste characterization samples (621698, 621699, 621702, and 621705) are included in the contract verification review and associated CVR forms but do not require data validation.

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 621697 &amp; 621698

Analytical Lab GEL

SDG No. 532455

*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		

Line No.	Item	Complete?		If no, explain
		Yes	No	
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 or 1-sigma for bioassay) 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	1, 1, 2, 2-Tetrachloroethane and methyl acetate failed recovery limits for LCS (QC1204740843) and (QC1204745822). Methyl acetate failed recovery limits for LCS (QC1204745816).
	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		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
	c) Laboratory control sample duplicate RPD data reported and met for other analyses	N/A		
3.5	Blank data a) Method or reagent blank data reported and met for all samples		X	Acetone detected in method blank (QC1204740842)
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Chloroform detected in CWL-FB 1
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 and TO-15) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668 and 8290) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850 and 8330) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

## 5.0 Data Anomaly Report

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

## 6.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
---------------------	----------	-------------------------------

Were deficiencies unresolved?  Yes  No

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

Reviewed by: Wendy Palencia Date: 02-22-2021 10:06:00

Closed by: Wendy Palencia Date: 02-22-2021 10:06:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 621699, 621700 &amp; 621701

Analytical Lab GEL

SDG No. 532557

*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		

Line No.	Item	Complete?		If no, explain
		Yes	No	
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 or 1-sigma for bioassay) 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	1, 1, 2, 2-Tetrachloroethane and methyl acetate failed recovery limits for LCS (QC1204740843) and (QC1204745822)
	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		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
	c) Laboratory control sample duplicate RPD data reported and met for other analyses	N/A		
3.5	Blank data a) Method or reagent blank data reported and met for all samples		X	Vanadium detected in method blank (QC1204737461)
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Chloroform detected in CWL DIW QC
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 and TO-15) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668 and 8290) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850 and 8330) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

## 5.0 Data Anomaly Report

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

## 6.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
---------------------	----------	-------------------------------

Were deficiencies unresolved?  Yes  No

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

Reviewed by: Wendy Palencia Date: 02-23-2021 08:02:00

Closed by: Wendy Palencia Date: 02-23-2021 08:02:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 621702, 621703 &amp; 621704

Analytical Lab GEL

SDG No. 532873

*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		One of three vials for sample 114204-001 received with headspace

### 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		

Line No.	Item	Complete?		If no, explain
		Yes	No	
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 or 1-sigma for bioassay) 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	1, 1, 2, 2-Tetrachloroethane and methyl acetate failed recovery limits for LCS (QC1204745355)
	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		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
	c) Laboratory control sample duplicate RPD data reported and met for other analyses	N/A		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Chloroform detected in CWL-PCCP FB 2 and CWL-PCCP EB-1
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 and TO-15) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668 and 8290) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850 and 8330) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

### 5.0 Data Anomaly Report

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

### 6.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
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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: 02-23-2021 13:06:00

Closed by: Wendy Palencia Date: 02-23-2021 13:06:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 621705 &amp; 621706

Analytical Lab GEL

SDG No. 532959

*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		

Line No.	Item	Complete?		If no, explain
		Yes	No	
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 or 1-sigma for bioassay) 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	1, 1, 2, 2-Tetrachloroethane and methyl acetate failed recovery limits for LCS (QC1204745355)
	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		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
	c) Laboratory control sample duplicate RPD data reported and met for other analyses	N/A		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
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 and TO-15) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668 and 8290) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850 and 8330) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

### 5.0 Data Anomaly Report

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

### 6.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
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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: 02-25-2021 12:39:00

Closed by: Wendy Palencia Date: 02-25-2021 12:39:00

**FIELD SAMPLING FORMS**

**JULY 2021**

**GROUNDWATER MONITORING**

**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL	
Well ID: CWL-BW5	Date: 07/20/21      Date:
Pump Method: Portable	Pump Depth: 522'

**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)	
515.48	0815	Start	-----	-----	-----	-----	-----	-----	-----	
516.94	0835	1	22.36	1145.5	193.7	7.07	0.58	103.45	7.69	
517.31	0841	2	21.81	1131.6	189.7	7.08	1.21	102.15	7.68	
517.60	0846	3	21.53	1125.1	184.8	7.09	0.57	100.92	7.62	
517.91	0850	4	21.34	1122.9	180.6	7.08	0.67	99.54	7.55	
518.06	0856	5	21.42	1120.2	177.0	7.08	0.75	98.15	7.43	
518.18	0900	6	21.42	1124.7	174.0	7.08	0.77	96.15	7.28	
518.24	0906	7	21.56	1123.4	169.9	7.08	0.85	95.94	7.25	
518.25	0913	8	21.69	1123.5	183.2	7.08	0.90	96.86	7.30	
518.24	0919	9	21.73	1128.3	173.0	7.07	0.65	97.06	7.30	
518.24	0926	10	21.73	1130.9	168.0	7.07	0.82	97.35	7.32	
518.24	0933	11	21.82	1132.5	166.8	7.07	0.90	99.51	7.47	
518.23	0939	12	21.88	1126.5	163.7	7.07	0.76	100.06	7.50	
518.23	0946	13	21.90	1130.2	162.8	7.08	0.43	101.33	7.61	
	0947	—	Sampling							

Comments:

~1.5gal. purged from tubing @ 0830

DTW/QC & FBI LOTH 062921



**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL	
Well ID: CWL-MW10	Date: 07/23/21      Date: <u>07/26/21</u>
Pump Method: Portable	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)
503.61	0846	Start	-----	-----	-----	-----	-----	-----	-----
506.26	0904	2	23.29	987.54	151.8	7.17	3.00	30.18	2.26
508.09	0915	4	23.56	1022.9	122.4	7.19	2.06	25.22	1.88
508.83	0920	5	23.74	1018.0	104.8	7.18	0.93	25.82	1.92
509.55	0927	6	23.75	1014.4	97.5	7.17	1.83	27.23	2.01
510.32	0933	7	23.57	1004.2	86.3	7.17	1.65	24.77	1.86
511.04	0939	8	23.44	1014.7	76.6	7.18	2.09	24.29	1.82
511.83	0945	9	23.36	1013.4	69.3	7.19	2.85	24.80	1.86
512.71	0951	10	23.44	1014.4	58.4	7.17	3.15	26.88	2.01
513.62	0958	11	23.48	1015.0	46.3	7.17	4.26	25.63	1.92
514.61	1004	12	23.70	1022.8	37.2	7.17	5.64	24.56	1.83
514.82	1006	12.25	23.87	1027.0	32.6	7.17	5.44	25.84	1.91
514.82	1006	Well	DRY	-----	-----	-----	-----	-----	-----
504.29	0829	START	-----	-----	-----	-----	-----	-----	-----
506.22	0843	0.5	20.90	982.37	2.0	7.17	4.62	48.93	3.74
506.67	0845	1	20.86	987.49	-7.9	7.17	3.09	32.85	2.54
507.04	0848	1.5	20.95	989.42	-11.5	7.17	3.55	28.45	2.06
	0849	SAMPLING							

07/26

Comments:

~ 1.5 gals purged from tubing @0856  
 0840 07/26/21

FB LOT #071421

**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL	
Well ID: CWL-MW11	Date: 07/22/21      Date:
Pump Method: Portable	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)
501.71	0831	Start	-----	-----	-----	-----	-----	-----	-----
505.88	0902	5	22.60	1073.0	183.9	7.10	0.40	81.12	6.18
507.49	0918	8	22.64	1076.6	171.8	7.09	0.82	79.45	6.05
508.66	0929	10	22.68	1080.5	165.5	7.10	0.72	81.67	6.21
509.83	0939	12	22.58	1078.9	161.6	7.09	0.91	82.67	6.30
511.06	0949	14	22.69	1080.3	157.6	7.09	1.64	83.07	6.31
511.63	0954	15	23.04	1076.1	16.0	7.09	1.73	78.84	5.93
512.21	1001	16	23.47	1095.4	-25.4	7.08	1.81	71.89	5.38
512.29	1010	17	24.76	1126.2	-8.2	7.05	1.70	77.16	5.61
512.38	1020	18	24.32	1136.0	24.0	6.75	1.95	80.56	5.83
512.81	1031	19	24.27	1113.1	49.4	6.76	1.60	96.33	7.25
513.31	1042	20	24.13	1119.2	74.1	6.76	1.21	105.62	7.81
513.49	1051	21	24.21	1123.2	79.6	6.77	1.16	95.90	6.98
	1052	Sampling →							

Comments:  
 ~ 1.5 gals purged from tubing@\_\_\_\_\_

*IMPORTANT NOTICE: A printed (and uncompleted) copy of this form may not be the most current form. The official version is located in the Long-Term Stewardship (LTS) ARAS document library, for which access is required. Upon completion, this document becomes record.*

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

SNL/NM Project Name: <b>CWL</b>		Blue Truck			
Calibrations done by: <b>D. Sanchez</b>			Date: <b>07/20/21</b>		
Make & Model: <b>In-Situ Aqua Troll 600</b>					
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571025</b>					
Other (SN): _____					
pH Calibration/Check					
pH Calibrated to (std):		NA		pH sloped to (std):	
		NA			
Reference value:	4.00		7.00		10.00
	Value	Temp	Value	Temp	Value
1. Time (24 hr):	<b>0629</b>	<b>4.10</b>	<b>23.73</b>	<b>7.09</b>	<b>23.78</b>
2. Time (24 hr):	<b>1430</b>	<b>4.12</b>	<b>23.81</b>	<b>7.08</b>	<b>23.94</b>
3. Time (24 hr):					
4. Time (24 hr):					
Standard Lot No.:	<b>0GK870</b>		<b>0GL004</b>		<b>0GK650</b>
Expiration Date.:	<b>NOV/22</b>		<b>DEC/22</b>		<b>NOV/22</b>
SC Calibration/Check			ORP Calibration/Check		
Reference Value: <b>1413 uS/cm @ 25C</b>			Reference Value: <b>220 mV</b>		
	Value	Temp		Value	Temp
1. Time (24 hr):	<b>0625</b>	<b>1411.6</b>	<b>24.18</b>	1. Time (24 hr):	<b>0635</b>
2. Time (24 hr):	<b>1427</b>	<b>1403.6</b>	<b>24.09</b>	2. Time (24 hr):	<b>1449</b>
3. Time (24 hr):				3. Time (24 hr):	
4. Time (24 hr):				4. Time (24 hr):	<b>A0279</b>
Standard Lot No.: <b>0GK781</b>	Expiration Date.: <b>NOV/21</b>		Standard Lot No.: <b>0GL1015</b>	Expiration Date.: <b>SEP/21</b>	
DO Calibration/Check					
Calibration Value:	81% air saturation @ 5200 ft.			Atmospheric Pressure in Hg	
1. Time (24 hr):	<b>0624</b>	<b>107.38</b>		<b>25.46</b>	
2. Time (24 hr):	<b>1426</b>	<b>108.78</b>		<b>25.10</b>	
3. Time (24 hr):					
4. Time (24 hr):					

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

SNL/NM Project Name: CWL		Blue Truck		
Calibration done by: D. Sanchez		Date: 7/20/21		
TURBIDIMETER				
Make & Model: HACH 2100Q		Serial No. S/N 19050C076301		
Reference Value	10	20	100	800
Standard Lot No.	A0288	A0295	A0276	A0279
1. Time (24 hr):	6620 10.0	19.9	98.7	774
2. Time (24 hr):	1423 10.2	20.3	104	791
3. Time (24 hr):				
4. Time (24 hr):				
Comments:				

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

SNL/NM Project Name: <b>CWL</b>		<b>Blue Truck</b>	
Calibrations done by: <b>R Lynch</b>		Date: <b>07/21/21</b>	
Make & Model: <b>In-Situ Aqua Troll 600</b>			
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571025</b>			
Other (SN): _____			
<b>pH Calibration/Check</b>			
pH Calibrated to (std): <b>NA</b>		pH sloped to (std): <b>NA</b>	
Reference value:	4.00		7.00
	Value	Temp	Value
1. Time (24 hr):	<b>0637</b>	<b>4.09</b>	<b>23.93</b>
2. Time (24 hr):	<b>1256</b>	<b>4.14</b>	<b>24.88</b>
3. Time (24 hr):			
4. Time (24 hr):			
Standard Lot No.:	<b>OGK870</b>	<b>0GL004</b>	<b>OGK650</b>
Expiration Date.:	<b>NOV/22</b>	<b>DEC/22</b>	<b>NOV/22</b>
<b>SC Calibration/Check</b>		<b>ORP Calibration/Check</b>	
Reference Value: <b>1413 uS/cm @ 25 C</b>		Reference Value: <b>220 mV</b>	
	Value	Temp	Value
1. Time (24 hr):	<b>0641</b>	<b>1385.8</b>	<b>23.98</b>
2. Time (24 hr):	<b>1302</b>	<b>1391.6</b>	<b>24.78</b>
3. Time (24 hr):			
4. Time (24 hr):			
Standard Lot No.:	<b>OGK781</b>	Expiration Date.: <b>NOV/21</b>	Standard Lot No.: <b>0GL1015</b>
			Expiration Date.: <b>SEP/21</b>
<b>DO Calibration/Check</b>			
Calibration Value: <b>100%</b>	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg
1. Time (24 hr):	<b>0633</b>	<b>106.76</b>	<b>26.11</b>
2. Time (24 hr):	<b>1255</b>	<b>100.01</b>	<b>26.55</b>
3. Time (24 hr):			
4. Time (24 hr):			

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

SNL/NM Project Name: CWL Blue truck				
Calibration done by: R Lynch			Date: 07/21/21	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 19050C076301	
Reference Value	10	20	100	800
Standard Lot No.	A0288	A0295	A0276	A0279
1. Time (24 hr): 0633	9.98	19.9	101	796
2. Time (24 hr): 1254	9.99	20.0	99.8	793
3. Time (24 hr):				
4. Time (24 hr):				
Comments:				

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

SNL/NM Project Name: <b>CWL</b> <b>Blue Truck</b>							
Calibrations done by: <b>R Lynch</b>				Date: <b>07/22/21</b>			
Make & Model: <b>In-Situ Aqua Troll 600</b>							
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571025</b>							
Other (SN): _____							
<b>pH Calibration/Check</b>							
pH Calibrated to (std): <b>NA</b>			pH sloped to (std): <b>NA</b>				
Reference value:	4.00		7.00		10.00		
	Value	Temp	Value	Temp	Value	Temp	
1. Time (24 hr):	<b>0632</b>	<b>4.03</b>	<b>23.23</b>	<b>7.01</b>	<b>23.78</b>	<b>9.98</b>	
2. Time (24 hr):	<b>1258</b>	<b>4.05</b>	<b>25.02</b>	<b>7.02</b>	<b>24.88</b>	<b>9.97</b>	
3. Time (24 hr):							
4. Time (24 hr):							
Standard Lot No.:	<b>OGK870</b>		<b>OGL004</b>		<b>OGK650</b>		
Expiration Date.:	<b>NOV/22</b>		<b>DEC/22</b>		<b>NOV/22</b>		
<b>SC Calibration/Check</b>			<b>ORP Calibration/Check</b>				
Reference Value: <b>1413 uS/cm @ 25 C</b>			Reference Value: <b>220 mV</b>				
	Value	Temp		Value	Temp		
1. Time (24 hr):	<b>0636</b>	<b>1380.7</b>	<b>23.84</b>	1. Time (24 hr): <b>0637</b>	<b>222.0</b>	<b>23.93</b>	
2. Time (24 hr):	<b>1308</b>	<b>1394.4</b>	<b>24.86</b>	2. Time (24 hr): <b>1309</b>	<b>221.8</b>	<b>24.97</b>	
3. Time (24 hr):				3. Time (24 hr):			
4. Time (24 hr):				4. Time (24 hr):			
Standard Lot No.:	<b>OGK781</b>	Expiration Date.:	<b>NOV/21</b>	Standard Lot No.:	<b>OGL1015</b>	Expiration Date.:	<b>SEP/21</b>
<b>DO Calibration/Check</b>							
Calibration Value: <b>100%</b>	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg				
1. Time (24 hr):	<b>0631</b>	<b>104.29</b>	<b>26.54</b>				
2. Time (24 hr):	<b>1257</b>	<b>100.44</b>	<b>26.43</b>				
3. Time (24 hr):							
4. Time (24 hr):							

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

SNL/NM Project Name: CWL		Blue truck		
Calibration done by: R Lynch		Date: 07/22/21		
TURBIDIMETER				
Make & Model: HACH 2100Q		Serial No. S/N 19050C076301		
Reference Value	10	20	100	800
Standard Lot No. <del>0631</del> <sup>ok 7/22/21</sup>	A0288	A0295	A0276	A0279
1. Time (24 hr): 0631	10.0	19.8	101	792
2. Time (24 hr): 1256	10.2	19.9	100	794
3. Time (24 hr):				
4. Time (24 hr):				
Comments:				

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

SNL/NM Project Name: <b>CWL</b>		<b>Blue Truck</b>							
Calibrations done by: <b>R Lynch</b>		Date: <b>07/23/21</b> <b>07/26/21</b>							
Make & Model: <b>In-Situ Aqua Troll 600</b>									
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571025</b>									
Other (SN): _____									
pH Calibration/Check									
pH Calibrated to (std): <b>NA</b>			pH sloped to (std): <b>NA</b>						
Reference value:	4.00		7.00		10.00				
	Value	Temp	Value	Temp	Value	Temp			
1. Time (24 hr):	<b>0639</b>	<b>4.02</b>	<b>24.53</b>	<b>7.01</b>	<b>24.38</b>	<b>10.01</b>	<b>24.42</b>		
2. Time (24 hr):	<b>1106</b>	<b>4.03</b>	<b>24.61</b>	<b>7.00</b>	<b>24.59</b>	<b>10.03</b>	<b>24.67</b>		
3. Time (24 hr):	<b>0631</b>	<b>4.04</b>	<b>24.19</b>	<b>7.02</b>	<b>24.14</b>	<b>10.01</b>	<b>24.09</b>		
4. Time (24 hr):	<b>1005</b>	<b>4.02</b>	<b>24.27</b>	<b>7.00</b>	<b>24.22</b>	<b>10.02</b>	<b>24.33</b>		
Standard Lot No.:	OGK870		OGL004		OGK650				
Expiration Date.:	NOV/22		DEC/22		NOV/22				
SC Calibration/Check				ORP Calibration/Check					
Reference Value: <b>1413 uS/cm @ 25 C</b>				Reference Value: <b>220 mV</b>					
	Value	Temp		Value	Temp				
1. Time (24 hr):	<b>0642</b>	<b>1370.4</b>	<b>23.84</b>	1. Time (24 hr):	<b>0643</b>	<b>219.4</b>	<b>24.36</b>		
2. Time (24 hr):	<b>1103</b>	<b>1381.6</b>	<b>24.20</b>	2. Time (24 hr):	<b>1104</b>	<b>219.7</b>	<b>24.40</b>		
3. Time (24 hr):	<b>0637</b>	<b>1379.2</b>	<b>24.16</b>	3. Time (24 hr):	<b>0630</b>	<b>219.4</b>	<b>24.23</b>		
4. Time (24 hr):	<b>1000</b>	<b>1381.6</b>	<b>24.31</b>	4. Time (24 hr):	<b>1003</b>	<b>219.7</b>	<b>24.30</b>		
Standard Lot No.:	OGK781		Expiration Date.:	NOV/21		Standard Lot No.:	OGL1015	Expiration Date.:	SEP/21
DO Calibration/Check									
Calibration Value: <b>100%</b>		81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg					
1. Time (24 hr):	<b>0638</b>	<b>98.30</b>		<b>26.54</b>					
2. Time (24 hr):	<b>1102</b>	<b>99.63</b>		<b>26.49</b>					
3. Time (24 hr):	<b>0629</b>	<b>99.03</b>		<b>26.30</b>					
4. Time (24 hr):	<b>1001</b>	<b>100.94</b>		<b>26.74</b>					

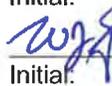
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## GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL		Blue truck		
Calibration done by: R Lynch		Date: 07/23/21 07/26/21		
TURBIDIMETER				
Make & Model: HACH 2100Q		Serial No. S/N 19050C076301		
Reference Value	10	20	100	800
Standard Lot No.	A0288	A0295	A0276	A0279
1. Time (24 hr): 0637	10.1	19.8	99.9	793
2. Time (24 hr): 1101	9.99	20.1	102	796
3. Time (24 hr): 0628	10.0	20.3	100	795
4. Time (24 hr): 1000	10.1	20.0	101	794
Comments:				

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

<b>SNL/NM</b> Project Name: <u>CWL</u>	Monitoring Well ID #: <u>Pre Decon</u>	Date: <u>7/19/2021</u> Date: _____
The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03.		
Pump and Tubing Bundle ID #: <u>1806B-640</u>	Water Level Indicator ID #: <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
Robert Lynch Print Name: _____	 Initial: _____	
William Gibson Print Name: _____	 Initial: _____	
<b>Condition of Equipment</b>		
Pump: <u>Good</u>	Tubing Bundle: <u>Good</u>	Water Level Indicator: <u>Excellent</u>
List of Decontamination Materials		
<b>Deionized Water</b>	<b>HNO<sub>3</sub></b>	<b>Detergent</b>
Source: <u>Culligan</u>	Grade: <u>NA</u>	Manufacturer: <u>Liquinox</u>
Lot Number: <u>6/29/21</u>	UN #: <u>NA</u>	Lot Number: <u>L1L0</u>
_____	Manufacturer: <u>NA</u>	Expiration Date: <u>11/22</u>
_____	Lot Number: <u>NA</u>	

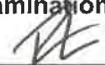
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**Portable Pump and Tubing / Water Level Indicator Decontamination Log Form**

<b>SNL/NM Project Name:</b> <u>CWL</u>	<b>Monitoring Well ID #:</b> <u>CWL-BW5</u>	<b>Date:</b> <u>7/20/2021</u> <b>Date:</b> _____
The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03.		
<b>Pump and Tubing Bundle ID #:</b> <u>1806B-640</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
<u>Denisha Sanchez</u> Print Name:	 Initial:	
<u>Zach Tenorio</u> Print Name:	 Initial:	
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Good</u>	<b>Tubing Bundle:</b> <u>Good</u>	<b>Water Level Indicator:</b> <u>Excellent</u>
<b>List of Decontamination Materials</b>		
<b>Deionized Water</b>	<b>HNO<sub>3</sub></b>	<b>Detergent</b>
<b>Source:</b> <u>Culligan</u>	<b>Grade:</b> <u>NA</u>	<b>Manufacturer:</b> <u>Liquinox</u>
<b>Lot Number:</b> <u>6/29/21</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L1L0</u>
_____	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>11/22</u>
_____	<b>Lot Number:</b> <u>NA</u>	

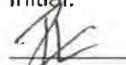
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**Portable Pump and Tubing / Water Level Indicator Decontamination Log Form**

<b>SNL/NM Project Name:</b> <u>CWL</u>	<b>Monitoring Well ID #:</b> <u>CWL-MW9</u>	<b>Date:</b> <u>7/21/2021</u> <b>Date:</b> _____
The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03.		
<b>Pump and Tubing Bundle ID #:</b> <u>1806B-640</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
Robert Lynch Print Name: _____		Initial: _____
Denisha Sanchez Print Name: _____		Initial: _____
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Good</u>	<b>Tubing Bundle:</b> <u>Good</u>	<b>Water Level Indicator:</b> <u>Excellent</u>
<b>List of Decontamination Materials</b>		
<b>Deionized Water</b>	<b>HNO<sub>3</sub></b>	<b>Detergent</b>
<b>Source:</b> <u>Culligan</u>	<b>Grade:</b> <u>NA</u>	<b>Manufacturer:</b> <u>liquinox</u>
<b>Lot Number:</b> <u>06/14/21-06-29-21-07/14/21</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L1L0</u>
_____	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>11/22</u>
_____	<b>Lot Number:</b> <u>NA</u>	_____

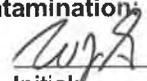
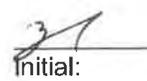
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**Portable Pump and Tubing / Water Level Indicator Decontamination Log Form**

<b>SNL/NM Project Name:</b> <u>CWL</u>	<b>Monitoring Well ID #:</b> <u>CWL-MW10</u>	<b>Date:</b> <u>7/26/2021</u> <b>Date:</b> _____
The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03.		
<b>Pump and Tubing Bundle ID #:</b> <u>1806B-640</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
Denisha Sanchez Print Name: _____	 Initial: _____	
Robert Lynch Print Name: _____	 Initial: _____	
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Good</u>	<b>Tubing Bundle:</b> <u>Good</u>	<b>Water Level Indicator:</b> <u>Excellent</u>
List of Decontamination Materials		
<b>Deionized Water</b>	<b>HNO<sub>3</sub></b>	<b>Detergent</b>
<b>Source:</b> <u>Culligan</u>	<b>Grade:</b> <u>NA</u>	<b>Manufacturer:</b> <u>Liquinox</u>
<b>Lot Number:</b> <u>7/14/21</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L1L0</u>
_____	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>11/22</u>
_____	<b>Lot Number:</b> <u>NA</u>	_____

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

<b>SNL/NM Project Name:</b> <u>CWL</u>	<b>Monitoring Well ID #:</b> <u>CWL-MW11</u>	<b>Date:</b> <u>7/22/2021</u> <b>Date:</b> _____
The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03.		
<b>Pump and Tubing Bundle ID #:</b> <u>1806B-640</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
William Gibson Print Name: _____		Initial: _____
Zach Tenorio Print Name: _____		Initial: _____
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Good</u>	<b>Tubing Bundle:</b> <u>Good</u>	<b>Water Level Indicator:</b> <u>Excellent</u>
<b>List of Decontamination Materials</b>		
<b>Deionized Water</b>	<b>HNO<sub>3</sub></b>	<b>Detergent</b>
<b>Source:</b> <u>Culligan</u>	<b>Grade:</b> <u>NA</u>	<b>Manufacturer:</b> <u>liquinox</u>
<b>Lot Number:</b> <u>07/14/21</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L1L0</u>
_____	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>11/22</u>
_____	<b>Lot Number:</b> <u>NA</u>	

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## **SUMMARY SHEET FOR JULY 2021 SAMPLES**

**Sample Summary for Chemical Waste Landfill Groundwater Monitoring  
July 2021**

<b>Sample ID</b>	<b>Sample Date</b>	<b>ARCOG</b>	<b>Sample Number</b>	<b>Sample Type</b>	<b>Associated Equipment Blank (ARCOG #/Sample #)</b>	<b>Associated Trip Blank (ARCOG # / Sample #)</b>	<b>Associated Field Blank (ARCOG # / Sample #)</b>	<b>Comments</b>
<b>CWL GWM: Project Task # 195122.10.11.03. Service Order # CF 327-21</b>								
<b>Environmental Samples</b>								
CWL-BW5	20-Jul-21	622246	115378	Environmental	n/a	622246 / 115379	622246 / 115377	
CWL-MW9	21-Jul-21	622249	115386	Environmental	n/a	622249 / 115387	n/a	
CWL-MW10	26-Jul-21	622254	115398	Environmental	n/a	622254 / 115399	622254 / 115397	
CWL-MW11	22-Jul-21	622252	115392	Environmental	622251 / 115390	622252 / 115394	n/a	
CWL-MW11	22-Jul-21	622252	115393	Duplicate	622251 / 115390	622252 / 115394	n/a	
CWL - EB1	21-Jul-21	622251	115390	Equipment Blank	n/a	622251 / 115391	n/a	Decon prior to CWL-MW11
CWL - FB1	20-Jul-21	622246	115377	Field Blank	n/a	622246 / 115379	n/a	at CWL-BW5
CWL - FB2	26-Jul-21	622254	115397	Field Blank	n/a	622254 / 115399	n/a	at CWL-MW10
CWL - DIWQC	20-Jul-21	622247	115382	QC-DIW	n/a	622247 / 115383	n/a	DI Source for equipment decontamination
<b>Waste Characterization Samples</b>								
CWL-BW5	20-Jul-21	622248	115384	Waste	n/a	622248 / 115385	n/a	No data validation required
CWL-MW9	21-Jul-21	622250	115388	Waste	n/a	622250 / 115389	n/a	No data validation required
CWL-MW10	23-Jul-21	622255	115400	Waste	n/a	622255 / 115401	n/a	No data validation required
CWL-MW11	22-Jul-21	622253	115395	Waste	n/a	622253 / 115396	n/a	No data validation required

**DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**

**CHEMICAL WASTE LANDFILL**

**GROUNDWATER MONITORING**

**JULY 2021**

**AR/COC NUMBERS 622246, 622247**

## Memorandum

Date: August 30, 2021

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622246 and 622247  
SDG: 550175  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Five samples were prepared and analyzed with accepted procedures using method EPA 8260D (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 and Preservation**

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

### **Instrument Tune**

All instrument tune requirements were met.

### **Calibration**

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

### **Blanks**

No target analyte was detected in any of 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 recoveries and RPDs met QC acceptance criteria.

It should be noted that the MS/MSD analyses were performed on a waste water sample submitted on ARCOG 622248 in the same SDG.

**Laboratory Control Sample (LCS)**

All LCS acceptance criteria were met.

**Detection Limits/Dilutions**

All detection limits were properly reported. The samples were not diluted.

**Tentatively Identified Compounds (TICs)**

TIC reports were not required.

**Other QC**

A TB was submitted for each ARCOG. FB1 was submitted on ARCOG 622246 and was associated with the sample on the same ARCOG. A DIWQC sample was submitted on ARCOG 622247 and was the DIW source for equipment decontamination for the CWL PCCP project.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 08/30/2021

## Memorandum

Date: August 30, 2021  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622246 and 622247  
SDG: 550175  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
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 SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Two samples were prepared and analyzed with approved procedures using method EPA 6020B (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

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

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

The ICP-MS tune met QC acceptance criteria.

### **Calibration**

All initial and continuing calibration criteria met QC acceptance criteria.

### **Reporting Limit Verification**

All LLCCV recoveries met QC acceptance criteria.

### **Blanks**

No target analytes were detected in any of 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)**

Results of the ICS A and AB analyses were evaluated because the Ca concentration for sample 550175003 was > the ICS value. All QC acceptance criteria were met.

### **ICP Serial Dilution**

The serial dilution met all QC acceptance criteria.

### **Other QC**

A DIWQC sample was submitted on ARCOG 622247 and was the DIW source for equipment decontamination for the CWL PCCP project.

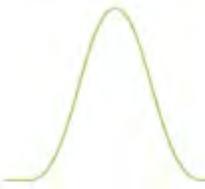
No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 08/30/2021

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## Sample Findings Summary



AR/COC: 622246, 622247

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#: 622246 and 622247	Site/Project: CWL PCCP	Validation Date: 08/30/2021
SDG #: 550175	Laboratory: GEL Laboratories, LLC	Validator: Linda Thal
Matrix: Aqueous	# of Samples: 7	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								

<p><u>Comments:</u> Collected 07/20/2021</p> <p>The ARCOGs noted that the TB vials were received from the lab with headspace.</p>
<p><u>Validated by:</u> </p>



## Sandia Inorganic Metals Worksheet

ARCO # (s): 622246 and 622247	SDG # (s): 550175	Matrix: Aqueous
Laboratory Sample IDs: 550175003, -006		
Method/Batch #: <b>3005A/6020B</b> : 2153925/2153926		

ICPMS Mass Cal:  Pass  Fail  NA    ICPMS Resolution:  Pass  Fail  NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A $\pm$ MDL ug/L (x50)	LLCCV %R	DIWQC -006
	Int. ug/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. Cr and Ni only.  
ICP-MS matrix QC on -003.  
-003 >ICS A for Ca

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

550175

Internal Lab

Batch No. *NA*

SMO Use

AR/COC 622246

Project Name: CWL PCCP	Date Samples Shipped: <i>7/20/2021</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <i>333596</i>	SMO Contact Phone: Wendy Palencia/505-844-3132	
Project/Task Number: 195122.10.11.03	Lab Contact: Zac Worsham/843-300-4224	Send Report to SMO: Stephanie Montaño/505-284-2553	
Service Order: CF327-21	Lab Destination: GEL		
	Contract No.: 1983530		

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					
115377	001	CWL - FB1	NA	7/20/21 09:34	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE (SW846-8260B)	001
115378	001	CWL-BW5	522	7/20/21 09:47	GW	G	3x40 ml	HCl	G	SA	VOC-TCE (SW846-8260B)	002
115378	002	CWL-BW5	522	7/20/21 09:48	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	003
115379	001	CWL - TB1	NA	7/20/21 09:34	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260B)	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			
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			
	Denisha Sanchez	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-7829/505-208-1375		Return Samples By:			
	William Gibson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-3307/505-239-7367		Comments: Trip blanks received from lab with head space.			
	Zachary Tenorio	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-8636/505-259-5765					

Relinquished by <i>[Signature]</i>	Org. <i>8888</i>	Date <i>7-20-21</i>	Time <i>1025</i>	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i>	Org. <i>0618</i>	Date <i>7/20/21</i>	Time <i>1025</i>	Received by	Org.	Date	Time
Relinquished by <i>[Signature]</i>	Org. <i>0618</i>	Date <i>7/20/21</i>	Time <i>1130</i>	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i>	Org.	Date <i>7 21 21</i>	Time <i>730</i>	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 **622247**

Project Name: CWL PCCP	Date Samples Shipped: <i>7/20/2021</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <i>333596</i>	SMO Contact Phone: Wendy Palencia/505-844-3132	
Project/Task Number: 195122.10.11.03	Lab Contact: Zac Worsham/843-300-4224	Send Report to SMO: Stephanie Montaño/505-284-2553	
Service Order: CF327-21	Lab Destination: GEL	Contract No.: 1983530	

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

Tech Area: \_\_\_\_\_  
 Building: \_\_\_\_\_ Room: \_\_\_\_\_ Operational Site: \_\_\_\_\_

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
							Type	Volume					
115382	001	CWL-DIWQC	NA	7/20/21	08:46	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE (SW846-8260B)	<i>005</i>
115382	002	CWL-DIWQC	NA	7/20/21	08:47	DIW	P	500 ml	HNO3	G	FB	CHROMIUM, NICKEL (SW846-6020)	<i>006</i>
115383	001	CWL - TB2	NA	7/20/21	08:46	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260B)	<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	
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
	Denisha Sanchez	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-7829/505-208-1375
	William Gibson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-3307/505-239-7367
	Zachary Tenorio	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-8636/505-259-5765
			Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	
			Return Samples By:	
			Comments: Trip blanks received from lab with head space.	

Relinquished by: <i>[Signature]</i> Org. <i>8888</i> Date <i>7-20-21</i> Time <i>10:25</i>	Relinquished by: _____ Org. _____ Date _____ Time _____
Received by: <i>[Signature]</i> Org. <i>0618</i> Date <i>7-20-21</i> Time <i>1:025</i>	Received by: _____ Org. _____ Date _____ Time _____
Relinquished by: <i>[Signature]</i> Org. <i>0618</i> Date <i>7/20/21</i> Time <i>11:30</i>	Relinquished by: _____ Org. _____ Date _____ Time _____
Received by: <i>[Signature]</i> Org. _____ Date <i>7-21-21</i> Time <i>7:30</i>	Received by: _____ Org. _____ Date _____ Time _____

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

**AR/COC NUMBERS 622249, 622251**

## Memorandum

Date: August 31, 2021

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622249 and 622251  
SDG: 550314  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Four samples were prepared and analyzed with accepted procedures using method EPA 8260D (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 and Preservation**

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

### **Instrument Tune**

All instrument tune requirements were met.

### **Calibration**

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

### **Blanks**

No target analyte was detected in any of 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 recoveries and RPDs met QC acceptance criteria.

**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 was submitted for each ARCO. EB1 was submitted on ARCO 622251 and was associated with the samples on ARCO 622252 submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 08/31/2021

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## Memorandum

Date: August 31, 2021  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622249 and 622251  
SDG: 550314  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
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 SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Two samples were prepared and analyzed with approved procedures using method EPA 6020B (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

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

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

The ICP-MS tune met QC acceptance criteria.

### **Calibration**

All initial and continuing calibration criteria met QC acceptance criteria.

### **Reporting Limit Verification**

All LLCCV recoveries met QC acceptance criteria.

### **Blanks**

No target analytes were detected in any of 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. It should be noted that the MS was performed on an SNL sample of similar matrix from another SDG. No data will be qualified.

### **Laboratory Replicate**

The replicate met all QC acceptance criteria. It should be noted that the replicate was performed on an SNL sample of similar matrix from another SDG. No data will be qualified.

### **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 for Al, Fe, Ca and Mg were < the ICS values.

### **ICP Serial Dilution**

The serial dilution met all QC acceptance criteria. It should be noted that the serial dilution was performed on an SNL sample of similar matrix from another SDG. No data will be qualified.

### **Other QC**

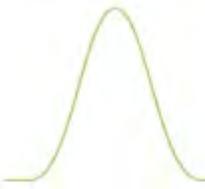
EB1 was submitted on ARCOG 622251 and was associated with the samples on ARCOG 622252 submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donivan

**Level:** I

**Date:** 08/31/2021



## Sample Findings Summary



AR/COC: 622249, 622251

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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#: 622249 and 622251	Site/Project: CWL PCCP	Validation Date: 08/31/2021
SDG #: 550314	Laboratory: GEL Laboratories, LLC	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								

<p><u>Comments:</u> Collected 07/21/2021</p> <p>The ARCOGs noted that the TB vials were received from the lab with headspace.</p> <p>EB1 was submitted on ARCOG 622251 and was associated with the samples on ARCOG 622252 submitted in another SDG.</p>
<p><u>Validated by:</u> </p>



## Sandia Inorganic Metals Worksheet

ARCO # (s): 622249 and 622251	SDG # (s): 550314	Matrix: Aqueous
Laboratory Sample IDs: 550314002, -011		
Method/Batch #: <b>3005A/6020B</b> : 2153925/2153926		

ICPMS Mass Cal:  Pass  Fail  NA    ICPMS Resolution:  Pass  Fail  NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A $\pm$ MDL ug/L (x50)	LLCCV %R	EB1 -011
	Int. ug/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. Cr and Ni only.  
ICP-MS matrix QC on SNL sample 550175003.  
samples < ICS A for Ca, Al, Mg and Fe

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

550314

SDG: 550314 Rev 1

Internal Lab		Page 1 of 1	
Batch No.		<b>AR/COC 622249</b>	
Project Name: CWL PCCP	Date Samples Shipped: <u>7/21/2021</u>	SMO Authorization: <u>[Signature]</u>	
Project/Task Manager: Timmie Jackson	Carrier/Waybill No: <u>333677</u>	SMO Contact Phone: Wendy Palencia/505-844-3132	
Project/Task Number: 195122.10.11.03	Lab Contact: Zac Worsham/843-300-4224	Send Report to SMO: Stephanie Montañño/505-284-2553	
Service Order: CF327-21	Lab Destination: GEL		
	Contract No.: 1983530		
Tech Area:		Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154	
Building:	Room:	Operational Site:	

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
115386	001	CWL-MW9	517	7/21/21 10:13	GW	G	3x40 ml	HCl	G	SA	VOC-TCE (SW846-8260B)	001
115386	002	CWL-MW9	517	7/21/21 10:14	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	002
115387	001	CWL - TB4	NA	7/21/21 10:13	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260B)	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			
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 <input type="checkbox"/>		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	<u>[Signature]</u>	<u>[Init]</u>	SNL/08888/505-844-4013/505-250-7090		Comments: Trip blanks received from lab with head space.			
	William Gibson	<u>[Signature]</u>	<u>[Init]</u>	SNL/08888/505-284-3307/505-239-7367					
	Zachary Tenorio	<u>[Signature]</u>	<u>[Init]</u>	SNL/08888/505-845-8636/505-259-5765					
Denisha Sanchez	<u>[Signature]</u>	<u>[Init]</u>	SNL/08888/505-845-7829/505-208-1375						
Relinquished by <u>[Signature]</u>	Org. <u>8688</u>	Date <u>7/21/21</u>	Time <u>1130</u>	Relinquished by	Org.	Date	Time	Lab Use	
Received by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>7/21/21</u>	Time <u>1130</u>	Received by	Org.	Date	Time		
Relinquished by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>7/21/21</u>	Time <u>1230</u>	Relinquished by	Org.	Date	Time		
Received by <u>[Signature]</u>	Org.	Date <u>7 22 21</u>	Time <u>7 30</u>	Received by	Org.	Date	Time		

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

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

SDG: 550314 Rev 1

Internal Lab		Page 1 of 1	
Batch No. <i>N/A</i>		AR/COC <b>622251</b>	
Project Name: CWL PCCP	Date Samples Shipped: <i>7/21/2021</i>	SMO Authorization: <i>[Signature]</i>	
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <i>333677</i>	SMO Contact Phone: Wendy Palencia/505-844-3132	
Project/Task Number: 195122.10.11.03	Lab Contact: Zac Worsham/843-300-4224	Send Report to SMO: Stephanie Montaño/505-284-2553	
Service Order: CF327-21	Lab Destination: GEL		
	Contract No.: 1983530		
Tech Area:		Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154	
Building:	Room:	Operational Site:	

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
115390	001	CWL - EB1	NA	7/21/21 11:13	DIW	G	3x40 ml	HCl	G	EB	VOC-TCE (SW846-8260B)	010
115390	002	CWL - EB1	NA	7/21/21 11:14	DIW	P	500 ml	HNO3	G	EB	CHROMIUM, NICKEL (SW846-6020)	011
115391	001	CWL - TB6	NA	7/21/21 11:13	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260B)	012

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				
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 <input type="checkbox"/>		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:			Lab Use	
	Robert Lynch	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-844-4013/505-250-7090		Comments: Trip blanks received from lab with head space.				
	William Gibson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-3307/505-239-7367						
	Zachary Tenorio	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-8636/505-259-5765						
	Denisha Sanchez	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-7829/505-208-1375						
Relinquished by <i>[Signature]</i>		Org. <i>8888</i>	Date <i>7-21-21</i>	Time <i>11:30</i>		Relinquished by		Org.	Date	Time
Received by <i>[Signature]</i>		Org. <i>0618</i>	Date <i>7/21/21</i>	Time <i>11:30</i>		Received by		Org.	Date	Time
Relinquished by <i>[Signature]</i>		Org. <i>0618</i>	Date <i>7/21/21</i>	Time <i>12:30</i>		Relinquished by		Org.	Date	Time
Received by <i>[Signature]</i>		Org.	Date <i>7/22/21</i>	Time <i>7:30</i>		Received by		Org.	Date	Time

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

**AR/COC NUMBER 62252**

## Memorandum

Date: August 31, 2021

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 622252  
SDG: 550467  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Three samples were prepared and analyzed with accepted procedures using method EPA 8260D (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 and Preservation**

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

### **Instrument Tune**

All instrument tune requirements were met.

