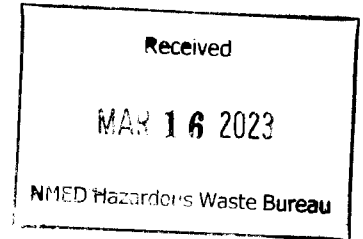




**Department of Energy**  
**National Nuclear Security Administration**  
**Sandia Field Office**  
P.O. Box 5400  
Albuquerque, NM 87185

**MAR 13 2023**

NNSA-2023-001620



Mr. Dave Cobrain  
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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 2022, Sandia National Laboratories, New Mexico,  
Environmental Protection Agency Identification Number NM5890110518

Dear Mr. Cobrain:

The Department of Energy, National Nuclear Security Administration, Sandia Field Office, and National Technology & Engineering Solutions of Sandia, LLC, submit the Subject document dated March 2023. This submittal is required by Part 2, Section 2.6.3, of the Chemical Waste Landfill Post-Closure Care Permit and satisfies the 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,

Daryl J. Hauck, Ph.D.  
Manager

cc: See Page 2

**MAR 13 2023**

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**Submittal of Chemical Waste Landfill Annual Post-Closure Care Report  
Calendar Year 2022, Sandia National Laboratories/New Mexico,  
Chemical Waste Landfill Post-Closure Care Permit**

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

**CERTIFICATION STATEMENT**


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

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(Affiliate)

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**Sandia  
National  
Laboratories**

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**CHEMICAL WASTE LANDFILL  
ANNUAL POST-CLOSURE CARE REPORT  
CALENDAR YEAR 2022**

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

---

**MARCH 2023**



**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 2022**

**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 2022 Soil-Gas Monitoring Forms and Reports
- Annex C      Chemical Waste Landfill Calendar Year 2022 Post-Closure Inspection Forms
- Annex D      Chemical Waste Landfill Calendar Year 2022 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
µg/L	micrograms per liter
mg/L	milligrams per liter
NMED	New Mexico Environment Department
NMAC	New Mexico Administrative Code
NNSA	National Nuclear Security Administration
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
PQL	practical quantitation limit
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 twelfth 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) 2022. 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 January 2022. There were no variances and there were no exceedances of trigger levels. Analytical and statistical assessment results were consistent with previous years with the exception of five results from various CWL-D2 and CWL-D3 soil-gas sampling ports that were lower than historical results. Based upon data validation and a review of field and laboratory records, no issues were identified. Eleven 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 or shortly afterwards. 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 2022 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 annual weedy species for limited moisture and nutrients.

Regulatory activities in CY 2022 included two submittals of updated reference documents cited in the PCCP (Hauck May and November 2022), and submittal of the CY 2021 CWL Annual Post-Closure Care Report (SNL/NM March 2022).

All PCCP requirements have been met for CY 2022. Industrial land use is being maintained for the CWL consistent with PCCP requirements. Based upon monitoring, inspection, and maintenance results, the ET Cover and associated site controls are 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) 2022. Modifications of the PCCP that have affected monitoring, inspection, maintenance, repair, and/or reporting requirements and PCCP-related document submittals to the New Mexico Environment Department (NMED) through CY 2022 are summarized in Chapter 7 of this report.

All PCCP monitoring, inspection, and maintenance/repair requirements have been met for CY 2022 and are documented in this twelfth 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 levels or 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 2022 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 2022 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, monitoring networks, and site controls perform as designed.

This CY 2022 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 a summary of monitoring, inspection, maintenance, and repair requirements from the PCCP.
- 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 2022 reporting period.
- Chapter 9 lists the references cited in this report.

Annexes are provided that include CY 2022 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 Annual 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 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 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 (NMED October 2009), and previous annual reports (CY 2012 through 2021). 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

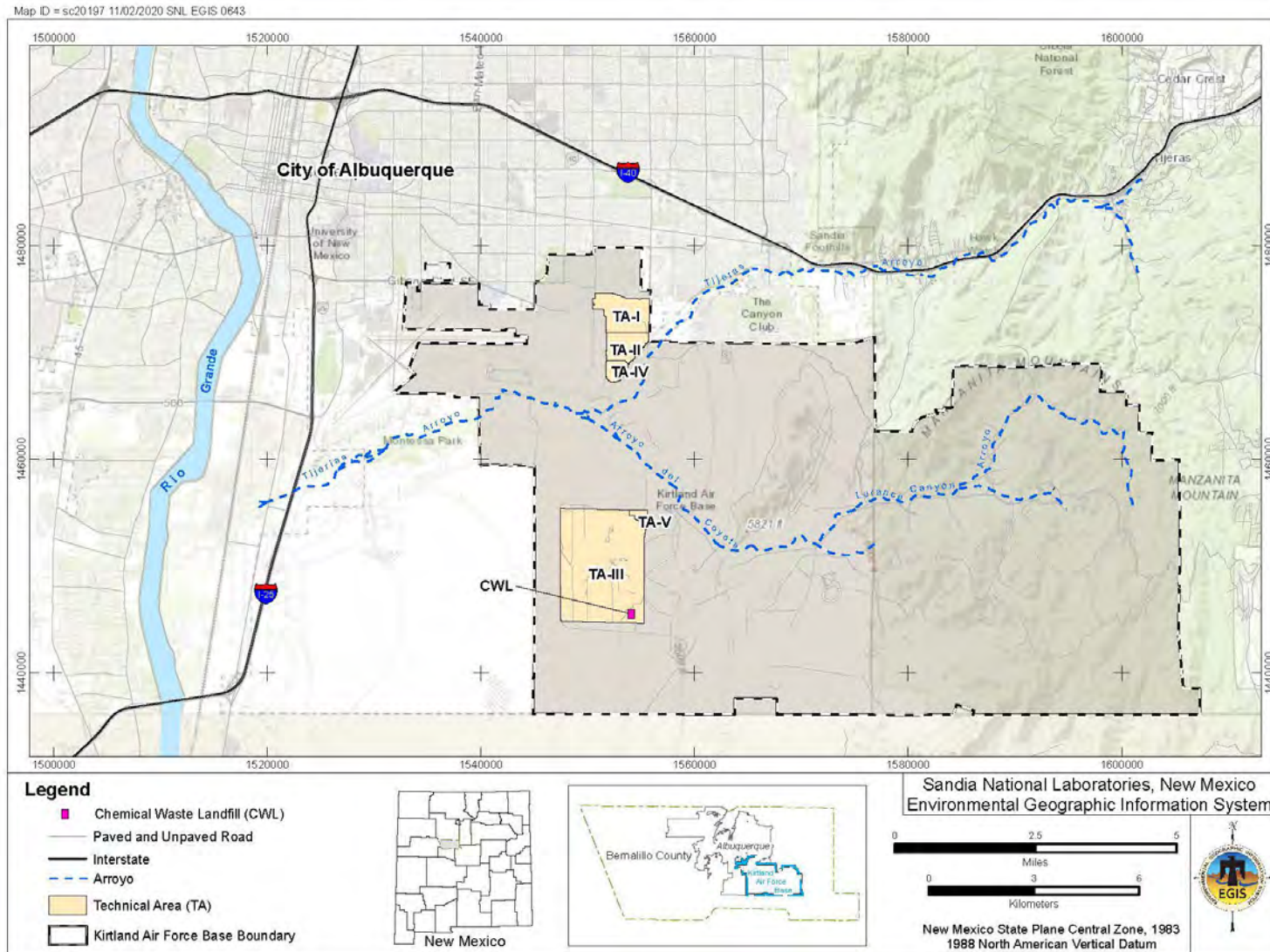


Figure 2-1  
 Location of the Chemical Waste Landfill with Respect to Kirtland Air Force Base and the City of Albuquerque

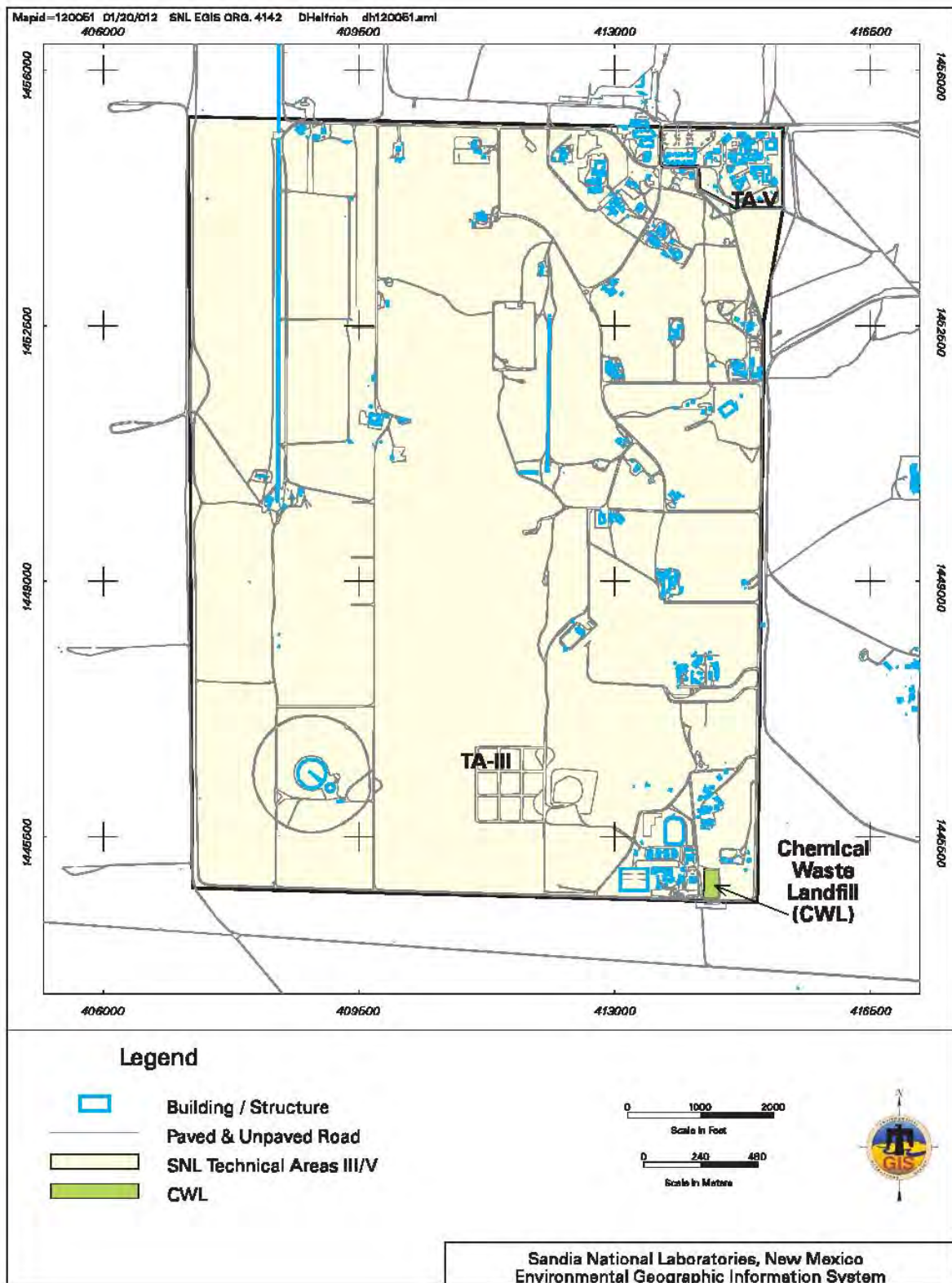


Figure 2-2  
Location of the Chemical Waste Landfill within Technical Area III

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.

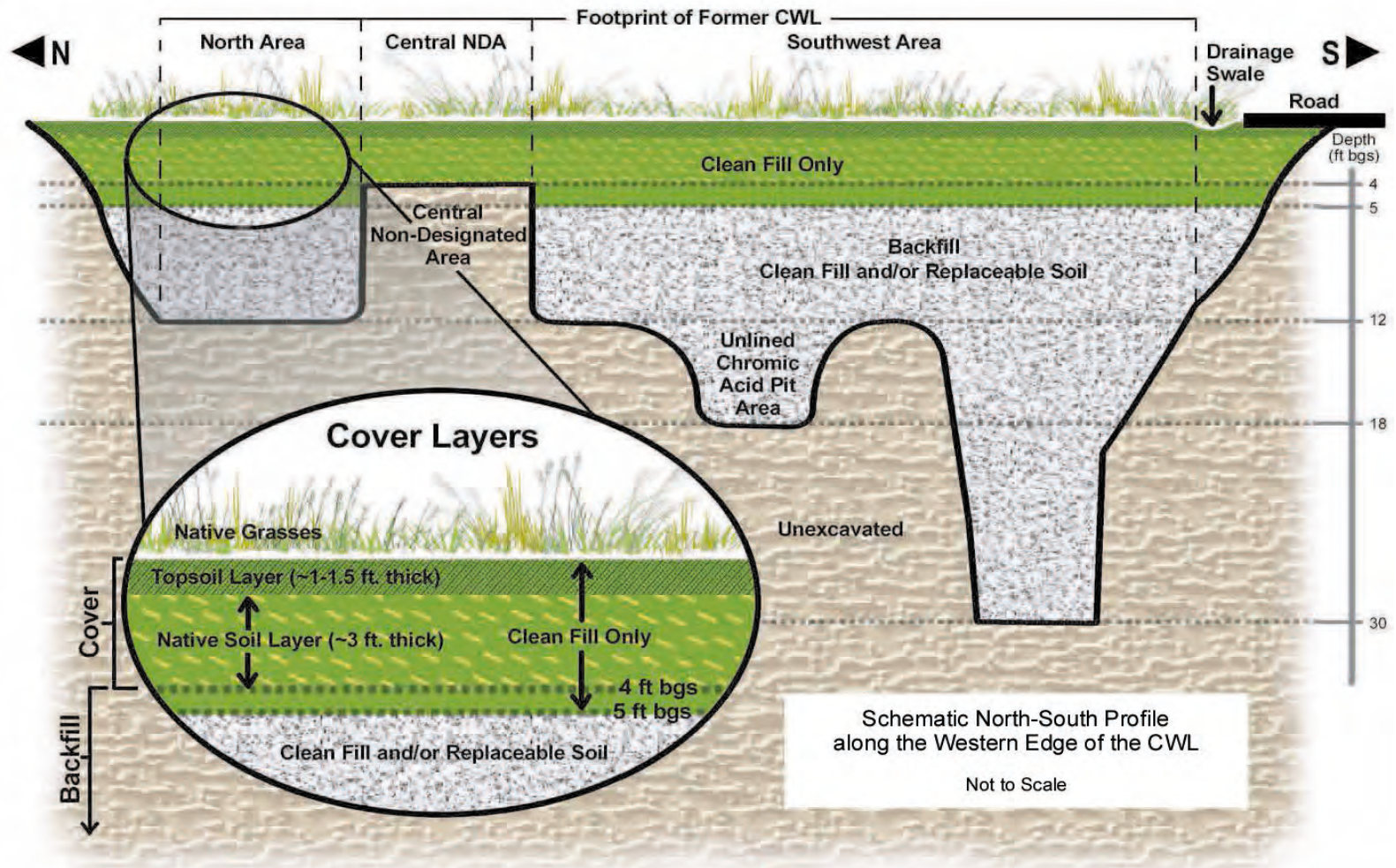
Well-completion diagrams for the groundwater monitoring wells are provided in PCCP Attachment 2.

### **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

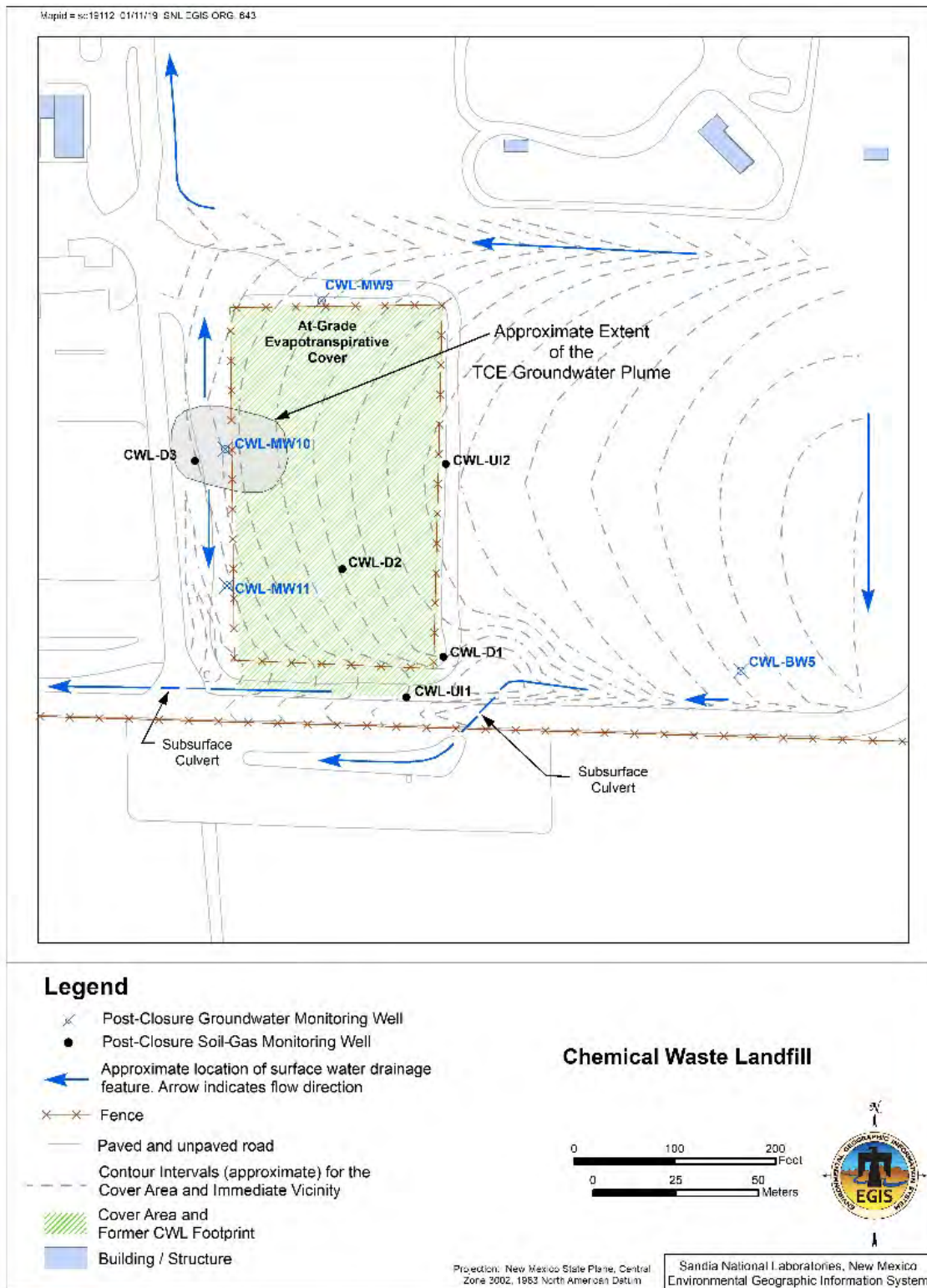


Figure 2-4  
 Chemical Waste Landfill Surface Drainage Patterns and Monitoring Networks

## **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 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, surface features, site controls, and emergency equipment throughout the post-closure care period.

Monitoring, inspection, and maintenance/repair activities were conducted in CY 2022 in accordance with PCCP Attachment 1, Sections 1.8 through 1.10. Results of CY 2022 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) analytical 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 frequency for the listed constituents; an enhanced list of constituents must be analyzed on an annual basis per 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.

VOCs = Volatile organic compounds.

### 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 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 future 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 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 (i.e., Annex D of this report).

### 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, must 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 and tubing replacement and/or maintenance/repair 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 must 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 must 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 must 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 2022 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 semiannual groundwater sampling events were conducted in CY 2022.

- The first sampling event was conducted January 12-19, 2022. 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-MW9. 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 August 2-9, 2022. 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-BW5. 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. 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 and tubing were rinsed with deionized water.

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). A portable Bennett Company groundwater sampling system was used to purge and collect groundwater samples from all wells. 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. As specified in the PCCP Groundwater SAP, groundwater stability is 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 August 2022 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. After completion of the purging process, samples are collected in appropriate containers.

To reduce the potential for low yield wells to purge dry prior to removal of the minimum purge volume (i.e., purged to the point where groundwater can no longer be removed by the sampling system), the sampling system is operated at the lowest achievable flow rate without damaging the sampling system. To achieve the lowest possible flow rate, the sampling system is equipped with a flow meter valve located along the discharge line and small diameter tubing (i.e., 0.25-inch inside diameter). If a well purges dry prior to removal of the minimum purge volume, it is allowed to recover, typically overnight, so there is sufficient groundwater volume in the well for sampling.

Consistent with historical monitoring results, minimum purge requirements were satisfied at all monitoring wells except CWL-MW10. This monitoring well was purged until dry, allowed to recover, and then sampled. The flow rate was continually adjusted during the CWL-MW10 purging process to achieve as low a flow rate as possible without causing the pump to fail.

During January 2022, approximately 13.0 gallons were purged from well CWL-MW10 prior to the well going dry (purge volume requirement was approximately 21 gallons). The average estimated flow rate was 0.171 gallons per minute (gpm), and the estimated flow rate was 0.143 gpm during the final three gallons (equivalent to 0.647 and 0.541 liters per minute, respectively). During August 2022, approximately 13.0 gallons were purged from CWL-MW10 prior to the well going dry (purge volume requirement was approximately 20 gallons). The average estimated flow rate was 0.210 gpm, and the estimated flow rate was 0.250 gpm during the final three gallons (equivalent to 0.795 and 0.946 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 environmental sample to reduce variability caused by time and/or sampling mechanics. Equipment blank (also referred to as rinse 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 August 2022 sampling events is provided below. Analytical results are presented in Section 4.2.2.

### ***First Semiannual Sampling Event – January 12-19, 2022***

An environmental duplicate sample was collected from CWL-MW9. One equipment blank sample was collected prior to sampling monitoring well CWL-MW9. The samples (equipment blank, environmental sample, and environmental duplicate sample) analyzed for all constituents. Two field blank samples were collected 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 after sampling CWL-MW11. The three field blank samples were submitted for VOC analysis (TCE and enhanced list VOCs). A total of six trip blank samples were submitted with the January 2022 groundwater samples and analyzed for TCE and the enhanced list of VOCs.

### ***Second Semiannual Sampling Event – August 2-9, 2022***

An environmental duplicate sample was collected from CWL-BW5. One equipment blank sample was collected prior to sampling CWL-BW5. The samples (equipment blank, environmental sample, and environmental duplicate sample) were analyzed for all constituents. Due to a temperature issue (Section 4.2.2), a second equipment blank sample was collected prior to sampling CWL-MW11 and analyzed for TCE only. Two field blank samples were collected by pouring deionized water into sample containers at the CWL-BW5 and CWL-MW11 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 after sampling CWL-MW9. The three field blank samples were submitted for TCE analysis. A total of seven trip blank samples were submitted with the August 2022 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 243 gallons of wastewater were generated during the January 2022 sampling event and approximately 246 gallons of wastewater were generated during the August 2022 sampling event (total of 489 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 August 2022 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 (PQL) are qualified as estimated values by the analytical laboratory and designated with a “J” laboratory qualifier. Analytical laboratory reports, including certificates of analyses, analytical methods, MDLs, PQLs, dates of analyses, results of QC analyses, and data validation reports are filed in the SNL/NM Records Center.

### 4.2.1 Environmental Sample Results

Table 4-1 summarizes TCE results and Table 4-2 summarizes chromium and nickel results for the January and August 2022 groundwater monitoring events. Table 4-3 summarizes results for the enhanced list VOCs included in the January 2022 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 August 2022 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 12-19, 2022***

TCE was detected above the MDL in the CWL-MW10 environmental sample at a concentration of 0.630 µg/L. There were no other detections of TCE or enhanced list VOCs. Chromium was not detected above the MDL in any of the groundwater samples. Nickel was detected at an estimated concentration between the MDL and PQL in the CWL-BW5 and CWL-MW11 environmental samples.

#### ***Second Semiannual Sampling Event – August 2-9, 2022***

TCE was detected above the MDL in the CWL-MW10 environmental sample at a concentration of 0.670 µg/L. There were no other detections of TCE. Chromium was not detected above the MDL in any of the groundwater samples. Nickel was detected at an estimated concentration between the MDL and PQL in the CWL-MW10 environmental sample. Nickel was reported at estimated concentrations between the MDL and PQL in the CWL-BW5 environmental and environmental duplicate samples, but these results were qualified as non-detections during data validation due to a similar nickel concentration reported in the associated equipment blank sample.

Table 4-1  
 Summary of TCE Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Analytical Method SW846-8260B<sup>a</sup>  
 Calendar Year 2022

Well ID	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
<b>January 2022 Sampling Event</b>					
CWL-BW5	ND	0.333	1.00	U	--
CWL-MW9	ND	0.333	1.00	U	--
CWL-MW9 (Duplicate)	ND	0.333	1.00	U	--
CWL-MW10	0.630	0.333	1.00	J	--
CWL-MW11	ND	0.333	1.00	U	--
<b>August 2022 Sampling Event</b>					
CWL-BW5	ND	0.333	1.00	U	--
CWL-BW5 (Duplicate)	ND	0.333	1.00	U	--
CWL-MW9	ND	0.333	1.00	U	--
CWL-MW10	0.670	0.333	1.00	J	--
CWL-MW11	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

-- = 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 2022

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
<b>January 2022 Sampling Event</b>						
CWL-BW5	Chromium	ND	0.003	0.010	U	--
	Nickel	0.000602	0.0006	0.002	J	--
CWL-MW9	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	U	--
CWL-MW9 (Duplicate)	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	0.000783	0.0006	0.002	J	--
<b>August 2022 Sampling Event</b>						
CWL-BW5	Chromium	ND	0.003	0.010	U	--
	Nickel	0.00107	0.0006	0.002	J	0.002U
CWL-BW5 (Duplicate)	Chromium	ND	0.003	0.010	U	--
	Nickel	0.00113	0.0006	0.002	J	0.002U
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	0.000748	0.0006	0.002	J	--
CWL-MW11	Chromium	ND	0.003	0.010	U	--
	Nickel	ND	0.0006	0.002	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

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

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

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.

Table 4-3  
 Summary of Additional Volatile Organic Compound Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Analytical Method SW846-8260B<sup>a</sup>  
 January 2022

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	0.333	1.00	U	--
	Chloroform	ND	0.333	1.00	U	--
	Tetrachloroethene	ND	0.333	1.00	U	--
	Trichlorofluoromethane	ND	0.333	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	1.00	U	--
CWL-MW9	1,1-Dichloroethene	ND	0.333	5.00	U	--
	Chloroform	ND	0.333	1.00	U	--
	Tetrachloroethene	ND	0.333	1.00	U	--
	Trichlorofluoromethane	ND	0.333	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	1.00	U	--
CWL-MW9 (Duplicate)	1,1-Dichloroethene	ND	0.333	1.00	U	--
	Chloroform	ND	0.333	5.00	U	--
	Tetrachloroethene	ND	0.333	1.00	U	--
	Trichlorofluoromethane	ND	0.333	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	1.00	U	--
CWL-MW10	1,1-Dichloroethene	ND	0.333	1.00	U	--
	Chloroform	ND	0.333	1.00	U	--
	Tetrachloroethene	ND	0.333	5.00	U	--
	Trichlorofluoromethane	ND	0.333	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	1.00	U	--
CWL-MW11	1,1-Dichloroethene	ND	0.333	1.00	U	--
	Chloroform	ND	0.333	1.00	U	--
	Tetrachloroethene	ND	0.333	1.00	U	--
	Trichlorofluoromethane	ND	0.333	5.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.98	1.00	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 2022

Notes:

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

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

Laboratory Qualifier

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

Validation Qualifier

-- = 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.

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 2022

Well ID	Temperature (°C)	SC (µmho/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (% Sat)	DO (mg/L)
<b>January 2022 Sampling Event</b>							
CWL-BW5	16.36	1025.6	129.7	6.98	1.25	78.05	7.74
CWL-MW9	19.02	970.47	120.5	7.07	0.41	63.13	5.25
CWL-MW10	18.87	964.56	-14.8	7.05	2.10	22.57	1.87
CWL-MW11	20.99	1069.5	13.8	7.05	2.68	78.13	6.19
<b>August 2022 Sampling Event</b>							
CWL-BW5	21.68	1127.3	195.9	7.10	0.60	79.78	6.15
CWL-MW9	22.39	1034.2	187.2	7.13	0.10	55.12	4.19
CWL-MW10	21.68	1016.3	-34.7	7.20	0.97	17.38	1.34
CWL-MW11	24.17	1090.6	25.8	7.03	0.67	62.13	4.60

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 provides the formula for calculating the relative percent difference (RPD) between the environmental and environmental duplicate sample results for the CY 2022 sample pairs. There were no validated detections for the January or August 2022 environmental-duplicate sample pairs, so no RPDs were calculated.

Chloroform was the only constituent detected above the MDL in the January 2022 equipment blank sample. No corrective action was necessary since this compound was not reported in the associated environmental samples. Nickel was the only constituent detected in the August 2022 equipment blank sample. As discussed in Section 4.1.2, the very low nickel concentrations reported in the CWL-BW5 environmental and environmental duplicate samples were qualified during data validation as non-detections because the reported concentrations were similar to the equipment blank result. The August 2022 equipment blank sample was received by the laboratory outside the temperature range due to a shipping delay, so the TCE result was qualified as unusable during data validation. No corrective action was necessary as TCE was not detected in the associated environmental samples. However, a second equipment blank sample was collected prior to sampling CWL-MW11 and no constituents (TCE, chromium, or nickel) were detected in this second equipment blank sample.

Table 4-5  
 Summary of Duplicate Sample Results  
 Chemical Waste Landfill Groundwater Monitoring  
 Calendar Year 2022

Well ID/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD <sup>a</sup>
<b>January 2022 Sampling Event (CWL-MW9)</b>			
No validated detections for comparison – all results non-detections.			
<b>August 2022 Sampling Event (CWL-BW5)</b>			
No validated detections for comparison – all results non-detections.			

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.

Chloroform was detected at very low concentrations above the MDL in the three field blank samples associated with the January 2022 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 August 2022.

No VOCs were detected in the six trip blank samples associated with the January 2022 environmental samples. TCE was not detected above the MDL in the seven trip blank samples associated with the August 2022 environmental samples.

### 4.2.3 Data Quality

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

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). Based upon the data validation and review criteria, all analytical data were determined acceptable except for the January 2022 CWL-MW9 metals results (addressed below) and the August 2022 equipment blank TCE result (addressed in Section 4.2.2). SNL/NM personnel requested the laboratory reanalyze (i.e., relog) the January

2022 CWL-MW9 metals samples (environmental and environmental duplicate samples) because the original sample results did not agree with historical results and the environmental-duplicate sample pair results did not agree. The reanalysis produced results that were consistent with historical results and did not confirm the original results. In addition, the reanalysis results for the environmental-duplicate sample pair agreed. Based upon professional judgment, the original CWL-MW9 metals sample results were qualified as “unusable” during data validation and the reanalysis results were included in this report. 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 August 2022 semiannual groundwater sampling events.

### 4.3 Data Evaluation

Groundwater monitoring is required to determine whether constituent concentrations in the groundwater beneath the CWL comply 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. These four wells were installed in 2010 and have been sampled 24 times as of August 2022 (November-December 2010, July-August 2011, and January and July/August 2012 through 2022). 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 results that are greater than the median (i.e., Median Test) is calculated to determine whether



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 <sup>a</sup> , 40 CFR § 264.94(a)(1)

Notes:

<sup>a</sup>SNL/NM background levels from Dinwiddie September 1997.

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.

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 both results are 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 2022 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%. CY 2022 sample results are also compared to the historical range (minimum and maximum result derived from historical results not including CY 2022 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 2022 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 2022 sample result. Then, the January 2022 sample result is compared to the median value and determined to be above or below. For the next groundwater sampling event (i.e., August 2022), the median value is recalculated and includes the January 2022 sample result; and the August 2022 sample result is compared to the recalculated median value.

The cumulative percentage of results exceeding median values 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. Action is only required if 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 2022 groundwater sampling data and statistical analysis for CWL-BW5/4A, CWL-MW9, CWL-MW10, and CWL-MW11 are presented in this section. Statistical assessment results are summarized in Table 4-7 and shown graphically in Figures 4-1 through 4-9.

The statistical analysis of specific constituents is not performed if all results for the data set were non-detections. The statistical analysis presented is significantly impacted by the very low concentrations and 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 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 since CY 2010, which has caused the Median Test results to increase. Statistical results are presented below for all cases where evaluation was possible.

#### ***Prediction Intervals Results***

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

CY 2022 CWL-BW5 chromium and TCE sample results were non-detections. The MDL for chromium (0.003 milligrams per liter [mg/L]) was within the prediction interval (i.e., range of 95%

Table 4-7  
Statistical Assessment Results Summary  
Chemical Waste Landfill Groundwater Monitoring  
Calendar Year 2022

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	0.00311	0.00257	0.00249	0.00373	Normal	54%	No
Nickel (mg/L)	0.0005	0.049	0.00416	0.00713	0.00246	0.00586	Normal	33%	No
TCE (µg/L)	0.1	0.78	0.336	0.111	0.309	0.363	Normal	11%	No
<b>CWL-MW9</b>									
Chromium (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No
Nickel (mg/L)	0.0005	0.00435	0.0017	0.00132	0.00124	0.00216	Normal	14%	No
TCE (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No
<b>CWL-MW10</b>									
Chromium (mg/L)	0.002	0.00325	0.0026	0.000524	0.00241	0.00279	Normal	48%	No
Nickel (mg/L)	0.000501	0.00707	0.00172	0.00166	0.00114	0.0023	Normal	10%	No
TCE (µg/L)	0.3	4.68	1.328	1.355	0.854	1.802	Normal	10%	No
<b>CWL-MW11</b>									
Chromium (mg/L)	0.002	0.00304	0.00263	0.00047	0.00247	0.00279	Normal	67%	No
Nickel (mg/L)	0.0005	0.00449	0.00148	0.00117	0.00107	0.00189	Normal	10%	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 2022 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.