### **Calibration**

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

### **Blanks**

No target analyte was detected in any of 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 recoveries and RPDs met QC acceptance criteria.

It should be noted that the MS/MSD analyses were performed on an SNL sample of similar matrix from another SDG. No data will 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 was submitted on ARCOG 622252. EB1 was submitted on ARCOG 622251 in another SDG and was associated with the samples on ARCOG 622252 submitted in this SDG. A field duplicate pair was submitted on ARCOG 622252. There are no “required” review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 08/31/2021

---

## Memorandum

Date: August 31, 2021  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 622252  
SDG: 550467  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
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 SMO Procedure AOP 00-03 Rev 06.

### **Summary**

Two samples were prepared and analyzed with approved procedures using method EPA 6020B (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

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

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

The ICP-MS tune met QC acceptance criteria.

### **Calibration**

All initial and continuing calibration criteria met QC acceptance criteria.

### **Reporting Limit Verification**

All LLCCV recoveries met QC acceptance criteria.

### **Blanks**

No target analytes were detected in any of 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)**

Results of the ICS A and AB analyses were not evaluated because the sample concentrations for Al, Fe, Ca and Mg were < the ICS values.

### **ICP Serial Dilution**

The serial dilution met all QC acceptance criteria.

### **Other QC**

EB1 was submitted on ARCOG 622251 in another SDG and was associated with the samples on ARCOG 622252 submitted in this SDG. A field duplicate pair was submitted on ARCOG 622252. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 08/31/2021

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## Sample Findings Summary



AR/COC: 622252

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#: 622252	Site/Project: CWL PCCP	Validation Date: 08/31/2021
SDG #: 550467	Laboratory: GEL Laboratories, LLC	Validator: Linda Thal
Matrix: Aqueous	# of Samples: 5	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								

<p><u>Comments:</u> Collected 07/22/2021</p> <p>The ARCOG noted that the TB vials were received from the lab with headspace.</p> <p>EB1 was submitted on ARCOG 622251 in another SDG and was associated with the samples on ARCOG 622252 submitted in this SDG.</p>
<p><u>Validated by:</u> </p>



## Sandia Inorganic Metals Worksheet

ARCO # (s): 622252	SDG # (s): 550467	Matrix: Aqueous
Laboratory Sample IDs: 550467002, -004		
Method/Batch #: <b>3005A/6020B</b> : 2155933/2155935		

ICPMS Mass Cal:  Pass  Fail  NA    ICPMS Resolution:  Pass  Fail  NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ±MDL ug/L (x50)	LLCCV %R	EB1 550314 -011
	Int. ug/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. Cr and Ni only.  
 ICP-MS matrix QC on -002.  
 Ca, Al, Mg and Fe < ICS A

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

550467

Internal Lab		<b>AR/COC</b> <span style="border: 1px solid black; padding: 2px;">622252</span>	
Batch No. <i>N/A</i>		SMO Use	
Project Name: CWL PCCP	Date Samples Shipped: <i>7/22/2021</i>	SMO Authorization: <i>[Signature]</i>	
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <i>333755</i>	SMO Contact Phone: <i>Wendy Palencia/505-844-3132</i>	
Project/Task Number: 195122.10.11.03	Lab Contact: Zac Worsham/843-300-4224	Send Report to SMO: <i>Stephanie Montaño/505-284-2553</i>	
Service Order: CF327-21	Lab Destination: GEL		
	Contract No.: 1983530		

Waste Characterization  
 RMA  
 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					
115392	001	CWL-MW11	513	7/22/21 10:52	GW	G	3x40 ml	HCl	G	SA	VOC-TCE (SW846-8260D)	001
115392	002	CWL-MW11	513	7/22/21 10:54	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	002
115393	001	CWL-MW11	513	7/22/21 10:53	GW	G	3x40 ml	HCl	G	DU	VOC-TCE (SW846-8260B)	003
115393	002	CWL-MW11	513	7/22/21 10:55	GW	P	500 ml	HNO3	G	DU	CHROMIUM, NICKEL (SW846-6020)	004
115394	001	CWL - TB7	NA	7/22/21 10:52	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260D)	005

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			
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>[Init]</i>	SNL/08888/505-844-4013/505-250-7090		Return Samples By:			
	William Gibson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-3307/505-239-7367		Comments: Trip blanks received from lab with head space.			
	Zachary Tenorio	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-8636/505-259-5765					
	Denisha Sanchez	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-845-7829/505-208-1375					
Relinquished by	<i>[Signature]</i>	Org. 8888	Date 7/22/21	Time 1130	Relinquished by	Org.	Date	Time	
Received by	<i>[Signature]</i>	Org. 0618	Date 7/22/21	Time 1130	Received by	Org.	Date	Time	
Relinquished by	<i>[Signature]</i>	Org. 0618	Date 7/22/21	Time 1230	Relinquished by	Org.	Date	Time	
Received by	<i>[Signature]</i>	Org.	Date 7/23/21	Time 715	Received by	Org.	Date	Time	

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

**AR/COC NUMBER 62254**

## Memorandum

Date: September 1, 2021

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622254  
SDG: 550692  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 06.

### Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 8260D (VOCs). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. The CCV %D was >20% but ≤40% with negative bias for trichloroethylene. The associated result for sample 550692002 was a detect and will be **qualified J-,C3**.

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 analyzed within the prescribed holding time and were properly preserved.

### Instrument Tune

All instrument tune requirements were met.

### Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the Summary section and as follows.

The CCV %D was >20% but ≤40% with negative bias for trichloroethylene. The associated results for samples -001 and -004 were non-detect and since no other calibration infractions occurred, will not be qualified.

### **Blanks**

No target analyte was detected in any of 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 recoveries and RPDs met QC acceptance criteria.

It should be noted that the MS/MSD analyses were performed on a waste water sample submitted on ARCOG 622255 in the same SDG.

### **Laboratory Control Sample (LCS)**

All LCS acceptance criteria were met.

### **Detection Limits/Dilutions**

All detection limits were properly reported. The samples were not diluted.

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

TIC reports were not required.

### **Other QC**

A TB and a FB were submitted on ARCOG 622254 and were associated with the sample on the same ARCOG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 09/01/2021

---

## Memorandum

Date: September 1, 2021  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622254  
SDG: 550692  
Laboratory: GEL  
Project/Task: 195122.10.11.03  
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 SMO Procedure AOP 00-03 Rev 06.

### **Summary**

One sample was prepared and analyzed with approved procedures using method EPA 6020B (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

### **Holding Times and Preservation**

The sample was prepared and analyzed within the prescribed holding times and was properly preserved.

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

The ICP-MS tune met QC acceptance criteria.

### **Calibration**

All initial and continuing calibration criteria met QC acceptance criteria.

### **Reporting Limit Verification**

All LLCCV recoveries met QC acceptance criteria.

### **Blanks**

No target analytes were detected in any of 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.

It should be noted that the MS analysis was performed on an SNL sample of similar matrix from another SDG. No data will be qualified.

#### **Laboratory Replicate**

The replicate met all QC acceptance criteria.

It should be noted that the replicate analysis was performed on an SNL sample of similar matrix from another SDG. No data will be qualified.

#### **Laboratory Control Sample (LCS)**

The LCS met all QC acceptance criteria.

#### **Detection Limits/Dilutions**

All detection limits were properly reported. The sample was not diluted.

#### **ICP Interference Check Sample (ICS A and AB)**

Results of the ICS A and AB analyses were not evaluated because the sample concentration for Ca, Mg, Al and Fe were < the ICS value.

#### **ICP Serial Dilution**

The serial dilution met all QC acceptance criteria.

It should be noted that the MS analysis was performed on an SNL sample of similar matrix from another SDG. No data will be qualified.

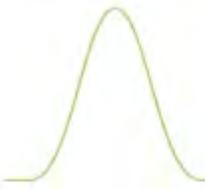
#### **Other QC**

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 09/01/2021



## Sample Findings Summary



AR/COC: 622254

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 8260D	115398-001/CWL-MW10	Trichloroethylene (79-01-6)	J-, C3

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

## Sandia Data Validation Summary Worksheet

ARCOG#: 622254	Site/Project: CWL PCCP	Validation Date: 09/01/2021
SDG #: 550692	Laboratory: GEL Laboratories, LLC	Validator: Linda Thal
Matrix: Aqueous	# of Samples: 4	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								

<p><u>Comments:</u> Collected 07/26/2021</p> <p>The ARCOG noted that the TB vials were received from the lab with headspace.</p>
<p><u>Validated by:</u> </p>



### Sandia Inorganic Metals Worksheet

ARCO # (s): 622254	SDG # (s): 550692	Matrix: Aqueous
Laboratory Sample IDs: 550692003		
Method/Batch #: <b>3005A/6020B</b> : 2155933/2155935		

ICPMS Mass Cal:  Pass  Fail  NA    ICPMS Resolution:  Pass  Fail  NA

Analyte (outliers)	Calibration						MB mg/L	5X Blank mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ±MDL ug/L (x50)	LLCCV %R		
	Int. ug/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. Cr and Ni only.  
 ICP-MS matrix QC on SNL sample 550467002  
 -003 <ICS A for Ca, Mg, Al and Fe

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 5 of 430 SDG: 550692

550692

Internal Lab

Batch No. *NA*

SMO Use

AR/COC 622254

Project Name: CWL PCCP	Date Samples Shipped: <i>7/26/21</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <i>333756</i>	SMO Contact Phone: <i>SMO</i>	
Project/Task Number: 195122.10.11.03	Lab Contact: Zac Worsham/843-300-4224	Wendy Palencia/505-844-3132	
Service Order: CF327-21	Lab Destination: GEL	Send Report to SMO: Stephanie Montaño/505-284-2553	
Contract No.: 1983530			

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

Tech Area: \_\_\_\_\_  
 Building: \_\_\_\_\_ Room: \_\_\_\_\_ Operational Site: \_\_\_\_\_

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
115397	001	CWL - FB2	NA	7/26/21 08:47	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE (SW846-8260B)	<i>001</i>
115398	001	CWL-MW10	515	7/26/21 08:49	GW	G	3x40 ml	HCl	G	SA	VOC-TCE (SW846-8260B)	<i>002</i>
115398	002	CWL-MW10	515	7/26/21 08:50	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	<i>003</i>
115399	001	CWL - TB9	NA	7/26/21 08:47	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260B)	<i>004</i>

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	Special Instructions/QC Requirements:	Conditions on Receipt																			
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:	EDD <input checked="" type="checkbox"/> Yes																				
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"/>																				
<b>Sample Team Members</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Name</th> <th>Signature</th> <th>Init.</th> <th>Company/Organization/Phone/Cell</th> </tr> <tr> <td>Robert Lynch</td> <td><i>[Signature]</i></td> <td><i>RL</i></td> <td>SNL/08888/505-844-4013/505-250-7090</td> </tr> <tr> <td>William Gibson</td> <td><i>[Signature]</i></td> <td><i>WG</i></td> <td>SNL/08888/505-284-3307/505-239-7367</td> </tr> <tr> <td>Zachary Tenorio</td> <td><i>[Signature]</i></td> <td><i>ZT</i></td> <td>SNL/08888/505-845-8636/505-259-5765</td> </tr> <tr> <td>Denisha Sanchez</td> <td><i>[Signature]</i></td> <td><i>DS</i></td> <td>SNL/08888/505-845-7829/505-208-1375</td> </tr> </table>	Name	Signature		Init.	Company/Organization/Phone/Cell	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/08888/505-844-4013/505-250-7090	William Gibson	<i>[Signature]</i>	<i>WG</i>	SNL/08888/505-284-3307/505-239-7367	Zachary Tenorio	<i>[Signature]</i>	<i>ZT</i>	SNL/08888/505-845-8636/505-259-5765	Denisha Sanchez	<i>[Signature]</i>	<i>DS</i>	SNL/08888/505-845-7829/505-208-1375	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Name	Signature	Init.	Company/Organization/Phone/Cell																		
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/08888/505-844-4013/505-250-7090																		
	William Gibson	<i>[Signature]</i>	<i>WG</i>	SNL/08888/505-284-3307/505-239-7367																		
Zachary Tenorio	<i>[Signature]</i>	<i>ZT</i>	SNL/08888/505-845-8636/505-259-5765																			
Denisha Sanchez	<i>[Signature]</i>	<i>DS</i>	SNL/08888/505-845-7829/505-208-1375																			
Comments: Trip blanks received from lab with head space.																						

Relinquished by <i>[Signature]</i> Org. <i>8888</i> Date <i>7-26-21</i> Time <i>0925</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>0608</i> Date <i>7-26-21</i> Time <i>0925</i>	Received by _____ Org. _____ Date _____ Time _____
Relinquished by <i>[Signature]</i> Org. <i>0608</i> Date <i>7-26-21</i> Time <i>1100</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. _____ Date <i>7/27/21</i> Time <i>6:00</i>	Received by _____ Org. _____ Date _____ Time _____

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

**CONTRACT VERIFICATION FORMS**  
**CHEMICAL WASTE LANDFILL**  
**GROUNDWATER MONITORING**  
**JULY 2021**

<b>AR/COC Number</b>	<b>Sample Type</b>
622246	Environmental & Quality Control
622247	Quality Control
622249	Environmental & Quality Control
622251	Quality Control
622252	Environmental & Quality Control
622254	Environmental & Quality Control

Note: The forms in this section include AR/COC numbers for environmental and quality control samples; the AR/COC forms are provided in the Data Validation Reports in this annex. AR/COCs for waste characterization samples (622248, 622250, 622253, and 622255) are included in the contract verification review and associated CVR forms but do not require data validation.

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 622246, 622247 &amp; 622248

Analytical Lab GEL

SDG No. 550175

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		

Line No.	Item	Complete?		If no, explain
		Yes	No	
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 or 1-sigma for bioassay) 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		RPD between sample and duplicate outside acceptance limits for bromide (QC1204868953)

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Matrix spike duplicate RPD data reported and met for all organic samples		X	RPD between PS/PSD outside acceptance range for bromomethane (QC1204877489/491)
	c) Laboratory control sample duplicate RPD data reported and met for other analyses	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		
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 and TO-15) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		All CCV standards did not meet acceptance limits
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668 and 8290) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850 and 8330) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

## 5.0 Data Anomaly Report

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

## 6.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
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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: 08-23-2021 11:42:00

Closed by: Wendy Palencia Date: 08-23-2021 11:42:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 622249, 622250 &amp; 622251

Analytical Lab GEL

SDG No. 550314

*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		

Line No.	Item	Complete?		If no, explain
		Yes	No	
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 or 1-sigma for bioassay) 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	Dichlorodifluoromethane failed recovery limits for PSD (QC1204879416)
3.4	Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
	c) Laboratory control sample duplicate RPD data reported and met for other analyses	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		
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 and TO-15) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		All CCV standards did not meet acceptance limits
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668 and 8290) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850 and 8330) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

### 5.0 Data Anomaly Report

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

### 6.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
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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: 08-24-2021 10:28:00

Closed by: Wendy Palencia Date: 08-24-2021 10:28:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 622252 &amp; 622253

Analytical Lab GEL

SDG No. 550467

*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		

Line No.	Item	Complete?		If no, explain
		Yes	No	
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 or 1-sigma for bioassay) 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		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
	c) Laboratory control sample duplicate RPD data reported and met for other analyses	N/A		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
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 and TO-15) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		All CCV standards did not meet acceptance limits
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668 and 8290) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850 and 8330) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

## 5.0 Data Anomaly Report

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

## 6.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
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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: 08-24-2021 12:05:00

Closed by: Wendy Palencia Date: 08-24-2021 12:05:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 622254 &amp; 622255

Analytical Lab GEL

SDG No. 550692

*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		

Line No.	Item	Complete?		If no, explain
		Yes	No	
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 or 1-sigma for bioassay) 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	1, 1-Dichloroethylene, 1, 2-Dibromo-3-chloropropane, Bromoform and trans-1, 2-Dichloroethylene failed recovery limits for LCS (QC1204880727)
	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		

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
	c) Laboratory control sample duplicate RPD data reported and met for other analyses	N/A		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Acetone detected in CWL - TB10
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 and TO-15) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		All CCV standards did not meet acceptance limits
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668 and 8290) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850 and 8330) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	X		
	b) Continuing calibration provided	X		
	c) ICP interference check sample data provided	X		
	d) ICP serial dilution provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	X		

## 5.0 Data Anomaly Report

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

## 6.0 Problem Resolution

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

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions
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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: 08-30-2021 12:04:00

Closed by: Wendy Palencia Date: 08-30-2021 12:04:00

**ANNEX B**

**Chemical Waste Landfill  
Calendar Year 2021  
Soil-Gas Monitoring Forms and Reports**

**Field Forms**

**Data Validation Reports**

**Contract Verification Forms**

**Certificates of Analysis**

**FIELD SAMPLING FORMS**  
**CHEMICAL WASTE LANDFILL**  
**POST-CLOSURE CARE SOIL-GAS MONITORING**

<b>Form Title</b>	<b>Corresponding Procedure</b>
Soil Vapor Sampling Log Form	FOP 08-22
Analysis Request and Chain of Custody*	LOP 94-03

\*Completed AR/COC forms are provided in the Data Validation Reports in this Annex.

### Soil Vapor Sampling Log Form

Location	Date	Time	Canister #	PID (ppm)	Flow Rate (cft/min)	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-FB1	2/1/21	0906	12111	NA	NA	-23	-8	FB
CWL-UI1-Port 3-40	2/1/21	0911	↓	↓	8	NA	NA	
	↓	↓	↓	↓	↓	↓	↓	
	↓	0911	↓	↓	↓	↓	↓	
	↓	0912	7759	NA	NA	-25	-8	
CWL-UI1-Port 2-80	2/1/21	0913	↓	↓	10	NA	NA	
	↓	↓	↓	↓	↓	↓	↓	
	↓	0913	↓	↓	↓	↓	↓	
	↓	0914	10011	NA	NA	-23	-8	
CWL-UI1-Port 1-120	2/1/21	0915	↓	↓	10	NA	NA	
	↓	↓	↓	↓	↓	↓	↓	
	↓	0916	↓	↓	↓	↓	↓	
	↓	0917	11144	NA	NA	-24	-8	

**Field Notes:** OB Split Sampling Port-1, 120'

### Soil Vapor Sampling Log Form

Location	Date	Time	Canister #	PID (ppm)	Flow Rate (L/FT <sup>3</sup> )	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-FB2	2/1/21	1053	11696	NA	NA	-25	-8	FB
CWL-UI2-Port 3-36	2/1/21	1058	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1058	↓	↓	↓	↓	↓	
		1059	09613	NA	NA	-23	-8	
CWL-UI2-Port 2-78	2/1/21	1100	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1100	↓	↓	↓	↓	↓	
		1101	34002044	NA	NA	-24	-8	
CWL-UI2-Port 1-136	2/1/21	1102	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1102	↓	↓	↓	↓	↓	
		1103	34000021	NA	NA	-24	-8	

**Field Notes:** OBSplit Sampling port 1-136!

## Soil Vapor Sampling Log Form

Location	Date	Time	Canister #	PID (ppm)	Flow Rate (cuff ft <sup>3</sup> /hr)	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-FB3	2/1/21	0837	34001574	NA	NA	-23	-8	FB
CWL-D1-Port 5-100	2/1/21	0840	↓	↓	8	NA	NA	
		0841	↓	↓	↓	↓	↓	
		0842	34001378	NA	NA	-25	-8	
CWL-D1-Port 4-160	2/1/21	0843	↓	↓	8	NA	NA	
		0844	↓	↓	↓	↓	↓	
		0845	10313	NA	NA	-23	-8	
CWL-D1-Port 3-240	2/1/21	0846	↓	↓	8	NA	NA	
		0848	↓	↓	↓	↓	↓	
		0849	10228	NA	NA	-24	-8	
CWL-D1-Port 2-350	2/1/21	0850	↓	↓	8	NA	NA	
		0852	↓	↓	↓	↓	↓	
		0853	09935	NA	NA	-23	-8	
CWL-D1-Port 1-470	2/1/21	0855	↓	↓	10	NA	NA	
		0858	↓	↓	↓	↓	↓	
		0859	10093	NA	NA	-22	-8	

Field Notes: OB Split Sampling CWL-D1-Port 1,470' + Port 2,350'.

## Soil Vapor Sampling Log Form

Location	Date	Time	Canister #	PID (ppm)	Flow Rate (cc/PT hr)	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-FB4	2/1/21	1008	11152	NA	NA	-24	-8	FB
CWL-D2-Port 5-120	2/1/21	1021	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1022	↓	↓	↓	↓	↓	
		1023	11982	NA	NA	-24	-8	
CWL-D2-Port 4-240	2/1/21	1024	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1025	↓	↓	↓	↓	↓	
		1026	34000382	NA	NA	-23	-8	
CWL-D2-Port 3-350	2/1/21	1027	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1029	↓	↓	↓	↓	↓	
		1030	34000554	NA	NA	-24	-8	
CWL-D2-Port 2-440	2/1/21	1030	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1032	↓	↓	↓	↓	↓	
		1033	09979	NA	NA	-23	-8	
CWL-D2-Port 1-470	2/1/21	1034	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1036	↓	↓	↓	↓	↓	
		1037	11024	NA	NA	-23	-8	

Field Notes: OBSplit Sampling D2- port 1+2.

## Soil Vapor Sampling Log Form

Location	Date	Time	Canister #	PID (ppm)	Flow Rate (CFM)	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-FB5	2/1/21	0926	34000446	NA	NA	-24	-8	FB
CWL-D3-Port 5-120	2/1/21	0935	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0936	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		0937	34000475	NA	NA	-23	-8	
CWL-D3-Port 4-170	2/1/21	0938	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0939	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		0940	34000306	NA	NA	-24	-8	
CWL-D3-Port 3-350	2/1/21	0941	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0943	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		0944	34000073	NA	NA	-23	-8	
CWL-D3-Port 2-440	2/1/21	0945	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0947	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		0948	34001473	NA	NA	-24	-8	SA
		↓	↓	↓	↓	↓	↓	
		0948	34000549	NA	NA	-24	-8	DU
CWL-D3-Port 1-480	2/1/21	0951	↓	↓	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0954	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		0955	10100	NA	NA	-25	-8	SA
		↓	↓	↓	↓	↓	↓	
		0955	34002107	NA	NA	-25	-8	DU

Field Notes: OB spit sampling port-1,480' Du. sampling port-2,440'

DU Samples Taken @ Port 2-440' & Port 1-480'

## **SUMMARY SHEET FOR FEBRUARY 2021 SAMPLES**

**Sample Summary for Chemical Waste Landfill Soil-Gas Monitoring  
February 2021**

Well ID	Sample Date	Sample ID / Port	SUMMA Number	ARCOG	Sample Number	Sample Type	Associated Equipment Blank (ARCOG #/Sample #)	Associated Trip Blank (ARCOG #/Sample #)	Associated Field Blank (ARCOG #/Sample #)	Comments
<b>Chemical Waste Landfill Soil Vapor Monitoring: Project Task Number 195122.10.11.03 / Service Order Number CF 327-20</b>										
CWL-UI1	1-Feb-21	CWL-UI1-40	7759	621709	114216	Environmental	n/a	n/a	621709 / 114215	
		CWL-UI1-80	10011		114217	Environmental				
		CWL-UI1-120	11144		114218	Environmental				
		CWL-FB1	12111		114215	Field QC				n/a
CWL-UI2	1-Feb-21	CWL-UI2-36	09613	621710	114220	Environmental	n/a	n/a	621710 / 114219	
		CWL-UI2-76	34002044		114221	Environmental				
		CWL-UI2-136	34000021		114222	Environmental				
		CWL-FB2	11696		114219	Field QC				n/a
CWL-D1	1-Feb-21	CWL-D1-100	34001378	621711	114228	Environmental	n/a	n/a	621711 / 114227	
		CWL-D1-160	10313		114229	Environmental				
		CWL-D1-240	10228		114230	Environmental				
		CWL-D1-350	09935		114231	Environmental				
		CWL-D1-470	10093		114232	Environmental				
		CWL-FB 3	34001574		114227	Field QC				n/a
CWL-D2	1-Feb-21	CWL-D2-120	11982	621712	114234	Environmental	n/a	n/a	621712 / 114233	
		CWL-D2-240	34000382		114235	Environmental				
		CWL-D2-350	34000554		114236	Environmental				
		CWL-D2-440	09979		114237	Environmental				
		CWL-D2-470	11024		114238	Environmental				
		CWL-FB 4	11152		114233	Field QC				n/a
CWL-D3	1-Feb-21	CWL-D3-120	34000475	621713	114240	Environmental	n/a	n/a	621713 / 114239	
		CWL-D3-170	34000306		114241	Environmental				
		CWL-D3-350	34000073		114242	Environmental				
		CWL-D3-440	34001473		114243	Environmental				
		CWL-D3-440	34000549		114244	Duplicate				
		CWL-D3-480	10100		114245	Environmental				
		CWL-D3-480	34002107		114246	Duplicate				
		CWL-FB 5	34000446		114239	Field QC				n/a

**DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**

**CHEMICAL WASTE LANDFILL**

**SOIL-GAS MONITORING**

**FEBRUARY 2021**

**AR/COC NUMBERS 621709, 621710, 621711, 621712, 621713**

## Memorandum

Date: February 24, 2021

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 621709, 621710, 621711, 621712 and 621713  
SDG: 140-21895  
Laboratory: Eurofins TestAmerica, Knoxville  
Project/Task: 195122.10.11.03  
Analysis: VOCs by method TO-15

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM SMO Procedure AOP 00-03 Rev 6.

### Summary

Twenty-eight 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. Benzene was detected at  $\leq$  the PQL in the MB associated with samples 140-21895-1, -5, -9 and -15. All associated sample results were detects  $\leq$  the PQL and will be **qualified U,B**; non-detect at their respective PQLs.
2. Carbon disulfide was detected at  $\leq$  the PQL in the MB and FB1 associated with samples -2 through -4. The associated sample results were detects  $\leq$  the PQL and will be **qualified U,B,B2**; non-detect at their respective PQLs.
3. Carbon disulfide was detected at  $\leq$  the PQL in the MB and FB3 associated with samples -10 through -14. The associated sample results were detects  $\leq$  the PQL and will be **qualified U,B,B2**; non-detect at their respective PQLs.
4. Carbon disulfide was detected at  $\leq$  the PQL in the MB associated with samples -6 through -8, -16 through -18 and -21. The associated sample results were detects  $\leq$  the PQL and will be **qualified U,B**; non-detect at their respective PQLs.
5. Chlorobenzene was detected at  $\leq$  the PQL in FB1, sample -1, associated with samples -2 through -4. The associated results for samples -3 and -4 were detects  $\leq$  the PQL and will be **qualified U,B2**; non-detect at their respective PQLs.

6. Chlorobenzene was detected at  $\leq$  the PQL in FB2, sample -5, associated with samples -6 through -8. The associated result for sample -8 was a detect  $\leq$  the PQL and will be **qualified 27U,B2**; non-detect at the PQL.
7. Methylene chloride was detected at  $>$  the PQL in FB4, sample -15, associated with samples -16 through -20. The associated result for sample -19 was a detect  $>$  the PQL but  $\leq 2X$  the FB value and will be **qualified 0.62U,B2**; non-detect at the sample result.
8. Tetrachloroethene was detected at  $\leq$  the PQL in FB4, sample -15, associated with samples -16 through -20. The associated result for sample -19 was a detect  $\leq$  the PQL be **qualified 0.092U,B2**; non-detect at the PQL.
9. Acetone was detected at  $\leq$  the PQL in FB5, sample -21, associated with samples -22 through -28. The associated results for samples -25 through -27 were detects  $>$  the PQL but  $\leq 10X$  the FB value and will be **qualified J+,B2**. The associated result for sample -28 was a detect  $<$  the PQL and will be **qualified 2.2U,B2**; non-detect at the PQL.
10. Benzene was detected at  $\leq$  the PQL in FB5, sample -21, associated with samples -22 through -28. The associated results for samples -22 through -24 were detects  $\leq$  the PQL and will be **qualified U,B2**; non-detect at the PQL.
11. 2-Butanone was detected at  $\leq$  the PQL in FB5, sample -21, associated with samples -22 through -28. The associated results for samples -25, -27 and -28 were detects  $\leq$  the PQL and will be **qualified U,B2**; non-detect at the PQL. The associated result for sample -26 was a detect  $>$  the PQL but  $\leq 10X$  the FB value and will be **qualified J+,B2**.
12. Chlorobenzene was detected at  $\leq$  the PQL in FB5, sample -21, associated with samples -22 through -28. The associated results for samples -23, and -25 through -27 were detects  $\leq$  the PQL and will be **qualified U,B2**; non-detect at the PQL.
13. 2-Hexanone was detected at  $\leq$  the PQL in FB5, sample -21, associated with samples -22 through -28. The associated results for samples -25 through -27 were detects  $\leq$  the PQL and will be **qualified U,B2**; non-detect at the PQL.
14. 4-Methyl-2-pentanone was detected at  $\leq$  the PQL in FB5, sample -21, associated with samples -22 through -28. The associated result for sample -25 was a detect  $>$  the PQL but  $\leq 5X$  the FB value and will be **qualified J+,B2**.
15. Neither a laboratory duplicate nor an LCS/LCSD was associated with the batches containing samples -1, -5, -9 and -15, and -20, -22 and -23. All associated sample results that were detects *except* the trichloroethene result for sample -23 which was analyzed at a dilution in a different batch will be **qualified J,RP1** and those that were non-detect will be **qualified UJ,RP1**.

Data are acceptable except as noted above 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.

## **Instrument Tune**

All instrument tune requirements were met.

## **Calibration**

The initial calibration and continuing calibration data met QC acceptance criteria except as follows.

For the CCV associated with samples -19, -24 through -28, the %D was >30% and positive for hexachlorobutadiene. The associated sample results were non-detect and will not be qualified.

## **Blanks**

No target analytes were detected in the blanks except as noted above in the Summary section and as follows.

Benzene was detected at  $\leq$  the PQL in FB1, sample -1, associated with samples -2 through -4; FB2, sample -5, associated with samples -6 through -8; FB3, sample -9, associated with samples -10 through -14 and FB4, sample -15, associated with samples -16 through -20. All FB results were qualified non-detect due to MB contamination and will not be applied to the associated field sample results.

Methylene chloride was detected at  $>$  the PQL and acetone, 2-butanone, carbon disulfide, chlorobenzene, tetrachloroethene, toluene and trichlorofluoromethane were detected at  $\leq$  the PQL in FB1, sample -1, associated with samples -2 through -4. The associated sample results for acetone, 2-butanone, methylene chloride, toluene and the chlorobenzene result for sample -2 were non-detect and will not be qualified. The associated sample results for tetrachloroethene and trichlorofluoromethane were detects  $>$  the PQL and  $>5X$  the FB value and will not be qualified.

Acetone, 2-butanone and chlorobenzene were detected at  $\leq$  the PQL in FB2, sample -5, associated with samples -6 through -8. The associated sample results for acetone and 2-butanone and the chlorobenzene results for samples -6 and -7 were non-detect and will not be qualified.

1,2,4-Trimethylbenzene; m,p-xylene and o-xylene were detected at  $>$  the PQL and ethylbenzene; 4-ethyltoluene; toluene and 1,3,5-trimethylbenzene were detected at  $\leq$  the PQL in FB3, sample -9, associated with samples -10 through -14. The associated sample results were non-detect and will not be qualified.

Methylene chloride was detected at  $>$  the PQL and tetrachloroethene, toluene and m,p-xylene were detected at  $\leq$  the PQL in FB4, sample -15, associated with samples -16 through -20. All associated sample results *except* the methylene chloride and tetrachloroethene results for sample -19 were non-detect and will not be qualified.

Acetone, benzene, 2-butanone, carbon disulfide, chlorobenzene, 2-hexanone and 4-methyl-2-pentanone were detected at  $\leq$  the PQL in FB5, sample -21, associated with samples -22 through -28. The FB result for carbon disulfide was qualified non-detect due to MB contamination and will not be applied to the associated field sample results. The acetone and 2-butanone results for samples -22 through -24, the chlorobenzene results for samples -22, -24, and -28, the 2-hexanone results for samples -22 through -24 and -28 and the 4-methyl-2-pentanone results for all associated samples *except* sample -25 were non-detect and will not be qualified. The benzene results for samples -25 through -28 were detects  $>$  the PQL and  $>5X$  the FB value 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)**

The LCS for all batches met QC acceptance criteria.

### **Laboratory Replicate**

Laboratory replicates met QC acceptance criteria except as noted above in the Summary section.

### **Detection Limits/Dilutions**

All detection limits were properly reported and correctly adjusted for summa canister dilutions. The following canister dilutions were performed for all target analytes.

Sample -1 (1.82X); -2 (15.55X); -3 (18.7X); -4 (16.51X); -5 (1.96X); -6 (14.77X); -7 (14.26X); -8 (16.84X); -9 (1.91X); -10 (16.34X); -11 (19.37X); -12 (50.46X); -13 (17.83X); -14 (1.91X); -15 (1.75X); -16 (50.63X); -17 (51.62X); -18 (16.29X); -19 (1.84X); -20 (18.58X); -21 (1.87X); -22 (17.77X); -23 (5.57X), -24 (1.9X), -25 (1.73X), -26 (1.73X), -27 (1.7X) and -28 (1.78X).

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

TIC reports were not required.

### **Other QC**

Mass spectra acceptability were verified during data validation and met QC acceptance criteria. Sample results < the PQL with missing ions or poor ratios were qualified J by the laboratory and were not further qualified during data validation.

FBs were submitted with each ARCOG and were associated with the samples on the same ARCOG. Two field duplicate pairs were submitted with ARCOG 621713. 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:** Linda Thal