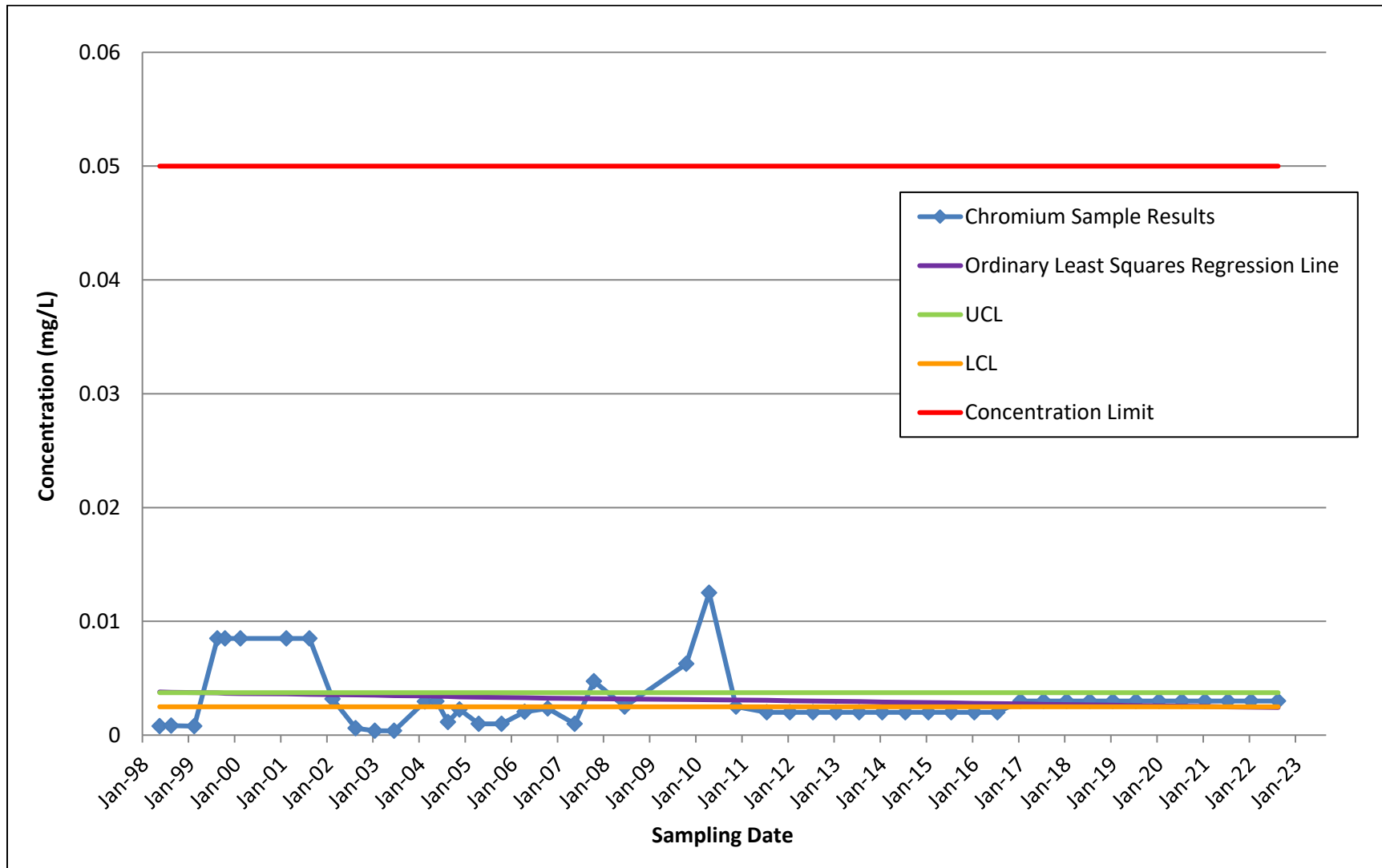


Figure 4-1  
Chromium Control Chart for CWL-BW5/4A

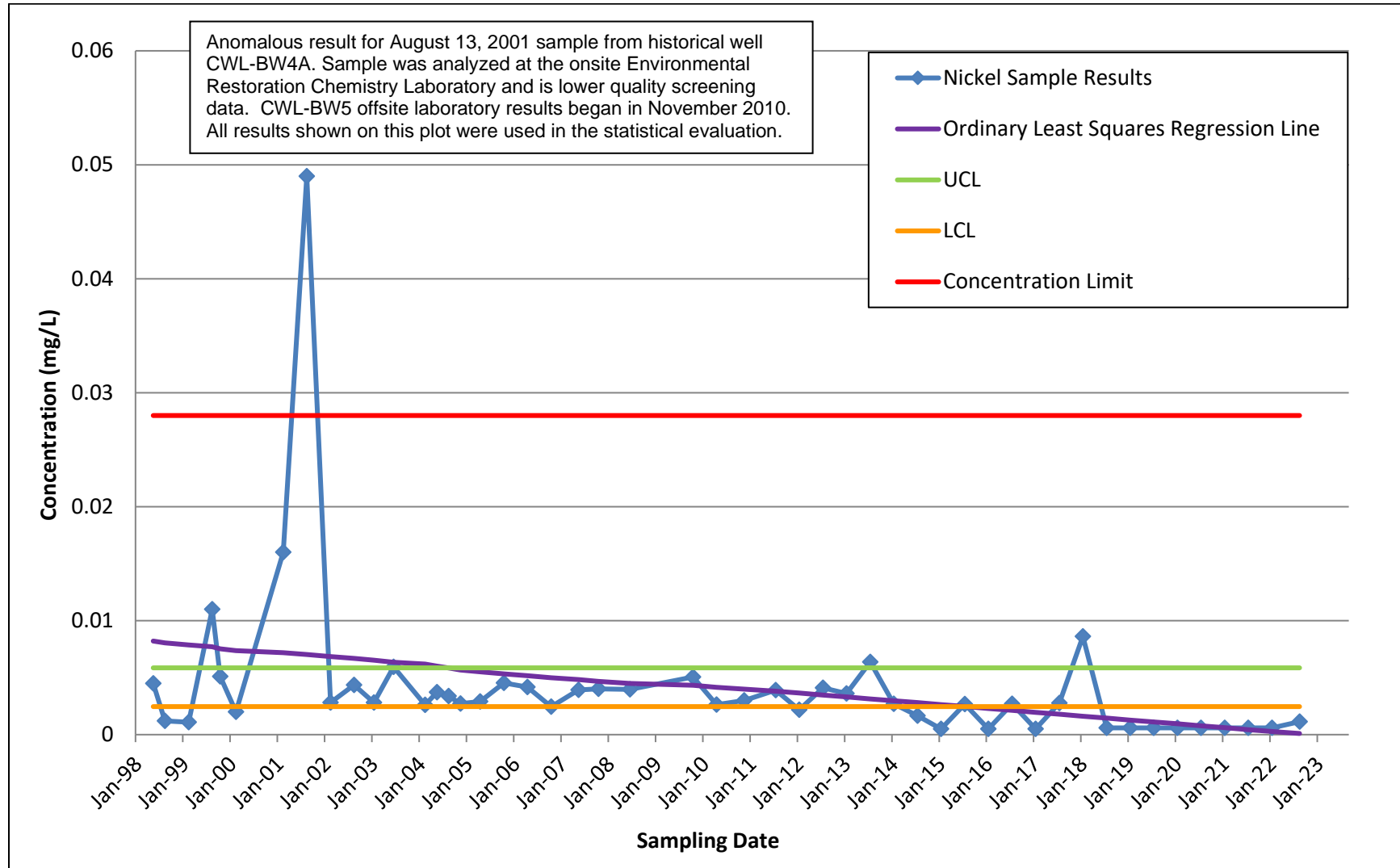


Figure 4-2  
 Nickel Control Chart for CWL-BW5/4A

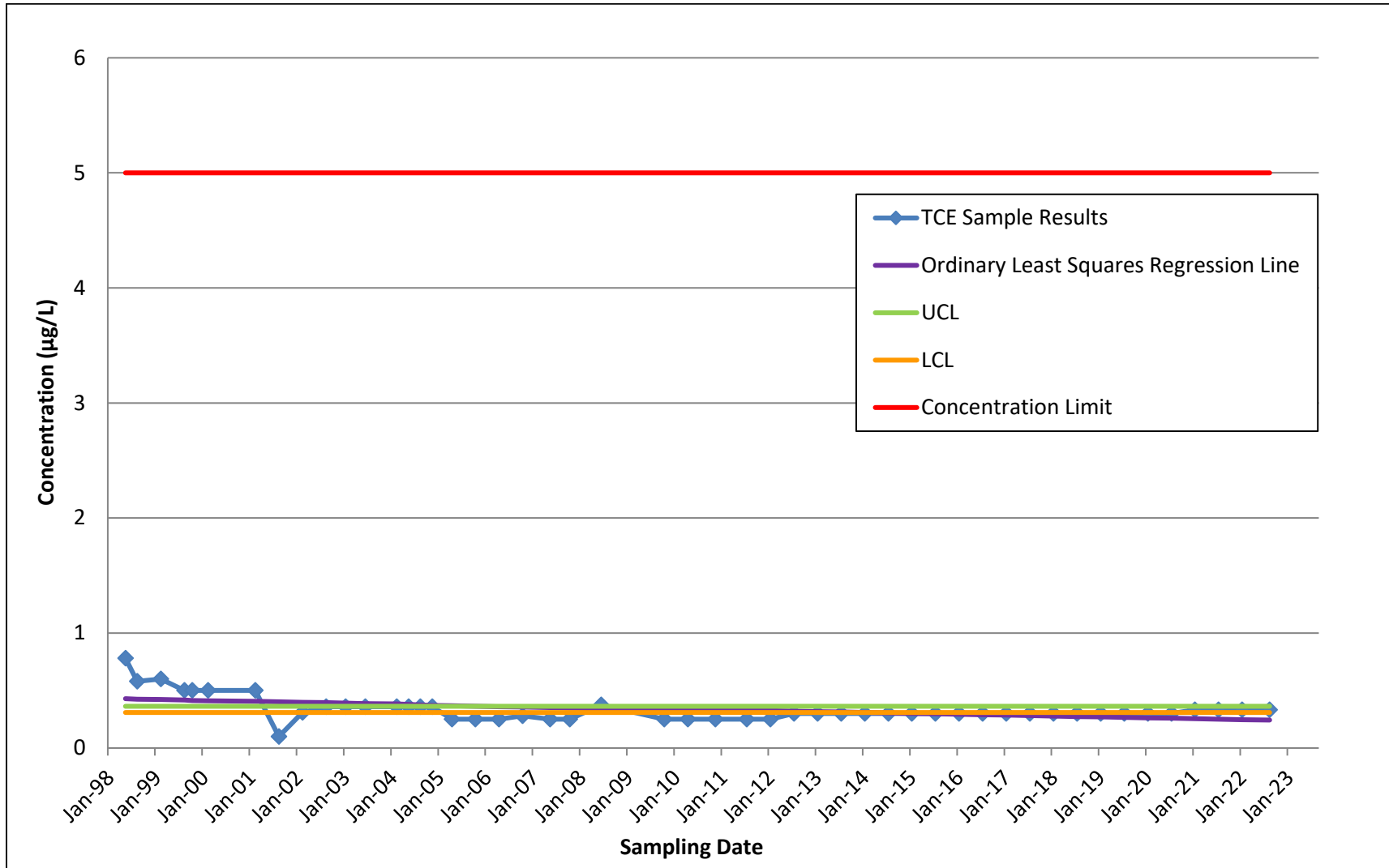


Figure 4-3  
TCE Control Chart for CWL-BW5/4A

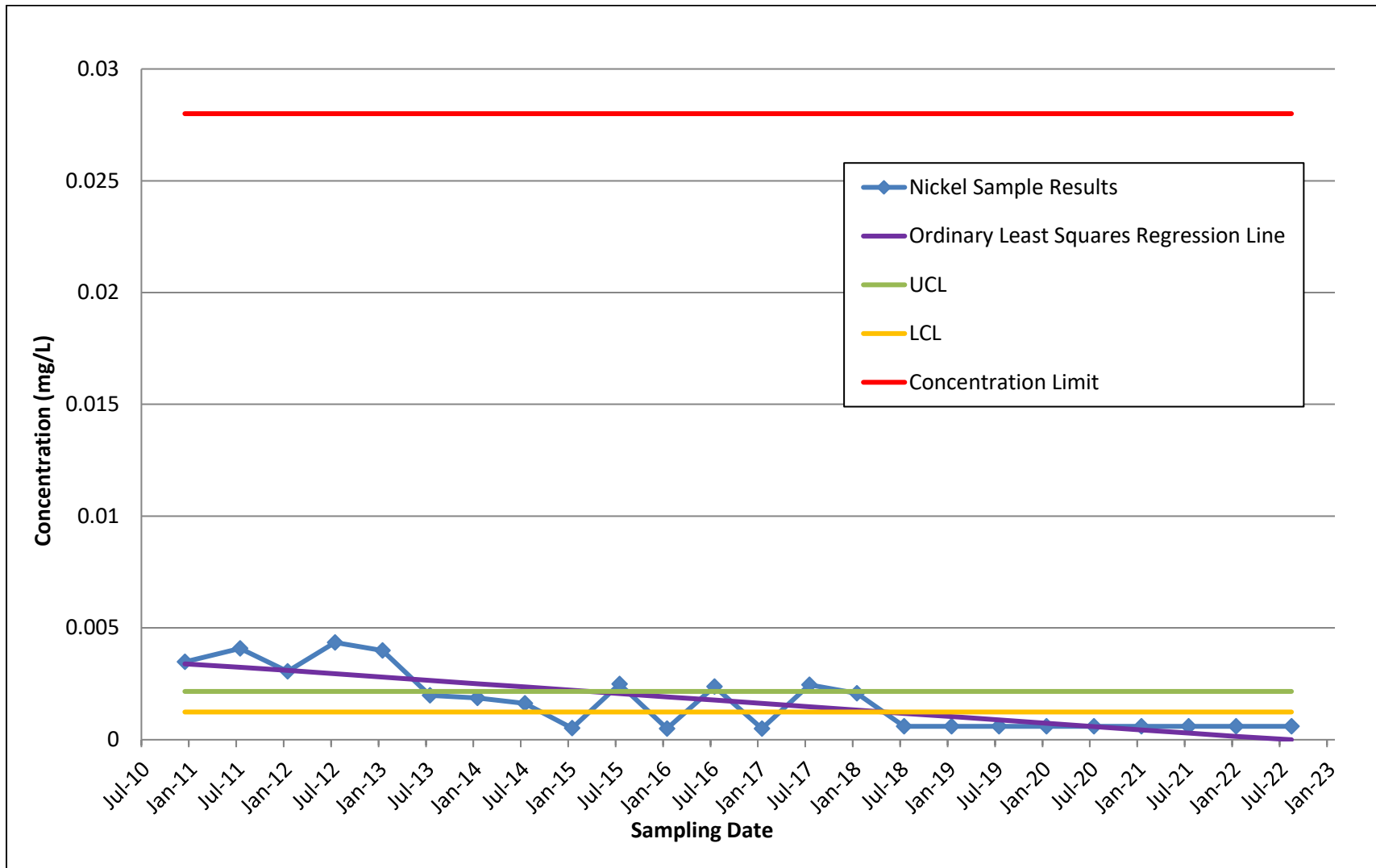


Figure 4-4  
Nickel Control Chart for CWL-MW9

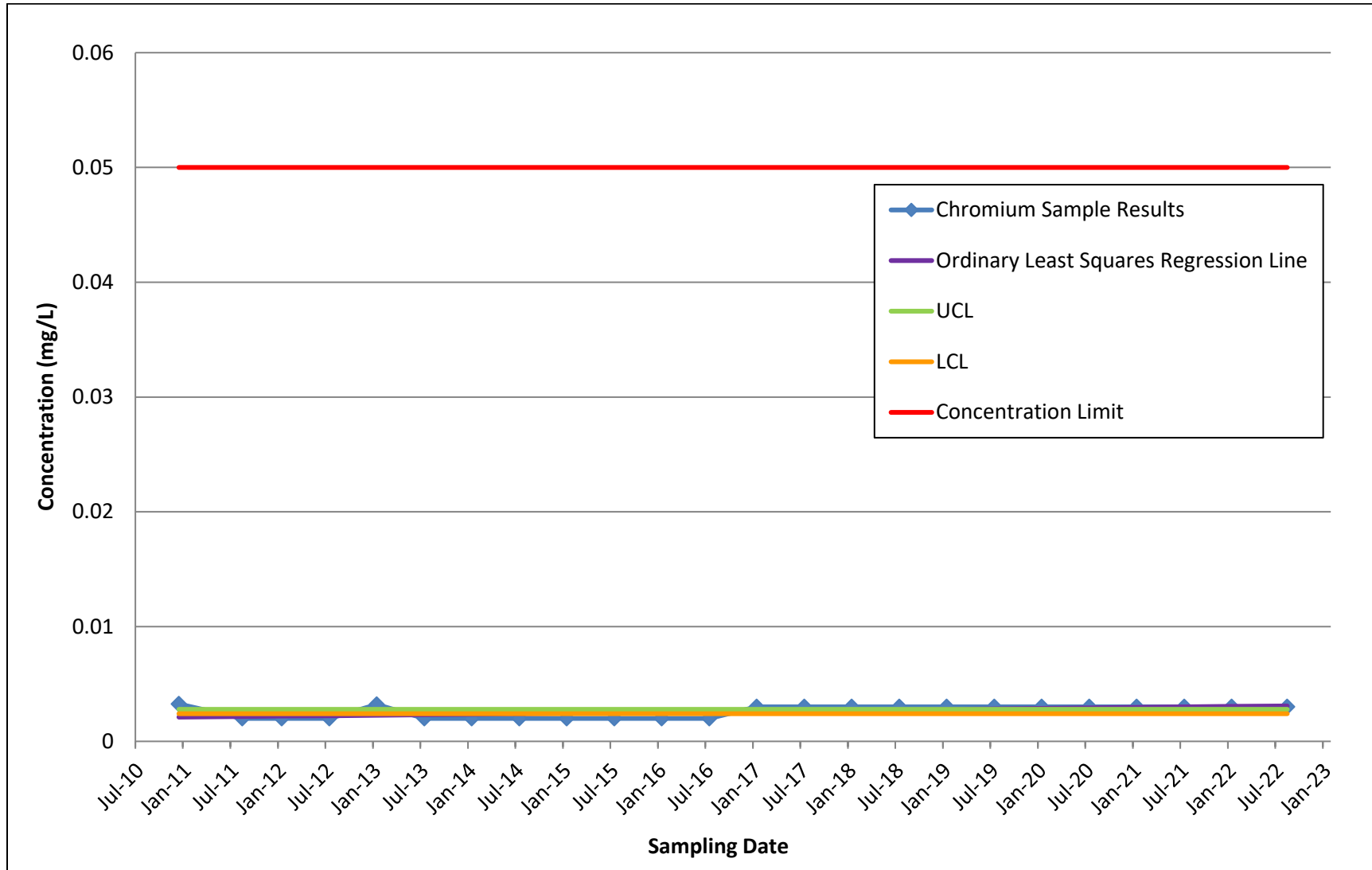


Figure 4-5  
Chromium Control Chart for CWL-MW10



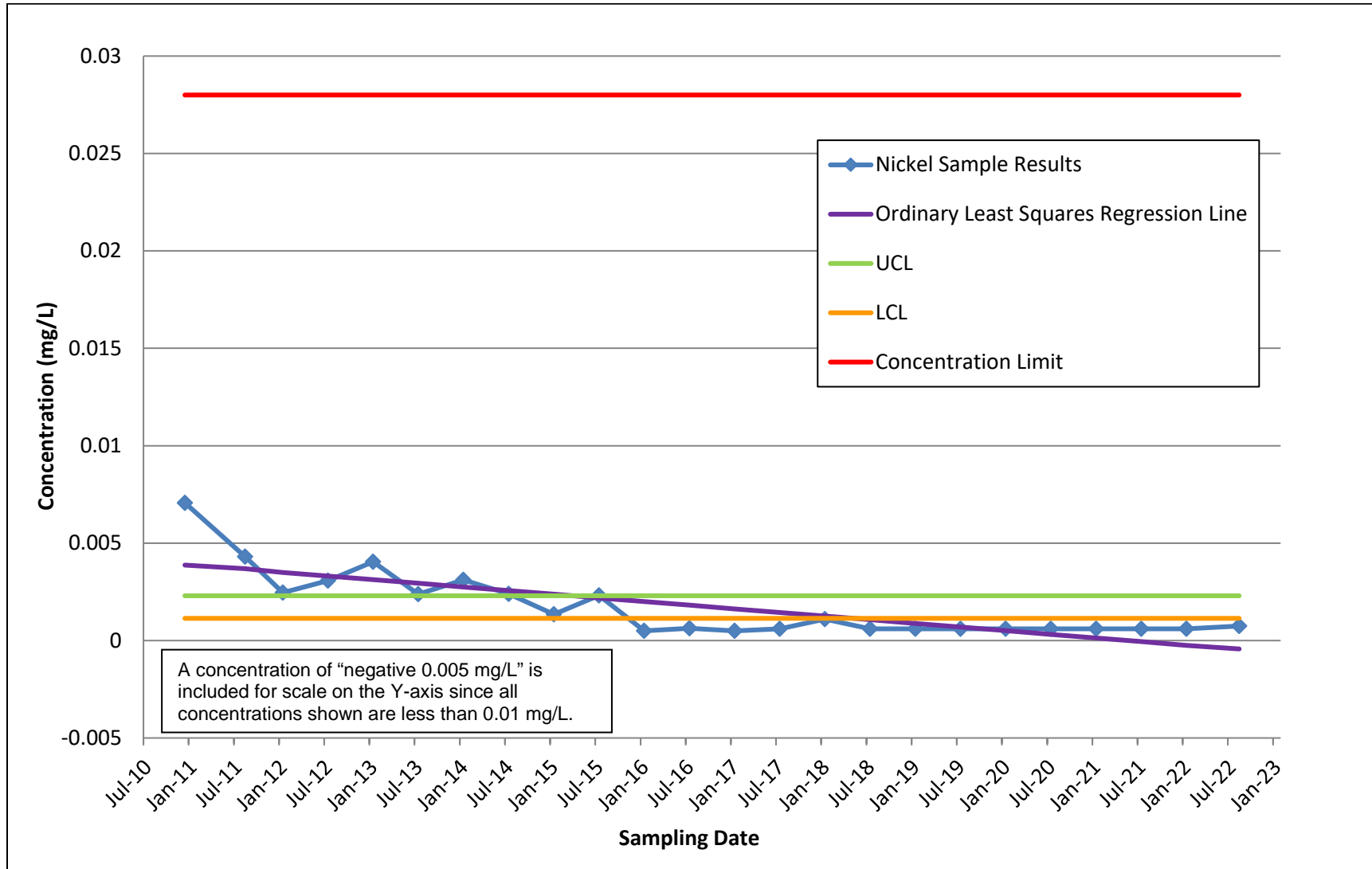


Figure 4-6  
Nickel Control Chart for CWL-MW10

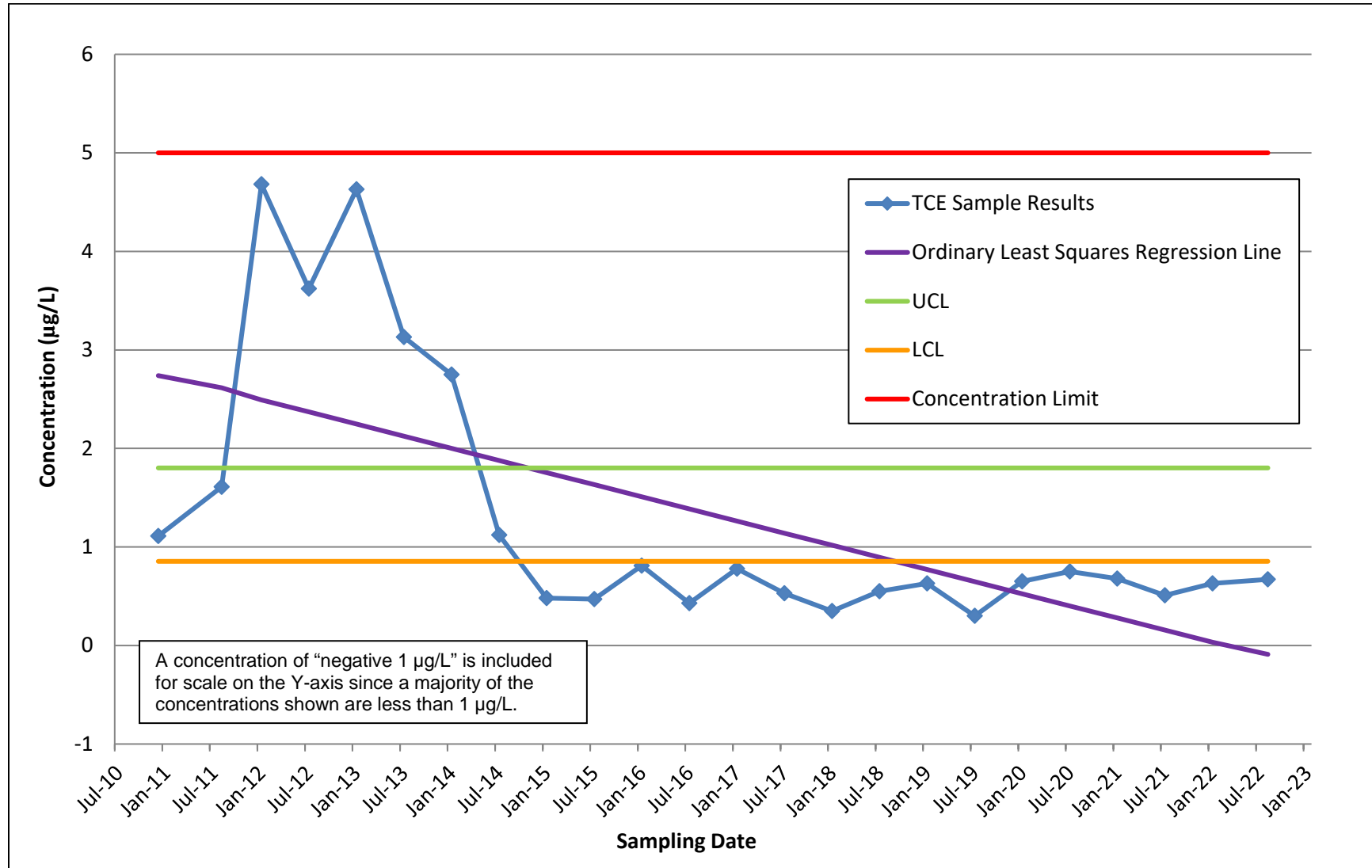


Figure 4-7  
 TCE Control Chart for CWL-MW10

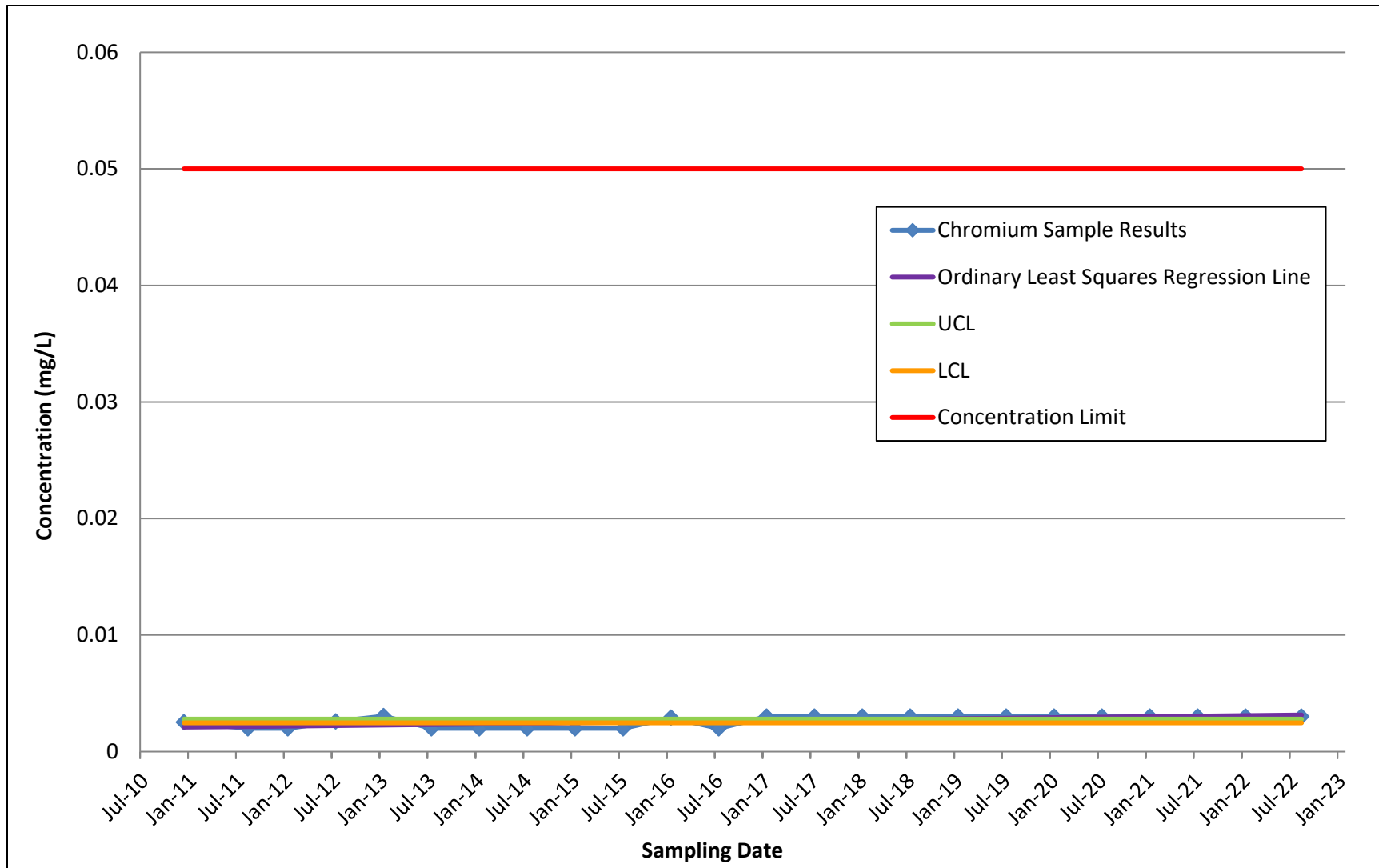


Figure 4-8  
Chromium Control Chart for CWL-MW11

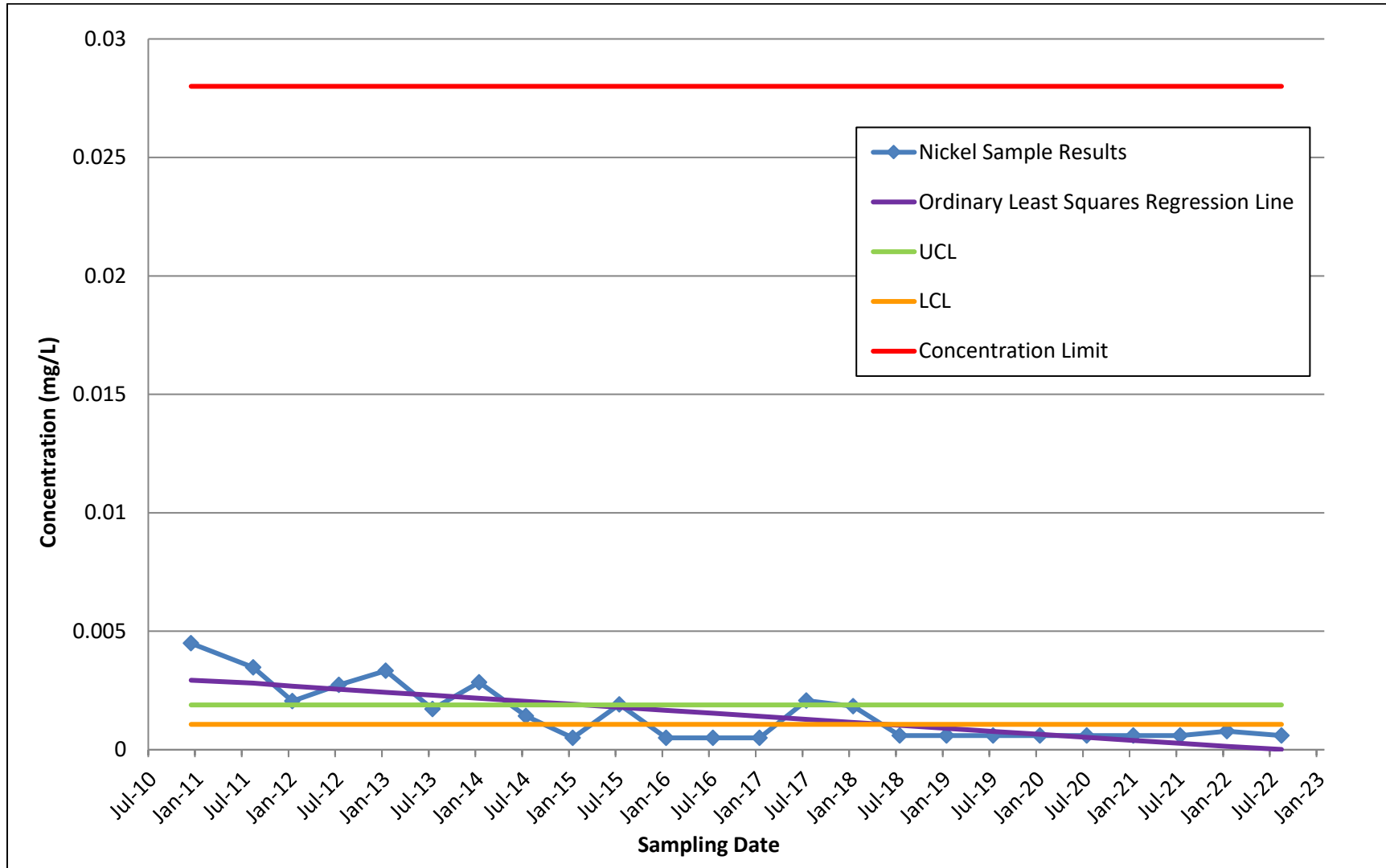


Figure 4-9  
Nickel Control Chart for CWL-MW11

LCL to 95% UCL) and the historical range (i.e., historical minimum and maximum results not including the CY 2022 results). The MDL for TCE (0.333 µg/L) was within the prediction interval and historical range. The nickel results (0.000602, 0.00107, and 0.00113 mg/L) were below the prediction interval but within the historical range. The nickel and TCE results are typical of data sets dominated by non-detections and MDLs that have decreased over time. TCE has not been detected in any CWL-BW5 samples (CY 2010 through 2022).

#### *Monitoring Well CWL-MW9*

Chromium and TCE have not been detected in any CWL-MW9 samples (CY 2010 through 2022). Therefore, statistical evaluation of these constituents is not presented. The CY 2022 nickel sample results were also both non-detections, and the MDL (0.0006 mg/L) was below the prediction interval but within the historical range. The nickel data set reflects numerous non-detections and a slight decrease in the MDL over time.

#### *Monitoring Well CWL-MW10*

CY 2022 CWL-MW10 chromium sample results were all non-detections and there was one detection of nickel in the August 2022 sample (0.000748 mg/L). The MDL for chromium (0.003 mg/L) was above the prediction interval but within the historical range. The nickel result was below the prediction interval but within the historical range. This data set reflects numerous non-detections and a slight decrease in the MDL over time. TCE results for the January and August 2022 environmental samples (0.630 and 0.670 µg/L, respectively) 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 2022 CWL-MW11 sample results were all non-detections except for the January 2022 nickel result (0.000783 mg/L). The MDL for chromium (0.003 mg/L) was above the prediction interval but within the historical range; this data set reflects a slight increase in the MDL over time. The nickel result was below the prediction interval but within the historical range; this data set reflects numerous non-detections and a slight decrease in the MDL over time. TCE has not been detected in any CWL-MW11 samples (CY 2010 through 2022); therefore, statistical evaluation of TCE is not presented.

### **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 and there are no exceedances of 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 67% for chromium (CWL-MW11); all CY 2022 CWL-MW11 chromium results were non-detects. The higher Median Test results for chromium are the result of a 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. Most chromium groundwater monitoring results continue to be non-detections. The low Median Test results for TCE in CWL-BW5/4A (11%) and nickel in CWL-MW10 and CWL-MW11 (10%) reflect a data set influenced by non-detection results and/or 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. The low Median Test results for TCE in CWL-MW10 (10%) reflect the decreasing concentration trend since July 2013.

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 steeper declining trend because of because of the chart scale and the significant decreases in TCE concentrations since July 2013. This indicates the two CWL VCMs were effective in eliminating and 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 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 due to reduced withdrawals by the City of Albuquerque. The groundwater elevation decline between October 2021 and October 2022 at the four monitoring wells ranged from 0.20 to 0.42 feet (CWL-MW11 and CWL-BW5, respectively). This amount of decline was consistent with the decline between CY 2020 to 2021, which ranged from 0.25 (CWL-MW11) to 0.38 (CWL-BW5).

In CY 2022, water levels were measured in the groundwater monitoring wells on a quarterly basis and during the January and August 2022 sampling events. Figure 4-10 depicts the potentiometric surface map of the Regional Aquifer beneath the CWL based upon the October 2022 water-level measurements and has changed very little over the past nine 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 gradient and flow direction is westward in the CWL vicinity, which is consistent with the hydrogeologic conceptual model for the KAFB area (SNL/NM June 2022).

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

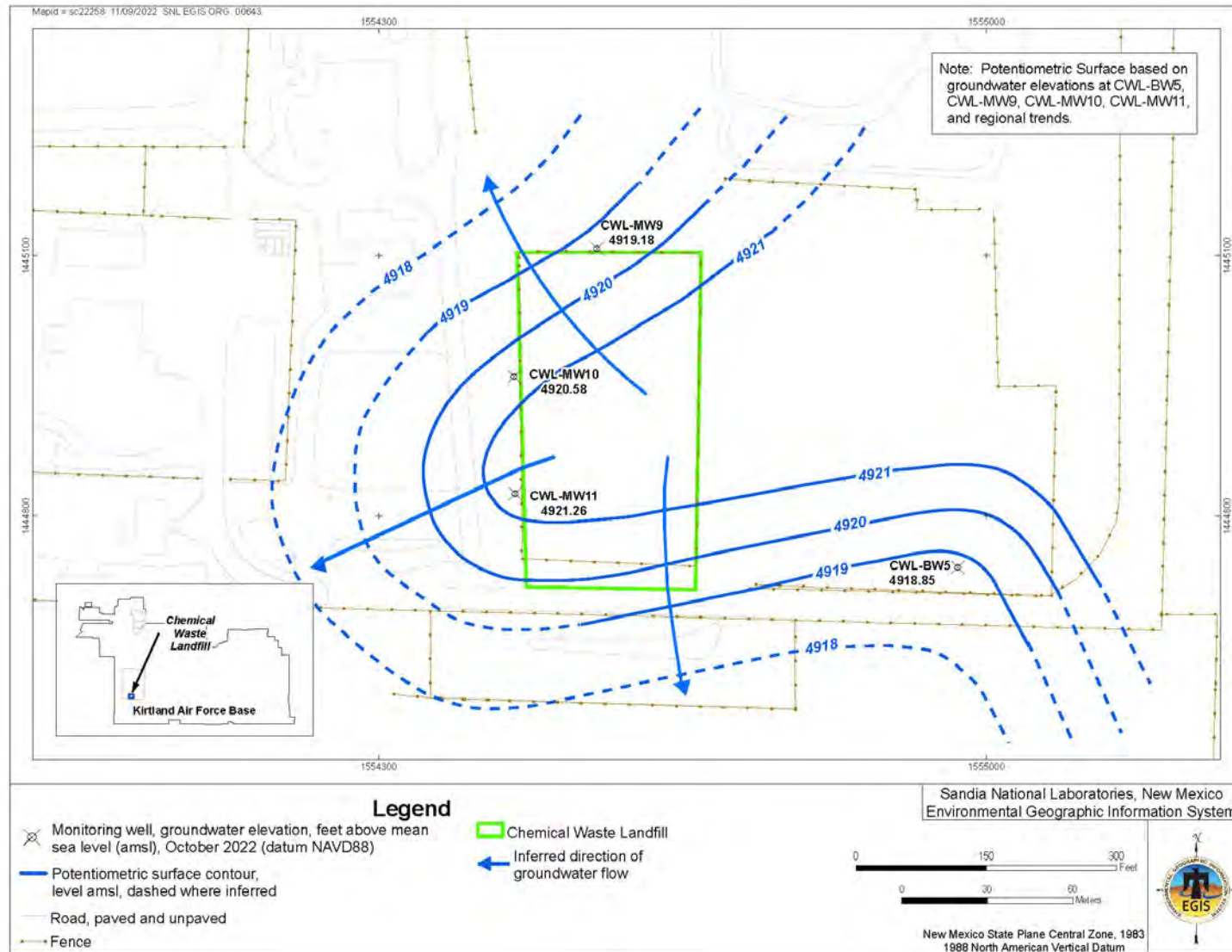


Figure 4-10  
 Potentiometric Surface of the Regional Aquifer at the Chemical Waste Landfill, October 2022

0.013 feet per foot. 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.



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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 2022 in accordance with PCCP Attachment 1, Sections 1.8 and 1.12, and Attachment 3 (NMED October 2009 and subsequent revisions). The CY 2022 annual soil-gas sampling event was the eleventh 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. A summary of soil-gas monitoring activities and results is provided in Section 8.1. 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 January 20, 2022. 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 2022 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 January 20, 2022 monitoring event, environmental duplicate samples were collected from two CWL-D1 monitoring well sample ports (100 feet bgs and 350 feet bgs ports). The environmental duplicate samples were collected using the manifold system that allows for the simultaneous collection of the environmental and environmental duplicate sample. The two environmental duplicate samples were submitted for analysis with the January 2022 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 January 2022 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 January 2022 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 January 2022. 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>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI1-40 20-Jan-22	Carbon tetrachloride	4.8	3.4	21	J	--
	Chloroform	220	3.7	21	--	--
	Dichlorodifluoromethane	9.5	3.7	21	J	--
	1,1-Dichloroethane	4.9	2.9	21	J	--
	1,2-Dichloroethane	4.4	2.6	21	J	--
	1,1-Dichloroethene	38	3.4	21	--	--
	1,2-Dichloropropane	27	2.6	21	Cl	--
	Tetrachloroethene	1100	3.2	21	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	210	2.6	21	--	--
	1,1,1-Trichloroethane	11	7.7	21	J	--
	1,1,2-Trichloroethane	4.9	4.0	21	J	--
	Trichloroethene	2100	3.4	11	--	--
	Trichlorofluoromethane	59	2.9	21	--	--
	Total Organics <sup>c</sup>	3793.5	NA	NA	NA	NA
CWL-UI1-80 20-Jan-22	Carbon tetrachloride	5.9	5.6	35	J	--
	Chloroform	230	6.1	35	--	--
	Dichlorodifluoromethane	14	6.1	35	J	--
	1,1-Dichloroethane	7.6	4.8	35	J	--
	1,1-Dichloroethene	90	5.6	35	--	--
	1,2-Dichloropropane	50	4.3	35	--	--
	Tetrachloroethene	360	5.2	35	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	310	4.3	35	--	--
	1,1,2-Trichloroethane	6.9	6.5	35	J	--
	Trichloroethene	3500	5.6	17	--	--
	Trichlorofluoromethane	86	4.8	35	--	--
	Total Organics <sup>c</sup>	4660.4	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI1-120 20-Jan-22	Carbon tetrachloride	12	7.5	46	J	--
	Chloroform	230	8.1	46	--	--
	Dichlorodifluoromethane	15	8.1	46	J	--
	1,2-Dichloroethane	26	5.8	46	J	--
	1,1-Dichloroethene	130	7.5	46	--	--
	1,2-Dichloropropane	66	5.8	46	CI	--
	Tetrachloroethene	280	7.0	46	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	440	5.8	46	--	--
	1,1,2-Trichloroethane	8.9	8.7	46	J	--
	Trichloroethene	4900	7.5	23	--	--
	Trichlorofluoromethane	120	6.4	46	--	--
	Total Organics <sup>c</sup>	6227.9	NA	NA	NA	NA
CWL-UI2-36 20-Jan-22	Carbon tetrachloride	4.0	2.7	17	J	--
	Chlorobenzene	4.6	4.6	17	J	--
	Chloroform	180	2.9	17	--	--
	Dichlorodifluoromethane	6.0	2.9	17	J	--
	1,1-Dichloroethene	10	2.7	17	J	--
	1,2-Dichloropropane	24	2.1	17	--	--
	Tetrachloroethene	43	2.5	17	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	120	2.1	17	--	--
	1,1,1-Trichloroethane	6.5	6.0	17	J	--
	Trichloroethene	1200	2.7	8.3	--	--
	Trichlorofluoromethane	38	2.3	17	--	--
	Total Organics <sup>c</sup>	1636.1	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-UI2-76 20-Jan-22	Carbon tetrachloride	4.9	3.5	22	J	--
	Chloroform	190	3.8	22	--	--
	Dichlorodifluoromethane	6.8	3.8	22	J	--
	1,2-Dichloroethane	4.4	2.7	22	J	--
	1,1-Dichloroethene	21	3.5	22	J	--
	1,2-Dichloropropane	33	2.7	22	CI	--
	Tetrachloroethene	49	3.2	22	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	170	2.7	22	--	--
	Trichloroethene	1600	3.5	11	--	--
	Trichlorofluoromethane	46	3.0	22	--	--
	Total Organics <sup>c</sup>	2125.1	NA	NA	NA	NA
	CWL-UI2-136 20-Jan-22	Carbon tetrachloride	9.0	4.8	30	J
Chloroform		250	5.2	30	--	--
Dichlorodifluoromethane		13	5.2	30	J	--
1,1-Dichloroethane		6.0	4.1	30	J	--
1,2-Dichloroethane		14	3.7	30	J	--
1,1-Dichloroethene		49	4.8	30	--	--
1,2-Dichloropropane		74	3.7	30	CI	--
Tetrachloroethene		70	4.4	30	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane		290	3.7	30	--	--
1,1,2-Trichloroethane		5.7	5.5	30	J	--
Trichloroethene		2900	4.8	15	--	--
Trichlorofluoromethane		83	4.1	30	--	--
Total Organics <sup>c</sup>	3763.7	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>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-100 20-Jan-22	Carbon tetrachloride	11	7.1	44	J	--
	Chloroform	200	7.6	44	--	--
	Dichlorodifluoromethane	17	7.6	44	J	--
	1,1-Dichloroethene	80	7.1	44	--	--
	1,2-Dichloropropane	61	5.4	44	--	--
	Tetrachloroethene	260	6.5	44	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	360	5.4	44	--	--
	1,1,2-Trichloroethane	8.5	8.2	44	J	--
	Trichloroethene	4100	7.1	22	--	--
	Trichlorofluoromethane	98	6.0	44	--	--
	Total Organics <sup>c</sup>	5195.5	NA	NA	NA	NA
CWL-D1-100 (Duplicate) 20-Jan-22	Carbon tetrachloride	13	6.2	38	J	--
	Chloroform	240	6.7	38	--	--
	Dichlorodifluoromethane	21	6.7	38	J	--
	1,2-Dichloroethane	18	4.8	38	J	--
	1,1-Dichloroethene	110	6.2	38	--	--
	1,2-Dichloropropane	86	4.8	38	CI	--
	Tetrachloroethene	330	5.7	38	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	440	4.8	38	--	--
	Trichloroethene	5200	6.2	19	--	--
	Trichlorofluoromethane	120	5.2	38	--	--
	Total Organics <sup>c</sup>	6578	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-160 20-Jan-22	Chloroform	200	17	99	--	--
	Dichlorodifluoromethane	19	17	99	J	--
	1,1-Dichloroethene	140	16	99	--	--
	1,2-Dichloropropane	95	12	99	J	--
	Tetrachloroethene	180	15	99	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	480	12	99	--	--
	Trichloroethene	4600	16	50	--	--
	Trichlorofluoromethane	120	14	99	--	--
	Total Organics <sup>c</sup>	5834	NA	NA	NA	NA
CWL-D1-240 20-Jan-22	Carbon tetrachloride	25	18	110	J	--
	Chloroform	260	19	110	--	--
	Dichlorodifluoromethane	41	19	110	J	--
	1,1-Dichloroethane	19	15	110	J	--
	1,2-Dichloroethane	23	14	110	J	--
	1,1-Dichloroethene	260	18	110	--	--
	1,2-Dichloropropane	140	14	110	--	--
	Tetrachloroethene	220	16	110	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	850	14	110	--	--
	Trichloroethene	9300	18	55	--	--
	Trichlorofluoromethane	230	15	110	--	--
	Total Organics <sup>c</sup>	11368	NA	NA	NA	NA

Refer to footnotes at end of table.



Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-350 20-Jan-22	Carbon tetrachloride	14	4.6	28	J	--
	Chloroform	82	4.9	28	--	--
	Dichlorodifluoromethane	26	4.9	28	J	--
	1,1-Dichloroethane	9.0	3.9	28	J	--
	1,1-Dichloroethene	190	4.6	28	--	--
	1,2-Dichloropropane	36	3.5	28	CI	--
	Tetrachloroethene	21	4.2	28	J	28U
	1,1,2-Trichloro-1,2,2-trifluoroethane	530	3.5	28	--	--
	Trichloroethene	3700	4.6	14	--	--
	Trichlorofluoromethane	170	3.9	28	--	--
	Total Organics <sup>c</sup>	4757	NA	NA	NA	NA
CWL-D1-350 (Duplicate) 20-Jan-22	Chloroform	60	11	65	J	--
	Dichlorodifluoromethane	17	11	65	J	--
	1,1-Dichloroethene	130	11	65	--	--
	1,2-Dichloropropane	24	8.1	65	J	--
	Tetrachloroethene	51	9.8	65	J	65U
	1,1,2-Trichloro-1,2,2-trifluoroethane	360	8.1	65	--	--
	Trichloroethene	2900	11	33	--	--
	Trichlorofluoromethane	110	8.9	65	--	--
Total Organics <sup>c</sup>	3601	NA	NA	NA	NA	

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D1-470 20-Jan-22	Benzene	0.35	0.25	1.5	J	1.5U
	Carbon tetrachloride	3.5	0.25	1.5	--	--
	Chloroform	3.7	0.27	1.5	--	--
	Dichlorodifluoromethane	12	0.27	1.5	--	--
	1,1-Dichloroethane	0.34	0.21	1.5	J	--
	1,1-Dichloroethene	41	0.25	1.5	--	--
	Tetrachloroethene	14	0.23	1.5	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	210	0.19	1.5	--	--
	Trichloroethene	220	0.62	1.9	--	--
	Trichlorofluoromethane	56	0.21	1.5	--	--
	Total Organics <sup>c</sup>	560.54	NA	NA	NA	NA
	CWL-D2-120 20-Jan-22	Carbon tetrachloride	12	12	75	J
Chloroform		230	13	75	--	--
Dichlorodifluoromethane		15	13	75	J	--
1,1-Dichloroethane		11	10	75	J	--
1,2-Dichloroethane		25	9.4	75	J	--
1,1-Dichloroethene		110	12	75	--	--
1,2-Dichloropropane		84	9.4	75	CI	--
Tetrachloroethene		140	11	75	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane		370	9.4	75	--	--
Trichloroethene		4100	12	37	--	--
Trichlorofluoromethane		100	10	75	--	--
Total Organics <sup>c</sup>		5197	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-240 20-Jan-22	Carbon tetrachloride	13	11	65	J	--
	Chloroform	250	11	65	--	--
	Dichlorodifluoromethane	21	11	65	J	--
	1,2-Dichloroethane	30	8.1	65	J	--
	1,1-Dichloroethene	150	11	65	--	--
	1,2-Dichloropropane	95	8.1	65	CI	--
	Tetrachloroethene	170	9.8	65	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	480	8.1	65	--	--
	Trichloroethene	5300	11	33	--	--
	Trichlorofluoromethane	140	9.0	65	--	--
	Total Organics <sup>c</sup>	6649	NA	NA	NA	NA
	CWL-D2-350 20-Jan-22	Carbon tetrachloride	16	7.2	44	J
Chlorobenzene		12	12	44	J	--
Chloroform		150	7.7	44	--	--
Dichlorodifluoromethane		22	7.7	44	J	--
1,1-Dichloroethane		9.3	6.1	44	J	--
1,1-Dichloroethene		120	7.2	44	--	--
1,2-Dichloropropane		71	5.5	44	CI	--
Tetrachloroethene		140	6.6	44	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane		450	5.5	44	--	--
Trichloroethene		4300	7.2	22	--	--
Trichlorofluoromethane		130	6.1	44	--	--
Total Organics <sup>c</sup>		5420.3	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>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D2-440 20-Jan-22	Acetone	6.7	0.60	2.1	--	J+
	Benzene	0.78	0.014	0.085	--	--
	Bromodichloromethane	0.021	0.019	0.085	J	--
	2-Butanone	0.71	0.077	0.42	--	J+
	Carbon disulfide	0.067	0.037	0.21	J	--
	Carbon tetrachloride	2.3	0.014	0.085	--	--
	Chlorobenzene	0.059	0.023	0.085	J	--
	Chloroform	12	0.79	4.5	--	--
	Chloromethane	0.33	0.070	0.21	--	--
	1,2-Dibromoethane	0.013	0.013	0.085	J	--
	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.017	0.013	0.085	J	--
	1,3-Dichlorobenzene	0.025	0.017	0.085	J	--
	1,4-Dichlorobenzene	0.017	0.017	0.085	J	0.085U
	Dichlorodifluoromethane	2.4	0.015	0.085	--	--
	1,1-Dichloroethane	1.3	0.012	0.085	--	--
	1,2-Dichloroethane	1.1	0.011	0.085	--	--
	1,1-Dichloroethene	17	0.73	4.5	--	--
	cis-1,2-Dichloroethene	0.055	0.011	0.085	J	--
	trans-1,2-Dichloroethene	0.048	0.014	0.085	J	--
	Ethylbenzene	0.021	0.014	0.085	B, J	0.085U
	2-Hexanone	0.058	0.025	0.21	J	--
	Methylene chloride	6.6	0.15	0.42	--	--
	Tetrachloroethene	14	0.68	4.5	--	--
	Toluene	0.49	0.024	0.13	--	J+
	1,1,2-Trichloro-1,2,2-trifluoroethane	42	0.56	4.5	--	--
	1,1,1-Trichloroethane	0.54	0.031	0.085	--	--
	1,1,2-Trichloroethane	0.10	0.016	0.085	--	--
	Trichloroethene	520	0.73	2.3	--	--
	Trichlorofluoromethane	14	0.62	4.5	--	--
	Vinyl chloride	0.052	0.027	0.042	--	--
m,p-Xylene	0.041	0.031	0.085	J	0.085U	
o-Xylene	0.025	0.016	0.085	J	0.085U	
Total Organics <sup>c</sup>	642.765	NA	NA	NA	NA	

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
<b>CWL-D2-470</b> 20-Jan-22	Carbon tetrachloride	8.7	5.8	36	J	--
	Chloroform	170	6.3	36	--	--
	Dichlorodifluoromethane	13	6.3	36	J	--
	1,1-Dichloroethane	5.5	4.9	36	J	--
	1,2-Dichloroethane	14	4.5	36	J	--
	1,1-Dichloroethene	70	5.8	36	--	--
	1,2-Dichloropropane	59	4.5	36	CI	--
	Tetrachloroethene	130	5.4	36	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	290	4.5	36	--	--
	Trichloroethene	3200	5.8	18	--	--
	Trichlorofluoromethane	88	4.9	36	--	--
	Total Organics <sup>c</sup>	4048.2	NA	NA	NA	NA
<b>CWL-D3-120</b> 20-Jan-22	Chloroform	53	3.8	22	--	--
	Dichlorodifluoromethane	7.1	3.8	22	J	--
	1,2-Dichloroethane	7.7	2.7	22	J	--
	1,1-Dichloroethene	36	3.5	22	--	--
	1,2-Dichloropropane	30	2.7	22	--	--
	Tetrachloroethene	27	3.2	22	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	130	2.7	22	--	--
	Trichloroethene	1200	3.5	11	--	--
	Trichlorofluoromethane	40	3.0	22	--	--
	Total Organics <sup>c</sup>	1530.8	NA	NA	NA	NA

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-170 20-Jan-22	Benzene	0.11	0.013	0.081	--	--
	Carbon disulfide	0.044	0.035	0.20	J	0.20U
	Carbon tetrachloride	0.14	0.013	0.081	--	--
	Chloroform	2.1	0.014	0.081	--	--
	1,2-Dibromoethane	0.012	0.012	0.081	J	--
	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.013	0.012	0.081	J	--
	Dichlorodifluoromethane	0.27	0.014	0.081	--	--
	1,1-Dichloroethane	0.041	0.011	0.081	J	--
	1,2-Dichloroethane	0.13	0.010	0.081	--	--
	1,1-Dichloroethene	0.49	0.013	0.081	--	--
	1,2-Dichloropropane	0.85	0.010	0.081	--	--
	Methylene chloride	0.45	0.14	0.40	--	J+
	Tetrachloroethene	1.4	0.012	0.081	--	--
	Toluene	0.051	0.023	0.12	J	0.12U
	1,1,2-Trichloro-1,2,2-trifluoroethane	2.2	0.010	0.081	--	--
	1,1,1-Trichloroethane	0.061	0.029	0.081	J	--
	1,1,2-Trichloroethane	0.037	0.015	0.081	J	--
	Trichloroethene	21	0.52	1.6	--	--
	Trichlorofluoromethane	0.84	0.011	0.081	--	--
	m,p-Xylene	0.029	0.029	0.081	J	0.081U
Total Organics <sup>c</sup>	30.144	NA	NA	NA	NA	

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-350 20-Jan-22	Acetone	5.8	2.4	8.5	J	--
	Benzene	0.17	0.055	0.34	J	--
	2-Butanone	0.76	0.31	1.7	J	--
	Carbon tetrachloride	0.11	0.055	0.34	J	--
	Chloroform	1.0	0.059	0.34	--	--
	Dichlorodifluoromethane	0.54	0.059	0.34	--	--
	1,2-Dichloroethane	0.21	0.042	0.34	J	--
	1,1-Dichloroethene	0.52	0.055	0.34	--	--
	1,2-Dichloropropane	0.88	0.042	0.34	Cl	--
	Ethylbenzene	0.065	0.055	0.34	B, J	0.34U
	4-Methyl-2-pentanone	0.24	0.23	0.85	J	--
	Tetrachloroethene	1.3	0.051	0.34	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.5	0.042	0.34	--	--
	1,1,2-Trichloroethane	0.066	0.063	0.34	J	--
	Trichloroethene	30	0.055	0.17	--	--
	Trichlorofluoromethane	0.63	0.046	0.34	--	--
	m,p-Xylene	0.15	0.12	0.34	J	0.34U
Total Organics <sup>c</sup>	43.726	NA	NA	NA	NA	

Refer to footnotes at end of table.

Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-440 20-Jan-22	Acetone	2.0	0.63	2.2	J	--
	Benzene	0.56	0.014	0.089	--	--
	Bromodichloromethane	0.024	0.020	0.089	J	--
	2-Butanone	0.55	0.081	0.44	--	--
	Carbon disulfide	0.19	0.039	0.22	J	0.22U
	Carbon tetrachloride	2.5	0.014	0.089	--	--
	Chlorobenzene	0.054	0.024	0.089	J	--
	Chloroform	15	0.62	3.5	--	--
	Chloromethane	0.21	0.073	0.22	J	--
	1,2-Dibromoethane	0.026	0.013	0.089	J	--
	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.019	0.013	0.089	J	--
	1,2-Dichlorobenzene	0.042	0.034	0.089	J	--
	1,3-Dichlorobenzene	0.024	0.018	0.089	J	--
	1,4-Dichlorobenzene	0.021	0.018	0.089	J	--
	Dichlorodifluoromethane	3.0	0.015	0.089	--	--
	1,1-Dichloroethane	1.1	0.012	0.089	--	--
	1,2-Dichloroethane	2.2	0.011	0.089	--	--
	1,1-Dichloroethene	20	0.58	3.5	--	--
	cis-1,2-Dichloroethene	0.068	0.011	0.089	J	--
	trans-1,2-Dichloroethene	0.031	0.014	0.089	J	--
	1,2-Dichloropropane	13	0.44	3.5	CI	--
	Ethylbenzene	0.039	0.014	0.089	B, J	0.089U
	2-Hexanone	0.077	0.027	0.22	J	--
	Methylene chloride	4.3	0.15	0.44	--	J+
	Tetrachloroethene	16	0.013	0.089	--	--
	Toluene	0.38	0.025	0.13	--	J+
	1,1,2-Trichloro-1,2,2-trifluoroethane	68	0.44	3.5	--	--
	1,1,1-Trichloroethane	0.47	0.032	0.089	--	--
	1,1,2-Trichloroethane	0.13	0.017	0.089	--	--
	Trichloroethene	630	0.58	1.8	--	--
	Trichlorofluoromethane	20	0.49	3.5	--	--
	Vinyl chloride	0.046	0.029	0.044	--	--
	m,p-Xylene	0.086	0.032	0.089	J	0.089U
o-Xylene	0.040	0.017	0.089	J	0.089U	
Total Organics <sup>c</sup>	799.832	NA	NA	NA	NA	

Refer to footnotes at end of table.



Table 5-1 (Continued)  
 Summary of Detected Volatile Organic Compounds  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Analytical Method TO-15<sup>a</sup>  
 January 2022

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier <sup>b</sup>	Validation Qualifier <sup>b</sup>
CWL-D3-480 20-Jan-22	Acetone	1.7	0.58	2.1	J	--
	Benzene	0.17	0.013	0.082	--	--
	2-Butanone	0.19	0.075	0.41	J	--
	Carbon disulfide	0.17	0.036	0.21	J	0.21U
	Carbon tetrachloride	0.079	0.013	0.082	J	--
	Chloroform	0.069	0.014	0.082	J	--
	Chloromethane	0.59	0.068	0.21	--	--
	1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.015	0.012	0.082	J	--
	1,4-Dichlorobenzene	0.017	0.016	0.082	J	--
	Dichlorodifluoromethane	0.36	0.014	0.082	--	--
	1,2-Dichloroethane	0.033	0.010	0.082	J	--
	1,1-Dichloroethene	0.029	0.013	0.082	J	--
	1,2-Dichloropropane	0.038	0.010	0.082	J	0.082U
	Ethylbenzene	0.043	0.013	0.082	B, J	0.082U
	4-Methyl-2-pentanone	0.12	0.055	0.21	J	--
	Methylene chloride	1.6	0.14	0.41	--	J+
	Tetrachloroethene	0.083	0.012	0.082	--	--
	Toluene	0.29	0.024	0.12	--	J+
	1,1,2-Trichloro-1,2,2-trifluoroethane	0.12	0.010	0.082	--	J+
	Trichloroethene	1.1	0.013	0.041	--	--
	Trichlorofluoromethane	0.24	0.011	0.082	--	--
	1,2,4-Trimethylbenzene	0.033	0.021	0.082	J	--
	m,p-Xylene	0.12	0.030	0.082	--	J+
o-Xylene	0.050	0.015	0.082	J	0.082U	
Total Organics <sup>c</sup>	6.958	NA	NA	NA	NA	

Refer to footnotes at end of table.

Table 5-1 (*Concluded*)  
Summary of Detected Volatile Organic Compounds  
Chemical Waste Landfill Soil-Gas Monitoring  
Analytical Method TO-15<sup>a</sup>  
January 2022

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.

CI = The peak identified by the data system exhibited chromatographic interference that could not be resolved. There is reason to suspect there may be high bias.

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 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.

<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.

## January 20, 2022 Soil-Gas Results

Twenty-three samples were collected from the 21 sampling ports (21 environmental samples and 2 environmental duplicate samples). In general, the January 2022 soil-gas results were consistent with the CY 2021 data set. A total of 34 VOCs were detected in both the CY 2022 and CY 2021 data sets. The VOCs ethylbenzene and o-xylene were not included in the list of detected VOCs below because all detections reported by the laboratory were qualified during data validation as not detected.

1,1,1-Trichloroethane	Benzene
1,1,2-Trichloroethane	Bromodichloromethane
1,1-Dichloroethane	Carbon disulfide
1,1-Dichloroethene	Carbon tetrachloride
1,2-Dichloro-1,1,2,2-tetrafluoroethane	Chlorobenzene
1,2,4-Trimethylbenzene	Chloroform
1,2-Dibromoethane	Chloromethane
1,2-Dichlorobenzene	Dichlorodifluoromethane
1,2-Dichloroethane	Methylene chloride
1,2-Dichloropropane	Tetrachloroethene
1,3-Dichlorobenzene	Toluene
1,4-Dichlorobenzene	Trichloroethene
1,1,2-Trichloro-1,2,2-trifluoroethane	Trichlorofluoromethane
2-Butanone	Vinyl chloride
2-Hexanone	cis-1,2-Dichloroethene
4-Methyl-2-pentanone	m,p-xylene
Acetone	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-D3-480) to 9,300 ppbv (CWL-D1-240). PCE was also detected in all samples except the reported concentrations in the CWL-D1-350 samples (environmental and environmental duplicate sample pair) were qualified as not detected during data validation (see Section 5.2.2). PCE concentrations ranged from 0.083 ppbv (CWL-D3-480) to 1,100 ppbv (CWL-UI1-40). Other VOCs detected in all samples, generally at lower concentrations, included chloroform; dichlorodifluoromethane; 1,1-dichloroethene; 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 6.958 ppbv (CWL-D3-480) to 11,368 ppbv (CWL-D1-240). The maximum TCE and Total VOC concentrations were both from the CWL-D1-240 sample.

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-D1-100 and CWL-D1-350. 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 January 2022 Duplicate Samples  
 Chemical Waste Landfill Soil-Gas Monitoring

Well ID/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD <sup>a</sup> (%)
	(ppbv)		
<b>CWL-D1-100</b>			
Tetrachloroethene	260	330	24
1,1,2-Trichloro-1,2,2-trifluoroethane	360	440	20
Trichloroethene	4100	5200	24
<b>CWL-D1-350</b>			
1,1,2-Trichloro-1,2,2-trifluoroethane	530	360	38
Trichloroethene	3700	2900	24

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 environmental duplicate samples. The environmental duplicate sample results show good agreement (i.e., RPDs less than 50), with RPDs ranging from 20 to 38.

A total of five field blank samples were submitted with the CY 2022 samples. VOCs detected above MDLs in field blank samples included acetone (3 samples), benzene (2 samples), 2-butanone (3 samples), carbon disulfide (2 samples), 1,2-dichloroethane (1 sample), 1,2-dibromoethane (1 sample), 1,2-dichloropropane (1 sample), 1,3-dichlorobenzene (1 sample), 1,4-dichlorobenzene (2 samples), 2-hexanone (1 sample), 1,1,2-trichloro-1,2,2-trifluoroethane (1 sample), 4-methyl-2-pentanone (1 sample), methylene chloride (3 samples), styrene (1 sample), PCE (2 samples), toluene (5 samples), TCE (2 samples), trichlorofluoromethane (2 samples), m,p-xylene (5 samples), and o-xylene (4 samples). Ethylbenzene was also detected (4 samples) but these results were qualified as non-detections during data validation due to laboratory method blank sample results (Section 5.2.3).

Benzene, carbon disulfide, 1,4-dichlorobenzene, 1,2-dichloropropane, PCE, toluene, m,p-xylene, and o-xylene in various samples from wells CWI-D1, CWI-D2, and CWL-D3 were qualified as not detected during data validation since both field blank and associated environmental sample results were low concentration detections 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 and matrix spike duplicates, and surrogate spike samples. Laboratory method blank samples were used to determine potential contamination introduced by the laboratory processes and laboratory spike samples were used to determine the accuracy and precision of the analytical method.

Ethylbenzene was detected in the laboratory method blank samples associated with numerous environmental samples and four of the five field blank samples (FB1, FB2, FB3, and FB5). As a result, the ethylbenzene results for the associated environmental samples (CWL-D2-440, CWL-D3-350, CWL-D3-440, and CWL-D3-480) and field blank samples (FB1, FB2, FB3, and FB5) were qualified as not detected during data validation; they were all detections less than the reporting limit. The qualified ethylbenzene field blank sample results were not applied to the associated environmental sample results.

As noted in the CY 2021 CWL Annual Report (SNL/NM March 2022), February 2021 results for sample ports CWL-D2-440, CWL-D3-350 (environmental and environmental duplicate samples), CWL-D3-440 and CWL-D3-480 were significantly lower than historical results from these sample ports. The January 2022 results for these ports were slightly higher or the same, but still well below the historical trend. In addition, the January 2022 results for CWL-D3-170 were significantly lower than the February 2021 and historical results for this sampling port. There were no issues identified during review of the field collection and analytical laboratory process for the February 2021 and January 2022 results.

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 January 2022 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 2022 soil-gas statistical assessment results are presented in Table 5-3. The calculated LCL of 3.7 ppmv for TCE (CWL-D2-470) is below the trigger level of 20 ppmv.

## 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. Tables 5-4 and 5-5 present historical and current TCE and Total VOCs soil-gas monitoring results, respectively, for the post-closure care monitoring network. The soil-gas data from June 1999 to October 2005 reflect post-VE VCM monitoring and those from January 2012 through January 2022 reflect monitoring results under the PCCP.

As discussed previously in Section 5.2.3, the February 2021 and January 2022 results for sample ports CWL-D2-440, CWL-D3-350, CWL-D3-440 and CWL-D3-480 and the January 2022 results for the CWL-D3-170 sample port were lower than expected based upon historical results.

Table 5-3  
 Statistical Assessment Results Summary  
 Chemical Waste Landfill Soil-Gas Monitoring  
 Calendar Year 2022

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)	2.9	7.1	4.3	1.1	3.7	4.9	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 2022, environmental and environmental duplicate sample results, including any resample results) and include the CY 2022 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	Jan 2022
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	2.10
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	3.50
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	4.90
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	1.20
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	1.60
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	2.90
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	5.20
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	4.60
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	9.30
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	3.70
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	0.22
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	4.10
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	5.30
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	4.30
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	0.52
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	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	1.20
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	0.02
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	0.03
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	0.63
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	0.001

Notes:

<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 January 2022 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 – January 2022 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	Jan 2022
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	3.79
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	4.66
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	6.23
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	1.64
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	2.13
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	3.76
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	6.58
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	5.83
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	11.37
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	4.76
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	0.56
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	5.20
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	6.65
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	5.42
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	0.64
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	4.05
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	1.53
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	0.03
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	0.04
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	0.80
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	0.01	0.01

Notes:

<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 January 2022 are EPA Method TO-15 results (EPA January 1999b). January 2012 through January 2022 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.

Figures 5-1 through 5-5 show the concentration of TCE over time and Figures 5-6 through 5-10 show the Total VOC concentration over time, respectively, for each sampling port of each well. These figures are graphical representations of the data presented in Tables 5-4 and 5-5. TCE is the primary VOC of concern, although other VOCs are also commonly detected throughout the soil-gas monitoring network at lower concentrations (see Section 5.2.1).

In general, TCE and Total VOC soil-gas concentrations are low, relatively stable, and slowly decreasing throughout the vadose zone (Tables 5-4 and 5-5 and Figures 5-1 through 5-10). When compared to the January 2012 results, all January 2022 TCE and Total VOC results show a decrease. January 2022 results ranged from 9.30 ppmv (CWL-D1-240) to 0.001 ppmv (CWL-D3-480) for TCE, and 11.37 ppmv (CWL-D1-240) to 0.01 ppmv (CWL-D3-480) for Total VOCs. Consistent with pre-VE VCM characterization data, post-VCM monitoring results, and the detailed conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004), the highest CY 2022 concentrations of TCE and Total VOCs remain in the central part of the vadose zone at the CWL-D1-240 sample port (i.e., 240 feet bgs). For the deepest sampling ports (CWL-D1-470, CWL-D2-470, and CWL-D3-480), the highest TCE and Total VOC concentrations have been consistently observed at CWL-D2-470.

The Total VOC plots (Figures 5-6 through 5-10) look different than the corresponding TCE plots (Figures 5-1 through 5-5) because the vertical axes of the Total VOC plots were expanded to capture the high acetone concentrations at CWL-UI2-36 (shallowest CWL-UI2 sampling port) that occurred from June 1999 through September 2004 (Table 5-5 and Figure 5-7) (SNL/NM December 2004). Concentrations of acetone and Total VOCs have decreased dramatically at CWL-UI2, most likely due to the LE VCM completed in February 2002 and upward diffusion of acetone to the surface.

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 2022 and were inspected during the sampling events. As discussed in Chapter 4 of this report, TCE concentrations in groundwater samples from CWL-MW10 have decreased since January 2013 and have remained below 1.0 µg/L since January 2015 (see Figure 4-7).

Twenty-four years of soil-gas monitoring since completion of the VE VCM in July 1998, including eleven years of soil-gas monitoring under the PCCP (CY 2012 through 2022), 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 investigation and VCM results, confirmed by ongoing soil-gas and groundwater monitoring results, and consistent with the conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004).