**Level:** I

**Date:** 03/01/2021



## Sample Findings Summary



AR/COC: 621709, 621710, 621711, 621712, 621713

Page 1 of 16

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
TO15_LL_PF	114215-001/CWL-FB1	1,1,1-TRICHLOROETHANE (71-55-6)	UJ, RP1
	114215-001/CWL-FB1	1,1,2,2-TETRACHLOROETHANE (79-34-5)	UJ, RP1
	114215-001/CWL-FB1	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	UJ, RP1
	114215-001/CWL-FB1	1,1,2-TRICHLOROETHANE (79-00-5)	UJ, RP1
	114215-001/CWL-FB1	1,1-DICHLOROETHANE (75-34-3)	UJ, RP1
	114215-001/CWL-FB1	1,1-DICHLOROETHENE (75-35-4)	UJ, RP1
	114215-001/CWL-FB1	1,2,4-TRICHLOROBENZENE (120-82-1)	UJ, RP1
	114215-001/CWL-FB1	1,2,4-TRIMETHYLBENZENE (95-63-6)	UJ, RP1
	114215-001/CWL-FB1	1,2-DIBROMOETHANE (EDB) (106-93-4)	UJ, RP1
	114215-001/CWL-FB1	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (76-14-2)	UJ, RP1
	114215-001/CWL-FB1	1,2-DICHLOROBENZENE (95-50-1)	UJ, RP1
	114215-001/CWL-FB1	1,2-DICHLOROETHANE (107-06-2)	UJ, RP1
	114215-001/CWL-FB1	1,2-DICHLOROPROPANE (78-87-5)	UJ, RP1
	114215-001/CWL-FB1	1,3,5-TRIMETHYLBENZENE (108-67-8)	UJ, RP1
	114215-001/CWL-FB1	1,3-DICHLOROBENZENE (541-73-1)	UJ, RP1
	114215-001/CWL-FB1	1,4-DICHLOROBENZENE (106-46-7)	UJ, RP1
	114215-001/CWL-FB1	2-BUTANONE (MEK) (78-93-3)	J, RP1
	114215-001/CWL-FB1	2-HEXANONE (591-78-6)	UJ, RP1
	114215-001/CWL-FB1	4-ETHYLTOLUENE (622-96-8)	UJ, RP1
	114215-001/CWL-FB1	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114215-001/CWL-FB1	ACETONE (67-64-1)	J, RP1
	114215-001/CWL-FB1	BENZENE (71-43-2)	0.091UJ, B,RP1
	114215-001/CWL-FB1	BENZYL CHLORIDE (100-44-7)	UJ, RP1
	114215-001/CWL-FB1	BROMODICHLOROMETHANE (75-27-4)	UJ, RP1
	114215-001/CWL-FB1	BROMOFORM (75-25-2)	UJ, RP1
	114215-001/CWL-FB1	BROMOMETHANE (74-83-9)	UJ, RP1
	114215-001/CWL-FB1	CARBON DISULFIDE (75-15-0)	J, RP1
	114215-001/CWL-FB1	CARBON TETRACHLORIDE (56-23-5)	UJ, RP1
	114215-001/CWL-FB1	CHLOROBENZENE (108-90-7)	J, RP1
	114215-001/CWL-FB1	CHLOROETHANE (75-00-3)	UJ, RP1
	114215-001/CWL-FB1	CHLOROFORM (67-66-3)	UJ, RP1
	114215-001/CWL-FB1	CHLOROMETHANE (74-87-3)	UJ, RP1
	114215-001/CWL-FB1	CIS-1,2-DICHLOROETHENE (156-59-2)	UJ, RP1
	114215-001/CWL-FB1	CIS-1,3-DICHLOROPROPENE (10061-01-5)	UJ, RP1
	114215-001/CWL-FB1	DIBROMOCHLOROMETHANE (124-48-1)	UJ, RP1
	114215-001/CWL-FB1	DICHLORODIFLUOROMETHANE (75-71-8)	UJ, RP1
	114215-001/CWL-FB1	ETHYLBENZENE (100-41-4)	UJ, RP1
	114215-001/CWL-FB1	HEXACHLOROBUTADIENE (87-68-3)	UJ, RP1
	114215-001/CWL-FB1	M,P-XYLENE (179601-23-1)	UJ, RP1
	114215-001/CWL-FB1	METHYLENE CHLORIDE (75-09-2)	J, RP1
	114215-001/CWL-FB1	O-XYLENE (95-47-6)	UJ, RP1
	114215-001/CWL-FB1	STYRENE (100-42-5)	UJ, RP1
	114215-001/CWL-FB1	TETRACHLOROETHENE (127-18-4)	J, RP1
	114215-001/CWL-FB1	TOLUENE (108-88-3)	J, RP1
	114215-001/CWL-FB1	TRANS-1,2-DICHLOROETHENE (156-60-5)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114215-001/CWL-FB1	TRANS-1,3-DICHLOROPROPENE (10061-02-6)	UJ, RP1
	114215-001/CWL-FB1	TRICHLOROETHENE (79-01-6)	UJ, RP1
	114215-001/CWL-FB1	TRICHLOROFLUOROMETHANE (75-69-4)	J, RP1
	114215-001/CWL-FB1	VINYL ACETATE (108-05-4)	UJ, RP1
	114215-001/CWL-FB1	VINYL CHLORIDE (75-01-4)	UJ, RP1
	114216-001/CWL-UI1-40	CARBON DISULFIDE (75-15-0)	78U, B,B2
	114217-001/CWL-UI1-80	CARBON DISULFIDE (75-15-0)	62U, B,B2
	114217-001/CWL-UI1-80	CHLOROBENZENE (108-90-7)	25U, B2
	114218-001/CWL-UI1-120	CARBON DISULFIDE (75-15-0)	83U, B,B2
	114218-001/CWL-UI1-120	CHLOROBENZENE (108-90-7)	33U, B2
	114219-001/CWL-FB2	1,1,1-TRICHLOROETHANE (71-55-6)	UJ, RP1
	114219-001/CWL-FB2	1,1,2,2-TETRACHLOROETHANE (79-34-5)	UJ, RP1
	114219-001/CWL-FB2	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	UJ, RP1
	114219-001/CWL-FB2	1,1,2-TRICHLOROETHANE (79-00-5)	UJ, RP1
	114219-001/CWL-FB2	1,1-DICHLOROETHANE (75-34-3)	UJ, RP1
	114219-001/CWL-FB2	1,1-DICHLOROETHENE (75-35-4)	UJ, RP1
	114219-001/CWL-FB2	1,2,4-TRICHLOROBENZENE (120-82-1)	UJ, RP1
	114219-001/CWL-FB2	1,2,4-TRIMETHYLBENZENE (95-63-6)	UJ, RP1
	114219-001/CWL-FB2	1,2-DIBROMOETHANE (EDB) (106-93-4)	UJ, RP1
	114219-001/CWL-FB2	1,2-DICHLORO-1,1,2,2-TETRAFLUROETHANE (76-14-2)	UJ, RP1
	114219-001/CWL-FB2	1,2-DICHLOROBENZENE (95-50-1)	UJ, RP1
	114219-001/CWL-FB2	1,2-DICHLOROETHANE (107-06-2)	UJ, RP1
	114219-001/CWL-FB2	1,2-DICHLOROPROPANE (78-87-5)	UJ, RP1
	114219-001/CWL-FB2	1,3,5-TRIMETHYLBENZENE (108-67-8)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114219-001/CWL-FB2	1,3-DICHLOROBENZENE (541-73-1)	UJ, RP1
	114219-001/CWL-FB2	1,4-DICHLOROBENZENE (106-46-7)	UJ, RP1
	114219-001/CWL-FB2	2-BUTANONE (MEK) (78-93-3)	J, RP1
	114219-001/CWL-FB2	2-HEXANONE (591-78-6)	UJ, RP1
	114219-001/CWL-FB2	4-ETHYLTOLUENE (622-96-8)	UJ, RP1
	114219-001/CWL-FB2	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	UJ, RP1
	114219-001/CWL-FB2	ACETONE (67-64-1)	J, RP1
	114219-001/CWL-FB2	BENZENE (71-43-2)	0.098UJ, B,RP1
	114219-001/CWL-FB2	BENZYL CHLORIDE (100-44-7)	UJ, RP1
	114219-001/CWL-FB2	BROMODICHLOROMETHANE (75- 27-4)	UJ, RP1
	114219-001/CWL-FB2	BROMOFORM (75-25-2)	UJ, RP1
	114219-001/CWL-FB2	BROMOMETHANE (74-83-9)	UJ, RP1
	114219-001/CWL-FB2	CARBON DISULFIDE (75-15-0)	UJ, RP1
	114219-001/CWL-FB2	CARBON TETRACHLORIDE (56-23-5)	UJ, RP1
	114219-001/CWL-FB2	CHLOROBENZENE (108-90-7)	J, RP1
	114219-001/CWL-FB2	CHLOROETHANE (75-00-3)	UJ, RP1
	114219-001/CWL-FB2	CHLOROFORM (67-66-3)	UJ, RP1
	114219-001/CWL-FB2	CHLOROMETHANE (74-87-3)	UJ, RP1
	114219-001/CWL-FB2	CIS-1,2-DICHLOROETHENE (156-59- 2)	UJ, RP1
	114219-001/CWL-FB2	CIS-1,3-DICHLOROPROPENE (10061- 01-5)	UJ, RP1
	114219-001/CWL-FB2	DIBROMOCHLOROMETHANE (124- 48-1)	UJ, RP1
	114219-001/CWL-FB2	DICHLORODIFLUOROMETHANE (75- 71-8)	UJ, RP1
	114219-001/CWL-FB2	ETHYLBENZENE (100-41-4)	UJ, RP1
	114219-001/CWL-FB2	HEXACHLOROBUTADIENE (87-68-3)	UJ, RP1
	114219-001/CWL-FB2	M,P-XYLENE (179601-23-1)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114219-001/CWL-FB2	METHYLENE CHLORIDE (75-09-2)	UJ, RP1
	114219-001/CWL-FB2	O-XYLENE (95-47-6)	UJ, RP1
	114219-001/CWL-FB2	STYRENE (100-42-5)	UJ, RP1
	114219-001/CWL-FB2	TETRACHLOROETHENE (127-18-4)	UJ, RP1
	114219-001/CWL-FB2	TOLUENE (108-88-3)	UJ, RP1
	114219-001/CWL-FB2	TRANS-1,2-DICHLOROETHENE (156-60-5)	UJ, RP1
	114219-001/CWL-FB2	TRANS-1,3-DICHLOROPROPENE (10061-02-6)	UJ, RP1
	114219-001/CWL-FB2	TRICHLOROETHENE (79-01-6)	UJ, RP1
	114219-001/CWL-FB2	TRICHLOROFLUOROMETHANE (75-69-4)	UJ, RP1
	114219-001/CWL-FB2	VINYL ACETATE (108-05-4)	UJ, RP1
	114219-001/CWL-FB2	VINYL CHLORIDE (75-01-4)	UJ, RP1
	114220-001/CWL-UI2-36	CARBON DISULFIDE (75-15-0)	74U, B
	114221-001/CWL-UI2-76	CARBON DISULFIDE (75-15-0)	57U, B
	114222-001/CWL-UI2-136	CARBON DISULFIDE (75-15-0)	67U, B
	114222-001/CWL-UI2-136	CHLOROBENZENE (108-90-7)	27U, B2
	114227-001/CWL-FB3	1,1,1-TRICHLOROETHANE (71-55-6)	UJ, RP1
	114227-001/CWL-FB3	1,1,2,2-TETRACHLOROETHANE (79-34-5)	UJ, RP1
	114227-001/CWL-FB3	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	UJ, RP1
	114227-001/CWL-FB3	1,1,2-TRICHLOROETHANE (79-00-5)	UJ, RP1
	114227-001/CWL-FB3	1,1-DICHLOROETHANE (75-34-3)	UJ, RP1
	114227-001/CWL-FB3	1,1-DICHLOROETHENE (75-35-4)	UJ, RP1
	114227-001/CWL-FB3	1,2,4-TRICHLOROBENZENE (120-82-1)	UJ, RP1
	114227-001/CWL-FB3	1,2,4-TRIMETHYLBENZENE (95-63-6)	J, RP1
	114227-001/CWL-FB3	1,2-DIBROMOETHANE (EDB) (106-93-4)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114227-001/CWL-FB3	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (76-14-2)	UJ, RP1
	114227-001/CWL-FB3	1,2-DICHLOROBENZENE (95-50-1)	UJ, RP1
	114227-001/CWL-FB3	1,2-DICHLOROETHANE (107-06-2)	UJ, RP1
	114227-001/CWL-FB3	1,2-DICHLOROPROPANE (78-87-5)	UJ, RP1
	114227-001/CWL-FB3	1,3,5-TRIMETHYLBENZENE (108-67-8)	J, RP1
	114227-001/CWL-FB3	1,3-DICHLOROBENZENE (541-73-1)	UJ, RP1
	114227-001/CWL-FB3	1,4-DICHLOROBENZENE (106-46-7)	UJ, RP1
	114227-001/CWL-FB3	2-BUTANONE (MEK) (78-93-3)	UJ, RP1
	114227-001/CWL-FB3	2-HEXANONE (591-78-6)	UJ, RP1
	114227-001/CWL-FB3	4-ETHYLTOLUENE (622-96-8)	J, RP1
	114227-001/CWL-FB3	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	UJ, RP1
	114227-001/CWL-FB3	ACETONE (67-64-1)	UJ, RP1
	114227-001/CWL-FB3	BENZENE (71-43-2)	0.096UJ, B,RP1
	114227-001/CWL-FB3	BENZYL CHLORIDE (100-44-7)	UJ, RP1
	114227-001/CWL-FB3	BROMODICHLOROMETHANE (75-27-4)	UJ, RP1
	114227-001/CWL-FB3	BROMOFORM (75-25-2)	UJ, RP1
	114227-001/CWL-FB3	BROMOMETHANE (74-83-9)	UJ, RP1
	114227-001/CWL-FB3	CARBON DISULFIDE (75-15-0)	J, RP1
	114227-001/CWL-FB3	CARBON TETRACHLORIDE (56-23-5)	UJ, RP1
	114227-001/CWL-FB3	CHLOROBENZENE (108-90-7)	UJ, RP1
	114227-001/CWL-FB3	CHLOROETHANE (75-00-3)	UJ, RP1
	114227-001/CWL-FB3	CHLOROFORM (67-66-3)	UJ, RP1
	114227-001/CWL-FB3	CHLOROMETHANE (74-87-3)	UJ, RP1
	114227-001/CWL-FB3	CIS-1,2-DICHLOROETHENE (156-59-2)	UJ, RP1
	114227-001/CWL-FB3	CIS-1,3-DICHLOROPROPENE (10061-01-5)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114227-001/CWL-FB3	DIBROMOCHLOROMETHANE (124-48-1)	UJ, RP1
	114227-001/CWL-FB3	DICHLORODIFLUOROMETHANE (75-71-8)	UJ, RP1
	114227-001/CWL-FB3	ETHYLBENZENE (100-41-4)	J, RP1
	114227-001/CWL-FB3	HEXACHLOROBUTADIENE (87-68-3)	UJ, RP1
	114227-001/CWL-FB3	M,P-XYLENE (179601-23-1)	J, RP1
	114227-001/CWL-FB3	METHYLENE CHLORIDE (75-09-2)	UJ, RP1
	114227-001/CWL-FB3	O-XYLENE (95-47-6)	J, RP1
	114227-001/CWL-FB3	STYRENE (100-42-5)	UJ, RP1
	114227-001/CWL-FB3	TETRACHLOROETHENE (127-18-4)	UJ, RP1
	114227-001/CWL-FB3	TOLUENE (108-88-3)	J, RP1
	114227-001/CWL-FB3	TRANS-1,2-DICHLOROETHENE (156-60-5)	UJ, RP1
	114227-001/CWL-FB3	TRANS-1,3-DICHLOROPROPENE (10061-02-6)	UJ, RP1
	114227-001/CWL-FB3	TRICHLOROETHENE (79-01-6)	UJ, RP1
	114227-001/CWL-FB3	TRICHLOROFLUOROMETHANE (75-69-4)	UJ, RP1
	114227-001/CWL-FB3	VINYL ACETATE (108-05-4)	UJ, RP1
	114227-001/CWL-FB3	VINYL CHLORIDE (75-01-4)	UJ, RP1
	114228-001/CWL-D1-100	CARBON DISULFIDE (75-15-0)	82U, B,B2
	114229-001/CWL-D1-160	CARBON DISULFIDE (75-15-0)	97U, B,B2
	114230-001/CWL-D1-240	CARBON DISULFIDE (75-15-0)	130U, B,B2
	114231-001/CWL-D1-350	CARBON DISULFIDE (75-15-0)	89U, B,B2
	114232-001/CWL-D1-470	CARBON DISULFIDE (75-15-0)	3.8U, B,B2
	114233-001/CWL-FB4	1,1,1-TRICHLOROETHANE (71-55-6)	UJ, RP1
	114233-001/CWL-FB4	1,1,2,2-TETRACHLOROETHANE (79-34-5)	UJ, RP1
	114233-001/CWL-FB4	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114233-001/CWL-FB4	1,1,2-TRICHLOROETHANE (79-00-5)	UJ, RP1
	114233-001/CWL-FB4	1,1-DICHLOROETHANE (75-34-3)	UJ, RP1
	114233-001/CWL-FB4	1,1-DICHLOROETHENE (75-35-4)	UJ, RP1
	114233-001/CWL-FB4	1,2,4-TRICHLOROBENZENE (120-82-1)	UJ, RP1
	114233-001/CWL-FB4	1,2,4-TRIMETHYLBENZENE (95-63-6)	UJ, RP1
	114233-001/CWL-FB4	1,2-DIBROMOETHANE (EDB) (106-93-4)	UJ, RP1
	114233-001/CWL-FB4	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (76-14-2)	UJ, RP1
	114233-001/CWL-FB4	1,2-DICHLOROBENZENE (95-50-1)	UJ, RP1
	114233-001/CWL-FB4	1,2-DICHLOROETHANE (107-06-2)	UJ, RP1
	114233-001/CWL-FB4	1,2-DICHLOROPROPANE (78-87-5)	UJ, RP1
	114233-001/CWL-FB4	1,3,5-TRIMETHYLBENZENE (108-67-8)	UJ, RP1
	114233-001/CWL-FB4	1,3-DICHLOROBENZENE (541-73-1)	UJ, RP1
	114233-001/CWL-FB4	1,4-DICHLOROBENZENE (106-46-7)	UJ, RP1
	114233-001/CWL-FB4	2-BUTANONE (MEK) (78-93-3)	UJ, RP1
	114233-001/CWL-FB4	2-HEXANONE (591-78-6)	UJ, RP1
	114233-001/CWL-FB4	4-ETHYLTOLUENE (622-96-8)	UJ, RP1
	114233-001/CWL-FB4	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	UJ, RP1
	114233-001/CWL-FB4	ACETONE (67-64-1)	UJ, RP1
	114233-001/CWL-FB4	BENZENE (71-43-2)	0.088UJ, B,RP1
	114233-001/CWL-FB4	BENZYL CHLORIDE (100-44-7)	UJ, RP1
	114233-001/CWL-FB4	BROMODICHLOROMETHANE (75-27-4)	UJ, RP1
	114233-001/CWL-FB4	BROMOFORM (75-25-2)	UJ, RP1
	114233-001/CWL-FB4	BROMOMETHANE (74-83-9)	UJ, RP1
	114233-001/CWL-FB4	CARBON DISULFIDE (75-15-0)	UJ, RP1
	114233-001/CWL-FB4	CARBON TETRACHLORIDE (56-23-5)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114233-001/CWL-FB4	CHLOROBENZENE (108-90-7)	UJ, RP1
	114233-001/CWL-FB4	CHLOROETHANE (75-00-3)	UJ, RP1
	114233-001/CWL-FB4	CHLOROFORM (67-66-3)	UJ, RP1
	114233-001/CWL-FB4	CHLOROMETHANE (74-87-3)	UJ, RP1
	114233-001/CWL-FB4	CIS-1,2-DICHLOROETHENE (156-59-2)	UJ, RP1
	114233-001/CWL-FB4	CIS-1,3-DICHLOROPROPENE (10061-01-5)	UJ, RP1
	114233-001/CWL-FB4	DIBROMOCHLOROMETHANE (124-48-1)	UJ, RP1
	114233-001/CWL-FB4	DICHLORODIFLUOROMETHANE (75-71-8)	UJ, RP1
	114233-001/CWL-FB4	ETHYLBENZENE (100-41-4)	UJ, RP1
	114233-001/CWL-FB4	HEXACHLOROBUTADIENE (87-68-3)	UJ, RP1
	114233-001/CWL-FB4	M,P-XYLENE (179601-23-1)	J, RP1
	114233-001/CWL-FB4	METHYLENE CHLORIDE (75-09-2)	J, RP1
	114233-001/CWL-FB4	O-XYLENE (95-47-6)	UJ, RP1
	114233-001/CWL-FB4	STYRENE (100-42-5)	UJ, RP1
	114233-001/CWL-FB4	TETRACHLOROETHENE (127-18-4)	J, RP1
	114233-001/CWL-FB4	TOLUENE (108-88-3)	J, RP1
	114233-001/CWL-FB4	TRANS-1,2-DICHLOROETHENE (156-60-5)	UJ, RP1
	114233-001/CWL-FB4	TRANS-1,3-DICHLOROPROPENE (10061-02-6)	UJ, RP1
	114233-001/CWL-FB4	TRICHLOROETHENE (79-01-6)	UJ, RP1
	114233-001/CWL-FB4	TRICHLOROFUOROMETHANE (75-69-4)	UJ, RP1
	114233-001/CWL-FB4	VINYL ACETATE (108-05-4)	UJ, RP1
	114233-001/CWL-FB4	VINYL CHLORIDE (75-01-4)	UJ, RP1
	114234-001/CWL-D2-120	CARBON DISULFIDE (75-15-0)	100U, B
	114235-001/CWL-D2-240	CARBON DISULFIDE (75-15-0)	100U, B

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114236-001/CWL-D2-350	CARBON DISULFIDE (75-15-0)	81U, B
	114237-001/CWL-D2-440	METHYLENE CHLORIDE (75-09-2)	0.62U, B2
	114237-001/CWL-D2-440	TETRACHLOROETHENE (127-18-4)	0.092U, B2
	114238-001/CWL-D2-470	1,1,1-TRICHLOROETHANE (71-55-6)	UJ, RP1
	114238-001/CWL-D2-470	1,1,2,2-TETRACHLOROETHANE (79-34-5)	UJ, RP1
	114238-001/CWL-D2-470	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	J, RP1
	114238-001/CWL-D2-470	1,1,2-TRICHLOROETHANE (79-00-5)	J, RP1
	114238-001/CWL-D2-470	1,1-DICHLOROETHANE (75-34-3)	J, RP1
	114238-001/CWL-D2-470	1,1-DICHLOROETHENE (75-35-4)	J, RP1
	114238-001/CWL-D2-470	1,2,4-TRICHLOROBENZENE (120-82-1)	UJ, RP1
	114238-001/CWL-D2-470	1,2,4-TRIMETHYLBENZENE (95-63-6)	UJ, RP1
	114238-001/CWL-D2-470	1,2-DIBROMOETHANE (EDB) (106-93-4)	UJ, RP1
	114238-001/CWL-D2-470	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (76-14-2)	UJ, RP1
	114238-001/CWL-D2-470	1,2-DICHLOROBENZENE (95-50-1)	UJ, RP1
	114238-001/CWL-D2-470	1,2-DICHLOROETHANE (107-06-2)	J, RP1
	114238-001/CWL-D2-470	1,2-DICHLOROPROPANE (78-87-5)	J, RP1
	114238-001/CWL-D2-470	1,3,5-TRIMETHYLBENZENE (108-67-8)	UJ, RP1
	114238-001/CWL-D2-470	1,3-DICHLOROBENZENE (541-73-1)	UJ, RP1
	114238-001/CWL-D2-470	1,4-DICHLOROBENZENE (106-46-7)	UJ, RP1
	114238-001/CWL-D2-470	2-BUTANONE (MEK) (78-93-3)	UJ, RP1
	114238-001/CWL-D2-470	2-HEXANONE (591-78-6)	UJ, RP1
	114238-001/CWL-D2-470	4-ETHYLTOLUENE (622-96-8)	UJ, RP1
	114238-001/CWL-D2-470	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	UJ, RP1
	114238-001/CWL-D2-470	ACETONE (67-64-1)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114238-001/CWL-D2-470	BENZENE (71-43-2)	J, RP1
	114238-001/CWL-D2-470	BENZYL CHLORIDE (100-44-7)	UJ, RP1
	114238-001/CWL-D2-470	BROMODICHLOROMETHANE (75-27-4)	UJ, RP1
	114238-001/CWL-D2-470	BROMOFORM (75-25-2)	UJ, RP1
	114238-001/CWL-D2-470	BROMOMETHANE (74-83-9)	UJ, RP1
	114238-001/CWL-D2-470	CARBON DISULFIDE (75-15-0)	UJ, RP1
	114238-001/CWL-D2-470	CARBON TETRACHLORIDE (56-23-5)	J, RP1
	114238-001/CWL-D2-470	CHLOROBENZENE (108-90-7)	J, RP1
	114238-001/CWL-D2-470	CHLOROETHANE (75-00-3)	UJ, RP1
	114238-001/CWL-D2-470	CHLOROFORM (67-66-3)	J, RP1
	114238-001/CWL-D2-470	CHLOROMETHANE (74-87-3)	UJ, RP1
	114238-001/CWL-D2-470	CIS-1,2-DICHLOROETHENE (156-59-2)	UJ, RP1
	114238-001/CWL-D2-470	CIS-1,3-DICHLOROPROPENE (10061-01-5)	UJ, RP1
	114238-001/CWL-D2-470	DIBROMOCHLOROMETHANE (124-48-1)	UJ, RP1
	114238-001/CWL-D2-470	DICHLORODIFLUOROMETHANE (75-71-8)	J, RP1
	114238-001/CWL-D2-470	ETHYLBENZENE (100-41-4)	UJ, RP1
	114238-001/CWL-D2-470	HEXACHLOROBUTADIENE (87-68-3)	UJ, RP1
	114238-001/CWL-D2-470	M,P-XYLENE (179601-23-1)	UJ, RP1
	114238-001/CWL-D2-470	METHYLENE CHLORIDE (75-09-2)	UJ, RP1
	114238-001/CWL-D2-470	O-XYLENE (95-47-6)	UJ, RP1
	114238-001/CWL-D2-470	STYRENE (100-42-5)	UJ, RP1
	114238-001/CWL-D2-470	TETRACHLOROETHENE (127-18-4)	J, RP1
	114238-001/CWL-D2-470	TOLUENE (108-88-3)	UJ, RP1
	114238-001/CWL-D2-470	TRANS-1,2-DICHLOROETHENE (156-60-5)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114238-001/CWL-D2-470	TRANS-1,3-DICHLOROPROPENE (10061-02-6)	UJ, RP1
	114238-001/CWL-D2-470	TRICHLOROETHENE (79-01-6)	J, RP1
	114238-001/CWL-D2-470	TRICHLOROFLUOROMETHANE (75-69-4)	J, RP1
	114238-001/CWL-D2-470	VINYL ACETATE (108-05-4)	UJ, RP1
	114238-001/CWL-D2-470	VINYL CHLORIDE (75-01-4)	UJ, RP1
	114239-001/CWL-FB5	CARBON DISULFIDE (75-15-0)	0.23U, B
	114240-001/CWL-D3-120	1,1,1-TRICHLOROETHANE (71-55-6)	UJ, RP1
	114240-001/CWL-D3-120	1,1,2,2-TETRACHLOROETHANE (79-34-5)	UJ, RP1
	114240-001/CWL-D3-120	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	J, RP1
	114240-001/CWL-D3-120	1,1,2-TRICHLOROETHANE (79-00-5)	J, RP1
	114240-001/CWL-D3-120	1,1-DICHLOROETHANE (75-34-3)	J, RP1
	114240-001/CWL-D3-120	1,1-DICHLOROETHENE (75-35-4)	J, RP1
	114240-001/CWL-D3-120	1,2,4-TRICHLOROBENZENE (120-82-1)	UJ, RP1
	114240-001/CWL-D3-120	1,2,4-TRIMETHYLBENZENE (95-63-6)	UJ, RP1
	114240-001/CWL-D3-120	1,2-DIBROMOETHANE (EDB) (106-93-4)	UJ, RP1
	114240-001/CWL-D3-120	1,2-DICHLORO-1,1,2,2-TETRAFLUROETHANE (76-14-2)	UJ, RP1
	114240-001/CWL-D3-120	1,2-DICHLOROBENZENE (95-50-1)	UJ, RP1
	114240-001/CWL-D3-120	1,2-DICHLOROETHANE (107-06-2)	J, RP1
	114240-001/CWL-D3-120	1,2-DICHLOROPROPANE (78-87-5)	J, RP1
	114240-001/CWL-D3-120	1,3,5-TRIMETHYLBENZENE (108-67-8)	UJ, RP1
	114240-001/CWL-D3-120	1,3-DICHLOROBENZENE (541-73-1)	UJ, RP1
	114240-001/CWL-D3-120	1,4-DICHLOROBENZENE (106-46-7)	UJ, RP1
	114240-001/CWL-D3-120	2-BUTANONE (MEK) (78-93-3)	UJ, RP1
	114240-001/CWL-D3-120	2-HEXANONE (591-78-6)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114240-001/CWL-D3-120	4-ETHYLTOLUENE (622-96-8)	UJ, RP1
	114240-001/CWL-D3-120	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	UJ, RP1
	114240-001/CWL-D3-120	ACETONE (67-64-1)	UJ, RP1
	114240-001/CWL-D3-120	BENZENE (71-43-2)	28UJ, B2,RP1
	114240-001/CWL-D3-120	BENZYL CHLORIDE (100-44-7)	UJ, RP1
	114240-001/CWL-D3-120	BROMODICHLOROMETHANE (75- 27-4)	UJ, RP1
	114240-001/CWL-D3-120	BROMOFORM (75-25-2)	UJ, RP1
	114240-001/CWL-D3-120	BROMOMETHANE (74-83-9)	UJ, RP1
	114240-001/CWL-D3-120	CARBON DISULFIDE (75-15-0)	UJ, RP1
	114240-001/CWL-D3-120	CARBON TETRACHLORIDE (56-23-5)	J, RP1
	114240-001/CWL-D3-120	CHLOROBENZENE (108-90-7)	UJ, RP1
	114240-001/CWL-D3-120	CHLOROETHANE (75-00-3)	UJ, RP1
	114240-001/CWL-D3-120	CHLOROFORM (67-66-3)	J, RP1
	114240-001/CWL-D3-120	CHLOROMETHANE (74-87-3)	UJ, RP1
	114240-001/CWL-D3-120	CIS-1,2-DICHLOROETHENE (156-59- 2)	UJ, RP1
	114240-001/CWL-D3-120	CIS-1,3-DICHLOROPROPENE (10061- 01-5)	UJ, RP1
	114240-001/CWL-D3-120	DIBROMOCHLOROMETHANE (124- 48-1)	UJ, RP1
	114240-001/CWL-D3-120	DICHLORODIFLUOROMETHANE (75- 71-8)	J, RP1
	114240-001/CWL-D3-120	ETHYLBENZENE (100-41-4)	UJ, RP1
	114240-001/CWL-D3-120	HEXACHLOROBUTADIENE (87-68-3)	UJ, RP1
	114240-001/CWL-D3-120	M,P-XYLENE (179601-23-1)	UJ, RP1
	114240-001/CWL-D3-120	METHYLENE CHLORIDE (75-09-2)	UJ, RP1
	114240-001/CWL-D3-120	O-XYLENE (95-47-6)	UJ, RP1
	114240-001/CWL-D3-120	STYRENE (100-42-5)	UJ, RP1
	114240-001/CWL-D3-120	TETRACHLOROETHENE (127-18-4)	J, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114240-001/CWL-D3-120	TOLUENE (108-88-3)	UJ, RP1
	114240-001/CWL-D3-120	TRANS-1,2-DICHLOROETHENE (156-60-5)	UJ, RP1
	114240-001/CWL-D3-120	TRANS-1,3-DICHLOROPROPENE (10061-02-6)	UJ, RP1
	114240-001/CWL-D3-120	TRICHLOROETHENE (79-01-6)	J, RP1
	114240-001/CWL-D3-120	TRICHLOROFLUOROMETHANE (75-69-4)	J, RP1
	114240-001/CWL-D3-120	VINYL ACETATE (108-05-4)	UJ, RP1
	114240-001/CWL-D3-120	VINYL CHLORIDE (75-01-4)	UJ, RP1
	114241-001/CWL-D3-170	1,1,1-TRICHLOROETHANE (71-55-6)	UJ, RP1
	114241-001/CWL-D3-170	1,1,2,2-TETRACHLOROETHANE (79-34-5)	UJ, RP1
	114241-001/CWL-D3-170	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	J, RP1
	114241-001/CWL-D3-170	1,1,2-TRICHLOROETHANE (79-00-5)	J, RP1
	114241-001/CWL-D3-170	1,1-DICHLOROETHANE (75-34-3)	J, RP1
	114241-001/CWL-D3-170	1,1-DICHLOROETHENE (75-35-4)	J, RP1
	114241-001/CWL-D3-170	1,2,4-TRICHLOROBENZENE (120-82-1)	UJ, RP1
	114241-001/CWL-D3-170	1,2,4-TRIMETHYLBENZENE (95-63-6)	UJ, RP1
	114241-001/CWL-D3-170	1,2-DIBROMOETHANE (EDB) (106-93-4)	UJ, RP1
	114241-001/CWL-D3-170	1,2-DICHLORO-1,1,2,2-TETRAFLUROETHANE (76-14-2)	UJ, RP1
	114241-001/CWL-D3-170	1,2-DICHLOROBENZENE (95-50-1)	UJ, RP1
	114241-001/CWL-D3-170	1,2-DICHLOROETHANE (107-06-2)	J, RP1
	114241-001/CWL-D3-170	1,2-DICHLOROPROPANE (78-87-5)	J, RP1
	114241-001/CWL-D3-170	1,3,5-TRIMETHYLBENZENE (108-67-8)	UJ, RP1
	114241-001/CWL-D3-170	1,3-DICHLOROBENZENE (541-73-1)	UJ, RP1
	114241-001/CWL-D3-170	1,4-DICHLOROBENZENE (106-46-7)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114241-001/CWL-D3-170	2-BUTANONE (MEK) (78-93-3)	UJ, RP1
	114241-001/CWL-D3-170	2-HEXANONE (591-78-6)	UJ, RP1
	114241-001/CWL-D3-170	4-ETHYLTOLUENE (622-96-8)	UJ, RP1
	114241-001/CWL-D3-170	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	UJ, RP1
	114241-001/CWL-D3-170	ACETONE (67-64-1)	UJ, RP1
	114241-001/CWL-D3-170	BENZENE (71-43-2)	4.5UJ, B2,RP1
	114241-001/CWL-D3-170	BENZYL CHLORIDE (100-44-7)	UJ, RP1
	114241-001/CWL-D3-170	BROMODICHLOROMETHANE (75- 27-4)	UJ, RP1
	114241-001/CWL-D3-170	BROMOFORM (75-25-2)	UJ, RP1
	114241-001/CWL-D3-170	BROMOMETHANE (74-83-9)	UJ, RP1
	114241-001/CWL-D3-170	CARBON DISULFIDE (75-15-0)	UJ, RP1
	114241-001/CWL-D3-170	CARBON TETRACHLORIDE (56-23-5)	J, RP1
	114241-001/CWL-D3-170	CHLOROBENZENE (108-90-7)	4.5UJ, B2,RP1
	114241-001/CWL-D3-170	CHLOROETHANE (75-00-3)	UJ, RP1
	114241-001/CWL-D3-170	CHLOROFORM (67-66-3)	J, RP1
	114241-001/CWL-D3-170	CHLOROMETHANE (74-87-3)	UJ, RP1
	114241-001/CWL-D3-170	CIS-1,2-DICHLOROETHENE (156-59- 2)	UJ, RP1
	114241-001/CWL-D3-170	CIS-1,3-DICHLOROPROPENE (10061- 01-5)	UJ, RP1
	114241-001/CWL-D3-170	DIBROMOCHLOROMETHANE (124- 48-1)	UJ, RP1
	114241-001/CWL-D3-170	DICHLORODIFLUOROMETHANE (75- 71-8)	J, RP1
	114241-001/CWL-D3-170	ETHYLBENZENE (100-41-4)	UJ, RP1
	114241-001/CWL-D3-170	HEXACHLOROBUTADIENE (87-68-3)	UJ, RP1
	114241-001/CWL-D3-170	M,P-XYLENE (179601-23-1)	UJ, RP1
	114241-001/CWL-D3-170	METHYLENE CHLORIDE (75-09-2)	UJ, RP1
	114241-001/CWL-D3-170	O-XYLENE (95-47-6)	UJ, RP1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	114241-001/CWL-D3-170	STYRENE (100-42-5)	UJ, RP1
	114241-001/CWL-D3-170	TETRACHLOROETHENE (127-18-4)	J, RP1
	114241-001/CWL-D3-170	TOLUENE (108-88-3)	UJ, RP1
	114241-001/CWL-D3-170	TRANS-1,2-DICHLOROETHENE (156-60-5)	UJ, RP1
	114241-001/CWL-D3-170	TRANS-1,3-DICHLOROPROPENE (10061-02-6)	UJ, RP1
	114241-001/CWL-D3-170	TRICHLOROFLUOROMETHANE (75-69-4)	J, RP1
	114241-001/CWL-D3-170	VINYL ACETATE (108-05-4)	UJ, RP1
	114241-001/CWL-D3-170	VINYL CHLORIDE (75-01-4)	UJ, RP1
	114242-001/CWL-D3-350	BENZENE (71-43-2)	0.38U, B2
	114243-001/CWL-D3-440	2-BUTANONE (MEK) (78-93-3)	0.43U, B2
	114243-001/CWL-D3-440	2-HEXANONE (591-78-6)	0.22U, B2
	114243-001/CWL-D3-440	4-METHYL-2-PENTANONE (MIBK) (108-10-1)	J+, B2
	114243-001/CWL-D3-440	ACETONE (67-64-1)	J+, B2
	114243-001/CWL-D3-440	CHLOROBENZENE (108-90-7)	0.087U, B2
	114244-001/CWL-D3-440	2-BUTANONE (MEK) (78-93-3)	J+, B2
	114244-001/CWL-D3-440	2-HEXANONE (591-78-6)	0.22U, B2
	114244-001/CWL-D3-440	ACETONE (67-64-1)	J+, B2
	114244-001/CWL-D3-440	CHLOROBENZENE (108-90-7)	0.087U, B2
	114245-001/CWL-D3-480	2-BUTANONE (MEK) (78-93-3)	0.43U, B2
	114245-001/CWL-D3-480	2-HEXANONE (591-78-6)	0.21U, B2
	114245-001/CWL-D3-480	ACETONE (67-64-1)	J+, B2
	114245-001/CWL-D3-480	CHLOROBENZENE (108-90-7)	0.085U, B2
	114246-001/CWL-D3-480	2-BUTANONE (MEK) (78-93-3)	0.45U, B2
	114246-001/CWL-D3-480	ACETONE (67-64-1)	2.2U, B2

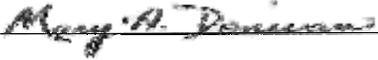
All other analyses met QC acceptance criteria; no further data should be qualified.

## Sandia Data Validation Summary Worksheet

ARCOC#: 621709, 621710, 621711, 621712 and 621713	Site/Project: CWL PCCP	Validation Date: 02/24/2021
SDG #: 140-21895	Laboratory: Eurofins TestAmerica, Knoxville	Validator: Mary Donovan
Matrix: Air	# of Samples: 28	CVR present: Yes
ARCOC(s) present: Yes	Sample Container Integrity: OK	
Analysis Type: <input checked="" type="checkbox"/> Organic <input 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								

<u>Comments:</u> Collected: 02/01/2021  No custody seals.
<u>Validated by:</u>  <div style="text-align: center;">  </div>

## Sandia Organic Worksheet (GC/MS VOC)

ARCO # (s): 621709, 621710, 621711, 621712 and 621713	SDG: 140-21895	Matrix: Air
Laboratory Sample IDs: 140-21895-1 through -28		
Method/Batch #s: <b>TO-15/46802</b> (samples -1, -5, -9, -15); 46803 (samples -20, -22, -23); 46842 (samples -19, -24DU, -24 through -28, -12DL, -16DL, -23DL); 46816 (samples -2 through -4, -6 through -8, -10 through -14, -16 through -18, -17DU, -21)	Tuning (pass/fail): pass	TICs Required? (yes/no): no

Analyte (outliers)	Calibration				MB	5X (10X) MB	LCS %R	Lab. REP RPD	FB1 -1	FB2 -5	FB3 -9	FB4 -15	5X (10X) FB4
	Int.	RF/ Slope	RSD/ r <sup>2</sup>	(ICV)/ CCV %D									
<b>Instrument MH ICAL 02/08/2021</b>													
<b>Batch 46802</b> (samples -1, -5, -9, -15)													
<b>Batch 46803</b> (samples -20, -22 -23)													
<b>Batch 46842</b> (samples -19, -24DU, -24 through -28, -12DL, -16DL, -23DL)													
Acetone	NA	✓	✓	✓	✓	NA	✓	✓	1.3J	2.3J	✓	✓	NA
Benzene	NA	✓	✓	✓	0.00821J <sup>1</sup>	0.041	✓	✓	0.033J	0.011J	0.016J	0.015J	0.08
2-Butanone	NA	✓	✓	✓	✓	NA	✓	✓	0.092J	0.17J	✓	✓	NA
Carbon disulfide	NA	✓	✓	✓	✓	NA	✓	✓	0.059J	✓	0.081J	✓	NA
Chlorobenzene	NA	✓	✓	✓	✓	NA	✓	✓	0.0079J	0.0076J	✓	✓	NA
Ethylbenzene	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.063J	✓	NA
4-Ethyltoluene	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.077J	✓	NA
Methylene chloride	NA	✓	✓	✓	✓	NA	✓	✓	0.74	✓	✓	0.46	(4.6)
Tetrachloroethene	NA	✓	✓	✓	✓	NA	✓	✓	0.048J	✓	✓	0.0090J	0.045
Toluene	NA	✓	✓	✓	✓	NA	✓	✓	0.12J	✓	0.12J	0.086J	(.86)
1,2,4-Trimethylbenzene	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.26	✓	NA
1,3,5-Trimethylbenzene	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.079J	✓	NA
Trichlorofluoromethane	NA	✓	✓	✓	✓	NA	✓	✓	0.014J	✓	✓	✓	NA
m,p-Xylene	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.27	0.037J	0.19
o-Xylene	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.11	✓	NA
Hexachlorobutadiene	NA	✓	✓	+32 <sup>3</sup>	✓	NA	✓	✓	✓	✓	✓	✓	NA

Analyte (outliers)	Calibration				MB	5X (10X) MB	LCS %R	Lab. REP RPD	FB5 -21	5X (10X) FB5			
	Int.	RF/ Slope	RSD/ r <sup>2</sup>	(ICV)/CC V %D									
<b>Instrument MS ICAL 01/20/2021</b>													
<b>Batch 46816</b> (samples -2 through -4, -6 through -8, -10 through -14, -16 through -18, -17DU, -21)													
Acetone	NA	✓	✓	✓	✓	NA	✓	✓	0.84J	(8.4)			
Benzene	NA	✓	✓	✓	✓	NA	✓	✓	0.016J	0.08			
2-Butanone	NA	✓	✓	✓	✓	NA	✓	✓	0.12J	(1.2)			
Carbon disulfide	NA	✓	✓	✓	0.0155J	0.078	✓	✓	0.03J	0.15			
Chlorobenzene	NA	✓	✓	✓	✓	NA	✓	✓	0.0076J	0.038			
2-Hexanone	NA	✓	✓	✓	✓	NA	✓	✓	0.029J	0.15			
4-Methyl-2-pentanone	NA	✓	✓	✓	✓	NA	✓	✓	0.18J	0.9			
<b>Surrogate Recovery Outliers</b>													
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													
<b>IS Outliers</b>													
	CBM		DFBZ		Chl-d5								
Sample ID	Area	RT	Area	RT	Area	RT							
None													

Comments: HTs OK. LCS limits CWL lab limits  
 ICAL MH 02/08/2021 All Avg.  
<sup>1</sup>Associated with batch 46802, all FBs, no precision data  
<sup>2</sup>Associated with batch 46803, no precision data  
<sup>3</sup>Associated with batch 46842

ICAL MS 01/20/2021 All avg. (batch 46816)

Ultra-high purity humidified nitrogen from a cryogenic reservoir is used in place of "zero air" by Eurofins TestAmerica Knoxville.  
 Canisters <RL for all target compounds.