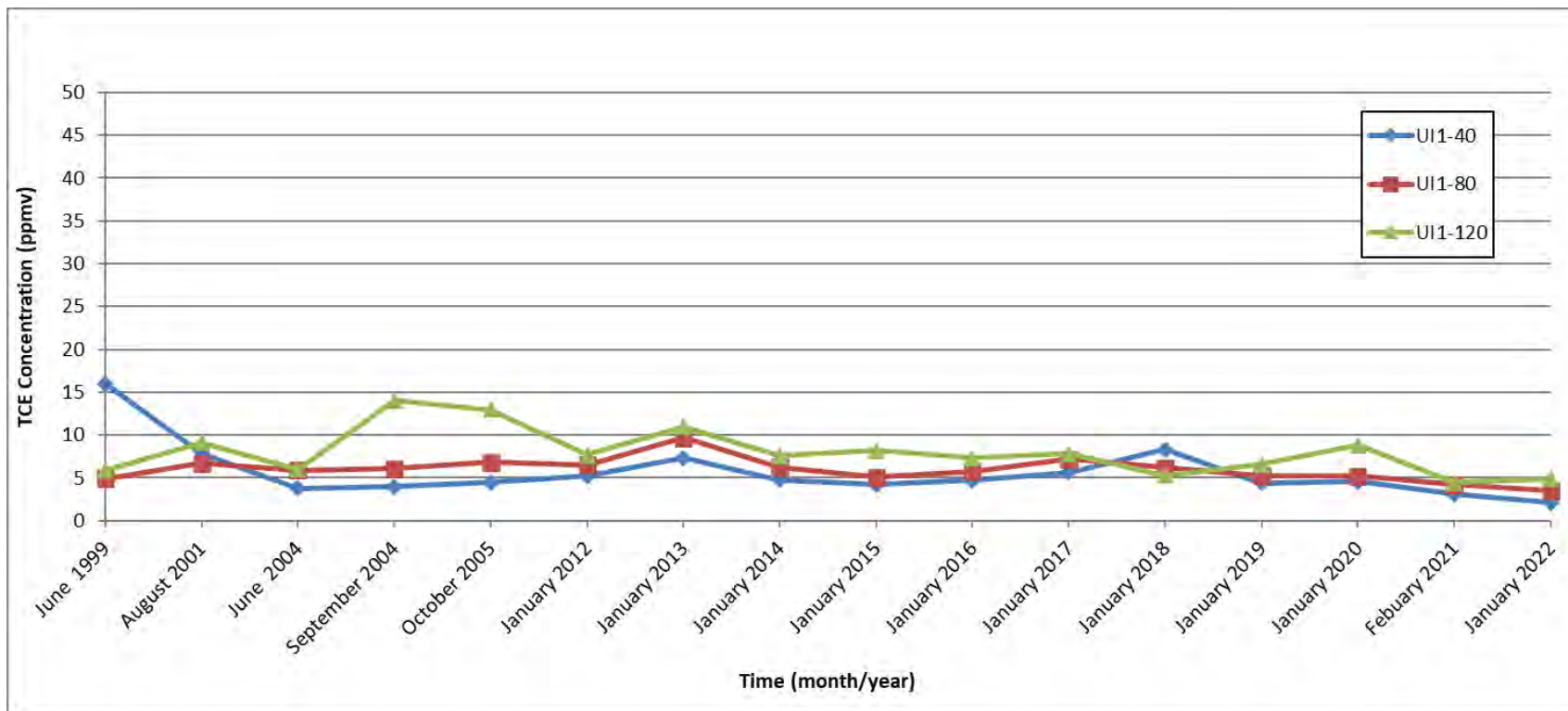


Figure 5-1  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well UI1 Ports

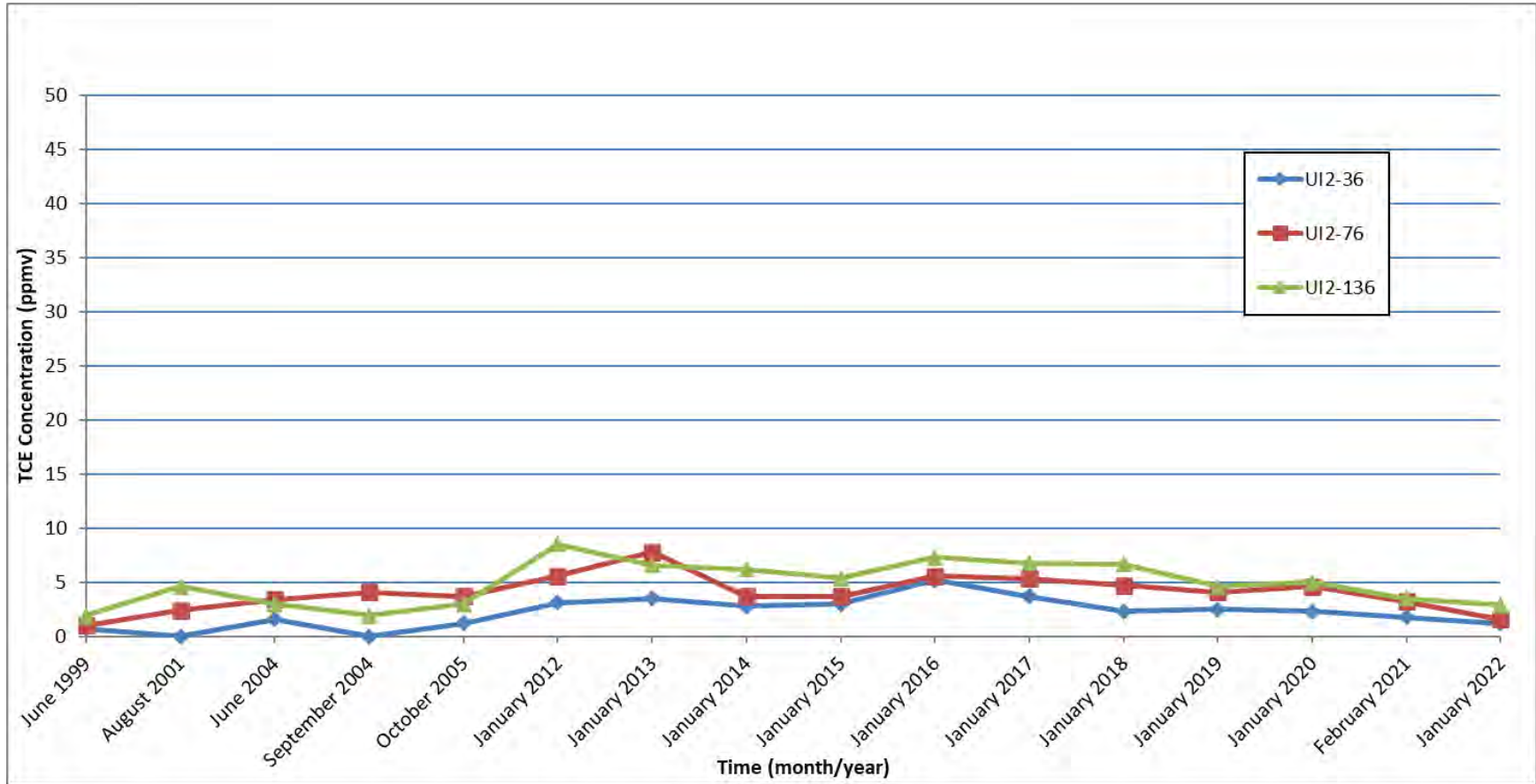


Figure 5-2  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well UI2 Ports

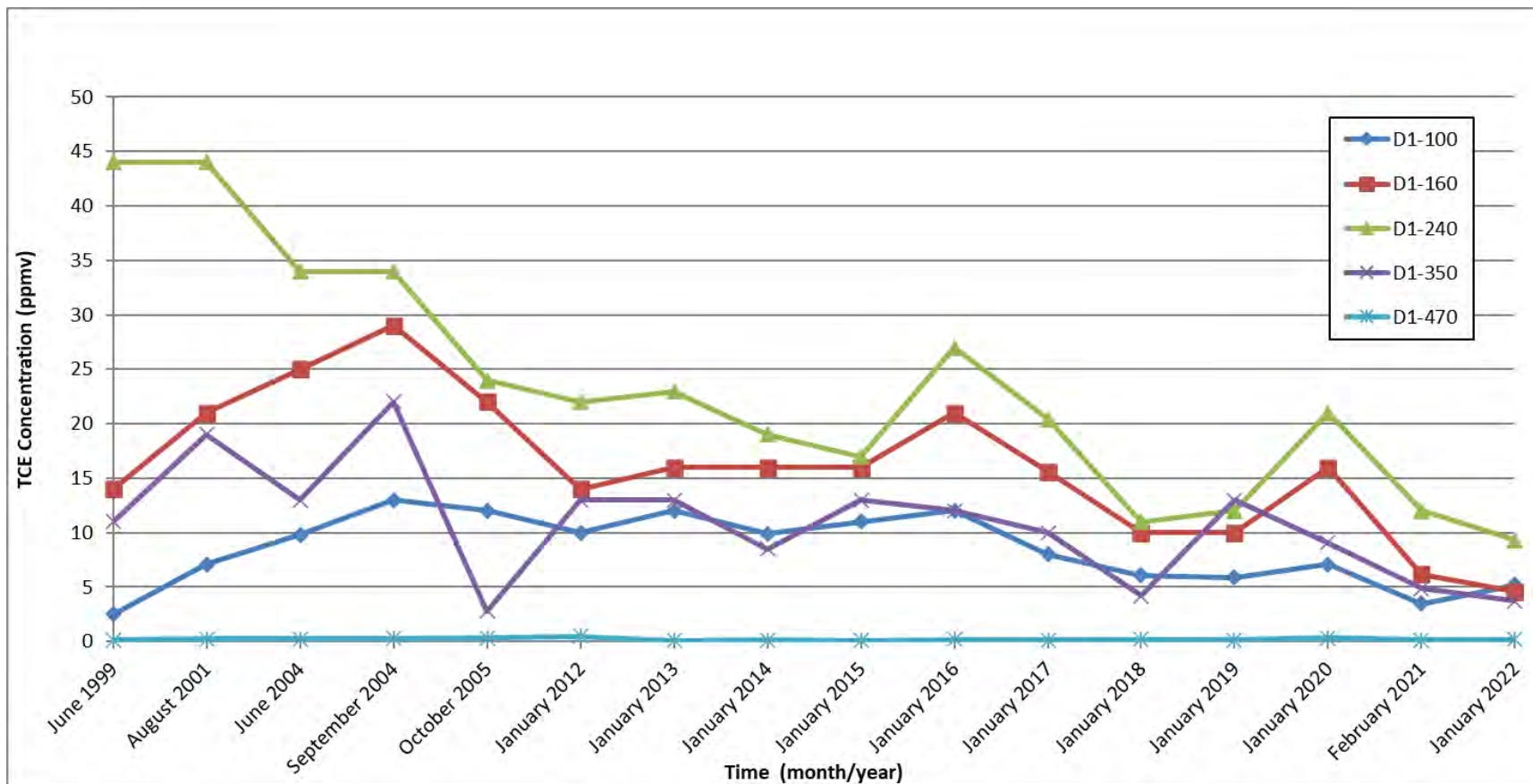


Figure 5-3  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well D1 Ports

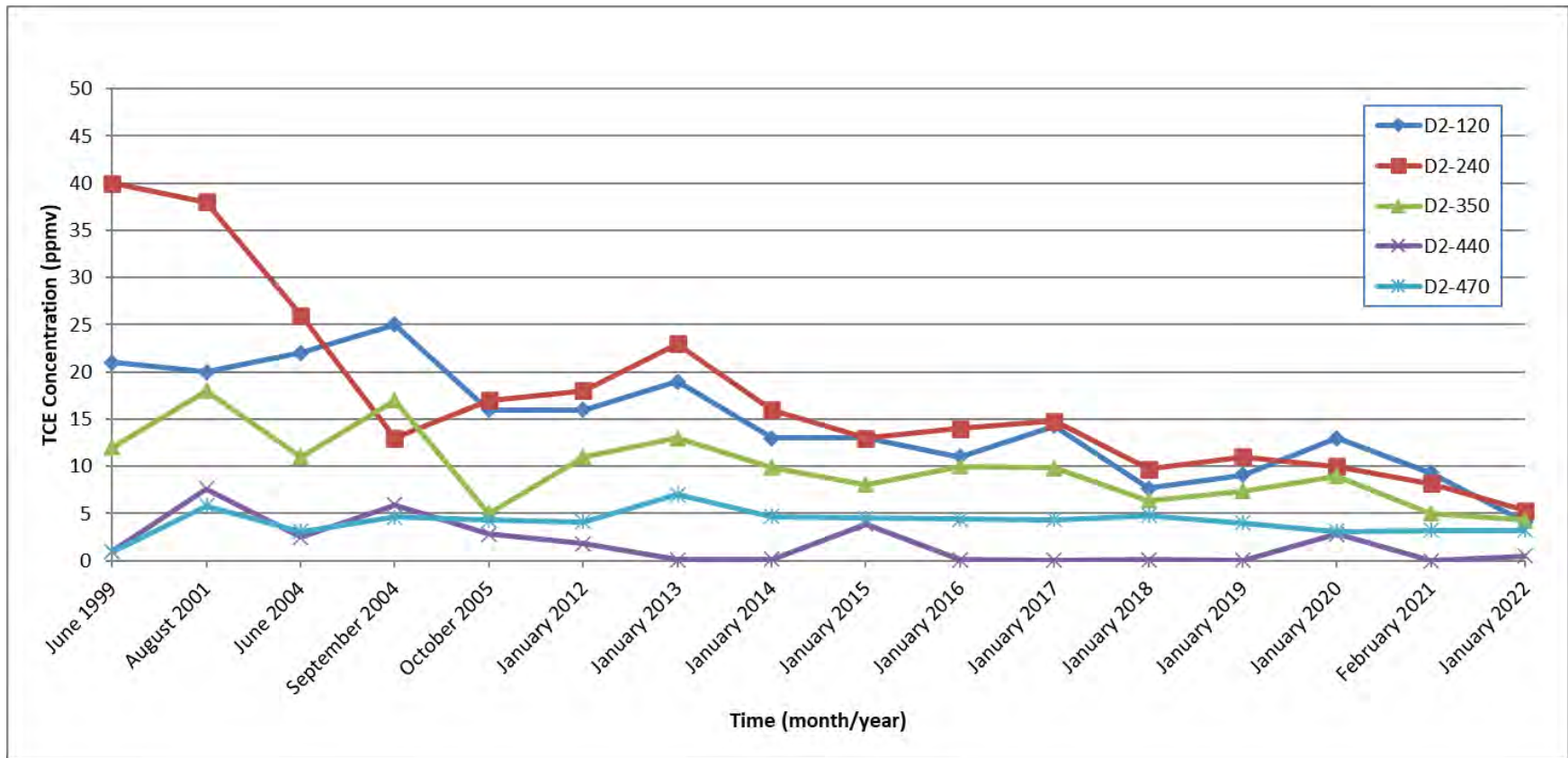


Figure 5-4  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well D2 Ports

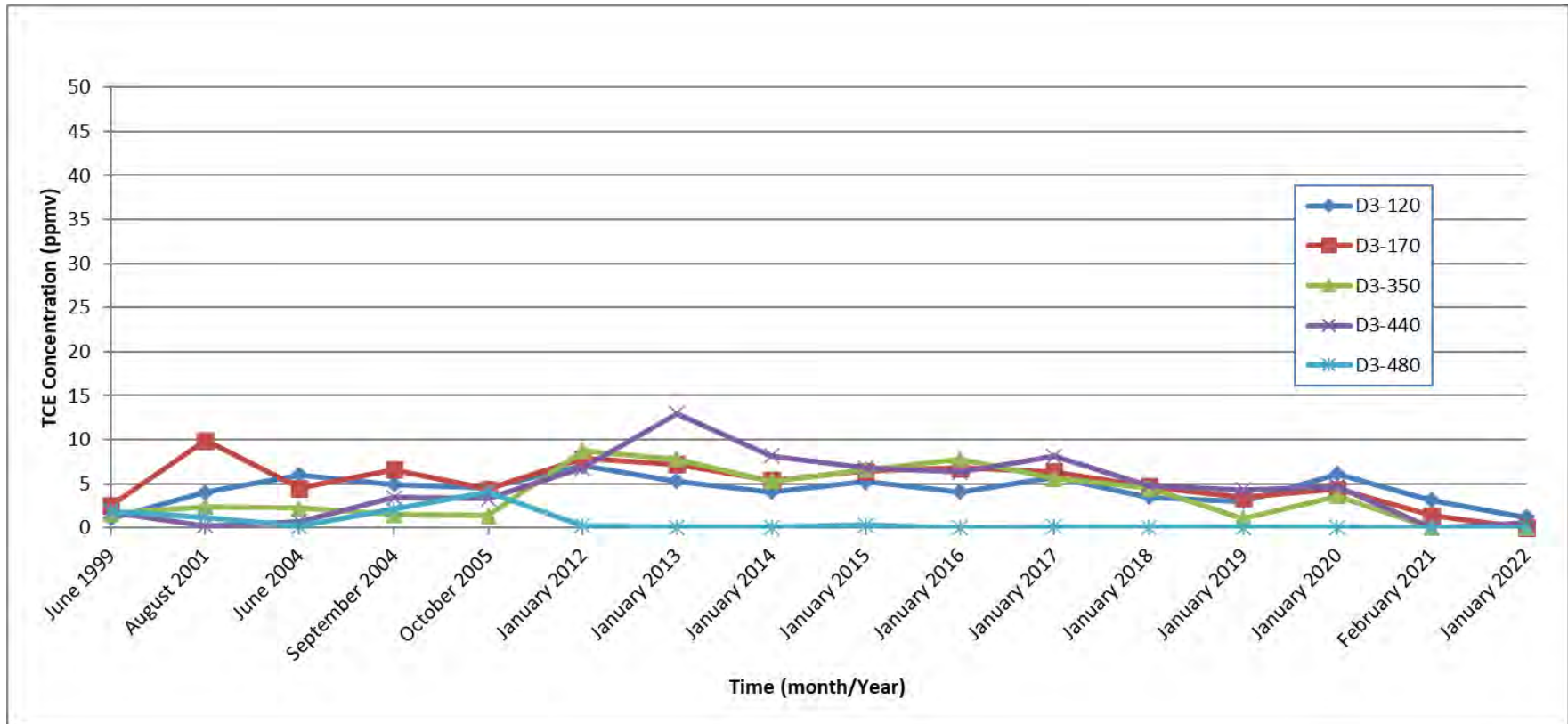


Figure 5-5  
Historical TCE Concentrations vs. Time  
Chemical Waste Landfill Well D3 Ports

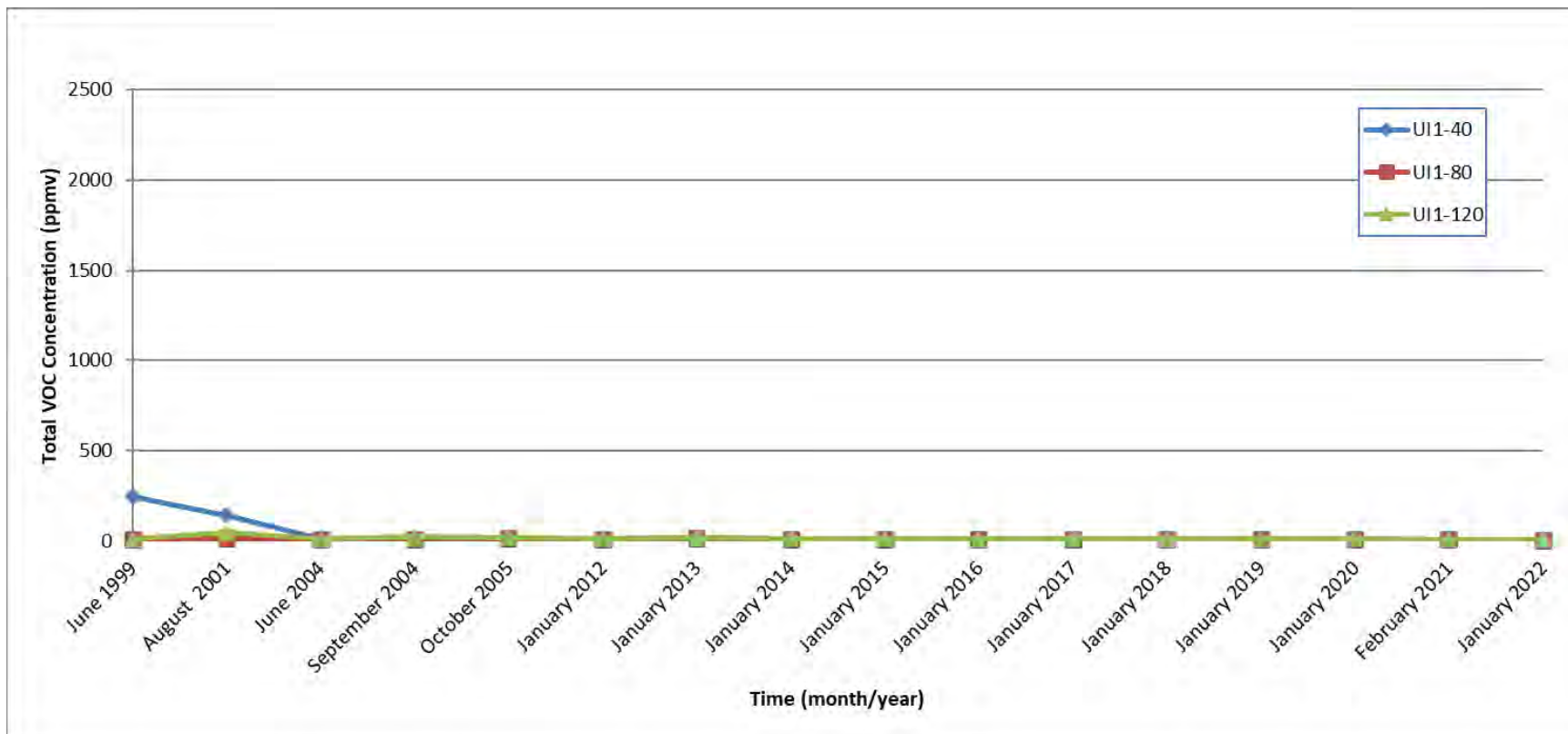


Figure 5-6  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well U11 Ports



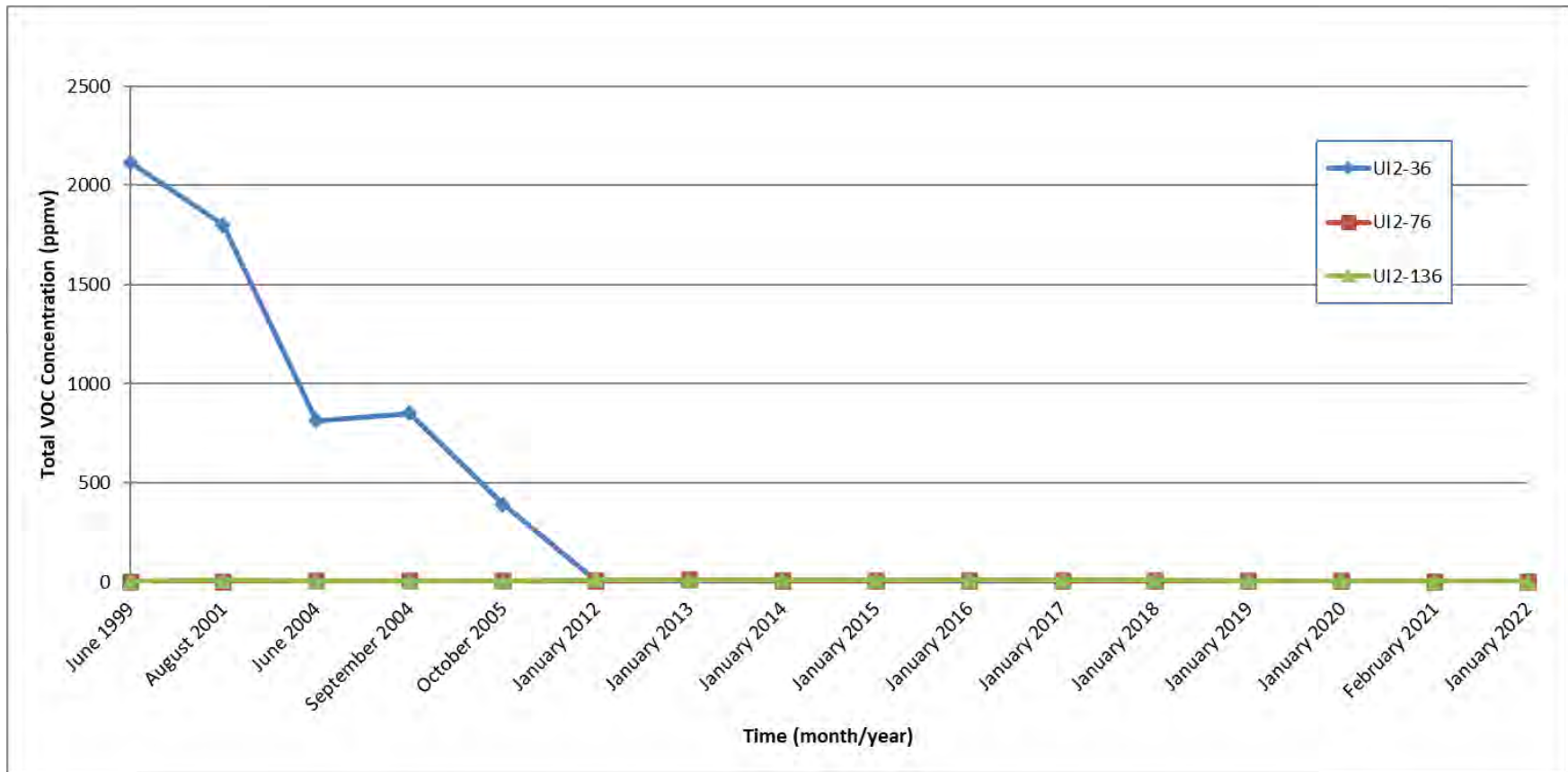


Figure 5-7  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well UI2 Ports

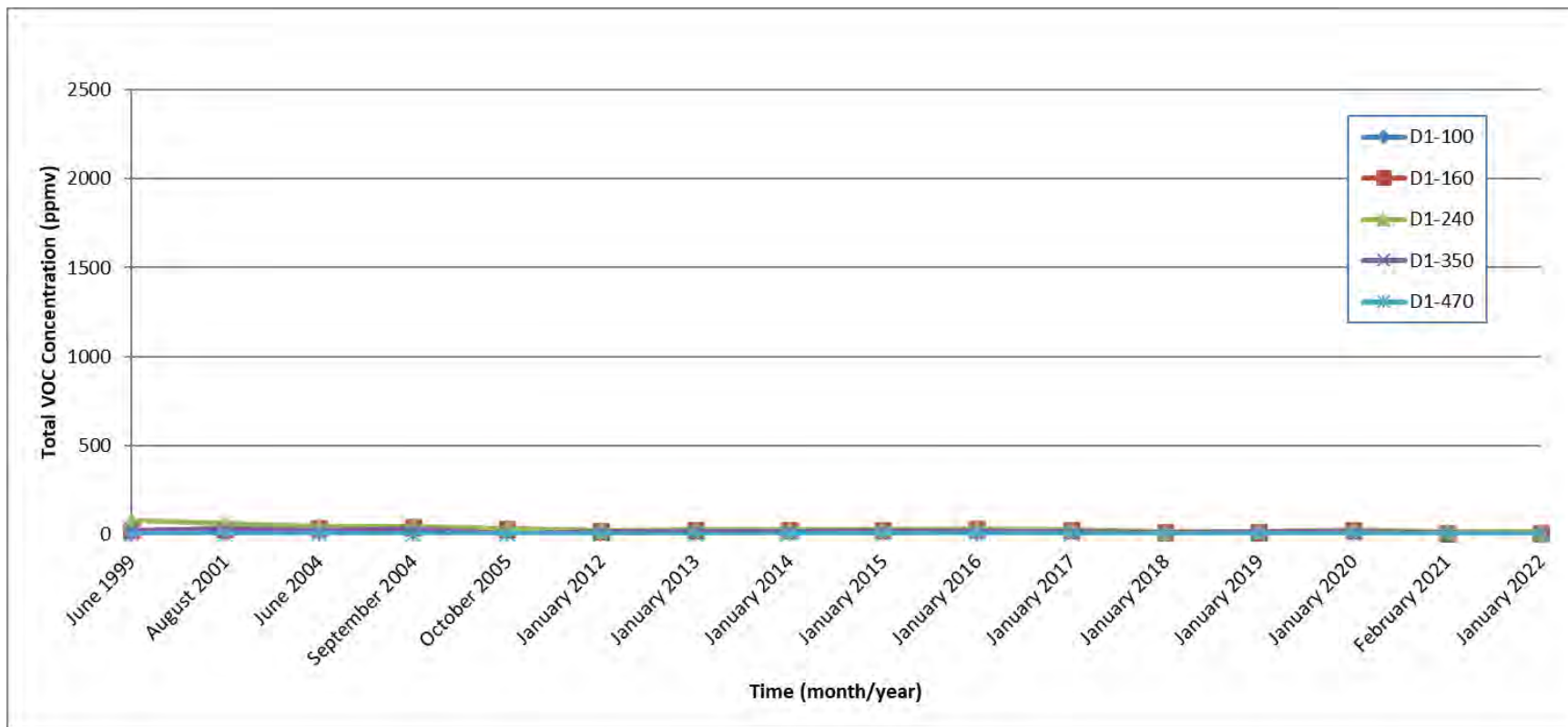


Figure 5-8  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well D1 Ports

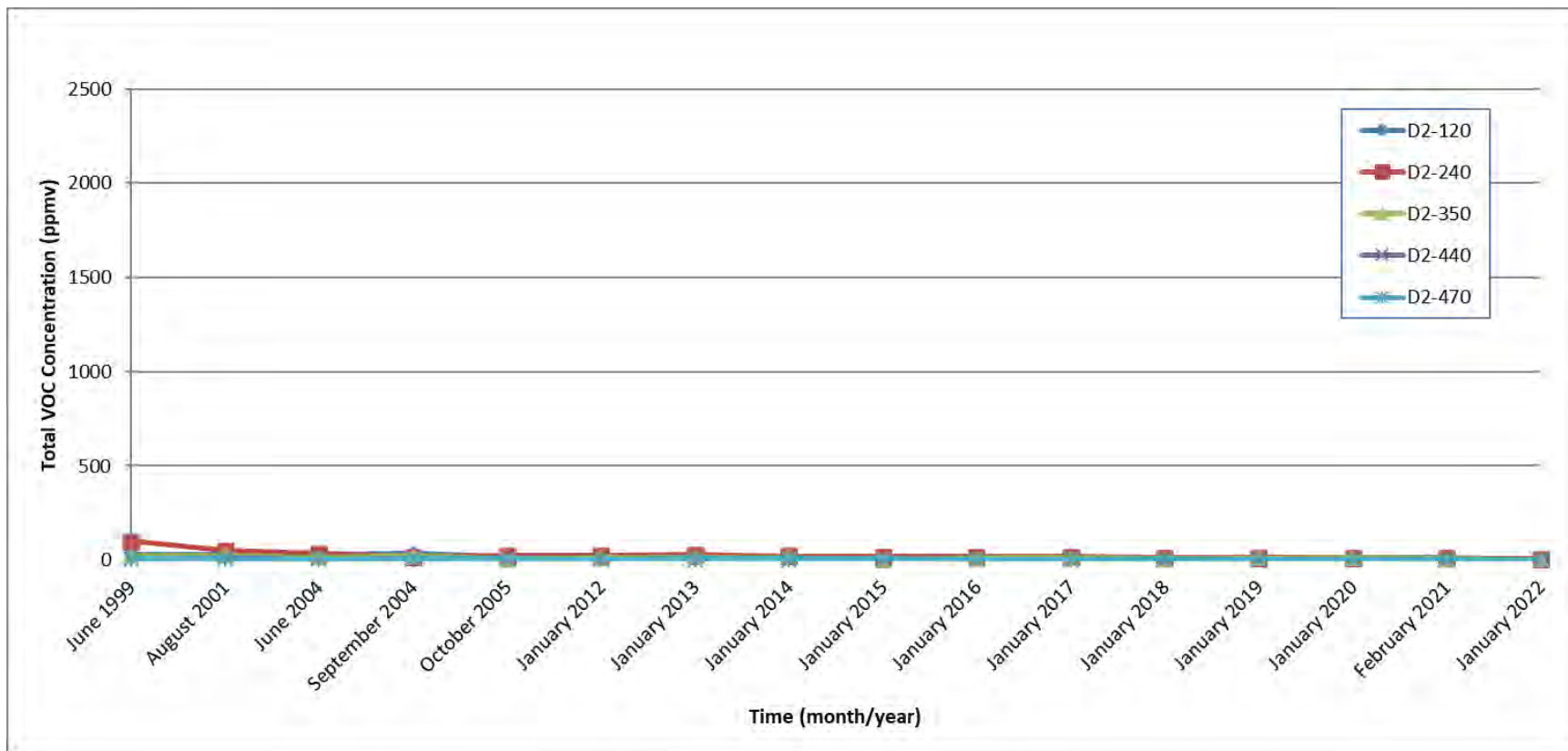


Figure 5-9  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well D2 Ports

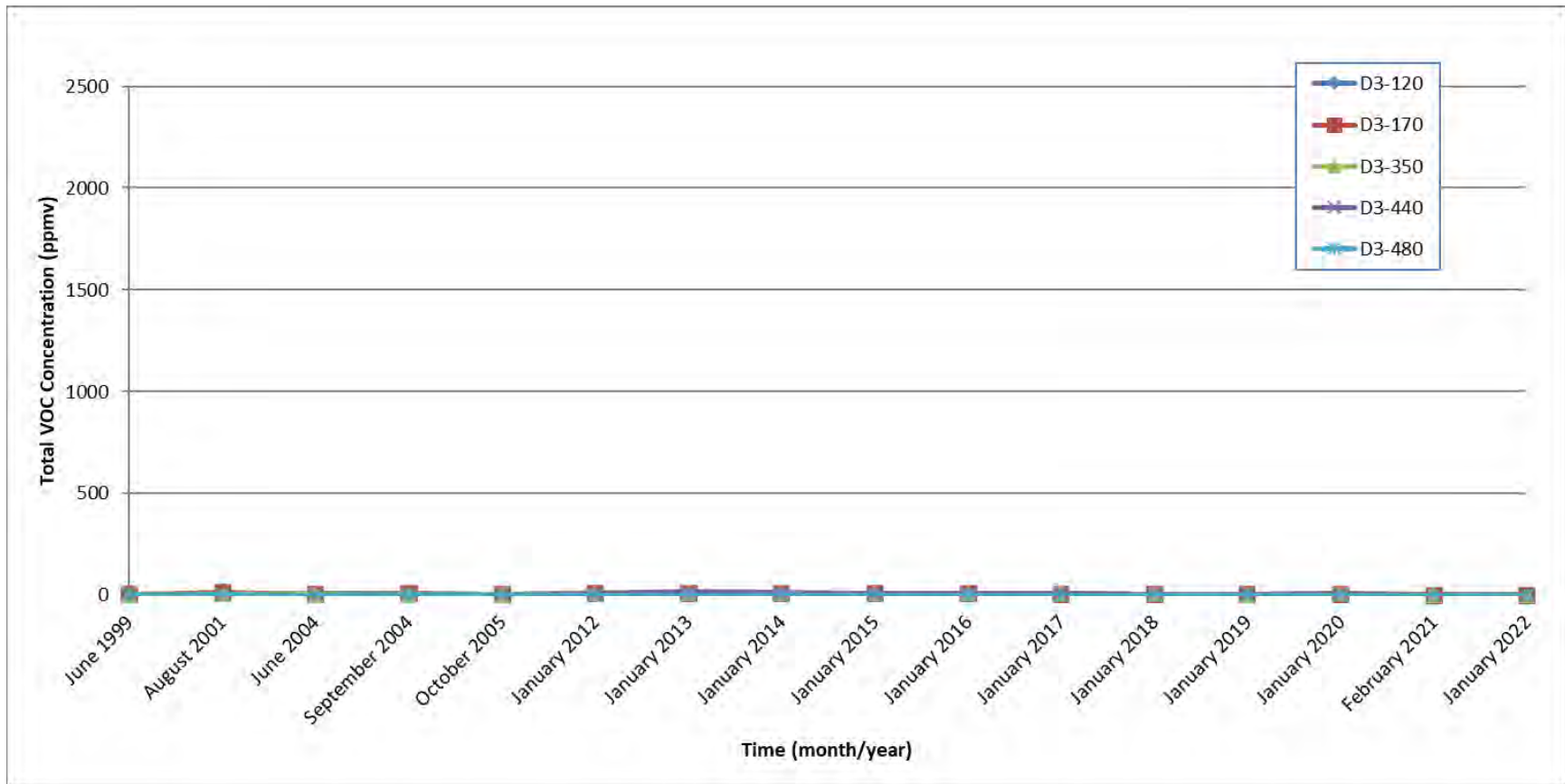


Figure 5-10  
Historical Total Volatile Organic Compound Concentrations vs. Time  
Chemical Waste Landfill Well D3 Ports

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

This chapter presents a summary of CY 2022 inspection, maintenance, and repair activities. Requirements for inspection, maintenance, and repair are presented in Section 3.2 of this report. The CWL post-closure care systems and features that require periodic inspection, maintenance, and/or repair include:

- Final cover system (vegetation and cover surface),
- 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 2022 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 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 19, 2022 by the SNL/NM staff biologist. 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 annual 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 were observed at frequencies and locations similar to previous inspections.

The CY 2022 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, and CY 2022 observations, as well as recommendations and ET Cover photographs.

### 6.1.2 Cover Inspection

Quarterly ET Cover surface inspections were performed by a field technician on March 1, June 1, August 31, and December 1, 2022. During all but the August 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 were in good condition throughout CY 2022 and no maintenance and/or repairs were required. Best practice cover and site maintenance performed during CY 2022 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, August 31, and December 1, 2022 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, and December 2022 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 for the March inspection. For this inspection the tumbleweeds were removed by the ET Cover maintenance contractor on April 4, 2022 within 60 days of 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 August 2022 monitoring events. In January 2022, 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 2, August 31, and December 1, 2022 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, August, and December 2022 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 for the March and August inspections. For these inspections the tumbleweeds were removed by the ET Cover maintenance contractor on April 4 and September 13, 2022, respectively, within 60 days of the inspection. Sediment and plant debris partially covering the survey monuments were removed by the field technician during the March, June, and August 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 within 60 days, as necessary, to maintain compliance with requirements for emergency equipment. All equipment was inspected and in good working order throughout CY 2022.

## **6.6 Cover and Site Maintenance**

Cover and site maintenance performed during CY 2022 by the ET Cover maintenance contractor is summarized below. ET Cover maintenance continued in CY 2022 with the long-range goal of maintaining healthy, self-sustaining native grasses on the CWL ET Cover and perimeter areas by reducing competition with annual 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 needs.

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). The two maintenance events conducted in April and September are described below and represent 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 herbicide; all focused on invasive weed control.

### ***April 4-7, 2022***

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



4.5 cubic yards of compressed weeds were removed and disposed at the City of Albuquerque 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 from the western perimeter fence to the road. This was the second annual application of Esplanade® at the CWL; the first was in early March 2021. 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 spray truck 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 spray truck 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), the supplemental watering system (i.e., hose sections, flow meter, and large sprinkler set for a ~70-foot wetting radius) was mobilized to the site and approximately 22,800 gallons of non-potable water was applied at six locations spaced evenly across the cover. This approach simulated a 0.5-inch precipitation event to ensure the minimum 0.25-inches of water needed to activate the Esplanade® and to provide additional moisture to the native grasses given the ongoing drought conditions. 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.

### ***September 12-13, 2022***

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 14 cubic yards of compressed weeds were removed and disposed at the City of Albuquerque Landfill. The supplemental watering system at the CWL was also demobilized for the year. Hose sections were disconnected and drained, and fittings (i.e., connectors, adaptors, and flow meters) were removed and stored in the CAMU conex with the fittings and associated tools. The supplemental watering system had been mobilized to the site earlier in April as described above.

## **7.0 REGULATORY ACTIVITIES**

On June 2, 2011, the NMED approved closure of the CWL and the PCCP took effect (Kieling June 2011). Regulatory activities in CY 2022 consisted of two submittals of updated reference documents cited in the PCCP and the submittal of the CY 2021 CWL Annual Post-Closure Care Report. 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 Permit Modification Requests**

There were no modifications to the CWL PCCP during the CY 2022 reporting period.

### **7.2 Permit Submittals**

On May 17, 2022, DOE/NNSA and NTESS submitted two updated reference documents cited in the PCCP in accordance with the requirements of Attachment 2, Section 2.0 and Attachment 3, Section 3.9 of the PCCP (Hauck May 2022). This submittal included two documents related to sample packaging/shipping and the contract verification process for monitoring results. On November 10, 2022, DOE/NNSA and NTESS submitted two additional updated reference documents cited in the PCCP related to soil-gas monitoring and sample management (Hauck November 2022). The documents were revised as part of the routine three-year review cycle to keep them current and to incorporate improvements. The revised reference documents became effective on April 22, 2022 (May submittal) and October 17, 2022 (November submittal) and were submitted to the NMED within 30 days of the effective date.

In CY 2022, DOE/NNSA and NTESS submitted the CY 2021 CWL Annual Post-Closure Care Report (SNL/NM March 2022) and NMED approved the report (Cobrain April 2022).

### **7.3 Technical Communication**

There were no technical communications with NMED staff regarding CWL activities in CY 2022.

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

Table 7-1 summarizes the NMED-approved modifications of the PCCP through CY 2022 that included changes to monitoring, inspection, maintenance, repair, and/or reporting requirements. Table 7-2 summarizes all submittals associated with the PCCP through CY 2022, not including routine annual reports.

Table 7-1  
 Chemical Waste Landfill Post-Closure Care Permit Modifications<sup>a</sup>

Date of Modification <sup>b</sup>	Affected Parts of PCCP	Description of Modification
February 20, 2012	Attachments 1-6	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.
November 24, 2020 <sup>c</sup>	Entire Permit	Application to renew the Chemical Waste Landfill PCCP.

Notes:

<sup>a</sup> Only PCCP modifications that changed monitoring, inspection, maintenance, repair, and/or reporting requirements are listed in the table.

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

<sup>c</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 6, 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.
May 17, 2022	Permit Attachments 2 & 3	Two operating procedures cited in the PCCP used by SNL/NM personnel for sample management and review of analytical data from contract laboratories.
November 10, 2022	Permit Attachments 2 & 3	Two operating procedures cited in the PCCP used by SNL/NM personnel to perform soil-gas monitoring and sample management.

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 2022 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 August 2022. There were no variances or non-conformances. Analytical and statistical assessment results were 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 were consistent with previous year's results.

One annual soil-gas monitoring event was conducted in January 2022. There were no variances and there were no exceedances of trigger levels. Analytical and statistical assessment results were consistent with previous years with the exception of five results from CWL-D2 and CWL-D3 soil-gas sampling ports that were lower relative to historical results. Based upon data validation and a review of field and laboratory records, no issues were identified. Eleven 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 plant debris and soil from survey monuments.

The ET Cover continues to meet successful revegetation criteria. As documented in the August 2022 annual inspection, the ET Cover is in good condition with even coverage of mature, native perennial grasses.

CY 2022 ET Cover maintenance was performed in April and September as best practice for ET Cover vegetation. CY 2022 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 April maintenance event included the second annual application of Esplanade<sup>®</sup>, a pre-emergent herbicide, to the entire ET Cover, 3-foot area outside the perimeter fence, and perimeter area from the western perimeter fence to the road. The first application was in March 2021. To ensure activation of the herbicide after application, a supplemental watering approach was used to simulate a minimum 0.25-inch precipitation event. Approximately 0.5 inches of water was applied evenly across the ET Cover and approximately 0.25 inches of water was applied evenly across the western perimeter area between the fence

and road. This pre-emergent herbicide was tested in CY 2020 and, based upon results observed so far, appears to be more effective at minimizing invasive weed growth than previously used pre-emergent herbicides with no adverse effects. 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 minimizing 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 needs.

### **8.3 Regulatory Activities**

Regulatory activities in CY 2022 included two submittals of updated reference documents cited in the PCCP (Hauck May and November 2022) and submittal of the CY 2021 CWL Annual Post-Closure Care Report (SNL/NM March 2022).

### **8.4 Conclusions**

All PCCP monitoring, inspection, and maintenance/repair requirements were met for CY 2022. This twelfth 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 and associated site controls are 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

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**ANNEX A**

**Chemical Waste Landfill**

**Calendar Year 2022 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 / AOP 95-16

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

**FIELD SAMPLING FORMS**  
**JANUARY 2022**  
**GROUNDWATER MONITORING**

**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL		
Well ID: CWL-BW5	Date: 01/12/22	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)
515.87	0911	Start	-----	-----	-----	-----	-----	-----	-----
517.88	0923	2	16.12	1022.7	146.9	6.85	0.61	80.31	7.98
518.53	0930	4	16.70	1032.6	141.0	6.90	0.73	79.90	7.86
518.76	0933	5	16.44	1026.0	139.9	6.92	1.06	79.26	7.85
518.96	0937	6	16.45	1028.8	138.7	6.93	1.08	78.93	7.80
519.17	0941	7	16.59	1032.7	137.5	6.94	1.37	79.25	7.82
519.32	0944	8	16.58	1031.3	134.8	6.95	1.40	79.04	7.80
519.49	0948	9	16.55	1030.4	133.0	6.96	1.52	78.62	7.76
519.64	0952	10	16.60	1030.4	131.3	6.97	1.11	78.32	7.73
519.77	0955	11	16.46	1025.0	130.4	6.97	0.89	77.91	7.71
519.89	0959	12	16.36	1025.6	129.7	6.98	1.25	78.05	7.74
	1000	Sampling →							

Comments:  
 ~ 1.5 gals purged from tubing @ 0916

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## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

SNL/NM Project Name: CWL		
Well ID: CWL-MW9	Date: 01/13/22	Date:
Pump Method: Portable	Pump Depth: 517'	

## 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)
506.72	0843	Start	-----	-----	-----	-----	-----	-----	-----
508.67	0858	2	17.16	931.36	149.4	6.97	0.46	67.18	5.80
509.31	0906	4	17.76	945.00	132.9	7.01	0.32	65.42	5.57
509.86	0913	6	17.85	944.10	126.7	7.03	0.28	63.59	5.41
510.28	0921	8	18.07	946.74	125.0	7.04	0.38	62.51	5.30
510.61	0928	10	18.36	951.13	123.9	7.05	0.23	62.18	5.03
510.84	0935	12	18.56	950.26	123.0	7.06	0.36	63.06	5.29
511.03	0943	14	18.46	945.77	121.5	7.07	0.71	62.79	5.28
511.14	0950	16	18.47	950.47	121.0	7.07	0.60	63.15	5.31
511.21	0953	17	18.46	949.32	121.5	7.07	0.83	62.97	5.30
511.25	0957	18	18.66	955.27	121.6	7.07	0.50	63.15	5.29
511.31	1001	19	18.89	965.09	121.4	7.07	0.35	62.99	5.25
511.34	1005	20	19.02	970.47	120.5	7.07	0.41	63.13	5.25
	1006	Sampling →							

Comments:

~ 1.5 gals purged from tubing @ 0851

**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL		
Well ID: CWL-MW10	Date: 01/17/22	Date: 01/19/22
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)
503.72	0839	Start	-----	-----	-----	-----	-----	-----	-----
506.41	0902	2	17.36	910.96	141.2	7.06	3.28	24.56	2.09
508.09	0912	4	18.55	937.81	99.3	7.08	1.79	22.25	1.83
508.69	0917	5	18.82	941.05	93.0	7.09	1.10	17.13	1.42
509.36	0922	6	18.73	937.39	76.6	7.09	1.16	16.58	1.38
510.07	0928	7	18.85	1015.1	65.0	7.10	1.16	15.56	1.29
510.77	0934	8	18.84	942.64	54.5	7.10	1.09	13.40	1.11
511.60	0941	9	19.18	948.44	47.2	7.10	1.72	11.78	0.97
512.37	0946	10	19.17	945.59	38.0	7.10	3.81	16.94	1.40
513.19	0952	11	19.29	948.61	28.9	7.10	5.72	20.63	1.70
514.04	0958	12	19.34	948.57	15.2	7.10	6.59	14.57	1.20
514.66	1002	12.5	19.29	950.90	15.1	7.11	7.27	21.54	1.74
515.05	1007	13	19.45	958.37	17.4	7.12	8.30	20.16	1.72
515.29	1007	Well	DRY	-----	-----	-----	-----	-----	-----
01/19/22- 505.25	0844	START	-----	-----	-----	-----	-----	-----	-----
507.03	0856	0.5	18.18	938.38	1.6	6.99	1.82	35.34	3.00
507.41	0859	1	18.48	944.31	-7.7	7.02	1.521	28.87	2.41
507.70	0902	1.5	18.66	959.44	-11.5	7.04	1.76	25.61	2.15
508.16	0904	2:	18.87	964.56	-14.8	7.05	2.10	22.57	1.87
	0905	Sampling							

Comments:

~ 1.5 gals purged from tubing @0851  
 0854 1/19/22

**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL		
Well ID: CWL-MW11	Date: 01/14/22	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)
501.84	0848	Start	-----	-----	-----	-----	-----	-----	-----
504.04	0905	2	18.96	1017.5	145.7	7.00	0.23	83.78	6.87
504.77	0911	4	19.45	1031.5	138.1	7.03	0.33	81.13	6.61
505.87	0918	6	19.80	1043.0	134.9	7.04	0.54	80.51	6.50
506.88	0926	8	20.10	1049.0	132.7	7.04	0.80	80.18	6.44
507.99	0934	10	20.34	1050.5	130.6	7.04	0.69	79.48	6.36
509.18	0942	12	20.57	1053.7	125.0	7.04	1.78	78.65	6.26
510.22	0951	14	20.67	1058.0	121.3	7.05	1.94	77.21	6.14
511.36	1003	16	20.72	1055.8	65.8	7.04	2.52	75.59	6.00
512.29	1014	18	20.93	1063.1	-45.1	7.04	3.38	69.11	5.42
512.21	1036	19	20.91	1046.1	-30.2	7.05	3.43	70.51	5.59
512.71	1042	20	20.72	1052.1	10.1	7.04	2.03	86.48	6.84
513.21	1049	21	20.99	1069.5	13.8	7.05	2.68	78.13	6.19
	1050	Sampling →							

Comments:  
 ~ 1.5 gals purged from tubing @ 0858  
  
 1015 pump stopped pumping, had to increase pressure

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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>01/12/22</b>			
Make & Model: <b>In-Situ Aqua Troll 600</b>							
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571114</b>							
Other (SN): <b>NA</b>							
<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>0649</b>	<b>41.00</b>	<b>22.49</b>	<b>7.02</b>	<b>21.39</b>	<b>10.00</b>	
2. Time (24 hr):	<b>1309</b>	<b>41.0</b>	<b>21.74</b>	<b>7.01</b>	<b>20.77</b>	<b>10.01</b>	
3. Time (24 hr):							
4. Time (24 hr):							
Standard Lot No.:	<b>1GC758</b>		<b>1GD1201</b>		<b>1GE278</b>		
Expiration Date.:	<b>MAR/23</b>		<b>APR/23</b>		<b>MAY/23</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>0648</b>	<b>1308.4</b>	<b>21.12</b>	1. Time (24 hr): <b>0655</b>	<b>220.0</b>	<b>21.28</b>	
2. Time (24 hr):	<b>1308</b>	<b>1295.3</b>	<b>20.71</b>	2. Time (24 hr): <b>1314</b>	<b>219.8</b>	<b>20.51</b>	
3. Time (24 hr):				3. Time (24 hr):			
4. Time (24 hr):				4. Time (24 hr):			
Standard Lot No.:	<b>1GE263</b>	Expiration Date.:	<b>MAY/22</b>	Standard Lot No.:	<b>1GD902</b>	Expiration Date.:	<b>JAN/22</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>0643</b>	<b>99.98</b>	<b>30.38</b>				
2. Time (24 hr):	<b>1307</b>	<b>100.50</b>	<b>25.81</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				
Calibration done by: R Lynch			Date: 01/12/22	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 21090D000519	
Reference Value	10	20	100	800
Standard Lot No.	A1215R	A1215R	A1205	A1243
1. Time (24 hr): 0644	10.0	20.1	99.8	813
2. Time (24 hr): 1306	9.99	20.0	101	821
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>R Lynch</b>				Date: <b>01/13/22</b>		
Make & Model: <b>In-Situ Aqua Troll 600</b>						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571114</b>						
Other (SN): <b>NA</b>						
<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>0624</b>	<b>3.99</b>	<b>23.74</b>	<b>7.01</b>	<b>22.34</b>	<b>9.99</b>
2. Time (24 hr):	<b>1329</b>	<b>4.00</b>	<b>22.31</b>	<b>7.02</b>	<b>22.44</b>	<b>10.00</b>
3. Time (24 hr):						
4. Time (24 hr):						
Standard Lot No.:	<b>1GC758</b>		<b>1GD1201</b>		<b>1GE278</b>	
Expiration Date.:	<b>MAR/23</b>		<b>APR/23</b>		<b>MAY/23</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>0623</b>	<b>1328.6</b>	<b>22.20</b>	1. Time (24 hr):	<b>0630</b>	<b>219.8</b>
2. Time (24 hr):	<b>1328</b>	<b>1334.1</b>	<b>22.41</b>	2. Time (24 hr):	<b>1335</b>	<b>219.9</b>
3. Time (24 hr):				3. Time (24 hr):		
4. Time (24 hr):				4. Time (24 hr):		
Standard Lot No.:	<b>1GE263</b>	Expiration Date.:	<b>MAY/22</b>	Standard Lot No.:	<b>1GD902</b>	Expiration Date.:
					<b>JAN/22</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>0622</b>	<b>98.75</b>	<b>26.97</b>			
2. Time (24 hr):	<b>1327</b>	<b>99.81</b>	<b>25.83</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				
Calibration done by: R Lynch			Date: 01/13/22	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 21090D000519	
Reference Value	10	20	100	800
Standard Lot No.	A1215R	A1215R	A1205	A1243
1. Time (24 hr): 0621	10.1	20.2	101	824
2. Time (24 hr): 1326	9.98	20.1	102	819
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>R Lynch</b>				Date: <b>01/14/22</b>		
Make & Model: <b>In-Situ Aqua Troll 600</b>						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571114</b>						
Other (SN): <b>NA</b>						
<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>0633</b>	<b>4.00</b>	<b>22.80</b>	<b>7.01</b>	<b>22.77</b>	<b>9.99</b>
2. Time (24 hr):	<b>1256</b>	<b>4.01</b>	<b>21.80</b>	<b>7.02</b>	<b>21.83</b>	<b>10.00</b>
3. Time (24 hr):						
4. Time (24 hr):						
Standard Lot No.:	<b>1GC758</b>		<b>1GD1201</b>		<b>1GE278</b>	
Expiration Date.:	<b>MAR/23</b>		<b>APR/23</b>		<b>MAY/23</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>0632</b>	<b>1360.5</b>	<b>22.90</b>	1. Time (24 hr):	<b>0640</b>	<b>220.3</b>
2. Time (24 hr):	<b>1255</b>	<b>1347.4</b>	<b>21.82</b>	2. Time (24 hr):	<b>1303</b>	<b>220.1</b>
3. Time (24 hr):				3. Time (24 hr):		
4. Time (24 hr):				4. Time (24 hr):		
Standard Lot No.:	<b>1GE263</b>	Expiration Date.:	<b>MAY/22</b>	Standard Lot No.:	<b>1GD902</b>	Expiration Date.:
						<b>JAN/22</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>98.63</b>	<b>26.68</b>			
2. Time (24 hr):	<b>1254</b>	<b>97.07</b>	<b>26.97</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: R Lynch			Date: 01/14/22	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 21090D000519	
Reference Value	10	20	100	800
Standard Lot No.	A1215R	A1215R	A1205	A1243
1. Time (24 hr): 0630	10.3	19.9	100	830
2. Time (24 hr): 1253	10.1	20.2	99.8	827
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>R Lynch</b>			Date: <b>01/17/22</b> <b>01/19/22</b>					
Make & Model: <b>In-Situ Aqua Troll 600</b>								
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571114</b>								
Other (SN): <b>NA</b>								
<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>3.98</b>	<b>23.66</b>	<b>7.02</b>	<b>21.25</b>	<b>10.00</b>	<b>21.19</b>	
2. Time (24 hr):	<b>1253</b>	<b>3.99</b>	<b>21.22</b>	<b>7.01</b>	<b>21.19</b>	<b>10.03</b>	<b>21.11</b>	
3. Time (24 hr):	<b>0628</b>	<b>4.00</b>	<b>22.53</b>	<b>7.02</b>	<b>22.40</b>	<b>9.99</b>	<b>24.05</b>	
4. Time (24 hr):	<b>1409</b>	<b>3.99</b>	<b>21.63</b>	<b>7.02</b>	<b>21.83</b>	<b>10.00</b>	<b>22.12</b>	
Standard Lot No.:	<b>1GC758</b>		<b>1GD1201</b>		<b>1GE278</b>			
Expiration Date.:	<b>MAR/23</b>		<b>APR/23</b>		<b>MAY/23</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>1329.9</b>	<b>21.49</b>	1. Time (24 hr):	<b>0640</b>	<b>222.0</b>	<b>21.35</b>	
2. Time (24 hr):	<b>1252</b>	<b>1328.3</b>	<b>21.35</b>	2. Time (24 hr):	<b>1300</b>	<b>221.8</b>	<b>21.30</b>	
3. Time (24 hr):	<b>0627</b>	<b>1334.0</b>	<b>22.01</b>	3. Time (24 hr):	<b>0633</b>	<b>219.2</b>	<b>22.29</b>	
4. Time (24 hr):	<b>1414</b>	<b>1325.1</b>	<b>21.82</b>	4. Time (24 hr):	<b>1415</b>	<b>220.1</b>	<b>21.91</b>	
Standard Lot No.:	<b>1GE263</b>		Expiration Date.:	<b>MAY/22</b>		Standard Lot No.:	<b>1GD902</b>	
				<b>JAN/22</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>0630</b>	<b>99.79</b>		<b>26.85</b>				
2. Time (24 hr):	<b>1251</b>	<b>100.88</b>		<b>26.38</b>				
3. Time (24 hr):	<b>0626</b>	<b>99.93</b>		<b>27.00</b>				
4. Time (24 hr):	<b>1408</b>	<b>100.45</b>		<b>27.35</b>				

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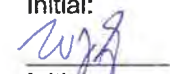
**GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2**

SNL/NM Project Name: CWL				
Calibration done by: R Lynch			Date: 01/17/22 01/19/22	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 21090D000519	
Reference Value	10	20	100	800
Standard Lot No.	A1215R	A1215R	A1205	A1243
1. Time (24 hr): 0629	10.3	19.8	101	824
2. Time (24 hr): 1250	10.1	20.0	100	831
3. Time (24 hr): 0625	9.99	20.4	101	827
4. Time (24 hr): 1407	10.2	20.1	99.7	821
Comments:				

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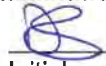



**Portable Pump and Tubing / Water Level Indicator Decontamination Log Form**

<b>SNL/NM Project Name:</b> <u>CWL</u>	<b>Monitoring Well ID #:</b> <u>Pre Decon</u>	<b>Date:</b> <u>1/11/2022</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-814</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
Denisha Sanchez Print Name: _____		 Initial: _____
William Gibson Print Name: _____		 Initial: _____
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Excellent</u>	<b>Tubing Bundle:</b> <u>Excellent</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>11/11/21 - 11/30/21</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L1L0</u>
<u>12/20/21</u>	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>11/22</u>
_____	<b>Lot Number:</b> <u>NA</u>	

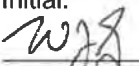
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**Portable Pump and Tubing / Water Level Indicator Decontamination Log Form**

<b>SNL/NM Project Name:</b> <u>CWL</u>	<b>Monitoring Well ID #:</b> <u>CWL-BW5</u>	<b>Date:</b> <u>1/12/2022</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-814</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>Excellent</u>	<b>Tubing Bundle:</b> <u>Excellent</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>11/21/21 - 12/20/21</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> <input type="checkbox"/>	<b>Monitoring Well ID #:</b> <u>CWL-MW9</u>	<b>Date:</b> <u>1/13/2022</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-814</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
Robert Lynch Print Name: _____	 Initial: _____	
William Gibson Print Name: _____	 Initial: _____	
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Excellent</u> <input type="checkbox"/>	<b>Tubing Bundle:</b> <u>Excellent</u> <input type="checkbox"/>	<b>Water Level Indicator:</b> <u>Excellent</u> <input type="checkbox"/>
<b>List of Decontamination Materials</b>		
<p style="text-align: center;"><b>Deionized Water</b></p> <b>Source:</b> <u>Culligan</u> <b>Lot Number:</b> <u>12/20/21</u> _____ _____	<p style="text-align: center;"><b>HNO<sub>3</sub></b></p> <b>Grade:</b> <u>NA</u> <b>UN #:</b> <u>NA</u> <b>Manufacturer:</b> <u>NA</u> <b>Lot Number:</b> <u>NA</u>	<p style="text-align: center;"><b>Detergent</b></p> <b>Manufacturer:</b> <u>liquinox</u> <b>Lot Number:</b> <u>L1L0</u> <b>Expiration Date:</b> <u>11/22</u>


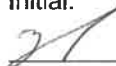
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**Portable Pump and Tubing / Water Level Indicator Decontamination Log Form**

<b>SNL/NM Project Name:</b> <u>CWL</u>	<b>Monitoring Well ID #:</b> <u>CWL-MW11</u>	<b>Date:</b> <u>1/14/2022</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-814</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>Excellent</u>	<b>Tubing Bundle:</b> <u>Excellent</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>12/20/21</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>1/19/2022</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-814</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>Excellent</u>	<b>Tubing Bundle:</b> <u>Excellent</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>12/20/21</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 JANUARY 2022 SAMPLES**

**Sample Summary for Chemical Waste Landfill Groundwater Monitoring  
January 2022**

<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	12-Jan-22	622743	116560	Environmental	n/a	622743 / 116561	622743 / 116559	
CWL-MW9	13-Jan-22	622746	116567	Environmental	622744 / 116562	622746 / 116569	n/a	
CWL-MW9	13-Jan-22	622746	116568	Duplicate	622744 / 116562	622746 / 116569	n/a	
CWL-MW10	19-Jan-22	622751	116581	Environmental	n/a	622751 / 116582	n/a	
CWL-MW11	14-Jan-22	622748	116573	Environmental	n/a	622748 / 116574	622748 / 116572	
CWL - EB1	12-Jan-22	622744	116562	Equipment Blank	n/a	622744 / 116563	n/a	Decon prior to CWL-MW9
CWL - FB1	12-Jan-22	622743	116559	Field Blank	n/a	622743 / 116561	n/a	at CWL-BW5
CWL - FB2	14-Jan-22	622748	116572	Field Blank	n/a	622748 / 116574	n/a	at CWL-MW11
CWL - DIWQC	14-Jan-22	622749	116575	QC-DIW	n/a	622749 / 116576	n/a	DI Source for equipment decontamination
<b>Waste Characterization Samples</b>								
CWL-BW5	12-Jan-22	622742	116551	Waste	n/a	622742 / 116552	n/a	No data validation required
CWL-MW9	13-Jan-22	622745	116564	Waste	n/a	622745 / 116565	n/a	No data validation required
CWL-MW10	17-Jan-22	622750	116577	Waste	n/a	622750 / 116578	n/a	No data validation required
CWL-MW11	14-Jan-22	622747	116570	Waste	n/a	622747 / 116571	n/a	No data validation required

**DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**

**CHEMICAL WASTE LANDFILL**

**GROUNDWATER MONITORING**

**JANUARY 2022**



**AR/COC NUMBERS 622743, 622744**

## Memorandum

Date: February 21, 2022

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622743 and 622744  
SDG: 567213  
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 analytes were detected in any of the blanks except as follows. Chloroform was detected at > the PQL in FB1, sample 567213007, submitted on ARCOG 622743 and associated with sample -008. The associated sample result was non-detect and not be qualified.

Chloroform was detected at > the PQL in EB1, sample -011 submitted on ARCOG 622744 and associated with samples on ARCOG 62746 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 a non-validated 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. FB1 was submitted with ARCOG 622743 and was associated with the sample on the same ARCOG. EB1 was submitted with ARCOG 622744 and was associated with the samples on ARCOG 622746, submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Linda Thal

**Level:** I

**Date:** 02/22/2022

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## Memorandum

Date: February 21, 2022  
To: File  
From: Mary Donovan  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622743 and 622744  
SDG: 567213  
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 a non-validated 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 a non-validated 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 567213009 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 a non-validated SNL sample of similar matrix from the same SDG. No data will be qualified.

### **Other QC**

EB1 was submitted with ARCOG 622744 and was associated with the samples on ARCOG 622746, submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Linda Thal

**Level:** I

**Date:** 02/22/2022



## Sample Findings Summary



AR/COC: 622743, 622744

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#: 622743 and 622744	Site/Project: CWL PCCP	Validation Date: 02/21/2022
SDG #: 567213	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: 01/12/2022

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

ARCOG 622742 was submitted in the same SDG but was not validated per client request.

EB1 was submitted on ARCOG 622744 and was associated with the samples on ARCOG 622746 submitted in another SDG.

Validated by:

*Mary A. Donovan*





## Sandia Inorganic Metals Worksheet

ARCO # (s): 622743 and 622744	SDG # (s): 567213	Matrix: Aqueous
Laboratory Sample IDs: 567213009, -012		
Method/Batch #s: <b>3005A/6020B</b> :2217886/2217887		

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 -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 532557002 (Sample was submitted on same SDG but not for validation.)  
 Ca >100 mg/L for sample -009; ICS A < MDL

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *N/A*

SMO Use

AR/COC **622743**

Project Name: CWL PCCP	Date Samples Shipped: <i>1/12/2022</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>34166</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: CF327-22	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					
116559	001	CWL- FB1	NA	1/12/22 09:53	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[CWL PCCP]	007
116560	001	CWL-BW5	522	1/12/22 10:00	GW	G	3x40 ml	HCl	G	SA	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[CWL PCCP]	008
116560	002	CWL-BW5	522	1/12/22 10:01	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	009
116561	001	CWL-TB2	NA	1/12/22 09:53	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[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		Sample Name		Signature		Negotiated TAT <input type="checkbox"/>		
Sample Team Members		Init.		Company/Organization/Phone/Cell		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab		

Relinquished by <i>[Signature]</i> Org. <i>8880</i> Date <i>1/12/22</i> Time <i>11:20</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>2618</i> Date <i>1/12/22</i> Time <i>11:20</i>	Received by _____ Org. _____ Date _____ Time _____
Relinquished by <i>[Signature]</i> Org. <i>00018</i> Date <i>1/12/22</i> Time <i>1300</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. _____ Date <i>1/13/22</i> Time <i>745</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/COC **622744**

Page 1 of 1

Project Name: CWL PCCP	Date Samples Shipped: <i>1/12/2022</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>34166</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: CF327-22	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					
116562	001	CWL- EB1	NA	1/12/22 11:00	DIW	G	3x40 ml	HCl	G	EB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[CWL PCCP]	011
116562	002	CWL- EB1	NA	1/12/22 11:01	DIW	P	500 ml	HNO3	G	EB	CHROMIUM, NICKEL (SW846-6020)	012
116563	001	CWL-TB3	NA	1/12/22 11:00	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[CWL PCCP]	013

<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> Special Instructions/QC Requirements: 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>[Init]</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>[Init]</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>[Init]</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>[Init]</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>[Init]</i>	SNL/08888/505-844-4013/505-250-7090	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	<b>Sample Disposal</b> <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <b>Return Samples By:</b> Comments: Trip blanks received from lab with head space.		
Name	Signature	Init.	Company/Organization/Phone/Cell																				
Robert Lynch	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-844-4013/505-250-7090																				
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>5588</i> Date <i>1/12/22</i> Time <i>11:20</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>0618</i> Date <i>1/12/22</i> Time <i>11:20</i>	Received by _____ Org. _____ Date _____ Time _____
Relinquished by <i>[Signature]</i> Org. <i>00618</i> Date <i>1/12/22</i> Time <i>1300</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. _____ Date <i>1/13/22</i> Time <i>745</i>	Received by _____ Org. _____ Date _____ Time _____

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

**AR/COC NUMBER 622746**

## Memorandum

Date: February 23, 2022

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622746  
SDG: 567417  
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 analytes were detected in any of the blanks except as follows. Chloroform was detected at > the PQL in EB1, sample 567213011 submitted on ARCOG 622744 in another SDG and associated with

samples 567417007 and -009 on ARCOG 622746 submitted in this SDG. 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 a non-validated 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 the ARCOG. EB1 was submitted on ARCOG 622744 in another SDG and was associated with the samples on ARCOG 622746, submitted in this SDG. A field duplicate pair was submitted on ARCOG 622746. 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:** 02/23/2022

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## Memorandum

Date: February 23, 2022  
To: File  
From: Mary Donovan  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622746  
SDG: 567417 and 570508 (relog)  
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. Problems were identified with the data package that resulted in the qualification of data.

1. Samples 567417008 and -010 were relogged and reanalyzed for metals as samples 570508001 (116567-R02) and -002 (116568-R02) because the original sample results did not agree with historical results and the field duplicate results did not agree with each other. The reanalysis did not confirm the original results and the original sample results will be **qualified R,X1** based on professional judgment and per client request.

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 for both samples because the sample concentrations for Ca were > 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.

### **Other QC**

EB1 was submitted on ARCOG 622744 in another SDG and was associated with the samples on ARCOG 622746, submitted in this SDG. A field duplicate pair was submitted on ARCOG 622746. 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:** 02/23/2022





## Sample Findings Summary



AR/COC: 622746

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005A/6020B			
	116567-002/CWL-MW9	Chromium (7440-47-3)	R, X1
	116567-002/CWL-MW9	Nickel (7440-02-0)	R, X1
	116568-002/CWL-MW9	Chromium (7440-47-3)	R, X1
	116568-002/CWL-MW9	Nickel (7440-02-0)	R, X1

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

## Sandia Data Validation Summary Worksheet

ARCOG#: 622746	Site/Project: CWL PCCP	Validation Date: 02/23/2022
SDG #: 567417 and 570508 (relog)*	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: 01/13/2022

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

ARCOG 622745 was submitted in the same SDG but was not validated per client request.

EB1 was submitted on ARCOG 622744 in another SDG and was associated with the samples on ARCOG 622746 submitted in this SDG.

Samples 116567-002 and 116568-002 were relogged in SDG 570508 as 116567-R02 and 116568-R02 for metals analysis per client request.

Validated by:

*Mary A. Donovan*



## Sandia Inorganic Metals Worksheet

ARCO # (s): 622746	SDG # (s): 567417 and 570508 (relog)*	Matrix: Aqueous
Laboratory Sample IDs: 567417008, -010 and 570508001, -002*		
Method/Batch #s: <b>3005A/6020B</b> :2219401/2219402 and 2230436/2230437*		

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 567213 -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 sample -001

\*Ca >100 mg/L for samples -001 and -002; ICS A < MDL

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC **622746**

Project Name: CWL PCCP	Date Samples Shipped: <i>Jan. 13, 2022</i>	SMO Authorization: <i>[Signature]</i>
Project/Task Manager: Timmie Jackson	Carrier/Waybill No: <i>341260</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: CF327-22	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

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					
116567	✓001	CWL-MW9	517	1/13/22 10:06	GW	G	3x40 ml	HCl	G	SA	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[CWL PCCP]	007
116567	✓002	CWL-MW9	517	1/13/22 10:08	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	008
116568	✓001	CWL-MW9	517	1/13/22 10:07	GW	G	3x40 ml	HCl	G	DU	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[CWL PCCP]	009
116568	✓002	CWL-MW9	517	1/13/22 10:09	GW	P	500 ml	HNO3	G	DU	CHROMIUM, NICKEL (SW846-6020)	010
116569	✓001	CWL-TB5	NA	1/13/22 10:06	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[CWL PCCP]	011

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.	
	Robert Lynch	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-844-4013/505-250-7090
	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	
			Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	
			Return Samples By:	
			Comments: Trip blanks recived from lab with head space.	

Relinquished by <i>[Signature]</i> Org. <i>8888</i> Date <i>1-13-22</i> Time <i>1045</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>0018</i> Date <i>1/13/22</i> Time <i>1045</i>	Received by _____ Org. _____ Date _____ Time _____
Relinquished by <i>[Signature]</i> Org. <i>0018</i> Date <i>1/13/22</i> Time <i>1205</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. _____ Date <i>1/14/22</i> Time <i>730</i>	Received by _____ Org. _____ Date _____ Time _____

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

**AR/COC NUMBERS 622748, 622749**

## Memorandum

Date: February 24, 2022

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622748 and 622749  
SDG: 567677  
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 analytes were detected in any of the blanks except as follows. Chloroform was detected at > the PQL in FB2, sample 567677007, associated with sample -008. The associated sample result was non-detect and will not be qualified.

Chloroform was detected at > the PQL in the DIWQC sample, sample -011. No field 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 unvalidated SNL sample of similar matrix from this 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. FB2 was submitted on ARCO 622748 and was associated with the sample on the same ARCO. A DIWQC sample was submitted on ARCO 622749 and was the DI source for equipment decontamination.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 02/24/2022

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## Memorandum

Date: February 24, 2022  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622748 and 622749  
SDG: 567677  
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 except as follows. Cr was detected at  $\leq$  the PQL in the method blank. The associated sample results were non-detect and will not be qualified.

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

The ICP-MS internal standards met QC acceptance criteria.

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

The MS met all QC acceptance criteria. It should be noted that the MS was performed on an unvalidated sample 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 was performed on an unvalidated sample 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 567677009 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 was performed on an unvalidated sample from the same SDG. No data will be qualified.

### **Other QC**

A DIWQC sample was submitted on ARCOG 622749 and was the DI source for equipment decontamination.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 02/24/2022



## Sample Findings Summary



AR/COC: 622748, 622749

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#: 622748 and 622749	Site/Project: CWL PCCP	Validation Date: 02/24/2022
SDG #: 567677	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								

Comments: Collected: 01/14/2022

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

Sample Receipt and Review Form section on headspace not completed.

ARCOCs 622747 and 622750 were submitted in the same SDG but were not validated per client request.

Validated by:

*L Thal*

## Sandia Organic Worksheet (GC/MS VOC)

ARCO # (s): 622748 and 622749	SDG: 567677	Matrix: Aqueous
Laboratory Sample IDs: 567677007, -008, -010, -011, -013		
Method/Batch #s: <b>8260D</b> 222809	Tuning (pass/fail): pass	TICs Required? (yes/no): no

Analyte (outliers)	Calibration				MB	5X (10X) MB	LCS %R	MS %R	MSD %R	MS/ MSD RPD	TB7 -010	TB8 -013	DIW QC -011	FB2 -007
	Int.	RF/ Slope	RSD /r <sup>2</sup>	(ICV)/CCV %D										
Chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	4.52	4.71

## Surrogate Recovery Outliers

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

## IS Outliers

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

Comments: HTs OK.

ICAL VOA1.I 12/13/2021 All average RF for reported analytes

MS/MSD on SNL sample 567677001 (An unvalidated sample in the same SDG)

## Sandia Inorganic Metals Worksheet

ARCO #s: 622748 and 622749

SDG #(s): 567677

Matrix: Aqueous

Laboratory Sample IDs: 567677009, -012

Method/Batch #s: **3005A/6020B**: 2219773/2219774ICPMS 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	DIWQC -012
	Int. ug/L	R <sup>2</sup>	ICV	CCV	ICB ug/L	CCB ug/L										
Cr	✓	✓	✓	✓	✓	✓	0.00631J	0.032	✓	✓	✓	✓	✓	✓	✓	✓

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 sample 567677002 (An unvalidated sample in the same SDG)

Ca &gt;100 mg/L for sample -009; ICS A &lt; MDL

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *n/a*

SMO Use

AR/COC **622748**

Project Name: CWL PCCP	Date Samples Shipped: <i>1/17/2022</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>34745</i>	SMO Contact Phone: <i>[Signature]</i>	
Project/Task Number: 195122.10.11.03	Lab Contact: Zac Worsham/843-300-4224	Wendy Palencia/505-844-3132	
Service Order: CF327-22	Lab Destination: GEL	Send Report to SMO: Stephanie Montaño/505-284-2553	
Tech Area:		Contract No.: 1983530	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					
116572	✓001	CWL-FB2	NA	1/14/22 09:55	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[CWL PCCP]	<i>007</i>
116573	✓001	CWL-MW11	513	1/14/22 10:50	GW	G	3x40 ml	HCl	G	SA	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[CWL PCCP]	<i>008</i>
116573	✓002	CWL-MW11	513	1/14/22 10:51	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	<i>009</i>
116574	✓001	CWL-TB7	NA	1/14/22 09:55	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)[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:		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
	Robert Lynch	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-844-4013/505-250-7090
	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	
			Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	Lab Use
			Return Samples By:	
Comments: Trip blanks rec'd from lab with head space.				

Relinquished by <i>[Signature]</i> Org. <i>8888</i> Date <i>1-14-22</i> Time <i>1125</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>0048</i> Date <i>1/14/22</i> Time <i>1125</i>	Received by _____ Org. _____ Date _____ Time _____
Relinquished by <i>[Signature]</i> Org. <i>00618</i> Date <i>1/17/22</i> Time <i>1030</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>62c</i> Date <i>1-18-22</i> Time <i>1115</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. *MA*

Page 1 of 1

SMO Use

AR/COC **622749**

Project Name: CWL PCCP	Date Samples Shipped: <i>1/17/2022</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>34745</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: CF327-22	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					
116575	✓001	CWL-DIWQC	NA	1/14/22 09:53	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)(CWL PCCP)	<i>011</i>
116575	✓002	CWL-DIWQC	NA	1/14/22 09:54	DIW	P	500 ml	HNO3	G	FB	CHROMIUM, NICKEL (SW846-6020)	<i>012</i>
116576	✓001	CWL-TB8	NA	1/14/22 09:53	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)(CWL PCCP)	<i>013</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	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/08888/505-844-4013/505-250-7090	Return Samples By: Comments: Trip blanks rec'd 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>[Signature]</i> Org. <i>8888</i> Date <i>1-14-22</i> Time <i>1125</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>0008</i> Date <i>1/14/22</i> Time <i>1125</i>	Received by _____ Org. _____ Date _____ Time _____
Relinquished by <i>[Signature]</i> Org. <i>0008</i> Date <i>1/17/22</i> Time <i>1030</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>GEL</i> Date <i>1/18/22</i> Time <i>1115</i>	Received by _____ Org. _____ Date _____ Time _____

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



**AR/COC NUMBER 622751**

## Memorandum

Date: February 24, 2022

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 622751  
SDG: 568206  
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**

Two 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 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 on the ARCOG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donivan

**Level:** I

**Date:** 02/24/2022

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## Memorandum

Date: February 24, 2022  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 622751  
SDG: 568206  
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.

**Laboratory Replicate**

The replicate met all QC acceptance criteria.

**Laboratory Control Sample (LCS)**

The LCS met all QC acceptance criteria.

**Detection Limits/Dilutions**

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

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

Results of the ICS A and AB analyses were evaluated 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.

**Other QC**

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 02/24/2022

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## Sample Findings Summary



AR/COC: 622751

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#: 622751	Site/Project: CWL PCCP	Validation Date: 02/24/2022
SDG #: 568206	Laboratory: GEL Laboratories, LLC	Validator: Linda Thal
Matrix: Aqueous	# of Samples: 3	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: 01/19/2022

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

Validated by:

*L Thal*





## Sandia Inorganic Metals Worksheet

ARCO # (s): 622751	SDG # (s): 568206	Matrix: Aqueous
Laboratory Sample IDs: 568206002		
Method/Batch #s: <b>3005A/6020B</b> : 2221842/2221843		

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 sample -002  
 Ca >100 mg/L for sample -002; ICS A < MDL

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

568206

Internal Lab

Batch No. *MA*

SMO Use

AR/COG **622751**

Project Name: <u>CWL PCCP</u>	Date Samples Shipped: <u>1/20/2022</u>	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: <u>Timmie Jackson</u>	Carrier/Waybill No. <u>341773</u>	SMO Contact Phone: <u>Wendy Palencia/505-844-3132</u>	
Project/Task Number: <u>195122.10.11.03</u>	Lab Contact: <u>Zac Worsham/843-300-4224</u>	Send Report to SMO: <u>Stephanie Montaño/505-284-2553</u>	
Service Order: <u>CF327-22</u>	Lab Destination: <u>GEL</u>	Contract No.: <u>1983530</u>	
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		Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
116581	✓001	CWL-MW10	515	1/19/22 09:05	GW	G	3x40 ml	HCl	G	SA	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)(CWL PCCP)	001
116581	✓002	CWL-MW10	515	1/19/22 09:06	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	002
116582	✓001	CWL-TB10	NA	1/19/22 09:05	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE,FREON 113,PCE,1,1-DCE, CHLOROFORM, FREON 11(SW846-8260D)(CWL PCCP)	003

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"/>		
<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: Comments: Trip blanks received from lab with head space.
	William Gibson	<i>[Signature]</i>	WG	SNL/08888/505-284-3307/505-239-7367	
	Zachary Tenorio	<i>[Signature]</i>	ZT	SNL/08888/505-845-8636/505-259-5765	
Denisha Sanchez	<i>[Signature]</i>	DS	SNL/08888/505-845-7829/505-208-1375		

Relinquished by <i>Denisha Sanchez</i> Org. <u>3888</u> Date <u>1-19-22</u> Time <u>0945</u>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <u>0618</u> Date <u>1/19/22</u> Time <u>0945</u>	Received by _____ Org. _____ Date _____ Time _____
Relinquished by <i>[Signature]</i> Org. <u>0618</u> Date <u>1/20/22</u> Time <u>1100</u>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <u>GEL</u> Date <u>1/22/22</u> Time <u>1005</u>	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 2022**

<b>AR/COC Number</b>	<b>Sample Type</b>
622743	Environmental & Quality Control
622744	Quality Control
622746	Environmental & Quality Control
622748	Environmental & Quality Control
622749	Quality Control
622751	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 (622742, 622745, 622747, and 622750) 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. 622742, 622743 &amp; 622744

Analytical Lab GEL

SDG No. 567213

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	Methylene chloride and 1,2,3-trichlorobenzene detected in method blank (QC1205004873). Molybdenum detected in method blank (QC1204997315). Total Phenol detected in method blank (QC1204998276).
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		Methylene chloride detected in CWL - TB1. Chloroform detected in CWL- FB1 and CWL- EB1.
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: 02-10-2022 10:55:00

Closed by: Wendy Palencia Date: 02-10-2022 10:55:00



## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 622745 &amp; 622746

Analytical Lab GEL

SDG No. 567417

*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	Methylene chloride and 1,2,3-trichlorobenzene detected in method blank (QC1205004873)
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Methylene chloride detected in CWL- TB4
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: 02-15-2022 07:01:00

Closed by: Wendy Palencia Date: 02-15-2022 07:01:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 622746 relog

Analytical Lab GEL

SDG No. 570508

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	N/A		
	c) Matrix spike recovery data reported and met	X		
3.4	Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		

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	N/A		
3.5	Blank data a) Method or reagent blank data reported and met for all samples	X		
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met	N/A		
3.6	Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time; "N" - result associated with spike analysis outside control limits	X		
3.7	Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8	Narrative included, correct, and complete	X		
3.9	Second column confirmation data provided for methods 8330 (high explosives), pesticides/PCBs 8081 and 8082 and herbicides 8151.	N/A		

#### 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	N/A		
	b) Initial calibration provided	N/A		
	c) Continuing calibration provided	N/A		
	d) Internal standard performance data provided	N/A		
	e) Instrument run logs provided	N/A		



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	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
---------------------	----------	-------------------------------

Were deficiencies unresolved?  Yes  No

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

Reviewed by: Wendy Palencia Date: 02-21-2022 12:26:00

Closed by: Wendy Palencia Date: 02-21-2022 12:26:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 622747, 622748, 622749 &amp; 622750

Analytical Lab GEL

SDG No. 567677

*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	Copper failed recovery limits for matrix spike (QC1205000841)
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	1,2,3-Trichlorobenzene, 1,2,4-trichlorobenzene and acetone detected in method blank (QC1205006754). Chromium, molybdenum and vanadium detected in method blank (QC1205000838). Mercury detected in method blank (QC1205014805).
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		Methylene chloride detected in CWL-TB6 and CWL-TB9. Chloroform detected in CWL-FB2 and CWL-DIWQC.
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 limits not met
	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: 02-15-2022 10:08:00

Closed by: Wendy Palencia Date: 02-15-2022 10:08:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 622751

Analytical Lab GEL

SDG No. 568206

*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		
	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	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
---------------------	----------	-------------------------------

Were deficiencies unresolved?  Yes  No

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

Reviewed by: Wendy Palencia Date: 02-15-2022 11:04:00

Closed by: Wendy Palencia Date: 02-15-2022 11:04:00

**FIELD SAMPLING FORMS**  
**AUGUST 2022**  
**GROUNDWATER MONITORING**

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

SNL/NM Project Name: CWL	
Well ID: CWL-BW5	Date: 08/02/22      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)
515.81	0836	Start	-----	-----	-----	-----	-----	-----	-----
517.58	0846	1	21.55	1108.5	209.3	7.11	0.31	80.66	6.22
517.74	0850	2	21.37	1122.9	206.2	7.12	0.31	80.72	6.24
518.18	0854	3	21.24	1120.3	207.5	7.12	0.46	80.30	6.23
518.48	0857	4	21.21	1118.5	204.4	7.11	1.37	80.12	6.22
518.56	0901	5	21.28	1119.5	204.8	7.11	1.25	80.05	6.20
518.80	0908	6	21.41	1123.3	203.6	7.10	1.73	80.04	6.19
518.86	0912	7	21.41	1128.1	205.3	7.10	1.28	79.48	6.14
518.91	0917	8	21.44	1126.1	204.8	7.10	1.14	79.79	6.17
519.00	0922	9	21.50	1117.4	203.1	7.09	0.94	80.06	6.18
519.04	0926	10	21.58	1124.1	199.6	7.10	0.78	79.75	6.15
519.06	0931	11	21.73	1128.9	197.3	7.09	0.74	79.75	6.13
519.11	0936	12	21.68	1127.3	195.9	7.10	0.60	79.78	6.15
	0937	Sampling →							

Comments:

~1.5 gals purged from tubing @ 0843

## FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

SNL/NM Project Name: CWL	
Well ID: CWL-MW9	Date: 08/03/22      Date:
Pump Method: Portable	Pump Depth: 517'

## 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)
506.74	0809	Start	-----	-----	-----	-----	-----	-----	-----
508.46	0827	2	21.90	1022.1	207.7	7.15	0.18	54.89	4.21
509.00	0836	4	21.82	1013.8	204.9	7.15	0.23	53.86	4.14
509.37	0846	6	21.86	1016.1	203.9	7.15	0.27	53.38	4.10
509.66	0855	8	21.87	1011.5	199.6	7.15	0.13	53.48	4.10
509.85	0904	10	22.03	1006.7	197.7	7.14	0.15	53.26	4.07
509.94	0914	12	22.22	1007.8	195.1	7.14	0.16	53.34	4.10
510.00	0924	14	22.19	1031.6	193.5	7.13	0.14	54.59	4.16
510.04	0934	16	22.25	1027.1	191.5	7.14	0.12	54.84	4.18
510.04	0940	17	22.25	1029.9	189.5	7.14	0.10	54.77	4.17
510.04	0945	18	22.37	1028.2	188.0	7.13	0.10	55.10	4.19
510.04	0950	19	22.39	1034.2	187.2	7.13	0.10	55.12	4.19
	0951	-----	SAMPLING	-----	-----	-----	-----	-----	-----

Comments:

~1.5 gals purged from tubing @ 0818

**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL	
Well ID: CWL-MW10	Date: 08/05/22      Date: 08/08/22
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)
503.85	0843	Start							
505.99	0856	1	23.72	1021.3	49.4	7.17	1.85	9.64	0.72
506.81	0900	2	23.29	1017.5	33.1	7.18	1.29	6.46	0.48
507.58	0905	3	23.24	1011.3	24.4	7.18	1.38	5.35	0.40
508.35	0909	4	23.24	1027.7	18.3	7.19	0.82	4.65	0.34
508.99	0913	5	23.27	1018.8	12.4	7.19	0.75	4.12	0.29
509.76	0918	6	23.31	1003.4	9.0	7.18	0.52	3.74	0.30
510.46	0922	7	23.10	1016.7	8.4	7.19	0.55	4.03	0.33
511.27	0927	8	22.89	1008.4	9.4	7.19	0.98	4.67	0.35
511.96	0930	9	23.04	1003.4	11.9	7.19	1.36	6.65	0.48
512.77	0937	10	23.11	1015.3	12.5	7.19	2.93	8.14	0.61
513.68	0942	11	22.96	1003.5	15.9	7.18	4.53	7.67	0.57
514.57	0947	12	23.01	991.44	14.3	7.18	5.92	7.49	0.56
515.06	0953	13	23.75	995.03	16.0	7.19	6.81	17.00	1.08
515.27	0954	Well	DRY						
08/08/22 504.61	0840	START							
506.47	0849	0.5	21.92	1023.4	-17.9	7.21	1.05	30.52	2.15
506.93	0851	1	21.75	1018.8	-21.8	7.21	0.65	28.96	2.24
507.35	0853	1.5	21.68	1016.3	-34.7	7.20	0.97	17.38	1.34
	0854	SAMPLING							

Comments:

~ 1.5 gals purged from tubing @0851

0847 08/08/22

red colored material observed on pump after removal from well.



**FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION**

SNL/NM Project Name: CWL	
Well ID: CWL-MW11	Date: 08/09/22      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)
502.04	0817	Start	-----	-----	-----	-----	-----	-----	-----
504.37	0837	2	21.43	1067.3	190.1	7.09	0.47	66.53	5.18
505.55	0847	4	21.46	1037.7	178.4	7.09	0.26	66.37	5.14
506.61	0857	6	21.62	1057.7	173.0	7.08	0.23	66.28	5.13
507.56	0910	8	22.06	1060.2	169.0	7.08	0.63	66.88	5.14
508.62	0914	10	22.46	1060.4	164.5	7.07	0.53	68.03	5.19
508.91	0928	12	22.77	1061.1	161.1	7.07	0.62	68.02	5.14
509.54	0939	14	22.98	1058.6	159.4	7.07	0.57	68.31	5.16
510.53	0953	16	23.29	1054.8	151.9	7.06	0.49	67.78	5.08
510.91	1000	17	23.48	1086.6	135.8	7.06	0.62	67.54	5.05
511.50	1011	18	23.66	1090.4	11.5	7.04	0.59	68.21	4.48
511.89	1023	19	24.27	1096.0	10.0	7.04	0.70	58.82	4.29
512.17	1035	20	24.17	1090.6	25.8	7.03	0.67	62.13	4.60
	1036	Sampling →							

Comments:  
 ~ 4 gals purged from tubing @ 0827  
  
 FB Lot # 080322

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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>08/02/22</b>		
Make & Model: <b>In-Situ Aqua Troll 600</b>						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571114</b>						
Other (SN): <b>NA</b>						
<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>0647</b>	<b>4.00</b>	<b>24.31</b>	<b>6.99</b>	<b>24.24</b>	<b>10.01</b>
2. Time (24 hr):	<b>1028</b>	<b>3.99</b>	<b>24.36</b>	<b>6.98</b>	<b>24.30</b>	<b>10.02</b>
3. Time (24 hr):						
4. Time (24 hr):						
Standard Lot No.:	<b>1GK093</b>		<b>1GK095</b>		<b>1G1516</b>	
Expiration Date.:	<b>NOV/23</b>		<b>NOV/23</b>		<b>SEP/23</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>0646</b>	<b>1382.2</b>	<b>24.30</b>	1. Time (24 hr):	<b>0654</b>	<b>220.8</b>
2. Time (24 hr):	<b>1027</b>	<b>1387.0</b>	<b>24.36</b>	2. Time (24 hr):	<b>1034</b>	<b>219.6</b>
3. Time (24 hr):				3. Time (24 hr):		
4. Time (24 hr):				4. Time (24 hr):		
Standard Lot No.:	<b>1GJ701</b>		Expiration Date.:		<b>OCT/22</b>	
			Standard Lot No.:		<b>1GK329</b>	
			Expiration Date.:		<b>AUG/22</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>0645</b>	<b>81.20</b>	<b>28.13</b>			
2. Time (24 hr):	<b>1026</b>	<b>81.37</b>	<b>26.41</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				
Calibration done by: R Lynch			Date:	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 21090D000589	
Reference Value	10	20	100	800
Standard Lot No.	A1215R	A1215R	A1205	A1243
1. Time (24 hr): 0645	10.3	20.2	103	809
2. Time (24 hr): 1025	10.2	20.0	101	806
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>R Lynch</b>				Date: <b>08/03/22</b>			
Make & Model: <b>In-Situ Aqua Troll 600</b>							
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571114</b>							
Other (SN): <b>NA</b>							
<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>0607</b>	<b>4.02</b>	<b>24.58</b>	<b>7.03</b>	<b>24.52</b>	<b>10.01</b>	
2. Time (24 hr):	<b>1304</b>	<b>4.01</b>	<b>24.60</b>	<b>7.02</b>	<b>24.60</b>	<b>10.01</b>	
3. Time (24 hr):							
4. Time (24 hr):							
Standard Lot No.:	<b>1GK093</b>		<b>1GK095</b>		<b>1G1516</b>		
Expiration Date.:	<b>NOV/23</b>		<b>NOV/23</b>		<b>SEP/23</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>0613</b>	<b>1390.4</b>	<b>24.33</b>	1. Time (24 hr):	<b>0614</b>	<b>219.3</b>	
2. Time (24 hr):	<b>1302</b>	<b>1398.6</b>	<b>24.42</b>	2. Time (24 hr):	<b>1310</b>	<b>219.7</b>	
3. Time (24 hr):				3. Time (24 hr):			
4. Time (24 hr):				4. Time (24 hr):			
Standard Lot No.:	<b>1GJ701</b>	Expiration Date.:	<b>OCT/22</b>	Standard Lot No.:	<b>1GK329</b>	Expiration Date.:	<b>AUG/22</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>0606</b>	<b>82.10</b>	<b>26.37</b>				
2. Time (24 hr):	<b>1301</b>	<b>82.17</b>	<b>26.44</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				
Calibration done by: R Lynch			Date: 08/03/22	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 21090D000589	
Reference Value	10	20	100	800
Standard Lot No.	A1215R	A1215R	A1205	A1243
1. Time (24 hr): 0552	10.3	20.3	103	809
2. Time (24 hr): 1300	10.2	20.0	103	810
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>R Lynch</b>			Date: <b>08/05/22</b> <b>08/08/22</b>						
Make & Model: <b>In-Situ Aqua Troll 600</b>									
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571114</b>									
Other (SN): <b>NA</b>									
<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>0628</b>	<b>4.01</b>	<b>24.20</b>	<b>7.02</b>	<b>24.24</b>	<b>10.02</b>	<b>24.08</b>		
2. Time (24 hr):	<b>1333</b>	<b>4.02</b>	<b>24.39</b>	<b>7.03</b>	<b>24.40</b>	<b>10.03</b>	<b>24.36</b>		
3. Time (24 hr):	<b>0635</b>	<b>4.03</b>	<b>24.49</b>	<b>7.01</b>	<b>24.61</b>	<b>10.01</b>	<b>24.59</b>		
4. Time (24 hr):	<b>1243</b>	<b>4.03</b>	<b>24.30</b>	<b>7.02</b>	<b>24.36</b>	<b>10.01</b>	<b>24.50</b>		
Standard Lot No.:	<b>1GK093</b>		<b>1GK095</b>		<b>1G1516</b>				
Expiration Date.:	<b>NOV/23</b>		<b>NOV/23</b>		<b>SEP/23</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>0627</b>	<b>1371.2</b>	<b>24.30</b>	1. Time (24 hr):	<b>0634</b>	<b>219.2</b>	<b>24.10</b>		
2. Time (24 hr):	<b>1332</b>	<b>1382.4</b>	<b>24.44</b>	2. Time (24 hr):	<b>1338</b>	<b>219.1</b>	<b>24.41</b>		
3. Time (24 hr):	<b>0633</b>	<b>1386.2</b>	<b>24.47</b>	3. Time (24 hr):	<b>0649</b>	<b>219.4</b>	<b>24.77</b>		
4. Time (24 hr):	<b>1242</b>	<b>1380.4</b>	<b>24.22</b>	4. Time (24 hr):	<b>1248</b>	<b>219.5</b>	<b>24.02</b>		
Standard Lot No.:	<b>1GJ701</b>		Expiration Date.:	<b>OCT/22</b>		Standard Lot No.:	<b>1GK329</b>	Expiration Date.:	<b>AUG/22</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>0626</b>	<b>81.58</b>	<b>26.38</b>						
2. Time (24 hr):	<b>1331</b>	<b>81.35</b>	<b>26.34</b>						
3. Time: (24 hr)	<b>0631</b>	<b>82.09</b>	<b>26.42</b>						
4. Time (24 hr):	<b>1241</b>	<b>82.22</b>	<b>26.52</b>						

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

SNL/NM Project Name: CWL				
Calibration done by: R Lynch			Date: 08/05/22 08/08/22	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 21090D000589	
Reference Value	10	20	100	800
Standard Lot No.	A1215R	A1215R	A1205	A1243
1. Time (24 hr): 0625	10.4	19.8	101	807
2. Time (24 hr): 1330	10.2	19.9	100	808
3. Time (24 hr): 0630	10.3	20.2	103	805
4. Time (24 hr): 1240	10.2	20.1	101	807
Comments:				

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

SNL/NM Project Name: <b>CWL</b>						
Calibrations done by: <b>R Lynch</b>				Date: <b>08/09/22</b>		
Make & Model: <b>In-Situ Aqua Troll 600</b>						
Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: <b>571114</b>						
Other (SN): <b>NA</b>						
<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>0628</b>	<b>4.00</b>	<b>24.06</b>	<b>7.00</b>	<b>24.09</b>	<b>10.01</b>
2. Time (24 hr):	<b>1236</b>	<b>3.99</b>	<b>24.18</b>	<b>7.01</b>	<b>24.20</b>	<b>10.00</b>
3. Time (24 hr):						
4. Time (24 hr):						
Standard Lot No.:	<b>1GK093</b>		<b>1GK095</b>		<b>1GK654</b>	
Expiration Date.:	<b>NOV/23</b>		<b>NOV/23</b>		<b>NOV/23</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>0624</b>	<b>1381.7</b>	<b>24.11</b>	1. Time (24 hr):	<b>0625</b>	<b>220.3</b>
2. Time (24 hr):	<b>1235</b>	<b>1386.9</b>	<b>24.21</b>	2. Time (24 hr):	<b>1242</b>	<b>220.8</b>
3. Time (24 hr):				3. Time (24 hr):		
4. Time (24 hr):				4. Time (24 hr):		
Standard Lot No.:	<b>1GJ701</b>		Expiration Date.:	<b>OCT/22</b>		Standard Lot No.:
				<b>1GK329</b>		Expiration Date.:
						<b>AUG/22</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>82.79</b>	<b>26.50</b>			
2. Time (24 hr):	<b>1234</b>	<b>82.10</b>	<b>26.78</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				
Calibration done by: R Lynch			Date: 08/09/22	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 21090D000589	
Reference Value	10	20	100	800
Standard Lot No.	A1215R	A1215R	A1205	A1243
1. Time (24 hr): 0622	10.3	20.2	103	807
2. Time (24 hr): 1233	10.2	20.0	101	806
3. Time (24 hr):				
4. Time (24 hr):				
Comments:				

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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>Pre Decon</u>	<b>Date:</b> <u>8/1/2022</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-893</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
Denisha Sanchez Print Name: _____		Initial: _____
Zach Tenorio Print Name: _____		Initial: _____
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Excellent</u>	<b>Tubing Bundle:</b> <u>Excellent</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>05/16/22 - 06/06/22</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L2C2</u>
_____	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>03/24</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-BW5</u>	<b>Date:</b> <u>8/2/2022</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-893</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
Zach Tenorio Print Name: _____	<u>ZT</u> Initial: _____	
Robert Lynch Print Name: _____	<u>RL</u> Initial: _____	
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Excellent</u>	<b>Tubing Bundle:</b> <u>Excellent</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>-5/16/22-06/06/22</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L2C2</u>
_____	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>03/24</u>
_____	<b>Lot Number:</b> <u>NA</u>	

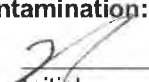
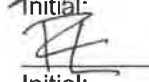
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**Portable Pump and Tubing / Water Level Indicator Decontamination Log Form**

<b>SNL/NM Project Name:</b> <u>CWL</u>	<b>Monitoring Well ID #:</b> <u>CWL-MW9</u>	<b>Date:</b> <u>8/4/2022</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-893</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
Zach Tenorio Print Name: _____	 Initial: _____	
Robert Lynch Print Name: _____	 Initial: _____	
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Excellent</u>	<b>Tubing Bundle:</b> <u>Excellent</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/ 858 N</u>	<b>Grade:</b> <u>NA</u>	<b>Manufacturer:</b> <u>Liquinox</u>
<b>Lot Number:</b> <u>05/16/22-858 N</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L2C2</u>
_____	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>03/24</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>8/8/2022</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-893</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
<u>Zach Tenorio</u> Print Name:	 Initial:	
<u>Robert Lynch</u> Print Name:		 Initial:
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Excellent</u>	<b>Tubing Bundle:</b> <u>Excellent</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/ 858</u>	<b>Grade:</b> <u>NA</u>	<b>Manufacturer:</b> <u>Liquinox</u>
<b>Lot Number:</b> <u>08/04/22-858 N</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L2C2</u>
_____	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>03/24</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>8/9/2022</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-893</u>	<b>Water Level Indicator ID #:</b> <u>362617</u>	
<b>Personnel Performing Decontamination:</b>		
<u>Zach Tenorio</u> Print Name:	<u>  ZT  </u> Initial:	
<u>Robert Lynch</u> Print Name:	<u>  RL  </u> Initial:	
<b>Condition of Equipment</b>		
<b>Pump:</b> <u>Excellent</u>	<b>Tubing Bundle:</b> <u>Excellent</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>08/03/22</u>	<b>UN #:</b> <u>NA</u>	<b>Lot Number:</b> <u>L2C2</u>
_____	<b>Manufacturer:</b> <u>NA</u>	<b>Expiration Date:</b> <u>03/24</u>
_____	<b>Lot Number:</b> <u>NA</u>	

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## **SUMMARY SHEET FOR AUGUST 2022 SAMPLES**

Sample Summary for Chemical Waste Landfill Groundwater Monitoring  
August 2022

Sample ID	Sample Date	ARCOG	Sample Number	Sample Type	Associated Equipment Blank (ARCOG #/Sample #)	Associated Trip Blank (ARCOG # / Sample #)	Associated Field Blank (ARCOG # / Sample #)	Comments
<b>CWL GWM: Project Task # 195122.10.11.03. Service Order # CF 327-22</b>								
<b>Environmental Samples</b>								
CWL-BW5	2-Aug-22	623547	118324	Environmental	623545 / 118319	623547 / 118326	623547 / 118323	
CWL-BW5	2-Aug-22	623547	118325	Duplicate	623545 / 118319	623547 / 118326	623547 / 118323	
CWL-MW9	3-Aug-22	623549	118329	Environmental	n/a	623549 / 118330	n/a	
CWL-MW10	8-Aug-22	623554	118340	Environmental	n/a	623554 / 118341	n/a	
CWL-MW11	9-Aug-22	623552	118336	Environmental	623620 / 118490	623552 / 118337	623552 / 118335	
CWL-EB 1	1-Aug-22	623545	118319	Equipment Blank	n/a	623545 / 118320	n/a	Decon prior to CWL-BW5. Samples received by lab outside temperature acceptance criteria.
CWL-EB 2	8-Aug-22	623620	118490	Equipment Blank	n/a	623620 / 118491	n/a	Decon prior to CWL-MW11
CWL-FB 1	2-Aug-22	623547	118323	Field Blank	n/a	623547 / 118326	n/a	at CWL-BW5
CWL-FB 2	9-Aug-22	623552	118335	Field Blank	n/a	623552 / 118337	n/a	at CWL-MW11
CWL-DIWQC	3-Aug-22	623550	118331	QC-DIW	n/a	623550 / 118332	n/a	DI Source for equipment decontamination
<b>Waste Characterization Samples</b>								
CWL-BW5	2-Aug-22	623546	118321	Waste	n/a	623546 / 118322	n/a	No data validation required
CWL-MW9	3-Aug-22	623548	118327	Waste	n/a	623548 / 118328	n/a	No data validation required
CWL-MW10	5-Aug-22	623553	118338	Waste	n/a	623553 / 118339	n/a	No data validation required
CWL-MW11	9-Aug-22	623551	118333	Waste	n/a	623551 / 118334	n/a	No data validation required



**DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**

**CHEMICAL WASTE LANDFILL**

**GROUNDWATER MONITORING**

**AUGUST 2022**

**AR/COC NUMBER 623545**

## Memorandum

Date: September 5, 2022

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 623545  
SDG: 588023  
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

Two 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 samples were received at 20°C. The associated sample results were non-detect and will be **qualified R,TP3**.

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 except as noted above in the Summary section.

### Instrument Tune

All instrument tune requirements were met.

### Calibration

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

### 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 from another SDG. No data will be qualified.

The analysis of the LCS serves as a matrix-specific measure of accuracy for the TB and EB. The LCS met QC acceptance criteria and no data will be qualified.

There was no matrix-specific replicate analysis for the TB and EB. However, based on professional judgement, no sample results 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 the ARCOG. An EB was submitted on ARCOG 623545 and was associated with the samples on ARCOG 623547 submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 09/06/2022

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## Memorandum

Date: September 5, 2022  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 623545  
SDG: 588023  
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 except as follows.

Ni was detected at  $\leq$  the PQL in EB1, sample 588023002. EB1 was submitted on ARCOG 623545 in this SDG and was associated with the samples on ARCOG 623547 submitted in another SDG. No data from this SDG will be qualified.

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

The ICP-MS internal standards met QC acceptance criteria.

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

The MS met all QC acceptance criteria.

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

The analysis of the LCS serves as a matrix-specific measure of accuracy for the EB. The LCS met QC acceptance criteria and 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 from another SDG. No data will be qualified.

There was no matrix-specific replicate analysis for the EB. However, based on professional judgement, no sample results 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 concentrations for Ca, Al, Mg and Fe 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.

### **Other QC**

An EB was submitted on ARCOG 623545 and was associated with the samples on ARCOG 623547 submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 09/06/2022

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## Sample Findings Summary



AR/COC: 623545

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 8260D			
	118319-001/CWL-EB1	Trichloroethylene (79-01-6)	R, TP3
	118320-001/CWL-TB1	Trichloroethylene (79-01-6)	R, TP3

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



## Sandia Data Validation Summary Worksheet

ARCOG#: 623545	Site/Project: CWL PCCP	Validation Date: 09/05/2022
SDG #: 588023	Laboratory: GEL Laboratories, LLC	Validator: Linda Thal
Matrix: Aqueous	# of Samples: 3	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
118319-001 CWL-EB1	588023001	VOC-TCE	HCl/20°C	08/01/2022	08/10/2022	08/10/2022	Yes	No
118320-001 CWL-TB1	588023003	VOC-TCE	HCl/20°C	08/01/2022	08/10/2022	08/10/2022	Yes	No

Comments: Collected: 08/01/2022

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

EB1 was submitted on ARCOG 623545 and was associated with the samples on ARCOG 623547 submitted in another SDG.

Validated by:

*L Thal*



### Sandia Inorganic Metals Worksheet

ARCOC #(s): 623545	SDG #(s): 588023	Matrix: Aqueous
Laboratory Sample IDs: 588023002		
Method/Batch #s: <b>3005A/6020B</b> : 2299452/2299453		

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 -002	5X
	Int. ug/L	R <sup>2</sup>	ICV	CCV	ICB ug/L	CCB ug/L											
Ni	NA	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	NA	NA	✓	0.000642J	0.00321	

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  
 DUP/MS/SD performed on SNL sample 588348002  
 ICS NA

### CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

page 1 of 1  
ARCOG 623545

**SMO Use**

Project Name: CWL PCCP Project Manager: Timmie Jackson P/T No: 195122.10.11.03	Date Samples Shipped: <u>8/1/2022</u> SNL Shipper #: <u>351773</u> Lab Contact: Zachary Worsham/ 843-300-4224 Lab Destination: GEL Contract No.: 1983530	SMO Authorization: <u>[Signature]</u> SMO Contact Phone: Wendy Palencia/505.844.3132	Waste Characterization: No RMA: No 4° Celsius: Yes
TA: Bldg: Room:	Last Chain: No Validation Req'd: Yes	Turnaround Time: 30 days EDD: Yes	SDG #: <u>8/1/2022</u> <u>588023</u>

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
118319	001	CWL-EB1	0	08/01/22 10:47	DIW	G	3x40 ml	HCl	G	EB	VOC-TCE (SW846-8260D)	001
118319	002	CWL-EB 1	0	08/01/22 10:48	DIW	P	500 ml	HNO3	G	EB	CHROMIUM, NICKEL (SW846-6020)	002
118320	001	CWL-TB1	0	08/01/22 10:47	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260D)	003

Sample Team Members	Name Denisha Sanchez Zachary Tenorio	Signature <u>[Signature]</u>	Comments: Trip blanks received from lab with head space.

Relinquished by <u>[Signature]</u>	Org. <u>8888</u>	Date <u>8/1/22</u>	Time <u>1105</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8/1/22</u>	Time <u>1105</u>	Received by	Org.	Date	Time
Relinquished by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8/1/22</u>	Time <u>1200</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org.	Date <u>8/1/22</u>	Time <u>7:55</u>	Received by	Org.	Date	Time

**AR/COC NUMBER 623547**

## Memorandum

Date: September 6, 2022

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 623547  
SDG: 588105  
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 RPD met QC acceptance criteria.

The analysis of the LCS serves as a matrix-specific measure of accuracy for the TB and FB. The LCS met QC acceptance criteria and no data will be qualified.

There was no matrix-specific replicate analysis for the TB and FB. However, based on professional judgement, no sample results 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 and FB 1 were submitted on ARCOG 623547 and were associated with the samples on the same ARCOG. EB 1 was submitted on ARCOG 623545 in another SDG and was associated with the samples on ARCOG 623547 submitted in this SDG. It should be noted that the EB result was rejected due to sample receipt temperature of 20°C. A field duplicate pair was submitted on ARCOG 623547. 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:** 09/07/2022

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## Memorandum

Date: September 6, 2022  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 623547  
SDG: 588105  
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. Problems were identified with the data package that resulted in the qualification of data.

1. Ni was detected at  $\leq$  the PQL in EB 1, sample 588023002, submitted on ARCOG 623545 in another SDG and associated with samples 588105003 and -005. The associated sample results were detects  $\leq$  the PQL and will be **qualified 0.002U,B2**; non-detect at the PQL.

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

### Holding Times 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 except as noted above in the Summary section.

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

The ICP-MS internal standards met QC acceptance criteria.

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

The MS met all QC acceptance criteria.

It should be noted that the MS was performed on an SNL sample 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 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 evaluated because the sample concentrations for Ca were > 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.

### **Other QC**

EB 1 was submitted on ARCOG 623545 in another SDG and was associated with the samples on ARCOG 623547 submitted in this SDG. A field duplicate pair was submitted on ARCOG 623547. 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:** 09/07/2022

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## Sample Findings Summary



AR/COC: 623547

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005A/6020B			
	118324-002/CWL-BW5	Nickel (7440-02-0)	0.002U, B2
	118325-002/CWL-BW5	Nickel (7440-02-0)	0.002U, B2

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

## Sandia Data Validation Summary Worksheet

ARCOG#: 623547	Site/Project: CWL PCCP	Validation Date: 09/06/2022
SDG #: 588105	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								

Comments: Collected: 08/02/2022

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

EB1 was submitted on ARCOG 623545 in another SDG and was associated with the samples on ARCOG 623547 submitted in this SDG.

ARCOG 623546 was submitted in the same SDG but was not validated per client request.

Validated by:

*L Thal*



## Sandia Inorganic Metals Worksheet

ARCO # (s): 623547	SDG # (s): 588105	Matrix: Aqueous
Laboratory Sample IDs: 588105003, -005		
Method/Batch #s: <b>3005A/6020B</b> : 2298686/2298687		

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 588023 -002	5X
	Int. ug/L	R <sup>2</sup>	ICV	CCV	ICB ug/L	CCB ug/L											
Ni	NA	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	0.000642J	0.00321	

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  
 DUP/MS/SD performed on SNL sample 588103003  
 Ca > ICS

CONTRACT LABORATORY  
ANALYSIS REQUEST AND CHAIN OF CUSTODY

8/3/22 (SD)  
588105

page 1 of 1  
ARCO 623547

SMO Use

Project Name: CWL PCCP Project Manager: Timmie Jackson P/T No: 195122.10.11.03	Date Samples Shipped: 8/2/2022 SNL Shipper #: 351867 Lab Contact: Zachary Worsham/ 843-300-4224 Lab Destination: GEL Contract No.: 1983530	SMO Authorization: <i>Old</i> SMO Contact Phone: Wendy Palencia/505.844.3132	Waste Characterization: No RMA: No 4° Celsius: Yes
TA: Bldg: Room:	Last Chain: No Validation Req'd: Yes	Turnaround Time: 30 days EDD: Yes	SDG #: 588105

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
118323	001	CWL-FB 1	0	08/02/22 09:33	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE (SW846-8260D)	001
118324	001	CWL-BW5	522	08/02/22 09:37	GW	G	3x40 ml	HCl	G	SA	VOC-TCE (SW846-8260D)	002
118324	002	CWL-BW5	522	08/02/22 09:39	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	003
118325	001	CWL-BW5	522	08/02/22 09:38	GW	G	3x40 ml	HCl	G	DU	VOC-TCE (SW846-8260D)	004
118325	002	CWL-BW5	522	08/02/22 09:40	GW	P	500 ml	HNO3	G	DU	CHROMIUM, NICKEL (SW846-6020)	005
118326	001	CWL-TB 3	0	08/02/22 09:33	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260D)	006

Sample Team Members	Name	Signature	Comments: Trip blanks received from lab with head space.
	Robert Lynch	<i>[Signature]</i>	
	Zachary Tenorio	<i>[Signature]</i>	

Relinquished by <i>[Signature]</i>	Org. 8888	Date 8/2/22	Time 1015	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i>	Org. 0618	Date 8/2/22	Time 1015	Received by	Org.	Date	Time
Relinquished by <i>[Signature]</i>	Org. 0618	Date 8/2/22	Time 1115	Relinquished by	Org.	Date	Time
Received by <i>[Signature]</i>	Org.	Date 8/3/22	Time 715	Received by	Org.	Date	Time

**AR/COC NUMBERS 623549, 623550**



## Memorandum

Date: September 7, 2022

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 623549 and 623550  
SDG: 588348  
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 RPD 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.

The analysis of the LCS serves as a matrix-specific measure of accuracy for the TBs and DIW QC sample. The LCS met QC acceptance criteria and no data will be qualified.

There was no matrix-specific replicate analysis for the TBs and DIW QC sample. However, based on professional judgement, no sample results 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 for each ARCO. A DIW QC sample was submitted on ARCO 623550 and was the source water for equipment decontamination for the sampling event.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 09/07/2022

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## Memorandum

Date: September 7, 2022  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 623549 and 623550  
SDG: 588348  
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 from the same SDG that was not part of data validation. 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 from the same SDG that was not part of data validation. 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 588348008 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 was performed on an SNL sample from the same SDG that was not part of data validation. No data will be qualified.

### **Other QC**

A DIW QC sample was submitted on ARCOG 623550 and was the source water for equipment decontamination for the sampling event.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donivan

**Level:** I

**Date:** 09/07/2022

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## Sample Findings Summary



AR/COC: 623549, 623550

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#: 623549 and 623550	Site/Project: CWL PCCP	Validation Date: 09/07/2022
SDG #: 588348	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								

Comments: Collected: 08/03/2022

The ARCOGs noted that the trip blank vials were received from the lab with headspace.  
 ARCOG 623548 was submitted in the same SDG but was not validated per client request.

Validated by:

*L Thal*



## Sandia Inorganic Metals Worksheet

ARCO # (s): 623549 and 623550	SDG # (s): 588348	Matrix: Aqueous
Laboratory Sample IDs: 588348008, -011		
Method/Batch #: <b>3005A/6020B</b> : 2299452/2299453		

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	DIWQC -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  
 DUP/MS/SD performed on SNL sample 588348002, same SDG, not part of data validation  
 Ca > ICS for -008



CONTRACT LABORATORY  
ANALYSIS REQUEST AND CHAIN OF CUSTODY

ARCO 623549

SMO Use

Project Name: CWL PCCP Project Manager: Timmie Jackson P/T No: 195122.10.11.03	Date Samples Shipped: <u>8/3/2022</u> SNL Shipper #: <u>351962</u> Lab Contact: Zachary Worsham/ 843-300-4224 Lab Destination: GEL Contract No.: 1983530	SMO Authorization: <u>[Signature]</u> SMO Contact Phone: Wendy Palencia/505.844.3132	Waste Characterization: <b>No</b> RMA: <b>No</b> 4° Celsius: <b>Yes</b>
TA: Bldg: Room:	Last Chain: <b>No</b> Validation Req'd: <b>Yes</b>	Turnaround Time: <b>30</b> days EDD: <b>Yes</b>	SDG #: <u>588348</u>

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
118329	001	CWL-MW9	517	08/03/22 09:51	GW	G	3x40 ml	HCl	G	SA	VOC-TCE (SW846-8260D)	007
118329	002	CWL-MW9	517	08/03/22 09:52	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	008
118330	001	CWL-TB 5	0	08/03/22 09:51	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260D)	009

Sample Team Members	Name	Signature	Comments: Trip blanks received from lab with head space.
	Robert Lynch	<u>[Signature]</u>	
	Zachary Tenorio	<u>[Signature]</u>	

Relinquished by <u>[Signature]</u> Org. <u>5888</u> Date <u>8/3/22</u> Time <u>10:30</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u> Org. <u>0618</u> Date <u>8/3/22</u> Time <u>10:30</u>	Received by	Org.	Date	Time
Relinquished by <u>[Signature]</u> Org. <u>0618</u> Date <u>8/3/22</u> Time <u>11:00</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u> Org. <u>0618</u> Date <u>8/4/22</u> Time <u>7:55</u>	Received by	Org.	Date	Time

CONTRACT LABORATORY  
ANALYSIS REQUEST AND CHAIN OF CUSTODY

SMO Use

Project Name: CWL PCCP Project Manager: Timmie Jackson P/T No: 195122.10.11.03	Date Samples Shipped: <u>8/3/2022</u> SNL Shipper #: <u>351962</u> Lab Contact: Zachary Worsham/ 843-300-4224 Lab Destination: GEL Contract No.: 1983530	SMO Authorization: <u>[Signature]</u> SMO Contact Phone: Wendy Palencia/505.844.3132	Waste Characterization: <b>No</b> RMA: <b>No</b> 4° Celsius: <b>Yes</b>
TA: Bldg: Room:	Last Chain: <b>No</b> Validation Req'd: <b>Yes</b>	Turnaround Time: <b>30</b> days EDD: <b>Yes</b>	SDG #: <u>588348</u>

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
118331	001	CWL-DIWQC	0	08/03/22 09:17	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE (SW846-8260D)	<u>010</u>
118331	002	CWL-DIWQC	0	08/03/22 09:18	DIW	P	500 ml	HNO3	G	FB	CHROMIUM, NICKEL (SW846-6020)	<u>011</u>
118332	001	CWL-TB 6	0	08/03/22 09:17	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260D)	<u>012</u>

Sample Team Members	Name	Signature	Comments: Trip blanks received from lab with head space.
	Robert Lynch	<u>[Signature]</u>	
	Zachary Tenorio	<u>[Signature]</u>	

Relinquished by <u>[Signature]</u>	Org. <u>5888</u>	Date <u>8-3-22</u>	Time <u>1030</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8-3-22</u>	Time <u>1030</u>	Received by	Org.	Date	Time
Relinquished by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8-3-22</u>	Time <u>1100</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org.	Date <u>8/4/22</u>	Time <u>7:55</u>	Received by	Org.	Date	Time

**AR/COC NUMBER 623552**

## Memorandum

Date: September 14, 2022

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 623552  
SDG: 589029  
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 was performed on an SNL sample of similar matrix from another SDG. No data will be qualified.

The analysis of the LCS serves as a matrix-specific measure of accuracy for the FB and TB. The LCS met QC acceptance criteria and no data will be qualified.

There was no matrix-specific replicate analysis for the FB and EB. However, based on professional judgement, no sample results 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 the ARCO. FB 2 was submitted on ARCO 623552 and was associated with the sample on the same ARCO. An EB was submitted on ARCO 623620 in another SDG and was associated with the sample on ARCO 623552 submitted in this SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 09/14/2022

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## Memorandum

Date: September 14, 2022  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 623552  
SDG: 589029  
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 QC acceptance criteria. It should be noted that the MS was performed on an SNL sample from the same SDG that was not part of data validation. No data will be qualified.

### **Laboratory Replicate**

The replicate met QC acceptance criteria. It should be noted that the replicate was performed on an SNL sample from the same SDG that was not part of data validation. No data will be qualified.

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

The LCS met 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 589029009 because the sample concentration for Ca was > the ICS values. 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 was performed on an SNL sample from the same SDG that was not part of data validation. No data will be qualified.

### **Other QC**

An EB was submitted on ARCOG 623620 in another SDG and was associated with the sample on ARCOG 623552 submitted in this SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 09/14/2022

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## Sample Findings Summary



AR/COC: 623552

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#: 623552	Site/Project: CWL PCCP	Validation Date: 09/14/2022
SDG #: 589029	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								

Comments: Collected: 08/09/2022

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

EB 2 was submitted on ARCOG 623620 in another SDG and was associated with the samples on ARCOG 623552 submitted in this SDG.

ARCOG 623551 was also submitted in SDG 589029 but was not part of data validation at the client's request.

Validated by: 



## Sandia Inorganic Metals Worksheet

ARCOG #(s): 623552	SDG #(s): 589029	Matrix: Aqueous
Laboratory Sample IDs: 589029009 (Cr, Ni)		
Method/Batch #s: <b>3005A/6020B</b> :2301720/2301721		

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 2 588898 -005
	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; ICPMS: DUP/MS/SD on SNL sample 589029002

-009 Ca > 100 000

CONTRACT LABORATORY  
ANALYSIS REQUEST AND CHAIN OF CUSTODY

page 1 of 1  
ARCOG **623552**

SMO Use

Project Name: CWL PCCP Project Manager: Timmie Jackson P/T No: 195122.10.11.03	Date Samples Shipped: <u>8/9/2022</u> SNL Shipper #: <u>352262</u> Lab Contact: Zachary Worsham/ 843-300-4224 Lab Destination: GEL Contract No.:1983530	SMO Authorization: <u>[Signature]</u> SMO Contact Phone: Wendy Palencia/505.844.3132	Waste Characterization: <b>No</b> RMA: <b>No</b> 4° Celsius: <b>Yes</b>
TA: Bldg: Room:	Last Chain: <b>Yes</b> Validation Req'd: <b>Yes</b>	Turnaround Time: <b>30</b> days EDD: <b>Yes</b>	SDG #: <u>589029</u>

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
118335	001	CWL-FB 2	0	08/09/22 10:14	DIW	G	3x40 ml	HCl	G	FB	VOC-TCE (SW846-8260D)	007
118336	001	CWL-MW11	513	08/09/22 10:36	GW	G	3x40 ml	HCl	G	SA	VOC-TCE (SW846-8260D)	008
118336	002	CWL-MW11	513	08/09/22 10:37	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	009
118337	001	CWL-TB 8	0	08/09/22 10:14	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260D)	010

Sample Team Members	Name	Signature	Comments: Trip blanks received from lab with head space.
	Robert Lynch	<u>[Signature]</u>	
	Zachary Tenorio	<u>[Signature]</u>	

Relinquished by <u>[Signature]</u>	Org. <u>9888</u>	Date <u>8/9/22</u>	Time <u>1115</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8/9/22</u>	Time <u>1115</u>	Received by	Org.	Date	Time
Relinquished by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8/9/22</u>	Time <u>1130</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org.	Date <u>8/10/22</u>	Time <u>730</u>	Received by	Org.	Date	Time

**AR/COC NUMBERS 623554, 623620**

## Memorandum

Date: September 14, 2022

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCOG: 623554 and 623620  
SDG: 588898  
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.

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

The analysis of the LCS serves as a matrix-specific measure of accuracy for the TBs and EB. The LCS met QC acceptance criteria and no data will be qualified.

There was no matrix-specific replicate analysis for the TBs and EB. However, based on professional judgement, no sample results 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 each ARCO. EB 2 was submitted on ARCO 623620 in this SDG and was associated with the samples on ARCO 623552 submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 09/14/2022

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## Memorandum

Date: September 14, 2022  
To: File  
From: Linda Thal  
Subject: Inorganic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 623554 and 623620  
SDG: 588898  
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 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.

The analysis of the LCS serves as a matrix-specific measure of accuracy for the EB. The LCS met QC acceptance criteria and no data will be qualified.

### **Laboratory Replicate**

The replicate met 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.

There was no matrix-specific replicate analysis for the EB. However, based on professional judgement, no sample results will be qualified.

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

The LCS met 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 588898002 because the sample concentration for Ca was > the ICS values. 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 was performed on an SNL sample of similar matrix from another SDG. No data will be qualified.

### **Other QC**

EB 2 was submitted on ARCOG 623620 in this SDG and was associated with the samples on ARCOG 623552 submitted in another SDG.

No other specific issues that affect data quality were identified.