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. <i>NA</i>	SMO Use	AR/COC	<b>621709</b>
Project Name: CWL PCCP	Date Samples Shipped: <i>2/2/2021</i>	SMO Authorization: <i>[Signature]</i>	
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <i>325097</i>	SMO Contact Phone: Wendy Palencia/505-844-3132	
Project/Task Number: 195122.10.11.03	Lab Contact: Jamie Mckinney/865-291-3006	Send Report to SMO: Stephanie Montaño/505-284-2553	
Service Order: CF327-21	Lab Destination: TAKX	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>	
Contract No.: 1636780		Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154	

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					
114215	001	CWL-FB1	12111	NA	2/1/21	09:06	UPN	S	6 L	None	G	FB	VOC (TO-15)	
114216	001	CWL-UI1-40	7759	40	2/1/21	09:12	SG	S	6 L	None	G	SA	VOC (TO-15)	
114217	001	CWL-UI1-80	10011	80	2/1/21	09:14	SG	S	6 L	None	G	SA	VOC (TO-15)	
114218	001	CWL-UI1-120	11144	120	2/1/21	09:17	SG	S	6 L	None	G	SA	VOC (TO-15)	
 140-21895 Chain of Custody													NO CUSTODY SEALS RECEIVED AMBIENT BXD 2-8-21 SOIX FED #4442 24565130 m G 28 CANS / 0 FUMES / 1 GADGE	

Last Chain: <input type="checkbox"/> Yes Validation Req'd: <input checked="" type="checkbox"/> Yes Background: <input type="checkbox"/> Yes Confirmatory: <input type="checkbox"/> Yes	<b>Sample Tracking</b> Date Entered: Entered by: QC inits.:	SMO Use	<b>Special Instructions/QC Requirements:</b> EDD <input checked="" type="checkbox"/> Yes Turnaround Time <input type="checkbox"/> 7-Day* <input type="checkbox"/> 15-Day* <input checked="" type="checkbox"/> 30-Day Negotiated TAT <input type="checkbox"/>	Conditions on Receipt																
<b>Sample Team Members</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Name</th> <th>Signature</th> <th>Init.</th> <th>Company/Organization/Phone/Cell</th> </tr> <tr> <td>Robert Lynch</td> <td><i>[Signature]</i></td> <td><i>RL</i></td> <td>SNL/08888/505-844-4013/505-250-7090</td> </tr> <tr> <td>Denisha Sanchez</td> <td><i>[Signature]</i></td> <td><i>DS</i></td> <td>SNL/08888/505-845-7829/505-208-1375</td> </tr> <tr> <td>Zachary Tenorio</td> <td><i>[Signature]</i></td> <td><i>ZT</i></td> <td>SNL/08888/505-845-8636/505-259-5765</td> </tr> </table>	Name	Signature	Init.	Company/Organization/Phone/Cell	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/08888/505-844-4013/505-250-7090	Denisha Sanchez	<i>[Signature]</i>	<i>DS</i>	SNL/08888/505-845-7829/505-208-1375	Zachary Tenorio	<i>[Signature]</i>	<i>ZT</i>	SNL/08888/505-845-8636/505-259-5765	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab Return Samples By: Comments:		Lab Use
Name	Signature	Init.	Company/Organization/Phone/Cell																	
Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/08888/505-844-4013/505-250-7090																	
Denisha Sanchez	<i>[Signature]</i>	<i>DS</i>	SNL/08888/505-845-7829/505-208-1375																	
Zachary Tenorio	<i>[Signature]</i>	<i>ZT</i>	SNL/08888/505-845-8636/505-259-5765																	

Relinquished by <i>[Signature]</i> Org. <i>08888</i> Date <i>2/1/21</i> Time <i>1330</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>00628</i> Date <i>2/1/21</i> Time <i>1330</i>	Received by _____ Org. _____ Date _____ Time _____
Relinquished by <i>[Signature]</i> Org. <i>00628</i> Date <i>2/2/21</i> Time <i>0930</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>TAKX</i> Date <i>2-8-21</i> Time <i>10:20</i>	Received by _____ Org. _____ Date _____ Time _____

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

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02/19/2021

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. MA AR/COC **621710**

SMO Use

Project Name: CWL PCCP	Date Samples Shipped: <u>2/2/2021</u>	SMO Authorization: <u>[Signature]</u>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <u>325097</u>	SMO Contact Phone: <u>[Signature]</u>	
Project/Task Number: 195122.10.11.03	Lab Contact: <u>Jamie McKinney/865-291-3006</u>	Wendy Palencia/505-844-3132	
Service Order: CF327-21	Lab Destination: TAKX	Send Report to SMO:	
Contract No.: 1636780		Stephanie Montaño/505-284-2553	

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					
114219	001	CWL-FB2 <u>1169616996</u> <sup>DL</sup> <sub>3-14-21</sub>	NA	2/1/21 10:53	UPN	S	6 L	None	G	FB	VOC (TO-15)	
114220	001	CWL-UI2-36 09613	36	2/1/21 10:59	SG	S	6 L	None	G	SA	VOC (TO-15)	
114221	001	CWL-UI2-76 34002044	76	2/1/21 11:01	SG	S	6 L	None	G	SA	VOC (TO-15)	
114222	001	CWL-UI2-136 34000021	136	2/1/21 11:03	SG	S	6 L	None	G	SA	VOC (TO-15)	

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																																									
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> <th>Sample Disposal</th> <th>Return to Client</th> <th>Disposal by Lab</th> </tr> <tr> <td></td> <td>Robert Lynch</td> <td><u>[Signature]</u></td> <td><u>RL</u></td> <td>SNL/08888/505-844-4013/505-250-7090</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td></td> <td>William Gibson</td> <td><u>[Signature]</u></td> <td><u>WG</u></td> <td>SNL/08888/505-284-3307/505-239-7367</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td>Zachary Tenorio</td> <td><u>[Signature]</u></td> <td><u>ZT</u></td> <td>SNL/08888/505-845-8636/505-259-5765</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td>Denisha Sanchez</td> <td><u>[Signature]</u></td> <td><u>DS</u></td> <td>SNL/08888/505-845-7829/505-208-1375</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Sample Team Members	Name	Signature		Init.	Company/Organization/Phone/Cell	Sample Disposal	Return to Client	Disposal by Lab		Robert Lynch	<u>[Signature]</u>	<u>RL</u>	SNL/08888/505-844-4013/505-250-7090	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		William Gibson	<u>[Signature]</u>	<u>WG</u>	SNL/08888/505-284-3307/505-239-7367	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Zachary Tenorio	<u>[Signature]</u>	<u>ZT</u>	SNL/08888/505-845-8636/505-259-5765	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Denisha Sanchez	<u>[Signature]</u>	<u>DS</u>	SNL/08888/505-845-7829/505-208-1375	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Return Samples By:		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal	Return to Client	Disposal by Lab																																					
	Robert Lynch	<u>[Signature]</u>	<u>RL</u>	SNL/08888/505-844-4013/505-250-7090	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																					
	William Gibson	<u>[Signature]</u>	<u>WG</u>	SNL/08888/505-284-3307/505-239-7367	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																					
	Zachary Tenorio	<u>[Signature]</u>	<u>ZT</u>	SNL/08888/505-845-8636/505-259-5765	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																					
	Denisha Sanchez	<u>[Signature]</u>	<u>DS</u>	SNL/08888/505-845-7829/505-208-1375	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																					

Relinquished by <u>[Signature]</u> Org. <u>08888</u> Date <u>2/1/21</u> Time <u>1330</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u> Org. <u>08888</u> Date <u>2/1/21</u> Time <u>1330</u>	Received by	Org.	Date	Time
Relinquished by <u>[Signature]</u> Org. <u>08888</u> Date <u>2/2/21</u> Time <u>0930</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u> Org. <u>08888</u> Date <u>2-8-21</u> Time <u>10:20</u>	Received by	Org.	Date	Time

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

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02/19/2021

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. <i>NA</i>	SMO Use		<b>AR/CO</b> <span style="border: 1px solid black; padding: 2px;"><b>621711</b></span>
Project Name: CWL PCCP	Date Samples Shipped: <i>2/2/2021</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <i>325097</i>	SMO Contact Phone: <i>[Signature]</i>	
Project/Task Number: 195122.10.11.03	Lab Contact: Jamie Mckinney/865-291-3006	Wendy Palencia/505-844-3132	
Service Order: CF327-21	Lab Destination: TAKX	Send Report to SMO: Stephanie Montaño/505-284-2553	
Contract No.: 1636780			

Tech Area:	Building:	Room:	Operational Site:
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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					
114227	001	CWL-FB3	34001574	NA	2/1/21	08:37	UPN	S	6 L	None	G	FB	VOC (TO-15)	
114228	001	CWL-D1-100	34001378	100	2/1/21	08:42	SG	S	6 L	None	G	SA	VOC (TO-15)	
114229	001	CWL-D1-160	10313	160	2/1/21	08:45	SG	S	6 L	None	G	SA	VOC (TO-15)	
114230	001	CWL-D1-240	10228	240	2/1/21	08:49	SG	S	6 L	None	G	SA	VOC (TO-15)	
114231	001	CWL-D1-350	09935	350	2/1/21	08:53	SG	S	6 L	None	G	SA	VOC (TO-15)	
114232	001	CWL-D1-470	10093	470	2/1/21	08:59	SG	S	6 L	None	G	SA	VOC (TO-15)	

<b>Last Chain:</b> <input type="checkbox"/> Yes <b>Validation Req'd:</b> <input checked="" type="checkbox"/> Yes <b>Background:</b> <input type="checkbox"/> Yes <b>Confirmatory:</b> <input type="checkbox"/> Yes	<b>Sample Tracking</b> Date Entered: Entered by: QC inits.:	<b>SMO Use</b>	<b>Special Instructions/QC Requirements:</b> EDD <input checked="" type="checkbox"/> Yes Turnaround Time <input type="checkbox"/> 7-Day* <input type="checkbox"/> 15-Day* <input checked="" type="checkbox"/> 30-Day Negotiated TAT <input type="checkbox"/>	Conditions on Receipt																
<b>Sample Team Members</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Name</th> <th>Signature</th> <th>Init.</th> <th>Company/Organization/Phone/Cell</th> </tr> <tr> <td>Robert Lynch</td> <td><i>[Signature]</i></td> <td><i>RL</i></td> <td>SNL/08888/505-844-4013/505-250-7090</td> </tr> <tr> <td>Denisha Sanchez</td> <td><i>[Signature]</i></td> <td><i>DS</i></td> <td>SNL/08888/505-845-7829/505-208-1375</td> </tr> <tr> <td>Zachary Tenorio</td> <td><i>[Signature]</i></td> <td><i>ZT</i></td> <td>SNL/08888/505-845-8636/505-259-5765</td> </tr> </table>	Name	Signature	Init.	Company/Organization/Phone/Cell	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/08888/505-844-4013/505-250-7090	Denisha Sanchez	<i>[Signature]</i>	<i>DS</i>	SNL/08888/505-845-7829/505-208-1375	Zachary Tenorio	<i>[Signature]</i>	<i>ZT</i>	SNL/08888/505-845-8636/505-259-5765	<b>Sample Disposal</b> <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <b>Return Samples By:</b> Comments:			Lab Use
Name	Signature	Init.	Company/Organization/Phone/Cell																	
Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/08888/505-844-4013/505-250-7090																	
Denisha Sanchez	<i>[Signature]</i>	<i>DS</i>	SNL/08888/505-845-7829/505-208-1375																	
Zachary Tenorio	<i>[Signature]</i>	<i>ZT</i>	SNL/08888/505-845-8636/505-259-5765																	

Relinquished by <i>[Signature]</i> Org. <i>08888</i> Date <i>2/1/21</i> Time <i>1330</i>	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i> Org. <i>00628</i> Date <i>2/1/21</i> Time <i>1330</i>	Received by	Org.	Date	Time
Relinquished by <i>[Signature]</i> SMO Org. <i>00628</i> Date <i>2/2/21</i> Time <i>0930</i>	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i> Org. <i>621711</i> Date <i>2-8-21</i> Time <i>11:20</i>	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.		SMO Use		AR/COC <b>621712</b>		
Project Name:	CWL PCCP	Date Samples Shipped:	2/2/2021	SMO Authorization:	<i>[Signature]</i>	
Project/Task Manager:	Timmie Jackson	Carrier/Waybill No.:	325077	SMO Contact Phone:		
Project/Task Number:	195122.10.11.03	Lab Contact:	Jamie Mckinney/865-291-3006	Wendy Palencia/505-844-3132		
Service Order:	CF327-21	Lab Destination:	TAKX	Send Report to SMO:		
		Contract No.:	1636780	Stephanie Montaño/505-284-2553		
Tech Area:						<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>
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					
114233	001	CWL-FB4	11152	NA	2/1/21	10:08	UPN	S	6 L	None	G	FB	VOC (TO-15)	
114234	001	CWL-D2-120	11982	120	2/1/21	10:23	SG	S	6 L	None	G	SA	VOC (TO-15)	
114235	001	CWL-D2-240	34000382	240	2/1/21	10:26	SG	S	6 L	None	G	SA	VOC (TO-15)	
114236	001	CWL-D2-350	34000554	350	2/1/21	10:30	SG	S	6 L	None	G	SA	VOC (TO-15)	
114237	001	CWL-D2-440	09979	440	2/1/21	10:33	SG	S	6 L	None	G	SA	VOC (TO-15)	
114238	001	CWL-D2-470	11024	470	2/1/21	10:37	SG	S	6 L	None	G	SA	VOC (TO-15)	

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				
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/08888/505-844-4013/505-250-7090		Return Samples By:				
	Denisha Sanchez	<i>[Signature]</i>	DS	SNL/08888/505-845-7829/505-208-1375		Comments:				
	Zachary Tenorio	<i>[Signature]</i>	ZT	SNL/08888/505-845-8636/505-259-5765						
Lab Use										

Relinquished by <i>[Signature]</i>	Org. 088	Date 2/1/21	Time 1330	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i>	Org. 00628	Date 2/1/21	Time 1330	Received by	Org.	Date	Time
Relinquished by <i>[Signature]</i>	Org. 00628	Date 2/2/21	Time 0930	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i>	Org. EIA NXX	Date 2-8-21	Time 1120	Received by	Org.	Date	Time

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

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02/19/2021

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.		<b>SMO Use</b>		<b>AR/CO</b>		<b>621713</b>	
Project Name: CWL PCCP		Date, Samples Shipped: 2/2/2021		SMO Authorization: <i>[Signature]</i>		<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius	
Project/Task Manager: Timmie Jackson		Carrier/Waybill No. 325097		SMO Contact Phone: Wendy Palencia/505-844-3132			
Project/Task Number: 195122.10.11.03		Lab Contact: Jamie Mckinney/865-291-3006		Send Report to SMO: Stephanie Montaño/505-284-2553			
Service Order: CF327-21		Lab Destination: TAKX		Contract No.: 1636780			

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

Tech Area:		Building:		Room:		Operational Site:									
Sample No.	Fraction	Sample Location Detail		Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID	
114239	001	CWL-FB5	34000446	NA	2/1/21	09:26	UPN	S	6 L	None	G	FB	VOC (TO-15)		
114240	001	CWL-D3-120	34000475	120	2/1/21	09:37	SG	S	6 L	None	G	SA	VOC (TO-15)		
114241	001	CWL-D3-170	34000306	170	2/1/21	09:40	SG	S	6 L	None	G	SA	VOC (TO-15)		
114242	001	CWL-D3-350	34000073	350	2/1/21	09:44	SG	S	6 L	None	G	SA	VOC (TO-15)		
114243	001	CWL-D3-440	34001473	440	2/1/21	09:48	SG	S	6 L	None	G	SA	VOC (TO-15)		
114244	001	CWL-D3-440	34000549	440	2/1/21	09:48	SG	S	6 L	None	G	DU	VOC (TO-15)		
114245	001	CWL-D3-480	10100	480	2/1/21	09:55	SG	S	6 L	None	G	SA	VOC (TO-15)		
114246	001	CWL-D3-480	34002107	480	2/1/21	09:55	SG	S	6 L	None	G	DU	VOC (TO-15)		

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				
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		Sample Disposal		Negotiated TAT		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab				
<b>Sample Team Members</b>	Name	Signature	Init.	Company/Organization/Phone/Cell		Return Samples By:				
	Robert Lynch	<i>[Signature]</i>	RL	SNL/08888/505-844-4013/505-250-7090		Comments:				
	Denisha Sanchez	<i>[Signature]</i>	DS	SNL/08888/505-845-7829/505-208-1375						
Zachary Tenorio	<i>[Signature]</i>	ZT	SNL/08888/505-845-8636/505-259-5765							

Relinquished by <i>[Signature]</i>	Org. 08888	Date 2/1/21	Time 1730	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i>	Org. 00628	Date 2/1/21	Time 1730	Received by	Org.	Date	Time
Relinquished by <i>[Signature]</i>	Org. 00628	Date 2/2/21	Time 0930	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i>	Org. 514 1514	Date 2-8-21	Time 10:21	Received by	Org.	Date	Time

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

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02/19/2021

**CONTRACT VERIFICATION REVIEW FORMS**

**CHEMICAL WASTE LANDFILL**

**SOIL-GAS MONITORING**

**FEBRUARY 2021**

<b>AR/COC Number</b>	<b>Sample Type</b>
621709	Environmental & Quality Control
621710	Environmental & Quality Control
621711	Environmental & Quality Control
621712	Environmental & Quality Control
621713	Environmental & Quality Control

Note: AR/COC forms are provided in the Data Validation Reports in this Annex.

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOC No. 621709, 621710, 621711, 621712 &amp; 621713

Analytical Lab TAKX

SDG No. 140-21895-1

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 ARCOC complete - data entry clerk initialed and dated	X		
1.2	Container type(s) correct for analyses requested	X		
1.3	Sample volume adequate for # and types of analyses requested	X		
1.4	Preservative correct for analyses requested	N/A		
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		

Line No.	Item	Complete?		If no, explain
		Yes	No	
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 or 1-sigma for bioassay) 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	X		Sample duplicates reported for samples 114235-001/CWL-D2-240 and 114242-001/CWL-D3-350

Line No.	Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
	b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
	c) Laboratory control sample duplicate RPD data reported and met for other analyses	X		
3.5	Blank data a) Method or reagent blank data reported and met for all samples		X	Benzene detected in method blank (batch 46802). Carbon disulfide detected in method blank (batch 46816).
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Several analytes detected in CWL-FB1, CWL-FB2, CWL-FB3 & CWL-FB4
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 and TO-15) a) 12-hour tune check provided	X		
	b) Initial calibration provided	X		
	c) Continuing calibration provided	X		CCV was outside acceptance limits for hexachlorobutadiene and naphthalene (batch 140-46842)
	d) Internal standard performance data provided	X		
	e) Instrument run logs provided	X		

Line No.	Item	Yes	No	Comments
4.2	GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) Instrument run logs provided	N/A		
4.3	HRGC/HRMS (1668 and 8290) a) 12-hour tune check provided	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Labeled compound recovery data provided	N/A		
	f) RRTs for samples and standards provided	N/A		
	g) Ion abundance ratios for samples and standards provided	N/A		
	h) Instrument run logs provided	N/A		
4.4	LC/MS/MS (6850 and 8330) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) CRI provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Chlorine isotope ratios provided (perchlorate only)	N/A		
	f) ICS provided (perchlorate only)	N/A		
4.5	Inorganics (metals) a) Initial calibration provided	N/A		
	b) Continuing calibration provided	N/A		
	c) ICP interference check sample data provided	N/A		
	d) ICP serial dilution provided	N/A		
	e) Instrument run logs provided	N/A		

Line No.	Item	Yes	No	Comments
4.6	Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

## 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
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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: 02-23-2021 14:18:00

Closed by: Wendy Palencia Date: 02-23-2021 14:18:00

**CERTIFICATES OF ANALYSIS  
SOIL-GAS SAMPLING RESULTS**

**Chemical Waste Landfill**

**February 2021 Samples**

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114215-001/CWL-FB1**

**Lab Sample ID: 140-21895-1**

Date Collected: 02/01/21 09:06

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.3	J	2.3	0.65	ppb v/v			02/10/21 03:25	1.82
Benzene	0.033	J B	0.091	0.0091	ppb v/v			02/10/21 03:25	1.82
Benzyl chloride	ND		0.18	0.043	ppb v/v			02/10/21 03:25	1.82
Bromodichloromethane	ND		0.091	0.020	ppb v/v			02/10/21 03:25	1.82
Bromoform	ND		0.091	0.010	ppb v/v			02/10/21 03:25	1.82
Bromomethane	ND		0.091	0.025	ppb v/v			02/10/21 03:25	1.82
2-Butanone (MEK)	0.092	J	0.46	0.083	ppb v/v			02/10/21 03:25	1.82
Carbon disulfide	0.059	J	0.23	0.013	ppb v/v			02/10/21 03:25	1.82
Carbon tetrachloride	ND		0.091	0.0080	ppb v/v			02/10/21 03:25	1.82
Chlorobenzene	0.0079	J	0.091	0.0068	ppb v/v			02/10/21 03:25	1.82
Chloroethane	ND		0.091	0.033	ppb v/v			02/10/21 03:25	1.82
Chloroform	ND		0.091	0.0080	ppb v/v			02/10/21 03:25	1.82
Chloromethane	ND		0.23	0.075	ppb v/v			02/10/21 03:25	1.82
Dibromochloromethane	ND		0.091	0.0080	ppb v/v			02/10/21 03:25	1.82
1,2-Dibromoethane (EDB)	ND		0.091	0.0080	ppb v/v			02/10/21 03:25	1.82
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.091	0.014	ppb v/v			02/10/21 03:25	1.82
1,2-Dichlorobenzene	ND		0.091	0.035	ppb v/v			02/10/21 03:25	1.82
1,3-Dichlorobenzene	ND		0.091	0.018	ppb v/v			02/10/21 03:25	1.82
1,4-Dichlorobenzene	ND		0.091	0.018	ppb v/v			02/10/21 03:25	1.82
Dichlorodifluoromethane	ND		0.091	0.016	ppb v/v			02/10/21 03:25	1.82
1,1-Dichloroethane	ND		0.091	0.0080	ppb v/v			02/10/21 03:25	1.82
1,2-Dichloroethane	ND		0.091	0.011	ppb v/v			02/10/21 03:25	1.82
1,1-Dichloroethene	ND		0.091	0.0091	ppb v/v			02/10/21 03:25	1.82
cis-1,2-Dichloroethene	ND		0.091	0.011	ppb v/v			02/10/21 03:25	1.82
trans-1,2-Dichloroethene	ND		0.091	0.0080	ppb v/v			02/10/21 03:25	1.82
1,2-Dichloropropane	ND		0.091	0.011	ppb v/v			02/10/21 03:25	1.82
cis-1,3-Dichloropropene	ND		0.091	0.018	ppb v/v			02/10/21 03:25	1.82
trans-1,3-Dichloropropene	ND		0.091	0.010	ppb v/v			02/10/21 03:25	1.82
Ethylbenzene	ND		0.091	0.015	ppb v/v			02/10/21 03:25	1.82
4-Ethyltoluene	ND		0.18	0.024	ppb v/v			02/10/21 03:25	1.82
Hexachlorobutadiene	ND		0.46	0.036	ppb v/v			02/10/21 03:25	1.82
2-Hexanone	ND		0.23	0.018	ppb v/v			02/10/21 03:25	1.82
4-Methyl-2-pentanone (MIBK)	ND		0.23	0.061	ppb v/v			02/10/21 03:25	1.82
Methylene Chloride	0.74		0.46	0.44	ppb v/v			02/10/21 03:25	1.82
Styrene	ND		0.091	0.027	ppb v/v			02/10/21 03:25	1.82
1,1,2,2-Tetrachloroethane	ND		0.091	0.016	ppb v/v			02/10/21 03:25	1.82
Tetrachloroethene	0.048	J	0.091	0.0080	ppb v/v			02/10/21 03:25	1.82
Toluene	0.12	J	0.14	0.089	ppb v/v			02/10/21 03:25	1.82
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.091	0.0091	ppb v/v			02/10/21 03:25	1.82
1,2,4-Trichlorobenzene	ND		0.46	0.073	ppb v/v			02/10/21 03:25	1.82
1,1,1-Trichloroethane	ND		0.091	0.042	ppb v/v			02/10/21 03:25	1.82
1,1,2-Trichloroethane	ND		0.091	0.0080	ppb v/v			02/10/21 03:25	1.82
Trichloroethene	ND		0.046	0.0068	ppb v/v			02/10/21 03:25	1.82
Trichlorofluoromethane	0.014	J	0.091	0.013	ppb v/v			02/10/21 03:25	1.82
1,2,4-Trimethylbenzene	ND		0.091	0.023	ppb v/v			02/10/21 03:25	1.82
1,3,5-Trimethylbenzene	ND		0.091	0.025	ppb v/v			02/10/21 03:25	1.82
Vinyl acetate	ND		0.46	0.032	ppb v/v			02/10/21 03:25	1.82
Vinyl chloride	ND		0.046	0.030	ppb v/v			02/10/21 03:25	1.82

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114215-001/CWL-FB1**

**Lab Sample ID: 140-21895-1**

Date Collected: 02/01/21 09:06

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		0.091	0.033	ppb v/v			02/10/21 03:25	1.82
o-Xylene	ND		0.091	0.017	ppb v/v			02/10/21 03:25	1.82
<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)	96		60 - 140					02/10/21 03:25	1.82

**Client Sample ID: 114216-001/CWL-UI1-40**

**Lab Sample ID: 140-21895-2**

Date Collected: 02/01/21 09:12

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		780	220	ppb v/v			02/11/21 03:38	15.55
<b>Benzene</b>	<b>5.2</b>	<b>J</b>	31	3.1	ppb v/v			02/11/21 03:38	15.55
Benzyl chloride	ND		62	15	ppb v/v			02/11/21 03:38	15.55
Bromodichloromethane	ND		31	7.0	ppb v/v			02/11/21 03:38	15.55
Bromoform	ND		31	3.5	ppb v/v			02/11/21 03:38	15.55
Bromomethane	ND		31	8.6	ppb v/v			02/11/21 03:38	15.55
2-Butanone (MEK)	ND		160	28	ppb v/v			02/11/21 03:38	15.55
<b>Carbon disulfide</b>	<b>6.6</b>	<b>J B</b>	78	4.3	ppb v/v			02/11/21 03:38	15.55
<b>Carbon tetrachloride</b>	<b>7.7</b>	<b>J</b>	31	2.7	ppb v/v			02/11/21 03:38	15.55
Chlorobenzene	ND		31	2.3	ppb v/v			02/11/21 03:38	15.55
Chloroethane	ND		31	11	ppb v/v			02/11/21 03:38	15.55
<b>Chloroform</b>	<b>330</b>		31	2.7	ppb v/v			02/11/21 03:38	15.55
Chloromethane	ND		78	26	ppb v/v			02/11/21 03:38	15.55
Dibromochloromethane	ND		31	2.7	ppb v/v			02/11/21 03:38	15.55
1,2-Dibromoethane (EDB)	ND		31	2.7	ppb v/v			02/11/21 03:38	15.55
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		31	4.7	ppb v/v			02/11/21 03:38	15.55
1,2-Dichlorobenzene	ND		31	12	ppb v/v			02/11/21 03:38	15.55
1,3-Dichlorobenzene	ND		31	6.2	ppb v/v			02/11/21 03:38	15.55
1,4-Dichlorobenzene	ND		31	6.2	ppb v/v			02/11/21 03:38	15.55
<b>Dichlorodifluoromethane</b>	<b>15</b>	<b>J</b>	31	5.4	ppb v/v			02/11/21 03:38	15.55
<b>1,1-Dichloroethane</b>	<b>7.9</b>	<b>J</b>	31	2.7	ppb v/v			02/11/21 03:38	15.55
1,2-Dichloroethane	ND		31	3.9	ppb v/v			02/11/21 03:38	15.55
<b>1,1-Dichloroethene</b>	<b>83</b>		31	3.1	ppb v/v			02/11/21 03:38	15.55
cis-1,2-Dichloroethene	ND		31	3.9	ppb v/v			02/11/21 03:38	15.55
trans-1,2-Dichloroethene	ND		31	2.7	ppb v/v			02/11/21 03:38	15.55
<b>1,2-Dichloropropane</b>	<b>38</b>		31	3.9	ppb v/v			02/11/21 03:38	15.55
cis-1,3-Dichloropropene	ND		31	6.2	ppb v/v			02/11/21 03:38	15.55
trans-1,3-Dichloropropene	ND		31	3.5	ppb v/v			02/11/21 03:38	15.55
Ethylbenzene	ND		31	5.1	ppb v/v			02/11/21 03:38	15.55
4-Ethyltoluene	ND		62	8.2	ppb v/v			02/11/21 03:38	15.55
Hexachlorobutadiene	ND		160	12	ppb v/v			02/11/21 03:38	15.55
2-Hexanone	ND		78	6.2	ppb v/v			02/11/21 03:38	15.55
4-Methyl-2-pentanone (MIBK)	ND		78	21	ppb v/v			02/11/21 03:38	15.55
Methylene Chloride	ND		160	150	ppb v/v			02/11/21 03:38	15.55
Styrene	ND		31	9.3	ppb v/v			02/11/21 03:38	15.55
1,1,2,2-Tetrachloroethane	ND		31	5.4	ppb v/v			02/11/21 03:38	15.55

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114216-001/CWL-U11-40**

**Lab Sample ID: 140-21895-2**

Date Collected: 02/01/21 09:12

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Tetrachloroethene</b>	<b>1800</b>		31	2.7	ppb v/v			02/11/21 03:38	15.55
Toluene	ND		47	30	ppb v/v			02/11/21 03:38	15.55
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>350</b>		31	3.1	ppb v/v			02/11/21 03:38	15.55
1,2,4-Trichlorobenzene	ND		160	25	ppb v/v			02/11/21 03:38	15.55
<b>1,1,1-Trichloroethane</b>	<b>18 J</b>		31	14	ppb v/v			02/11/21 03:38	15.55
<b>1,1,2-Trichloroethane</b>	<b>5.0 J</b>		31	2.7	ppb v/v			02/11/21 03:38	15.55
<b>Trichloroethene</b>	<b>3100</b>		16	2.3	ppb v/v			02/11/21 03:38	15.55
<b>Trichlorofluoromethane</b>	<b>92</b>		31	4.3	ppb v/v			02/11/21 03:38	15.55
1,2,4-Trimethylbenzene	ND		31	7.8	ppb v/v			02/11/21 03:38	15.55
1,3,5-Trimethylbenzene	ND		31	8.6	ppb v/v			02/11/21 03:38	15.55
Vinyl acetate	ND		160	11	ppb v/v			02/11/21 03:38	15.55
Vinyl chloride	ND		16	10	ppb v/v			02/11/21 03:38	15.55
m,p-Xylene	ND		31	11	ppb v/v			02/11/21 03:38	15.55
o-Xylene	ND		31	5.8	ppb v/v			02/11/21 03:38	15.55
<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		60 - 140					02/11/21 03:38	15.55

**Client Sample ID: 114217-001/CWL-U11-80**

**Lab Sample ID: 140-21895-3**

Date Collected: 02/01/21 09:14

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		620	180	ppb v/v			02/11/21 04:31	18.7
<b>Benzene</b>	<b>4.8 J</b>		25	2.5	ppb v/v			02/11/21 04:31	18.7
Benzyl chloride	ND		50	12	ppb v/v			02/11/21 04:31	18.7
Bromodichloromethane	ND		25	5.6	ppb v/v			02/11/21 04:31	18.7
Bromoform	ND		25	2.8	ppb v/v			02/11/21 04:31	18.7
Bromomethane	ND		25	6.9	ppb v/v			02/11/21 04:31	18.7
2-Butanone (MEK)	ND		120	23	ppb v/v			02/11/21 04:31	18.7
<b>Carbon disulfide</b>	<b>5.6 J B</b>		62	3.4	ppb v/v			02/11/21 04:31	18.7
<b>Carbon tetrachloride</b>	<b>9.6 J</b>		25	2.2	ppb v/v			02/11/21 04:31	18.7
<b>Chlorobenzene</b>	<b>2.0 J</b>		25	1.9	ppb v/v			02/11/21 04:31	18.7
Chloroethane	ND		25	9.0	ppb v/v			02/11/21 04:31	18.7
<b>Chloroform</b>	<b>290</b>		25	2.2	ppb v/v			02/11/21 04:31	18.7
Chloromethane	ND		62	21	ppb v/v			02/11/21 04:31	18.7
Dibromochloromethane	ND		25	2.2	ppb v/v			02/11/21 04:31	18.7
1,2-Dibromoethane (EDB)	ND		25	2.2	ppb v/v			02/11/21 04:31	18.7
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		25	3.7	ppb v/v			02/11/21 04:31	18.7
1,2-Dichlorobenzene	ND		25	9.7	ppb v/v			02/11/21 04:31	18.7
1,3-Dichlorobenzene	ND		25	5.0	ppb v/v			02/11/21 04:31	18.7
1,4-Dichlorobenzene	ND		25	5.0	ppb v/v			02/11/21 04:31	18.7
<b>Dichlorodifluoromethane</b>	<b>19 J</b>		25	4.4	ppb v/v			02/11/21 04:31	18.7
<b>1,1-Dichloroethane</b>	<b>8.6 J</b>		25	2.2	ppb v/v			02/11/21 04:31	18.7
<b>1,2-Dichloroethane</b>	<b>10 J</b>		25	3.1	ppb v/v			02/11/21 04:31	18.7
<b>1,1-Dichloroethene</b>	<b>160</b>		25	2.5	ppb v/v			02/11/21 04:31	18.7

Eurofins TestAmerica, Knoxville

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114217-001/CWL-U11-80**

**Lab Sample ID: 140-21895-3**

Date Collected: 02/01/21 09:14

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		25	3.1	ppb v/v			02/11/21 04:31	18.7
trans-1,2-Dichloroethene	ND		25	2.2	ppb v/v			02/11/21 04:31	18.7
<b>1,2-Dichloropropane</b>	<b>57</b>		25	3.1	ppb v/v			02/11/21 04:31	18.7
cis-1,3-Dichloropropene	ND		25	5.0	ppb v/v			02/11/21 04:31	18.7
trans-1,3-Dichloropropene	ND		25	2.8	ppb v/v			02/11/21 04:31	18.7
Ethylbenzene	ND		25	4.1	ppb v/v			02/11/21 04:31	18.7
4-Ethyltoluene	ND		50	6.5	ppb v/v			02/11/21 04:31	18.7
Hexachlorobutadiene	ND		120	10	ppb v/v			02/11/21 04:31	18.7
2-Hexanone	ND		62	5.0	ppb v/v			02/11/21 04:31	18.7
4-Methyl-2-pentanone (MIBK)	ND		62	17	ppb v/v			02/11/21 04:31	18.7
Methylene Chloride	ND		120	120	ppb v/v			02/11/21 04:31	18.7
Styrene	ND		25	7.5	ppb v/v			02/11/21 04:31	18.7
1,1,2,2-Tetrachloroethane	ND		25	4.4	ppb v/v			02/11/21 04:31	18.7
<b>Tetrachloroethene</b>	<b>630</b>		25	2.2	ppb v/v			02/11/21 04:31	18.7
Toluene	ND		37	24	ppb v/v			02/11/21 04:31	18.7
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>450</b>		25	2.5	ppb v/v			02/11/21 04:31	18.7
1,2,4-Trichlorobenzene	ND		120	20	ppb v/v			02/11/21 04:31	18.7
<b>1,1,1-Trichloroethane</b>	<b>17 J</b>		25	12	ppb v/v			02/11/21 04:31	18.7
<b>1,1,2-Trichloroethane</b>	<b>4.5 J</b>		25	2.2	ppb v/v			02/11/21 04:31	18.7
<b>Trichloroethene</b>	<b>4200</b>		12	1.9	ppb v/v			02/11/21 04:31	18.7
<b>Trichlorofluoromethane</b>	<b>120</b>		25	3.4	ppb v/v			02/11/21 04:31	18.7
1,2,4-Trimethylbenzene	ND		25	6.2	ppb v/v			02/11/21 04:31	18.7
1,3,5-Trimethylbenzene	ND		25	6.9	ppb v/v			02/11/21 04:31	18.7
Vinyl acetate	ND		120	8.7	ppb v/v			02/11/21 04:31	18.7
Vinyl chloride	ND		12	8.1	ppb v/v			02/11/21 04:31	18.7
m,p-Xylene	ND		25	9.0	ppb v/v			02/11/21 04:31	18.7
o-Xylene	ND		25	4.7	ppb v/v			02/11/21 04:31	18.7

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		60 - 140		02/11/21 04:31	18.7

**Client Sample ID: 114218-001/CWL-U11-120**

**Lab Sample ID: 140-21895-4**

Date Collected: 02/01/21 09:17

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		830	240	ppb v/v			02/11/21 05:24	16.51
<b>Benzene</b>	<b>3.9 J</b>		33	3.3	ppb v/v			02/11/21 05:24	16.51
Benzyl chloride	ND		66	16	ppb v/v			02/11/21 05:24	16.51
Bromodichloromethane	ND		33	7.4	ppb v/v			02/11/21 05:24	16.51
Bromoform	ND		33	3.7	ppb v/v			02/11/21 05:24	16.51
Bromomethane	ND		33	9.1	ppb v/v			02/11/21 05:24	16.51
2-Butanone (MEK)	ND		170	30	ppb v/v			02/11/21 05:24	16.51
<b>Carbon disulfide</b>	<b>7.1 J B</b>		83	4.5	ppb v/v			02/11/21 05:24	16.51
<b>Carbon tetrachloride</b>	<b>11 J</b>		33	2.9	ppb v/v			02/11/21 05:24	16.51
<b>Chlorobenzene</b>	<b>3.3 J</b>		33	2.5	ppb v/v			02/11/21 05:24	16.51

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114218-001/CWL-UI1-120**

**Lab Sample ID: 140-21895-4**

Date Collected: 02/01/21 09:17

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		33	12	ppb v/v			02/11/21 05:24	16.51
<b>Chloroform</b>	<b>240</b>		33	2.9	ppb v/v			02/11/21 05:24	16.51
Chloromethane	ND		83	27	ppb v/v			02/11/21 05:24	16.51
Dibromochloromethane	ND		33	2.9	ppb v/v			02/11/21 05:24	16.51
<b>1,2-Dibromoethane (EDB)</b>	<b>3.3</b>	<b>J</b>	33	2.9	ppb v/v			02/11/21 05:24	16.51
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		33	5.0	ppb v/v			02/11/21 05:24	16.51
1,2-Dichlorobenzene	ND		33	13	ppb v/v			02/11/21 05:24	16.51
1,3-Dichlorobenzene	ND		33	6.6	ppb v/v			02/11/21 05:24	16.51
1,4-Dichlorobenzene	ND		33	6.6	ppb v/v			02/11/21 05:24	16.51
<b>Dichlorodifluoromethane</b>	<b>18</b>	<b>J</b>	33	5.8	ppb v/v			02/11/21 05:24	16.51
<b>1,1-Dichloroethane</b>	<b>10</b>	<b>J</b>	33	2.9	ppb v/v			02/11/21 05:24	16.51
<b>1,2-Dichloroethane</b>	<b>19</b>	<b>J</b>	33	4.1	ppb v/v			02/11/21 05:24	16.51
<b>1,1-Dichloroethene</b>	<b>170</b>		33	3.3	ppb v/v			02/11/21 05:24	16.51
cis-1,2-Dichloroethene	ND		33	4.1	ppb v/v			02/11/21 05:24	16.51
trans-1,2-Dichloroethene	ND		33	2.9	ppb v/v			02/11/21 05:24	16.51
<b>1,2-Dichloropropane</b>	<b>66</b>		33	4.1	ppb v/v			02/11/21 05:24	16.51
cis-1,3-Dichloropropene	ND		33	6.6	ppb v/v			02/11/21 05:24	16.51
trans-1,3-Dichloropropene	ND		33	3.7	ppb v/v			02/11/21 05:24	16.51
Ethylbenzene	ND		33	5.4	ppb v/v			02/11/21 05:24	16.51
4-Ethyltoluene	ND		66	8.7	ppb v/v			02/11/21 05:24	16.51
Hexachlorobutadiene	ND		170	13	ppb v/v			02/11/21 05:24	16.51
2-Hexanone	ND		83	6.6	ppb v/v			02/11/21 05:24	16.51
4-Methyl-2-pentanone (MIBK)	ND		83	22	ppb v/v			02/11/21 05:24	16.51
Methylene Chloride	ND		170	160	ppb v/v			02/11/21 05:24	16.51
Styrene	ND		33	9.9	ppb v/v			02/11/21 05:24	16.51
1,1,2,2-Tetrachloroethane	ND		33	5.8	ppb v/v			02/11/21 05:24	16.51
<b>Tetrachloroethene</b>	<b>420</b>		33	2.9	ppb v/v			02/11/21 05:24	16.51
Toluene	ND		50	32	ppb v/v			02/11/21 05:24	16.51
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>450</b>		33	3.3	ppb v/v			02/11/21 05:24	16.51
1,2,4-Trichlorobenzene	ND		170	26	ppb v/v			02/11/21 05:24	16.51
1,1,1-Trichloroethane	ND		33	15	ppb v/v			02/11/21 05:24	16.51
<b>1,1,2-Trichloroethane</b>	<b>5.0</b>	<b>J</b>	33	2.9	ppb v/v			02/11/21 05:24	16.51
<b>Trichloroethene</b>	<b>4500</b>		17	2.5	ppb v/v			02/11/21 05:24	16.51
<b>Trichlorofluoromethane</b>	<b>110</b>		33	4.5	ppb v/v			02/11/21 05:24	16.51
1,2,4-Trimethylbenzene	ND		33	8.3	ppb v/v			02/11/21 05:24	16.51
1,3,5-Trimethylbenzene	ND		33	9.1	ppb v/v			02/11/21 05:24	16.51
Vinyl acetate	ND		170	12	ppb v/v			02/11/21 05:24	16.51
Vinyl chloride	ND		17	11	ppb v/v			02/11/21 05:24	16.51
m,p-Xylene	ND		33	12	ppb v/v			02/11/21 05:24	16.51
o-Xylene	ND		33	6.2	ppb v/v			02/11/21 05:24	16.51

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		60 - 140		02/11/21 05:24	16.51

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114219-001/CWL-FB2**

**Lab Sample ID: 140-21895-5**

Date Collected: 02/01/21 10:53

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	2.3	J	2.5	0.70	ppb v/v			02/10/21 04:29	1.96
Benzene	0.011	J B	0.098	0.0098	ppb v/v			02/10/21 04:29	1.96
Benzyl chloride	ND		0.20	0.047	ppb v/v			02/10/21 04:29	1.96
Bromodichloromethane	ND		0.098	0.022	ppb v/v			02/10/21 04:29	1.96
Bromoform	ND		0.098	0.011	ppb v/v			02/10/21 04:29	1.96
Bromomethane	ND		0.098	0.027	ppb v/v			02/10/21 04:29	1.96
2-Butanone (MEK)	0.17	J	0.49	0.089	ppb v/v			02/10/21 04:29	1.96
Carbon disulfide	ND		0.25	0.013	ppb v/v			02/10/21 04:29	1.96
Carbon tetrachloride	ND		0.098	0.0086	ppb v/v			02/10/21 04:29	1.96
Chlorobenzene	0.0076	J	0.098	0.0074	ppb v/v			02/10/21 04:29	1.96
Chloroethane	ND		0.098	0.036	ppb v/v			02/10/21 04:29	1.96
Chloroform	ND		0.098	0.0086	ppb v/v			02/10/21 04:29	1.96
Chloromethane	ND		0.25	0.081	ppb v/v			02/10/21 04:29	1.96
Dibromochloromethane	ND		0.098	0.0086	ppb v/v			02/10/21 04:29	1.96
1,2-Dibromoethane (EDB)	ND		0.098	0.0086	ppb v/v			02/10/21 04:29	1.96
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.098	0.015	ppb v/v			02/10/21 04:29	1.96
1,2-Dichlorobenzene	ND		0.098	0.038	ppb v/v			02/10/21 04:29	1.96
1,3-Dichlorobenzene	ND		0.098	0.020	ppb v/v			02/10/21 04:29	1.96
1,4-Dichlorobenzene	ND		0.098	0.020	ppb v/v			02/10/21 04:29	1.96
Dichlorodifluoromethane	ND		0.098	0.017	ppb v/v			02/10/21 04:29	1.96
1,1-Dichloroethane	ND		0.098	0.0086	ppb v/v			02/10/21 04:29	1.96
1,2-Dichloroethane	ND		0.098	0.012	ppb v/v			02/10/21 04:29	1.96
1,1-Dichloroethene	ND		0.098	0.0098	ppb v/v			02/10/21 04:29	1.96
cis-1,2-Dichloroethene	ND		0.098	0.012	ppb v/v			02/10/21 04:29	1.96
trans-1,2-Dichloroethene	ND		0.098	0.0086	ppb v/v			02/10/21 04:29	1.96
1,2-Dichloropropane	ND		0.098	0.012	ppb v/v			02/10/21 04:29	1.96
cis-1,3-Dichloropropene	ND		0.098	0.020	ppb v/v			02/10/21 04:29	1.96
trans-1,3-Dichloropropene	ND		0.098	0.011	ppb v/v			02/10/21 04:29	1.96
Ethylbenzene	ND		0.098	0.016	ppb v/v			02/10/21 04:29	1.96
4-Ethyltoluene	ND		0.20	0.026	ppb v/v			02/10/21 04:29	1.96
Hexachlorobutadiene	ND		0.49	0.039	ppb v/v			02/10/21 04:29	1.96
2-Hexanone	ND		0.25	0.020	ppb v/v			02/10/21 04:29	1.96
4-Methyl-2-pentanone (MIBK)	ND		0.25	0.066	ppb v/v			02/10/21 04:29	1.96
Methylene Chloride	ND		0.49	0.48	ppb v/v			02/10/21 04:29	1.96
Styrene	ND		0.098	0.029	ppb v/v			02/10/21 04:29	1.96
1,1,2,2-Tetrachloroethane	ND		0.098	0.017	ppb v/v			02/10/21 04:29	1.96
Tetrachloroethene	ND		0.098	0.0086	ppb v/v			02/10/21 04:29	1.96
Toluene	ND		0.15	0.096	ppb v/v			02/10/21 04:29	1.96
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.098	0.0098	ppb v/v			02/10/21 04:29	1.96
1,2,4-Trichlorobenzene	ND		0.49	0.078	ppb v/v			02/10/21 04:29	1.96
1,1,1-Trichloroethane	ND		0.098	0.045	ppb v/v			02/10/21 04:29	1.96
1,1,2-Trichloroethane	ND		0.098	0.0086	ppb v/v			02/10/21 04:29	1.96
Trichloroethene	ND		0.049	0.0074	ppb v/v			02/10/21 04:29	1.96
Trichlorofluoromethane	ND		0.098	0.013	ppb v/v			02/10/21 04:29	1.96
1,2,4-Trimethylbenzene	ND		0.098	0.025	ppb v/v			02/10/21 04:29	1.96
1,3,5-Trimethylbenzene	ND		0.098	0.027	ppb v/v			02/10/21 04:29	1.96
Vinyl acetate	ND		0.49	0.034	ppb v/v			02/10/21 04:29	1.96
Vinyl chloride	ND		0.049	0.032	ppb v/v			02/10/21 04:29	1.96

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114219-001/CWL-FB2**

**Lab Sample ID: 140-21895-5**

Date Collected: 02/01/21 10:53

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		0.098	0.036	ppb v/v			02/10/21 04:29	1.96
o-Xylene	ND		0.098	0.018	ppb v/v			02/10/21 04:29	1.96
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		60 - 140					02/10/21 04:29	1.96

**Client Sample ID: 114220-001/CWL-UI2-36**

**Lab Sample ID: 140-21895-6**

Date Collected: 02/01/21 10:59

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		740	210	ppb v/v			02/10/21 17:04	14.77
<b>Benzene</b>	<b>3.3</b>	<b>J</b>	30	3.0	ppb v/v			02/10/21 17:04	14.77
Benzyl chloride	ND		59	14	ppb v/v			02/10/21 17:04	14.77
Bromodichloromethane	ND		30	6.6	ppb v/v			02/10/21 17:04	14.77
Bromoform	ND		30	3.3	ppb v/v			02/10/21 17:04	14.77
Bromomethane	ND		30	8.1	ppb v/v			02/10/21 17:04	14.77
2-Butanone (MEK)	ND		150	27	ppb v/v			02/10/21 17:04	14.77
<b>Carbon disulfide</b>	<b>6.8</b>	<b>J B</b>	74	4.1	ppb v/v			02/10/21 17:04	14.77
<b>Carbon tetrachloride</b>	<b>4.7</b>	<b>J</b>	30	2.6	ppb v/v			02/10/21 17:04	14.77
Chlorobenzene	ND		30	2.2	ppb v/v			02/10/21 17:04	14.77
Chloroethane	ND		30	11	ppb v/v			02/10/21 17:04	14.77
<b>Chloroform</b>	<b>270</b>		30	2.6	ppb v/v			02/10/21 17:04	14.77
Chloromethane	ND		74	24	ppb v/v			02/10/21 17:04	14.77
Dibromochloromethane	ND		30	2.6	ppb v/v			02/10/21 17:04	14.77
1,2-Dibromoethane (EDB)	ND		30	2.6	ppb v/v			02/10/21 17:04	14.77
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		30	4.4	ppb v/v			02/10/21 17:04	14.77
1,2-Dichlorobenzene	ND		30	11	ppb v/v			02/10/21 17:04	14.77
1,3-Dichlorobenzene	ND		30	5.9	ppb v/v			02/10/21 17:04	14.77
1,4-Dichlorobenzene	ND		30	5.9	ppb v/v			02/10/21 17:04	14.77
<b>Dichlorodifluoromethane</b>	<b>11</b>	<b>J</b>	30	5.2	ppb v/v			02/10/21 17:04	14.77
<b>1,1-Dichloroethane</b>	<b>3.3</b>	<b>J</b>	30	2.6	ppb v/v			02/10/21 17:04	14.77
1,2-Dichloroethane	ND		30	3.7	ppb v/v			02/10/21 17:04	14.77
<b>1,1-Dichloroethene</b>	<b>19</b>	<b>J</b>	30	3.0	ppb v/v			02/10/21 17:04	14.77
cis-1,2-Dichloroethene	ND		30	3.7	ppb v/v			02/10/21 17:04	14.77
trans-1,2-Dichloroethene	ND		30	2.6	ppb v/v			02/10/21 17:04	14.77
<b>1,2-Dichloropropane</b>	<b>36</b>		30	3.7	ppb v/v			02/10/21 17:04	14.77
cis-1,3-Dichloropropene	ND		30	5.9	ppb v/v			02/10/21 17:04	14.77
trans-1,3-Dichloropropene	ND		30	3.3	ppb v/v			02/10/21 17:04	14.77
Ethylbenzene	ND		30	4.8	ppb v/v			02/10/21 17:04	14.77
4-Ethyltoluene	ND		59	7.8	ppb v/v			02/10/21 17:04	14.77
Hexachlorobutadiene	ND		150	12	ppb v/v			02/10/21 17:04	14.77
2-Hexanone	ND		74	5.9	ppb v/v			02/10/21 17:04	14.77
4-Methyl-2-pentanone (MIBK)	ND		74	20	ppb v/v			02/10/21 17:04	14.77
Methylene Chloride	ND		150	140	ppb v/v			02/10/21 17:04	14.77
Styrene	ND		30	8.9	ppb v/v			02/10/21 17:04	14.77
1,1,2,2-Tetrachloroethane	ND		30	5.2	ppb v/v			02/10/21 17:04	14.77

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114220-001/CWL-UI2-36**

**Lab Sample ID: 140-21895-6**

Date Collected: 02/01/21 10:59

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Tetrachloroethene</b>	<b>85</b>		30	2.6	ppb v/v			02/10/21 17:04	14.77
Toluene	ND		44	29	ppb v/v			02/10/21 17:04	14.77
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>210</b>		30	3.0	ppb v/v			02/10/21 17:04	14.77
1,2,4-Trichlorobenzene	ND		150	24	ppb v/v			02/10/21 17:04	14.77
1,1,1-Trichloroethane	ND		30	14	ppb v/v			02/10/21 17:04	14.77
1,1,2-Trichloroethane	ND		30	2.6	ppb v/v			02/10/21 17:04	14.77
<b>Trichloroethene</b>	<b>1800</b>		15	2.2	ppb v/v			02/10/21 17:04	14.77
<b>Trichlorofluoromethane</b>	<b>59</b>		30	4.1	ppb v/v			02/10/21 17:04	14.77
1,2,4-Trimethylbenzene	ND		30	7.4	ppb v/v			02/10/21 17:04	14.77
1,3,5-Trimethylbenzene	ND		30	8.1	ppb v/v			02/10/21 17:04	14.77
Vinyl acetate	ND		150	10	ppb v/v			02/10/21 17:04	14.77
Vinyl chloride	ND		15	9.6	ppb v/v			02/10/21 17:04	14.77
m,p-Xylene	ND		30	11	ppb v/v			02/10/21 17:04	14.77
o-Xylene	ND		30	5.5	ppb v/v			02/10/21 17:04	14.77
<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)	93		60 - 140					02/10/21 17:04	14.77

**Client Sample ID: 114221-001/CWL-UI2-76**

**Lab Sample ID: 140-21895-7**

Date Collected: 02/01/21 11:01

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		570	160	ppb v/v			02/10/21 18:01	14.26
<b>Benzene</b>	<b>2.7</b>	<b>J</b>	23	2.3	ppb v/v			02/10/21 18:01	14.26
Benzyl chloride	ND		46	11	ppb v/v			02/10/21 18:01	14.26
Bromodichloromethane	ND		23	5.1	ppb v/v			02/10/21 18:01	14.26
Bromoform	ND		23	2.6	ppb v/v			02/10/21 18:01	14.26
Bromomethane	ND		23	6.3	ppb v/v			02/10/21 18:01	14.26
2-Butanone (MEK)	ND		110	21	ppb v/v			02/10/21 18:01	14.26
<b>Carbon disulfide</b>	<b>5.9</b>	<b>J B</b>	57	3.1	ppb v/v			02/10/21 18:01	14.26
<b>Carbon tetrachloride</b>	<b>9.6</b>	<b>J</b>	23	2.0	ppb v/v			02/10/21 18:01	14.26
Chlorobenzene	ND		23	1.7	ppb v/v			02/10/21 18:01	14.26
Chloroethane	ND		23	8.3	ppb v/v			02/10/21 18:01	14.26
<b>Chloroform</b>	<b>400</b>		23	2.0	ppb v/v			02/10/21 18:01	14.26
Chloromethane	ND		57	19	ppb v/v			02/10/21 18:01	14.26
Dibromochloromethane	ND		23	2.0	ppb v/v			02/10/21 18:01	14.26
1,2-Dibromoethane (EDB)	ND		23	2.0	ppb v/v			02/10/21 18:01	14.26
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		23	3.4	ppb v/v			02/10/21 18:01	14.26
1,2-Dichlorobenzene	ND		23	8.8	ppb v/v			02/10/21 18:01	14.26
1,3-Dichlorobenzene	ND		23	4.6	ppb v/v			02/10/21 18:01	14.26
1,4-Dichlorobenzene	ND		23	4.6	ppb v/v			02/10/21 18:01	14.26
<b>Dichlorodifluoromethane</b>	<b>16</b>	<b>J</b>	23	4.0	ppb v/v			02/10/21 18:01	14.26
<b>1,1-Dichloroethane</b>	<b>5.1</b>	<b>J</b>	23	2.0	ppb v/v			02/10/21 18:01	14.26
1,2-Dichloroethane	ND		23	2.9	ppb v/v			02/10/21 18:01	14.26
<b>1,1-Dichloroethene</b>	<b>58</b>		23	2.3	ppb v/v			02/10/21 18:01	14.26

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114221-001/CWL-UI2-76**

**Lab Sample ID: 140-21895-7**

Date Collected: 02/01/21 11:01

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		23	2.9	ppb v/v			02/10/21 18:01	14.26
trans-1,2-Dichloroethene	ND		23	2.0	ppb v/v			02/10/21 18:01	14.26
<b>1,2-Dichloropropane</b>	<b>74</b>		23	2.9	ppb v/v			02/10/21 18:01	14.26
cis-1,3-Dichloropropene	ND		23	4.6	ppb v/v			02/10/21 18:01	14.26
trans-1,3-Dichloropropene	ND		23	2.6	ppb v/v			02/10/21 18:01	14.26
Ethylbenzene	ND		23	3.7	ppb v/v			02/10/21 18:01	14.26
4-Ethyltoluene	ND		46	6.0	ppb v/v			02/10/21 18:01	14.26
Hexachlorobutadiene	ND		110	9.1	ppb v/v			02/10/21 18:01	14.26
2-Hexanone	ND		57	4.6	ppb v/v			02/10/21 18:01	14.26
4-Methyl-2-pentanone (MIBK)	ND		57	15	ppb v/v			02/10/21 18:01	14.26
Methylene Chloride	ND		110	110	ppb v/v			02/10/21 18:01	14.26
Styrene	ND		23	6.8	ppb v/v			02/10/21 18:01	14.26
1,1,2,2-Tetrachloroethane	ND		23	4.0	ppb v/v			02/10/21 18:01	14.26
<b>Tetrachloroethene</b>	<b>130</b>		23	2.0	ppb v/v			02/10/21 18:01	14.26
Toluene	ND		34	22	ppb v/v			02/10/21 18:01	14.26
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>390</b>		23	2.3	ppb v/v			02/10/21 18:01	14.26
1,2,4-Trichlorobenzene	ND		110	18	ppb v/v			02/10/21 18:01	14.26
<b>1,1,1-Trichloroethane</b>	<b>12 J</b>		23	11	ppb v/v			02/10/21 18:01	14.26
<b>1,1,2-Trichloroethane</b>	<b>2.8 J</b>		23	2.0	ppb v/v			02/10/21 18:01	14.26
<b>Trichloroethene</b>	<b>3200</b>		11	1.7	ppb v/v			02/10/21 18:01	14.26
<b>Trichlorofluoromethane</b>	<b>100</b>		23	3.1	ppb v/v			02/10/21 18:01	14.26
1,2,4-Trimethylbenzene	ND		23	5.7	ppb v/v			02/10/21 18:01	14.26
1,3,5-Trimethylbenzene	ND		23	6.3	ppb v/v			02/10/21 18:01	14.26
Vinyl acetate	ND		110	8.0	ppb v/v			02/10/21 18:01	14.26
Vinyl chloride	ND		11	7.4	ppb v/v			02/10/21 18:01	14.26
m,p-Xylene	ND		23	8.3	ppb v/v			02/10/21 18:01	14.26
o-Xylene	ND		23	4.3	ppb v/v			02/10/21 18:01	14.26

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		60 - 140		02/10/21 18:01	14.26

**Client Sample ID: 114222-001/CWL-UI2-136**

**Lab Sample ID: 140-21895-8**

Date Collected: 02/01/21 11:03

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		670	190	ppb v/v			02/10/21 18:53	16.84
Benzene	ND		27	2.7	ppb v/v			02/10/21 18:53	16.84
Benzyl chloride	ND		54	13	ppb v/v			02/10/21 18:53	16.84
Bromodichloromethane	ND		27	6.1	ppb v/v			02/10/21 18:53	16.84
Bromoform	ND		27	3.0	ppb v/v			02/10/21 18:53	16.84
Bromomethane	ND		27	7.4	ppb v/v			02/10/21 18:53	16.84
2-Butanone (MEK)	ND		130	25	ppb v/v			02/10/21 18:53	16.84
<b>Carbon disulfide</b>	<b>5.7 J B</b>		67	3.7	ppb v/v			02/10/21 18:53	16.84
<b>Carbon tetrachloride</b>	<b>8.9 J</b>		27	2.4	ppb v/v			02/10/21 18:53	16.84
<b>Chlorobenzene</b>	<b>2.5 J</b>		27	2.0	ppb v/v			02/10/21 18:53	16.84

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114222-001/CWL-UI2-136**

**Lab Sample ID: 140-21895-8**

Date Collected: 02/01/21 11:03

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		27	9.8	ppb v/v			02/10/21 18:53	16.84
<b>Chloroform</b>	<b>330</b>		27	2.4	ppb v/v			02/10/21 18:53	16.84
Chloromethane	ND		67	22	ppb v/v			02/10/21 18:53	16.84
Dibromochloromethane	ND		27	2.4	ppb v/v			02/10/21 18:53	16.84
1,2-Dibromoethane (EDB)	ND		27	2.4	ppb v/v			02/10/21 18:53	16.84
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		27	4.0	ppb v/v			02/10/21 18:53	16.84
1,2-Dichlorobenzene	ND		27	10	ppb v/v			02/10/21 18:53	16.84
1,3-Dichlorobenzene	ND		27	5.4	ppb v/v			02/10/21 18:53	16.84
1,4-Dichlorobenzene	ND		27	5.4	ppb v/v			02/10/21 18:53	16.84
<b>Dichlorodifluoromethane</b>	<b>16 J</b>		27	4.7	ppb v/v			02/10/21 18:53	16.84
1,1-Dichloroethane	ND		27	2.4	ppb v/v			02/10/21 18:53	16.84
<b>1,2-Dichloroethane</b>	<b>12 J</b>		27	3.4	ppb v/v			02/10/21 18:53	16.84
<b>1,1-Dichloroethene</b>	<b>68</b>		27	2.7	ppb v/v			02/10/21 18:53	16.84
cis-1,2-Dichloroethene	ND		27	3.4	ppb v/v			02/10/21 18:53	16.84
trans-1,2-Dichloroethene	ND		27	2.4	ppb v/v			02/10/21 18:53	16.84
<b>1,2-Dichloropropane</b>	<b>100</b>		27	3.4	ppb v/v			02/10/21 18:53	16.84
cis-1,3-Dichloropropene	ND		27	5.4	ppb v/v			02/10/21 18:53	16.84
trans-1,3-Dichloropropene	ND		27	3.0	ppb v/v			02/10/21 18:53	16.84
Ethylbenzene	ND		27	4.4	ppb v/v			02/10/21 18:53	16.84
4-Ethyltoluene	ND		54	7.1	ppb v/v			02/10/21 18:53	16.84
Hexachlorobutadiene	ND		130	11	ppb v/v			02/10/21 18:53	16.84
2-Hexanone	ND		67	5.4	ppb v/v			02/10/21 18:53	16.84
4-Methyl-2-pentanone (MIBK)	ND		67	18	ppb v/v			02/10/21 18:53	16.84
Methylene Chloride	ND		130	130	ppb v/v			02/10/21 18:53	16.84
Styrene	ND		27	8.1	ppb v/v			02/10/21 18:53	16.84
1,1,2,2-Tetrachloroethane	ND		27	4.7	ppb v/v			02/10/21 18:53	16.84
<b>Tetrachloroethene</b>	<b>120</b>		27	2.4	ppb v/v			02/10/21 18:53	16.84
Toluene	ND		40	26	ppb v/v			02/10/21 18:53	16.84
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>380</b>		27	2.7	ppb v/v			02/10/21 18:53	16.84
1,2,4-Trichlorobenzene	ND		130	22	ppb v/v			02/10/21 18:53	16.84
1,1,1-Trichloroethane	ND		27	12	ppb v/v			02/10/21 18:53	16.84
<b>1,1,2-Trichloroethane</b>	<b>3.7 J</b>		27	2.4	ppb v/v			02/10/21 18:53	16.84
<b>Trichloroethene</b>	<b>3500</b>		13	2.0	ppb v/v			02/10/21 18:53	16.84
<b>Trichlorofluoromethane</b>	<b>100</b>		27	3.7	ppb v/v			02/10/21 18:53	16.84
1,2,4-Trimethylbenzene	ND		27	6.7	ppb v/v			02/10/21 18:53	16.84
1,3,5-Trimethylbenzene	ND		27	7.4	ppb v/v			02/10/21 18:53	16.84
Vinyl acetate	ND		130	9.4	ppb v/v			02/10/21 18:53	16.84
Vinyl chloride	ND		13	8.8	ppb v/v			02/10/21 18:53	16.84
m,p-Xylene	ND		27	9.8	ppb v/v			02/10/21 18:53	16.84
o-Xylene	ND		27	5.1	ppb v/v			02/10/21 18:53	16.84

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		60 - 140		02/10/21 18:53	16.84

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114227-001/CWL-FB3**

**Lab Sample ID: 140-21895-9**

Date Collected: 02/01/21 08:37

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		2.4	0.68	ppb v/v			02/10/21 05:33	1.91
<b>Benzene</b>	<b>0.016</b>	<b>J B</b>	0.096	0.0096	ppb v/v			02/10/21 05:33	1.91
Benzyl chloride	ND		0.19	0.045	ppb v/v			02/10/21 05:33	1.91
Bromodichloromethane	ND		0.096	0.021	ppb v/v			02/10/21 05:33	1.91
Bromoform	ND		0.096	0.011	ppb v/v			02/10/21 05:33	1.91
Bromomethane	ND		0.096	0.026	ppb v/v			02/10/21 05:33	1.91
2-Butanone (MEK)	ND		0.48	0.087	ppb v/v			02/10/21 05:33	1.91
<b>Carbon disulfide</b>	<b>0.081</b>	<b>J</b>	0.24	0.013	ppb v/v			02/10/21 05:33	1.91
Carbon tetrachloride	ND		0.096	0.0084	ppb v/v			02/10/21 05:33	1.91
Chlorobenzene	ND		0.096	0.0072	ppb v/v			02/10/21 05:33	1.91
Chloroethane	ND		0.096	0.035	ppb v/v			02/10/21 05:33	1.91
Chloroform	ND		0.096	0.0084	ppb v/v			02/10/21 05:33	1.91
Chloromethane	ND		0.24	0.079	ppb v/v			02/10/21 05:33	1.91
Dibromochloromethane	ND		0.096	0.0084	ppb v/v			02/10/21 05:33	1.91
1,2-Dibromoethane (EDB)	ND		0.096	0.0084	ppb v/v			02/10/21 05:33	1.91
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.096	0.014	ppb v/v			02/10/21 05:33	1.91
1,2-Dichlorobenzene	ND		0.096	0.037	ppb v/v			02/10/21 05:33	1.91
1,3-Dichlorobenzene	ND		0.096	0.019	ppb v/v			02/10/21 05:33	1.91
1,4-Dichlorobenzene	ND		0.096	0.019	ppb v/v			02/10/21 05:33	1.91
Dichlorodifluoromethane	ND		0.096	0.017	ppb v/v			02/10/21 05:33	1.91
1,1-Dichloroethane	ND		0.096	0.0084	ppb v/v			02/10/21 05:33	1.91
1,2-Dichloroethane	ND		0.096	0.012	ppb v/v			02/10/21 05:33	1.91
1,1-Dichloroethene	ND		0.096	0.0096	ppb v/v			02/10/21 05:33	1.91
cis-1,2-Dichloroethene	ND		0.096	0.012	ppb v/v			02/10/21 05:33	1.91
trans-1,2-Dichloroethene	ND		0.096	0.0084	ppb v/v			02/10/21 05:33	1.91
1,2-Dichloropropane	ND		0.096	0.012	ppb v/v			02/10/21 05:33	1.91
cis-1,3-Dichloropropene	ND		0.096	0.019	ppb v/v			02/10/21 05:33	1.91
trans-1,3-Dichloropropene	ND		0.096	0.011	ppb v/v			02/10/21 05:33	1.91
<b>Ethylbenzene</b>	<b>0.063</b>	<b>J</b>	0.096	0.016	ppb v/v			02/10/21 05:33	1.91
<b>4-Ethyltoluene</b>	<b>0.077</b>	<b>J</b>	0.19	0.025	ppb v/v			02/10/21 05:33	1.91
Hexachlorobutadiene	ND		0.48	0.038	ppb v/v			02/10/21 05:33	1.91
2-Hexanone	ND		0.24	0.019	ppb v/v			02/10/21 05:33	1.91
4-Methyl-2-pentanone (MIBK)	ND		0.24	0.064	ppb v/v			02/10/21 05:33	1.91
Methylene Chloride	ND		0.48	0.47	ppb v/v			02/10/21 05:33	1.91
Styrene	ND		0.096	0.029	ppb v/v			02/10/21 05:33	1.91
1,1,2,2-Tetrachloroethane	ND		0.096	0.017	ppb v/v			02/10/21 05:33	1.91
Tetrachloroethene	ND		0.096	0.0084	ppb v/v			02/10/21 05:33	1.91
<b>Toluene</b>	<b>0.12</b>	<b>J</b>	0.14	0.093	ppb v/v			02/10/21 05:33	1.91
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.096	0.0096	ppb v/v			02/10/21 05:33	1.91
1,2,4-Trichlorobenzene	ND		0.48	0.076	ppb v/v			02/10/21 05:33	1.91
1,1,1-Trichloroethane	ND		0.096	0.044	ppb v/v			02/10/21 05:33	1.91
1,1,2-Trichloroethane	ND		0.096	0.0084	ppb v/v			02/10/21 05:33	1.91
Trichloroethene	ND		0.048	0.0072	ppb v/v			02/10/21 05:33	1.91
Trichlorofluoromethane	ND		0.096	0.013	ppb v/v			02/10/21 05:33	1.91
<b>1,2,4-Trimethylbenzene</b>	<b>0.26</b>		0.096	0.024	ppb v/v			02/10/21 05:33	1.91
<b>1,3,5-Trimethylbenzene</b>	<b>0.079</b>	<b>J</b>	0.096	0.026	ppb v/v			02/10/21 05:33	1.91
Vinyl acetate	ND		0.48	0.033	ppb v/v			02/10/21 05:33	1.91
Vinyl chloride	ND		0.048	0.031	ppb v/v			02/10/21 05:33	1.91

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114227-001/CWL-FB3**

**Lab Sample ID: 140-21895-9**

Date Collected: 02/01/21 08:37

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	0.27		0.096	0.035	ppb v/v			02/10/21 05:33	1.91
o-Xylene	0.11		0.096	0.018	ppb v/v			02/10/21 05:33	1.91
<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)	97		60 - 140					02/10/21 05:33	1.91

**Client Sample ID: 114228-001/CWL-D1-100**

**Lab Sample ID: 140-21895-10**

Date Collected: 02/01/21 08:42

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		820	230	ppb v/v			02/10/21 19:46	16.34
Benzene	4.7	J	33	3.3	ppb v/v			02/10/21 19:46	16.34
Benzyl chloride	ND		65	16	ppb v/v			02/10/21 19:46	16.34
Bromodichloromethane	ND		33	7.4	ppb v/v			02/10/21 19:46	16.34
Bromoform	ND		33	3.7	ppb v/v			02/10/21 19:46	16.34
Bromomethane	ND		33	9.0	ppb v/v			02/10/21 19:46	16.34
2-Butanone (MEK)	ND		160	30	ppb v/v			02/10/21 19:46	16.34
Carbon disulfide	7.5	J B	82	4.5	ppb v/v			02/10/21 19:46	16.34
Carbon tetrachloride	8.3	J	33	2.9	ppb v/v			02/10/21 19:46	16.34
Chlorobenzene	ND		33	2.5	ppb v/v			02/10/21 19:46	16.34
Chloroethane	ND		33	12	ppb v/v			02/10/21 19:46	16.34
Chloroform	190		33	2.9	ppb v/v			02/10/21 19:46	16.34
Chloromethane	ND		82	27	ppb v/v			02/10/21 19:46	16.34
Dibromochloromethane	ND		33	2.9	ppb v/v			02/10/21 19:46	16.34
1,2-Dibromoethane (EDB)	ND		33	2.9	ppb v/v			02/10/21 19:46	16.34
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		33	4.9	ppb v/v			02/10/21 19:46	16.34
1,2-Dichlorobenzene	ND		33	13	ppb v/v			02/10/21 19:46	16.34
1,3-Dichlorobenzene	ND		33	6.5	ppb v/v			02/10/21 19:46	16.34
1,4-Dichlorobenzene	ND		33	6.5	ppb v/v			02/10/21 19:46	16.34
Dichlorodifluoromethane	15	J	33	5.7	ppb v/v			02/10/21 19:46	16.34
1,1-Dichloroethane	7.0	J	33	2.9	ppb v/v			02/10/21 19:46	16.34
1,2-Dichloroethane	9.1	J	33	4.1	ppb v/v			02/10/21 19:46	16.34
1,1-Dichloroethene	110		33	3.3	ppb v/v			02/10/21 19:46	16.34
cis-1,2-Dichloroethene	ND		33	4.1	ppb v/v			02/10/21 19:46	16.34
trans-1,2-Dichloroethene	ND		33	2.9	ppb v/v			02/10/21 19:46	16.34
1,2-Dichloropropane	60		33	4.1	ppb v/v			02/10/21 19:46	16.34
cis-1,3-Dichloropropene	ND		33	6.5	ppb v/v			02/10/21 19:46	16.34
trans-1,3-Dichloropropene	ND		33	3.7	ppb v/v			02/10/21 19:46	16.34
Ethylbenzene	ND		33	5.3	ppb v/v			02/10/21 19:46	16.34
4-Ethyltoluene	ND		65	8.6	ppb v/v			02/10/21 19:46	16.34
Hexachlorobutadiene	ND		160	13	ppb v/v			02/10/21 19:46	16.34
2-Hexanone	ND		82	6.5	ppb v/v			02/10/21 19:46	16.34
4-Methyl-2-pentanone (MIBK)	ND		82	22	ppb v/v			02/10/21 19:46	16.34
Methylene Chloride	ND		160	160	ppb v/v			02/10/21 19:46	16.34
Styrene	ND		33	9.8	ppb v/v			02/10/21 19:46	16.34
1,1,2,2-Tetrachloroethane	ND		33	5.7	ppb v/v			02/10/21 19:46	16.34

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114228-001/CWL-D1-100**

**Lab Sample ID: 140-21895-10**

Date Collected: 02/01/21 08:42

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Tetrachloroethene</b>	<b>350</b>		33	2.9	ppb v/v			02/10/21 19:46	16.34
Toluene	ND		49	32	ppb v/v			02/10/21 19:46	16.34
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>360</b>		33	3.3	ppb v/v			02/10/21 19:46	16.34
1,2,4-Trichlorobenzene	ND		160	26	ppb v/v			02/10/21 19:46	16.34
1,1,1-Trichloroethane	ND		33	15	ppb v/v			02/10/21 19:46	16.34
<b>1,1,2-Trichloroethane</b>	<b>3.1</b>	<b>J</b>	33	2.9	ppb v/v			02/10/21 19:46	16.34
<b>Trichloroethene</b>	<b>3500</b>		16	2.5	ppb v/v			02/10/21 19:46	16.34
<b>Trichlorofluoromethane</b>	<b>90</b>		33	4.5	ppb v/v			02/10/21 19:46	16.34
1,2,4-Trimethylbenzene	ND		33	8.2	ppb v/v			02/10/21 19:46	16.34
1,3,5-Trimethylbenzene	ND		33	9.0	ppb v/v			02/10/21 19:46	16.34
Vinyl acetate	ND		160	11	ppb v/v			02/10/21 19:46	16.34
Vinyl chloride	ND		16	11	ppb v/v			02/10/21 19:46	16.34
m,p-Xylene	ND		33	12	ppb v/v			02/10/21 19:46	16.34
o-Xylene	ND		33	6.1	ppb v/v			02/10/21 19:46	16.34
<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		60 - 140					02/10/21 19:46	16.34

**Client Sample ID: 114229-001/CWL-D1-160**

**Lab Sample ID: 140-21895-11**

Date Collected: 02/01/21 08:45

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		970	280	ppb v/v			02/10/21 20:39	19.37
<b>Benzene</b>	<b>6.8</b>	<b>J</b>	39	3.9	ppb v/v			02/10/21 20:39	19.37
Benzyl chloride	ND		77	18	ppb v/v			02/10/21 20:39	19.37
Bromodichloromethane	ND		39	8.7	ppb v/v			02/10/21 20:39	19.37
Bromoform	ND		39	4.4	ppb v/v			02/10/21 20:39	19.37
Bromomethane	ND		39	11	ppb v/v			02/10/21 20:39	19.37
2-Butanone (MEK)	ND		190	35	ppb v/v			02/10/21 20:39	19.37
<b>Carbon disulfide</b>	<b>8.6</b>	<b>J B</b>	97	5.3	ppb v/v			02/10/21 20:39	19.37
<b>Carbon tetrachloride</b>	<b>15</b>	<b>J</b>	39	3.4	ppb v/v			02/10/21 20:39	19.37
Chlorobenzene	ND		39	2.9	ppb v/v			02/10/21 20:39	19.37
Chloroethane	ND		39	14	ppb v/v			02/10/21 20:39	19.37
<b>Chloroform</b>	<b>250</b>		39	3.4	ppb v/v			02/10/21 20:39	19.37
Chloromethane	ND		97	32	ppb v/v			02/10/21 20:39	19.37
Dibromochloromethane	ND		39	3.4	ppb v/v			02/10/21 20:39	19.37
1,2-Dibromoethane (EDB)	ND		39	3.4	ppb v/v			02/10/21 20:39	19.37
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		39	5.8	ppb v/v			02/10/21 20:39	19.37
1,2-Dichlorobenzene	ND		39	15	ppb v/v			02/10/21 20:39	19.37
1,3-Dichlorobenzene	ND		39	7.7	ppb v/v			02/10/21 20:39	19.37
1,4-Dichlorobenzene	ND		39	7.7	ppb v/v			02/10/21 20:39	19.37
<b>Dichlorodifluoromethane</b>	<b>23</b>	<b>J</b>	39	6.8	ppb v/v			02/10/21 20:39	19.37
<b>1,1-Dichloroethane</b>	<b>12</b>	<b>J</b>	39	3.4	ppb v/v			02/10/21 20:39	19.37
<b>1,2-Dichloroethane</b>	<b>18</b>	<b>J</b>	39	4.8	ppb v/v			02/10/21 20:39	19.37
<b>1,1-Dichloroethene</b>	<b>220</b>		39	3.9	ppb v/v			02/10/21 20:39	19.37

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114229-001/CWL-D1-160**

**Lab Sample ID: 140-21895-11**

Date Collected: 02/01/21 08:45

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		39	4.8	ppb v/v			02/10/21 20:39	19.37
trans-1,2-Dichloroethene	ND		39	3.4	ppb v/v			02/10/21 20:39	19.37
<b>1,2-Dichloropropane</b>	<b>100</b>		39	4.8	ppb v/v			02/10/21 20:39	19.37
cis-1,3-Dichloropropene	ND		39	7.7	ppb v/v			02/10/21 20:39	19.37
trans-1,3-Dichloropropene	ND		39	4.4	ppb v/v			02/10/21 20:39	19.37
Ethylbenzene	ND		39	6.3	ppb v/v			02/10/21 20:39	19.37
4-Ethyltoluene	ND		77	10	ppb v/v			02/10/21 20:39	19.37
Hexachlorobutadiene	ND		190	15	ppb v/v			02/10/21 20:39	19.37
2-Hexanone	ND		97	7.7	ppb v/v			02/10/21 20:39	19.37
4-Methyl-2-pentanone (MIBK)	ND		97	26	ppb v/v			02/10/21 20:39	19.37
Methylene Chloride	ND		190	190	ppb v/v			02/10/21 20:39	19.37
Styrene	ND		39	12	ppb v/v			02/10/21 20:39	19.37
1,1,2,2-Tetrachloroethane	ND		39	6.8	ppb v/v			02/10/21 20:39	19.37
<b>Tetrachloroethene</b>	<b>310</b>		39	3.4	ppb v/v			02/10/21 20:39	19.37
Toluene	ND		58	38	ppb v/v			02/10/21 20:39	19.37
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>630</b>		39	3.9	ppb v/v			02/10/21 20:39	19.37
1,2,4-Trichlorobenzene	ND		190	31	ppb v/v			02/10/21 20:39	19.37
1,1,1-Trichloroethane	ND		39	18	ppb v/v			02/10/21 20:39	19.37
<b>1,1,2-Trichloroethane</b>	<b>4.5 J</b>		39	3.4	ppb v/v			02/10/21 20:39	19.37
<b>Trichloroethene</b>	<b>6200</b>		19	2.9	ppb v/v			02/10/21 20:39	19.37
<b>Trichlorofluoromethane</b>	<b>160</b>		39	5.3	ppb v/v			02/10/21 20:39	19.37
1,2,4-Trimethylbenzene	ND		39	9.7	ppb v/v			02/10/21 20:39	19.37
1,3,5-Trimethylbenzene	ND		39	11	ppb v/v			02/10/21 20:39	19.37
Vinyl acetate	ND		190	14	ppb v/v			02/10/21 20:39	19.37
Vinyl chloride	ND		19	13	ppb v/v			02/10/21 20:39	19.37
m,p-Xylene	ND		39	14	ppb v/v			02/10/21 20:39	19.37
o-Xylene	ND		39	7.3	ppb v/v			02/10/21 20:39	19.37

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		60 - 140		02/10/21 20:39	19.37

**Client Sample ID: 114230-001/CWL-D1-240**

**Lab Sample ID: 140-21895-12**

Date Collected: 02/01/21 08:49

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		1300	360	ppb v/v			02/10/21 21:31	50.46
<b>Benzene</b>	<b>9.1 J</b>		50	5.0	ppb v/v			02/10/21 21:31	50.46
Benzyl chloride	ND		100	24	ppb v/v			02/10/21 21:31	50.46
Bromodichloromethane	ND		50	11	ppb v/v			02/10/21 21:31	50.46
Bromoform	ND		50	5.7	ppb v/v			02/10/21 21:31	50.46
Bromomethane	ND		50	14	ppb v/v			02/10/21 21:31	50.46
2-Butanone (MEK)	ND		250	46	ppb v/v			02/10/21 21:31	50.46
<b>Carbon disulfide</b>	<b>11 J B</b>		130	6.9	ppb v/v			02/10/21 21:31	50.46
<b>Carbon tetrachloride</b>	<b>27 J</b>		50	4.4	ppb v/v			02/10/21 21:31	50.46
<b>Chlorobenzene</b>	<b>5.2 J</b>		50	3.8	ppb v/v			02/10/21 21:31	50.46

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114230-001/CWL-D1-240**

**Lab Sample ID: 140-21895-12**

**Date Collected: 02/01/21 08:49**

**Matrix: Air**

**Date Received: 02/08/21 10:20**

**Sample Container: Summa Canister 6L**

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		50	18	ppb v/v			02/10/21 21:31	50.46
<b>Chloroform</b>	<b>300</b>		50	4.4	ppb v/v			02/10/21 21:31	50.46
Chloromethane	ND		130	42	ppb v/v			02/10/21 21:31	50.46
Dibromochloromethane	ND		50	4.4	ppb v/v			02/10/21 21:31	50.46
1,2-Dibromoethane (EDB)	ND		50	4.4	ppb v/v			02/10/21 21:31	50.46
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		50	7.6	ppb v/v			02/10/21 21:31	50.46
1,2-Dichlorobenzene	ND		50	20	ppb v/v			02/10/21 21:31	50.46
1,3-Dichlorobenzene	ND		50	10	ppb v/v			02/10/21 21:31	50.46
1,4-Dichlorobenzene	ND		50	10	ppb v/v			02/10/21 21:31	50.46
<b>Dichlorodifluoromethane</b>	<b>39 J</b>		50	8.8	ppb v/v			02/10/21 21:31	50.46
<b>1,1-Dichloroethane</b>	<b>19 J</b>		50	4.4	ppb v/v			02/10/21 21:31	50.46
<b>1,2-Dichloroethane</b>	<b>21 J</b>		50	6.3	ppb v/v			02/10/21 21:31	50.46
<b>1,1-Dichloroethene</b>	<b>430</b>		50	5.0	ppb v/v			02/10/21 21:31	50.46
cis-1,2-Dichloroethene	ND		50	6.3	ppb v/v			02/10/21 21:31	50.46
trans-1,2-Dichloroethene	ND		50	4.4	ppb v/v			02/10/21 21:31	50.46
<b>1,2-Dichloropropane</b>	<b>160</b>		50	6.3	ppb v/v			02/10/21 21:31	50.46
cis-1,3-Dichloropropene	ND		50	10	ppb v/v			02/10/21 21:31	50.46
trans-1,3-Dichloropropene	ND		50	5.7	ppb v/v			02/10/21 21:31	50.46
Ethylbenzene	ND		50	8.2	ppb v/v			02/10/21 21:31	50.46
4-Ethyltoluene	ND		100	13	ppb v/v			02/10/21 21:31	50.46
Hexachlorobutadiene	ND		250	20	ppb v/v			02/10/21 21:31	50.46
2-Hexanone	ND		130	10	ppb v/v			02/10/21 21:31	50.46
4-Methyl-2-pentanone (MIBK)	ND		130	34	ppb v/v			02/10/21 21:31	50.46
Methylene Chloride	ND		250	250	ppb v/v			02/10/21 21:31	50.46
Styrene	ND		50	15	ppb v/v			02/10/21 21:31	50.46
1,1,2,2-Tetrachloroethane	ND		50	8.8	ppb v/v			02/10/21 21:31	50.46
<b>Tetrachloroethene</b>	<b>310</b>		50	4.4	ppb v/v			02/10/21 21:31	50.46
Toluene	ND		76	49	ppb v/v			02/10/21 21:31	50.46
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>1100</b>		50	5.0	ppb v/v			02/10/21 21:31	50.46
1,2,4-Trichlorobenzene	ND		250	40	ppb v/v			02/10/21 21:31	50.46
1,1,1-Trichloroethane	ND		50	23	ppb v/v			02/10/21 21:31	50.46
1,1,2-Trichloroethane	ND		50	4.4	ppb v/v			02/10/21 21:31	50.46
<b>Trichlorofluoromethane</b>	<b>270</b>		50	6.9	ppb v/v			02/10/21 21:31	50.46
1,2,4-Trimethylbenzene	ND		50	13	ppb v/v			02/10/21 21:31	50.46
1,3,5-Trimethylbenzene	ND		50	14	ppb v/v			02/10/21 21:31	50.46
Vinyl acetate	ND		250	18	ppb v/v			02/10/21 21:31	50.46
Vinyl chloride	ND		25	16	ppb v/v			02/10/21 21:31	50.46
m,p-Xylene	ND		50	18	ppb v/v			02/10/21 21:31	50.46
o-Xylene	ND		50	9.5	ppb v/v			02/10/21 21:31	50.46