**Reviewed by:** Mary Donovan

**Level:** I

**Date:** 09/14/2022



## Sample Findings Summary



AR/COC: 623554, 623620

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#: 623554 and 623620	Site/Project: CWL PCCP	Validation Date: 09/14/2022
SDG #: 588898	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								

Comments: Collected: 08/08/2022

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

EB 2 was submitted on ARCOG 623620 and was associated with the samples on ARCOG 623552 submitted in another SDG.

Validated by:

*L. Thal*



### Sandia Inorganic Metals Worksheet

ARCO #s: 623554 and 623620	SDG #(s): 588898	Matrix: Aqueous
Laboratory Sample IDs: 588898002, -005 (Cr, Ni)		
Method/Batch #s: <b>3005A/6020B</b> :2301047/2301048		

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 2 -005
	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; ICPMS: DUP/MS/SD on SNL sample 588775002  
 -005 < ICSA for Al, Ca, Fe and Mg  
 -002 Ca > 100 000

CONTRACT LABORATORY  
ANALYSIS REQUEST AND CHAIN OF CUSTODY

ARCO 623554

SMO Use

Project Name: CWL PCCP Project Manager: Timmie Jackson P/T No: 195122.10.11.03	Date Samples Shipped: <u>8/8/2022</u> SNL Shipper #: <u>352177</u> Lab Contact: Zachary Worsham/ 843-300-4224 Lab Destination: GEL Contract No.: 1983530	SMO Authorization: <u>Obel</u> SMO Contact Phone: Wendy Palencia/505.844.3132	Waste Characterization: No RMA: No 4° Celsius: Yes
TA: Bldg: Room:	Last Chain: No Validation Req'd: Yes	Turnaround Time: 30 days EDD: Yes	SDG #: <u>588898</u>

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
118340	001	CWL-MW10	515	08/08/22 08:54	GW	G	3x40 ml	HCl	G	SA	VOC-TCE (SW846-8260D)	001
118340	002	CWL-MW10	515	08/08/22 08:55	GW	P	500 ml	HNO3	G	SA	CHROMIUM, NICKEL (SW846-6020)	002
118341	001	CWL-TB 10	0	08/08/22 08:54	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260D)	003

Sample Team Members	Name	Signature	Comments: Trip blanks received from lab with head space.
	Robert Lynch	<u>[Signature]</u>	
	Zachary Tenorio	<u>[Signature]</u>	

Relinquished by <u>[Signature]</u>	Org. <u>8888</u>	Date <u>8/8/22</u>	Time <u>1020</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8/9/22</u>	Time <u>1020</u>	Received by	Org.	Date	Time
Relinquished by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8/8/22</u>	Time <u>1045</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org.	Date <u>8/9/22</u>	Time <u>745</u>	Received by	Org.	Date	Time

CONTRACT LABORATORY  
ANALYSIS REQUEST AND CHAIN OF CUSTODY

page 1 of 1  
ARCO 623620

SMO Use

Project Name: CWL PCCP Project Manager: Timmie Jackson P/T No: 195122.10.11.03	Date Samples Shipped: <u>8/8/2022</u> SNL Shipper #: <u>352172</u> Lab Contact: Zachary Worsham/ 843-300-4224 Lab Destination: GEL Contract No.: 1983530	SMO Authorization: <u>[Signature]</u> SMO Contact Phone: Wendy Palencia/505.844.3132	Waste Characterization: <b>No</b> RMA: <b>No</b> 4° Celsius: <b>Yes</b>
TA: Bldg: Room:	Last Chain: <b>No</b> Validation Req'd: <b>Yes</b>	Turnaround Time: <b>30</b> days EDD: <b>Yes</b>	SDG #: <u>588898</u>

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
118490	001	CWL-EB 2	0	08/08/22 09:55	DIW	G	3x40 ml	HCl	G	EB	VOC-TCE (SW846-8260D)	004
118490	002	CWL-EB 2	0	08/08/22 09:56	DIW	P	500 ml	HNO3	G	EB	CHROMIUM, NICKEL (SW846-6020)	005
118491	001	CWL-TB 11	0	08/08/22 09:55	DIW	G	3x40 ml	HCl	G	TB	VOC-TCE (SW846-8260D)	006

Sample Team Members	Name	Signature	Comments: Trip blanks received from lab with head space.
	Robert Lynch	<u>[Signature]</u>	
	Zachary Tenorio	<u>[Signature]</u>	

Relinquished by <u>[Signature]</u>	Org. <u>8888</u>	Date <u>8/8/22</u>	Time <u>1020</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8/8/22</u>	Time <u>1020</u>	Received by	Org.	Date	Time
Relinquished by <u>[Signature]</u>	Org. <u>0618</u>	Date <u>8/8/22</u>	Time <u>1015</u>	Relinquished by	Org.	Date	Time
Received by <u>[Signature]</u>	Org.	Date <u>8-9-22</u>	Time <u>745</u>	Received by	Org.	Date	Time

**CONTRACT VERIFICATION FORMS**  
**CHEMICAL WASTE LANDFILL**  
**GROUNDWATER MONITORING**  
**AUGUST 2022**

<b>AR/COC Number</b>	<b>Sample Type</b>
623545	Quality Control
623547	Environmental & Quality Control
623549	Environmental & Quality Control
623550	Quality Control
623552	Environmental & Quality Control
623554	Environmental & Quality Control
623620	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 (623546, 623548, 623551, and 623553) are included in the contract verification review and associated CVR forms but do not require data validation.



## Contract Verification Form (CVR)

Project Leader LI

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 623545

Analytical Lab GEL

SDG No. 588023

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	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		Samples received at 20 degrees C

### 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		
	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, 8330, 537 and 1633) 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		
	g) Isotope dilution/EIS performance data provided (PFAS 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		

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

## 5.0 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: 09-01-2022 07:14:00

Closed by: Wendy Palencia Date: 09-01-2022 07:14:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 623546 &amp; 623547

Analytical Lab GEL

SDG No. 588105

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	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	Vinyl chloride failed recovery limits for LCS (QC1205173227)
	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	1,2,3-Trichlorobenzene, 1,2,4-trichlorobenzene, acetone and methylene chloride detected in method blank (QC1205163752). Acetone detected in method blank (QC1205173229).
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Acetone and methylene chloride detected in CWL-TB 2
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 limits not met
	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, 8330, 537 and 1633) 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		
	g) Isotope dilution/EIS performance data provided (PFAS 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		

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

## 5.0 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: 09-01-2022 08:30:00

Closed by: Wendy Palencia Date: 09-01-2022 08:30:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 623548, 623549 &amp; 623550

Analytical Lab GEL

SDG No. 588348

*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	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	Trichlorotrifluoroethane failed recovery limits for PS/PSD (QC1205165380/382)
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 limits not met
	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, 8330, 537 and 1633) 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		
	g) Isotope dilution/EIS performance data provided (PFAS 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		

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

## 5.0 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: 09-02-2022 08:37:00

Closed by: Wendy Palencia Date: 09-02-2022 08:37:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 623551 &amp; 623552

Analytical Lab GEL

SDG No. 589029

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	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	Chloromethane and methylene chloride detected in method blank (QC1205170556). Manganese detected in method blank (QC1205161575).
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Chloromethane and methylene chloride detected in CWL-TB 7
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 limits not met
	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, 8330, 537 and 1633) 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		
	g) Isotope dilution/EIS performance data provided (PFAS 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		

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

## 5.0 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: 09-12-2022 12:51:00

Closed by: Wendy Palencia Date: 09-12-2022 12:51:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 623553

Analytical Lab GEL

SDG No. 588775

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	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	Trichlorotrifluoroethane failed recovery limits for PS/PSD (QC1205165380/382). Potassium failed recovery limits for MS and PS (QC1205160315) and (QC1205178262).
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 limits not met
	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, 8330, 537 and 1633) 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		
	g) Isotope dilution/EIS performance data provided (PFAS 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		



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

## 5.0 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: 09-06-2022 09:59:00

Closed by: Wendy Palencia Date: 09-06-2022 09:59:00

## Contract Verification Form (CVR)

Project Leader JACKSON

Project Name CWL PCCP

Project/Task No. 195122\_10.11.03

ARCOG No. 623554 &amp; 623620

Analytical Lab GEL

SDG No. 588898

*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	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		
	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, 8330, 537 and 1633) 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		
	g) Isotope dilution/EIS performance data provided (PFAS 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		

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

## 5.0 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: 09-12-2022 09:41:00

Closed by: Wendy Palencia Date: 09-12-2022 09:41:00

**ANNEX B**

**Chemical Waste Landfill**

**Calendar Year 2022 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 / AOP 95-16

\*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 (cu FT/Hr)	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-SV-FB1	1-20-22	0826	10885	NA	NA	-22	-6	FB
CWL-UI1-Port 3-40	1-20-22	0830	↓	NA	10	NA	NA	
	↓	↓	↓	↓	↓	↓	↓	
	↓	0831	↓	↓	↓	↓	↓	
	↓	0832	11690	NA	NA	-24	-6	
CWL-UI1-Port 2-80	1-20-22	0833	↓	NA	10	NA	NA	
	↓	↓	↓	↓	↓	↓	↓	
	↓	0834	↓	↓	↓	↓	↓	
	↓	0835	34000594	NA	NA	-24	-6	
CWL-UI1-Port 1-120	1-20-22	0838	↓	NA	10	NA	NA	
	↓	↓	↓	↓	↓	↓	↓	
	↓	0839	↓	↓	↓	↓	↓	
	↓	0840	34000305	NA	NA	-23	-6	

Field Notes:

NMED OB split sample port 1+2.

### Soil Vapor Sampling Log Form

Location	Date	Time	Canister #	PID (ppm)	Flow Rate (cu FT Hr)	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-SV-FB2	1-20-22	0932	10849	NA	NA	-22	-6	FB
CWL-UI2-Port 3-36	1-20-22	0936	↓	NA	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0937	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		0938	34600090	NA	NA	-24	-6	
CWL-UI2-Port 2-76	1-20-22	0938	↓	NA	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0939	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		0940	11154	NA	NA	-23	-6	
CWL-UI2-Port 1-136	1-20-22	0941	↓	NA	12	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0942	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		0943	7963	NA	NA	-23	-6	

**Field Notes:**

NMED OB Split Sampling part 1 + 2.

### Soil Vapor Sampling Log Form

Location	Date	Time	Canister #	PID (ppm)	Flow Rate (cubic ft/hr)	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-SV-FB3	1-20-22	0854	09675	NA	NA	-22	-6	FB
CWL-D1-Port 5-100	1-20-22	0858	↓	NA	10	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0859	↓	↓	↓	↓	↓	
		0900	10262	NA	NA	-23	-6	SA
		0900	10479	NA	NA	-23	-6	DU
CWL-D1-Port 4-160	1-20-22	0901	↓	NA	12	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0902	↓	↓	↓	↓	↓	
		0903	10212	NA	NA	-24	-6	
CWL-D1-Port 3-240	1-20-22	0904	↓	NA	12	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0905	↓	↓	↓	↓	↓	
		0906	11966	NA	NA	-24	-6	
CWL-D1-Port 2-350	1-20-22	0907	↓	NA	12	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0909	↓	↓	↓	↓	↓	
		0911	10684	NA	NA	-23	-6	SA
		0911	11151	NA	NA	-23	-6	DU
CWL-D1-Port 1-470	1-20-22	0914	↓	NA	12	NA	NA	
		↓	↓	↓	↓	↓	↓	
		0916	↓	↓	↓	↓	↓	
		0918	09592	NA	NA	-23	-6	

**Field Notes:**

NMED OB Split port 1+2.

**Soil Vapor Sampling Log Form**

Location	Date	Time	Canister #	PID (ppm)	Flow Rate (cubic ft/hr)	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-SV-FB4	1-20-22	1038	34001277	NA	NA	-22	-6	
CWL-D2-Port 5-120	1-20-22	1055	↓	NA	12	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1056	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		1057	10065	NA	NA	-23	-6	
CWL-D2-Port 4-240	1-20-22	1058	↓	NA	12	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1059	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		1100	11207	NA	NA	-23	-6	
CWL-D2-Port 3-350	1-20-22	1101	↓	NA	12	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1103	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		1104	3400127	NA	NA	-24	-6	
CWL-D2-Port 2-440	1-20-22	1105	↓	NA	12	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1107	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		1108	11198	NA	NA	-24	-6	
CWL-D2-Port 1-470	1-20-22	1110	↓	NA	13	NA	NA	
		↓	↓	↓	↓	↓	↓	
		1112	↓	↓	↓	↓	↓	
		↓	↓	↓	↓	↓	↓	
		1114	12088	NA	NA	-23	-6	

**Field Notes:**

NMED on split sampling port 1 + 2.

Soil Vapor Sampling Log Form

Location	Date	Time	Canister #	PID (ppm)	Flow Rate (cu FT Hr)	Initial Canister Vacuum (PSI)	Ending Canister Vacuum (PSI)	Comments
CWL-SV-FB5	1-20-22	0957	11043	NA	NA	-23	-6	FB
CWL-D3-Port 5-120	1-20-22	1002		NA	12	NA	NA	
		↓		↓	↓	↓	↓	
		1003		↓	↓	↓	↓	
		↓		↓	↓	↓	↓	
		1004	10635	NA	NA	-24	-6	
CWL-D3-Port 4-170	1-20-22	1005		NA	12	NA	NA	
		↓		↓	↓	↓	↓	
		1006		↓	↓	↓	↓	
		↓		↓	↓	↓	↓	
		1007	34061524	NA	NA	-24	-6	
CWL-D3-Port 3-350	1-20-22	1009		NA	14	NA	NA	
		↓		↓	↓	↓	↓	
		1011		↓	↓	↓	↓	
		↓		↓	↓	↓	↓	
		1012	10471	NA	NA	-24	-6	
CWL-D3-Port 2-440	1-20-22	1013		NA	17	NA	NA	
		↓		↓	↓	↓	↓	
		1015		↓	↓	↓	↓	
		↓		↓	↓	↓	↓	
		1016	09548	NA	NA	-24	-6	
CWL-D3-Port 1-480	1-26-22	1019		NA	17	NA	NA	
		↓		↓	↓	↓	↓	
		1021		↓	↓	↓	↓	
		↓		↓	↓	↓	↓	
		1025	<sup>21/26/21</sup> <del>34000216</del> 8194	NA	NA	-23	-6	See notes *
<p>Field Notes: Switched canister @ port 1-480 (canister bad) new canister # 8194 34000216</p> <p>NMED OB split sample port 1+2 (du)</p>								

**SUMMARY SHEET FOR JANUARY 2022 SAMPLES**

**Sample Summary for Chemical Waste Landfill Soil-Gas Monitoring  
January 2022**

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 327-22</b>										
CWL-UI1	20-Jan-22	CWL-UI1-40	11690	622756	116593	Environmental	n/a	n/a	622756 / 116592	
		CWL-UI1-80	34000594		116594	Environmental				
		CWL-UI1-120	34000305		116595	Environmental				
		CWL-SV-FB1	10885		116592	Field QC				n/a
CWL-UI2	20-Jan-22	CWL-UI2-36	34000090	622755	116597	Environmental	n/a	n/a	622755 / 116596	
		CWL-UI2-76	11154		116598	Environmental				
		CWL-UI2-136	7963		116599	Environmental				
		CWL-SV-FB2	10849		116596	Field QC				n/a
CWL-D1	20-Jan-22	CWL-D1-100	10262	622757	116601	Environmental	n/a	n/a	622757 / 116600	
		CWL-D1-100	10479		116602	Duplicate				
		CWL-D1-160	10212		116603	Environmental				
		CWL-D1-240	11966		116604	Environmental				
		CWL-D1-350	10684		116605	Environmental				
		CWL-D1-350	11151		116606	Duplicate				
		CWL-D1-470	09592		116607	Environmental				
CWL-SV-FB3	09675	116600	Field QC	n/a	n/a	n/a	Ultra Pure N2			
CWL-D2	20-Jan-22	CWL-D2-120	10065	622758	116609	Environmental	n/a	n/a	622758 / 116608	
		CWL-D2-240	11207		116610	Environmental				
		CWL-D2-350	34001127		116611	Environmental				
		CWL-D2-440	11198		116612	Environmental				
		CWL-D2-470	12088		116613	Environmental				
CWL-SV-FB4	34001277	116608	Field QC	n/a	n/a	n/a	Ultra Pure N2			
CWL-D3	20-Jan-22	CWL-D3-120	10635	622759	116615	Environmental	n/a	n/a	622759 / 116614	
		CWL-D3-170	34001524		116616	Environmental				
		CWL-D3-350	10471		116617	Environmental				
		CWL-D3-440	09548		116618	Environmental				
		CWL-D3-480	8194		116619	Environmental				
CWL-SV-FB5	11043	116614	Field QC	n/a	n/a	n/a	Ultra Pure N2			

**DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES**

**CHEMICAL WASTE LANDFILL**

**SOIL-GAS MONITORING**

**JANUARY 2022**



**AR/COC NUMBERS 622755, 622756, 622757, 622758, 622759**

## Memorandum

Date: February 17, 2022

To: File

From: Mary Donovan

Subject: GC/MS Organic Data Review and Validation – SNL  
Site: CWL PCCP  
ARCO: 622755, 622756, 622757, 622758 and 622759  
SDG: 140-26221  
Laboratory: Eurofins 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. Ethylbenzene was detected at  $\leq$  the PQL in the MB associated with samples 140-26221-1, -5, -9, -16, -17, -21, -23, -26, -27 and -28. The associated results for samples -1, -5, -9, -21, -23, -26, -27 and -28 were detects  $\leq$  the PQL and will be **qualified U,B**; non-detect at their respective PQLs.
2. For the initial calibration associated with samples -2, -3, -4, -6, -7, -8, -10 through -15, -18, -19, -20, -22, -24 and -25, the intercept was negative with an absolute value  $\leq 3X$  the MDL for chloromethane. All associated sample results were non-detect and will be **qualified UJ,I5**.
3. Benzene was detected at  $\leq$  the PQL in FB3, sample -9, associated with samples -10 through -16. The associated result for sample -16 was a detect  $\leq$  the PQL and will be **qualified 1.5U,B2**; non-detect at the PQL.
4. Tetrachloroethene was detected at  $\leq$  the PQL in FB3, sample -9, associated with samples -10 through -16. The associated results for samples -14 and -15 were detects  $\leq$  the PQL and will be **qualified U,B2**; non-detect at their respective PQL.
5. Acetone; 2-butanone; 1,4-dichlorobenzene; toluene; m,p-xylene and o-xylene were detected at  $\leq$  the PQL in FB4, sample -17, associated with samples -18 through -22. The 1,4-dichlorobenzene;

m,p-xylene and o-xylene results for sample -21 were detects  $\leq$  the PQL and will be **qualified U,B2**; non-detect at their respective PQL. The acetone, 2-butanone and toluene results for sample -21 were detects  $>$  the PQL but  $\leq$  10X the FB values and will be **qualified J+,B2**.

6. Methylene chloride was detected at  $>$  the PQL in FB5, sample -23, associated with samples -24 through -28. The associated results for samples -25, -27 and -28 were detects  $>$  the PQL but  $\leq$  10X the FB value and will be **qualified J+,B2**.
7. Carbon disulfide; 1,2-dichloropropane; toluene; 1,1,2-trichloro-1,2,2-trifluoroethane; m,p-xylene and o-xylene in FB5, sample -23, associated with samples -24 through -28. The carbon disulfide results for samples -25, -27 and -28; the 1,2-dichloropropane result for sample -28; the toluene result for sample -25; the m,p-xylene results for samples -25, -26 and -27 and the o-xylene results for samples -27 and -28 were detects  $\leq$  the PQL and will be **qualified U,B2**; non-detect at their respective PQLs. The toluene results for samples -27 and -28 were detects  $>$  the PQL but  $\leq$  10X the FB value and will be **qualified J+,B2**. The 1,1,2-trichloro-1,2,2-trifluoroethane and m,p-xylene results for sample -28 were detects  $>$  the PQL but  $\leq$  5X the FB value and will be **qualified J+,B2**.

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 noted above in the Summary section and as follows.

For the initial calibration associated with samples -1, -5, -9, -16, -17, -21, -23, -26, -27 and -28, the intercept was positive and  $>$  the MDL for bromoform. The associated samples results were non-detect and will not be qualified.

For the CCV associated with samples -1, -5, -9, -16, -17, -21, -23, -26, -27 and -28, the %Ds were  $>$ 30% but  $\leq$  45% and negative for 1,2,4-trichlorobenzene and hexachlorobutadiene. The associated sample results were non-detect and, since no other calibration infractions occurred, will not be qualified.

For the CCV associated with samples -2, -3, -4, -6, -7, -8, -10 through -15, -18, -19, -20 and -22, the %Ds were  $>$ 30% and positive for chloromethane; 1,2-dichloro-1,1,2,2-tetrafluoromethane and bromomethane. The associated sample results were non-detect and will not be qualified.

For the CCV associated with samples -2, -3, -4, -6, -7, -8, -10 through -15, -18, -19, -20 and -22, the %D was  $>$ 30% but  $\leq$  45% and negative for vinyl acetate. The associated sample results were non-detect and, since no other calibration infractions occurred, will not be qualified.

For the CCV associated with samples -24 and -25, the %Ds were >30% but ≤ 45% and negative for vinyl acetate and 1,2,4-trichlorobenzene. The associated sample results were non-detect and, since no other calibration infractions occurred, will not be qualified.

### **Blanks**

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

Ethylbenzene was detected at ≤ the PQL in the MB associated with samples -1, -5, -9, -16, -17, -21, -23, -26, -27 and -28. The associated results for samples -16 and -17 were non-detect and will not be qualified.

Ethylbenzene was detected at ≤ the PQL in FB2, sample -1, associated with samples -2 through -4; FB1, sample -5, associated with samples -6 through -8; FB3, sample -9, associated with samples -10 through -16 and FB5, sample -23, associated with samples -24 through -28. The associated FB results were qualified non-detect due to MB contamination and will not be applied to the associated field sample results.

Methylene chloride; toluene and m,p-xylene were detected at > the PQL and acetone; benzene; 2-butanone; carbon disulfide; 1,3-dichlorobenzene; 1,4-dichlorobenzene; 1,2-dichloroethane; 4-methyl-2-pentanone; styrene; tetrachloroethene; trichloroethene; trichlorofluoromethane and o-xylene were detected at ≤ the PQL in FB 2 sample -1, associated with samples -2 through -4. All associated sample results *except* those for tetrachloroethene, trichloroethene and trichlorofluoromethane were non-detect and will not be qualified. The associated sample results for tetrachloroethene, trichloroethene and trichlorofluoromethane were detects > the PQL and >5X the FB value and will not be qualified.

2-Butanone; 2-hexanone; toluene and m,p-xylene were detected at ≤ the PQL in FB1, sample -5, associated with samples -6 through -8. The associated sample results were non-detect and will not be qualified.

Methylene chloride and toluene were detected at > the PQL and acetone; benzene; 1,2-dibromoethane; tetrachloroethene; m,p-xylene and o-xylene were detected at ≤ the PQL in FB3, sample -9, associated with samples -10 through -16. All associated sample results *except* the benzene result for sample -16 and all tetrachloroethene sample results, were non-detect and will not be qualified. The tetrachloroethene results for samples -10 through -13 and -16 were detects > the PQL and >5X the FB value and will not be qualified.

Acetone; 2-butanone; 1,4-dichlorobenzene; toluene; m,p-xylene and o-xylene were detected at ≤ the PQL in FB4, sample -17, associated with samples -18 through -22. All associated results for samples -18, -19, -20 and -22 were non-detect and will not be qualified.

Methylene chloride and trichloroethene were detected at > the PQL and carbon disulfide; 1,2-dichloropropane; toluene; 1,1,2-trichloro-1,2,2,-trifluoroethane; trichlorofluoromethane; m,p-xylene and o-xylene were detected at ≤ the PQL in FB5, sample -23, associated with samples -24 through -28. The carbon disulfide; methylene chloride and toluene results for samples -24 and -26; the m,p-xylene result for sample -24 and the o-xylene results for samples -24, -25 and -26 were non-detect and will not be qualified. All associated sample results for trichloroethene were detects > the PQL and > 5X the FB value and will not be qualified. The remaining associated sample results for 1,2-dichloropropane; 1,1,2-trichloro-1,2,2,-trifluoroethane and trichlorofluoromethane 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/ Laboratory Control Sample Duplicate (LCS/LCSD)**

The LCS/LCSD for all batches met QC acceptance criteria except as follows. For the LCS and/or LCSD associated with samples -2, -3, -4, -6, -7, -8, -10 through -15, -18, -19, -20 and -22, the %Rs were > the laboratory upper acceptance limits for bromomethane, chloroethane and vinyl chloride. The associated sample results were non-detect and will not be qualified.

### **Laboratory Replicate**

Laboratory replicates met QC acceptance criteria except as follows. For the laboratory replicate associated with batch 58365, the RPD for benzene was flagged by the lab for exceeding method acceptance criteria. However, both the sample and replicate results were < the PQL and, therefore, no sample results will be qualified.

### **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 (1.93X); -2 (4.99X); -3 (5.38X); -4 (9.59X); -5 (1.71X); -6 (5.28X); -7 (10.42X); -8 (13.92X); -9 (1.71X); -10 (15.24X); -11 (19.05X); -12 (32.31X); -13 (41.2X); -14 (14.14X); -15 (17.89X); -16 (1.9X); -17 (1.75X); -18 (18.71X); -19 (19.55X); -20 (15.46X); -21 (1.69X); -22 (12.59X); -23 (1.68X), -24 (5.4X), -25 (1.61X), -26 (1.69X), -27 (1.77X) and -28 (1.64X).

### **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 622757. 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:** 02/23/2022

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## Sample Findings Summary



AR/COC: 622755, 622756, 622757, 622758, 622759

Page 1 of 3

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
<b>TO15_LL_PF</b>			
	116592-001/CWL-SV-FB1	ETHYLBENZENE (100-41-4)	0.086U, B
	116593-001/CWL-UI1-40	CHLOROMETHANE (74-87-3)	UJ, I5
	116594-001/CWL-UI1-80	CHLOROMETHANE (74-87-3)	UJ, I5
	116595-001/CWL-UI1-120	CHLOROMETHANE (74-87-3)	UJ, I5
	116596-001/CWL-SV-FB2	ETHYLBENZENE (100-41-4)	0.097U, B
	116597-001/CWL-UI2-36	CHLOROMETHANE (74-87-3)	UJ, I5
	116598-001/CWL-UI2-76	CHLOROMETHANE (74-87-3)	UJ, I5
	116599-001/CWL-UI2-136	CHLOROMETHANE (74-87-3)	UJ, I5
	116600-001/CWL-SV-FB3	ETHYLBENZENE (100-41-4)	0.086U, B
	116601-001/CWL-D1-100	CHLOROMETHANE (74-87-3)	UJ, I5
	116602-001/CWL-D1-100	CHLOROMETHANE (74-87-3)	UJ, I5
	116603-001/CWL-D1-160	CHLOROMETHANE (74-87-3)	UJ, I5
	116604-001/CWL-D1-240	CHLOROMETHANE (74-87-3)	UJ, I5
	116605-001/CWL-D1-350	CHLOROMETHANE (74-87-3)	UJ, I5
	116605-001/CWL-D1-350	TETRACHLOROETHENE (127-18-4)	28U, B2
	116606-001/CWL-D1-350	CHLOROMETHANE (74-87-3)	UJ, I5
	116606-001/CWL-D1-350	TETRACHLOROETHENE (127-18-4)	65U, B2
	116607-001/CWL-D1-470	BENZENE (71-43-2)	1.5U, B2
	116609-001/CWL-D2-120	CHLOROMETHANE (74-87-3)	UJ, I5
	116610-001/CWL-D2-240	CHLOROMETHANE (74-87-3)	UJ, I5
	116611-001/CWL-D2-350	CHLOROMETHANE (74-87-3)	UJ, I5
	116612-001/CWL-D2-440	1,4-DICHLOROBENZENE (106-46-7)	0.085U, B2
	116612-001/CWL-D2-440	2-BUTANONE (MEK) (78-93-3)	J+, B2
	116612-001/CWL-D2-440	ACETONE (67-64-1)	J+, B2

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	116612-001/CWL-D2-440	ETHYLBENZENE (100-41-4)	0.085U, B
	116612-001/CWL-D2-440	M,P-XYLENE (179601-23-1)	0.085U, B2
	116612-001/CWL-D2-440	O-XYLENE (95-47-6)	0.085U, B2
	116612-001/CWL-D2-440	TOLUENE (108-88-3)	J+, B2
	116613-001/CWL-D2-470	CHLOROMETHANE (74-87-3)	UJ, I5
	116614-001/CWL-SV-FB5	ETHYLBENZENE (100-41-4)	0.084U, B
	116615-001/CWL-D3-120	CHLOROMETHANE (74-87-3)	UJ, I5
	116616-001/CWL-D3-170	CARBON DISULFIDE (75-15-0)	0.20U, B2
	116616-001/CWL-D3-170	CHLOROMETHANE (74-87-3)	UJ, I5
	116616-001/CWL-D3-170	M,P-XYLENE (179601-23-1)	0.081U, B2
	116616-001/CWL-D3-170	METHYLENE CHLORIDE (75-09-2)	J+, B2
	116616-001/CWL-D3-170	TOLUENE (108-88-3)	0.12U, B2
	116617-001/CWL-D3-350	ETHYLBENZENE (100-41-4)	0.34U, B
	116617-001/CWL-D3-350	M,P-XYLENE (179601-23-1)	0.34U, B2
	116618-001/CWL-D3-440	CARBON DISULFIDE (75-15-0)	0.22U, B2
	116618-001/CWL-D3-440	ETHYLBENZENE (100-41-4)	0.089U, B
	116618-001/CWL-D3-440	M,P-XYLENE (179601-23-1)	0.089U, B2
	116618-001/CWL-D3-440	METHYLENE CHLORIDE (75-09-2)	J+, B2
	116618-001/CWL-D3-440	O-XYLENE (95-47-6)	0.089U, B2
	116618-001/CWL-D3-440	TOLUENE (108-88-3)	J+, B2
	116619-001/CWL-D3-480	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (76-13-1)	J+, B2
	116619-001/CWL-D3-480	1,2-DICHLOROPROPANE (78-87-5)	0.082U, B2
	116619-001/CWL-D3-480	CARBON DISULFIDE (75-15-0)	0.21U, B2
	116619-001/CWL-D3-480	ETHYLBENZENE (100-41-4)	0.082U, B
	116619-001/CWL-D3-480	M,P-XYLENE (179601-23-1)	J+, B2
	116619-001/CWL-D3-480	METHYLENE CHLORIDE (75-09-2)	J+, B2
	116619-001/CWL-D3-480	O-XYLENE (95-47-6)	0.082U, B2
	116619-001/CWL-D3-480	TOLUENE (108-88-3)	J+, B2



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Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
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All other analyses met QC acceptance criteria; no further data should be qualified.

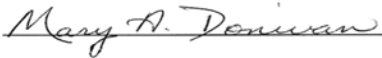


## Sandia Data Validation Summary Worksheet

ARCOG#: 622755, 622756, 655757, 622758 and 622759	Site/Project: CWL PCCP	Validation Date: 02/17/2022
SDG #: 140-26221	Laboratory: Eurofins Knoxville	Validator: Mary Donivan
Matrix: Air	# of Samples: 28	CVR present: Yes
ARCOG(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: 01/20/2022  No custody seals.
<u>Validated by:</u>  <div style="text-align: center; font-family: cursive; font-size: 1.2em;">  </div>

## Sandia Organic Worksheet (GC/MS VOC)

ARCO # (s): 622755, 622756, 622757, 622758 and 622759	SDG: 140-26221	Matrix: Air
Laboratory Sample IDs: 140-26221-1 through -28		
Method/Batch #s: <b>TO-15</b> /58224 [samples -1, -5, -9, -16, -17, -21, -23, -26, -27, -28, -26DU]; 58279 [samples -2, -3, -4, -6, -7, -8, -10 through -15, -18, -19, -20, -22, -28RE, -22 DU]; 568304 [samples -16 (diluted), -16DU (diluted)]; 53865 [samples -21 (diluted), -24, -25, -25 (diluted) -27 (diluted), -27DU (diluted)]	Tuning (pass/fail):pass	TICs Required? (yes/no):no

Analyte (outliers)	Calibration				MB	5X (10X) MB	LCS %R	Lab. REP RPD	FB2 -1	FB1 -5	FB3 -9	FB4 -17	FB5 -23
	Int.	RF/ Slope	RSD/ r <sup>2</sup>	(ICV)/ CCV %D									
<b>Instrument MR ICAL 10/07/2021</b>													
<b>Batch 58224</b> (samples -1, -5, -9, -16, -17, -21, -23, -26, -27, -28, -26DU) <sup>1</sup>													
<b>Batch 58304</b> (samples -16, -16DU diluted for TCE only)													
Acetone	NA	✓	✓	✓	✓	NA	✓	✓	1.5J	✓	0.89J	0.90J	✓
Benzene	NA	✓	✓	✓	✓	NA	✓	✓	0.026J	✓	0.019J	✓	✓
2-Butanone	NA	✓	✓	✓	✓	NA	✓	✓	0.13J	0.19J	✓	0.11J	✓
Carbon disulfide	NA	✓	✓	✓	✓	NA	✓	✓	0.061J	✓	✓	✓	0.050J
1,2-Dibromoethane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.013J	✓	✓
1,3-Dichlorobenzene	NA	✓	✓	✓	✓	NA	✓	✓	0.021J	✓	✓	✓	✓
1,4-Dichlorobenzene	NA	✓	✓	✓	✓	NA	✓	✓	0.023J	✓	✓	0.018J	✓
1,2-Dichloroethane	NA	✓	✓	✓	✓	NA	✓	✓	0.012J	✓	✓	✓	✓
1,2-Dichloropropane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	0.011J
Ethylbenzene	NA	✓	✓	✓	0.0146J <sup>1</sup>	0.073	✓	✓	0.041J	0.015J	0.015J	✓	0.015J
2-Hexanone	NA	✓	✓	✓	✓	NA	✓	✓	✓	0.032J	✓	✓	✓
4-Methyl-2-pentanone	NA	✓	✓	✓	✓	NA	✓	✓	0.21J	✓	✓	✓	✓
Methylene chloride	NA	✓	✓	✓	✓	NA	✓	✓	4.6	✓	0.51	✓	0.85
Styrene	NA	✓	✓	✓	✓	NA	✓	✓	0.035J	✓	✓	✓	✓
Tetrachloroethene	NA	✓	✓	✓	✓	NA	✓	✓	0.034J	✓	0.015J	✓	✓
Toluene	NA	✓	✓	✓	✓	NA	✓	✓	0.42	0.091J	0.13	0.092J	0.10J
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	0.030J
Trichloroethene	NA	✓	✓	✓	✓	NA	✓	✓	0.017J	✓	✓	✓	0.072
Trichlorofluoromethane	NA	✓	✓	✓	✓	NA	✓	✓	0.035J	✓	✓	✓	0.018J
m,p-Xylene	NA	✓	✓	✓	✓	NA	✓	✓	0.11	0.037J	0.041J	0.040J	0.036J
o-Xylene	NA	✓	✓	✓	✓	NA	✓	✓	0.044J	✓	0.020J	0.018J	0.018J
Bromoform	+0.041	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓
1,2,4-Trichlorobenzene	NA	✓	✓	-40 <sup>1</sup>	✓	NA	✓	✓	✓	✓	✓	✓	✓

Hexachlorobutadiene	NA	✓	✓	-31 <sup>1</sup>	✓	NA	✓	✓	✓	✓	✓	✓	✓
Analyte (outliers)	Calibration				MB	5X (10X) MB	LCS %R	LCSD %R	LCS/ LCSD RPD	Lab. REP RPD			
	Int.	RF/ Slope	RSD/ r <sup>2</sup>	(ICV)/ CCV %D									
<b>Instrument MS ICAL 01/04/2022</b>													
<b>Batch 58279</b> (samples -2, -3, -4, -6, -7, -8, -10 through -15, -18, -19, -20, -22, -28RE, -22 DU) <sup>2</sup>													
<b>Batch 58365</b> [samples -21(diluted*), -24, -25, -25 (diluted for TCE), -27 (diluted*), -27DU (diluted)] <sup>3</sup>													
Benzene	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	30 <sup>3**</sup>		
Chloromethane	-0.129	✓	✓	+37 <sup>2</sup>	✓	NA	✓	✓	✓	✓			
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NA	✓	✓	+31 <sup>2</sup>	✓	NA	✓	✓	✓	✓			
Vinyl acetate	NA	✓	✓	-36 <sup>2</sup> , -35 <sup>3</sup>	✓	NA	✓	✓	✓	✓			
1,2,4-Trichlorobenzene	NA	✓	✓	-32 <sup>3</sup>	✓	NA	✓	✓	✓	✓			
Bromomethane	NA	✓	✓	+33 <sup>2</sup>	✓	NA	133 <sup>2</sup>	142 <sup>2</sup>	✓	✓			
Chloroethane	NA	✓	✓	✓	✓	NA	✓	131 <sup>2</sup>	✓	✓			
Vinyl chloride	NA	✓	✓	✓	✓	NA	✓	137 <sup>2</sup>	✓	✓			
<b>Surrogate Recovery Outliers</b>													
Sample ID	BFB %R					Sample ID	BFB %R						
None													
<b>IS Outliers</b>													
	CBM		DFBZ		CBZ-d5								
Sample ID	Area	RT	Area	RT	Area	RT							
None													

Comments: HTs OK.

ICAL MR 10/07/2021 Linear: Bromoform and Benzyl chloride; Quadratic, forced: Carbon tetrachloride

ICAL MS 01/04/2022 Linear: Chloromethane, Hexachlorobutadiene; Quadratic, forced: Bromoform

<sup>1</sup>Associated with batch 58224

<sup>2</sup>Associated with batch 58279. -28RE was analyzed to check for carryover, no carryover was detected and the original results from batch 58224 were reported

<sup>3</sup>Associated with batch 58365. \*Chloroform; 1,1-Dichloroethene; Tetrachloroethene (-21 only); 1,2-Dichloropropane (-27 only); 1,1,2-Trichloro-1,2,2-trifluoroethane; Trichloroethene and Trichlorofluoromethane reported from dilutions for samples -21 and -27

\*\*RPD was flagged by the lab, but sample (-27 diluted) and replicate (diluted) results were both below PQL and qualification is not required

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.

All FBs and sample -28 diluted due to limited sample volume

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

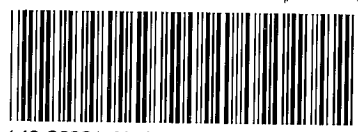
Page 1 of 1

Batch No. *W/A* AR/COC **622755**

SMO Use

Project Name: CWL PCCP	Date Samples Shipped: <i>1/21/2022</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Timmie Jackson	Carrier/Waybill No. <i>341752</i>	SMO Contact Phone: Wendy Palencia/505-844-3132	<input type="checkbox"/> RMA
Project/Task Number: 195122.10.11.03	Lab Contact: Jamie McKinney/865-291-3006	Send Report to SMO: Stephanie Montaño/505-284-2553	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>
Service Order: CF327-22	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
							Type	Volume					
116596	✓001	CWL-SV-FB2	10849	UPN	1/20/22 09:32	UPN	S	6 L	None	G	FB	VOC (TO-15)	
116597	✓001	CWL-UI2-36	34000090	36	1/20/22 09:38	SG	S	6 L	None	G	SA	VOC (TO-15)	
116598	✓001	CWL-UI2-76	11154	76	1/20/22 09:40	SG	S	6 L	None	G	SA	VOC (TO-15)	
116599	✓001	CWL-UI2-136	7963	136	1/20/22 09:43	SG	S	6 L	None	G	SA	VOC (TO-15)	
 140-26221 Chain of Custody													

Last Chain: <input type="checkbox"/> Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt          Lab Use																														
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> </tr> <tr> <td></td> <td>Robert Lynch</td> <td><i>[Signature]</i></td> <td><i>[Init]</i></td> <td>SNL/08888/505-844-4013/505-250-7090</td> <td><input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab</td> </tr> <tr> <td></td> <td>William Gibson</td> <td><i>[Signature]</i></td> <td><i>[Init]</i></td> <td>SNL/08888/505-284-3307/505-239-7367</td> <td rowspan="4">Return Samples By: Comments: Reference attached forms</td> </tr> <tr> <td></td> <td>Zachary Tenorio</td> <td><i>[Signature]</i></td> <td><i>[Init]</i></td> <td>SNL/08888/505-845-8636/505-259-5765</td> </tr> <tr> <td></td> <td>Denisha Sanchez</td> <td><i>[Signature]</i></td> <td><i>[Init]</i></td> <td>SNL/08888/505-845-7829/505-208-1375</td> </tr> <tr> <td></td> <td>Timmie Jackson</td> <td><i>[Signature]</i></td> <td><i>[Init]</i></td> <td>SNL/08888/505-284-2547/505-263-6639</td> </tr> </table>	Sample Team Members	Name		Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal		Robert Lynch	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-844-4013/505-250-7090	<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab		William Gibson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-3307/505-239-7367	Return Samples By: Comments: Reference attached forms		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		Timmie Jackson	<i>[Signature]</i>	<i>[Init]</i>
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal																												
	Robert Lynch	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-844-4013/505-250-7090	<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab																												
	William Gibson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-3307/505-239-7367	Return Samples By: Comments: Reference attached forms																												
	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																													
	Timmie Jackson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-2547/505-263-6639																													

Relinquished by <i>[Signature]</i> Org. <i>8888</i> Date <i>1/20/22</i> Time <i>14:05</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>OK18</i> Date <i>1/20/22</i> Time <i>1405</i>	Received by <i>[Signature]</i> Org. <i>ETAKNY</i> Date <i>01.25.22</i> Time <i>10:30</i>
Relinquished by <i>[Signature]</i> Org. <i>OK18</i> Date <i>1/20/22</i> Time <i>0800</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by _____ Org. _____ Date _____ Time _____	Received by _____ Org. _____ Date _____ Time _____

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

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02/15/2022

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *MA* SMO Use AR/COC **622756**

Project Name: CWL PCCP	Date Samples Shipped: <i>1/21/2022</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>341752</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: CF327-22	Lab Destination: TAKX	Contract No.: 1636780	

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					
116592	✓001	CWL-SV-FB1 10885	NA	1/20/22 08:26	UPN	S	6 L	None	G	FB	VOC (TO-15)	
116593	✓001	CWL-UI1-40 11690	40	1/20/22 08:32	SG	S	6 L	None	G	SA	VOC (TO-15)	
116594	✓001	CWL-UI1-80 34000594	80	1/20/22 08:35	SG	S	6 L	None	G	SA	VOC (TO-15)	
116595	✓001	CWL-UI1-120 34000305	120	1/20/22 08:40	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"/>				
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: Reference attached forms.		
	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			
Timmie Jackson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-2547/505-263-6639	Lab Use			

Relinquished by <i>[Signature]</i> Org. <i>5888</i> Date <i>1/20/22</i> Time <i>14:05</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>0618</i> Date <i>1/20/22</i> Time <i>1405</i>	Received by <i>[Signature]</i> Org. <i>ETAPNY</i> Date <i>01-25-22</i> Time <i>10:30</i>
Relinquished by <i>[Signature]</i> Org. <i>0618</i> Date <i>1/20/22</i> Time <i>0800</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by _____ Org. _____ Date _____ Time _____	Received by _____ Org. _____ Date _____ Time _____

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

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02/15/2022

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *N/A*

SMO Use

AR/COC **622757**

Project Name: CWL PCCP	Date Samples Shipped: <i>1/21/2022</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Timmie Jackson	Carrier/Waybill No: <i>341752</i>	SMO Contact Phone: Wendy Palencia/505-844-3132	<input type="checkbox"/> RMA
Project/Task Number: 195122.10.11.03	Lab Contact: Jamie McKinney/865-291-3006	Send Report to SMO: Stephanie Montaño/505-284-2553	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> <b>4° Celsius</b>
Service Order: CF327-22	Lab Destination: TAKX		
	Contract No: 1636780		

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					
116600	✓001	CWL-SV-FB3	09675	NA	1/20/22	08:54	UNP	S	6 L	None	G	FB	VOC (TO-15)	
116601	✓001	CWL-D1-100	10262	100	1/20/22	09:00	SG	S	6 L	None	G	SA	VOC (TO-15)	
116602	✓001	CWL-D1-100	10479	100	1/20/22	09:00	SG	S	6 L	None	G	DU	VOC (TO-15)	
116603	✓001	CWL-D1-160	10212	160	1/20/22	09:03	SG	S	6 L	None	G	SA	VOC (TO-15)	
116604	✓001	CWL-D1-240	11966	240	1/20/22	09:06	SG	S	6 L	None	G	SA	VOC (TO-15)	
116605	✓001	CWL-D1-350	10684	350	1/20/22	09:11	SG	S	6 L	None	G	SA	VOC (TO-15)	
116606	✓001	CWL-D1-350	11151	350	1/20/22	09:11	SG	S	6 L	None	G	DU	VOC (TO-15)	
116607	✓001	CWL-D1-470	09592	470	1/20/22	09:18	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
	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: Reference attached forms.
	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	
	Timmie Jackson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-2547/505-263-6639	

Relinquished by <i>[Signature]</i> Org. <i>5888</i> Date <i>1/20/22</i> Time <i>1405</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. <i>0618</i> Date <i>1/20/22</i> Time <i>1405</i>	Received by <i>[Signature]</i> Org. <i>ETAVLN</i> Date <i>01.25.22</i> Time <i>10:30</i>
Relinquished by <i>[Signature]</i> Org. <i>0618</i> Date <i>1/20/22</i> Time <i>0800</i>	Relinquished by _____ Org. _____ Date _____ Time _____
Received by _____ Org. _____ Date _____ Time _____	Received by _____ Org. _____ Date _____ Time _____

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

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02/15/2022

# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *N/A*

AR/COC **622758**

Project Name: CWL PCCP		Date Samples Shipped: <i>1/21/2022</i>		SMO Authorization: <i>[Signature]</i>		<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMA <input type="checkbox"/> Released by COC No.	
Project/Task Manager: Timmie Jackson		Carrier/Waybill No: <i>341752</i>		SMO Contact Phone: Wendy Palencia/505-844-3132		<input checked="" type="checkbox"/> 4° Celsius	
Project/Task Number: 195122.10.11.03		Lab Contact: Jamie McKinney/865-291-3006		Send Report to SMO: Stephanie Montaño/505-284-2553		Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154	
Service Order: CF327-22		Lab Destination: TAKX		Contract No.: 1636780			

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					
116608	✓ 001	CWL-SV-FB4	34001277	NA	1/20/22	10:38	UPN	S	6 L	None	G	FB	VOC (TO-15)	
116609	✓ 001	CWL-D2-120	10065	120	1/20/22	10:57	SG	S	6 L	None	G	SA	VOC (TO-15)	
116610	✓ 001	CWL-D2-240	11207	240	1/20/22	11:00	SG	S	6 L	None	G	SA	VOC (TO-15)	
116611	✓ 001	CWL-D2-350	34001127	350	1/20/22	11:04	SG	S	6 L	None	G	SA	VOC (TO-15)	
116612	✓ 001	CWL-D2-440	11198	440	1/20/22	11:08	SG	S	6 L	None	G	SA	VOC (TO-15)	
116613	✓ 001	CWL-D2-470	12088	470	1/20/22	11:14	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 initials:		Negotiated TAT		<input type="checkbox"/>					
<b>Sample Team Members</b>	Name		Signature		Init.		Company/Organization/Phone/Cell		Sample Disposal		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch		<i>[Signature]</i>		<i>RL</i>		SNL/08888/505-844-4013/505-250-7090		Return Samples By:		
	William Gibson		<i>[Signature]</i>		<i>WG</i>		SNL/08888/505-284-3307/505-239-7367		Comments: Reference attached forms.		
	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				
Timmie Jackson		<i>[Signature]</i>		<i>TJ</i>		SNL/08888/505-284-2547/505-263-6639					

Relinquished by <i>[Signature]</i>	Org. <i>8888</i>	Date <i>1/20/22</i>	Time <i>14:05</i>	Relinquished by <i>[Signature]</i>	Org.	Date	Time
Received by <i>[Signature]</i>	Org. <i>0618</i>	Date <i>1/20/22</i>	Time <i>12:05</i>	Received by <i>[Signature]</i>	Org. <i>FTANVX</i>	Date <i>01-25-22</i>	Time <i>10:30</i>
Relinquished by <i>[Signature]</i>	Org. <i>0618</i>	Date <i>1/21/22</i>	Time <i>0800</i>	Relinquished by	Org.	Date	Time
Received by	Org.	Date	Time	Received by	Org.	Date	Time

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

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02/15/2022



# CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *MA* AR/COC **622759**

Project Name: CWL PCCP Date Samples Shipped: *1/21/2022* SMO Authorization: *[Signature]*

Project/Task Manager: Timmie Jackson Carrier/Waybill No.: *341752* SMO Contact Phone: *[Signature]*

Project/Task Number: 195122.10.11.03 Lab Contact: Jamie McKinney/865-291-3006 Wendy Palencia/505-844-3132

Service Order: CF327-22 Lab Destination: TAKX Send Report to SMO:  4° Celsius

Contract No.: 1636780 Stephanie Montañó/505-284-2553

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

Tech Area: \_\_\_\_\_

Building: \_\_\_\_\_ Room: \_\_\_\_\_ Operational Site: \_\_\_\_\_

Sample No.	Fraction	Sample Location Detail		Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
								Type	Volume					
116614	✓ 001	CWL-SV-FB5	11043	NA	1/20/22	09:57	UPN	S	6 L	None	G	FB	VOC (TO-15)	
116615	✓ 001	CWL-D3-120	10635	120	1/20/22	10:04	SG	S	6 L	None	G	SA	VOC (TO-15)	
116616	✓ 001	CWL-D3-170	34001524	170	1/20/22	10:07	SG	S	6 L	None	G	SA	VOC (TO-15)	
116617	✓ 001	CWL-D3-350	10471	350	1/20/22	10:12	SG	S	6 L	None	G	SA	VOC (TO-15)	
116618	✓ 001	CWL-D3-440	09548	440	1/20/22	10:16	SG	S	6 L	None	G	SA	VOC (TO-15)	
116619	✓ 001	CWL-D3-480	8194	480	1/20/22	10:25	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          Lab Use
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>	<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: Reference attached forms.				
	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						
Timmie Jackson	<i>[Signature]</i>	<i>[Init]</i>	SNL/08888/505-284-2547/505-263-6639							

Relinquished by <i>[Signature]</i> Org. 8888 Date 1/20/22 Time 1405	Relinquished by _____ Org. _____ Date _____ Time _____
Received by <i>[Signature]</i> Org. 0618 Date 1/20/22 Time 1405	Received by <i>[Signature]</i> Org. ETRVNYX Date 01.25.22 Time 10:30
Relinquished by <i>[Signature]</i> Org. 0618 Date 1/21/22 Time 0800	Relinquished by _____ Org. _____ Date _____ Time _____
Received by _____ Org. _____ Date _____ Time _____	Received by _____ Org. _____ Date _____ Time _____

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

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02/15/2022

**CONTRACT VERIFICATION REVIEW FORMS**

**CHEMICAL WASTE LANDFILL**

**SOIL-GAS MONITORING**

**JANUARY 2022**

<b>AR/COC Number</b>	<b>Sample Type</b>
622755	Environmental & Quality Control
622756	Environmental & Quality Control
622757	Environmental & Quality Control
622758	Environmental & Quality Control
622759	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. 622755, 622756, 622757, 622758 &amp; 622759

Analytical Lab TAKX

SDG No. 140-26221-1

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	X		
1.5	Custody records continuous and complete	X		
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X		
1.7	Date samples received	X		
1.8	Condition upon receipt information provided	X		

### 2.0 Analytical Laboratory Report

Line No.	Item	Complete?		If no, explain
		Yes	No	
2.1	Data reviewed, signature	X		
2.2	Method reference number(s) complete and correct	X		
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X		
2.4	Matrix spike/matrix spike duplicate data provided	N/A		
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and Lc	X		

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	Bromomethane failed recovery limits for LCS (batch 140-58279). Bromomethane, chloroethane and vinyl chloride failed recovery limits for LCSD (batch 140-58279).
	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		

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	Ethylbenzene detected in MB 140-58224
	b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Several analytes detected in CWL-SV-FB2, CWL-SV-FB1, CWL-SV-FB3, CWL-SV-FB4 & CWL-SV-FB5.
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	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
---------------------	----------	-------------------------------

Were deficiencies unresolved?  Yes  No

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

Reviewed by: Wendy Palencia Date: 02-09-2022 12:24:00

Closed by: Wendy Palencia Date: 02-09-2022 12:24:00

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

**Chemical Waste Landfill**

**January 2022 Samples**



# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116596-001/CWL-SV-FB2**

**Lab Sample ID: 140-26221-1**

Date Collected: 01/20/22 09:32

Matrix: Air

Date Received: 01/25/22 10:30

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>1.5</b>	<b>J</b>	2.4	0.69	ppb v/v			01/27/22 15:42	1.93
<b>Benzene</b>	<b>0.026</b>	<b>J</b>	0.097	0.016	ppb v/v			01/27/22 15:42	1.93
Benzyl chloride	ND		0.19	0.046	ppb v/v			01/27/22 15:42	1.93
Bromodichloromethane	ND		0.097	0.022	ppb v/v			01/27/22 15:42	1.93
Bromoform	ND		0.097	0.033	ppb v/v			01/27/22 15:42	1.93
Bromomethane	ND		0.097	0.027	ppb v/v			01/27/22 15:42	1.93
<b>2-Butanone (MEK)</b>	<b>0.13</b>	<b>J</b>	0.48	0.088	ppb v/v			01/27/22 15:42	1.93
<b>Carbon disulfide</b>	<b>0.061</b>	<b>J</b>	0.24	0.042	ppb v/v			01/27/22 15:42	1.93
Carbon tetrachloride	ND		0.097	0.016	ppb v/v			01/27/22 15:42	1.93
Chlorobenzene	ND		0.097	0.027	ppb v/v			01/27/22 15:42	1.93
Chloroethane	ND		0.097	0.039	ppb v/v			01/27/22 15:42	1.93
Chloroform	ND		0.097	0.017	ppb v/v			01/27/22 15:42	1.93
Chloromethane	ND		0.24	0.080	ppb v/v			01/27/22 15:42	1.93
Dibromochloromethane	ND		0.097	0.017	ppb v/v			01/27/22 15:42	1.93
1,2-Dibromoethane (EDB)	ND		0.097	0.014	ppb v/v			01/27/22 15:42	1.93
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.097	0.014	ppb v/v			01/27/22 15:42	1.93
1,2-Dichlorobenzene	ND		0.097	0.037	ppb v/v			01/27/22 15:42	1.93
<b>1,3-Dichlorobenzene</b>	<b>0.021</b>	<b>J</b>	0.097	0.019	ppb v/v			01/27/22 15:42	1.93
<b>1,4-Dichlorobenzene</b>	<b>0.023</b>	<b>J</b>	0.097	0.019	ppb v/v			01/27/22 15:42	1.93
Dichlorodifluoromethane	ND		0.097	0.017	ppb v/v			01/27/22 15:42	1.93
1,1-Dichloroethane	ND		0.097	0.013	ppb v/v			01/27/22 15:42	1.93
<b>1,2-Dichloroethane</b>	<b>0.012</b>	<b>J</b>	0.097	0.012	ppb v/v			01/27/22 15:42	1.93
1,1-Dichloroethene	ND		0.097	0.016	ppb v/v			01/27/22 15:42	1.93
cis-1,2-Dichloroethene	ND		0.097	0.012	ppb v/v			01/27/22 15:42	1.93
trans-1,2-Dichloroethene	ND		0.097	0.016	ppb v/v			01/27/22 15:42	1.93
1,2-Dichloropropane	ND		0.097	0.012	ppb v/v			01/27/22 15:42	1.93
cis-1,3-Dichloropropene	ND		0.097	0.023	ppb v/v			01/27/22 15:42	1.93
trans-1,3-Dichloropropene	ND		0.097	0.024	ppb v/v			01/27/22 15:42	1.93
<b>Ethylbenzene</b>	<b>0.041</b>	<b>J B</b>	0.097	0.016	ppb v/v			01/27/22 15:42	1.93
4-Ethyltoluene	ND		0.19	0.025	ppb v/v			01/27/22 15:42	1.93
Hexachlorobutadiene	ND		0.48	0.039	ppb v/v			01/27/22 15:42	1.93
2-Hexanone	ND		0.24	0.029	ppb v/v			01/27/22 15:42	1.93
<b>4-Methyl-2-pentanone (MIBK)</b>	<b>0.21</b>	<b>J</b>	0.24	0.065	ppb v/v			01/27/22 15:42	1.93
<b>Methylene Chloride</b>	<b>4.6</b>		0.48	0.17	ppb v/v			01/27/22 15:42	1.93
<b>Styrene</b>	<b>0.035</b>	<b>J</b>	0.097	0.029	ppb v/v			01/27/22 15:42	1.93
1,1,2,2-Tetrachloroethane	ND		0.097	0.017	ppb v/v			01/27/22 15:42	1.93
<b>Tetrachloroethene</b>	<b>0.034</b>	<b>J</b>	0.097	0.014	ppb v/v			01/27/22 15:42	1.93
<b>Toluene</b>	<b>0.42</b>		0.14	0.028	ppb v/v			01/27/22 15:42	1.93
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.097	0.012	ppb v/v			01/27/22 15:42	1.93
1,2,4-Trichlorobenzene	ND		0.48	0.042	ppb v/v			01/27/22 15:42	1.93
1,1,1-Trichloroethane	ND		0.097	0.035	ppb v/v			01/27/22 15:42	1.93
1,1,2-Trichloroethane	ND		0.097	0.018	ppb v/v			01/27/22 15:42	1.93
<b>Trichloroethene</b>	<b>0.017</b>	<b>J</b>	0.048	0.016	ppb v/v			01/27/22 15:42	1.93
<b>Trichlorofluoromethane</b>	<b>0.035</b>	<b>J</b>	0.097	0.013	ppb v/v			01/27/22 15:42	1.93
1,2,4-Trimethylbenzene	ND		0.097	0.024	ppb v/v			01/27/22 15:42	1.93
1,3,5-Trimethylbenzene	ND		0.19	0.078	ppb v/v			01/27/22 15:42	1.93
Vinyl acetate	ND		0.48	0.034	ppb v/v			01/27/22 15:42	1.93
Vinyl chloride	ND		0.048	0.031	ppb v/v			01/27/22 15:42	1.93

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116596-001/CWL-SV-FB2**

**Lab Sample ID: 140-26221-1**

Date Collected: 01/20/22 09:32

Matrix: Air

Date Received: 01/25/22 10:30

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	0.11		0.097	0.035	ppb v/v			01/27/22 15:42	1.93
o-Xylene	0.044	J	0.097	0.018	ppb v/v			01/27/22 15:42	1.93
<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					01/27/22 15:42	1.93

**Client Sample ID: 116597-001/CWL-UI2-36**

**Lab Sample ID: 140-26221-2**

Date Collected: 01/20/22 09:38

Matrix: Air

Date Received: 01/25/22 10:30

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		420	120	ppb v/v			01/28/22 15:57	4.99
Benzene	ND		17	2.7	ppb v/v			01/28/22 15:57	4.99
Benzyl chloride	ND		33	7.9	ppb v/v			01/28/22 15:57	4.99
Bromodichloromethane	ND		17	3.7	ppb v/v			01/28/22 15:57	4.99
Bromoform	ND		17	5.6	ppb v/v			01/28/22 15:57	4.99
Bromomethane	ND	*+	17	4.6	ppb v/v			01/28/22 15:57	4.99
2-Butanone (MEK)	ND		83	15	ppb v/v			01/28/22 15:57	4.99
Carbon disulfide	ND		42	7.3	ppb v/v			01/28/22 15:57	4.99
Carbon tetrachloride	4.0	J	17	2.7	ppb v/v			01/28/22 15:57	4.99
Chlorobenzene	4.6	J	17	4.6	ppb v/v			01/28/22 15:57	4.99
Chloroethane	ND	*+	17	6.7	ppb v/v			01/28/22 15:57	4.99
Chloroform	180		17	2.9	ppb v/v			01/28/22 15:57	4.99
Chloromethane	ND		42	14	ppb v/v			01/28/22 15:57	4.99
Dibromochloromethane	ND		17	2.9	ppb v/v			01/28/22 15:57	4.99
1,2-Dibromoethane (EDB)	ND		17	2.5	ppb v/v			01/28/22 15:57	4.99
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		17	2.5	ppb v/v			01/28/22 15:57	4.99
1,2-Dichlorobenzene	ND		17	6.4	ppb v/v			01/28/22 15:57	4.99
1,3-Dichlorobenzene	ND		17	3.3	ppb v/v			01/28/22 15:57	4.99
1,4-Dichlorobenzene	ND		17	3.3	ppb v/v			01/28/22 15:57	4.99
Dichlorodifluoromethane	6.0	J	17	2.9	ppb v/v			01/28/22 15:57	4.99
1,1-Dichloroethane	ND		17	2.3	ppb v/v			01/28/22 15:57	4.99
1,2-Dichloroethane	ND		17	2.1	ppb v/v			01/28/22 15:57	4.99
1,1-Dichloroethene	10	J	17	2.7	ppb v/v			01/28/22 15:57	4.99
cis-1,2-Dichloroethene	ND		17	2.1	ppb v/v			01/28/22 15:57	4.99
trans-1,2-Dichloroethene	ND		17	2.7	ppb v/v			01/28/22 15:57	4.99
1,2-Dichloropropane	24		17	2.1	ppb v/v			01/28/22 15:57	4.99
cis-1,3-Dichloropropene	ND		17	4.0	ppb v/v			01/28/22 15:57	4.99
trans-1,3-Dichloropropene	ND		17	4.2	ppb v/v			01/28/22 15:57	4.99
Ethylbenzene	ND		17	2.7	ppb v/v			01/28/22 15:57	4.99
4-Ethyltoluene	ND		33	4.4	ppb v/v			01/28/22 15:57	4.99
Hexachlorobutadiene	ND		83	6.7	ppb v/v			01/28/22 15:57	4.99
2-Hexanone	ND		42	5.0	ppb v/v			01/28/22 15:57	4.99
4-Methyl-2-pentanone (MIBK)	ND		42	11	ppb v/v			01/28/22 15:57	4.99
Methylene Chloride	ND		83	29	ppb v/v			01/28/22 15:57	4.99
Styrene	ND		17	5.0	ppb v/v			01/28/22 15:57	4.99
1,1,2,2-Tetrachloroethane	ND		17	2.9	ppb v/v			01/28/22 15:57	4.99

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116597-001/CWL-UI2-36**

**Lab Sample ID: 140-26221-2**

Date Collected: 01/20/22 09:38

Matrix: Air

Date Received: 01/25/22 10:30

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>43</b>		17	2.5	ppb v/v			01/28/22 15:57	4.99
Toluene	ND		25	4.8	ppb v/v			01/28/22 15:57	4.99
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>120</b>		17	2.1	ppb v/v			01/28/22 15:57	4.99
1,2,4-Trichlorobenzene	ND		83	7.3	ppb v/v			01/28/22 15:57	4.99
<b>1,1,1-Trichloroethane</b>	<b>6.5 J</b>		17	6.0	ppb v/v			01/28/22 15:57	4.99
1,1,2-Trichloroethane	ND		17	3.1	ppb v/v			01/28/22 15:57	4.99
<b>Trichloroethene</b>	<b>1200</b>		8.3	2.7	ppb v/v			01/28/22 15:57	4.99
<b>Trichlorofluoromethane</b>	<b>38</b>		17	2.3	ppb v/v			01/28/22 15:57	4.99
1,2,4-Trimethylbenzene	ND		17	4.2	ppb v/v			01/28/22 15:57	4.99
1,3,5-Trimethylbenzene	ND		33	14	ppb v/v			01/28/22 15:57	4.99
Vinyl acetate	ND		83	5.8	ppb v/v			01/28/22 15:57	4.99
Vinyl chloride	ND	*+	8.3	5.4	ppb v/v			01/28/22 15:57	4.99
m,p-Xylene	ND		17	6.0	ppb v/v			01/28/22 15:57	4.99
o-Xylene	ND		17	3.1	ppb v/v			01/28/22 15:57	4.99
<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)	81		60 - 140					01/28/22 15:57	4.99

**Client Sample ID: 116598-001/CWL-UI2-76**

**Lab Sample ID: 140-26221-3**

Date Collected: 01/20/22 09:40

Matrix: Air

Date Received: 01/25/22 10:30

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		540	150	ppb v/v			01/28/22 16:42	5.38
Benzene	ND		22	3.5	ppb v/v			01/28/22 16:42	5.38
Benzyl chloride	ND		43	10	ppb v/v			01/28/22 16:42	5.38
Bromodichloromethane	ND		22	4.8	ppb v/v			01/28/22 16:42	5.38
Bromoform	ND		22	7.3	ppb v/v			01/28/22 16:42	5.38
Bromomethane	ND	*+	22	5.9	ppb v/v			01/28/22 16:42	5.38
2-Butanone (MEK)	ND		110	20	ppb v/v			01/28/22 16:42	5.38
Carbon disulfide	ND		54	9.4	ppb v/v			01/28/22 16:42	5.38
<b>Carbon tetrachloride</b>	<b>4.9 J</b>		22	3.5	ppb v/v			01/28/22 16:42	5.38
Chlorobenzene	ND		22	5.9	ppb v/v			01/28/22 16:42	5.38
Chloroethane	ND	*+	22	8.6	ppb v/v			01/28/22 16:42	5.38
<b>Chloroform</b>	<b>190</b>		22	3.8	ppb v/v			01/28/22 16:42	5.38
Chloromethane	ND		54	18	ppb v/v			01/28/22 16:42	5.38
Dibromochloromethane	ND		22	3.8	ppb v/v			01/28/22 16:42	5.38
1,2-Dibromoethane (EDB)	ND		22	3.2	ppb v/v			01/28/22 16:42	5.38
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		22	3.2	ppb v/v			01/28/22 16:42	5.38
1,2-Dichlorobenzene	ND		22	8.3	ppb v/v			01/28/22 16:42	5.38
1,3-Dichlorobenzene	ND		22	4.3	ppb v/v			01/28/22 16:42	5.38
1,4-Dichlorobenzene	ND		22	4.3	ppb v/v			01/28/22 16:42	5.38
<b>Dichlorodifluoromethane</b>	<b>6.8 J</b>		22	3.8	ppb v/v			01/28/22 16:42	5.38
1,1-Dichloroethane	ND		22	3.0	ppb v/v			01/28/22 16:42	5.38
<b>1,2-Dichloroethane</b>	<b>4.4 J</b>		22	2.7	ppb v/v			01/28/22 16:42	5.38
<b>1,1-Dichloroethene</b>	<b>21 J</b>		22	3.5	ppb v/v			01/28/22 16:42	5.38

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# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116598-001/CWL-UI2-76**

**Lab Sample ID: 140-26221-3**

Date Collected: 01/20/22 09:40

Matrix: Air

Date Received: 01/25/22 10:30

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		22	2.7	ppb v/v			01/28/22 16:42	5.38
trans-1,2-Dichloroethene	ND		22	3.5	ppb v/v			01/28/22 16:42	5.38
<b>1,2-Dichloropropane</b>	<b>33</b>	<b>CI</b>	22	2.7	ppb v/v			01/28/22 16:42	5.38
cis-1,3-Dichloropropene	ND		22	5.1	ppb v/v			01/28/22 16:42	5.38
trans-1,3-Dichloropropene	ND		22	5.4	ppb v/v			01/28/22 16:42	5.38
Ethylbenzene	ND		22	3.5	ppb v/v			01/28/22 16:42	5.38
4-Ethyltoluene	ND		43	5.6	ppb v/v			01/28/22 16:42	5.38
Hexachlorobutadiene	ND		110	8.6	ppb v/v			01/28/22 16:42	5.38
2-Hexanone	ND		54	6.5	ppb v/v			01/28/22 16:42	5.38
4-Methyl-2-pentanone (MIBK)	ND		54	15	ppb v/v			01/28/22 16:42	5.38
Methylene Chloride	ND		110	38	ppb v/v			01/28/22 16:42	5.38
Styrene	ND		22	6.5	ppb v/v			01/28/22 16:42	5.38
1,1,2,2-Tetrachloroethane	ND		22	3.8	ppb v/v			01/28/22 16:42	5.38
<b>Tetrachloroethene</b>	<b>49</b>		22	3.2	ppb v/v			01/28/22 16:42	5.38
Toluene	ND		32	6.2	ppb v/v			01/28/22 16:42	5.38
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>170</b>		22	2.7	ppb v/v			01/28/22 16:42	5.38
1,2,4-Trichlorobenzene	ND		110	9.4	ppb v/v			01/28/22 16:42	5.38
1,1,1-Trichloroethane	ND		22	7.8	ppb v/v			01/28/22 16:42	5.38
1,1,2-Trichloroethane	ND		22	4.0	ppb v/v			01/28/22 16:42	5.38
<b>Trichloroethene</b>	<b>1600</b>		11	3.5	ppb v/v			01/28/22 16:42	5.38
<b>Trichlorofluoromethane</b>	<b>46</b>		22	3.0	ppb v/v			01/28/22 16:42	5.38
1,2,4-Trimethylbenzene	ND		22	5.4	ppb v/v			01/28/22 16:42	5.38
1,3,5-Trimethylbenzene	ND		43	17	ppb v/v			01/28/22 16:42	5.38
Vinyl acetate	ND		110	7.5	ppb v/v			01/28/22 16:42	5.38
Vinyl chloride	ND	*+	11	7.0	ppb v/v			01/28/22 16:42	5.38
m,p-Xylene	ND		22	7.8	ppb v/v			01/28/22 16:42	5.38
o-Xylene	ND		22	4.0	ppb v/v			01/28/22 16:42	5.38
<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)	79		60 - 140					01/28/22 16:42	5.38

**Client Sample ID: 116599-001/CWL-UI2-136**

**Lab Sample ID: 140-26221-4**

Date Collected: 01/20/22 09:43

Matrix: Air

Date Received: 01/25/22 10:30

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			01/28/22 17:27	9.59
Benzene	ND		30	4.8	ppb v/v			01/28/22 17:27	9.59
Benzyl chloride	ND		59	14	ppb v/v			01/28/22 17:27	9.59
Bromodichloromethane	ND		30	6.6	ppb v/v			01/28/22 17:27	9.59
Bromoform	ND		30	10	ppb v/v			01/28/22 17:27	9.59
Bromomethane	ND	*+	30	8.1	ppb v/v			01/28/22 17:27	9.59
2-Butanone (MEK)	ND		150	27	ppb v/v			01/28/22 17:27	9.59
Carbon disulfide	ND		74	13	ppb v/v			01/28/22 17:27	9.59
<b>Carbon tetrachloride</b>	<b>9.0</b>	<b>J</b>	30	4.8	ppb v/v			01/28/22 17:27	9.59
Chlorobenzene	ND		30	8.1	ppb v/v			01/28/22 17:27	9.59

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# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116599-001/CWL-UI2-136**

**Lab Sample ID: 140-26221-4**

Date Collected: 01/20/22 09:43

Matrix: Air

Date Received: 01/25/22 10:30

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	*+	30	12	ppb v/v			01/28/22 17:27	9.59
<b>Chloroform</b>	<b>250</b>		30	5.2	ppb v/v			01/28/22 17:27	9.59
Chloromethane	ND		74	24	ppb v/v			01/28/22 17:27	9.59
Dibromochloromethane	ND		30	5.2	ppb v/v			01/28/22 17:27	9.59
1,2-Dibromoethane (EDB)	ND		30	4.4	ppb v/v			01/28/22 17:27	9.59
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		30	4.4	ppb v/v			01/28/22 17:27	9.59
1,2-Dichlorobenzene	ND		30	11	ppb v/v			01/28/22 17:27	9.59
1,3-Dichlorobenzene	ND		30	5.9	ppb v/v			01/28/22 17:27	9.59
1,4-Dichlorobenzene	ND		30	5.9	ppb v/v			01/28/22 17:27	9.59
<b>Dichlorodifluoromethane</b>	<b>13</b>	<b>J</b>	30	5.2	ppb v/v			01/28/22 17:27	9.59
<b>1,1-Dichloroethane</b>	<b>6.0</b>	<b>J</b>	30	4.1	ppb v/v			01/28/22 17:27	9.59
<b>1,2-Dichloroethane</b>	<b>14</b>	<b>J</b>	30	3.7	ppb v/v			01/28/22 17:27	9.59
<b>1,1-Dichloroethene</b>	<b>49</b>		30	4.8	ppb v/v			01/28/22 17:27	9.59
cis-1,2-Dichloroethene	ND		30	3.7	ppb v/v			01/28/22 17:27	9.59
trans-1,2-Dichloroethene	ND		30	4.8	ppb v/v			01/28/22 17:27	9.59
<b>1,2-Dichloropropane</b>	<b>74</b>	<b>CI</b>	30	3.7	ppb v/v			01/28/22 17:27	9.59
cis-1,3-Dichloropropene	ND		30	7.0	ppb v/v			01/28/22 17:27	9.59
trans-1,3-Dichloropropene	ND		30	7.4	ppb v/v			01/28/22 17:27	9.59
Ethylbenzene	ND		30	4.8	ppb v/v			01/28/22 17:27	9.59
4-Ethyltoluene	ND		59	7.7	ppb v/v			01/28/22 17:27	9.59
Hexachlorobutadiene	ND		150	12	ppb v/v			01/28/22 17:27	9.59
2-Hexanone	ND		74	8.9	ppb v/v			01/28/22 17:27	9.59
4-Methyl-2-pentanone (MIBK)	ND		74	20	ppb v/v			01/28/22 17:27	9.59
Methylene Chloride	ND		150	52	ppb v/v			01/28/22 17:27	9.59
Styrene	ND		30	8.9	ppb v/v			01/28/22 17:27	9.59
1,1,2,2-Tetrachloroethane	ND		30	5.2	ppb v/v			01/28/22 17:27	9.59
<b>Tetrachloroethene</b>	<b>70</b>		30	4.4	ppb v/v			01/28/22 17:27	9.59
Toluene	ND		44	8.5	ppb v/v			01/28/22 17:27	9.59
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>290</b>		30	3.7	ppb v/v			01/28/22 17:27	9.59
1,2,4-Trichlorobenzene	ND		150	13	ppb v/v			01/28/22 17:27	9.59
1,1,1-Trichloroethane	ND		30	11	ppb v/v			01/28/22 17:27	9.59
<b>1,1,2-Trichloroethane</b>	<b>5.7</b>	<b>J</b>	30	5.5	ppb v/v			01/28/22 17:27	9.59
<b>Trichloroethene</b>	<b>2900</b>		15	4.8	ppb v/v			01/28/22 17:27	9.59
<b>Trichlorofluoromethane</b>	<b>83</b>		30	4.1	ppb v/v			01/28/22 17:27	9.59
1,2,4-Trimethylbenzene	ND		30	7.4	ppb v/v			01/28/22 17:27	9.59
1,3,5-Trimethylbenzene	ND		59	24	ppb v/v			01/28/22 17:27	9.59
Vinyl acetate	ND		150	10	ppb v/v			01/28/22 17:27	9.59
Vinyl chloride	ND	*+	15	9.6	ppb v/v			01/28/22 17:27	9.59
m,p-Xylene	ND		30	11	ppb v/v			01/28/22 17:27	9.59
o-Xylene	ND		30	5.5	ppb v/v			01/28/22 17:27	9.59
<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)	80		60 - 140					01/28/22 17:27	9.59

# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116592-001/CWL-SV-FB1**

**Lab Sample ID: 140-26221-5**

Date Collected: 01/20/22 08:26

Matrix: Air

Date Received: 01/25/22 10:30

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		2.1	0.61	ppb v/v			01/27/22 16:38	1.71
Benzene	ND		0.086	0.014	ppb v/v			01/27/22 16:38	1.71
Benzyl chloride	ND		0.17	0.041	ppb v/v			01/27/22 16:38	1.71
Bromodichloromethane	ND		0.086	0.019	ppb v/v			01/27/22 16:38	1.71
Bromoform	ND		0.086	0.029	ppb v/v			01/27/22 16:38	1.71
Bromomethane	ND		0.086	0.024	ppb v/v			01/27/22 16:38	1.71
<b>2-Butanone (MEK)</b>	<b>0.19</b>	<b>J</b>	0.43	0.078	ppb v/v			01/27/22 16:38	1.71
Carbon disulfide	ND		0.21	0.037	ppb v/v			01/27/22 16:38	1.71
Carbon tetrachloride	ND		0.086	0.014	ppb v/v			01/27/22 16:38	1.71
Chlorobenzene	ND		0.086	0.024	ppb v/v			01/27/22 16:38	1.71
Chloroethane	ND		0.086	0.034	ppb v/v			01/27/22 16:38	1.71
Chloroform	ND		0.086	0.015	ppb v/v			01/27/22 16:38	1.71
Chloromethane	ND		0.21	0.071	ppb v/v			01/27/22 16:38	1.71
Dibromochloromethane	ND		0.086	0.015	ppb v/v			01/27/22 16:38	1.71
1,2-Dibromoethane (EDB)	ND		0.086	0.013	ppb v/v			01/27/22 16:38	1.71
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.086	0.013	ppb v/v			01/27/22 16:38	1.71
1,2-Dichlorobenzene	ND		0.086	0.033	ppb v/v			01/27/22 16:38	1.71
1,3-Dichlorobenzene	ND		0.086	0.017	ppb v/v			01/27/22 16:38	1.71
1,4-Dichlorobenzene	ND		0.086	0.017	ppb v/v			01/27/22 16:38	1.71
Dichlorodifluoromethane	ND		0.086	0.015	ppb v/v			01/27/22 16:38	1.71
1,1-Dichloroethane	ND		0.086	0.012	ppb v/v			01/27/22 16:38	1.71
1,2-Dichloroethane	ND		0.086	0.011	ppb v/v			01/27/22 16:38	1.71
1,1-Dichloroethene	ND		0.086	0.014	ppb v/v			01/27/22 16:38	1.71
cis-1,2-Dichloroethene	ND		0.086	0.011	ppb v/v			01/27/22 16:38	1.71
trans-1,2-Dichloroethene	ND		0.086	0.014	ppb v/v			01/27/22 16:38	1.71
1,2-Dichloropropane	ND		0.086	0.011	ppb v/v			01/27/22 16:38	1.71
cis-1,3-Dichloropropene	ND		0.086	0.020	ppb v/v			01/27/22 16:38	1.71
trans-1,3-Dichloropropene	ND		0.086	0.021	ppb v/v			01/27/22 16:38	1.71
<b>Ethylbenzene</b>	<b>0.015</b>	<b>J B</b>	0.086	0.014	ppb v/v			01/27/22 16:38	1.71
4-Ethyltoluene	ND		0.17	0.022	ppb v/v			01/27/22 16:38	1.71
Hexachlorobutadiene	ND		0.43	0.034	ppb v/v			01/27/22 16:38	1.71
<b>2-Hexanone</b>	<b>0.032</b>	<b>J</b>	0.21	0.026	ppb v/v			01/27/22 16:38	1.71
4-Methyl-2-pentanone (MIBK)	ND		0.21	0.058	ppb v/v			01/27/22 16:38	1.71
Methylene Chloride	ND		0.43	0.15	ppb v/v			01/27/22 16:38	1.71
Styrene	ND		0.086	0.026	ppb v/v			01/27/22 16:38	1.71
1,1,2,2-Tetrachloroethane	ND		0.086	0.015	ppb v/v			01/27/22 16:38	1.71
Tetrachloroethene	ND		0.086	0.013	ppb v/v			01/27/22 16:38	1.71
<b>Toluene</b>	<b>0.091</b>	<b>J</b>	0.13	0.025	ppb v/v			01/27/22 16:38	1.71
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.086	0.011	ppb v/v			01/27/22 16:38	1.71
1,2,4-Trichlorobenzene	ND		0.43	0.037	ppb v/v			01/27/22 16:38	1.71
1,1,1-Trichloroethane	ND		0.086	0.031	ppb v/v			01/27/22 16:38	1.71
1,1,2-Trichloroethane	ND		0.086	0.016	ppb v/v			01/27/22 16:38	1.71
Trichloroethene	ND		0.043	0.014	ppb v/v			01/27/22 16:38	1.71
Trichlorofluoromethane	ND		0.086	0.012	ppb v/v			01/27/22 16:38	1.71
1,2,4-Trimethylbenzene	ND		0.086	0.021	ppb v/v			01/27/22 16:38	1.71
1,3,5-Trimethylbenzene	ND		0.17	0.069	ppb v/v			01/27/22 16:38	1.71
Vinyl acetate	ND		0.43	0.030	ppb v/v			01/27/22 16:38	1.71
Vinyl chloride	ND		0.043	0.028	ppb v/v			01/27/22 16:38	1.71

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116592-001/CWL-SV-FB1**

**Lab Sample ID: 140-26221-5**

Date Collected: 01/20/22 08:26

Matrix: Air

Date Received: 01/25/22 10:30

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	0.037	J	0.086	0.031	ppb v/v			01/27/22 16:38	1.71
o-Xylene	ND		0.086	0.016	ppb v/v			01/27/22 16:38	1.71
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		60 - 140					01/27/22 16:38	1.71

**Client Sample ID: 116593-001/CWL-UI1-40**

**Lab Sample ID: 140-26221-6**

Date Collected: 01/20/22 08:32

Matrix: Air

Date Received: 01/25/22 10:30

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		530	150	ppb v/v			01/28/22 18:12	5.28
Benzene	ND		21	3.4	ppb v/v			01/28/22 18:12	5.28
Benzyl chloride	ND		42	10	ppb v/v			01/28/22 18:12	5.28
Bromodichloromethane	ND		21	4.8	ppb v/v			01/28/22 18:12	5.28
Bromoform	ND		21	7.1	ppb v/v			01/28/22 18:12	5.28
Bromomethane	ND	*+	21	5.8	ppb v/v			01/28/22 18:12	5.28
2-Butanone (MEK)	ND		110	19	ppb v/v			01/28/22 18:12	5.28
Carbon disulfide	ND		53	9.2	ppb v/v			01/28/22 18:12	5.28
Carbon tetrachloride	4.8	J	21	3.4	ppb v/v			01/28/22 18:12	5.28
Chlorobenzene	ND		21	5.8	ppb v/v			01/28/22 18:12	5.28
Chloroethane	ND	*+	21	8.4	ppb v/v			01/28/22 18:12	5.28
Chloroform	220		21	3.7	ppb v/v			01/28/22 18:12	5.28
Chloromethane	ND		53	17	ppb v/v			01/28/22 18:12	5.28
Dibromochloromethane	ND		21	3.7	ppb v/v			01/28/22 18:12	5.28
1,2-Dibromoethane (EDB)	ND		21	3.2	ppb v/v			01/28/22 18:12	5.28
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		21	3.2	ppb v/v			01/28/22 18:12	5.28
1,2-Dichlorobenzene	ND		21	8.2	ppb v/v			01/28/22 18:12	5.28
1,3-Dichlorobenzene	ND		21	4.2	ppb v/v			01/28/22 18:12	5.28
1,4-Dichlorobenzene	ND		21	4.2	ppb v/v			01/28/22 18:12	5.28
Dichlorodifluoromethane	9.5	J	21	3.7	ppb v/v			01/28/22 18:12	5.28
1,1-Dichloroethane	4.9	J	21	2.9	ppb v/v			01/28/22 18:12	5.28
1,2-Dichloroethane	4.4	J	21	2.6	ppb v/v			01/28/22 18:12	5.28
1,1-Dichloroethene	38		21	3.4	ppb v/v			01/28/22 18:12	5.28
cis-1,2-Dichloroethene	ND		21	2.6	ppb v/v			01/28/22 18:12	5.28
trans-1,2-Dichloroethene	ND		21	3.4	ppb v/v			01/28/22 18:12	5.28
1,2-Dichloropropane	27	CI	21	2.6	ppb v/v			01/28/22 18:12	5.28
cis-1,3-Dichloropropene	ND		21	5.0	ppb v/v			01/28/22 18:12	5.28
trans-1,3-Dichloropropene	ND		21	5.3	ppb v/v			01/28/22 18:12	5.28
Ethylbenzene	ND		21	3.4	ppb v/v			01/28/22 18:12	5.28
4-Ethyltoluene	ND		42	5.5	ppb v/v			01/28/22 18:12	5.28
Hexachlorobutadiene	ND		110	8.4	ppb v/v			01/28/22 18:12	5.28
2-Hexanone	ND		53	6.3	ppb v/v			01/28/22 18:12	5.28
4-Methyl-2-pentanone (MIBK)	ND		53	14	ppb v/v			01/28/22 18:12	5.28
Methylene Chloride	ND		110	37	ppb v/v			01/28/22 18:12	5.28
Styrene	ND		21	6.3	ppb v/v			01/28/22 18:12	5.28
1,1,2,2-Tetrachloroethane	ND		21	3.7	ppb v/v			01/28/22 18:12	5.28

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# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116593-001/CWL-U11-40**

**Lab Sample ID: 140-26221-6**

Date Collected: 01/20/22 08:32

Matrix: Air

Date Received: 01/25/22 10:30

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>1100</b>		21	3.2	ppb v/v			01/28/22 18:12	5.28
Toluene	ND		32	6.1	ppb v/v			01/28/22 18:12	5.28
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>210</b>		21	2.6	ppb v/v			01/28/22 18:12	5.28
1,2,4-Trichlorobenzene	ND		110	9.2	ppb v/v			01/28/22 18:12	5.28
<b>1,1,1-Trichloroethane</b>	<b>11 J</b>		21	7.7	ppb v/v			01/28/22 18:12	5.28
<b>1,1,2-Trichloroethane</b>	<b>4.9 J</b>		21	4.0	ppb v/v			01/28/22 18:12	5.28
<b>Trichloroethene</b>	<b>2100</b>		11	3.4	ppb v/v			01/28/22 18:12	5.28
<b>Trichlorofluoromethane</b>	<b>59</b>		21	2.9	ppb v/v			01/28/22 18:12	5.28
1,2,4-Trimethylbenzene	ND		21	5.3	ppb v/v			01/28/22 18:12	5.28
1,3,5-Trimethylbenzene	ND		42	17	ppb v/v			01/28/22 18:12	5.28
Vinyl acetate	ND		110	7.4	ppb v/v			01/28/22 18:12	5.28
Vinyl chloride	ND	*+	11	6.9	ppb v/v			01/28/22 18:12	5.28
m,p-Xylene	ND		21	7.7	ppb v/v			01/28/22 18:12	5.28
o-Xylene	ND		21	4.0	ppb v/v			01/28/22 18:12	5.28
<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)	81		60 - 140					01/28/22 18:12	5.28

**Client Sample ID: 116594-001/CWL-U11-80**

**Lab Sample ID: 140-26221-7**

Date Collected: 01/20/22 08:35

Matrix: Air

Date Received: 01/25/22 10:30

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		870	250	ppb v/v			01/28/22 18:58	10.42
Benzene	ND		35	5.6	ppb v/v			01/28/22 18:58	10.42
Benzyl chloride	ND		69	16	ppb v/v			01/28/22 18:58	10.42
Bromodichloromethane	ND		35	7.8	ppb v/v			01/28/22 18:58	10.42
Bromoform	ND		35	12	ppb v/v			01/28/22 18:58	10.42
Bromomethane	ND	*+	35	9.6	ppb v/v			01/28/22 18:58	10.42
2-Butanone (MEK)	ND		170	32	ppb v/v			01/28/22 18:58	10.42
Carbon disulfide	ND		87	15	ppb v/v			01/28/22 18:58	10.42
<b>Carbon tetrachloride</b>	<b>5.9 J</b>		35	5.6	ppb v/v			01/28/22 18:58	10.42
Chlorobenzene	ND		35	9.6	ppb v/v			01/28/22 18:58	10.42
Chloroethane	ND	*+	35	14	ppb v/v			01/28/22 18:58	10.42
<b>Chloroform</b>	<b>230</b>		35	6.1	ppb v/v			01/28/22 18:58	10.42
Chloromethane	ND		87	29	ppb v/v			01/28/22 18:58	10.42
Dibromochloromethane	ND		35	6.1	ppb v/v			01/28/22 18:58	10.42
1,2-Dibromoethane (EDB)	ND		35	5.2	ppb v/v			01/28/22 18:58	10.42
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		35	5.2	ppb v/v			01/28/22 18:58	10.42
1,2-Dichlorobenzene	ND		35	13	ppb v/v			01/28/22 18:58	10.42
1,3-Dichlorobenzene	ND		35	6.9	ppb v/v			01/28/22 18:58	10.42
1,4-Dichlorobenzene	ND		35	6.9	ppb v/v			01/28/22 18:58	10.42
<b>Dichlorodifluoromethane</b>	<b>14 J</b>		35	6.1	ppb v/v			01/28/22 18:58	10.42
<b>1,1-Dichloroethane</b>	<b>7.6 J</b>		35	4.8	ppb v/v			01/28/22 18:58	10.42
1,2-Dichloroethane	ND		35	4.3	ppb v/v			01/28/22 18:58	10.42
<b>1,1-Dichloroethene</b>	<b>90</b>		35	5.6	ppb v/v			01/28/22 18:58	10.42



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116594-001/CWL-U11-80**

**Lab Sample ID: 140-26221-7**

Date Collected: 01/20/22 08:35

Matrix: Air

Date Received: 01/25/22 10:30

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		35	4.3	ppb v/v			01/28/22 18:58	10.42
trans-1,2-Dichloroethene	ND		35	5.6	ppb v/v			01/28/22 18:58	10.42
<b>1,2-Dichloropropane</b>	<b>50</b>		35	4.3	ppb v/v			01/28/22 18:58	10.42
cis-1,3-Dichloropropene	ND		35	8.2	ppb v/v			01/28/22 18:58	10.42
trans-1,3-Dichloropropene	ND		35	8.7	ppb v/v			01/28/22 18:58	10.42
Ethylbenzene	ND		35	5.6	ppb v/v			01/28/22 18:58	10.42
4-Ethyltoluene	ND		69	9.1	ppb v/v			01/28/22 18:58	10.42
Hexachlorobutadiene	ND		170	14	ppb v/v			01/28/22 18:58	10.42
2-Hexanone	ND		87	10	ppb v/v			01/28/22 18:58	10.42
4-Methyl-2-pentanone (MIBK)	ND		87	23	ppb v/v			01/28/22 18:58	10.42
Methylene Chloride	ND		170	61	ppb v/v			01/28/22 18:58	10.42
Styrene	ND		35	10	ppb v/v			01/28/22 18:58	10.42
1,1,2,2-Tetrachloroethane	ND		35	6.1	ppb v/v			01/28/22 18:58	10.42
<b>Tetrachloroethene</b>	<b>360</b>		35	5.2	ppb v/v			01/28/22 18:58	10.42
Toluene	ND		52	10	ppb v/v			01/28/22 18:58	10.42
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>310</b>		35	4.3	ppb v/v			01/28/22 18:58	10.42
1,2,4-Trichlorobenzene	ND		170	15	ppb v/v			01/28/22 18:58	10.42
1,1,1-Trichloroethane	ND		35	13	ppb v/v			01/28/22 18:58	10.42
<b>1,1,2-Trichloroethane</b>	<b>6.9 J</b>		35	6.5	ppb v/v			01/28/22 18:58	10.42
<b>Trichloroethene</b>	<b>3500</b>		17	5.6	ppb v/v			01/28/22 18:58	10.42
<b>Trichlorofluoromethane</b>	<b>86</b>		35	4.8	ppb v/v			01/28/22 18:58	10.42
1,2,4-Trimethylbenzene	ND		35	8.7	ppb v/v			01/28/22 18:58	10.42
1,3,5-Trimethylbenzene	ND		69	28	ppb v/v			01/28/22 18:58	10.42
Vinyl acetate	ND		170	12	ppb v/v			01/28/22 18:58	10.42
Vinyl chloride	ND	*+	17	11	ppb v/v			01/28/22 18:58	10.42
m,p-Xylene	ND		35	13	ppb v/v			01/28/22 18:58	10.42
o-Xylene	ND		35	6.5	ppb v/v			01/28/22 18:58	10.42
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	79		60 - 140					01/28/22 18:58	10.42

**Client Sample ID: 116595-001/CWL-U11-120**

**Lab Sample ID: 140-26221-8**

Date Collected: 01/20/22 08:40

Matrix: Air

Date Received: 01/25/22 10:30

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		1200	330	ppb v/v			01/28/22 19:43	13.92
Benzene	ND		46	7.5	ppb v/v			01/28/22 19:43	13.92
Benzyl chloride	ND		93	22	ppb v/v			01/28/22 19:43	13.92
Bromodichloromethane	ND		46	10	ppb v/v			01/28/22 19:43	13.92
Bromoform	ND		46	16	ppb v/v			01/28/22 19:43	13.92
Bromomethane	ND	*+	46	13	ppb v/v			01/28/22 19:43	13.92
2-Butanone (MEK)	ND		230	42	ppb v/v			01/28/22 19:43	13.92
Carbon disulfide	ND		120	20	ppb v/v			01/28/22 19:43	13.92
<b>Carbon tetrachloride</b>	<b>12 J</b>		46	7.5	ppb v/v			01/28/22 19:43	13.92
Chlorobenzene	ND		46	13	ppb v/v			01/28/22 19:43	13.92

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116595-001/CWL-UI1-120**

**Lab Sample ID: 140-26221-8**

Date Collected: 01/20/22 08:40

Matrix: Air

Date Received: 01/25/22 10:30

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	*+	46	19	ppb v/v			01/28/22 19:43	13.92
<b>Chloroform</b>	<b>230</b>		46	8.1	ppb v/v			01/28/22 19:43	13.92
Chloromethane	ND		120	38	ppb v/v			01/28/22 19:43	13.92
Dibromochloromethane	ND		46	8.1	ppb v/v			01/28/22 19:43	13.92
1,2-Dibromoethane (EDB)	ND		46	7.0	ppb v/v			01/28/22 19:43	13.92
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		46	7.0	ppb v/v			01/28/22 19:43	13.92
1,2-Dichlorobenzene	ND		46	18	ppb v/v			01/28/22 19:43	13.92
1,3-Dichlorobenzene	ND		46	9.3	ppb v/v			01/28/22 19:43	13.92
1,4-Dichlorobenzene	ND		46	9.3	ppb v/v			01/28/22 19:43	13.92
<b>Dichlorodifluoromethane</b>	<b>15</b>	<b>J</b>	46	8.1	ppb v/v			01/28/22 19:43	13.92
1,1-Dichloroethane	ND		46	6.4	ppb v/v			01/28/22 19:43	13.92
<b>1,2-Dichloroethane</b>	<b>26</b>	<b>J</b>	46	5.8	ppb v/v			01/28/22 19:43	13.92
<b>1,1-Dichloroethene</b>	<b>130</b>		46	7.5	ppb v/v			01/28/22 19:43	13.92
cis-1,2-Dichloroethene	ND		46	5.8	ppb v/v			01/28/22 19:43	13.92
trans-1,2-Dichloroethene	ND		46	7.5	ppb v/v			01/28/22 19:43	13.92
<b>1,2-Dichloropropane</b>	<b>66</b>	<b>CI</b>	46	5.8	ppb v/v			01/28/22 19:43	13.92
cis-1,3-Dichloropropene	ND		46	11	ppb v/v			01/28/22 19:43	13.92
trans-1,3-Dichloropropene	ND		46	12	ppb v/v			01/28/22 19:43	13.92
Ethylbenzene	ND		46	7.5	ppb v/v			01/28/22 19:43	13.92
4-Ethyltoluene	ND		93	12	ppb v/v			01/28/22 19:43	13.92
Hexachlorobutadiene	ND		230	19	ppb v/v			01/28/22 19:43	13.92
2-Hexanone	ND		120	14	ppb v/v			01/28/22 19:43	13.92
4-Methyl-2-pentanone (MIBK)	ND		120	31	ppb v/v			01/28/22 19:43	13.92
Methylene Chloride	ND		230	81	ppb v/v			01/28/22 19:43	13.92
Styrene	ND		46	14	ppb v/v			01/28/22 19:43	13.92
1,1,2,2-Tetrachloroethane	ND		46	8.1	ppb v/v			01/28/22 19:43	13.92
<b>Tetrachloroethene</b>	<b>280</b>		46	7.0	ppb v/v			01/28/22 19:43	13.92
Toluene	ND		70	13	ppb v/v			01/28/22 19:43	13.92
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>440</b>		46	5.8	ppb v/v			01/28/22 19:43	13.92
1,2,4-Trichlorobenzene	ND		230	20	ppb v/v			01/28/22 19:43	13.92
1,1,1-Trichloroethane	ND		46	17	ppb v/v			01/28/22 19:43	13.92
<b>1,1,2-Trichloroethane</b>	<b>8.9</b>	<b>J</b>	46	8.7	ppb v/v			01/28/22 19:43	13.92
<b>Trichloroethene</b>	<b>4900</b>		23	7.5	ppb v/v			01/28/22 19:43	13.92
<b>Trichlorofluoromethane</b>	<b>120</b>		46	6.4	ppb v/v			01/28/22 19:43	13.92
1,2,4-Trimethylbenzene	ND		46	12	ppb v/v			01/28/22 19:43	13.92
1,3,5-Trimethylbenzene	ND		93	38	ppb v/v			01/28/22 19:43	13.92
Vinyl acetate	ND		230	16	ppb v/v			01/28/22 19:43	13.92
Vinyl chloride	ND	*+	23	15	ppb v/v			01/28/22 19:43	13.92
m,p-Xylene	ND		46	17	ppb v/v			01/28/22 19:43	13.92
o-Xylene	ND		46	8.7	ppb v/v			01/28/22 19:43	13.92

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	83		60 - 140		01/28/22 19:43	13.92

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116600-001/CWL-SV-FB3**

**Lab Sample ID: 140-26221-9**

Date Collected: 01/20/22 08:54

Matrix: Air

Date Received: 01/25/22 10:30

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	0.89	J	2.1	0.61	ppb v/v			01/27/22 17:34	1.71
Benzene	0.019	J	0.086	0.014	ppb v/v			01/27/22 17:34	1.71
Benzyl chloride	ND		0.17	0.041	ppb v/v			01/27/22 17:34	1.71
Bromodichloromethane	ND		0.086	0.019	ppb v/v			01/27/22 17:34	1.71
Bromoform	ND		0.086	0.029	ppb v/v			01/27/22 17:34	1.71
Bromomethane	ND		0.086	0.024	ppb v/v			01/27/22 17:34	1.71
2-Butanone (MEK)	ND		0.43	0.078	ppb v/v			01/27/22 17:34	1.71
Carbon disulfide	ND		0.21	0.037	ppb v/v			01/27/22 17:34	1.71
Carbon tetrachloride	ND		0.086	0.014	ppb v/v			01/27/22 17:34	1.71
Chlorobenzene	ND		0.086	0.024	ppb v/v			01/27/22 17:34	1.71
Chloroethane	ND		0.086	0.034	ppb v/v			01/27/22 17:34	1.71
Chloroform	ND		0.086	0.015	ppb v/v			01/27/22 17:34	1.71
Chloromethane	ND		0.21	0.071	ppb v/v			01/27/22 17:34	1.71
Dibromochloromethane	ND		0.086	0.015	ppb v/v			01/27/22 17:34	1.71
1,2-Dibromoethane (EDB)	0.013	J	0.086	0.013	ppb v/v			01/27/22 17:34	1.71
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.086	0.013	ppb v/v			01/27/22 17:34	1.71
1,2-Dichlorobenzene	ND		0.086	0.033	ppb v/v			01/27/22 17:34	1.71
1,3-Dichlorobenzene	ND		0.086	0.017	ppb v/v			01/27/22 17:34	1.71
1,4-Dichlorobenzene	ND		0.086	0.017	ppb v/v			01/27/22 17:34	1.71
Dichlorodifluoromethane	ND		0.086	0.015	ppb v/v			01/27/22 17:34	1.71
1,1-Dichloroethane	ND		0.086	0.012	ppb v/v			01/27/22 17:34	1.71
1,2-Dichloroethane	ND		0.086	0.011	ppb v/v			01/27/22 17:34	1.71
1,1-Dichloroethene	ND		0.086	0.014	ppb v/v			01/27/22 17:34	1.71
cis-1,2-Dichloroethene	ND		0.086	0.011	ppb v/v			01/27/22 17:34	1.71
trans-1,2-Dichloroethene	ND		0.086	0.014	ppb v/v			01/27/22 17:34	1.71
1,2-Dichloropropane	ND		0.086	0.011	ppb v/v			01/27/22 17:34	1.71
cis-1,3-Dichloropropene	ND		0.086	0.020	ppb v/v			01/27/22 17:34	1.71
trans-1,3-Dichloropropene	ND		0.086	0.021	ppb v/v			01/27/22 17:34	1.71
Ethylbenzene	0.015	J B	0.086	0.014	ppb v/v			01/27/22 17:34	1.71
4-Ethyltoluene	ND		0.17	0.022	ppb v/v			01/27/22 17:34	1.71
Hexachlorobutadiene	ND		0.43	0.034	ppb v/v			01/27/22 17:34	1.71
2-Hexanone	ND		0.21	0.026	ppb v/v			01/27/22 17:34	1.71
4-Methyl-2-pentanone (MIBK)	ND		0.21	0.058	ppb v/v			01/27/22 17:34	1.71
Methylene Chloride	0.51		0.43	0.15	ppb v/v			01/27/22 17:34	1.71
Styrene	ND		0.086	0.026	ppb v/v			01/27/22 17:34	1.71
1,1,2,2-Tetrachloroethane	ND		0.086	0.015	ppb v/v			01/27/22 17:34	1.71
Tetrachloroethene	0.015	J	0.086	0.013	ppb v/v			01/27/22 17:34	1.71
Toluene	0.13		0.13	0.025	ppb v/v			01/27/22 17:34	1.71
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.086	0.011	ppb v/v			01/27/22 17:34	1.71
1,2,4-Trichlorobenzene	ND		0.43	0.037	ppb v/v			01/27/22 17:34	1.71
1,1,1-Trichloroethane	ND		0.086	0.031	ppb v/v			01/27/22 17:34	1.71
1,1,2-Trichloroethane	ND		0.086	0.016	ppb v/v			01/27/22 17:34	1.71
Trichloroethene	ND		0.043	0.014	ppb v/v			01/27/22 17:34	1.71
Trichlorofluoromethane	ND		0.086	0.012	ppb v/v			01/27/22 17:34	1.71
1,2,4-Trimethylbenzene	ND		0.086	0.021	ppb v/v			01/27/22 17:34	1.71
1,3,5-Trimethylbenzene	ND		0.17	0.069	ppb v/v			01/27/22 17:34	1.71
Vinyl acetate	ND		0.43	0.030	ppb v/v			01/27/22 17:34	1.71
Vinyl chloride	ND		0.043	0.028	ppb v/v			01/27/22 17:34	1.71

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116600-001/CWL-SV-FB3**

**Lab Sample ID: 140-26221-9**

Date Collected: 01/20/22 08:54

Matrix: Air

Date Received: 01/25/22 10:30

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	0.041	J	0.086	0.031	ppb v/v			01/27/22 17:34	1.71
o-Xylene	0.020	J	0.086	0.016	ppb v/v			01/27/22 17:34	1.71
<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)	90		60 - 140					01/27/22 17:34	1.71

**Client Sample ID: 116601-001/CWL-D1-100**

**Lab Sample ID: 140-26221-10**

Date Collected: 01/20/22 09:00

Matrix: Air

Date Received: 01/25/22 10:30

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		1100	310	ppb v/v			01/28/22 20:27	15.24
Benzene	ND		44	7.1	ppb v/v			01/28/22 20:27	15.24
Benzyl chloride	ND		87	21	ppb v/v			01/28/22 20:27	15.24
Bromodichloromethane	ND		44	9.8	ppb v/v			01/28/22 20:27	15.24
Bromoform	ND		44	15	ppb v/v			01/28/22 20:27	15.24
Bromomethane	ND	*+	44	12	ppb v/v			01/28/22 20:27	15.24
2-Butanone (MEK)	ND		220	40	ppb v/v			01/28/22 20:27	15.24
Carbon disulfide	ND		110	19	ppb v/v			01/28/22 20:27	15.24
<b>Carbon tetrachloride</b>	<b>11</b>	<b>J</b>	44	7.1	ppb v/v			01/28/22 20:27	15.24
Chlorobenzene	ND		44	12	ppb v/v			01/28/22 20:27	15.24
Chloroethane	ND	*+	44	17	ppb v/v			01/28/22 20:27	15.24
<b>Chloroform</b>	<b>200</b>		44	7.6	ppb v/v			01/28/22 20:27	15.24
Chloromethane	ND		110	36	ppb v/v			01/28/22 20:27	15.24
Dibromochloromethane	ND		44	7.6	ppb v/v			01/28/22 20:27	15.24
1,2-Dibromoethane (EDB)	ND		44	6.5	ppb v/v			01/28/22 20:27	15.24
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		44	6.5	ppb v/v			01/28/22 20:27	15.24
1,2-Dichlorobenzene	ND		44	17	ppb v/v			01/28/22 20:27	15.24
1,3-Dichlorobenzene	ND		44	8.7	ppb v/v			01/28/22 20:27	15.24
1,4-Dichlorobenzene	ND		44	8.7	ppb v/v			01/28/22 20:27	15.24
<b>Dichlorodifluoromethane</b>	<b>17</b>	<b>J</b>	44	7.6	ppb v/v			01/28/22 20:27	15.24
1,1-Dichloroethane	ND		44	6.0	ppb v/v			01/28/22 20:27	15.24
1,2-Dichloroethane	ND		44	5.4	ppb v/v			01/28/22 20:27	15.24
<b>1,1-Dichloroethene</b>	<b>80</b>		44	7.1	ppb v/v			01/28/22 20:27	15.24
cis-1,2-Dichloroethene	ND		44	5.4	ppb v/v			01/28/22 20:27	15.24
trans-1,2-Dichloroethene	ND		44	7.1	ppb v/v			01/28/22 20:27	15.24
<b>1,2-Dichloropropane</b>	<b>61</b>		44	5.4	ppb v/v			01/28/22 20:27	15.24
cis-1,3-Dichloropropene	ND		44	10	ppb v/v			01/28/22 20:27	15.24
trans-1,3-Dichloropropene	ND		44	11	ppb v/v			01/28/22 20:27	15.24
Ethylbenzene	ND		44	7.1	ppb v/v			01/28/22 20:27	15.24
4-Ethyltoluene	ND		87	11	ppb v/v			01/28/22 20:27	15.24
Hexachlorobutadiene	ND		220	17	ppb v/v			01/28/22 20:27	15.24
2-Hexanone	ND		110	13	ppb v/v			01/28/22 20:27	15.24
4-Methyl-2-pentanone (MIBK)	ND		110	29	ppb v/v			01/28/22 20:27	15.24
Methylene Chloride	ND		220	76	ppb v/v			01/28/22 20:27	15.24
Styrene	ND		44	13	ppb v/v			01/28/22 20:27	15.24
1,1,2,2-Tetrachloroethane	ND		44	7.6	ppb v/v			01/28/22 20:27	15.24

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116601-001/CWL-D1-100**

**Lab Sample ID: 140-26221-10**

Date Collected: 01/20/22 09:00

Matrix: Air

Date Received: 01/25/22 10:30

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>260</b>		44	6.5	ppb v/v			01/28/22 20:27	15.24
Toluene	ND		65	13	ppb v/v			01/28/22 20:27	15.24
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>360</b>		44	5.4	ppb v/v			01/28/22 20:27	15.24
1,2,4-Trichlorobenzene	ND		220	19	ppb v/v			01/28/22 20:27	15.24
1,1,1-Trichloroethane	ND		44	16	ppb v/v			01/28/22 20:27	15.24
<b>1,1,2-Trichloroethane</b>	<b>8.5</b>	<b>J</b>	44	8.2	ppb v/v			01/28/22 20:27	15.24
<b>Trichloroethene</b>	<b>4100</b>		22	7.1	ppb v/v			01/28/22 20:27	15.24
<b>Trichlorofluoromethane</b>	<b>98</b>		44	6.0	ppb v/v			01/28/22 20:27	15.24
1,2,4-Trimethylbenzene	ND		44	11	ppb v/v			01/28/22 20:27	15.24
1,3,5-Trimethylbenzene	ND		87	35	ppb v/v			01/28/22 20:27	15.24
Vinyl acetate	ND		220	15	ppb v/v			01/28/22 20:27	15.24
Vinyl chloride	ND	*+	22	14	ppb v/v			01/28/22 20:27	15.24
m,p-Xylene	ND		44	16	ppb v/v			01/28/22 20:27	15.24
o-Xylene	ND		44	8.2	ppb v/v			01/28/22 20:27	15.24
<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)	82		60 - 140					01/28/22 20:27	15.24

**Client Sample ID: 116602-001/CWL-D1-100**

**Lab Sample ID: 140-26221-11**

Date Collected: 01/20/22 09:00

Matrix: Air

Date Received: 01/25/22 10:30

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		950	270	ppb v/v			01/29/22 07:54	19.05
Benzene	ND		38	6.2	ppb v/v			01/29/22 07:54	19.05
Benzyl chloride	ND		76	18	ppb v/v			01/29/22 07:54	19.05
Bromodichloromethane	ND		38	8.6	ppb v/v			01/29/22 07:54	19.05
Bromoform	ND		38	13	ppb v/v			01/29/22 07:54	19.05
Bromomethane	ND	*+	38	10	ppb v/v			01/29/22 07:54	19.05
2-Butanone (MEK)	ND		190	35	ppb v/v			01/29/22 07:54	19.05
Carbon disulfide	ND		95	17	ppb v/v			01/29/22 07:54	19.05
<b>Carbon tetrachloride</b>	<b>13</b>	<b>J</b>	38	6.2	ppb v/v			01/29/22 07:54	19.05
Chlorobenzene	ND		38	10	ppb v/v			01/29/22 07:54	19.05
Chloroethane	ND	*+	38	15	ppb v/v			01/29/22 07:54	19.05
<b>Chloroform</b>	<b>240</b>		38	6.7	ppb v/v			01/29/22 07:54	19.05
Chloromethane	ND		95	31	ppb v/v			01/29/22 07:54	19.05
Dibromochloromethane	ND		38	6.7	ppb v/v			01/29/22 07:54	19.05
1,2-Dibromoethane (EDB)	ND		38	5.7	ppb v/v			01/29/22 07:54	19.05
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		38	5.7	ppb v/v			01/29/22 07:54	19.05
1,2-Dichlorobenzene	ND		38	15	ppb v/v			01/29/22 07:54	19.05
1,3-Dichlorobenzene	ND		38	7.6	ppb v/v			01/29/22 07:54	19.05
1,4-Dichlorobenzene	ND		38	7.6	ppb v/v			01/29/22 07:54	19.05
<b>Dichlorodifluoromethane</b>	<b>21</b>	<b>J</b>	38	6.7	ppb v/v			01/29/22 07:54	19.05
1,1-Dichloroethane	ND		38	5.2	ppb v/v			01/29/22 07:54	19.05
<b>1,2-Dichloroethane</b>	<b>18</b>	<b>J</b>	38	4.8	ppb v/v			01/29/22 07:54	19.05
<b>1,1-Dichloroethene</b>	<b>110</b>		38	6.2	ppb v/v			01/29/22 07:54	19.05

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# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116602-001/CWL-D1-100**

**Lab Sample ID: 140-26221-11**

Date Collected: 01/20/22 09:00

Matrix: Air

Date Received: 01/25/22 10:30

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		38	4.8	ppb v/v			01/29/22 07:54	19.05
trans-1,2-Dichloroethene	ND		38	6.2	ppb v/v			01/29/22 07:54	19.05
<b>1,2-Dichloropropane</b>	<b>86</b>	<b>CI</b>	38	4.8	ppb v/v			01/29/22 07:54	19.05
cis-1,3-Dichloropropene	ND		38	9.0	ppb v/v			01/29/22 07:54	19.05
trans-1,3-Dichloropropene	ND		38	9.5	ppb v/v			01/29/22 07:54	19.05
Ethylbenzene	ND		38	6.2	ppb v/v			01/29/22 07:54	19.05
4-Ethyltoluene	ND		76	10	ppb v/v			01/29/22 07:54	19.05
Hexachlorobutadiene	ND		190	15	ppb v/v			01/29/22 07:54	19.05
2-Hexanone	ND		95	11	ppb v/v			01/29/22 07:54	19.05
4-Methyl-2-pentanone (MIBK)	ND		95	26	ppb v/v			01/29/22 07:54	19.05
Methylene Chloride	ND		190	67	ppb v/v			01/29/22 07:54	19.05
Styrene	ND		38	11	ppb v/v			01/29/22 07:54	19.05
1,1,2,2-Tetrachloroethane	ND		38	6.7	ppb v/v			01/29/22 07:54	19.05
<b>Tetrachloroethene</b>	<b>330</b>		38	5.7	ppb v/v			01/29/22 07:54	19.05
Toluene	ND		57	11	ppb v/v			01/29/22 07:54	19.05
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>440</b>		38	4.8	ppb v/v			01/29/22 07:54	19.05
1,2,4-Trichlorobenzene	ND		190	17	ppb v/v			01/29/22 07:54	19.05
1,1,1-Trichloroethane	ND		38	14	ppb v/v			01/29/22 07:54	19.05
1,1,2-Trichloroethane	ND		38	7.1	ppb v/v			01/29/22 07:54	19.05
<b>Trichloroethene</b>	<b>5200</b>		19	6.2	ppb v/v			01/29/22 07:54	19.05
<b>Trichlorofluoromethane</b>	<b>120</b>		38	5.2	ppb v/v			01/29/22 07:54	19.05
1,2,4-Trimethylbenzene	ND		38	9.5	ppb v/v			01/29/22 07:54	19.05
1,3,5-Trimethylbenzene	ND		76	31	ppb v/v			01/29/22 07:54	19.05
Vinyl acetate	ND		190	13	ppb v/v			01/29/22 07:54	19.05
Vinyl chloride	ND	*+	19	12	ppb v/v			01/29/22 07:54	19.05
m,p-Xylene	ND		38	14	ppb v/v			01/29/22 07:54	19.05
o-Xylene	ND		38	7.1	ppb v/v			01/29/22 07:54	19.05

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	84		60 - 140		01/29/22 07:54	19.05

**Client Sample ID: 116603-001/CWL-D1-160**

**Lab Sample ID: 140-26221-12**

Date Collected: 01/20/22 09:03

Matrix: Air

Date Received: 01/25/22 10:30

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		2500	710	ppb v/v			01/28/22 21:58	32.31
Benzene	ND		99	16	ppb v/v			01/28/22 21:58	32.31
Benzyl chloride	ND		200	47	ppb v/v			01/28/22 21:58	32.31
Bromodichloromethane	ND		99	22	ppb v/v			01/28/22 21:58	32.31
Bromoform	ND		99	34	ppb v/v			01/28/22 21:58	32.31
Bromomethane	ND	*+	99	27	ppb v/v			01/28/22 21:58	32.31
2-Butanone (MEK)	ND		500	91	ppb v/v			01/28/22 21:58	32.31
Carbon disulfide	ND		250	43	ppb v/v			01/28/22 21:58	32.31
Carbon tetrachloride	ND		99	16	ppb v/v			01/28/22 21:58	32.31
Chlorobenzene	ND		99	27	ppb v/v			01/28/22 21:58	32.31