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		60 - 140		02/10/21 21:31	50.46

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) - DL**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Trichloroethene</b>	<b>12000</b>		50	7.6	ppb v/v			02/11/21 20:20	50.46

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114230-001/CWL-D1-240**

**Lab Sample ID: 140-21895-12**

Date Collected: 02/01/21 08:49

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		60 - 140		02/11/21 20:20	50.46

**Client Sample ID: 114231-001/CWL-D1-350**

**Lab Sample ID: 140-21895-13**

Date Collected: 02/01/21 08:53

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		890	250	ppb v/v			02/10/21 22:24	17.83
<b>Benzene</b>	<b>6.6</b>	<b>J</b>	36	3.6	ppb v/v			02/10/21 22:24	17.83
Benzyl chloride	ND		71	17	ppb v/v			02/10/21 22:24	17.83
Bromodichloromethane	ND		36	8.0	ppb v/v			02/10/21 22:24	17.83
Bromoform	ND		36	4.0	ppb v/v			02/10/21 22:24	17.83
Bromomethane	ND		36	9.8	ppb v/v			02/10/21 22:24	17.83
2-Butanone (MEK)	ND		180	33	ppb v/v			02/10/21 22:24	17.83
<b>Carbon disulfide</b>	<b>7.6</b>	<b>J B</b>	89	4.9	ppb v/v			02/10/21 22:24	17.83
<b>Carbon tetrachloride</b>	<b>15</b>	<b>J</b>	36	3.1	ppb v/v			02/10/21 22:24	17.83
Chlorobenzene	ND		36	2.7	ppb v/v			02/10/21 22:24	17.83
Chloroethane	ND		36	13	ppb v/v			02/10/21 22:24	17.83
<b>Chloroform</b>	<b>96</b>		36	3.1	ppb v/v			02/10/21 22:24	17.83
Chloromethane	ND		89	29	ppb v/v			02/10/21 22:24	17.83
Dibromochloromethane	ND		36	3.1	ppb v/v			02/10/21 22:24	17.83
1,2-Dibromoethane (EDB)	ND		36	3.1	ppb v/v			02/10/21 22:24	17.83
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		36	5.3	ppb v/v			02/10/21 22:24	17.83
1,2-Dichlorobenzene	ND		36	14	ppb v/v			02/10/21 22:24	17.83
1,3-Dichlorobenzene	ND		36	7.1	ppb v/v			02/10/21 22:24	17.83
1,4-Dichlorobenzene	ND		36	7.1	ppb v/v			02/10/21 22:24	17.83
<b>Dichlorodifluoromethane</b>	<b>23</b>	<b>J</b>	36	6.2	ppb v/v			02/10/21 22:24	17.83
<b>1,1-Dichloroethane</b>	<b>9.0</b>	<b>J</b>	36	3.1	ppb v/v			02/10/21 22:24	17.83
1,2-Dichloroethane	ND		36	4.5	ppb v/v			02/10/21 22:24	17.83
<b>1,1-Dichloroethene</b>	<b>240</b>		36	3.6	ppb v/v			02/10/21 22:24	17.83
cis-1,2-Dichloroethene	ND		36	4.5	ppb v/v			02/10/21 22:24	17.83
trans-1,2-Dichloroethene	ND		36	3.1	ppb v/v			02/10/21 22:24	17.83
<b>1,2-Dichloropropane</b>	<b>58</b>		36	4.5	ppb v/v			02/10/21 22:24	17.83
cis-1,3-Dichloropropene	ND		36	7.1	ppb v/v			02/10/21 22:24	17.83
trans-1,3-Dichloropropene	ND		36	4.0	ppb v/v			02/10/21 22:24	17.83
Ethylbenzene	ND		36	5.8	ppb v/v			02/10/21 22:24	17.83
4-Ethyltoluene	ND		71	9.4	ppb v/v			02/10/21 22:24	17.83
Hexachlorobutadiene	ND		180	14	ppb v/v			02/10/21 22:24	17.83
2-Hexanone	ND		89	7.1	ppb v/v			02/10/21 22:24	17.83
4-Methyl-2-pentanone (MIBK)	ND		89	24	ppb v/v			02/10/21 22:24	17.83
Methylene Chloride	ND		180	170	ppb v/v			02/10/21 22:24	17.83
Styrene	ND		36	11	ppb v/v			02/10/21 22:24	17.83
1,1,2,2-Tetrachloroethane	ND		36	6.2	ppb v/v			02/10/21 22:24	17.83
<b>Tetrachloroethene</b>	<b>120</b>		36	3.1	ppb v/v			02/10/21 22:24	17.83
Toluene	ND		53	35	ppb v/v			02/10/21 22:24	17.83
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>580</b>		36	3.6	ppb v/v			02/10/21 22:24	17.83
1,2,4-Trichlorobenzene	ND		180	29	ppb v/v			02/10/21 22:24	17.83

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114231-001/CWL-D1-350**

**Lab Sample ID: 140-21895-13**

Date Collected: 02/01/21 08:53

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		36	16	ppb v/v			02/10/21 22:24	17.83
1,1,2-Trichloroethane	ND		36	3.1	ppb v/v			02/10/21 22:24	17.83
<b>Trichloroethene</b>	<b>4900</b>		18	2.7	ppb v/v			02/10/21 22:24	17.83
<b>Trichlorofluoromethane</b>	<b>150</b>		36	4.9	ppb v/v			02/10/21 22:24	17.83
1,2,4-Trimethylbenzene	ND		36	8.9	ppb v/v			02/10/21 22:24	17.83
1,3,5-Trimethylbenzene	ND		36	9.8	ppb v/v			02/10/21 22:24	17.83
Vinyl acetate	ND		180	12	ppb v/v			02/10/21 22:24	17.83
Vinyl chloride	ND		18	12	ppb v/v			02/10/21 22:24	17.83
m,p-Xylene	ND		36	13	ppb v/v			02/10/21 22:24	17.83
o-Xylene	ND		36	6.7	ppb v/v			02/10/21 22:24	17.83
<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		60 - 140					02/10/21 22:24	17.83

**Client Sample ID: 114232-001/CWL-D1-470**

**Lab Sample ID: 140-21895-14**

Date Collected: 02/01/21 08:59

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		38	11	ppb v/v			02/10/21 23:16	1.91
<b>Benzene</b>	<b>0.53</b>	<b>J</b>	1.5	0.15	ppb v/v			02/10/21 23:16	1.91
Benzyl chloride	ND		3.1	0.73	ppb v/v			02/10/21 23:16	1.91
Bromodichloromethane	ND		1.5	0.34	ppb v/v			02/10/21 23:16	1.91
Bromoform	ND		1.5	0.17	ppb v/v			02/10/21 23:16	1.91
Bromomethane	ND		1.5	0.42	ppb v/v			02/10/21 23:16	1.91
2-Butanone (MEK)	ND		7.6	1.4	ppb v/v			02/10/21 23:16	1.91
<b>Carbon disulfide</b>	<b>0.42</b>	<b>J B</b>	3.8	0.21	ppb v/v			02/10/21 23:16	1.91
<b>Carbon tetrachloride</b>	<b>1.7</b>		1.5	0.13	ppb v/v			02/10/21 23:16	1.91
Chlorobenzene	ND		1.5	0.11	ppb v/v			02/10/21 23:16	1.91
Chloroethane	ND		1.5	0.55	ppb v/v			02/10/21 23:16	1.91
<b>Chloroform</b>	<b>1.4</b>	<b>J</b>	1.5	0.13	ppb v/v			02/10/21 23:16	1.91
Chloromethane	ND		3.8	1.3	ppb v/v			02/10/21 23:16	1.91
Dibromochloromethane	ND		1.5	0.13	ppb v/v			02/10/21 23:16	1.91
1,2-Dibromoethane (EDB)	ND		1.5	0.13	ppb v/v			02/10/21 23:16	1.91
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.5	0.23	ppb v/v			02/10/21 23:16	1.91
1,2-Dichlorobenzene	ND		1.5	0.59	ppb v/v			02/10/21 23:16	1.91
1,3-Dichlorobenzene	ND		1.5	0.31	ppb v/v			02/10/21 23:16	1.91
1,4-Dichlorobenzene	ND		1.5	0.31	ppb v/v			02/10/21 23:16	1.91
<b>Dichlorodifluoromethane</b>	<b>8.3</b>		1.5	0.27	ppb v/v			02/10/21 23:16	1.91
<b>1,1-Dichloroethane</b>	<b>0.17</b>	<b>J</b>	1.5	0.13	ppb v/v			02/10/21 23:16	1.91
1,2-Dichloroethane	ND		1.5	0.19	ppb v/v			02/10/21 23:16	1.91
<b>1,1-Dichloroethene</b>	<b>24</b>		1.5	0.15	ppb v/v			02/10/21 23:16	1.91
cis-1,2-Dichloroethene	ND		1.5	0.19	ppb v/v			02/10/21 23:16	1.91
trans-1,2-Dichloroethene	ND		1.5	0.13	ppb v/v			02/10/21 23:16	1.91
<b>1,2-Dichloropropane</b>	<b>0.31</b>	<b>J</b>	1.5	0.19	ppb v/v			02/10/21 23:16	1.91
cis-1,3-Dichloropropene	ND		1.5	0.31	ppb v/v			02/10/21 23:16	1.91
trans-1,3-Dichloropropene	ND		1.5	0.17	ppb v/v			02/10/21 23:16	1.91

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114232-001/CWL-D1-470**

**Lab Sample ID: 140-21895-14**

Date Collected: 02/01/21 08:59

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	ND		1.5	0.25	ppb v/v			02/10/21 23:16	1.91
4-Ethyltoluene	ND		3.1	0.40	ppb v/v			02/10/21 23:16	1.91
Hexachlorobutadiene	ND		7.6	0.61	ppb v/v			02/10/21 23:16	1.91
2-Hexanone	ND		3.8	0.31	ppb v/v			02/10/21 23:16	1.91
4-Methyl-2-pentanone (MIBK)	ND		3.8	1.0	ppb v/v			02/10/21 23:16	1.91
Methylene Chloride	ND		7.6	7.4	ppb v/v			02/10/21 23:16	1.91
Styrene	ND		1.5	0.46	ppb v/v			02/10/21 23:16	1.91
1,1,2,2-Tetrachloroethane	ND		1.5	0.27	ppb v/v			02/10/21 23:16	1.91
<b>Tetrachloroethene</b>	<b>7.0</b>		1.5	0.13	ppb v/v			02/10/21 23:16	1.91
Toluene	ND		2.3	1.5	ppb v/v			02/10/21 23:16	1.91
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>130</b>		1.5	0.15	ppb v/v			02/10/21 23:16	1.91
1,2,4-Trichlorobenzene	ND		7.6	1.2	ppb v/v			02/10/21 23:16	1.91
1,1,1-Trichloroethane	ND		1.5	0.71	ppb v/v			02/10/21 23:16	1.91
1,1,2-Trichloroethane	ND		1.5	0.13	ppb v/v			02/10/21 23:16	1.91
<b>Trichloroethene</b>	<b>160</b>		0.76	0.11	ppb v/v			02/10/21 23:16	1.91
<b>Trichlorofluoromethane</b>	<b>38</b>		1.5	0.21	ppb v/v			02/10/21 23:16	1.91
1,2,4-Trimethylbenzene	ND		1.5	0.38	ppb v/v			02/10/21 23:16	1.91
1,3,5-Trimethylbenzene	ND		1.5	0.42	ppb v/v			02/10/21 23:16	1.91
Vinyl acetate	ND		7.6	0.53	ppb v/v			02/10/21 23:16	1.91
Vinyl chloride	ND		0.76	0.50	ppb v/v			02/10/21 23:16	1.91
m,p-Xylene	ND		1.5	0.55	ppb v/v			02/10/21 23:16	1.91
o-Xylene	ND		1.5	0.29	ppb v/v			02/10/21 23:16	1.91
<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)	97		60 - 140					02/10/21 23:16	1.91

**Client Sample ID: 114233-001/CWL-FB4**

**Lab Sample ID: 140-21895-15**

Date Collected: 02/01/21 10:08

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		2.2	0.62	ppb v/v			02/10/21 06:37	1.75
<b>Benzene</b>	<b>0.015</b>	<b>J B</b>	0.088	0.0088	ppb v/v			02/10/21 06:37	1.75
Benzyl chloride	ND		0.18	0.042	ppb v/v			02/10/21 06:37	1.75
Bromodichloromethane	ND		0.088	0.020	ppb v/v			02/10/21 06:37	1.75
Bromoform	ND		0.088	0.0098	ppb v/v			02/10/21 06:37	1.75
Bromomethane	ND		0.088	0.024	ppb v/v			02/10/21 06:37	1.75
2-Butanone (MEK)	ND		0.44	0.080	ppb v/v			02/10/21 06:37	1.75
Carbon disulfide	ND		0.22	0.012	ppb v/v			02/10/21 06:37	1.75
Carbon tetrachloride	ND		0.088	0.0077	ppb v/v			02/10/21 06:37	1.75
Chlorobenzene	ND		0.088	0.0066	ppb v/v			02/10/21 06:37	1.75
Chloroethane	ND		0.088	0.032	ppb v/v			02/10/21 06:37	1.75
Chloroform	ND		0.088	0.0077	ppb v/v			02/10/21 06:37	1.75
Chloromethane	ND		0.22	0.072	ppb v/v			02/10/21 06:37	1.75
Dibromochloromethane	ND		0.088	0.0077	ppb v/v			02/10/21 06:37	1.75
1,2-Dibromoethane (EDB)	ND		0.088	0.0077	ppb v/v			02/10/21 06:37	1.75

Eurofins TestAmerica, Knoxville

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114233-001/CWL-FB4**

**Lab Sample ID: 140-21895-15**

Date Collected: 02/01/21 10:08

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.088	0.013	ppb v/v			02/10/21 06:37	1.75
1,2-Dichlorobenzene	ND		0.088	0.034	ppb v/v			02/10/21 06:37	1.75
1,3-Dichlorobenzene	ND		0.088	0.018	ppb v/v			02/10/21 06:37	1.75
1,4-Dichlorobenzene	ND		0.088	0.018	ppb v/v			02/10/21 06:37	1.75
Dichlorodifluoromethane	ND		0.088	0.015	ppb v/v			02/10/21 06:37	1.75
1,1-Dichloroethane	ND		0.088	0.0077	ppb v/v			02/10/21 06:37	1.75
1,2-Dichloroethane	ND		0.088	0.011	ppb v/v			02/10/21 06:37	1.75
1,1-Dichloroethene	ND		0.088	0.0088	ppb v/v			02/10/21 06:37	1.75
cis-1,2-Dichloroethene	ND		0.088	0.011	ppb v/v			02/10/21 06:37	1.75
trans-1,2-Dichloroethene	ND		0.088	0.0077	ppb v/v			02/10/21 06:37	1.75
1,2-Dichloropropane	ND		0.088	0.011	ppb v/v			02/10/21 06:37	1.75
cis-1,3-Dichloropropene	ND		0.088	0.018	ppb v/v			02/10/21 06:37	1.75
trans-1,3-Dichloropropene	ND		0.088	0.0098	ppb v/v			02/10/21 06:37	1.75
Ethylbenzene	ND		0.088	0.014	ppb v/v			02/10/21 06:37	1.75
4-Ethyltoluene	ND		0.18	0.023	ppb v/v			02/10/21 06:37	1.75
Hexachlorobutadiene	ND		0.44	0.035	ppb v/v			02/10/21 06:37	1.75
2-Hexanone	ND		0.22	0.018	ppb v/v			02/10/21 06:37	1.75
4-Methyl-2-pentanone (MIBK)	ND		0.22	0.059	ppb v/v			02/10/21 06:37	1.75
<b>Methylene Chloride</b>	<b>0.46</b>		0.44	0.43	ppb v/v			02/10/21 06:37	1.75
Styrene	ND		0.088	0.026	ppb v/v			02/10/21 06:37	1.75
1,1,2,2-Tetrachloroethane	ND		0.088	0.015	ppb v/v			02/10/21 06:37	1.75
<b>Tetrachloroethene</b>	<b>0.0090</b>	<b>J</b>	0.088	0.0077	ppb v/v			02/10/21 06:37	1.75
<b>Toluene</b>	<b>0.086</b>	<b>J</b>	0.13	0.085	ppb v/v			02/10/21 06:37	1.75
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.088	0.0088	ppb v/v			02/10/21 06:37	1.75
1,2,4-Trichlorobenzene	ND		0.44	0.070	ppb v/v			02/10/21 06:37	1.75
1,1,1-Trichloroethane	ND		0.088	0.040	ppb v/v			02/10/21 06:37	1.75
1,1,2-Trichloroethane	ND		0.088	0.0077	ppb v/v			02/10/21 06:37	1.75
Trichloroethene	ND		0.044	0.0066	ppb v/v			02/10/21 06:37	1.75
Trichlorofluoromethane	ND		0.088	0.012	ppb v/v			02/10/21 06:37	1.75
1,2,4-Trimethylbenzene	ND		0.088	0.022	ppb v/v			02/10/21 06:37	1.75
1,3,5-Trimethylbenzene	ND		0.088	0.024	ppb v/v			02/10/21 06:37	1.75
Vinyl acetate	ND		0.44	0.031	ppb v/v			02/10/21 06:37	1.75
Vinyl chloride	ND		0.044	0.028	ppb v/v			02/10/21 06:37	1.75
<b>m,p-Xylene</b>	<b>0.037</b>	<b>J</b>	0.088	0.032	ppb v/v			02/10/21 06:37	1.75
o-Xylene	ND		0.088	0.016	ppb v/v			02/10/21 06:37	1.75
<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)	96		60 - 140					02/10/21 06:37	1.75

**Client Sample ID: 114234-001/CWL-D2-120**

**Lab Sample ID: 140-21895-16**

Date Collected: 02/01/21 10:23

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		1000	290	ppb v/v			02/11/21 00:09	50.63
<b>Benzene</b>	<b>8.3</b>	<b>J</b>	41	4.1	ppb v/v			02/11/21 00:09	50.63
Benzyl chloride	ND		81	19	ppb v/v			02/11/21 00:09	50.63

Eurofins TestAmerica, Knoxville

# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114234-001/CWL-D2-120**

**Lab Sample ID: 140-21895-16**

Date Collected: 02/01/21 10:23

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromodichloromethane	ND		41	9.1	ppb v/v			02/11/21 00:09	50.63
Bromoform	ND		41	4.6	ppb v/v			02/11/21 00:09	50.63
Bromomethane	ND		41	11	ppb v/v			02/11/21 00:09	50.63
2-Butanone (MEK)	ND		200	37	ppb v/v			02/11/21 00:09	50.63
<b>Carbon disulfide</b>	<b>8.2</b>	<b>J B</b>	100	5.6	ppb v/v			02/11/21 00:09	50.63
<b>Carbon tetrachloride</b>	<b>22</b>	<b>J</b>	41	3.5	ppb v/v			02/11/21 00:09	50.63
<b>Chlorobenzene</b>	<b>4.0</b>	<b>J</b>	41	3.0	ppb v/v			02/11/21 00:09	50.63
Chloroethane	ND		41	15	ppb v/v			02/11/21 00:09	50.63
<b>Chloroform</b>	<b>470</b>		41	3.5	ppb v/v			02/11/21 00:09	50.63
Chloromethane	ND		100	33	ppb v/v			02/11/21 00:09	50.63
Dibromochloromethane	ND		41	3.5	ppb v/v			02/11/21 00:09	50.63
1,2-Dibromoethane (EDB)	ND		41	3.5	ppb v/v			02/11/21 00:09	50.63
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		41	6.1	ppb v/v			02/11/21 00:09	50.63
1,2-Dichlorobenzene	ND		41	16	ppb v/v			02/11/21 00:09	50.63
1,3-Dichlorobenzene	ND		41	8.1	ppb v/v			02/11/21 00:09	50.63
1,4-Dichlorobenzene	ND		41	8.1	ppb v/v			02/11/21 00:09	50.63
<b>Dichlorodifluoromethane</b>	<b>34</b>	<b>J</b>	41	7.1	ppb v/v			02/11/21 00:09	50.63
<b>1,1-Dichloroethane</b>	<b>17</b>	<b>J</b>	41	3.5	ppb v/v			02/11/21 00:09	50.63
<b>1,2-Dichloroethane</b>	<b>39</b>	<b>J</b>	41	5.1	ppb v/v			02/11/21 00:09	50.63
<b>1,1-Dichloroethene</b>	<b>300</b>		41	4.1	ppb v/v			02/11/21 00:09	50.63
cis-1,2-Dichloroethene	ND		41	5.1	ppb v/v			02/11/21 00:09	50.63
trans-1,2-Dichloroethene	ND		41	3.5	ppb v/v			02/11/21 00:09	50.63
<b>1,2-Dichloropropane</b>	<b>190</b>		41	5.1	ppb v/v			02/11/21 00:09	50.63
cis-1,3-Dichloropropene	ND		41	8.1	ppb v/v			02/11/21 00:09	50.63
trans-1,3-Dichloropropene	ND		41	4.6	ppb v/v			02/11/21 00:09	50.63
Ethylbenzene	ND		41	6.6	ppb v/v			02/11/21 00:09	50.63
4-Ethyltoluene	ND		81	11	ppb v/v			02/11/21 00:09	50.63
Hexachlorobutadiene	ND		200	16	ppb v/v			02/11/21 00:09	50.63
2-Hexanone	ND		100	8.1	ppb v/v			02/11/21 00:09	50.63
4-Methyl-2-pentanone (MIBK)	ND		100	27	ppb v/v			02/11/21 00:09	50.63
Methylene Chloride	ND		200	200	ppb v/v			02/11/21 00:09	50.63
Styrene	ND		41	12	ppb v/v			02/11/21 00:09	50.63
1,1,2,2-Tetrachloroethane	ND		41	7.1	ppb v/v			02/11/21 00:09	50.63
<b>Tetrachloroethene</b>	<b>400</b>		41	3.5	ppb v/v			02/11/21 00:09	50.63
Toluene	ND		61	39	ppb v/v			02/11/21 00:09	50.63
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>850</b>		41	4.1	ppb v/v			02/11/21 00:09	50.63
1,2,4-Trichlorobenzene	ND		200	32	ppb v/v			02/11/21 00:09	50.63
<b>1,1,1-Trichloroethane</b>	<b>22</b>	<b>J</b>	41	19	ppb v/v			02/11/21 00:09	50.63
<b>1,1,2-Trichloroethane</b>	<b>6.9</b>	<b>J</b>	41	3.5	ppb v/v			02/11/21 00:09	50.63
<b>Trichlorofluoromethane</b>	<b>220</b>		41	5.6	ppb v/v			02/11/21 00:09	50.63
1,2,4-Trimethylbenzene	ND		41	10	ppb v/v			02/11/21 00:09	50.63
1,3,5-Trimethylbenzene	ND		41	11	ppb v/v			02/11/21 00:09	50.63
Vinyl acetate	ND		200	14	ppb v/v			02/11/21 00:09	50.63
Vinyl chloride	ND		20	13	ppb v/v			02/11/21 00:09	50.63
m,p-Xylene	ND		41	15	ppb v/v			02/11/21 00:09	50.63
o-Xylene	ND		41	7.6	ppb v/v			02/11/21 00:09	50.63

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114234-001/CWL-D2-120**

**Lab Sample ID: 140-21895-16**

Date Collected: 02/01/21 10:23

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		60 - 140		02/11/21 00:09	50.63

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) - DL**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	9300		51	7.6	ppb v/v			02/11/21 21:12	50.63

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		60 - 140		02/11/21 21:12	50.63

**Client Sample ID: 114235-001/CWL-D2-240**

**Lab Sample ID: 140-21895-17**

Date Collected: 02/01/21 10:26

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		1000	290	ppb v/v			02/11/21 01:53	51.62
<b>Benzene</b>	<b>5.9</b>	<b>J</b>	41	4.1	ppb v/v			02/11/21 01:53	51.62
Benzyl chloride	ND		83	20	ppb v/v			02/11/21 01:53	51.62
Bromodichloromethane	ND		41	9.3	ppb v/v			02/11/21 01:53	51.62
Bromoform	ND		41	4.6	ppb v/v			02/11/21 01:53	51.62
Bromomethane	ND		41	11	ppb v/v			02/11/21 01:53	51.62
2-Butanone (MEK)	ND		210	38	ppb v/v			02/11/21 01:53	51.62
<b>Carbon disulfide</b>	<b>9.1</b>	<b>J B</b>	100	5.7	ppb v/v			02/11/21 01:53	51.62
<b>Carbon tetrachloride</b>	<b>21</b>	<b>J</b>	41	3.6	ppb v/v			02/11/21 01:53	51.62
<b>Chlorobenzene</b>	<b>3.9</b>	<b>J</b>	41	3.1	ppb v/v			02/11/21 01:53	51.62
Chloroethane	ND		41	15	ppb v/v			02/11/21 01:53	51.62
<b>Chloroform</b>	<b>360</b>		41	3.6	ppb v/v			02/11/21 01:53	51.62
Chloromethane	ND		100	34	ppb v/v			02/11/21 01:53	51.62
Dibromochloromethane	ND		41	3.6	ppb v/v			02/11/21 01:53	51.62
1,2-Dibromoethane (EDB)	ND		41	3.6	ppb v/v			02/11/21 01:53	51.62
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		41	6.2	ppb v/v			02/11/21 01:53	51.62
1,2-Dichlorobenzene	ND		41	16	ppb v/v			02/11/21 01:53	51.62
1,3-Dichlorobenzene	ND		41	8.3	ppb v/v			02/11/21 01:53	51.62
1,4-Dichlorobenzene	ND		41	8.3	ppb v/v			02/11/21 01:53	51.62
<b>Dichlorodifluoromethane</b>	<b>34</b>	<b>J</b>	41	7.2	ppb v/v			02/11/21 01:53	51.62
<b>1,1-Dichloroethane</b>	<b>18</b>	<b>J</b>	41	3.6	ppb v/v			02/11/21 01:53	51.62
<b>1,2-Dichloroethane</b>	<b>28</b>	<b>J</b>	41	5.2	ppb v/v			02/11/21 01:53	51.62
<b>1,1-Dichloroethene</b>	<b>330</b>		41	4.1	ppb v/v			02/11/21 01:53	51.62
cis-1,2-Dichloroethene	ND		41	5.2	ppb v/v			02/11/21 01:53	51.62
trans-1,2-Dichloroethene	ND		41	3.6	ppb v/v			02/11/21 01:53	51.62
<b>1,2-Dichloropropane</b>	<b>160</b>		41	5.2	ppb v/v			02/11/21 01:53	51.62
cis-1,3-Dichloropropene	ND		41	8.3	ppb v/v			02/11/21 01:53	51.62
trans-1,3-Dichloropropene	ND		41	4.6	ppb v/v			02/11/21 01:53	51.62
Ethylbenzene	ND		41	6.7	ppb v/v			02/11/21 01:53	51.62
4-Ethyltoluene	ND		83	11	ppb v/v			02/11/21 01:53	51.62
Hexachlorobutadiene	ND		210	17	ppb v/v			02/11/21 01:53	51.62
2-Hexanone	ND		100	8.3	ppb v/v			02/11/21 01:53	51.62
4-Methyl-2-pentanone (MIBK)	ND		100	28	ppb v/v			02/11/21 01:53	51.62
Methylene Chloride	ND		210	200	ppb v/v			02/11/21 01:53	51.62

Eurofins TestAmerica, Knoxville

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114235-001/CWL-D2-240**

**Lab Sample ID: 140-21895-17**

Date Collected: 02/01/21 10:26

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	ND		41	12	ppb v/v			02/11/21 01:53	51.62
1,1,2,2-Tetrachloroethane	ND		41	7.2	ppb v/v			02/11/21 01:53	51.62
<b>Tetrachloroethene</b>	<b>290</b>		41	3.6	ppb v/v			02/11/21 01:53	51.62
Toluene	ND		62	40	ppb v/v			02/11/21 01:53	51.62
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>860</b>		41	4.1	ppb v/v			02/11/21 01:53	51.62
1,2,4-Trichlorobenzene	ND		210	33	ppb v/v			02/11/21 01:53	51.62
1,1,1-Trichloroethane	ND		41	19	ppb v/v			02/11/21 01:53	51.62
<b>1,1,2-Trichloroethane</b>	<b>3.9 J</b>		41	3.6	ppb v/v			02/11/21 01:53	51.62
<b>Trichloroethene</b>	<b>8200</b>		21	3.1	ppb v/v			02/11/21 01:53	51.62
<b>Trichlorofluoromethane</b>	<b>220</b>		41	5.7	ppb v/v			02/11/21 01:53	51.62
1,2,4-Trimethylbenzene	ND		41	10	ppb v/v			02/11/21 01:53	51.62
1,3,5-Trimethylbenzene	ND		41	11	ppb v/v			02/11/21 01:53	51.62
Vinyl acetate	ND		210	14	ppb v/v			02/11/21 01:53	51.62
Vinyl chloride	ND		21	13	ppb v/v			02/11/21 01:53	51.62
m,p-Xylene	ND		41	15	ppb v/v			02/11/21 01:53	51.62
o-Xylene	ND		41	7.7	ppb v/v			02/11/21 01:53	51.62
<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)	96		60 - 140					02/11/21 01:53	51.62

**Client Sample ID: 114236-001/CWL-D2-350**

**Lab Sample ID: 140-21895-18**

Date Collected: 02/01/21 10:30

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		810	230	ppb v/v			02/11/21 02:45	16.29
<b>Benzene</b>	<b>5.7 J</b>		33	3.3	ppb v/v			02/11/21 02:45	16.29
Benzyl chloride	ND		65	15	ppb v/v			02/11/21 02:45	16.29
Bromodichloromethane	ND		33	7.3	ppb v/v			02/11/21 02:45	16.29
Bromoform	ND		33	3.7	ppb v/v			02/11/21 02:45	16.29
Bromomethane	ND		33	9.0	ppb v/v			02/11/21 02:45	16.29
2-Butanone (MEK)	ND		160	30	ppb v/v			02/11/21 02:45	16.29
<b>Carbon disulfide</b>	<b>8.2 J B</b>		81	4.5	ppb v/v			02/11/21 02:45	16.29
<b>Carbon tetrachloride</b>	<b>14 J</b>		33	2.9	ppb v/v			02/11/21 02:45	16.29
Chlorobenzene	ND		33	2.4	ppb v/v			02/11/21 02:45	16.29
Chloroethane	ND		33	12	ppb v/v			02/11/21 02:45	16.29
<b>Chloroform</b>	<b>190</b>		33	2.9	ppb v/v			02/11/21 02:45	16.29
Chloromethane	ND		81	27	ppb v/v			02/11/21 02:45	16.29
Dibromochloromethane	ND		33	2.9	ppb v/v			02/11/21 02:45	16.29
1,2-Dibromoethane (EDB)	ND		33	2.9	ppb v/v			02/11/21 02:45	16.29
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		33	4.9	ppb v/v			02/11/21 02:45	16.29
1,2-Dichlorobenzene	ND		33	13	ppb v/v			02/11/21 02:45	16.29
1,3-Dichlorobenzene	ND		33	6.5	ppb v/v			02/11/21 02:45	16.29
1,4-Dichlorobenzene	ND		33	6.5	ppb v/v			02/11/21 02:45	16.29
<b>Dichlorodifluoromethane</b>	<b>23 J</b>		33	5.7	ppb v/v			02/11/21 02:45	16.29
<b>1,1-Dichloroethane</b>	<b>10 J</b>		33	2.9	ppb v/v			02/11/21 02:45	16.29

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114236-001/CWL-D2-350**

**Lab Sample ID: 140-21895-18**

Date Collected: 02/01/21 10:30

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	12	J	33	4.1	ppb v/v			02/11/21 02:45	16.29
1,1-Dichloroethene	220		33	3.3	ppb v/v			02/11/21 02:45	16.29
cis-1,2-Dichloroethene	ND		33	4.1	ppb v/v			02/11/21 02:45	16.29
trans-1,2-Dichloroethene	ND		33	2.9	ppb v/v			02/11/21 02:45	16.29
1,2-Dichloropropane	80		33	4.1	ppb v/v			02/11/21 02:45	16.29
cis-1,3-Dichloropropene	ND		33	6.5	ppb v/v			02/11/21 02:45	16.29
trans-1,3-Dichloropropene	ND		33	3.7	ppb v/v			02/11/21 02:45	16.29
Ethylbenzene	ND		33	5.3	ppb v/v			02/11/21 02:45	16.29
4-Ethyltoluene	ND		65	8.6	ppb v/v			02/11/21 02:45	16.29
Hexachlorobutadiene	ND		160	13	ppb v/v			02/11/21 02:45	16.29
2-Hexanone	ND		81	6.5	ppb v/v			02/11/21 02:45	16.29
4-Methyl-2-pentanone (MIBK)	ND		81	22	ppb v/v			02/11/21 02:45	16.29
Methylene Chloride	ND		160	160	ppb v/v			02/11/21 02:45	16.29
Styrene	ND		33	9.8	ppb v/v			02/11/21 02:45	16.29
1,1,2,2-Tetrachloroethane	ND		33	5.7	ppb v/v			02/11/21 02:45	16.29
Tetrachloroethene	210		33	2.9	ppb v/v			02/11/21 02:45	16.29
Toluene	ND		49	32	ppb v/v			02/11/21 02:45	16.29
1,1,2-Trichloro-1,2,2-trifluoroethane	530		33	3.3	ppb v/v			02/11/21 02:45	16.29
1,2,4-Trichlorobenzene	ND		160	26	ppb v/v			02/11/21 02:45	16.29
1,1,1-Trichloroethane	ND		33	15	ppb v/v			02/11/21 02:45	16.29
1,1,2-Trichloroethane	ND		33	2.9	ppb v/v			02/11/21 02:45	16.29
Trichloroethene	5000		16	2.4	ppb v/v			02/11/21 02:45	16.29
Trichlorofluoromethane	150		33	4.5	ppb v/v			02/11/21 02:45	16.29
1,2,4-Trimethylbenzene	ND		33	8.1	ppb v/v			02/11/21 02:45	16.29
1,3,5-Trimethylbenzene	ND		33	9.0	ppb v/v			02/11/21 02:45	16.29
Vinyl acetate	ND		160	11	ppb v/v			02/11/21 02:45	16.29
Vinyl chloride	ND		16	11	ppb v/v			02/11/21 02:45	16.29
m,p-Xylene	ND		33	12	ppb v/v			02/11/21 02:45	16.29
o-Xylene	ND		33	6.1	ppb v/v			02/11/21 02:45	16.29
<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		60 - 140					02/11/21 02:45	16.29

**Client Sample ID: 114237-001/CWL-D2-440**

**Lab Sample ID: 140-21895-19**

Date Collected: 02/01/21 10:33

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.1		2.3	0.66	ppb v/v			02/11/21 13:20	1.84
Benzene	0.020	J	0.092	0.0092	ppb v/v			02/11/21 13:20	1.84
Benzyl chloride	ND		0.18	0.044	ppb v/v			02/11/21 13:20	1.84
Bromodichloromethane	ND		0.092	0.021	ppb v/v			02/11/21 13:20	1.84
Bromoform	ND		0.092	0.010	ppb v/v			02/11/21 13:20	1.84
Bromomethane	ND		0.092	0.025	ppb v/v			02/11/21 13:20	1.84
2-Butanone (MEK)	0.088	J	0.46	0.084	ppb v/v			02/11/21 13:20	1.84
Carbon disulfide	0.033	J	0.23	0.013	ppb v/v			02/11/21 13:20	1.84

# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114237-001/CWL-D2-440**

**Lab Sample ID: 140-21895-19**

Date Collected: 02/01/21 10:33

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Carbon tetrachloride</b>	<b>0.017</b>	<b>J</b>	0.092	0.0081	ppb v/v			02/11/21 13:20	1.84
Chlorobenzene	ND		0.092	0.0069	ppb v/v			02/11/21 13:20	1.84
<b>Chloroethane</b>	<b>0.77</b>		0.092	0.033	ppb v/v			02/11/21 13:20	1.84
<b>Chloroform</b>	<b>0.69</b>		0.092	0.0081	ppb v/v			02/11/21 13:20	1.84
<b>Chloromethane</b>	<b>0.58</b>		0.23	0.076	ppb v/v			02/11/21 13:20	1.84
Dibromochloromethane	ND		0.092	0.0081	ppb v/v			02/11/21 13:20	1.84
1,2-Dibromoethane (EDB)	ND		0.092	0.0081	ppb v/v			02/11/21 13:20	1.84
<b>1,2-Dichloro-1,1,2,2-tetrafluoroethane</b>	<b>0.016</b>	<b>J</b>	0.092	0.014	ppb v/v			02/11/21 13:20	1.84
1,2-Dichlorobenzene	ND		0.092	0.036	ppb v/v			02/11/21 13:20	1.84
1,3-Dichlorobenzene	ND		0.092	0.018	ppb v/v			02/11/21 13:20	1.84
1,4-Dichlorobenzene	ND		0.092	0.018	ppb v/v			02/11/21 13:20	1.84
<b>Dichlorodifluoromethane</b>	<b>0.46</b>		0.092	0.016	ppb v/v			02/11/21 13:20	1.84
<b>1,1-Dichloroethane</b>	<b>0.048</b>	<b>J</b>	0.092	0.0081	ppb v/v			02/11/21 13:20	1.84
<b>1,2-Dichloroethane</b>	<b>0.048</b>	<b>J</b>	0.092	0.012	ppb v/v			02/11/21 13:20	1.84
<b>1,1-Dichloroethene</b>	<b>1.5</b>		0.092	0.0092	ppb v/v			02/11/21 13:20	1.84
cis-1,2-Dichloroethene	ND		0.092	0.012	ppb v/v			02/11/21 13:20	1.84
<b>trans-1,2-Dichloroethene</b>	<b>0.12</b>		0.092	0.0081	ppb v/v			02/11/21 13:20	1.84
<b>1,2-Dichloropropane</b>	<b>0.039</b>	<b>J</b>	0.092	0.012	ppb v/v			02/11/21 13:20	1.84
cis-1,3-Dichloropropene	ND		0.092	0.018	ppb v/v			02/11/21 13:20	1.84
trans-1,3-Dichloropropene	ND		0.092	0.010	ppb v/v			02/11/21 13:20	1.84
Ethylbenzene	ND		0.092	0.015	ppb v/v			02/11/21 13:20	1.84
4-Ethyltoluene	ND		0.18	0.024	ppb v/v			02/11/21 13:20	1.84
Hexachlorobutadiene	ND		0.46	0.037	ppb v/v			02/11/21 13:20	1.84
2-Hexanone	ND		0.23	0.018	ppb v/v			02/11/21 13:20	1.84
4-Methyl-2-pentanone (MIBK)	ND		0.23	0.062	ppb v/v			02/11/21 13:20	1.84
<b>Methylene Chloride</b>	<b>0.62</b>		0.46	0.45	ppb v/v			02/11/21 13:20	1.84
Styrene	ND		0.092	0.028	ppb v/v			02/11/21 13:20	1.84
1,1,2,2-Tetrachloroethane	ND		0.092	0.016	ppb v/v			02/11/21 13:20	1.84
<b>Tetrachloroethene</b>	<b>0.065</b>	<b>J</b>	0.092	0.0081	ppb v/v			02/11/21 13:20	1.84
Toluene	ND		0.14	0.090	ppb v/v			02/11/21 13:20	1.84
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>0.82</b>		0.092	0.0092	ppb v/v			02/11/21 13:20	1.84
1,2,4-Trichlorobenzene	ND		0.46	0.074	ppb v/v			02/11/21 13:20	1.84
1,1,1-Trichloroethane	ND		0.092	0.043	ppb v/v			02/11/21 13:20	1.84
1,1,2-Trichloroethane	ND		0.092	0.0081	ppb v/v			02/11/21 13:20	1.84
<b>Trichloroethene</b>	<b>1.6</b>		0.046	0.0069	ppb v/v			02/11/21 13:20	1.84
<b>Trichlorofluoromethane</b>	<b>1.2</b>		0.092	0.013	ppb v/v			02/11/21 13:20	1.84
1,2,4-Trimethylbenzene	ND		0.092	0.023	ppb v/v			02/11/21 13:20	1.84
1,3,5-Trimethylbenzene	ND		0.092	0.025	ppb v/v			02/11/21 13:20	1.84
Vinyl acetate	ND		0.46	0.032	ppb v/v			02/11/21 13:20	1.84
Vinyl chloride	ND		0.046	0.030	ppb v/v			02/11/21 13:20	1.84
m,p-Xylene	ND		0.092	0.033	ppb v/v			02/11/21 13:20	1.84
o-Xylene	ND		0.092	0.017	ppb v/v			02/11/21 13:20	1.84

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		60 - 140		02/11/21 13:20	1.84

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114238-001/CWL-D2-470**

**Lab Sample ID: 140-21895-20**

Date Collected: 02/01/21 10:37

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		740	210	ppb v/v			02/10/21 20:52	18.58
<b>Benzene</b>	<b>3.4</b>	<b>J</b>	30	3.0	ppb v/v			02/10/21 20:52	18.58
Benzyl chloride	ND		59	14	ppb v/v			02/10/21 20:52	18.58
Bromodichloromethane	ND		30	6.7	ppb v/v			02/10/21 20:52	18.58
Bromoform	ND		30	3.3	ppb v/v			02/10/21 20:52	18.58
Bromomethane	ND		30	8.2	ppb v/v			02/10/21 20:52	18.58
2-Butanone (MEK)	ND		150	27	ppb v/v			02/10/21 20:52	18.58
Carbon disulfide	ND		74	4.1	ppb v/v			02/10/21 20:52	18.58
<b>Carbon tetrachloride</b>	<b>5.8</b>	<b>J</b>	30	2.6	ppb v/v			02/10/21 20:52	18.58
<b>Chlorobenzene</b>	<b>2.3</b>	<b>J</b>	30	2.2	ppb v/v			02/10/21 20:52	18.58
Chloroethane	ND		30	11	ppb v/v			02/10/21 20:52	18.58
<b>Chloroform</b>	<b>230</b>		30	2.6	ppb v/v			02/10/21 20:52	18.58
Chloromethane	ND		74	25	ppb v/v			02/10/21 20:52	18.58
Dibromochloromethane	ND		30	2.6	ppb v/v			02/10/21 20:52	18.58
1,2-Dibromoethane (EDB)	ND		30	2.6	ppb v/v			02/10/21 20:52	18.58
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		30	4.5	ppb v/v			02/10/21 20:52	18.58
1,2-Dichlorobenzene	ND		30	12	ppb v/v			02/10/21 20:52	18.58
1,3-Dichlorobenzene	ND		30	5.9	ppb v/v			02/10/21 20:52	18.58
1,4-Dichlorobenzene	ND		30	5.9	ppb v/v			02/10/21 20:52	18.58
<b>Dichlorodifluoromethane</b>	<b>9.6</b>	<b>J</b>	30	5.2	ppb v/v			02/10/21 20:52	18.58
<b>1,1-Dichloroethane</b>	<b>7.9</b>	<b>J</b>	30	2.6	ppb v/v			02/10/21 20:52	18.58
<b>1,2-Dichloroethane</b>	<b>13</b>	<b>J</b>	30	3.7	ppb v/v			02/10/21 20:52	18.58
<b>1,1-Dichloroethene</b>	<b>83</b>		30	3.0	ppb v/v			02/10/21 20:52	18.58
cis-1,2-Dichloroethene	ND		30	3.7	ppb v/v			02/10/21 20:52	18.58
trans-1,2-Dichloroethene	ND		30	2.6	ppb v/v			02/10/21 20:52	18.58
<b>1,2-Dichloropropane</b>	<b>80</b>		30	3.7	ppb v/v			02/10/21 20:52	18.58
cis-1,3-Dichloropropene	ND		30	5.9	ppb v/v			02/10/21 20:52	18.58
trans-1,3-Dichloropropene	ND		30	3.3	ppb v/v			02/10/21 20:52	18.58
Ethylbenzene	ND		30	4.8	ppb v/v			02/10/21 20:52	18.58
4-Ethyltoluene	ND		59	7.8	ppb v/v			02/10/21 20:52	18.58
Hexachlorobutadiene	ND		150	12	ppb v/v			02/10/21 20:52	18.58
2-Hexanone	ND		74	5.9	ppb v/v			02/10/21 20:52	18.58
4-Methyl-2-pentanone (MIBK)	ND		74	20	ppb v/v			02/10/21 20:52	18.58
Methylene Chloride	ND		150	140	ppb v/v			02/10/21 20:52	18.58
Styrene	ND		30	8.9	ppb v/v			02/10/21 20:52	18.58
1,1,2,2-Tetrachloroethane	ND		30	5.2	ppb v/v			02/10/21 20:52	18.58
<b>Tetrachloroethene</b>	<b>190</b>		30	2.6	ppb v/v			02/10/21 20:52	18.58
Toluene	ND		45	29	ppb v/v			02/10/21 20:52	18.58
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>200</b>		30	3.0	ppb v/v			02/10/21 20:52	18.58
1,2,4-Trichlorobenzene	ND		150	24	ppb v/v			02/10/21 20:52	18.58
1,1,1-Trichloroethane	ND		30	14	ppb v/v			02/10/21 20:52	18.58
<b>1,1,2-Trichloroethane</b>	<b>4.0</b>	<b>J</b>	30	2.6	ppb v/v			02/10/21 20:52	18.58
<b>Trichloroethene</b>	<b>3200</b>		15	2.2	ppb v/v			02/10/21 20:52	18.58
<b>Trichlorofluoromethane</b>	<b>64</b>		30	4.1	ppb v/v			02/10/21 20:52	18.58
1,2,4-Trimethylbenzene	ND		30	7.4	ppb v/v			02/10/21 20:52	18.58
1,3,5-Trimethylbenzene	ND		30	8.2	ppb v/v			02/10/21 20:52	18.58
Vinyl acetate	ND		150	10	ppb v/v			02/10/21 20:52	18.58
Vinyl chloride	ND		15	9.7	ppb v/v			02/10/21 20:52	18.58

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114238-001/CWL-D2-470**

**Lab Sample ID: 140-21895-20**

Date Collected: 02/01/21 10:37

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		30	11	ppb v/v			02/10/21 20:52	18.58
o-Xylene	ND		30	5.6	ppb v/v			02/10/21 20:52	18.58
<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		60 - 140					02/10/21 20:52	18.58

**Client Sample ID: 114239-001/CWL-FB5**

**Lab Sample ID: 140-21895-21**

Date Collected: 02/01/21 09:26

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.84	J	2.3	0.67	ppb v/v			02/10/21 13:33	1.87
Benzene	0.016	J	0.094	0.0094	ppb v/v			02/10/21 13:33	1.87
Benzyl chloride	ND		0.19	0.044	ppb v/v			02/10/21 13:33	1.87
Bromodichloromethane	ND		0.094	0.021	ppb v/v			02/10/21 13:33	1.87
Bromoform	ND		0.094	0.011	ppb v/v			02/10/21 13:33	1.87
Bromomethane	ND		0.094	0.026	ppb v/v			02/10/21 13:33	1.87
2-Butanone (MEK)	0.12	J	0.47	0.085	ppb v/v			02/10/21 13:33	1.87
Carbon disulfide	0.030	J B	0.23	0.013	ppb v/v			02/10/21 13:33	1.87
Carbon tetrachloride	ND		0.094	0.0082	ppb v/v			02/10/21 13:33	1.87
Chlorobenzene	0.0076	J	0.094	0.0070	ppb v/v			02/10/21 13:33	1.87
Chloroethane	ND		0.094	0.034	ppb v/v			02/10/21 13:33	1.87
Chloroform	ND		0.094	0.0082	ppb v/v			02/10/21 13:33	1.87
Chloromethane	ND		0.23	0.077	ppb v/v			02/10/21 13:33	1.87
Dibromochloromethane	ND		0.094	0.0082	ppb v/v			02/10/21 13:33	1.87
1,2-Dibromoethane (EDB)	ND		0.094	0.0082	ppb v/v			02/10/21 13:33	1.87
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.094	0.014	ppb v/v			02/10/21 13:33	1.87
1,2-Dichlorobenzene	ND		0.094	0.036	ppb v/v			02/10/21 13:33	1.87
1,3-Dichlorobenzene	ND		0.094	0.019	ppb v/v			02/10/21 13:33	1.87
1,4-Dichlorobenzene	ND		0.094	0.019	ppb v/v			02/10/21 13:33	1.87
Dichlorodifluoromethane	ND		0.094	0.016	ppb v/v			02/10/21 13:33	1.87
1,1-Dichloroethane	ND		0.094	0.0082	ppb v/v			02/10/21 13:33	1.87
1,2-Dichloroethane	ND		0.094	0.012	ppb v/v			02/10/21 13:33	1.87
1,1-Dichloroethene	ND		0.094	0.0094	ppb v/v			02/10/21 13:33	1.87
cis-1,2-Dichloroethene	ND		0.094	0.012	ppb v/v			02/10/21 13:33	1.87
trans-1,2-Dichloroethene	ND		0.094	0.0082	ppb v/v			02/10/21 13:33	1.87
1,2-Dichloropropane	ND		0.094	0.012	ppb v/v			02/10/21 13:33	1.87
cis-1,3-Dichloropropene	ND		0.094	0.019	ppb v/v			02/10/21 13:33	1.87
trans-1,3-Dichloropropene	ND		0.094	0.011	ppb v/v			02/10/21 13:33	1.87
Ethylbenzene	ND		0.094	0.015	ppb v/v			02/10/21 13:33	1.87
4-Ethyltoluene	ND		0.19	0.025	ppb v/v			02/10/21 13:33	1.87
Hexachlorobutadiene	ND		0.47	0.037	ppb v/v			02/10/21 13:33	1.87
2-Hexanone	0.029	J	0.23	0.019	ppb v/v			02/10/21 13:33	1.87
4-Methyl-2-pentanone (MIBK)	0.18	J	0.23	0.063	ppb v/v			02/10/21 13:33	1.87
Methylene Chloride	ND		0.47	0.46	ppb v/v			02/10/21 13:33	1.87
Styrene	ND		0.094	0.028	ppb v/v			02/10/21 13:33	1.87
1,1,2,2-Tetrachloroethane	ND		0.094	0.016	ppb v/v			02/10/21 13:33	1.87

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114239-001/CWL-FB5**

**Lab Sample ID: 140-21895-21**

Date Collected: 02/01/21 09:26

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	ND		0.094	0.0082	ppb v/v			02/10/21 13:33	1.87
Toluene	ND		0.14	0.091	ppb v/v			02/10/21 13:33	1.87
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.094	0.0094	ppb v/v			02/10/21 13:33	1.87
1,2,4-Trichlorobenzene	ND		0.47	0.075	ppb v/v			02/10/21 13:33	1.87
1,1,1-Trichloroethane	ND		0.094	0.043	ppb v/v			02/10/21 13:33	1.87
1,1,2-Trichloroethane	ND		0.094	0.0082	ppb v/v			02/10/21 13:33	1.87
Trichloroethene	ND		0.047	0.0070	ppb v/v			02/10/21 13:33	1.87
Trichlorofluoromethane	ND		0.094	0.013	ppb v/v			02/10/21 13:33	1.87
1,2,4-Trimethylbenzene	ND		0.094	0.023	ppb v/v			02/10/21 13:33	1.87
1,3,5-Trimethylbenzene	ND		0.094	0.026	ppb v/v			02/10/21 13:33	1.87
Vinyl acetate	ND		0.47	0.033	ppb v/v			02/10/21 13:33	1.87
Vinyl chloride	ND		0.047	0.030	ppb v/v			02/10/21 13:33	1.87
m,p-Xylene	ND		0.094	0.034	ppb v/v			02/10/21 13:33	1.87
o-Xylene	ND		0.094	0.018	ppb v/v			02/10/21 13:33	1.87
<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		60 - 140					02/10/21 13:33	1.87

**Client Sample ID: 114240-001/CWL-D3-120**

**Lab Sample ID: 140-21895-22**

Date Collected: 02/01/21 09:37

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		710	200	ppb v/v			02/10/21 21:44	17.77
<b>Benzene</b>	<b>3.2</b>	<b>J</b>	28	2.8	ppb v/v			02/10/21 21:44	17.77
Benzyl chloride	ND		57	14	ppb v/v			02/10/21 21:44	17.77
Bromodichloromethane	ND		28	6.4	ppb v/v			02/10/21 21:44	17.77
Bromoform	ND		28	3.2	ppb v/v			02/10/21 21:44	17.77
Bromomethane	ND		28	7.8	ppb v/v			02/10/21 21:44	17.77
2-Butanone (MEK)	ND		140	26	ppb v/v			02/10/21 21:44	17.77
Carbon disulfide	ND		71	3.9	ppb v/v			02/10/21 21:44	17.77
<b>Carbon tetrachloride</b>	<b>6.9</b>	<b>J</b>	28	2.5	ppb v/v			02/10/21 21:44	17.77
Chlorobenzene	ND		28	2.1	ppb v/v			02/10/21 21:44	17.77
Chloroethane	ND		28	10	ppb v/v			02/10/21 21:44	17.77
<b>Chloroform</b>	<b>140</b>		28	2.5	ppb v/v			02/10/21 21:44	17.77
Chloromethane	ND		71	23	ppb v/v			02/10/21 21:44	17.77
Dibromochloromethane	ND		28	2.5	ppb v/v			02/10/21 21:44	17.77
1,2-Dibromoethane (EDB)	ND		28	2.5	ppb v/v			02/10/21 21:44	17.77
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		28	4.3	ppb v/v			02/10/21 21:44	17.77
1,2-Dichlorobenzene	ND		28	11	ppb v/v			02/10/21 21:44	17.77
1,3-Dichlorobenzene	ND		28	5.7	ppb v/v			02/10/21 21:44	17.77
1,4-Dichlorobenzene	ND		28	5.7	ppb v/v			02/10/21 21:44	17.77
<b>Dichlorodifluoromethane</b>	<b>16</b>	<b>J</b>	28	5.0	ppb v/v			02/10/21 21:44	17.77
<b>1,1-Dichloroethane</b>	<b>6.6</b>	<b>J</b>	28	2.5	ppb v/v			02/10/21 21:44	17.77
<b>1,2-Dichloroethane</b>	<b>18</b>	<b>J</b>	28	3.6	ppb v/v			02/10/21 21:44	17.77
<b>1,1-Dichloroethene</b>	<b>110</b>		28	2.8	ppb v/v			02/10/21 21:44	17.77
cis-1,2-Dichloroethene	ND		28	3.6	ppb v/v			02/10/21 21:44	17.77

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114240-001/CWL-D3-120**

**Lab Sample ID: 140-21895-22**

Date Collected: 02/01/21 09:37

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		28	2.5	ppb v/v			02/10/21 21:44	17.77
<b>1,2-Dichloropropane</b>	<b>78</b>		28	3.6	ppb v/v			02/10/21 21:44	17.77
cis-1,3-Dichloropropene	ND		28	5.7	ppb v/v			02/10/21 21:44	17.77
trans-1,3-Dichloropropene	ND		28	3.2	ppb v/v			02/10/21 21:44	17.77
Ethylbenzene	ND		28	4.6	ppb v/v			02/10/21 21:44	17.77
4-Ethyltoluene	ND		57	7.5	ppb v/v			02/10/21 21:44	17.77
Hexachlorobutadiene	ND		140	11	ppb v/v			02/10/21 21:44	17.77
2-Hexanone	ND		71	5.7	ppb v/v			02/10/21 21:44	17.77
4-Methyl-2-pentanone (MIBK)	ND		71	19	ppb v/v			02/10/21 21:44	17.77
Methylene Chloride	ND		140	140	ppb v/v			02/10/21 21:44	17.77
Styrene	ND		28	8.5	ppb v/v			02/10/21 21:44	17.77
1,1,2,2-Tetrachloroethane	ND		28	5.0	ppb v/v			02/10/21 21:44	17.77
<b>Tetrachloroethene</b>	<b>89</b>		28	2.5	ppb v/v			02/10/21 21:44	17.77
Toluene	ND		43	28	ppb v/v			02/10/21 21:44	17.77
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>340</b>		28	2.8	ppb v/v			02/10/21 21:44	17.77
1,2,4-Trichlorobenzene	ND		140	23	ppb v/v			02/10/21 21:44	17.77
1,1,1-Trichloroethane	ND		28	13	ppb v/v			02/10/21 21:44	17.77
<b>1,1,2-Trichloroethane</b>	<b>2.9 J</b>		28	2.5	ppb v/v			02/10/21 21:44	17.77
<b>Trichloroethene</b>	<b>3100</b>		14	2.1	ppb v/v			02/10/21 21:44	17.77
<b>Trichlorofluoromethane</b>	<b>100</b>		28	3.9	ppb v/v			02/10/21 21:44	17.77
1,2,4-Trimethylbenzene	ND		28	7.1	ppb v/v			02/10/21 21:44	17.77
1,3,5-Trimethylbenzene	ND		28	7.8	ppb v/v			02/10/21 21:44	17.77
Vinyl acetate	ND		140	10	ppb v/v			02/10/21 21:44	17.77
Vinyl chloride	ND		14	9.2	ppb v/v			02/10/21 21:44	17.77
m,p-Xylene	ND		28	10	ppb v/v			02/10/21 21:44	17.77
o-Xylene	ND		28	5.3	ppb v/v			02/10/21 21:44	17.77
<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		60 - 140					02/10/21 21:44	17.77

**Client Sample ID: 114241-001/CWL-D3-170**

**Lab Sample ID: 140-21895-23**

Date Collected: 02/01/21 09:40

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		110	32	ppb v/v			02/10/21 22:35	5.57
<b>Benzene</b>	<b>1.2 J</b>		4.5	0.45	ppb v/v			02/10/21 22:35	5.57
Benzyl chloride	ND		8.9	2.1	ppb v/v			02/10/21 22:35	5.57
Bromodichloromethane	ND		4.5	1.0	ppb v/v			02/10/21 22:35	5.57
Bromoform	ND		4.5	0.50	ppb v/v			02/10/21 22:35	5.57
Bromomethane	ND		4.5	1.2	ppb v/v			02/10/21 22:35	5.57
2-Butanone (MEK)	ND		22	4.1	ppb v/v			02/10/21 22:35	5.57
Carbon disulfide	ND		11	0.61	ppb v/v			02/10/21 22:35	5.57
<b>Carbon tetrachloride</b>	<b>3.7 J</b>		4.5	0.39	ppb v/v			02/10/21 22:35	5.57
<b>Chlorobenzene</b>	<b>0.40 J</b>		4.5	0.33	ppb v/v			02/10/21 22:35	5.57
Chloroethane	ND		4.5	1.6	ppb v/v			02/10/21 22:35	5.57

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114241-001/CWL-D3-170**

**Lab Sample ID: 140-21895-23**

Date Collected: 02/01/21 09:40

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloroform</b>	<b>57</b>		4.5	0.39	ppb v/v			02/10/21 22:35	5.57
Chloromethane	ND		11	3.7	ppb v/v			02/10/21 22:35	5.57
Dibromochloromethane	ND		4.5	0.39	ppb v/v			02/10/21 22:35	5.57
1,2-Dibromoethane (EDB)	ND		4.5	0.39	ppb v/v			02/10/21 22:35	5.57
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		4.5	0.67	ppb v/v			02/10/21 22:35	5.57
1,2-Dichlorobenzene	ND		4.5	1.7	ppb v/v			02/10/21 22:35	5.57
1,3-Dichlorobenzene	ND		4.5	0.89	ppb v/v			02/10/21 22:35	5.57
1,4-Dichlorobenzene	ND		4.5	0.89	ppb v/v			02/10/21 22:35	5.57
<b>Dichlorodifluoromethane</b>	<b>7.9</b>		4.5	0.78	ppb v/v			02/10/21 22:35	5.57
<b>1,1-Dichloroethane</b>	<b>2.8 J</b>		4.5	0.39	ppb v/v			02/10/21 22:35	5.57
<b>1,2-Dichloroethane</b>	<b>7.2</b>		4.5	0.56	ppb v/v			02/10/21 22:35	5.57
<b>1,1-Dichloroethene</b>	<b>57</b>		4.5	0.45	ppb v/v			02/10/21 22:35	5.57
cis-1,2-Dichloroethene	ND		4.5	0.56	ppb v/v			02/10/21 22:35	5.57
trans-1,2-Dichloroethene	ND		4.5	0.39	ppb v/v			02/10/21 22:35	5.57
<b>1,2-Dichloropropane</b>	<b>37</b>		4.5	0.56	ppb v/v			02/10/21 22:35	5.57
cis-1,3-Dichloropropene	ND		4.5	0.89	ppb v/v			02/10/21 22:35	5.57
trans-1,3-Dichloropropene	ND		4.5	0.50	ppb v/v			02/10/21 22:35	5.57
Ethylbenzene	ND		4.5	0.72	ppb v/v			02/10/21 22:35	5.57
4-Ethyltoluene	ND		8.9	1.2	ppb v/v			02/10/21 22:35	5.57
Hexachlorobutadiene	ND		22	1.8	ppb v/v			02/10/21 22:35	5.57
2-Hexanone	ND		11	0.89	ppb v/v			02/10/21 22:35	5.57
4-Methyl-2-pentanone (MIBK)	ND		11	3.0	ppb v/v			02/10/21 22:35	5.57
Methylene Chloride	ND		22	22	ppb v/v			02/10/21 22:35	5.57
Styrene	ND		4.5	1.3	ppb v/v			02/10/21 22:35	5.57
1,1,2,2-Tetrachloroethane	ND		4.5	0.78	ppb v/v			02/10/21 22:35	5.57
<b>Tetrachloroethene</b>	<b>41</b>		4.5	0.39	ppb v/v			02/10/21 22:35	5.57
Toluene	ND		6.7	4.3	ppb v/v			02/10/21 22:35	5.57
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>160</b>		4.5	0.45	ppb v/v			02/10/21 22:35	5.57
1,2,4-Trichlorobenzene	ND		22	3.6	ppb v/v			02/10/21 22:35	5.57
1,1,1-Trichloroethane	ND		4.5	2.1	ppb v/v			02/10/21 22:35	5.57
<b>1,1,2-Trichloroethane</b>	<b>0.83 J</b>		4.5	0.39	ppb v/v			02/10/21 22:35	5.57
<b>Trichlorofluoromethane</b>	<b>48</b>		4.5	0.61	ppb v/v			02/10/21 22:35	5.57
1,2,4-Trimethylbenzene	ND		4.5	1.1	ppb v/v			02/10/21 22:35	5.57
1,3,5-Trimethylbenzene	ND		4.5	1.2	ppb v/v			02/10/21 22:35	5.57
Vinyl acetate	ND		22	1.6	ppb v/v			02/10/21 22:35	5.57
Vinyl chloride	ND		2.2	1.4	ppb v/v			02/10/21 22:35	5.57
m,p-Xylene	ND		4.5	1.6	ppb v/v			02/10/21 22:35	5.57
o-Xylene	ND		4.5	0.84	ppb v/v			02/10/21 22:35	5.57

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		60 - 140		02/10/21 22:35	5.57

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) - DL**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Trichloroethene</b>	<b>1400</b>		7.4	1.1	ppb v/v			02/11/21 22:03	5.57

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		60 - 140		02/11/21 22:03	5.57

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114242-001/CWL-D3-350**

**Lab Sample ID: 140-21895-24**

Date Collected: 02/01/21 09:44

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		9.5	2.7	ppb v/v			02/11/21 15:09	1.9
<b>Benzene</b>	<b>0.19</b>	<b>J</b>	0.38	0.038	ppb v/v			02/11/21 15:09	1.9
Benzyl chloride	ND		0.76	0.18	ppb v/v			02/11/21 15:09	1.9
Bromodichloromethane	ND		0.38	0.086	ppb v/v			02/11/21 15:09	1.9
Bromoform	ND		0.38	0.043	ppb v/v			02/11/21 15:09	1.9
Bromomethane	ND		0.38	0.10	ppb v/v			02/11/21 15:09	1.9
2-Butanone (MEK)	ND		1.9	0.35	ppb v/v			02/11/21 15:09	1.9
Carbon disulfide	ND		0.95	0.052	ppb v/v			02/11/21 15:09	1.9
<b>Carbon tetrachloride</b>	<b>0.089</b>	<b>J</b>	0.38	0.033	ppb v/v			02/11/21 15:09	1.9
Chlorobenzene	ND		0.38	0.029	ppb v/v			02/11/21 15:09	1.9
Chloroethane	ND		0.38	0.14	ppb v/v			02/11/21 15:09	1.9
<b>Chloroform</b>	<b>1.2</b>		0.38	0.033	ppb v/v			02/11/21 15:09	1.9
Chloromethane	ND		0.95	0.31	ppb v/v			02/11/21 15:09	1.9
Dibromochloromethane	ND		0.38	0.033	ppb v/v			02/11/21 15:09	1.9
1,2-Dibromoethane (EDB)	ND		0.38	0.033	ppb v/v			02/11/21 15:09	1.9
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.38	0.057	ppb v/v			02/11/21 15:09	1.9
1,2-Dichlorobenzene	ND		0.38	0.15	ppb v/v			02/11/21 15:09	1.9
1,3-Dichlorobenzene	ND		0.38	0.076	ppb v/v			02/11/21 15:09	1.9
1,4-Dichlorobenzene	ND		0.38	0.076	ppb v/v			02/11/21 15:09	1.9
<b>Dichlorodifluoromethane</b>	<b>0.51</b>		0.38	0.067	ppb v/v			02/11/21 15:09	1.9
<b>1,1-Dichloroethane</b>	<b>0.048</b>	<b>J</b>	0.38	0.033	ppb v/v			02/11/21 15:09	1.9
<b>1,2-Dichloroethane</b>	<b>0.18</b>	<b>J</b>	0.38	0.048	ppb v/v			02/11/21 15:09	1.9
<b>1,1-Dichloroethene</b>	<b>0.57</b>		0.38	0.038	ppb v/v			02/11/21 15:09	1.9
cis-1,2-Dichloroethene	ND		0.38	0.048	ppb v/v			02/11/21 15:09	1.9
trans-1,2-Dichloroethene	ND		0.38	0.033	ppb v/v			02/11/21 15:09	1.9
<b>1,2-Dichloropropane</b>	<b>0.63</b>		0.38	0.048	ppb v/v			02/11/21 15:09	1.9
cis-1,3-Dichloropropene	ND		0.38	0.076	ppb v/v			02/11/21 15:09	1.9
trans-1,3-Dichloropropene	ND		0.38	0.043	ppb v/v			02/11/21 15:09	1.9
Ethylbenzene	ND		0.38	0.062	ppb v/v			02/11/21 15:09	1.9
4-Ethyltoluene	ND		0.76	0.10	ppb v/v			02/11/21 15:09	1.9
Hexachlorobutadiene	ND		1.9	0.15	ppb v/v			02/11/21 15:09	1.9
2-Hexanone	ND		0.95	0.076	ppb v/v			02/11/21 15:09	1.9
4-Methyl-2-pentanone (MIBK)	ND		0.95	0.26	ppb v/v			02/11/21 15:09	1.9
Methylene Chloride	ND		1.9	1.9	ppb v/v			02/11/21 15:09	1.9
Styrene	ND		0.38	0.11	ppb v/v			02/11/21 15:09	1.9
1,1,2,2-Tetrachloroethane	ND		0.38	0.067	ppb v/v			02/11/21 15:09	1.9
<b>Tetrachloroethene</b>	<b>1.6</b>		0.38	0.033	ppb v/v			02/11/21 15:09	1.9
Toluene	ND		0.57	0.37	ppb v/v			02/11/21 15:09	1.9
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>1.4</b>		0.38	0.038	ppb v/v			02/11/21 15:09	1.9
1,2,4-Trichlorobenzene	ND		1.9	0.30	ppb v/v			02/11/21 15:09	1.9
1,1,1-Trichloroethane	ND		0.38	0.18	ppb v/v			02/11/21 15:09	1.9
<b>1,1,2-Trichloroethane</b>	<b>0.042</b>	<b>J</b>	0.38	0.033	ppb v/v			02/11/21 15:09	1.9
<b>Trichloroethene</b>	<b>23</b>		0.19	0.029	ppb v/v			02/11/21 15:09	1.9
<b>Trichlorofluoromethane</b>	<b>0.65</b>		0.38	0.052	ppb v/v			02/11/21 15:09	1.9
1,2,4-Trimethylbenzene	ND		0.38	0.095	ppb v/v			02/11/21 15:09	1.9
1,3,5-Trimethylbenzene	ND		0.38	0.10	ppb v/v			02/11/21 15:09	1.9
Vinyl acetate	ND		1.9	0.13	ppb v/v			02/11/21 15:09	1.9
Vinyl chloride	ND		0.19	0.12	ppb v/v			02/11/21 15:09	1.9

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114242-001/CWL-D3-350**

**Lab Sample ID: 140-21895-24**

Date Collected: 02/01/21 09:44

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	ND		0.38	0.14	ppb v/v			02/11/21 15:09	1.9
o-Xylene	ND		0.38	0.071	ppb v/v			02/11/21 15:09	1.9
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		60 - 140					02/11/21 15:09	1.9

**Client Sample ID: 114243-001/CWL-D3-440**

**Lab Sample ID: 140-21895-25**

Date Collected: 02/01/21 09:48

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	2.9		2.2	0.62	ppb v/v			02/11/21 16:14	1.73
Benzene	0.23		0.087	0.0087	ppb v/v			02/11/21 16:14	1.73
Benzyl chloride	ND		0.17	0.041	ppb v/v			02/11/21 16:14	1.73
Bromodichloromethane	ND		0.087	0.019	ppb v/v			02/11/21 16:14	1.73
Bromoform	0.0097	J	0.087	0.0097	ppb v/v			02/11/21 16:14	1.73
Bromomethane	0.030	J	0.087	0.024	ppb v/v			02/11/21 16:14	1.73
2-Butanone (MEK)	0.36	J	0.43	0.079	ppb v/v			02/11/21 16:14	1.73
Carbon disulfide	0.027	J	0.22	0.012	ppb v/v			02/11/21 16:14	1.73
Carbon tetrachloride	0.068	J	0.087	0.0076	ppb v/v			02/11/21 16:14	1.73
Chlorobenzene	0.033	J	0.087	0.0065	ppb v/v			02/11/21 16:14	1.73
Chloroethane	0.035	J	0.087	0.031	ppb v/v			02/11/21 16:14	1.73
Chloroform	0.089		0.087	0.0076	ppb v/v			02/11/21 16:14	1.73
Chloromethane	0.58		0.22	0.071	ppb v/v			02/11/21 16:14	1.73
Dibromochloromethane	ND		0.087	0.0076	ppb v/v			02/11/21 16:14	1.73
1,2-Dibromoethane (EDB)	ND		0.087	0.0076	ppb v/v			02/11/21 16:14	1.73
1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.017	J	0.087	0.013	ppb v/v			02/11/21 16:14	1.73
1,2-Dichlorobenzene	ND		0.087	0.034	ppb v/v			02/11/21 16:14	1.73
1,3-Dichlorobenzene	ND		0.087	0.017	ppb v/v			02/11/21 16:14	1.73
1,4-Dichlorobenzene	ND		0.087	0.017	ppb v/v			02/11/21 16:14	1.73
Dichlorodifluoromethane	0.33		0.087	0.015	ppb v/v			02/11/21 16:14	1.73
1,1-Dichloroethane	ND		0.087	0.0076	ppb v/v			02/11/21 16:14	1.73
1,2-Dichloroethane	0.025	J	0.087	0.011	ppb v/v			02/11/21 16:14	1.73
1,1-Dichloroethene	0.035	J	0.087	0.0087	ppb v/v			02/11/21 16:14	1.73
cis-1,2-Dichloroethene	ND		0.087	0.011	ppb v/v			02/11/21 16:14	1.73
trans-1,2-Dichloroethene	ND		0.087	0.0076	ppb v/v			02/11/21 16:14	1.73
1,2-Dichloropropane	0.034	J	0.087	0.011	ppb v/v			02/11/21 16:14	1.73
cis-1,3-Dichloropropene	ND		0.087	0.017	ppb v/v			02/11/21 16:14	1.73
trans-1,3-Dichloropropene	ND		0.087	0.0097	ppb v/v			02/11/21 16:14	1.73
Ethylbenzene	0.072	J	0.087	0.014	ppb v/v			02/11/21 16:14	1.73
4-Ethyltoluene	ND		0.17	0.023	ppb v/v			02/11/21 16:14	1.73
Hexachlorobutadiene	ND		0.43	0.035	ppb v/v			02/11/21 16:14	1.73
2-Hexanone	0.027	J	0.22	0.017	ppb v/v			02/11/21 16:14	1.73
4-Methyl-2-pentanone (MIBK)	0.25		0.22	0.058	ppb v/v			02/11/21 16:14	1.73
Methylene Chloride	3.3		0.43	0.42	ppb v/v			02/11/21 16:14	1.73
Styrene	ND		0.087	0.026	ppb v/v			02/11/21 16:14	1.73

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114243-001/CWL-D3-440**

**Lab Sample ID: 140-21895-25**

Date Collected: 02/01/21 09:48

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		0.087	0.015	ppb v/v			02/11/21 16:14	1.73
<b>Tetrachloroethene</b>	<b>0.085</b>	<b>J</b>	0.087	0.0076	ppb v/v			02/11/21 16:14	1.73
<b>Toluene</b>	<b>0.63</b>		0.13	0.084	ppb v/v			02/11/21 16:14	1.73
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>0.15</b>		0.087	0.0087	ppb v/v			02/11/21 16:14	1.73
1,2,4-Trichlorobenzene	ND		0.43	0.069	ppb v/v			02/11/21 16:14	1.73
1,1,1-Trichloroethane	ND		0.087	0.040	ppb v/v			02/11/21 16:14	1.73
<b>1,1,2-Trichloroethane</b>	<b>0.011</b>	<b>J</b>	0.087	0.0076	ppb v/v			02/11/21 16:14	1.73
<b>Trichloroethene</b>	<b>1.1</b>		0.043	0.0065	ppb v/v			02/11/21 16:14	1.73
<b>Trichlorofluoromethane</b>	<b>0.26</b>		0.087	0.012	ppb v/v			02/11/21 16:14	1.73
<b>1,2,4-Trimethylbenzene</b>	<b>0.039</b>	<b>J</b>	0.087	0.022	ppb v/v			02/11/21 16:14	1.73
1,3,5-Trimethylbenzene	ND		0.087	0.024	ppb v/v			02/11/21 16:14	1.73
Vinyl acetate	ND		0.43	0.030	ppb v/v			02/11/21 16:14	1.73
Vinyl chloride	ND		0.043	0.028	ppb v/v			02/11/21 16:14	1.73
<b>m,p-Xylene</b>	<b>0.18</b>		0.087	0.031	ppb v/v			02/11/21 16:14	1.73
<b>o-Xylene</b>	<b>0.070</b>	<b>J</b>	0.087	0.016	ppb v/v			02/11/21 16:14	1.73
<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)	97		60 - 140					02/11/21 16:14	1.73

**Client Sample ID: 114244-001/CWL-D3-440**

**Lab Sample ID: 140-21895-26**

Date Collected: 02/01/21 09:48

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Acetone</b>	<b>3.2</b>		2.2	0.62	ppb v/v			02/11/21 17:20	1.73
<b>Benzene</b>	<b>0.25</b>		0.087	0.0087	ppb v/v			02/11/21 17:20	1.73
Benzyl chloride	ND		0.17	0.041	ppb v/v			02/11/21 17:20	1.73
Bromodichloromethane	ND		0.087	0.019	ppb v/v			02/11/21 17:20	1.73
<b>Bromoform</b>	<b>0.011</b>	<b>J</b>	0.087	0.0097	ppb v/v			02/11/21 17:20	1.73
<b>Bromomethane</b>	<b>0.11</b>		0.087	0.024	ppb v/v			02/11/21 17:20	1.73
<b>2-Butanone (MEK)</b>	<b>0.44</b>		0.43	0.079	ppb v/v			02/11/21 17:20	1.73
<b>Carbon disulfide</b>	<b>0.33</b>		0.22	0.012	ppb v/v			02/11/21 17:20	1.73
<b>Carbon tetrachloride</b>	<b>0.076</b>	<b>J</b>	0.087	0.0076	ppb v/v			02/11/21 17:20	1.73
<b>Chlorobenzene</b>	<b>0.013</b>	<b>J</b>	0.087	0.0065	ppb v/v			02/11/21 17:20	1.73
<b>Chloroethane</b>	<b>0.21</b>		0.087	0.031	ppb v/v			02/11/21 17:20	1.73
<b>Chloroform</b>	<b>0.11</b>		0.087	0.0076	ppb v/v			02/11/21 17:20	1.73
<b>Chloromethane</b>	<b>1.5</b>		0.22	0.071	ppb v/v			02/11/21 17:20	1.73
Dibromochloromethane	ND		0.087	0.0076	ppb v/v			02/11/21 17:20	1.73
1,2-Dibromoethane (EDB)	ND		0.087	0.0076	ppb v/v			02/11/21 17:20	1.73
<b>1,2-Dichloro-1,1,2,2-tetrafluoroethane</b>	<b>0.019</b>	<b>J</b>	0.087	0.013	ppb v/v			02/11/21 17:20	1.73
1,2-Dichlorobenzene	ND		0.087	0.034	ppb v/v			02/11/21 17:20	1.73
1,3-Dichlorobenzene	ND		0.087	0.017	ppb v/v			02/11/21 17:20	1.73
1,4-Dichlorobenzene	ND		0.087	0.017	ppb v/v			02/11/21 17:20	1.73
<b>Dichlorodifluoromethane</b>	<b>0.34</b>		0.087	0.015	ppb v/v			02/11/21 17:20	1.73
<b>1,1-Dichloroethane</b>	<b>0.011</b>	<b>J</b>	0.087	0.0076	ppb v/v			02/11/21 17:20	1.73
<b>1,2-Dichloroethane</b>	<b>0.040</b>	<b>J</b>	0.087	0.011	ppb v/v			02/11/21 17:20	1.73

Eurofins TestAmerica, Knoxville

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114244-001/CWL-D3-440**

**Lab Sample ID: 140-21895-26**

Date Collected: 02/01/21 09:48

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,1-Dichloroethene</b>	<b>0.039</b>	<b>J</b>	0.087	0.0087	ppb v/v			02/11/21 17:20	1.73
cis-1,2-Dichloroethene	ND		0.087	0.011	ppb v/v			02/11/21 17:20	1.73
trans-1,2-Dichloroethene	ND		0.087	0.0076	ppb v/v			02/11/21 17:20	1.73
<b>1,2-Dichloropropane</b>	<b>0.037</b>	<b>J</b>	0.087	0.011	ppb v/v			02/11/21 17:20	1.73
cis-1,3-Dichloropropene	ND		0.087	0.017	ppb v/v			02/11/21 17:20	1.73
trans-1,3-Dichloropropene	ND		0.087	0.0097	ppb v/v			02/11/21 17:20	1.73
<b>Ethylbenzene</b>	<b>0.071</b>	<b>J</b>	0.087	0.014	ppb v/v			02/11/21 17:20	1.73
4-Ethyltoluene	ND		0.17	0.023	ppb v/v			02/11/21 17:20	1.73
Hexachlorobutadiene	ND		0.43	0.035	ppb v/v			02/11/21 17:20	1.73
<b>2-Hexanone</b>	<b>0.040</b>	<b>J</b>	0.22	0.017	ppb v/v			02/11/21 17:20	1.73
4-Methyl-2-pentanone (MIBK)	ND		0.22	0.058	ppb v/v			02/11/21 17:20	1.73
<b>Methylene Chloride</b>	<b>0.59</b>		0.43	0.42	ppb v/v			02/11/21 17:20	1.73
Styrene	ND		0.087	0.026	ppb v/v			02/11/21 17:20	1.73
1,1,2,2-Tetrachloroethane	ND		0.087	0.015	ppb v/v			02/11/21 17:20	1.73
<b>Tetrachloroethene</b>	<b>0.12</b>		0.087	0.0076	ppb v/v			02/11/21 17:20	1.73
<b>Toluene</b>	<b>0.45</b>		0.13	0.084	ppb v/v			02/11/21 17:20	1.73
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>0.17</b>		0.087	0.0087	ppb v/v			02/11/21 17:20	1.73
1,2,4-Trichlorobenzene	ND		0.43	0.069	ppb v/v			02/11/21 17:20	1.73
1,1,1-Trichloroethane	ND		0.087	0.040	ppb v/v			02/11/21 17:20	1.73
1,1,2-Trichloroethane	ND		0.087	0.0076	ppb v/v			02/11/21 17:20	1.73
<b>Trichloroethene</b>	<b>1.2</b>		0.043	0.0065	ppb v/v			02/11/21 17:20	1.73
<b>Trichlorofluoromethane</b>	<b>0.26</b>		0.087	0.012	ppb v/v			02/11/21 17:20	1.73
<b>1,2,4-Trimethylbenzene</b>	<b>0.041</b>	<b>J</b>	0.087	0.022	ppb v/v			02/11/21 17:20	1.73
1,3,5-Trimethylbenzene	ND		0.087	0.024	ppb v/v			02/11/21 17:20	1.73
Vinyl acetate	ND		0.43	0.030	ppb v/v			02/11/21 17:20	1.73
<b>Vinyl chloride</b>	<b>0.044</b>		0.043	0.028	ppb v/v			02/11/21 17:20	1.73
<b>m,p-Xylene</b>	<b>0.17</b>		0.087	0.031	ppb v/v			02/11/21 17:20	1.73
<b>o-Xylene</b>	<b>0.065</b>	<b>J</b>	0.087	0.016	ppb v/v			02/11/21 17:20	1.73
<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)	97		60 - 140					02/11/21 17:20	1.73

**Client Sample ID: 114245-001/CWL-D3-480**

**Lab Sample ID: 140-21895-27**

Date Collected: 02/01/21 09:55

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Acetone</b>	<b>2.9</b>		2.1	0.61	ppb v/v			02/11/21 18:25	1.7
<b>Benzene</b>	<b>0.24</b>		0.085	0.0085	ppb v/v			02/11/21 18:25	1.7
Benzyl chloride	ND		0.17	0.040	ppb v/v			02/11/21 18:25	1.7
Bromodichloromethane	ND		0.085	0.019	ppb v/v			02/11/21 18:25	1.7
<b>Bromoform</b>	<b>0.011</b>	<b>J</b>	0.085	0.0096	ppb v/v			02/11/21 18:25	1.7
Bromomethane	ND		0.085	0.023	ppb v/v			02/11/21 18:25	1.7
<b>2-Butanone (MEK)</b>	<b>0.39</b>	<b>J</b>	0.43	0.078	ppb v/v			02/11/21 18:25	1.7
<b>Carbon disulfide</b>	<b>0.014</b>	<b>J</b>	0.21	0.012	ppb v/v			02/11/21 18:25	1.7
<b>Carbon tetrachloride</b>	<b>0.072</b>	<b>J</b>	0.085	0.0074	ppb v/v			02/11/21 18:25	1.7