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116603-001/CWL-D1-160**

**Lab Sample ID: 140-26221-12**

Date Collected: 01/20/22 09:03

Matrix: Air

Date Received: 01/25/22 10:30

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	*+	99	40	ppb v/v			01/28/22 21:58	32.31
<b>Chloroform</b>	<b>200</b>		99	17	ppb v/v			01/28/22 21:58	32.31
Chloromethane	ND		250	82	ppb v/v			01/28/22 21:58	32.31
Dibromochloromethane	ND		99	17	ppb v/v			01/28/22 21:58	32.31
1,2-Dibromoethane (EDB)	ND		99	15	ppb v/v			01/28/22 21:58	32.31
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		99	15	ppb v/v			01/28/22 21:58	32.31
1,2-Dichlorobenzene	ND		99	39	ppb v/v			01/28/22 21:58	32.31
1,3-Dichlorobenzene	ND		99	20	ppb v/v			01/28/22 21:58	32.31
1,4-Dichlorobenzene	ND		99	20	ppb v/v			01/28/22 21:58	32.31
<b>Dichlorodifluoromethane</b>	<b>19</b>	<b>J</b>	99	17	ppb v/v			01/28/22 21:58	32.31
1,1-Dichloroethane	ND		99	14	ppb v/v			01/28/22 21:58	32.31
1,2-Dichloroethane	ND		99	12	ppb v/v			01/28/22 21:58	32.31
<b>1,1-Dichloroethene</b>	<b>140</b>		99	16	ppb v/v			01/28/22 21:58	32.31
cis-1,2-Dichloroethene	ND		99	12	ppb v/v			01/28/22 21:58	32.31
trans-1,2-Dichloroethene	ND		99	16	ppb v/v			01/28/22 21:58	32.31
<b>1,2-Dichloropropane</b>	<b>95</b>	<b>J</b>	99	12	ppb v/v			01/28/22 21:58	32.31
cis-1,3-Dichloropropene	ND		99	24	ppb v/v			01/28/22 21:58	32.31
trans-1,3-Dichloropropene	ND		99	25	ppb v/v			01/28/22 21:58	32.31
Ethylbenzene	ND		99	16	ppb v/v			01/28/22 21:58	32.31
4-Ethyltoluene	ND		200	26	ppb v/v			01/28/22 21:58	32.31
Hexachlorobutadiene	ND		500	40	ppb v/v			01/28/22 21:58	32.31
2-Hexanone	ND		250	30	ppb v/v			01/28/22 21:58	32.31
4-Methyl-2-pentanone (MIBK)	ND		250	67	ppb v/v			01/28/22 21:58	32.31
Methylene Chloride	ND		500	170	ppb v/v			01/28/22 21:58	32.31
Styrene	ND		99	30	ppb v/v			01/28/22 21:58	32.31
1,1,2,2-Tetrachloroethane	ND		99	17	ppb v/v			01/28/22 21:58	32.31
<b>Tetrachloroethene</b>	<b>180</b>		99	15	ppb v/v			01/28/22 21:58	32.31
Toluene	ND		150	29	ppb v/v			01/28/22 21:58	32.31
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>480</b>		99	12	ppb v/v			01/28/22 21:58	32.31
1,2,4-Trichlorobenzene	ND		500	43	ppb v/v			01/28/22 21:58	32.31
1,1,1-Trichloroethane	ND		99	36	ppb v/v			01/28/22 21:58	32.31
1,1,2-Trichloroethane	ND		99	19	ppb v/v			01/28/22 21:58	32.31
<b>Trichloroethene</b>	<b>4600</b>		50	16	ppb v/v			01/28/22 21:58	32.31
<b>Trichlorofluoromethane</b>	<b>120</b>		99	14	ppb v/v			01/28/22 21:58	32.31
1,2,4-Trimethylbenzene	ND		99	25	ppb v/v			01/28/22 21:58	32.31
1,3,5-Trimethylbenzene	ND		200	81	ppb v/v			01/28/22 21:58	32.31
Vinyl acetate	ND		500	35	ppb v/v			01/28/22 21:58	32.31
Vinyl chloride	ND	*+	50	32	ppb v/v			01/28/22 21:58	32.31
m,p-Xylene	ND		99	36	ppb v/v			01/28/22 21:58	32.31
o-Xylene	ND		99	19	ppb v/v			01/28/22 21:58	32.31

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	81		60 - 140		01/28/22 21:58	32.31

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116604-001/CWL-D1-240**

**Lab Sample ID: 140-26221-13**

Date Collected: 01/20/22 09:06

Matrix: Air

Date Received: 01/25/22 10:30

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		2700	780	ppb v/v			01/28/22 22:43	41.2
Benzene	ND		110	18	ppb v/v			01/28/22 22:43	41.2
Benzyl chloride	ND		220	52	ppb v/v			01/28/22 22:43	41.2
Bromodichloromethane	ND		110	25	ppb v/v			01/28/22 22:43	41.2
Bromoform	ND		110	37	ppb v/v			01/28/22 22:43	41.2
Bromomethane	ND	*+	110	30	ppb v/v			01/28/22 22:43	41.2
2-Butanone (MEK)	ND		550	100	ppb v/v			01/28/22 22:43	41.2
Carbon disulfide	ND		270	48	ppb v/v			01/28/22 22:43	41.2
<b>Carbon tetrachloride</b>	<b>25</b>	<b>J</b>	110	18	ppb v/v			01/28/22 22:43	41.2
Chlorobenzene	ND		110	30	ppb v/v			01/28/22 22:43	41.2
Chloroethane	ND	*+	110	44	ppb v/v			01/28/22 22:43	41.2
<b>Chloroform</b>	<b>260</b>		110	19	ppb v/v			01/28/22 22:43	41.2
Chloromethane	ND		270	91	ppb v/v			01/28/22 22:43	41.2
Dibromochloromethane	ND		110	19	ppb v/v			01/28/22 22:43	41.2
1,2-Dibromoethane (EDB)	ND		110	16	ppb v/v			01/28/22 22:43	41.2
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	16	ppb v/v			01/28/22 22:43	41.2
1,2-Dichlorobenzene	ND		110	43	ppb v/v			01/28/22 22:43	41.2
1,3-Dichlorobenzene	ND		110	22	ppb v/v			01/28/22 22:43	41.2
1,4-Dichlorobenzene	ND		110	22	ppb v/v			01/28/22 22:43	41.2
<b>Dichlorodifluoromethane</b>	<b>41</b>	<b>J</b>	110	19	ppb v/v			01/28/22 22:43	41.2
<b>1,1-Dichloroethane</b>	<b>19</b>	<b>J</b>	110	15	ppb v/v			01/28/22 22:43	41.2
<b>1,2-Dichloroethane</b>	<b>23</b>	<b>J</b>	110	14	ppb v/v			01/28/22 22:43	41.2
<b>1,1-Dichloroethene</b>	<b>260</b>		110	18	ppb v/v			01/28/22 22:43	41.2
cis-1,2-Dichloroethene	ND		110	14	ppb v/v			01/28/22 22:43	41.2
trans-1,2-Dichloroethene	ND		110	18	ppb v/v			01/28/22 22:43	41.2
<b>1,2-Dichloropropane</b>	<b>140</b>		110	14	ppb v/v			01/28/22 22:43	41.2
cis-1,3-Dichloropropene	ND		110	26	ppb v/v			01/28/22 22:43	41.2
trans-1,3-Dichloropropene	ND		110	27	ppb v/v			01/28/22 22:43	41.2
Ethylbenzene	ND		110	18	ppb v/v			01/28/22 22:43	41.2
4-Ethyltoluene	ND		220	29	ppb v/v			01/28/22 22:43	41.2
Hexachlorobutadiene	ND		550	44	ppb v/v			01/28/22 22:43	41.2
2-Hexanone	ND		270	33	ppb v/v			01/28/22 22:43	41.2
4-Methyl-2-pentanone (MIBK)	ND		270	74	ppb v/v			01/28/22 22:43	41.2
Methylene Chloride	ND		550	190	ppb v/v			01/28/22 22:43	41.2
Styrene	ND		110	33	ppb v/v			01/28/22 22:43	41.2
1,1,2,2-Tetrachloroethane	ND		110	19	ppb v/v			01/28/22 22:43	41.2
<b>Tetrachloroethene</b>	<b>220</b>		110	16	ppb v/v			01/28/22 22:43	41.2
Toluene	ND		160	32	ppb v/v			01/28/22 22:43	41.2
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>850</b>		110	14	ppb v/v			01/28/22 22:43	41.2
1,2,4-Trichlorobenzene	ND		550	48	ppb v/v			01/28/22 22:43	41.2
1,1,1-Trichloroethane	ND		110	40	ppb v/v			01/28/22 22:43	41.2
1,1,2-Trichloroethane	ND		110	21	ppb v/v			01/28/22 22:43	41.2
<b>Trichloroethene</b>	<b>9300</b>		55	18	ppb v/v			01/28/22 22:43	41.2
<b>Trichlorofluoromethane</b>	<b>230</b>		110	15	ppb v/v			01/28/22 22:43	41.2
1,2,4-Trimethylbenzene	ND		110	27	ppb v/v			01/28/22 22:43	41.2
1,3,5-Trimethylbenzene	ND		220	89	ppb v/v			01/28/22 22:43	41.2
Vinyl acetate	ND		550	38	ppb v/v			01/28/22 22:43	41.2
Vinyl chloride	ND	*+	55	36	ppb v/v			01/28/22 22:43	41.2



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116604-001/CWL-D1-240**

**Lab Sample ID: 140-26221-13**

Date Collected: 01/20/22 09:06

Matrix: Air

Date Received: 01/25/22 10:30

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		110	40	ppb v/v			01/28/22 22:43	41.2
o-Xylene	ND		110	21	ppb v/v			01/28/22 22:43	41.2
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	82		60 - 140					01/28/22 22:43	41.2

**Client Sample ID: 116605-001/CWL-D1-350**

**Lab Sample ID: 140-26221-14**

Date Collected: 01/20/22 09:11

Matrix: Air

Date Received: 01/25/22 10:30

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			01/29/22 08:40	14.14
Benzene	ND		28	4.6	ppb v/v			01/29/22 08:40	14.14
Benzyl chloride	ND		57	13	ppb v/v			01/29/22 08:40	14.14
Bromodichloromethane	ND		28	6.4	ppb v/v			01/29/22 08:40	14.14
Bromoform	ND		28	9.5	ppb v/v			01/29/22 08:40	14.14
Bromomethane	ND	*+	28	7.8	ppb v/v			01/29/22 08:40	14.14
2-Butanone (MEK)	ND		140	26	ppb v/v			01/29/22 08:40	14.14
Carbon disulfide	ND		71	12	ppb v/v			01/29/22 08:40	14.14
<b>Carbon tetrachloride</b>	<b>14</b>	<b>J</b>	28	4.6	ppb v/v			01/29/22 08:40	14.14
Chlorobenzene	ND		28	7.8	ppb v/v			01/29/22 08:40	14.14
Chloroethane	ND	*+	28	11	ppb v/v			01/29/22 08:40	14.14
<b>Chloroform</b>	<b>82</b>		28	4.9	ppb v/v			01/29/22 08:40	14.14
Chloromethane	ND		71	23	ppb v/v			01/29/22 08:40	14.14
Dibromochloromethane	ND		28	4.9	ppb v/v			01/29/22 08:40	14.14
1,2-Dibromoethane (EDB)	ND		28	4.2	ppb v/v			01/29/22 08:40	14.14
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		28	4.2	ppb v/v			01/29/22 08:40	14.14
1,2-Dichlorobenzene	ND		28	11	ppb v/v			01/29/22 08:40	14.14
1,3-Dichlorobenzene	ND		28	5.7	ppb v/v			01/29/22 08:40	14.14
1,4-Dichlorobenzene	ND		28	5.7	ppb v/v			01/29/22 08:40	14.14
<b>Dichlorodifluoromethane</b>	<b>26</b>	<b>J</b>	28	4.9	ppb v/v			01/29/22 08:40	14.14
<b>1,1-Dichloroethane</b>	<b>9.0</b>	<b>J</b>	28	3.9	ppb v/v			01/29/22 08:40	14.14
1,2-Dichloroethane	ND		28	3.5	ppb v/v			01/29/22 08:40	14.14
<b>1,1-Dichloroethene</b>	<b>190</b>		28	4.6	ppb v/v			01/29/22 08:40	14.14
cis-1,2-Dichloroethene	ND		28	3.5	ppb v/v			01/29/22 08:40	14.14
trans-1,2-Dichloroethene	ND		28	4.6	ppb v/v			01/29/22 08:40	14.14
<b>1,2-Dichloropropane</b>	<b>36</b>	<b>CI</b>	28	3.5	ppb v/v			01/29/22 08:40	14.14
cis-1,3-Dichloropropene	ND		28	6.7	ppb v/v			01/29/22 08:40	14.14
trans-1,3-Dichloropropene	ND		28	7.1	ppb v/v			01/29/22 08:40	14.14
Ethylbenzene	ND		28	4.6	ppb v/v			01/29/22 08:40	14.14
4-Ethyltoluene	ND		57	7.4	ppb v/v			01/29/22 08:40	14.14
Hexachlorobutadiene	ND		140	11	ppb v/v			01/29/22 08:40	14.14
2-Hexanone	ND		71	8.5	ppb v/v			01/29/22 08:40	14.14
4-Methyl-2-pentanone (MIBK)	ND		71	19	ppb v/v			01/29/22 08:40	14.14
Methylene Chloride	ND		140	49	ppb v/v			01/29/22 08:40	14.14
Styrene	ND		28	8.5	ppb v/v			01/29/22 08:40	14.14
1,1,2,2-Tetrachloroethane	ND		28	4.9	ppb v/v			01/29/22 08:40	14.14

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# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116605-001/CWL-D1-350**

**Lab Sample ID: 140-26221-14**

Date Collected: 01/20/22 09:11

Matrix: Air

Date Received: 01/25/22 10:30

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>21</b>	<b>J</b>	28	4.2	ppb v/v			01/29/22 08:40	14.14
Toluene	ND		42	8.1	ppb v/v			01/29/22 08:40	14.14
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>530</b>		28	3.5	ppb v/v			01/29/22 08:40	14.14
1,2,4-Trichlorobenzene	ND		140	12	ppb v/v			01/29/22 08:40	14.14
1,1,1-Trichloroethane	ND		28	10	ppb v/v			01/29/22 08:40	14.14
1,1,2-Trichloroethane	ND		28	5.3	ppb v/v			01/29/22 08:40	14.14
<b>Trichloroethene</b>	<b>3700</b>		14	4.6	ppb v/v			01/29/22 08:40	14.14
<b>Trichlorofluoromethane</b>	<b>170</b>		28	3.9	ppb v/v			01/29/22 08:40	14.14
1,2,4-Trimethylbenzene	ND		28	7.1	ppb v/v			01/29/22 08:40	14.14
1,3,5-Trimethylbenzene	ND		57	23	ppb v/v			01/29/22 08:40	14.14
Vinyl acetate	ND		140	9.9	ppb v/v			01/29/22 08:40	14.14
Vinyl chloride	ND	*+	14	9.2	ppb v/v			01/29/22 08:40	14.14
m,p-Xylene	ND		28	10	ppb v/v			01/29/22 08:40	14.14
o-Xylene	ND		28	5.3	ppb v/v			01/29/22 08:40	14.14
<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)	83		60 - 140					01/29/22 08:40	14.14

**Client Sample ID: 116606-001/CWL-D1-350**

**Lab Sample ID: 140-26221-15**

Date Collected: 01/20/22 09:11

Matrix: Air

Date Received: 01/25/22 10:30

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		1600	460	ppb v/v			01/29/22 00:13	17.89
Benzene	ND		65	11	ppb v/v			01/29/22 00:13	17.89
Benzyl chloride	ND		130	31	ppb v/v			01/29/22 00:13	17.89
Bromodichloromethane	ND		65	15	ppb v/v			01/29/22 00:13	17.89
Bromoform	ND		65	22	ppb v/v			01/29/22 00:13	17.89
Bromomethane	ND	*+	65	18	ppb v/v			01/29/22 00:13	17.89
2-Butanone (MEK)	ND		330	59	ppb v/v			01/29/22 00:13	17.89
Carbon disulfide	ND		160	28	ppb v/v			01/29/22 00:13	17.89
Carbon tetrachloride	ND		65	11	ppb v/v			01/29/22 00:13	17.89
Chlorobenzene	ND		65	18	ppb v/v			01/29/22 00:13	17.89
Chloroethane	ND	*+	65	26	ppb v/v			01/29/22 00:13	17.89
<b>Chloroform</b>	<b>60</b>	<b>J</b>	65	11	ppb v/v			01/29/22 00:13	17.89
Chloromethane	ND		160	54	ppb v/v			01/29/22 00:13	17.89
Dibromochloromethane	ND		65	11	ppb v/v			01/29/22 00:13	17.89
1,2-Dibromoethane (EDB)	ND		65	9.8	ppb v/v			01/29/22 00:13	17.89
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		65	9.8	ppb v/v			01/29/22 00:13	17.89
1,2-Dichlorobenzene	ND		65	25	ppb v/v			01/29/22 00:13	17.89
1,3-Dichlorobenzene	ND		65	13	ppb v/v			01/29/22 00:13	17.89
1,4-Dichlorobenzene	ND		65	13	ppb v/v			01/29/22 00:13	17.89
<b>Dichlorodifluoromethane</b>	<b>17</b>	<b>J</b>	65	11	ppb v/v			01/29/22 00:13	17.89
1,1-Dichloroethane	ND		65	8.9	ppb v/v			01/29/22 00:13	17.89
1,2-Dichloroethane	ND		65	8.1	ppb v/v			01/29/22 00:13	17.89
<b>1,1-Dichloroethene</b>	<b>130</b>		65	11	ppb v/v			01/29/22 00:13	17.89

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# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116606-001/CWL-D1-350**

**Lab Sample ID: 140-26221-15**

Date Collected: 01/20/22 09:11

Matrix: Air

Date Received: 01/25/22 10:30

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		65	8.1	ppb v/v			01/29/22 00:13	17.89
trans-1,2-Dichloroethene	ND		65	11	ppb v/v			01/29/22 00:13	17.89
<b>1,2-Dichloropropane</b>	<b>24</b>	<b>J</b>	65	8.1	ppb v/v			01/29/22 00:13	17.89
cis-1,3-Dichloropropene	ND		65	15	ppb v/v			01/29/22 00:13	17.89
trans-1,3-Dichloropropene	ND		65	16	ppb v/v			01/29/22 00:13	17.89
Ethylbenzene	ND		65	11	ppb v/v			01/29/22 00:13	17.89
4-Ethyltoluene	ND		130	17	ppb v/v			01/29/22 00:13	17.89
Hexachlorobutadiene	ND		330	26	ppb v/v			01/29/22 00:13	17.89
2-Hexanone	ND		160	20	ppb v/v			01/29/22 00:13	17.89
4-Methyl-2-pentanone (MIBK)	ND		160	44	ppb v/v			01/29/22 00:13	17.89
Methylene Chloride	ND		330	110	ppb v/v			01/29/22 00:13	17.89
Styrene	ND		65	20	ppb v/v			01/29/22 00:13	17.89
1,1,2,2-Tetrachloroethane	ND		65	11	ppb v/v			01/29/22 00:13	17.89
<b>Tetrachloroethene</b>	<b>51</b>	<b>J</b>	65	9.8	ppb v/v			01/29/22 00:13	17.89
Toluene	ND		98	19	ppb v/v			01/29/22 00:13	17.89
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>360</b>		65	8.1	ppb v/v			01/29/22 00:13	17.89
1,2,4-Trichlorobenzene	ND		330	28	ppb v/v			01/29/22 00:13	17.89
1,1,1-Trichloroethane	ND		65	24	ppb v/v			01/29/22 00:13	17.89
1,1,2-Trichloroethane	ND		65	12	ppb v/v			01/29/22 00:13	17.89
<b>Trichloroethene</b>	<b>2900</b>		33	11	ppb v/v			01/29/22 00:13	17.89
<b>Trichlorofluoromethane</b>	<b>110</b>		65	8.9	ppb v/v			01/29/22 00:13	17.89
1,2,4-Trimethylbenzene	ND		65	16	ppb v/v			01/29/22 00:13	17.89
1,3,5-Trimethylbenzene	ND		130	53	ppb v/v			01/29/22 00:13	17.89
Vinyl acetate	ND		330	23	ppb v/v			01/29/22 00:13	17.89
Vinyl chloride	ND	*+	33	21	ppb v/v			01/29/22 00:13	17.89
m,p-Xylene	ND		65	24	ppb v/v			01/29/22 00:13	17.89
o-Xylene	ND		65	12	ppb v/v			01/29/22 00:13	17.89

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	80		60 - 140		01/29/22 00:13	17.89

**Client Sample ID: 116607-001/CWL-D1-470**

**Lab Sample ID: 140-26221-16**

Date Collected: 01/20/22 09:18

Matrix: Air

Date Received: 01/25/22 10:30

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			01/27/22 20:05	1.9
<b>Benzene</b>	<b>0.35</b>	<b>J</b>	1.5	0.25	ppb v/v			01/27/22 20:05	1.9
Benzyl chloride	ND		3.0	0.72	ppb v/v			01/27/22 20:05	1.9
Bromodichloromethane	ND		1.5	0.34	ppb v/v			01/27/22 20:05	1.9
Bromoform	ND		1.5	0.51	ppb v/v			01/27/22 20:05	1.9
Bromomethane	ND		1.5	0.42	ppb v/v			01/27/22 20:05	1.9
2-Butanone (MEK)	ND		7.6	1.4	ppb v/v			01/27/22 20:05	1.9
Carbon disulfide	ND		3.8	0.67	ppb v/v			01/27/22 20:05	1.9
<b>Carbon tetrachloride</b>	<b>3.5</b>		1.5	0.25	ppb v/v			01/27/22 20:05	1.9
Chlorobenzene	ND		1.5	0.42	ppb v/v			01/27/22 20:05	1.9

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# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116607-001/CWL-D1-470**

**Lab Sample ID: 140-26221-16**

Date Collected: 01/20/22 09:18

Matrix: Air

Date Received: 01/25/22 10:30

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		1.5	0.61	ppb v/v			01/27/22 20:05	1.9
<b>Chloroform</b>	<b>3.7</b>		1.5	0.27	ppb v/v			01/27/22 20:05	1.9
Chloromethane	ND		3.8	1.3	ppb v/v			01/27/22 20:05	1.9
Dibromochloromethane	ND		1.5	0.27	ppb v/v			01/27/22 20:05	1.9
1,2-Dibromoethane (EDB)	ND		1.5	0.23	ppb v/v			01/27/22 20:05	1.9
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.5	0.23	ppb v/v			01/27/22 20:05	1.9
1,2-Dichlorobenzene	ND		1.5	0.59	ppb v/v			01/27/22 20:05	1.9
1,3-Dichlorobenzene	ND		1.5	0.30	ppb v/v			01/27/22 20:05	1.9
1,4-Dichlorobenzene	ND		1.5	0.30	ppb v/v			01/27/22 20:05	1.9
<b>Dichlorodifluoromethane</b>	<b>12</b>		1.5	0.27	ppb v/v			01/27/22 20:05	1.9
<b>1,1-Dichloroethane</b>	<b>0.34 J</b>		1.5	0.21	ppb v/v			01/27/22 20:05	1.9
1,2-Dichloroethane	ND		1.5	0.19	ppb v/v			01/27/22 20:05	1.9
<b>1,1-Dichloroethene</b>	<b>41</b>		1.5	0.25	ppb v/v			01/27/22 20:05	1.9
cis-1,2-Dichloroethene	ND		1.5	0.19	ppb v/v			01/27/22 20:05	1.9
trans-1,2-Dichloroethene	ND		1.5	0.25	ppb v/v			01/27/22 20:05	1.9
1,2-Dichloropropane	ND		1.5	0.19	ppb v/v			01/27/22 20:05	1.9
cis-1,3-Dichloropropene	ND		1.5	0.36	ppb v/v			01/27/22 20:05	1.9
trans-1,3-Dichloropropene	ND		1.5	0.38	ppb v/v			01/27/22 20:05	1.9
Ethylbenzene	ND		1.5	0.25	ppb v/v			01/27/22 20:05	1.9
4-Ethyltoluene	ND		3.0	0.40	ppb v/v			01/27/22 20:05	1.9
Hexachlorobutadiene	ND		7.6	0.61	ppb v/v			01/27/22 20:05	1.9
2-Hexanone	ND		3.8	0.46	ppb v/v			01/27/22 20:05	1.9
4-Methyl-2-pentanone (MIBK)	ND		3.8	1.0	ppb v/v			01/27/22 20:05	1.9
Methylene Chloride	ND		7.6	2.7	ppb v/v			01/27/22 20:05	1.9
Styrene	ND		1.5	0.46	ppb v/v			01/27/22 20:05	1.9
1,1,2,2-Tetrachloroethane	ND		1.5	0.27	ppb v/v			01/27/22 20:05	1.9
<b>Tetrachloroethene</b>	<b>14</b>		1.5	0.23	ppb v/v			01/27/22 20:05	1.9
Toluene	ND		2.3	0.44	ppb v/v			01/27/22 20:05	1.9
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>210</b>		1.5	0.19	ppb v/v			01/27/22 20:05	1.9
1,2,4-Trichlorobenzene	ND		7.6	0.67	ppb v/v			01/27/22 20:05	1.9
1,1,1-Trichloroethane	ND		1.5	0.55	ppb v/v			01/27/22 20:05	1.9
1,1,2-Trichloroethane	ND		1.5	0.29	ppb v/v			01/27/22 20:05	1.9
<b>Trichloroethene</b>	<b>220</b>		1.9	0.62	ppb v/v			01/29/22 13:18	1.9
<b>Trichlorofluoromethane</b>	<b>56</b>		1.5	0.21	ppb v/v			01/27/22 20:05	1.9
1,2,4-Trimethylbenzene	ND		1.5	0.38	ppb v/v			01/27/22 20:05	1.9
1,3,5-Trimethylbenzene	ND		3.0	1.2	ppb v/v			01/27/22 20:05	1.9
Vinyl acetate	ND		7.6	0.53	ppb v/v			01/27/22 20:05	1.9
Vinyl chloride	ND		0.76	0.49	ppb v/v			01/27/22 20:05	1.9
m,p-Xylene	ND		1.5	0.55	ppb v/v			01/27/22 20:05	1.9
o-Xylene	ND		1.5	0.29	ppb v/v			01/27/22 20:05	1.9
<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)	87		60 - 140					01/27/22 20:05	1.9
4-Bromofluorobenzene (Surr)	90		60 - 140					01/29/22 13:18	1.9

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

Client Sample ID: 116608-001/CWL-SV-FB4

Lab Sample ID: 140-26221-17

Date Collected: 01/20/22 10:38

Matrix: Air

Date Received: 01/25/22 10:30

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	0.90	J	2.2	0.62	ppb v/v			01/27/22 18:27	1.75
Benzene	ND		0.088	0.014	ppb v/v			01/27/22 18:27	1.75
Benzyl chloride	ND		0.18	0.042	ppb v/v			01/27/22 18:27	1.75
Bromodichloromethane	ND		0.088	0.020	ppb v/v			01/27/22 18:27	1.75
Bromoform	ND		0.088	0.030	ppb v/v			01/27/22 18:27	1.75
Bromomethane	ND		0.088	0.024	ppb v/v			01/27/22 18:27	1.75
2-Butanone (MEK)	0.11	J	0.44	0.080	ppb v/v			01/27/22 18:27	1.75
Carbon disulfide	ND		0.22	0.038	ppb v/v			01/27/22 18:27	1.75
Carbon tetrachloride	ND		0.088	0.014	ppb v/v			01/27/22 18:27	1.75
Chlorobenzene	ND		0.088	0.024	ppb v/v			01/27/22 18:27	1.75
Chloroethane	ND		0.088	0.035	ppb v/v			01/27/22 18:27	1.75
Chloroform	ND		0.088	0.015	ppb v/v			01/27/22 18:27	1.75
Chloromethane	ND		0.22	0.072	ppb v/v			01/27/22 18:27	1.75
Dibromochloromethane	ND		0.088	0.015	ppb v/v			01/27/22 18:27	1.75
1,2-Dibromoethane (EDB)	ND		0.088	0.013	ppb v/v			01/27/22 18:27	1.75
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.088	0.013	ppb v/v			01/27/22 18:27	1.75
1,2-Dichlorobenzene	ND		0.088	0.034	ppb v/v			01/27/22 18:27	1.75
1,3-Dichlorobenzene	ND		0.088	0.018	ppb v/v			01/27/22 18:27	1.75
1,4-Dichlorobenzene	0.018	J	0.088	0.018	ppb v/v			01/27/22 18:27	1.75
Dichlorodifluoromethane	ND		0.088	0.015	ppb v/v			01/27/22 18:27	1.75
1,1-Dichloroethane	ND		0.088	0.012	ppb v/v			01/27/22 18:27	1.75
1,2-Dichloroethane	ND		0.088	0.011	ppb v/v			01/27/22 18:27	1.75
1,1-Dichloroethene	ND		0.088	0.014	ppb v/v			01/27/22 18:27	1.75
cis-1,2-Dichloroethene	ND		0.088	0.011	ppb v/v			01/27/22 18:27	1.75
trans-1,2-Dichloroethene	ND		0.088	0.014	ppb v/v			01/27/22 18:27	1.75
1,2-Dichloropropane	ND		0.088	0.011	ppb v/v			01/27/22 18:27	1.75
cis-1,3-Dichloropropene	ND		0.088	0.021	ppb v/v			01/27/22 18:27	1.75
trans-1,3-Dichloropropene	ND		0.088	0.022	ppb v/v			01/27/22 18:27	1.75
Ethylbenzene	ND		0.088	0.014	ppb v/v			01/27/22 18:27	1.75
4-Ethyltoluene	ND		0.18	0.023	ppb v/v			01/27/22 18:27	1.75
Hexachlorobutadiene	ND		0.44	0.035	ppb v/v			01/27/22 18:27	1.75
2-Hexanone	ND		0.22	0.026	ppb v/v			01/27/22 18:27	1.75
4-Methyl-2-pentanone (MIBK)	ND		0.22	0.059	ppb v/v			01/27/22 18:27	1.75
Methylene Chloride	ND		0.44	0.15	ppb v/v			01/27/22 18:27	1.75
Styrene	ND		0.088	0.026	ppb v/v			01/27/22 18:27	1.75
1,1,2,2-Tetrachloroethane	ND		0.088	0.015	ppb v/v			01/27/22 18:27	1.75
Tetrachloroethene	ND		0.088	0.013	ppb v/v			01/27/22 18:27	1.75
Toluene	0.092	J	0.13	0.025	ppb v/v			01/27/22 18:27	1.75
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.088	0.011	ppb v/v			01/27/22 18:27	1.75
1,2,4-Trichlorobenzene	ND		0.44	0.038	ppb v/v			01/27/22 18:27	1.75
1,1,1-Trichloroethane	ND		0.088	0.032	ppb v/v			01/27/22 18:27	1.75
1,1,2-Trichloroethane	ND		0.088	0.016	ppb v/v			01/27/22 18:27	1.75
Trichloroethene	ND		0.044	0.014	ppb v/v			01/27/22 18:27	1.75
Trichlorofluoromethane	ND		0.088	0.012	ppb v/v			01/27/22 18:27	1.75
1,2,4-Trimethylbenzene	ND		0.088	0.022	ppb v/v			01/27/22 18:27	1.75
1,3,5-Trimethylbenzene	ND		0.18	0.071	ppb v/v			01/27/22 18:27	1.75
Vinyl acetate	ND		0.44	0.031	ppb v/v			01/27/22 18:27	1.75
Vinyl chloride	ND		0.044	0.028	ppb v/v			01/27/22 18:27	1.75

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116608-001/CWL-SV-FB4**

**Lab Sample ID: 140-26221-17**

Date Collected: 01/20/22 10:38

Matrix: Air

Date Received: 01/25/22 10:30

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	0.040	J	0.088	0.032	ppb v/v			01/27/22 18:27	1.75
o-Xylene	0.018	J	0.088	0.016	ppb v/v			01/27/22 18:27	1.75
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		60 - 140					01/27/22 18:27	1.75

**Client Sample ID: 116609-001/CWL-D2-120**

**Lab Sample ID: 140-26221-18**

Date Collected: 01/20/22 10:57

Matrix: Air

Date Received: 01/25/22 10:30

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		1900	530	ppb v/v			01/29/22 00:58	18.71
Benzene	ND		75	12	ppb v/v			01/29/22 00:58	18.71
Benzyl chloride	ND		150	36	ppb v/v			01/29/22 00:58	18.71
Bromodichloromethane	ND		75	17	ppb v/v			01/29/22 00:58	18.71
Bromoform	ND		75	25	ppb v/v			01/29/22 00:58	18.71
Bromomethane	ND	*+	75	21	ppb v/v			01/29/22 00:58	18.71
2-Butanone (MEK)	ND		370	68	ppb v/v			01/29/22 00:58	18.71
Carbon disulfide	ND		190	33	ppb v/v			01/29/22 00:58	18.71
Carbon tetrachloride	12	J	75	12	ppb v/v			01/29/22 00:58	18.71
Chlorobenzene	ND		75	21	ppb v/v			01/29/22 00:58	18.71
Chloroethane	ND	*+	75	30	ppb v/v			01/29/22 00:58	18.71
Chloroform	230		75	13	ppb v/v			01/29/22 00:58	18.71
Chloromethane	ND		190	62	ppb v/v			01/29/22 00:58	18.71
Dibromochloromethane	ND		75	13	ppb v/v			01/29/22 00:58	18.71
1,2-Dibromoethane (EDB)	ND		75	11	ppb v/v			01/29/22 00:58	18.71
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		75	11	ppb v/v			01/29/22 00:58	18.71
1,2-Dichlorobenzene	ND		75	29	ppb v/v			01/29/22 00:58	18.71
1,3-Dichlorobenzene	ND		75	15	ppb v/v			01/29/22 00:58	18.71
1,4-Dichlorobenzene	ND		75	15	ppb v/v			01/29/22 00:58	18.71
Dichlorodifluoromethane	15	J	75	13	ppb v/v			01/29/22 00:58	18.71
1,1-Dichloroethane	11	J	75	10	ppb v/v			01/29/22 00:58	18.71
1,2-Dichloroethane	25	J	75	9.4	ppb v/v			01/29/22 00:58	18.71
1,1-Dichloroethene	110		75	12	ppb v/v			01/29/22 00:58	18.71
cis-1,2-Dichloroethene	ND		75	9.4	ppb v/v			01/29/22 00:58	18.71
trans-1,2-Dichloroethene	ND		75	12	ppb v/v			01/29/22 00:58	18.71
1,2-Dichloropropane	84	CI	75	9.4	ppb v/v			01/29/22 00:58	18.71
cis-1,3-Dichloropropene	ND		75	18	ppb v/v			01/29/22 00:58	18.71
trans-1,3-Dichloropropene	ND		75	19	ppb v/v			01/29/22 00:58	18.71
Ethylbenzene	ND		75	12	ppb v/v			01/29/22 00:58	18.71
4-Ethyltoluene	ND		150	20	ppb v/v			01/29/22 00:58	18.71
Hexachlorobutadiene	ND		370	30	ppb v/v			01/29/22 00:58	18.71
2-Hexanone	ND		190	22	ppb v/v			01/29/22 00:58	18.71
4-Methyl-2-pentanone (MIBK)	ND		190	51	ppb v/v			01/29/22 00:58	18.71
Methylene Chloride	ND		370	130	ppb v/v			01/29/22 00:58	18.71
Styrene	ND		75	22	ppb v/v			01/29/22 00:58	18.71
1,1,2,2-Tetrachloroethane	ND		75	13	ppb v/v			01/29/22 00:58	18.71

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# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116609-001/CWL-D2-120**

**Lab Sample ID: 140-26221-18**

Date Collected: 01/20/22 10:57

Matrix: Air

Date Received: 01/25/22 10:30

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>140</b>		75	11	ppb v/v			01/29/22 00:58	18.71
Toluene	ND		110	22	ppb v/v			01/29/22 00:58	18.71
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>370</b>		75	9.4	ppb v/v			01/29/22 00:58	18.71
1,2,4-Trichlorobenzene	ND		370	33	ppb v/v			01/29/22 00:58	18.71
1,1,1-Trichloroethane	ND		75	27	ppb v/v			01/29/22 00:58	18.71
1,1,2-Trichloroethane	ND		75	14	ppb v/v			01/29/22 00:58	18.71
<b>Trichloroethene</b>	<b>4100</b>		37	12	ppb v/v			01/29/22 00:58	18.71
<b>Trichlorofluoromethane</b>	<b>100</b>		75	10	ppb v/v			01/29/22 00:58	18.71
1,2,4-Trimethylbenzene	ND		75	19	ppb v/v			01/29/22 00:58	18.71
1,3,5-Trimethylbenzene	ND		150	61	ppb v/v			01/29/22 00:58	18.71
Vinyl acetate	ND		370	26	ppb v/v			01/29/22 00:58	18.71
Vinyl chloride	ND	*+	37	24	ppb v/v			01/29/22 00:58	18.71
m,p-Xylene	ND		75	27	ppb v/v			01/29/22 00:58	18.71
o-Xylene	ND		75	14	ppb v/v			01/29/22 00:58	18.71
<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)	79		60 - 140					01/29/22 00:58	18.71

**Client Sample ID: 116610-001/CWL-D2-240**

**Lab Sample ID: 140-26221-19**

Date Collected: 01/20/22 11:00

Matrix: Air

Date Received: 01/25/22 10:30

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		1600	460	ppb v/v			01/29/22 01:42	19.55
Benzene	ND		65	11	ppb v/v			01/29/22 01:42	19.55
Benzyl chloride	ND		130	31	ppb v/v			01/29/22 01:42	19.55
Bromodichloromethane	ND		65	15	ppb v/v			01/29/22 01:42	19.55
Bromoform	ND		65	22	ppb v/v			01/29/22 01:42	19.55
Bromomethane	ND	*+	65	18	ppb v/v			01/29/22 01:42	19.55
2-Butanone (MEK)	ND		330	59	ppb v/v			01/29/22 01:42	19.55
Carbon disulfide	ND		160	29	ppb v/v			01/29/22 01:42	19.55
<b>Carbon tetrachloride</b>	<b>13</b>	<b>J</b>	65	11	ppb v/v			01/29/22 01:42	19.55
Chlorobenzene	ND		65	18	ppb v/v			01/29/22 01:42	19.55
Chloroethane	ND	*+	65	26	ppb v/v			01/29/22 01:42	19.55
<b>Chloroform</b>	<b>250</b>		65	11	ppb v/v			01/29/22 01:42	19.55
Chloromethane	ND		160	54	ppb v/v			01/29/22 01:42	19.55
Dibromochloromethane	ND		65	11	ppb v/v			01/29/22 01:42	19.55
1,2-Dibromoethane (EDB)	ND		65	9.8	ppb v/v			01/29/22 01:42	19.55
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		65	9.8	ppb v/v			01/29/22 01:42	19.55
1,2-Dichlorobenzene	ND		65	25	ppb v/v			01/29/22 01:42	19.55
1,3-Dichlorobenzene	ND		65	13	ppb v/v			01/29/22 01:42	19.55
1,4-Dichlorobenzene	ND		65	13	ppb v/v			01/29/22 01:42	19.55
<b>Dichlorodifluoromethane</b>	<b>21</b>	<b>J</b>	65	11	ppb v/v			01/29/22 01:42	19.55
1,1-Dichloroethane	ND		65	9.0	ppb v/v			01/29/22 01:42	19.55
<b>1,2-Dichloroethane</b>	<b>30</b>	<b>J</b>	65	8.1	ppb v/v			01/29/22 01:42	19.55
<b>1,1-Dichloroethene</b>	<b>150</b>		65	11	ppb v/v			01/29/22 01:42	19.55

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116610-001/CWL-D2-240**

**Lab Sample ID: 140-26221-19**

Date Collected: 01/20/22 11:00

Matrix: Air

Date Received: 01/25/22 10:30

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		65	8.1	ppb v/v			01/29/22 01:42	19.55
trans-1,2-Dichloroethene	ND		65	11	ppb v/v			01/29/22 01:42	19.55
<b>1,2-Dichloropropane</b>	<b>95</b>	<b>CI</b>	65	8.1	ppb v/v			01/29/22 01:42	19.55
cis-1,3-Dichloropropene	ND		65	15	ppb v/v			01/29/22 01:42	19.55
trans-1,3-Dichloropropene	ND		65	16	ppb v/v			01/29/22 01:42	19.55
Ethylbenzene	ND		65	11	ppb v/v			01/29/22 01:42	19.55
4-Ethyltoluene	ND		130	17	ppb v/v			01/29/22 01:42	19.55
Hexachlorobutadiene	ND		330	26	ppb v/v			01/29/22 01:42	19.55
2-Hexanone	ND		160	20	ppb v/v			01/29/22 01:42	19.55
4-Methyl-2-pentanone (MIBK)	ND		160	44	ppb v/v			01/29/22 01:42	19.55
Methylene Chloride	ND		330	110	ppb v/v			01/29/22 01:42	19.55
Styrene	ND		65	20	ppb v/v			01/29/22 01:42	19.55
1,1,2,2-Tetrachloroethane	ND		65	11	ppb v/v			01/29/22 01:42	19.55
<b>Tetrachloroethene</b>	<b>170</b>		65	9.8	ppb v/v			01/29/22 01:42	19.55
Toluene	ND		98	19	ppb v/v			01/29/22 01:42	19.55
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>480</b>		65	8.1	ppb v/v			01/29/22 01:42	19.55
1,2,4-Trichlorobenzene	ND		330	29	ppb v/v			01/29/22 01:42	19.55
1,1,1-Trichloroethane	ND		65	24	ppb v/v			01/29/22 01:42	19.55
1,1,2-Trichloroethane	ND		65	12	ppb v/v			01/29/22 01:42	19.55
<b>Trichloroethene</b>	<b>5300</b>		33	11	ppb v/v			01/29/22 01:42	19.55
<b>Trichlorofluoromethane</b>	<b>140</b>		65	9.0	ppb v/v			01/29/22 01:42	19.55
1,2,4-Trimethylbenzene	ND		65	16	ppb v/v			01/29/22 01:42	19.55
1,3,5-Trimethylbenzene	ND		130	53	ppb v/v			01/29/22 01:42	19.55
Vinyl acetate	ND		330	23	ppb v/v			01/29/22 01:42	19.55
Vinyl chloride	ND	*+	33	21	ppb v/v			01/29/22 01:42	19.55
m,p-Xylene	ND		65	24	ppb v/v			01/29/22 01:42	19.55
o-Xylene	ND		65	12	ppb v/v			01/29/22 01:42	19.55

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	81		60 - 140		01/29/22 01:42	19.55

**Client Sample ID: 116611-001/CWL-D2-350**

**Lab Sample ID: 140-26221-20**

Date Collected: 01/20/22 11:04

Matrix: Air

Date Received: 01/25/22 10:30

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		1100	310	ppb v/v			01/29/22 02:28	15.46
Benzene	ND		44	7.2	ppb v/v			01/29/22 02:28	15.46
Benzyl chloride	ND		88	21	ppb v/v			01/29/22 02:28	15.46
Bromodichloromethane	ND		44	9.9	ppb v/v			01/29/22 02:28	15.46
Bromoform	ND		44	15	ppb v/v			01/29/22 02:28	15.46
Bromomethane	ND	*+	44	12	ppb v/v			01/29/22 02:28	15.46
2-Butanone (MEK)	ND		220	40	ppb v/v			01/29/22 02:28	15.46
Carbon disulfide	ND		110	19	ppb v/v			01/29/22 02:28	15.46
<b>Carbon tetrachloride</b>	<b>16</b>	<b>J</b>	44	7.2	ppb v/v			01/29/22 02:28	15.46
<b>Chlorobenzene</b>	<b>12</b>	<b>J</b>	44	12	ppb v/v			01/29/22 02:28	15.46



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116611-001/CWL-D2-350**

**Lab Sample ID: 140-26221-20**

**Date Collected: 01/20/22 11:04**

**Matrix: Air**

**Date Received: 01/25/22 10:30**

**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	*+	44	18	ppb v/v			01/29/22 02:28	15.46
<b>Chloroform</b>	<b>150</b>		44	7.7	ppb v/v			01/29/22 02:28	15.46
Chloromethane	ND		110	36	ppb v/v			01/29/22 02:28	15.46
Dibromochloromethane	ND		44	7.7	ppb v/v			01/29/22 02:28	15.46
1,2-Dibromoethane (EDB)	ND		44	6.6	ppb v/v			01/29/22 02:28	15.46
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		44	6.6	ppb v/v			01/29/22 02:28	15.46
1,2-Dichlorobenzene	ND		44	17	ppb v/v			01/29/22 02:28	15.46
1,3-Dichlorobenzene	ND		44	8.8	ppb v/v			01/29/22 02:28	15.46
1,4-Dichlorobenzene	ND		44	8.8	ppb v/v			01/29/22 02:28	15.46
<b>Dichlorodifluoromethane</b>	<b>22</b>	<b>J</b>	44	7.7	ppb v/v			01/29/22 02:28	15.46
<b>1,1-Dichloroethane</b>	<b>9.3</b>	<b>J</b>	44	6.1	ppb v/v			01/29/22 02:28	15.46
1,2-Dichloroethane	ND		44	5.5	ppb v/v			01/29/22 02:28	15.46
<b>1,1-Dichloroethene</b>	<b>120</b>		44	7.2	ppb v/v			01/29/22 02:28	15.46
cis-1,2-Dichloroethene	ND		44	5.5	ppb v/v			01/29/22 02:28	15.46
trans-1,2-Dichloroethene	ND		44	7.2	ppb v/v			01/29/22 02:28	15.46
<b>1,2-Dichloropropane</b>	<b>71</b>	<b>CI</b>	44	5.5	ppb v/v			01/29/22 02:28	15.46
cis-1,3-Dichloropropene	ND		44	10	ppb v/v			01/29/22 02:28	15.46
trans-1,3-Dichloropropene	ND		44	11	ppb v/v			01/29/22 02:28	15.46
Ethylbenzene	ND		44	7.2	ppb v/v			01/29/22 02:28	15.46
4-Ethyltoluene	ND		88	12	ppb v/v			01/29/22 02:28	15.46
Hexachlorobutadiene	ND		220	18	ppb v/v			01/29/22 02:28	15.46
2-Hexanone	ND		110	13	ppb v/v			01/29/22 02:28	15.46
4-Methyl-2-pentanone (MIBK)	ND		110	30	ppb v/v			01/29/22 02:28	15.46
Methylene Chloride	ND		220	77	ppb v/v			01/29/22 02:28	15.46
Styrene	ND		44	13	ppb v/v			01/29/22 02:28	15.46
1,1,2,2-Tetrachloroethane	ND		44	7.7	ppb v/v			01/29/22 02:28	15.46
<b>Tetrachloroethene</b>	<b>140</b>		44	6.6	ppb v/v			01/29/22 02:28	15.46
Toluene	ND		66	13	ppb v/v			01/29/22 02:28	15.46
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>450</b>		44	5.5	ppb v/v			01/29/22 02:28	15.46
1,2,4-Trichlorobenzene	ND		220	19	ppb v/v			01/29/22 02:28	15.46
1,1,1-Trichloroethane	ND		44	16	ppb v/v			01/29/22 02:28	15.46
1,1,2-Trichloroethane	ND		44	8.3	ppb v/v			01/29/22 02:28	15.46
<b>Trichloroethene</b>	<b>4300</b>		22	7.2	ppb v/v			01/29/22 02:28	15.46
<b>Trichlorofluoromethane</b>	<b>130</b>		44	6.1	ppb v/v			01/29/22 02:28	15.46
1,2,4-Trimethylbenzene	ND		44	11	ppb v/v			01/29/22 02:28	15.46
1,3,5-Trimethylbenzene	ND		88	36	ppb v/v			01/29/22 02:28	15.46
Vinyl acetate	ND		220	15	ppb v/v			01/29/22 02:28	15.46
Vinyl chloride	ND	*+	22	14	ppb v/v			01/29/22 02:28	15.46
m,p-Xylene	ND		44	16	ppb v/v			01/29/22 02:28	15.46
o-Xylene	ND		44	8.3	ppb v/v			01/29/22 02:28	15.46

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	82		60 - 140		01/29/22 02:28	15.46

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116612-001/CWL-D2-440**

**Lab Sample ID: 140-26221-21**

Date Collected: 01/20/22 11:08

**Matrix: Air**

Date Received: 01/25/22 10:30

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	6.7		2.1	0.60	ppb v/v			01/27/22 20:58	1.69
Benzene	0.78		0.085	0.014	ppb v/v			01/27/22 20:58	1.69
Benzyl chloride	ND		0.17	0.040	ppb v/v			01/27/22 20:58	1.69
Bromodichloromethane	0.021	J	0.085	0.019	ppb v/v			01/27/22 20:58	1.69
Bromoform	ND		0.085	0.029	ppb v/v			01/27/22 20:58	1.69
Bromomethane	ND		0.085	0.023	ppb v/v			01/27/22 20:58	1.69
2-Butanone (MEK)	0.71		0.42	0.077	ppb v/v			01/27/22 20:58	1.69
Carbon disulfide	0.067	J	0.21	0.037	ppb v/v			01/27/22 20:58	1.69
Carbon tetrachloride	2.3		0.085	0.014	ppb v/v			01/27/22 20:58	1.69
Chlorobenzene	0.059	J	0.085	0.023	ppb v/v			01/27/22 20:58	1.69
Chloroethane	ND		0.085	0.034	ppb v/v			01/27/22 20:58	1.69
Chloroform	12		4.5	0.79	ppb v/v			01/31/22 18:40	1.69
Chloromethane	0.33		0.21	0.070	ppb v/v			01/27/22 20:58	1.69
Dibromochloromethane	ND		0.085	0.015	ppb v/v			01/27/22 20:58	1.69
1,2-Dibromoethane (EDB)	0.013	J	0.085	0.013	ppb v/v			01/27/22 20:58	1.69
1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.017	J	0.085	0.013	ppb v/v			01/27/22 20:58	1.69
1,2-Dichlorobenzene	ND		0.085	0.033	ppb v/v			01/27/22 20:58	1.69
1,3-Dichlorobenzene	0.025	J	0.085	0.017	ppb v/v			01/27/22 20:58	1.69
1,4-Dichlorobenzene	0.017	J	0.085	0.017	ppb v/v			01/27/22 20:58	1.69
Dichlorodifluoromethane	2.4		0.085	0.015	ppb v/v			01/27/22 20:58	1.69
1,1-Dichloroethane	1.3		0.085	0.012	ppb v/v			01/27/22 20:58	1.69
1,2-Dichloroethane	1.1		0.085	0.011	ppb v/v			01/27/22 20:58	1.69
1,1-Dichloroethene	17		4.5	0.73	ppb v/v			01/31/22 18:40	1.69
cis-1,2-Dichloroethene	0.055	J	0.085	0.011	ppb v/v			01/27/22 20:58	1.69
trans-1,2-Dichloroethene	0.048	J	0.085	0.014	ppb v/v			01/27/22 20:58	1.69
1,2-Dichloropropane	ND		0.085	0.011	ppb v/v			01/27/22 20:58	1.69
cis-1,3-Dichloropropene	ND		0.085	0.020	ppb v/v			01/27/22 20:58	1.69
trans-1,3-Dichloropropene	ND		0.085	0.021	ppb v/v			01/27/22 20:58	1.69
Ethylbenzene	0.021	J B	0.085	0.014	ppb v/v			01/27/22 20:58	1.69
4-Ethyltoluene	ND		0.17	0.022	ppb v/v			01/27/22 20:58	1.69
Hexachlorobutadiene	ND		0.42	0.034	ppb v/v			01/27/22 20:58	1.69
2-Hexanone	0.058	J	0.21	0.025	ppb v/v			01/27/22 20:58	1.69
4-Methyl-2-pentanone (MIBK)	ND		0.21	0.057	ppb v/v			01/27/22 20:58	1.69
Methylene Chloride	6.6		0.42	0.15	ppb v/v			01/27/22 20:58	1.69
Styrene	ND		0.085	0.025	ppb v/v			01/27/22 20:58	1.69
1,1,2,2-Tetrachloroethane	ND		0.085	0.015	ppb v/v			01/27/22 20:58	1.69
Tetrachloroethene	14		4.5	0.68	ppb v/v			01/31/22 18:40	1.69
Toluene	0.49		0.13	0.024	ppb v/v			01/27/22 20:58	1.69
1,1,2-Trichloro-1,2,2-trifluoroethane	42		4.5	0.56	ppb v/v			01/31/22 18:40	1.69
1,2,4-Trichlorobenzene	ND		0.42	0.037	ppb v/v			01/27/22 20:58	1.69
1,1,1-Trichloroethane	0.54		0.085	0.031	ppb v/v			01/27/22 20:58	1.69
1,1,2-Trichloroethane	0.10		0.085	0.016	ppb v/v			01/27/22 20:58	1.69
Trichloroethene	520		2.3	0.73	ppb v/v			01/31/22 18:40	1.69
Trichlorofluoromethane	14		4.5	0.62	ppb v/v			01/31/22 18:40	1.69
1,2,4-Trimethylbenzene	ND		0.085	0.021	ppb v/v			01/27/22 20:58	1.69
1,3,5-Trimethylbenzene	ND		0.17	0.069	ppb v/v			01/27/22 20:58	1.69
Vinyl acetate	ND		0.42	0.030	ppb v/v			01/27/22 20:58	1.69

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116612-001/CWL-D2-440**

**Lab Sample ID: 140-26221-21**

Date Collected: 01/20/22 11:08

Matrix: Air

Date Received: 01/25/22 10:30

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	0.052		0.042	0.027	ppb v/v			01/27/22 20:58	1.69
m,p-Xylene	0.041	J	0.085	0.031	ppb v/v			01/27/22 20:58	1.69
o-Xylene	0.025	J	0.085	0.016	ppb v/v			01/27/22 20:58	1.69

Surrogate	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		60 - 140			01/27/22 20:58	1.69
4-Bromofluorobenzene (Surr)	91		60 - 140			01/31/22 18:40	1.69

**Client Sample ID: 116613-001/CWL-D2-470**

**Lab Sample ID: 140-26221-22**

Date Collected: 01/20/22 11:14

Matrix: Air

Date Received: 01/25/22 10:30

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		900	260	ppb v/v			01/29/22 03:58	12.59
Benzene	ND		36	5.8	ppb v/v			01/29/22 03:58	12.59
Benzyl chloride	ND		72	17	ppb v/v			01/29/22 03:58	12.59
Bromodichloromethane	ND		36	8.1	ppb v/v			01/29/22 03:58	12.59
Bromoform	ND		36	12	ppb v/v			01/29/22 03:58	12.59
Bromomethane	ND	*+	36	9.9	ppb v/v			01/29/22 03:58	12.59
2-Butanone (MEK)	ND		180	33	ppb v/v			01/29/22 03:58	12.59
Carbon disulfide	ND		90	16	ppb v/v			01/29/22 03:58	12.59
Carbon tetrachloride	8.7	J	36	5.8	ppb v/v			01/29/22 03:58	12.59
Chlorobenzene	ND		36	9.9	ppb v/v			01/29/22 03:58	12.59
Chloroethane	ND	*+	36	14	ppb v/v			01/29/22 03:58	12.59
Chloroform	170		36	6.3	ppb v/v			01/29/22 03:58	12.59
Chloromethane	ND		90	30	ppb v/v			01/29/22 03:58	12.59
Dibromochloromethane	ND		36	6.3	ppb v/v			01/29/22 03:58	12.59
1,2-Dibromoethane (EDB)	ND		36	5.4	ppb v/v			01/29/22 03:58	12.59
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		36	5.4	ppb v/v			01/29/22 03:58	12.59
1,2-Dichlorobenzene	ND		36	14	ppb v/v			01/29/22 03:58	12.59
1,3-Dichlorobenzene	ND		36	7.2	ppb v/v			01/29/22 03:58	12.59
1,4-Dichlorobenzene	ND		36	7.2	ppb v/v			01/29/22 03:58	12.59
Dichlorodifluoromethane	13	J	36	6.3	ppb v/v			01/29/22 03:58	12.59
1,1-Dichloroethane	5.5	J	36	4.9	ppb v/v			01/29/22 03:58	12.59
1,2-Dichloroethane	14	J	36	4.5	ppb v/v			01/29/22 03:58	12.59
1,1-Dichloroethene	70		36	5.8	ppb v/v			01/29/22 03:58	12.59
cis-1,2-Dichloroethene	ND		36	4.5	ppb v/v			01/29/22 03:58	12.59
trans-1,2-Dichloroethene	ND		36	5.8	ppb v/v			01/29/22 03:58	12.59
1,2-Dichloropropane	59	CI	36	4.5	ppb v/v			01/29/22 03:58	12.59
cis-1,3-Dichloropropene	ND		36	8.5	ppb v/v			01/29/22 03:58	12.59
trans-1,3-Dichloropropene	ND		36	9.0	ppb v/v			01/29/22 03:58	12.59
Ethylbenzene	ND		36	5.8	ppb v/v			01/29/22 03:58	12.59
4-Ethyltoluene	ND		72	9.4	ppb v/v			01/29/22 03:58	12.59
Hexachlorobutadiene	ND		180	14	ppb v/v			01/29/22 03:58	12.59
2-Hexanone	ND		90	11	ppb v/v			01/29/22 03:58	12.59
4-Methyl-2-pentanone (MIBK)	ND		90	24	ppb v/v			01/29/22 03:58	12.59
Methylene Chloride	ND		180	63	ppb v/v			01/29/22 03:58	12.59

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# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116613-001/CWL-D2-470**

**Lab Sample ID: 140-26221-22**

Date Collected: 01/20/22 11:14

Matrix: Air

Date Received: 01/25/22 10:30

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		36	11	ppb v/v			01/29/22 03:58	12.59
1,1,2,2-Tetrachloroethane	ND		36	6.3	ppb v/v			01/29/22 03:58	12.59
<b>Tetrachloroethene</b>	<b>130</b>		36	5.4	ppb v/v			01/29/22 03:58	12.59
Toluene	ND		54	10	ppb v/v			01/29/22 03:58	12.59
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>290</b>		36	4.5	ppb v/v			01/29/22 03:58	12.59
1,2,4-Trichlorobenzene	ND		180	16	ppb v/v			01/29/22 03:58	12.59
1,1,1-Trichloroethane	ND		36	13	ppb v/v			01/29/22 03:58	12.59
1,1,2-Trichloroethane	ND		36	6.7	ppb v/v			01/29/22 03:58	12.59
<b>Trichloroethene</b>	<b>3200</b>		18	5.8	ppb v/v			01/29/22 03:58	12.59
<b>Trichlorofluoromethane</b>	<b>88</b>		36	4.9	ppb v/v			01/29/22 03:58	12.59
1,2,4-Trimethylbenzene	ND		36	9.0	ppb v/v			01/29/22 03:58	12.59
1,3,5-Trimethylbenzene	ND		72	29	ppb v/v			01/29/22 03:58	12.59
Vinyl acetate	ND		180	13	ppb v/v			01/29/22 03:58	12.59
Vinyl chloride	ND	*+	18	12	ppb v/v			01/29/22 03:58	12.59
m,p-Xylene	ND		36	13	ppb v/v			01/29/22 03:58	12.59
o-Xylene	ND		36	6.7	ppb v/v			01/29/22 03:58	12.59
<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)	82		60 - 140					01/29/22 03:58	12.59