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114245-001/CWL-D3-480**

**Lab Sample ID: 140-21895-27**

Date Collected: 02/01/21 09:55

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chlorobenzene</b>	<b>0.0081</b>	<b>J</b>	0.085	0.0064	ppb v/v			02/11/21 18:25	1.7
Chloroethane	ND		0.085	0.031	ppb v/v			02/11/21 18:25	1.7
<b>Chloroform</b>	<b>0.10</b>		0.085	0.0074	ppb v/v			02/11/21 18:25	1.7
<b>Chloromethane</b>	<b>0.55</b>		0.21	0.070	ppb v/v			02/11/21 18:25	1.7
Dibromochloromethane	ND		0.085	0.0074	ppb v/v			02/11/21 18:25	1.7
1,2-Dibromoethane (EDB)	ND		0.085	0.0074	ppb v/v			02/11/21 18:25	1.7
<b>1,2-Dichloro-1,1,2,2-tetrafluoroethane</b>	<b>0.018</b>	<b>J</b>	0.085	0.013	ppb v/v			02/11/21 18:25	1.7
1,2-Dichlorobenzene	ND		0.085	0.033	ppb v/v			02/11/21 18:25	1.7
1,3-Dichlorobenzene	ND		0.085	0.017	ppb v/v			02/11/21 18:25	1.7
1,4-Dichlorobenzene	ND		0.085	0.017	ppb v/v			02/11/21 18:25	1.7
<b>Dichlorodifluoromethane</b>	<b>0.34</b>		0.085	0.015	ppb v/v			02/11/21 18:25	1.7
1,1-Dichloroethane	ND		0.085	0.0074	ppb v/v			02/11/21 18:25	1.7
<b>1,2-Dichloroethane</b>	<b>0.022</b>	<b>J</b>	0.085	0.011	ppb v/v			02/11/21 18:25	1.7
<b>1,1-Dichloroethene</b>	<b>0.047</b>	<b>J</b>	0.085	0.0085	ppb v/v			02/11/21 18:25	1.7
cis-1,2-Dichloroethene	ND		0.085	0.011	ppb v/v			02/11/21 18:25	1.7
trans-1,2-Dichloroethene	ND		0.085	0.0074	ppb v/v			02/11/21 18:25	1.7
<b>1,2-Dichloropropane</b>	<b>0.033</b>	<b>J</b>	0.085	0.011	ppb v/v			02/11/21 18:25	1.7
cis-1,3-Dichloropropene	ND		0.085	0.017	ppb v/v			02/11/21 18:25	1.7
trans-1,3-Dichloropropene	ND		0.085	0.0096	ppb v/v			02/11/21 18:25	1.7
<b>Ethylbenzene</b>	<b>0.072</b>	<b>J</b>	0.085	0.014	ppb v/v			02/11/21 18:25	1.7
<b>4-Ethyltoluene</b>	<b>0.033</b>	<b>J</b>	0.17	0.022	ppb v/v			02/11/21 18:25	1.7
Hexachlorobutadiene	ND		0.43	0.034	ppb v/v			02/11/21 18:25	1.7
<b>2-Hexanone</b>	<b>0.043</b>	<b>J</b>	0.21	0.017	ppb v/v			02/11/21 18:25	1.7
4-Methyl-2-pentanone (MIBK)	ND		0.21	0.057	ppb v/v			02/11/21 18:25	1.7
Methylene Chloride	ND		0.43	0.41	ppb v/v			02/11/21 18:25	1.7
Styrene	ND		0.085	0.026	ppb v/v			02/11/21 18:25	1.7
1,1,2,2-Tetrachloroethane	ND		0.085	0.015	ppb v/v			02/11/21 18:25	1.7
<b>Tetrachloroethene</b>	<b>0.051</b>	<b>J</b>	0.085	0.0074	ppb v/v			02/11/21 18:25	1.7
<b>Toluene</b>	<b>0.43</b>		0.13	0.083	ppb v/v			02/11/21 18:25	1.7
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>0.20</b>		0.085	0.0085	ppb v/v			02/11/21 18:25	1.7
1,2,4-Trichlorobenzene	ND		0.43	0.068	ppb v/v			02/11/21 18:25	1.7
1,1,1-Trichloroethane	ND		0.085	0.039	ppb v/v			02/11/21 18:25	1.7
1,1,2-Trichloroethane	ND		0.085	0.0074	ppb v/v			02/11/21 18:25	1.7
<b>Trichloroethene</b>	<b>1.1</b>		0.043	0.0064	ppb v/v			02/11/21 18:25	1.7
<b>Trichlorofluoromethane</b>	<b>0.27</b>		0.085	0.012	ppb v/v			02/11/21 18:25	1.7
<b>1,2,4-Trimethylbenzene</b>	<b>0.041</b>	<b>J</b>	0.085	0.021	ppb v/v			02/11/21 18:25	1.7
1,3,5-Trimethylbenzene	ND		0.085	0.023	ppb v/v			02/11/21 18:25	1.7
Vinyl acetate	ND		0.43	0.030	ppb v/v			02/11/21 18:25	1.7
Vinyl chloride	ND		0.043	0.028	ppb v/v			02/11/21 18:25	1.7
<b>m,p-Xylene</b>	<b>0.17</b>		0.085	0.031	ppb v/v			02/11/21 18:25	1.7
<b>o-Xylene</b>	<b>0.067</b>	<b>J</b>	0.085	0.016	ppb v/v			02/11/21 18:25	1.7
<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)	96		60 - 140					02/11/21 18:25	1.7

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114246-001/CWL-D3-480**

**Lab Sample ID: 140-21895-28**

Date Collected: 02/01/21 09:55

Matrix: Air

Date Received: 02/08/21 10:20

Sample Container: Summa Canister 6L

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Acetone</b>	<b>2.0</b>	<b>J</b>	2.2	0.63	ppb v/v			02/11/21 19:29	1.78
<b>Benzene</b>	<b>0.24</b>		0.089	0.0089	ppb v/v			02/11/21 19:29	1.78
Benzyl chloride	ND		0.18	0.042	ppb v/v			02/11/21 19:29	1.78
Bromodichloromethane	ND		0.089	0.020	ppb v/v			02/11/21 19:29	1.78
<b>Bromoform</b>	<b>0.011</b>	<b>J</b>	0.089	0.010	ppb v/v			02/11/21 19:29	1.78
Bromomethane	ND		0.089	0.024	ppb v/v			02/11/21 19:29	1.78
<b>2-Butanone (MEK)</b>	<b>0.17</b>	<b>J</b>	0.45	0.081	ppb v/v			02/11/21 19:29	1.78
Carbon disulfide	ND		0.22	0.012	ppb v/v			02/11/21 19:29	1.78
<b>Carbon tetrachloride</b>	<b>0.074</b>	<b>J</b>	0.089	0.0078	ppb v/v			02/11/21 19:29	1.78
Chlorobenzene	ND		0.089	0.0067	ppb v/v			02/11/21 19:29	1.78
Chloroethane	ND		0.089	0.032	ppb v/v			02/11/21 19:29	1.78
<b>Chloroform</b>	<b>0.11</b>		0.089	0.0078	ppb v/v			02/11/21 19:29	1.78
<b>Chloromethane</b>	<b>0.50</b>		0.22	0.073	ppb v/v			02/11/21 19:29	1.78
Dibromochloromethane	ND		0.089	0.0078	ppb v/v			02/11/21 19:29	1.78
1,2-Dibromoethane (EDB)	ND		0.089	0.0078	ppb v/v			02/11/21 19:29	1.78
<b>1,2-Dichloro-1,1,2,2-tetrafluoroethane</b>	<b>0.020</b>	<b>J</b>	0.089	0.013	ppb v/v			02/11/21 19:29	1.78
1,2-Dichlorobenzene	ND		0.089	0.034	ppb v/v			02/11/21 19:29	1.78
1,3-Dichlorobenzene	ND		0.089	0.018	ppb v/v			02/11/21 19:29	1.78
1,4-Dichlorobenzene	ND		0.089	0.018	ppb v/v			02/11/21 19:29	1.78
<b>Dichlorodifluoromethane</b>	<b>0.36</b>		0.089	0.016	ppb v/v			02/11/21 19:29	1.78
1,1-Dichloroethane	ND		0.089	0.0078	ppb v/v			02/11/21 19:29	1.78
<b>1,2-Dichloroethane</b>	<b>0.022</b>	<b>J</b>	0.089	0.011	ppb v/v			02/11/21 19:29	1.78
<b>1,1-Dichloroethene</b>	<b>0.052</b>	<b>J</b>	0.089	0.0089	ppb v/v			02/11/21 19:29	1.78
cis-1,2-Dichloroethene	ND		0.089	0.011	ppb v/v			02/11/21 19:29	1.78
trans-1,2-Dichloroethene	ND		0.089	0.0078	ppb v/v			02/11/21 19:29	1.78
<b>1,2-Dichloropropane</b>	<b>0.036</b>	<b>J</b>	0.089	0.011	ppb v/v			02/11/21 19:29	1.78
cis-1,3-Dichloropropene	ND		0.089	0.018	ppb v/v			02/11/21 19:29	1.78
trans-1,3-Dichloropropene	ND		0.089	0.010	ppb v/v			02/11/21 19:29	1.78
<b>Ethylbenzene</b>	<b>0.075</b>	<b>J</b>	0.089	0.014	ppb v/v			02/11/21 19:29	1.78
<b>4-Ethyltoluene</b>	<b>0.040</b>	<b>J</b>	0.18	0.023	ppb v/v			02/11/21 19:29	1.78
Hexachlorobutadiene	ND		0.45	0.036	ppb v/v			02/11/21 19:29	1.78
2-Hexanone	ND		0.22	0.018	ppb v/v			02/11/21 19:29	1.78
4-Methyl-2-pentanone (MIBK)	ND		0.22	0.060	ppb v/v			02/11/21 19:29	1.78
Methylene Chloride	ND		0.45	0.43	ppb v/v			02/11/21 19:29	1.78
Styrene	ND		0.089	0.027	ppb v/v			02/11/21 19:29	1.78
1,1,2,2-Tetrachloroethane	ND		0.089	0.016	ppb v/v			02/11/21 19:29	1.78
<b>Tetrachloroethene</b>	<b>0.12</b>		0.089	0.0078	ppb v/v			02/11/21 19:29	1.78
<b>Toluene</b>	<b>0.44</b>		0.13	0.087	ppb v/v			02/11/21 19:29	1.78
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>0.22</b>		0.089	0.0089	ppb v/v			02/11/21 19:29	1.78
1,2,4-Trichlorobenzene	ND		0.45	0.071	ppb v/v			02/11/21 19:29	1.78
1,1,1-Trichloroethane	ND		0.089	0.041	ppb v/v			02/11/21 19:29	1.78
1,1,2-Trichloroethane	ND		0.089	0.0078	ppb v/v			02/11/21 19:29	1.78
<b>Trichloroethene</b>	<b>1.2</b>		0.045	0.0067	ppb v/v			02/11/21 19:29	1.78
<b>Trichlorofluoromethane</b>	<b>0.29</b>		0.089	0.012	ppb v/v			02/11/21 19:29	1.78
<b>1,2,4-Trimethylbenzene</b>	<b>0.043</b>	<b>J</b>	0.089	0.022	ppb v/v			02/11/21 19:29	1.78
1,3,5-Trimethylbenzene	ND		0.089	0.024	ppb v/v			02/11/21 19:29	1.78
Vinyl acetate	ND		0.45	0.031	ppb v/v			02/11/21 19:29	1.78

# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL PCCP

Job ID: 140-21895-1

**Client Sample ID: 114246-001/CWL-D3-480**

**Lab Sample ID: 140-21895-28**

**Date Collected: 02/01/21 09:55**

**Matrix: Air**

**Date Received: 02/08/21 10:20**

**Sample Container: Summa Canister 6L**

**Method: TO 15 LL - Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		0.045	0.029	ppb v/v			02/11/21 19:29	1.78
<b>m,p-Xylene</b>	<b>0.17</b>		0.089	0.032	ppb v/v			02/11/21 19:29	1.78
<b>o-Xylene</b>	<b>0.066</b>	<b>J</b>	0.089	0.017	ppb v/v			02/11/21 19:29	1.78
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		60 - 140					02/11/21 19:29	1.78

**ANNEX C**

**Chemical Waste Landfill**

**Calendar Year 2021**

**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 March 1, 2021
2. Time of Inspection 1425 - 1450
3. Name of Inspector Robert Zick, Darvella Michel

**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	
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 3/1/21 No 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	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**

<b>Note Number</b>	<b>Description</b>
1	<i>Windblown plant debris needs to be removed from drainage culverts.</i>
2	<i>Windblown plant debris needs to be removed from security fence.</i>
3	<i>Accumulated sediment and plant debris on western most survey monument</i>

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 3 assigned to Danielle Michel Date action completed 3/1/2021

Action (Note Number) 1 assigned to Robert Zöck Date action completed 3/3/2021

Action (Note Number) 2 assigned to Robert Zöck Date action completed 3/3/2021

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

3. Accumulated sediment and plant debris removed from western most survey monument at time of the inspection. By 3/1/2021

1 & 2. B&I removed windblown plant debris from drainage culverts and security fence. By 3/3/2021

Inspector's Signature



Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center



*date:* March 16, 2021

*to:* Mike Mitchell (08888)  
Robert Ziock (08888)

*from:* Jennifer Payne (00643) [jjpayne@sandia.gov](mailto:jjpayne@sandia.gov)

*subject:* **CWL March 2021 Quarterly Inspections - Biology Follow-Up**

**Biological Requirement:**

Biological Surveys are required prior to driving across any area of native vegetation, spraying herbicides or initiating other work activities that disturb wildlife.

Please submit request three weeks to prior work at: <https://info.sandia.gov/esh/ecoticket/request.php>

Should personnel find a bird's nest during any of the work associated with these sites, they will need to halt work, and contact the Ecology Program at <https://info.sandia.gov/esh/ecoticket/request.php>. If other wildlife is encountered that may cause a health and safety issue, contact the Ecology Program.

All proposed project activities would be conducted according to applicable requirements identified in ESH001, ES&H Policy. Detailed instruction can be found in the ES&H Manual, MN471022: "Migratory Birds, Protected Species, and Other Biota".

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The biology quarterly evaluation of the Chemical Waste Landfill was conducted on March 11, 2021.

Observations

- Currently the CWL native grass community appears to be healthy, while in winter dormancy.
- Small late-winter seasonal weeds are present in low abundance across the landfill. The weed presence is much lower than what has been observed during the past few years at this time.
- Esplanade pre-emergent herbicide was applied across the cover the previous week. The green tracer dye used during herbicide application is still visible, giving the cover a light green hue overall.
- No biological concerns observed at this time.

Recommendations

- The CWL area is currently in “Extreme Drought” according to the U.S. Drought Monitor. On March 4, 2021 the Sandia Meteorological Program provided, “Seasonal Outlooks developed by NOAA and the European Commission both predict that New Mexico will be hotter and drier from March through May. Current temperature and precipitation trends combined with these climate models, contribute to a high confidence in these predictions.”

Based on the current drought conditions and seasonal outlook, the CWL cover may require supplemental water to bolster the health of the native grass community. Over the past few years, the native grass community has developed substantially while the weed presence has gradually decreased. However, the native grass community has not yet achieved full maturity and is not capable of surviving extended periods drought due to root systems that have not fully developed. If substantial soil-wetting precipitation events do not occur by late spring, supplemental watering may be needed.

- Summer and fall weed growth should be monitored across the cover to evaluate the efficacy of the Esplanade herbicide. Another application may be useful in October or November 2021 to provide at least 12 consecutive months of weed control.

If you should have any questions, don't hesitate to contact me at my office 845-9849, cell 218-1815, or email at [jjpayne@sandia.gov](mailto:jjpayne@sandia.gov).

cc: Customer Funded Records Center  
Ecology Library  
Matt Baumann  
Rick Dotson

## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection June 1, 2021
2. Time of Inspection 11:50
3. Name of Inspector Robert Ziock, Caitlin Lalhance

**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	
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	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)**

Action (Note Number) 1 assigned to Robert Zöck Date action completed 6/1/2021

Action (Note Number) 2 assigned to Robert Zöck Date action completed 6/1/2021

Action (Note Number) 3 assigned to Robert Zöck Date action completed 6/1/2021

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

1. & 2. Wind blown plant debris removed at time of the inspection. RZ 6/1/2021

3. Sediment removed from western most survey monument at time of the inspection. RZ 6/1/2021

Inspector's Signature 

Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center



*date:* June 22, 2021

*to:* Mike Mitchell (08854)  
Robert Ziock (08854)

*from:* Jennifer Payne (00643) [jjpayne@sandia.gov](mailto:jjpayne@sandia.gov)

*subject:* **June 2021 CWL Quarterly Inspection Biology Follow-Up**

**Biological Requirement:**

Biological Surveys are required prior to driving across any area of native vegetation, spraying herbicides or initiating other work activities that disturb wildlife.

Please submit request three weeks to prior work at: <https://ecoticket-ng.sandia.gov/request.php>. Should personnel find a bird's nest during any of the work associated with these sites, they will need to halt work, and contact the Ecology Program at <https://ecoticket-ng.sandia.gov/request.php>. If other wildlife is encountered that may cause a health and safety issue, contact the Ecology Program.

All proposed project activities would be conducted according to applicable requirements identified in ESH001, ES&H Policy. Detailed instruction can be found in the ES&H Manual, MN471022: "Migratory Birds, Protected Species, and Other Biota".

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**ET Cover Observations and Recommendations**

The biology quarterly evaluation of the CWL ET Cover was conducted on June 7, 2021.

- Overall, the CWL looks excellent. The native bunchgrasses appear to be very healthy with leaf blades turning green as the weather warms.
- The weed density across the ET Cover is significantly lower than in previous June surveys. The Esplanade pre-emergent herbicide appears to be working very well.
- Although the weed presence is significantly reduced, a variety of weeds were observed that should be removed during the upcoming maintenance event.
- Some larger prickly pear cacti were observed that the project manager may want to have removed to reduce the potential for personnel to be poked by spines and/or reduce the opportunity for prickly pear cactus to become established more widely across the ET Cover. Ecologically, they are fine to remain onsite.

- Supplemental watering may benefit the ET Cover in September. The temperatures are lower in September than in June, July or August, making the watering effort more effective due to reduced evapotranspiration losses. And, planned sequential events could more deeply saturate the soil column, where the water could remain for up to a year and bolster the grasses through the heat of next summer if necessary.
- September supplemental watering may be needed based on recent climate history and the 3-month outlook. The January - May 2021 climate trend of temperatures slightly above normal and precipitation totals below normal is predicted to remain through August. From the SNL meteorology June 2021 monthly climate update:

With precipitation totals remaining below normal in southwest and central New Mexico, drought conditions have persisted through May. Around 75% of the state is still experiencing an extreme drought, while 46% of the state is experiencing exceptional drought. We are currently experiencing extreme drought (D3) at Kirtland Air Force Base. The current three-month outlook (June - August) is forecasting above-average temperatures and below-average precipitation. These conditions will favor persistent/worsening drought conditions in New Mexico and a severe fire season.

- To maintain progress on reducing the weed presence on the CWL another application of Esplanade is recommended in the fall before the ground freezes, ideally in September. This will aid in controlling early germinating weeds. Esplanade 200 SC is only effective at controlling weeds when it is applied before weeds emerge from seed. Winter annuals cannot survive in hot weather, they germinate from seed when temperatures become lower in the fall. Summer weeds generally emerge as soon as soil temperatures begin to warm, which can happen very early in a mild New Mexico winter. Esplanade 200 SC is effective for up to 8 months, providing a long period of weed germination control. An application in September 2021 after a thorough debris removal event will likely interfere with weed germination in the fall, winter, and early spring.

cc: Customer Funded Records Center  
Ecology Library  
Matt Baumann

## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 9/23/2021
2. Time of Inspection 13:05 - 13:30
3. Name of Inspector Robert Ziock, Caillín Lathorne

<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: (Inspector must initial box before proceeding with the inspection.) Training records maintained at CAMU Administrative Trailer.</p>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: auto;"> <p style="font-size: 2em; margin: 0;">RZ CL</p> </div>
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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	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**

<b>Note Number</b>	<b>Description</b>
1.	<i>Wind-blown plant debris in south drainage culverts</i>
2.	<i>Wind-blown plant debris on security fence</i>
3.	<i>Sediment accumulation on survey monuments.</i>



## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 12/1/21
2. Time of Inspection 1020 - 1045
3. Name of Inspector Caitlin LaChance / 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: OL  
 (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	Yes	3
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.	N/A	N/A	



**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 1 assigned to Robert Ziock Date action completed 12/1/21  
Action (Note Number) 2 assigned to Robert Ziock Date action completed 12/1/21  
Action (Note Number) 3 assigned to Robert Ziock Date action completed 12/1/21  
Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_  
Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

- ① Wind blown plant debris / tumble weeds removed from culvert at time of inspection.
- ② Windblown plant debris / tumbleweeds removed from security fence at time of inspection.
- ③ Warning signs (3) replaced along northern security fence at time of inspection.

Inspector's Signature



Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center



*date:* December 8, 2021

*to:* Mike Mitchell (08854)  
Robert Ziock (08854)

*from:* Jennifer Payne (00643) [jjpayne@sandia.gov](mailto:jjpayne@sandia.gov)

*subject:* **December 2021 CWL Quarterly Biology Inspection**

**Biological Requirement:**

Biological Surveys are required prior to driving across any area of native vegetation, spraying herbicides or initiating other work activities that disturb wildlife.

Please submit request three weeks to prior work at: <https://info.sandia.gov/esh/ecoticket/request.php>

Should personnel find a bird's nest during any of the work associated with these sites, they will need to halt work, and contact the Ecology Program at <https://info.sandia.gov/esh/ecoticket/request.php>. If other wildlife is encountered that may cause a health and safety issue, contact the Ecology Program.

All proposed project activities would be conducted according to applicable requirements identified in ESH001, ES&H Policy. Detailed instruction can be found in the ES&H Manual, MN471022: "Migratory Birds, Protected Species, and Other Biota".

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**ET Cover Observations and Recommendations**

The biology quarterly evaluation of the CWL ET Cover was conducted on December 7, 2021.

- Overall, the native vegetation community on the CWL cover looks very good. In 2021 the native perennial bunchgrasses continued to mature with each bunchgrass growing slightly larger, strongly correlated with meteorological conditions. The 2021 growing season in the SNL/NM area continued to be dominated by drought conditions, varying from Severe to Extreme Drought throughout the season according to the U.S. Drought Monitor. Native perennial vegetation has evolved with drought in New Mexico, it is the most adaptable and resilient type of vegetation to live with drought.
- Nothing unexpected was observed.
- The native bunchgrasses appear to be healthy and in the same condition as observed during the August inspection except the grass leaves have dried out, they are no longer green and photosynthesizing. After full seed development in the summer, the leaves of warm season

perennial bunchgrasses begin to dry out in the summer heat in preparation for winter dormancy. During winter dormancy the bunchgrasses remain alive using resources stored in their roots and the base of their stems.

- The fence surrounding the cover was clear of tumbleweeds, as was the cover.

cc: Customer Funded Records Center  
Ecology Library

## **GROUNDWATER/SOIL-GAS EQUIPMENT INSPECTIONS**

## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Groundwater Monitoring Locations / Sampling Equipment

1. Date of Inspection 1/19/21
2. Time of Inspection 0845
3. Name of Inspector Zach Tenorio

**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: M  
 (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 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 \_\_\_\_\_
- Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_
- Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

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Inspector's Signature



Original to: 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 Groundwater Monitoring Locations / Sampling Equipment

1. Date of Inspection 7/20/21
2. Time of Inspection 0800
3. Name of Inspector Zach Tenorio

**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: 31  
*(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 2-1-21
2. Time of Inspection 0830
3. Name of Inspector Zach Tenorio

<p><b><u>Mandatory requirement:</u></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: <i>(Inspector must initial box before proceeding with the inspection.)</i></p> <p style="text-align: right; font-size: 2em; font-family: cursive;">31</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. 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.	Yes	NO	

<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)**

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

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Inspector's Signature 

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## **BIOLOGY INSPECTION**

## Chemical Waste Landfill Post-Closure Inspection Form Biology Inspection Checklist for the CWL Cover

**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.)*



Approximate vegetative coverage (i.e., living plants): 38 %<sup>1</sup>

Approximate percent native vegetation of the total vegetative cover: 99 %

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>Sporobolus cryptandrus</u>	<u>Sand dropseed</u>	<u>2 %</u>
<u>Bouteloua gracilis</u>	<u>Blue grama</u>	<u>20 %</u>
<u>Pleuraphis jamesii</u>	<u>Galleta grass</u>	<u>10 %</u>
<u>Sporobolus flexuosus</u>	<u>Mesa dropseed</u>	<u>6 %</u>
<u>Sphaeralcea hastulata</u>	<u>Wrinkled globemallow</u>	<u>&lt;0.5 %</u>
<u>Euphorbia exstipulata</u>	<u>Square-seed spurge</u>	<u>&lt;0.5 %</u>
<u>Salsola tragus</u>	<u>Russian thistle</u>	<u>&lt;0.5 %</u>
<u>Opuntia phaeacantha</u>	<u>Brown-spined prickly pear</u>	<u>&lt;0.5 %</u>
<u>Chenopodium incanum</u>	<u>Mealy goosefoot</u>	<u>&lt;0.5 %</u>
<u>Solanum elaeagnifolium</u>	<u>Silverleaf nightshade</u>	<u>&lt; 0.5%</u>
<u>Sphaeralcea angustifolia</u>	<u>Narrowleaf globemallow</u>	<u>&lt; 0.5%</u>
<u>Stephanomeria pauciflora</u>	<u>Wire lettuce</u>	<u>&lt; 0.5%</u>
<u>Sphaeralcea incana</u>	<u>Yellow globemallow</u>	<u>&lt; 0.5%</u>
<u>Setaria leucophila</u>	<u>Plains bristlegrass</u>	<u>&lt; 0.5%</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? No

Does any burrow(s) appear to be active? Yes

Animal Burrow Notes: Ant burrows are distributed across the CWL cover with varied activity levels, all ant burrows have normal ant-size entrances that are much smaller than 4 inches in diameter. No map is attached because there are no burrow entrances in excess of 4 inches in diameter. The ant burrows are very active this year, ants were widely observed across the cover to be actively harvesting seeds from the grasses and carrying them to their nests.

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: No deeply rooted plant species are present on the cover. There is a low presence of weedy species on the cover.

## Chemical Waste Landfill

### Biology Inspection Checklist for the CWL Cover (Concluded)

#### General Observations:

Overall, the CWL Cover is in very good condition. The complexity of native grass species, ages, and spacing is very good. The native bunch grasses have continued to mature across the cover in the past year. The native grass clumps are displaying a healthy amount of green, mirroring the surrounding native grasslands.

A moderate amount of grasses had set seed in 2021 at the time of the inspection. Grasses are primarily identified to species by the structure of their seed heads (inflorescence). The lack of seed heads on *Sporobolus cryptandrus* (Sand dropseed) and *Sporobolus flexuosus* (Mesa dropseed) at the time of inspection made exact quantification more difficult between these two species.

Almost all of the plants on the CWL are perennials. Extremely few weedy annuals were observed, significant progress has been made on the CWL in reducing the number weedy plants. The maintenance activities affecting the 2021 growing season have been very effective in controlling weedy species. The reduction of weedy plants on the CWL is and will continue to assist the health of the perennial native species by reducing competition for soil moisture, soil nutrients, and space. Continued development of the established bunch grasses to more fully occupy interspaces on the CWL will help to reduce future maintenance and improve the overall health of the established native grasses.

Occasional maintenance events are recommended to continue for the next 3-5 years. The CWL soil still contains a high quantity of weed seed from pre-2021 growing seasons when weeds were abundant across the cover at times and set seed. Although weed seed can remain dormant in the soil for many years, the percent of viable weed seed decreases significantly each year. Pre-emergent herbicide applications will help to proactively control weed growth on the cover by interfering with weed seed germination.

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**Biological Aspects Map – [note: sketch map to locate specific features described above is attached if needed – see notes above]**

Survey Biologist Name: \_\_\_\_\_

Date: August 17, 2021  
Time: 10:45 AM – 12:35 PM

Original to: Chemical Waste Landfill Operating Record

**ANNEX D**  
**Chemical Waste Landfill**  
**Calendar Year 2021**  
**Biology Report**

## **2021 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) 2021 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 2021 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 2021 was conducted on August 17, 2021 and the inspection observations are documented on the “Chemical Waste Landfill Post-Closure Inspection Form Biology Inspection Checklist for the CWL Cover” (Annex C). Photographs of the ET Cover taken during the August 17, 2021 inspection are presented at the end of this report. The inspection was conducted during the 2021 growing season to accurately determine the coverage of living plants. In addition, the staff biologist monitored the ET Cover vegetation and biological parameters during the 2021 quarterly inspections of the ET Cover surface, storm water diversion structures, security fence, and survey benchmarks as a best practice.

Self-sustaining native grasses are an important component of overall ET Cover performance. The native 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. Native grass species create the optimal, self-sustaining plant community because they are adapted to the local climate and soil conditions. The CWL is located at a relatively high elevation, approximately 5,400 feet above sea level, in a semi-arid climate that experiences high temperatures throughout the summer, cold temperatures in the winter, drying winds in the spring, and infrequent precipitation. Perennial native grass species are most effective 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 roots of perennial native grasses enable them to better 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 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 ET Cover was weeded, reseeded, and supplemental watering was conducted for approximately two months during the end of the 2009 growing season. Based upon the results of the September 2011 CWL Biology Inspection, 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 through 2021 CWL Biology Inspections document ET Cover conditions that continue to meet the criteria for successful revegetation.

## 2021 Chemical Waste Landfill Biology Report

### Local Climate Trends for 2021 Growing Season

Climate trends for north-central New Mexico are presented in this section as they have a significant impact on the ET Cover vegetation. Since the reseeding effort in August 2009, the local climate has generally experienced below average precipitation and warmer than average temperatures. Precipitation, relative humidity, wind speed, and temperature all impact soil moisture and plant growth. These meteorological factors are integrated into the U. S. Drought Monitor status (briefly summarized in the two following paragraphs) and are presented in the local meteorological discussion. Tables 1 and 2 at the end of this report provide local SNL Technical Area III meteorological data for the period preceding and including the CY 2021 growing season. A 25-year data set (1995-2019) provides the reference mean monthly meteorological data and is included in Tables 1 and 2 for comparison; these data are hereafter referred to as the “average.”

The U.S. Drought Monitor is a weekly updated map that shows the parts of the U.S. in drought and breaks them into categories depending on severity. This weekly map is produced jointly by the National Oceanic and Atmospheric Administration (NOAA), the U.S. Department of Agriculture (USDA), and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln. The map authors synthesize varied drought indicator data sources to create a snapshot of current drought conditions. Data sources include climatological inputs, soil moisture indicators, hydrologic data, and contributions from a nationwide network of more than 450 scientific observers. The U.S. Drought Monitor provides a simple but robust insight of the meteorological conditions affecting the local vegetation.

At the time of the 2021 Biology Inspection, the CWL area drought status was on the border between D2 Severe and D3 Extreme Drought. This status indicates crops are impacted and the native vegetation is likely under significant stress.

Soil moisture content 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. In arid and semiarid climates such as New Mexico, plant functions such as growth and photosynthesis are limited by low soil moisture conditions (Xu January 2011). For this reason, monitoring the ET Cover vegetation and local meteorological conditions throughout the year is important. The following brief discussion of meteorological conditions includes the last three months of CY 2020.

### *Precipitation and Relative Humidity*

Extremely dry meteorological conditions dominated the nine months (October 2020 through June 2021) preceding the 2021 monsoon season. October through December 2020 and January through May 2021 was an eight-month period of significantly below average precipitation. June 2021 was the only non-monsoonal month with above average precipitation. Relative humidity was also lower than average during this nine-month timeframe except for the months of May and June 2021.

## 2021 Chemical Waste Landfill Biology Report

The North American Monsoon season is July through September and is an important feature of New Mexico's summer climate and growing season. Monsoonal moisture typically provides approximately half of the annual precipitation in the Kirtland Air Force Base area. Slightly above-average precipitation was received overall during the 2021 monsoon season (total of 4.35 inches versus 4.17 inches). Relative humidity was above average in July, but slightly below average in August and September.

The last three months of 2021 experienced a return to drier conditions, with below average precipitation and relative humidity. Total precipitation in 2021 was 6.81 inches, 23% below the annual average of 8.86 inches.

### *Temperature and Wind Speeds*

In CY 2021 the CWL experienced 96.5 degrees of temperature variability, with a low of 6.3°F in February and a high of 102.8°F in July. Monthly mean temperature for 2021 was 59.0°F, this was 1.6°F above the 25-year annual mean of 57.4°F. The monthly mean temperature for nine months in 2021 exceeded their 25-year monthly means, with a maximum variation of +5.6°F in November.

The 2021 monthly and annual wind speed means were very close to 25-year monthly and annual means. All monthly wind means were within 1.0 miles per hour of their respective 25-year means, except for November (1.1 miles per hour difference).

### ET Cover Development and Maintenance

The successional development of the native grasses on the ET Cover has been significant in the past eight growing seasons. Many tightly spaced juvenile native grass clumps died off in large numbers in 2013; this allowed for greater spacing between the remaining resilient grass clumps, allowing for healthy growth of their root systems and above ground biomass. Since 2013 the native grass clumps have matured in these open areas, facilitated by active best practice maintenance described in Chapter 6 of each respective CWL Annual Post-Closure Care Report.

ET Cover best practice maintenance activities performed by the ET Cover maintenance contractor in CY 2021 are presented in Section 6.6 of this report and were performed in response to inspections, general site conditions, and recommendations by the staff biologist. The four maintenance events conducted in March, May, July, and October were designed to achieve the long-term goal of establishing a healthy, self-sustaining native grass community on the ET Cover by reducing competition with weedy species for limited moisture and nutrients. This work included removal live and dead weeds from the ET Cover, storm-water diversion structures, and perimeter areas, and applying a pre-emergent herbicide designed for invasive weed control. The pre-emergent herbicide Esplanade was tested in selected areas on and around the ET Cover in CY 2020 and was applied to the ET Cover and perimeter areas in March 2021 (see Section 6.6).

## 2021 Chemical Waste Landfill Biology Report

### August 17, 2021 Inspection Results

The August 2021 Biology Inspection determined the ET Cover continues to meet or exceed all permit requirements related to biological parameters as shown in the photographs of the ET Cover taken during the August 17, 2021 inspection presented at the end of this report. These criteria are provided below.

- Total foliar coverage equal to or greater than 20%
- Of the 20% total foliar coverage, 50% or greater comprised of native perennial species
- No areas devoid of vegetation greater than 200 square feet
- No animal burrows in excess of 4 inches in diameter.

The ET Cover foliar coverage was approximately 38%, of which approximately 99% was native perennial grasses. In general, the level of weedy plant species present on the ET Cover was very low (i.e., less than 1%), in part due to several well-timed weed removal events. Blue grama was the dominant grass species (20% total foliar coverage), followed by Galleta grass (10% foliar coverage). The four native grass species present on the ET Cover accounted for 38% total foliar coverage. Grasses are primarily identified to species by the structure of their seed heads (inflorescence).

Overall, the ET Cover was observed to be in very good condition. Juvenile and more mature native grass clumps were robust across the ET Cover, providing a healthy varied-age plant community. The native grass clumps displayed a healthy amount of green, mirroring the surrounding native grasslands and indicating good photosynthetic activity. Grasses had set a moderate number of seeds, most likely in response to the drought conditions as described previously. A normal response to drought is for perennial plants to conserve energy by creating fewer seeds, which require a lot of energy to produce. Plant strategies such as this enable native plants to survive drought conditions by optimizing energy stores. As the ET Cover develops into a fully mature plant community, the native species composition will likely continue to gradually change (i.e., foliar coverage of different native grasses will shift over time).

### Recommendations

Based on vegetation inspection and monitoring conducted during CY 2021, the existing native grasses could benefit from continued efforts to reduce competition from annual weedy species and other less desirable native species. This would benefit the established native grasses through increased availability of soil moisture and nutrients and assist development of native perennial grasses in the open spaces on the ET Cover (i.e., allow existing native grass clumps and their root systems to continue to expand and develop). To achieve this, pre-emergent herbicide is recommended for application in March 2022 to proactively control weed growth on the ET Cover by limiting weed seed germination. Continued reduction of weed growth will aid in the maturation of the native grasses into a more robust, mature native plant community by significantly reducing competition for soil moisture and other soil nutrients by non-native plant species. The native clump grasses

## 2021 Chemical Waste Landfill Biology Report

have formed good spacing; currently no additional native plant recruitment is needed onsite from seed.

As of December 7, 2021, the CWL and KAFB are in D4 Extreme Drought status according to the U.S. Drought Monitor. Below-average precipitation and worsening drought conditions may persist. Current and anticipated drought conditions may have a lasting negative effect on plants during the 2022 growing season. Due to the still maturing plant community on the CWL, supplemental watering may be considered in 2022 to provide supplemental soil moisture.

The mean annual temperature is expected to continue to rise in coming decades due to global climate change. Gradually increasing mean temperatures coupled with increased climate variability, such as periods of drought and/or periods of flooding, will continue to stress native vegetation at SNL/NM and across the southwestern United States. Mature, native perennial grasses will continue to be the most resilient type of plant community. Supporting the continued progression of an ET Cover native grass community that mimics the composition of the surrounding, naturally occurring plant community is the best approach for optimum ET Cover performance under anticipated climate variability scenarios and increasing climatological stresses.

### 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.

U. S. Drought Monitor (August 2021 and December 2021)  
<http://droughtmonitor.unl.edu/>

Xu, Zhenzhu, Guangsheng Zhou, January 2011. "Responses of photosynthetic capacity to soil moisture gradient in perennial rhizome grass and perennial bunchgrass," BMC Plant Biology, 11 (21). <https://bmcpantbiol.biomedcentral.com/articles/10.1186/1471-2229-11-21> Accessed December 16, 2019.

## 2021 Chemical Waste Landfill Biology Report

**Table 1**  
**October-December 2020 Meteorological Data Summary for the Chemical Waste Landfill<sup>a</sup>**

Month	October	November	December	
<b>Temperature (°F)</b>				3-Month Avg
Monthly Mean	57.9	50.5	36.8	48.4
25-year Temp Means	58.0	46.6	37.3	47.3
<b>Precipitation (Inches)</b>				3-Month Total
Monthly Total	0.13	0.12	0.15	0.13
25-year Precip Means	0.95	0.47	0.57	0.66
<b>Relative Humidity (RH) (%)</b>				3-Month Avg
Monthly Mean	28.4	39.0	43.7	37.0
25-year RH Means	42.6	45.0	53.4	47.0
<b>Wind (Miles/hour)</b>				3-Month Avg
Monthly Mean	7.9	7.9	6.6	7.5
25-year Wind Means	7.9	7.1	6.7	7.2

<sup>a</sup>Information Source: SNL/NM Meteorological Monitoring Program.

% = Percent.

°F = Fahrenheit.

RH = Relative humidity.

SNL/NM = Sandia National Laboratories/New Mexico.

## 2021 Chemical Waste Landfill Biology Report

**Table 2**  
**2021 Meteorological Data Summary for the Chemical Waste Landfill<sup>a</sup>**

<b>Month</b>	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	
<b>Year</b>	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	
<b>Temperature (°F)</b>													Annual <sup>b</sup>
Monthly Mean	37.9	41.3	48.1	57.2	66.9	77.5	76.5	75.9	72.5	58.8	52.2	43.4	59.0
25-year Temp Means	37.7	42.1	49.3	56.0	65.7	75.7	76.8	74.8	69.3	58.0	46.6	37.3	57.4
<b>Precipitation (Inches)</b>													Annual <sup>c</sup>
Monthly Total	0.13	0.26	0.31	0.30	0.29	0.66	1.60	1.55	1.20	0.06	0.16	0.29	6.81
25-year Precip Means	0.39	0.43	0.50	0.52	0.34	0.52	1.72	1.46	0.99	0.95	0.47	0.57	8.86
<b>Relative Humidity (%)</b>													Annual <sup>b</sup>
Monthly Mean	46.3	41.8	33.8	26.9	28.1	30.3	49.3	43.5	41.1	36.5	35.7	41.5	37.9
25-year RH Means	51.1	44.5	35.8	30.7	27.2	25.3	40.6	44.3	42.3	42.6	45.0	53.4	40.2
<b>Wind (Miles/hour)</b>													Annual <sup>b</sup>
Monthly Mean	7.7	8.8	9.4	11.1	10.7	9.8	8.4	8.6	7.2	7.8	6.0	7.0	8.5
25-year Wind Means	6.9	8.2	9.1	10.3	9.9	9.7	8.4	7.9	8.0	7.9	7.1	6.7	8.3

<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.

% = Percent.

°F = Fahrenheit.

RH = Relative humidity.

**2021 CWL Biology Inspection Photographs – August 17, 2021**



CWL: Northwest portion of the cover



CWL: Southwest portion of the cover

**2021 CWL Biology Inspection Photographs – August 17, 2021**



CWL: Southeast portion of the cover



CWL: Northeast portion of the cover

**2021 CWL Biology Inspection Photographs – August 17, 2021**



CWL: Looking north from the center of the cover



CWL: Looking east from the center of the cover

**2021 CWL Biology Inspection Photographs – August 17, 2021**



CWL: Looking south from the center of the cover



CWL: Looking west from the center of the cover