**Client Sample ID: 116614-001/CWL-SV-FB5**

**Lab Sample ID: 140-26221-23**

Date Collected: 01/20/22 09:57

Matrix: Air

Date Received: 01/25/22 10:30

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		2.1	0.60	ppb v/v			01/27/22 19:22	1.68
Benzene	ND		0.084	0.014	ppb v/v			01/27/22 19:22	1.68
Benzyl chloride	ND		0.17	0.040	ppb v/v			01/27/22 19:22	1.68
Bromodichloromethane	ND		0.084	0.019	ppb v/v			01/27/22 19:22	1.68
Bromoform	ND		0.084	0.028	ppb v/v			01/27/22 19:22	1.68
Bromomethane	ND		0.084	0.023	ppb v/v			01/27/22 19:22	1.68
2-Butanone (MEK)	ND		0.42	0.077	ppb v/v			01/27/22 19:22	1.68
<b>Carbon disulfide</b>	<b>0.050</b>	<b>J</b>	0.21	0.037	ppb v/v			01/27/22 19:22	1.68
Carbon tetrachloride	ND		0.084	0.014	ppb v/v			01/27/22 19:22	1.68
Chlorobenzene	ND		0.084	0.023	ppb v/v			01/27/22 19:22	1.68
Chloroethane	ND		0.084	0.034	ppb v/v			01/27/22 19:22	1.68
Chloroform	ND		0.084	0.015	ppb v/v			01/27/22 19:22	1.68
Chloromethane	ND		0.21	0.069	ppb v/v			01/27/22 19:22	1.68
Dibromochloromethane	ND		0.084	0.015	ppb v/v			01/27/22 19:22	1.68
1,2-Dibromoethane (EDB)	ND		0.084	0.013	ppb v/v			01/27/22 19:22	1.68
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.084	0.013	ppb v/v			01/27/22 19:22	1.68
1,2-Dichlorobenzene	ND		0.084	0.033	ppb v/v			01/27/22 19:22	1.68
1,3-Dichlorobenzene	ND		0.084	0.017	ppb v/v			01/27/22 19:22	1.68
1,4-Dichlorobenzene	ND		0.084	0.017	ppb v/v			01/27/22 19:22	1.68
Dichlorodifluoromethane	ND		0.084	0.015	ppb v/v			01/27/22 19:22	1.68
1,1-Dichloroethane	ND		0.084	0.012	ppb v/v			01/27/22 19:22	1.68

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# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116614-001/CWL-SV-FB5**

**Lab Sample ID: 140-26221-23**

Date Collected: 01/20/22 09:57

Matrix: Air

Date Received: 01/25/22 10:30

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	ND		0.084	0.011	ppb v/v			01/27/22 19:22	1.68
1,1-Dichloroethene	ND		0.084	0.014	ppb v/v			01/27/22 19:22	1.68
cis-1,2-Dichloroethene	ND		0.084	0.011	ppb v/v			01/27/22 19:22	1.68
trans-1,2-Dichloroethene	ND		0.084	0.014	ppb v/v			01/27/22 19:22	1.68
<b>1,2-Dichloropropane</b>	<b>0.011</b>	<b>J</b>	0.084	0.011	ppb v/v			01/27/22 19:22	1.68
cis-1,3-Dichloropropene	ND		0.084	0.020	ppb v/v			01/27/22 19:22	1.68
trans-1,3-Dichloropropene	ND		0.084	0.021	ppb v/v			01/27/22 19:22	1.68
<b>Ethylbenzene</b>	<b>0.015</b>	<b>J B</b>	0.084	0.014	ppb v/v			01/27/22 19:22	1.68
4-Ethyltoluene	ND		0.17	0.022	ppb v/v			01/27/22 19:22	1.68
Hexachlorobutadiene	ND		0.42	0.034	ppb v/v			01/27/22 19:22	1.68
2-Hexanone	ND		0.21	0.025	ppb v/v			01/27/22 19:22	1.68
4-Methyl-2-pentanone (MIBK)	ND		0.21	0.057	ppb v/v			01/27/22 19:22	1.68
<b>Methylene Chloride</b>	<b>0.85</b>		0.42	0.15	ppb v/v			01/27/22 19:22	1.68
Styrene	ND		0.084	0.025	ppb v/v			01/27/22 19:22	1.68
1,1,2,2-Tetrachloroethane	ND		0.084	0.015	ppb v/v			01/27/22 19:22	1.68
Tetrachloroethene	ND		0.084	0.013	ppb v/v			01/27/22 19:22	1.68
<b>Toluene</b>	<b>0.10</b>	<b>J</b>	0.13	0.024	ppb v/v			01/27/22 19:22	1.68
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>0.030</b>	<b>J</b>	0.084	0.011	ppb v/v			01/27/22 19:22	1.68
1,2,4-Trichlorobenzene	ND		0.42	0.037	ppb v/v			01/27/22 19:22	1.68
1,1,1-Trichloroethane	ND		0.084	0.030	ppb v/v			01/27/22 19:22	1.68
1,1,2-Trichloroethane	ND		0.084	0.016	ppb v/v			01/27/22 19:22	1.68
<b>Trichloroethene</b>	<b>0.072</b>		0.042	0.014	ppb v/v			01/27/22 19:22	1.68
<b>Trichlorofluoromethane</b>	<b>0.018</b>	<b>J</b>	0.084	0.012	ppb v/v			01/27/22 19:22	1.68
1,2,4-Trimethylbenzene	ND		0.084	0.021	ppb v/v			01/27/22 19:22	1.68
1,3,5-Trimethylbenzene	ND		0.17	0.068	ppb v/v			01/27/22 19:22	1.68
Vinyl acetate	ND		0.42	0.029	ppb v/v			01/27/22 19:22	1.68
Vinyl chloride	ND		0.042	0.027	ppb v/v			01/27/22 19:22	1.68
<b>m,p-Xylene</b>	<b>0.036</b>	<b>J</b>	0.084	0.030	ppb v/v			01/27/22 19:22	1.68
<b>o-Xylene</b>	<b>0.018</b>	<b>J</b>	0.084	0.016	ppb v/v			01/27/22 19:22	1.68
<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)	88		60 - 140					01/27/22 19:22	1.68

**Client Sample ID: 116615-001/CWL-D3-120**

**Lab Sample ID: 140-26221-24**

Date Collected: 01/20/22 10:04

Matrix: Air

Date Received: 01/25/22 10:30

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		540	150	ppb v/v			01/31/22 16:16	5.4
Benzene	ND		22	3.5	ppb v/v			01/31/22 16:16	5.4
Benzyl chloride	ND		43	10	ppb v/v			01/31/22 16:16	5.4
Bromodichloromethane	ND		22	4.9	ppb v/v			01/31/22 16:16	5.4
Bromoform	ND		22	7.3	ppb v/v			01/31/22 16:16	5.4
Bromomethane	ND		22	5.9	ppb v/v			01/31/22 16:16	5.4
2-Butanone (MEK)	ND		110	20	ppb v/v			01/31/22 16:16	5.4
Carbon disulfide	ND		54	9.5	ppb v/v			01/31/22 16:16	5.4

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116615-001/CWL-D3-120**

**Lab Sample ID: 140-26221-24**

Date Collected: 01/20/22 10:04

Matrix: Air

Date Received: 01/25/22 10:30

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
Carbon tetrachloride	ND		22	3.5	ppb v/v			01/31/22 16:16	5.4
Chlorobenzene	ND		22	5.9	ppb v/v			01/31/22 16:16	5.4
Chloroethane	ND		22	8.6	ppb v/v			01/31/22 16:16	5.4
<b>Chloroform</b>	<b>53</b>		22	3.8	ppb v/v			01/31/22 16:16	5.4
Chloromethane	ND		54	18	ppb v/v			01/31/22 16:16	5.4
Dibromochloromethane	ND		22	3.8	ppb v/v			01/31/22 16:16	5.4
1,2-Dibromoethane (EDB)	ND		22	3.2	ppb v/v			01/31/22 16:16	5.4
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		22	3.2	ppb v/v			01/31/22 16:16	5.4
1,2-Dichlorobenzene	ND		22	8.4	ppb v/v			01/31/22 16:16	5.4
1,3-Dichlorobenzene	ND		22	4.3	ppb v/v			01/31/22 16:16	5.4
1,4-Dichlorobenzene	ND		22	4.3	ppb v/v			01/31/22 16:16	5.4
<b>Dichlorodifluoromethane</b>	<b>7.1</b>	<b>J</b>	22	3.8	ppb v/v			01/31/22 16:16	5.4
1,1-Dichloroethane	ND		22	3.0	ppb v/v			01/31/22 16:16	5.4
<b>1,2-Dichloroethane</b>	<b>7.7</b>	<b>J</b>	22	2.7	ppb v/v			01/31/22 16:16	5.4
<b>1,1-Dichloroethene</b>	<b>36</b>		22	3.5	ppb v/v			01/31/22 16:16	5.4
cis-1,2-Dichloroethene	ND		22	2.7	ppb v/v			01/31/22 16:16	5.4
trans-1,2-Dichloroethene	ND		22	3.5	ppb v/v			01/31/22 16:16	5.4
<b>1,2-Dichloropropane</b>	<b>30</b>		22	2.7	ppb v/v			01/31/22 16:16	5.4
cis-1,3-Dichloropropene	ND		22	5.1	ppb v/v			01/31/22 16:16	5.4
trans-1,3-Dichloropropene	ND		22	5.4	ppb v/v			01/31/22 16:16	5.4
Ethylbenzene	ND		22	3.5	ppb v/v			01/31/22 16:16	5.4
4-Ethyltoluene	ND		43	5.7	ppb v/v			01/31/22 16:16	5.4
Hexachlorobutadiene	ND		110	8.6	ppb v/v			01/31/22 16:16	5.4
2-Hexanone	ND		54	6.5	ppb v/v			01/31/22 16:16	5.4
4-Methyl-2-pentanone (MIBK)	ND		54	15	ppb v/v			01/31/22 16:16	5.4
Methylene Chloride	ND		110	38	ppb v/v			01/31/22 16:16	5.4
Styrene	ND		22	6.5	ppb v/v			01/31/22 16:16	5.4
1,1,2,2-Tetrachloroethane	ND		22	3.8	ppb v/v			01/31/22 16:16	5.4
<b>Tetrachloroethene</b>	<b>27</b>		22	3.2	ppb v/v			01/31/22 16:16	5.4
Toluene	ND		32	6.2	ppb v/v			01/31/22 16:16	5.4
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>130</b>		22	2.7	ppb v/v			01/31/22 16:16	5.4
1,2,4-Trichlorobenzene	ND		110	9.5	ppb v/v			01/31/22 16:16	5.4
1,1,1-Trichloroethane	ND		22	7.8	ppb v/v			01/31/22 16:16	5.4
1,1,2-Trichloroethane	ND		22	4.1	ppb v/v			01/31/22 16:16	5.4
<b>Trichloroethene</b>	<b>1200</b>		11	3.5	ppb v/v			01/31/22 16:16	5.4
<b>Trichlorofluoromethane</b>	<b>40</b>		22	3.0	ppb v/v			01/31/22 16:16	5.4
1,2,4-Trimethylbenzene	ND		22	5.4	ppb v/v			01/31/22 16:16	5.4
1,3,5-Trimethylbenzene	ND		43	18	ppb v/v			01/31/22 16:16	5.4
Vinyl acetate	ND		110	7.6	ppb v/v			01/31/22 16:16	5.4
Vinyl chloride	ND		11	7.0	ppb v/v			01/31/22 16:16	5.4
m,p-Xylene	ND		22	7.8	ppb v/v			01/31/22 16:16	5.4
o-Xylene	ND		22	4.1	ppb v/v			01/31/22 16:16	5.4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	87		60 - 140		01/31/22 16:16	5.4

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116616-001/CWL-D3-170**

**Lab Sample ID: 140-26221-25**

Date Collected: 01/20/22 10:07

Matrix: Air

Date Received: 01/25/22 10:30

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		2.0	0.57	ppb v/v			01/31/22 17:09	1.61
<b>Benzene</b>	<b>0.11</b>		0.081	0.013	ppb v/v			01/31/22 17:09	1.61
Benzyl chloride	ND		0.16	0.038	ppb v/v			01/31/22 17:09	1.61
Bromodichloromethane	ND		0.081	0.018	ppb v/v			01/31/22 17:09	1.61
Bromoform	ND		0.081	0.027	ppb v/v			01/31/22 17:09	1.61
Bromomethane	ND		0.081	0.022	ppb v/v			01/31/22 17:09	1.61
2-Butanone (MEK)	ND		0.40	0.073	ppb v/v			01/31/22 17:09	1.61
<b>Carbon disulfide</b>	<b>0.044</b>	<b>J</b>	0.20	0.035	ppb v/v			01/31/22 17:09	1.61
<b>Carbon tetrachloride</b>	<b>0.14</b>		0.081	0.013	ppb v/v			01/31/22 17:09	1.61
Chlorobenzene	ND		0.081	0.022	ppb v/v			01/31/22 17:09	1.61
Chloroethane	ND		0.081	0.032	ppb v/v			01/31/22 17:09	1.61
<b>Chloroform</b>	<b>2.1</b>		0.081	0.014	ppb v/v			01/31/22 17:09	1.61
Chloromethane	ND		0.20	0.066	ppb v/v			01/31/22 17:09	1.61
Dibromochloromethane	ND		0.081	0.014	ppb v/v			01/31/22 17:09	1.61
<b>1,2-Dibromoethane (EDB)</b>	<b>0.012</b>	<b>J</b>	0.081	0.012	ppb v/v			01/31/22 17:09	1.61
<b>1,2-Dichloro-1,1,2,2-tetrafluoroethane</b>	<b>0.013</b>	<b>J</b>	0.081	0.012	ppb v/v			01/31/22 17:09	1.61
1,2-Dichlorobenzene	ND		0.081	0.031	ppb v/v			01/31/22 17:09	1.61
1,3-Dichlorobenzene	ND		0.081	0.016	ppb v/v			01/31/22 17:09	1.61
1,4-Dichlorobenzene	ND		0.081	0.016	ppb v/v			01/31/22 17:09	1.61
<b>Dichlorodifluoromethane</b>	<b>0.27</b>		0.081	0.014	ppb v/v			01/31/22 17:09	1.61
<b>1,1-Dichloroethane</b>	<b>0.041</b>	<b>J</b>	0.081	0.011	ppb v/v			01/31/22 17:09	1.61
<b>1,2-Dichloroethane</b>	<b>0.13</b>		0.081	0.010	ppb v/v			01/31/22 17:09	1.61
<b>1,1-Dichloroethene</b>	<b>0.49</b>		0.081	0.013	ppb v/v			01/31/22 17:09	1.61
cis-1,2-Dichloroethene	ND		0.081	0.010	ppb v/v			01/31/22 17:09	1.61
trans-1,2-Dichloroethene	ND		0.081	0.013	ppb v/v			01/31/22 17:09	1.61
<b>1,2-Dichloropropane</b>	<b>0.85</b>		0.081	0.010	ppb v/v			01/31/22 17:09	1.61
cis-1,3-Dichloropropene	ND		0.081	0.019	ppb v/v			01/31/22 17:09	1.61
trans-1,3-Dichloropropene	ND		0.081	0.020	ppb v/v			01/31/22 17:09	1.61
Ethylbenzene	ND		0.081	0.013	ppb v/v			01/31/22 17:09	1.61
4-Ethyltoluene	ND		0.16	0.021	ppb v/v			01/31/22 17:09	1.61
Hexachlorobutadiene	ND		0.40	0.032	ppb v/v			01/31/22 17:09	1.61
2-Hexanone	ND		0.20	0.024	ppb v/v			01/31/22 17:09	1.61
4-Methyl-2-pentanone (MIBK)	ND		0.20	0.054	ppb v/v			01/31/22 17:09	1.61
<b>Methylene Chloride</b>	<b>0.45</b>		0.40	0.14	ppb v/v			01/31/22 17:09	1.61
Styrene	ND		0.081	0.024	ppb v/v			01/31/22 17:09	1.61
1,1,2,2-Tetrachloroethane	ND		0.081	0.014	ppb v/v			01/31/22 17:09	1.61
<b>Tetrachloroethene</b>	<b>1.4</b>		0.081	0.012	ppb v/v			01/31/22 17:09	1.61
<b>Toluene</b>	<b>0.051</b>	<b>J</b>	0.12	0.023	ppb v/v			01/31/22 17:09	1.61
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>2.2</b>		0.081	0.010	ppb v/v			01/31/22 17:09	1.61
1,2,4-Trichlorobenzene	ND		0.40	0.035	ppb v/v			01/31/22 17:09	1.61
<b>1,1,1-Trichloroethane</b>	<b>0.061</b>	<b>J</b>	0.081	0.029	ppb v/v			01/31/22 17:09	1.61
<b>1,1,2-Trichloroethane</b>	<b>0.037</b>	<b>J</b>	0.081	0.015	ppb v/v			01/31/22 17:09	1.61
<b>Trichloroethene</b>	<b>21</b>		1.6	0.52	ppb v/v			01/31/22 17:54	1.61
<b>Trichlorofluoromethane</b>	<b>0.84</b>		0.081	0.011	ppb v/v			01/31/22 17:09	1.61
1,2,4-Trimethylbenzene	ND		0.081	0.020	ppb v/v			01/31/22 17:09	1.61
1,3,5-Trimethylbenzene	ND		0.16	0.065	ppb v/v			01/31/22 17:09	1.61
Vinyl acetate	ND		0.40	0.028	ppb v/v			01/31/22 17:09	1.61

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116616-001/CWL-D3-170**

**Lab Sample ID: 140-26221-25**

Date Collected: 01/20/22 10:07

Matrix: Air

Date Received: 01/25/22 10:30

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		0.040	0.026	ppb v/v			01/31/22 17:09	1.61
<b>m,p-Xylene</b>	<b>0.029</b>	<b>J</b>	0.081	0.029	ppb v/v			01/31/22 17:09	1.61
o-Xylene	ND		0.081	0.015	ppb v/v			01/31/22 17:09	1.61
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		60 - 140					01/31/22 17:09	1.61
4-Bromofluorobenzene (Surr)	92		60 - 140					01/31/22 17:54	1.61

**Client Sample ID: 116617-001/CWL-D3-350**

**Lab Sample ID: 140-26221-26**

Date Collected: 01/20/22 10:12

Matrix: Air

Date Received: 01/25/22 10:30

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>5.8</b>	<b>J</b>	8.5	2.4	ppb v/v			01/27/22 22:27	1.69
<b>Benzene</b>	<b>0.17</b>	<b>J</b>	0.34	0.055	ppb v/v			01/27/22 22:27	1.69
Benzyl chloride	ND		0.68	0.16	ppb v/v			01/27/22 22:27	1.69
Bromodichloromethane	ND		0.34	0.076	ppb v/v			01/27/22 22:27	1.69
Bromoform	ND		0.34	0.11	ppb v/v			01/27/22 22:27	1.69
Bromomethane	ND		0.34	0.093	ppb v/v			01/27/22 22:27	1.69
<b>2-Butanone (MEK)</b>	<b>0.76</b>	<b>J</b>	1.7	0.31	ppb v/v			01/27/22 22:27	1.69
Carbon disulfide	ND		0.85	0.15	ppb v/v			01/27/22 22:27	1.69
<b>Carbon tetrachloride</b>	<b>0.11</b>	<b>J</b>	0.34	0.055	ppb v/v			01/27/22 22:27	1.69
Chlorobenzene	ND		0.34	0.093	ppb v/v			01/27/22 22:27	1.69
Chloroethane	ND		0.34	0.14	ppb v/v			01/27/22 22:27	1.69
<b>Chloroform</b>	<b>1.0</b>		0.34	0.059	ppb v/v			01/27/22 22:27	1.69
Chloromethane	ND		0.85	0.28	ppb v/v			01/27/22 22:27	1.69
Dibromochloromethane	ND		0.34	0.059	ppb v/v			01/27/22 22:27	1.69
1,2-Dibromoethane (EDB)	ND		0.34	0.051	ppb v/v			01/27/22 22:27	1.69
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.34	0.051	ppb v/v			01/27/22 22:27	1.69
1,2-Dichlorobenzene	ND		0.34	0.13	ppb v/v			01/27/22 22:27	1.69
1,3-Dichlorobenzene	ND		0.34	0.068	ppb v/v			01/27/22 22:27	1.69
1,4-Dichlorobenzene	ND		0.34	0.068	ppb v/v			01/27/22 22:27	1.69
<b>Dichlorodifluoromethane</b>	<b>0.54</b>		0.34	0.059	ppb v/v			01/27/22 22:27	1.69
1,1-Dichloroethane	ND		0.34	0.046	ppb v/v			01/27/22 22:27	1.69
<b>1,2-Dichloroethane</b>	<b>0.21</b>	<b>J</b>	0.34	0.042	ppb v/v			01/27/22 22:27	1.69
<b>1,1-Dichloroethene</b>	<b>0.52</b>		0.34	0.055	ppb v/v			01/27/22 22:27	1.69
cis-1,2-Dichloroethene	ND		0.34	0.042	ppb v/v			01/27/22 22:27	1.69
trans-1,2-Dichloroethene	ND		0.34	0.055	ppb v/v			01/27/22 22:27	1.69
<b>1,2-Dichloropropane</b>	<b>0.88</b>	<b>CI</b>	0.34	0.042	ppb v/v			01/27/22 22:27	1.69
cis-1,3-Dichloropropene	ND		0.34	0.080	ppb v/v			01/27/22 22:27	1.69
trans-1,3-Dichloropropene	ND		0.34	0.085	ppb v/v			01/27/22 22:27	1.69
<b>Ethylbenzene</b>	<b>0.065</b>	<b>J B</b>	0.34	0.055	ppb v/v			01/27/22 22:27	1.69
4-Ethyltoluene	ND		0.68	0.089	ppb v/v			01/27/22 22:27	1.69
Hexachlorobutadiene	ND		1.7	0.14	ppb v/v			01/27/22 22:27	1.69
2-Hexanone	ND		0.85	0.10	ppb v/v			01/27/22 22:27	1.69
<b>4-Methyl-2-pentanone (MIBK)</b>	<b>0.24</b>	<b>J</b>	0.85	0.23	ppb v/v			01/27/22 22:27	1.69
Methylene Chloride	ND		1.7	0.59	ppb v/v			01/27/22 22:27	1.69



# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

Client Sample ID: 116617-001/CWL-D3-350

Lab Sample ID: 140-26221-26

Date Collected: 01/20/22 10:12

Matrix: Air

Date Received: 01/25/22 10:30

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		0.34	0.10	ppb v/v			01/27/22 22:27	1.69
1,1,2,2-Tetrachloroethane	ND		0.34	0.059	ppb v/v			01/27/22 22:27	1.69
<b>Tetrachloroethene</b>	<b>1.3</b>		0.34	0.051	ppb v/v			01/27/22 22:27	1.69
Toluene	ND		0.51	0.097	ppb v/v			01/27/22 22:27	1.69
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>1.5</b>		0.34	0.042	ppb v/v			01/27/22 22:27	1.69
1,2,4-Trichlorobenzene	ND		1.7	0.15	ppb v/v			01/27/22 22:27	1.69
1,1,1-Trichloroethane	ND		0.34	0.12	ppb v/v			01/27/22 22:27	1.69
<b>1,1,2-Trichloroethane</b>	<b>0.066</b>	<b>J</b>	0.34	0.063	ppb v/v			01/27/22 22:27	1.69
<b>Trichloroethene</b>	<b>30</b>		0.17	0.055	ppb v/v			01/27/22 22:27	1.69
<b>Trichlorofluoromethane</b>	<b>0.63</b>		0.34	0.046	ppb v/v			01/27/22 22:27	1.69
1,2,4-Trimethylbenzene	ND		0.34	0.085	ppb v/v			01/27/22 22:27	1.69
1,3,5-Trimethylbenzene	ND		0.68	0.27	ppb v/v			01/27/22 22:27	1.69
Vinyl acetate	ND		1.7	0.12	ppb v/v			01/27/22 22:27	1.69
Vinyl chloride	ND		0.17	0.11	ppb v/v			01/27/22 22:27	1.69
<b>m,p-Xylene</b>	<b>0.15</b>	<b>J</b>	0.34	0.12	ppb v/v			01/27/22 22:27	1.69
o-Xylene	ND		0.34	0.063	ppb v/v			01/27/22 22:27	1.69
<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)	89		60 - 140					01/27/22 22:27	1.69

Client Sample ID: 116618-001/CWL-D3-440

Lab Sample ID: 140-26221-27

Date Collected: 01/20/22 10:16

Matrix: Air

Date Received: 01/25/22 10:30

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			01/27/22 23:19	1.77
<b>Benzene</b>	<b>0.56</b>		0.089	0.014	ppb v/v			01/27/22 23:19	1.77
Benzyl chloride	ND		0.18	0.042	ppb v/v			01/27/22 23:19	1.77
<b>Bromodichloromethane</b>	<b>0.024</b>	<b>J</b>	0.089	0.020	ppb v/v			01/27/22 23:19	1.77
Bromoform	ND		0.089	0.030	ppb v/v			01/27/22 23:19	1.77
Bromomethane	ND		0.089	0.024	ppb v/v			01/27/22 23:19	1.77
<b>2-Butanone (MEK)</b>	<b>0.55</b>		0.44	0.081	ppb v/v			01/27/22 23:19	1.77
<b>Carbon disulfide</b>	<b>0.19</b>	<b>J</b>	0.22	0.039	ppb v/v			01/27/22 23:19	1.77
<b>Carbon tetrachloride</b>	<b>2.5</b>		0.089	0.014	ppb v/v			01/27/22 23:19	1.77
<b>Chlorobenzene</b>	<b>0.054</b>	<b>J</b>	0.089	0.024	ppb v/v			01/27/22 23:19	1.77
Chloroethane	ND		0.089	0.035	ppb v/v			01/27/22 23:19	1.77
<b>Chloroform</b>	<b>15</b>		3.5	0.62	ppb v/v			01/31/22 19:25	1.77
<b>Chloromethane</b>	<b>0.21</b>	<b>J</b>	0.22	0.073	ppb v/v			01/27/22 23:19	1.77
Dibromochloromethane	ND		0.089	0.015	ppb v/v			01/27/22 23:19	1.77
<b>1,2-Dibromoethane (EDB)</b>	<b>0.026</b>	<b>J</b>	0.089	0.013	ppb v/v			01/27/22 23:19	1.77
<b>1,2-Dichloro-1,1,2,2-tetrafluoroethane</b>	<b>0.019</b>	<b>J</b>	0.089	0.013	ppb v/v			01/27/22 23:19	1.77
<b>1,2-Dichlorobenzene</b>	<b>0.042</b>	<b>J</b>	0.089	0.034	ppb v/v			01/27/22 23:19	1.77
<b>1,3-Dichlorobenzene</b>	<b>0.024</b>	<b>J</b>	0.089	0.018	ppb v/v			01/27/22 23:19	1.77
<b>1,4-Dichlorobenzene</b>	<b>0.021</b>	<b>J</b>	0.089	0.018	ppb v/v			01/27/22 23:19	1.77
<b>Dichlorodifluoromethane</b>	<b>3.0</b>		0.089	0.015	ppb v/v			01/27/22 23:19	1.77
<b>1,1-Dichloroethane</b>	<b>1.1</b>		0.089	0.012	ppb v/v			01/27/22 23:19	1.77

Eurofins Knoxville

# Client Sample Results

Client: Sandia National Laboratories  
Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116618-001/CWL-D3-440**

**Lab Sample ID: 140-26221-27**

Date Collected: 01/20/22 10:16

Matrix: Air

Date Received: 01/25/22 10:30

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	2.2		0.089	0.011	ppb v/v			01/27/22 23:19	1.77
1,1-Dichloroethene	20		3.5	0.58	ppb v/v			01/31/22 19:25	1.77
cis-1,2-Dichloroethene	0.068	J	0.089	0.011	ppb v/v			01/27/22 23:19	1.77
trans-1,2-Dichloroethene	0.031	J	0.089	0.014	ppb v/v			01/27/22 23:19	1.77
1,2-Dichloropropane	13	CI	3.5	0.44	ppb v/v			01/31/22 19:25	1.77
cis-1,3-Dichloropropene	ND		0.089	0.021	ppb v/v			01/27/22 23:19	1.77
trans-1,3-Dichloropropene	ND		0.089	0.022	ppb v/v			01/27/22 23:19	1.77
Ethylbenzene	0.039	J B	0.089	0.014	ppb v/v			01/27/22 23:19	1.77
4-Ethyltoluene	ND		0.18	0.023	ppb v/v			01/27/22 23:19	1.77
Hexachlorobutadiene	ND		0.44	0.035	ppb v/v			01/27/22 23:19	1.77
2-Hexanone	0.077	J	0.22	0.027	ppb v/v			01/27/22 23:19	1.77
4-Methyl-2-pentanone (MIBK)	ND		0.22	0.060	ppb v/v			01/27/22 23:19	1.77
Methylene Chloride	4.3		0.44	0.15	ppb v/v			01/27/22 23:19	1.77
Styrene	ND		0.089	0.027	ppb v/v			01/27/22 23:19	1.77
1,1,2,2-Tetrachloroethane	ND		0.089	0.015	ppb v/v			01/27/22 23:19	1.77
Tetrachloroethene	16		0.089	0.013	ppb v/v			01/27/22 23:19	1.77
Toluene	0.38		0.13	0.025	ppb v/v			01/27/22 23:19	1.77
1,1,2-Trichloro-1,2,2-trifluoroethane	68		3.5	0.44	ppb v/v			01/31/22 19:25	1.77
1,2,4-Trichlorobenzene	ND		0.44	0.039	ppb v/v			01/27/22 23:19	1.77
1,1,1-Trichloroethane	0.47		0.089	0.032	ppb v/v			01/27/22 23:19	1.77
1,1,2-Trichloroethane	0.13		0.089	0.017	ppb v/v			01/27/22 23:19	1.77
Trichloroethene	630		1.8	0.58	ppb v/v			01/31/22 19:25	1.77
Trichlorofluoromethane	20		3.5	0.49	ppb v/v			01/31/22 19:25	1.77
1,2,4-Trimethylbenzene	ND		0.089	0.022	ppb v/v			01/27/22 23:19	1.77
1,3,5-Trimethylbenzene	ND		0.18	0.072	ppb v/v			01/27/22 23:19	1.77
Vinyl acetate	ND		0.44	0.031	ppb v/v			01/27/22 23:19	1.77
Vinyl chloride	0.046		0.044	0.029	ppb v/v			01/27/22 23:19	1.77
m,p-Xylene	0.086	J	0.089	0.032	ppb v/v			01/27/22 23:19	1.77
o-Xylene	0.040	J	0.089	0.017	ppb v/v			01/27/22 23:19	1.77
<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)	96		60 - 140					01/27/22 23:19	1.77
4-Bromofluorobenzene (Surr)	94		60 - 140					01/31/22 19:25	1.77

**Client Sample ID: 116619-001/CWL-D3-480**

**Lab Sample ID: 140-26221-28**

Date Collected: 01/20/22 10:25

Matrix: Air

Date Received: 01/25/22 10:30

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	1.7	J	2.1	0.58	ppb v/v			01/28/22 00:13	1.64
Benzene	0.17		0.082	0.013	ppb v/v			01/28/22 00:13	1.64
Benzyl chloride	ND		0.16	0.039	ppb v/v			01/28/22 00:13	1.64
Bromodichloromethane	ND		0.082	0.018	ppb v/v			01/28/22 00:13	1.64
Bromoform	ND		0.082	0.028	ppb v/v			01/28/22 00:13	1.64
Bromomethane	ND		0.082	0.023	ppb v/v			01/28/22 00:13	1.64
2-Butanone (MEK)	0.19	J	0.41	0.075	ppb v/v			01/28/22 00:13	1.64

# Client Sample Results

Client: Sandia National Laboratories  
 Project/Site: CWL PCCP

Job ID: 140-26221-1

**Client Sample ID: 116619-001/CWL-D3-480**

**Lab Sample ID: 140-26221-28**

Date Collected: 01/20/22 10:25

Matrix: Air

Date Received: 01/25/22 10:30

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 disulfide</b>	<b>0.17</b>	<b>J</b>	0.21	0.036	ppb v/v			01/28/22 00:13	1.64
<b>Carbon tetrachloride</b>	<b>0.079</b>	<b>J</b>	0.082	0.013	ppb v/v			01/28/22 00:13	1.64
Chlorobenzene	ND		0.082	0.023	ppb v/v			01/28/22 00:13	1.64
Chloroethane	ND		0.082	0.033	ppb v/v			01/28/22 00:13	1.64
<b>Chloroform</b>	<b>0.069</b>	<b>J</b>	0.082	0.014	ppb v/v			01/28/22 00:13	1.64
<b>Chloromethane</b>	<b>0.59</b>		0.21	0.068	ppb v/v			01/28/22 00:13	1.64
Dibromochloromethane	ND		0.082	0.014	ppb v/v			01/28/22 00:13	1.64
1,2-Dibromoethane (EDB)	ND		0.082	0.012	ppb v/v			01/28/22 00:13	1.64
<b>1,2-Dichloro-1,1,2,2-tetrafluoroethane</b>	<b>0.015</b>	<b>J</b>	0.082	0.012	ppb v/v			01/28/22 00:13	1.64
1,2-Dichlorobenzene	ND		0.082	0.032	ppb v/v			01/28/22 00:13	1.64
1,3-Dichlorobenzene	ND		0.082	0.016	ppb v/v			01/28/22 00:13	1.64
<b>1,4-Dichlorobenzene</b>	<b>0.017</b>	<b>J</b>	0.082	0.016	ppb v/v			01/28/22 00:13	1.64
<b>Dichlorodifluoromethane</b>	<b>0.36</b>		0.082	0.014	ppb v/v			01/28/22 00:13	1.64
1,1-Dichloroethane	ND		0.082	0.011	ppb v/v			01/28/22 00:13	1.64
<b>1,2-Dichloroethane</b>	<b>0.033</b>	<b>J</b>	0.082	0.010	ppb v/v			01/28/22 00:13	1.64
<b>1,1-Dichloroethene</b>	<b>0.029</b>	<b>J</b>	0.082	0.013	ppb v/v			01/28/22 00:13	1.64
cis-1,2-Dichloroethene	ND		0.082	0.010	ppb v/v			01/28/22 00:13	1.64
trans-1,2-Dichloroethene	ND		0.082	0.013	ppb v/v			01/28/22 00:13	1.64
<b>1,2-Dichloropropane</b>	<b>0.038</b>	<b>J</b>	0.082	0.010	ppb v/v			01/28/22 00:13	1.64
cis-1,3-Dichloropropene	ND		0.082	0.019	ppb v/v			01/28/22 00:13	1.64
trans-1,3-Dichloropropene	ND		0.082	0.021	ppb v/v			01/28/22 00:13	1.64
<b>Ethylbenzene</b>	<b>0.043</b>	<b>J B</b>	0.082	0.013	ppb v/v			01/28/22 00:13	1.64
4-Ethyltoluene	ND		0.16	0.022	ppb v/v			01/28/22 00:13	1.64
Hexachlorobutadiene	ND		0.41	0.033	ppb v/v			01/28/22 00:13	1.64
2-Hexanone	ND		0.21	0.025	ppb v/v			01/28/22 00:13	1.64
<b>4-Methyl-2-pentanone (MIBK)</b>	<b>0.12</b>	<b>J</b>	0.21	0.055	ppb v/v			01/28/22 00:13	1.64
<b>Methylene Chloride</b>	<b>1.6</b>		0.41	0.14	ppb v/v			01/28/22 00:13	1.64
Styrene	ND		0.082	0.025	ppb v/v			01/28/22 00:13	1.64
1,1,2,2-Tetrachloroethane	ND		0.082	0.014	ppb v/v			01/28/22 00:13	1.64
<b>Tetrachloroethene</b>	<b>0.083</b>		0.082	0.012	ppb v/v			01/28/22 00:13	1.64
<b>Toluene</b>	<b>0.29</b>		0.12	0.024	ppb v/v			01/28/22 00:13	1.64
<b>1,1,2-Trichloro-1,2,2-trifluoroethane</b>	<b>0.12</b>		0.082	0.010	ppb v/v			01/28/22 00:13	1.64
1,2,4-Trichlorobenzene	ND		0.41	0.036	ppb v/v			01/28/22 00:13	1.64
1,1,1-Trichloroethane	ND		0.082	0.030	ppb v/v			01/28/22 00:13	1.64
1,1,2-Trichloroethane	ND		0.082	0.015	ppb v/v			01/28/22 00:13	1.64
<b>Trichloroethene</b>	<b>1.1</b>		0.041	0.013	ppb v/v			01/28/22 00:13	1.64
<b>Trichlorofluoromethane</b>	<b>0.24</b>		0.082	0.011	ppb v/v			01/28/22 00:13	1.64
<b>1,2,4-Trimethylbenzene</b>	<b>0.033</b>	<b>J</b>	0.082	0.021	ppb v/v			01/28/22 00:13	1.64
1,3,5-Trimethylbenzene	ND		0.16	0.067	ppb v/v			01/28/22 00:13	1.64
Vinyl acetate	ND		0.41	0.029	ppb v/v			01/28/22 00:13	1.64
Vinyl chloride	ND		0.041	0.027	ppb v/v			01/28/22 00:13	1.64
<b>m,p-Xylene</b>	<b>0.12</b>		0.082	0.030	ppb v/v			01/28/22 00:13	1.64
<b>o-Xylene</b>	<b>0.050</b>	<b>J</b>	0.082	0.015	ppb v/v			01/28/22 00:13	1.64
<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					01/28/22 00:13	1.64
4-Bromofluorobenzene (Surr)	91		60 - 140					01/28/22 13:52	1.64

**ANNEX C**


**Chemical Waste Landfill**

**Calendar Year 2022 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, 2022
2. Time of Inspection 12:50-13:10
3. Name of Inspector Robert Zbeck, Danielle Michel, Caitlin LaChance

<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="text-align: right; border: 1px solid black; width: 100px; height: 40px; margin-left: auto;">  </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

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**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 southern drainage culverts.</i>
2.	<i>Wind-blown plant debris on security fence</i>
3.	<i>Wind-blown plant debris and sediment accumulation 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) 1 assigned to Robert Zook Date action completed 4/4/2022  
Action (Note Number) 2 assigned to Robert Zook Date action completed 4/4/2022  
Action (Note Number) 3 assigned to Danielle Michel Date action completed 3/1/2022  
Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_  
Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

3. Wind-blown plant debris and sediment were removed from western most survey monument at time of inspection.

1. Wind-blown plant debris removed from southern drainage culverts on April 4, 2022 by B&I/Yellowstone.

2. Wind-blown plant debris removed from security fence on April 4, 2022 by B&I/Yellowstone.

Inspector's Signature [Signature]  
Original to: Chemical Waste Landfill Operating Record  
Copy to: Environmental Safety and Health (ES&H) and Security Records Center



*date:* March 14, 2022

*to:* Mike Mitchell (08888)  
Robert Ziock (08888)

*from:* Jennifer Payne (00643) [jjpayne@sandia.gov](mailto:jjpayne@sandia.gov)

*subject:* **CWL March 2022 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 14, 2022.

Observations

- The CWL native grass community appears to be in a healthy state of winter dormancy.
- No seasonal weeds were observed across the landfill. During the month of March in previous years small late-winter seasonal weeds were present in low abundance across the landfill. The lack of weeds this March may be due to Esplanade being previously applied and its successful suppression of weeds, and/or due very low precipitation since the end of the monsoon season. The CWL area has received less than one inch of total precipitation during the five months of October 2021 – February 2022. The area is currently in "Extreme Drought" according to the March 1, 2022 U.S. Drought Monitor ([droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)).
- No biological concerns observed at this time.

Recommendations

- On March 8, 2022 the Sandia Meteorological Program provided:

The Seasonal Outlooks developed by NOAA and the European commission predict that New Mexico will be hotter than average with below-average precipitation through the upcoming months. Current trends combined with this climate model contribute to high confidence in this prediction. According to the El Niño/ Southern Oscillation (ENSO) Diagnostic Discussion issued by the Climate Prediction Center, “La Niña is likely to continue into the Northern Hemisphere spring (77% chance during March-May 2022) and then transition to ENSO-neutral (56% chance during May-July 2022).” La Niña conditions will continue to impact the southwest and amplify below-average precipitation, promoting worsening drought conditions.


Based on the current drought conditions and seasonal outlook, the CWL cover may require supplemental water to bolster the health of the still-developing native grass community. If substantial soil-wetting precipitation events do not occur during the 2022 monsoon season, supplemental watering may be needed.

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  
Sue Collins  
Matt Baumann

## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection June 1, 2022
2. Time of Inspection 11:00 - 15:00
3. Name of Inspector Robert Zibek, Danielle Michel

<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: small;">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. 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.	<i>yes</i>	<i>No</i>	
B. Erosion of the soil cover in excess of 6 inches deep.	<i>yes</i>	<i>No</i>	
C. Evidence of water ponding on the CWL cover surface in excess of 100 square feet.	<i>yes</i>	<i>No</i>	
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.	<i>yes</i>	<i>No</i>	
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.	<i>yes</i>	<i>No</i>	

<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.	<i>yes</i>	<i>No</i>	
B. Channel sediment accumulation in excess of 6 inches deep.	<i>yes</i>	<i>No</i>	
C. Debris that blocks more than 1/3 of the channel width.	<i>yes</i>	<i>yes</i>	<i>1</i>

**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**

Note Number	Description
1.	<i>Wind-blown plant debris in drainage culverts.</i>
2.	<i>Wind-blown plant debris on security fence.</i>
3.	<i>Wind-blown plant debris and sediment covering western most survey monument</i>

**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 June 1, 2022  
Action (Note Number) 2 assigned to Robert Zöck Date action completed June 1, 2022  
Action (Note Number) 3 assigned to Robert Zöck Date action completed June 2, 2022  
Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_  
Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

1. Wind-blown plant debris removed from drainage culverts during the inspection.
2. Wind-blown plant debris removed from security fence during inspection.
3. Wind-blown plant debris and sediment removed from western most survey monument on June 2, 2022

Inspector's Signature [Handwritten Signature]

Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

*date:* June 16, 2022

*to:* Mike Mitchell (08854)  
Robert Ziock (08854)

*from:* Jennifer Payne (00643) [jjpayne@sandia.gov](mailto:jjpayne@sandia.gov)

*subject:* **June 2022 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 13, 2022.

- Overall, the CWL vegetation appeared to be in good health at the time of the inspection. Some of the native bunchgrasses had developed some new green leaves at their bases. None of the bunchgrasses had abundance of green sprouts but overall, the bunchgrasses on ET Cover had more new growth than the surrounding TA3 native vegetation. This is likely due to a higher level of soil moisture on the ET Cover than in the surrounding areas of native vegetation because the CWL gravel mulch reduces evaporative soil losses and it also collects condensation, adding to the soil moisture content.
- No weeds observed.



- A few wire lettuce (*Stephanomeria pauciflora*) were observed on the cover, actively photosynthesizing and in flower. A few very shriveled brown-spined prickly pear (*Opuntia phaeacantha*) were also observed, reflecting the ongoing drought conditions.
- A faint two-track was observed along the western edge of the ET Cover. This was likely developed during repeated maintenance events.

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 August 31, 2022
2. Time of Inspection 12:20 - 1247
3. Name of Inspector Robert Zock, Danielle Michel

<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>RZ</i>                  (Inspector must initial box before proceeding with the inspection.)                  Training records maintained at CAMU Administrative Trailer.</p>
--

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.	<i>yes</i>	<i>No</i>	
B. Erosion of the soil cover in excess of 6 inches deep.	<i>yes</i>	<i>No</i>	
C. Evidence of water ponding on the CWL cover surface in excess of 100 square feet.	<i>yes</i>	<i>No</i>	
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.	<i>yes</i>	<i>No</i>	
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.	<i>yes</i>	<i>No</i>	

<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.	<i>yes</i>	<i>No</i>	
B. Channel sediment accumulation in excess of 6 inches deep.	<i>yes</i>	<i>No</i>	
C. Debris that blocks more than 1/3 of the channel width.	<i>yes</i>	<i>No</i>	

**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	1
B. Fence wires and posts in need of repair/maintenance.	yes	No	
C. Gates in need of oiling/repair/maintenance.	yes	No	
D. Locks in need of cleaning or replacement.	yes	No	
E. Warning signs in need of repair or replacement.	yes	No	
F. Survey monuments in vicinity of CWL visible.	yes	yes	2

<b>IV. PREVIOUS DEFICIENCIES</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.	No	No	

**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 on fence.</i>
2.	<i>Sediment accumulation on western</i>
	<i>most survey monument.</i>

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 1. assigned to Robert Zak Date action completed 9/13/22

Action (Note Number) 2. assigned to Robert Zak Date action completed 8/31/22

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:**

2. Sediment accumulated on western most bench mark removed at time of inspection.

1. Wind-blown plant debris removed by BGI/Yellowstone on 9/13/2022.

Inspector's Signature



Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

## Chemical Waste Landfill Post-Closure Inspection Form Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection December 1, 2022
2. Time of Inspection 09:25 - 10:15
3. Name of Inspector Robert Zöck, Danielle 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: *(Inspector must initial box before proceeding with the inspection.)*

*Rz*

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

<b>I. COVER SYSTEM [Quarterly]</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Visible settlement of the soil cover in excess of 6 inches.	<i>yes</i>	<i>No</i>	
B. Erosion of the soil cover in excess of 6 inches deep.	<i>yes</i>	<i>No</i>	
C. Evidence of water ponding on the CWL cover surface in excess of 100 square feet.	<i>yes</i>	<i>No</i>	
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.	<i>yes</i>	<i>No</i>	
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.	<i>yes</i>	<i>No</i>	

<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.	<i>yes</i>	<i>No</i>	
B. Channel sediment accumulation in excess of 6 inches deep.	<i>yes</i>	<i>No</i>	
C. Debris that blocks more than 1/3 of the channel width.	<i>yes</i>	<i>yes</i>	<i>1</i>

**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

<b>III. SECURITY FENCE [Quarterly]</b>			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Accumulation of wind-blown plants and debris.	yes	yes	2
B. Fence wires and posts in need of repair/maintenance.	yes	No	
C. Gates in need of oiling/repair/maintenance.	yes	No	
D. Locks in need of cleaning or replacement.	yes	No	
E. Warning signs in need of repair or replacement.	yes	No	
F. Survey monuments in vicinity of CWL visible.	yes	No	

<b>IV. PREVIOUS DEFICIENCIES</b>			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.	NA	NA	





**Chemical Waste Landfill  
Post-Closure Inspection Form  
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 1 assigned to Robert Zick Date action completed 12/1/2022

Action (Note Number) 2 assigned to Robert Zick Date action completed 12/1/2022

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

Action (Note Number) \_\_\_\_\_ assigned to \_\_\_\_\_ Date action completed \_\_\_\_\_

**Additional Comments:**

1, 2. Wind-blown plant debris removed from drainage culverts and security fence at time of the 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 9, 2022

*to:* Mike Mitchell (08854)  
Robert Ziock (08854)

*from:* Jennifer Payne (00643) [jjpayne@sandia.gov](mailto:jjpayne@sandia.gov)

*subject:* **December 2022 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, 2022.

- Overall, the native vegetation community on the CWL cover looks good.
- The native bunchgrasses appear to be healthy and in the same condition as observed during the August inspection. The grass leaves have mostly dried out, some grasses are still displaying a small amount of green, with limited photosynthesis still occurring. 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.
- There are some larger open spaces on the cover that are expected to fill in with weeds whenever the Esplanade pre-emergent herbicide eventually breaks down and no longer prevents weed establishment. These open spaces are not huge, but they are larger than the openings found between native bunchgrasses in the surrounding areas. The CWL cover has had some vegetation

transitions since it was seeded in 2009, from a turf appearance of juvenile bunchgrasses to thick weed coverage. The death of some bunchgrasses and the new establishment of juveniles is a normal process for any grass community of plants. In naturally established grasslands when a disturbance occurs, larger openings can be created. Depending on the seed bank in the soil and meteorological conditions these openings may become filled with native bunchgrasses, shrubs, forbs, and/or weedy species. The current spacing between native bunchgrasses contains some larger openings in some areas than it has been in some of the years since it was seeded in 2009. Due to the expected lack of current native seed bank in the soil, it is likely these open areas may naturally become filled in with weedy species, and eventually be replaced with native bunchgrasses. These spaces can be managed by adding additional seed below the soil crust, or they can progress without interference.

- 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 1-12-22
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: (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           *37*          

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 08/02/22
2. Time of Inspection 0830
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: ZT  
(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 Soil-Gas Monitoring Locations / Sampling Equipment

1. Date of Inspection 1-20-22
2. Time of Inspection 0815
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>	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto;">  </div>
<p>Training records maintained at CAMU Administrative Trailer.</p>	

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     *37*    

Original to: Chemical Waste Landfill Operating Record

## **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>Setaria leucophila</u>	<u>Plains bristlegrass</u>	<u>&lt; 0.5%</u>
<u>Opuntia phaeacantha</u>	<u>Brown-spined prickly pear</u>	<u>&lt;0.5 %</u>
<u>Sphaeralcea incana</u>	<u>Yellow globemallow</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> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>

Note: <sup>1</sup>All species observed to be present at less than one-half of one-percent are not calculated into the total vegetative coverage

## Chemical Waste Landfill Biology Inspection Checklist for the CWL Cover (Continued)

**Permit Requirements:**

1) Is the total foliar coverage (i.e., land surface covered with living plants) greater than or equal to 20%? Yes If "No," explain below.

Notes: \_\_\_\_\_

2) Of the 20% total foliar coverage, is 50% or greater comprised of native perennial species, and 50% or less comprised of annual species? Yes If "No," explain below.

Notes: \_\_\_\_\_

3) Are there any contiguous areas of no vegetation greater than 200 square feet (approximately 14 x14 ft.)? No If "Yes," mark such areas on a map and attach to this checklist. Describe area(s) and plans to actively improve/repair area(s) as detailed in Permit Attachment 1, Section 1.9.1.3 below.

Notes: \_\_\_\_\_

4) Are there any animal burrow entrances on the cover in excess of 4 inches in diameter? No If "Yes," mark such areas on a map and provide additional information below.

Notes: \_\_\_\_\_

**General Cover Information:**

Are any burrows smaller than 4 inches in diameter present on the cover? 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 an extremely 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 gradually mature across the cover in the past year. The native grass clumps are displaying a healthy amount of green, mirroring the surrounding native grasslands.

Very few grasses had set seed in 2022 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. As observed in 2021, very few weedy annuals were observed, notably no Russian thistle were observed. Significant progress has been made on the CWL in reducing the number weedy plants over the past few years. The maintenance activities affecting the 2022 growing season have been very effective in controlling weedy species. Large barren interspaces between the native bunch grasses were present, these spaces were previously filled with 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.

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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:   
Original to: Chemical Waste Landfill Operating Record

Date: August 19, 2022  
Time: 3:35PM-5:50PM

**ANNEX D**

**Chemical Waste Landfill  
Calendar Year 2022 Biology Report**

## 2022 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) 2022 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 for late 2021 through 2022, 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 2022 was conducted on August 19, 2022 and the inspection observations are documented on the “Chemical Waste Landfill Post-Closure Inspection Form Biology Inspection Checklist for the CWL Cover” (provided in Annex C of this CWL Annual Post-Closure Care Report). The inspection was conducted during the 2022 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 March, June, and December 2022 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 2022 CWL Biology Inspections document ET Cover conditions that continue to meet the criteria for successful revegetation.

### Local Climate Trends for 2022 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 reseeded effort in August 2009,

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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 below. 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 2022 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 2022 Biology Inspection, the CWL area conditions were “D2 Severe Drought” indicating water shortages and adverse impact to crops. Under these conditions the native vegetation is also likely under stress. The drought conditions were improved over August 2021 conditions due to a strong 2022 monsoon season that started early in mid-June and continued through August.

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 local meteorological conditions includes the last three months of CY 2021.

### *Precipitation and Relative Humidity*

Extremely dry meteorological conditions dominated the nine months (October 2021 through June 2022) preceding the 2022 monsoon season (July through September 2022). October 2021 through May 2022 was an eight-month period of significantly below average precipitation and relative humidity, with no precipitation recorded in April and May 2022. March and June 2022 were the only non-monsoonal months with above average precipitation, with June recording 2.13 inches, 1.61 inches above the average of 0.52 inches. The October 2021 through June 2022 precipitation total was 1.18 inches below

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average. Relative humidity was also generally lower than average during this nine-month timeframe.

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. Total precipitation during the 2022 monsoon season was 3.79 inches, 0.38 inches below the average of 4.17 inches. However, when the month of June is added to the range, the total precipitation for June through September 2022 was 5.92 inches, 1.23 inches above the average of 4.69 inches for the four-month period. Relative humidity was above average in August and September, but slightly below average in July.

During the last three months of 2022, October and December experienced more precipitation than average, with drier than average conditions in November. Total precipitation in 2022 was 9.84 inches, 10% above the annual average of 8.86 inches.

### *Temperature and Wind Speeds*

In CY 2022 the monthly mean temperature was 58.1°F, this was 0.7°F above the 25-year annual mean of 57.4°F. The monthly mean temperature for six months in 2022 exceeded their 25-year monthly means, with a maximum variation of +4.6°F in May.

The 2022 monthly and annual wind speed means were very close or the same as the 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 May (1.9 miles per hour difference). The 2022 annual mean and 25-year means were the same (8.3 miles per hour).

### ET Cover Development and Maintenance

The successional development of the native grasses on the ET Cover has been significant in the past nine 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 2022 are presented in Section 6.6 of this CWL Annual Post-Closure Care Report and were performed in response to inspections, general site conditions, and recommendations by the staff biologist. The two maintenance events conducted in April and September 2022 were part of 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 first applied to the ET Cover and perimeter areas in March 2021. The application

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completed in April 2022 was the second annual application on the ET Cover. Based upon the inspections in CY 2022, Esplanade is effective for invasive weed control (see Section 6.6).

### August 19, 2022 Inspection Results

The August 2022 Biology Inspection determined the ET Cover continues to meet or exceed all permit requirements related to biological parameters. Photographs of the ET Cover taken during the annual inspection are presented at the end of this report. The successful revegetation criteria from Attachment 1, Section 1.9 of the PCCP 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 CY 2022, in part due to the annual application of Esplanade the last two years prior to the growing season. Invasive weeds that grew on the ET Cover in CY 2022 were easily controlled by small-scale 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.

Overall, the ET Cover vegetation was observed to be in very good condition. Juvenile and more mature native grass clumps were evenly spaced across the ET Cover, providing a healthy, varied-age plant community. The native grass clumps displayed a healthy amount of green, mirroring the surrounding areas and indicating good photosynthetic activity. Grasses had set a moderate number of seeds, most likely in response to the ongoing 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 2022, the existing native grasses could benefit from continued efforts to monitor and potentially reduce competition from annual weedy species. Development of the native perennial grass community could also be facilitated in the open spaces on the ET Cover where invasive weeds have been significantly reduced over the past two years. This could occur through natural (i.e., seed from existing grasses) or assisted (i.e., drill seeding) processes. No immediate action is necessary as the open spaces between native grass clumps that were

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observed during the August 2022 inspection are well within the plant cover requirements (i.e., no areas devoid of vegetation greater than 200 square feet).

Given the current ET Cover vegetation status and the effective duration of the pre-emergent herbicide Esplanade applied in 2021 and 2022, the annual application of Esplanade is not recommended in 2023. The two previous applications (March 2021 and April 2022) have proven effective at weed control and the open spaces between grass clumps have stayed mostly clear of weeds throughout the 2022 growing season. This is evidenced by the minor best practice maintenance level of effort in CY 2022. Esplanade also prevents new growth of native grass from seeds dropped on the soil surface by the established native grasses. Based on available information for Esplanade, it could remain effective for as much as two to three years. For 2023 best practice maintenance, the focus should be to control invasive weed growth in open spaces as needed through manual weed removal. The manual removal approach will be evaluated over the next two years. Based upon results, other strategies for additional native plant recruitment from seed in the larger open areas will be evaluated as the pre-emergent herbicide loses effectiveness over time.

Below-average precipitation and worsening drought conditions are expected to continue according to forecast models. Current and anticipated future drought conditions may stress the ET Cover vegetation during the 2023 growing season. As has been done in the past, supplemental watering will be considered in 2023 to provide additional soil moisture pending actual conditions.

Ongoing drought conditions will be monitored along with their impacts on the ET Cover vegetation. Mature, native perennial grasses will continue to be the most resilient type of plant community and require the minimum amount maintenance. 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, 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 2022)

<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://bmcplantbiol.biomedcentral.com/articles/10.1186/1471-2229-11-21> Accessed December 16, 2019.

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**Table 1**  
**October-December 2021 Meteorological Data Summary for the Chemical Waste Landfill<sup>a</sup>**

Month	October	November	December	
<b>Temperature (°F)</b>				3-Month Avg
Monthly Mean	58.8	52.2	43.4	51.5
25-year Temp Means	58.0	46.6	37.3	47.3
<b>Precipitation (Inches)</b>				3-Month Total
Monthly Total	0.06	0.16	0.29	0.51
25-year Precip Means	0.95	0.47	0.57	1.99
<b>Relative Humidity (RH) (%)</b>				3-Month Avg
Monthly Mean	36.5	35.7	41.5	37.9
25-year RH Means	42.6	45.0	53.4	47.0
<b>Wind (Miles/hour)</b>				3-Month Avg
Monthly Mean	7.8	6.0	7.0	6.9
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.



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**Table 2**  
**2022 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>	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	
<b>Temperature (°F)</b>													Annual <sup>b</sup>
Monthly Mean	39.5	38.3	48.2	59.9	70.3	75.6	79.7	74.7	72.1	56.1	43.0	39.5	58.1
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	0.04	0.07	0.76	0.0	0.0	2.13	1.1	2.37	0.32	1.92	0.38	0.75	9.84
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	46.8	40.4	34.4	18.9	15.0	37.7	40.1	50.5	42.6	55.1	42.4	53.0	39.7
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	7.0	7.7	8.2	11.2	11.8	8.7	7.7	8.0	7.8	7.9	7.5	6.3	8.3
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.

**2022 CWL Biology Inspection Photographs – August 19, 2022**



CWL: Northwest portion of the cover



CWL: Southwest portion of the cover

**2022 CWL Biology Inspection Photographs – August 19, 2022**



**CWL: Southeast portion of the cover**



**CWL: Northeast portion of the cover**

**2022 CWL Biology Inspection Photographs – August 19, 2022**



CWL: Looking north from the center of the cover



CWL: Looking east from the center of the cover

**2022 CWL Biology Inspection Photographs – August 19, 2022**



CWL: Looking south from the center of the cover



CWL: Looking west from the center of the cover