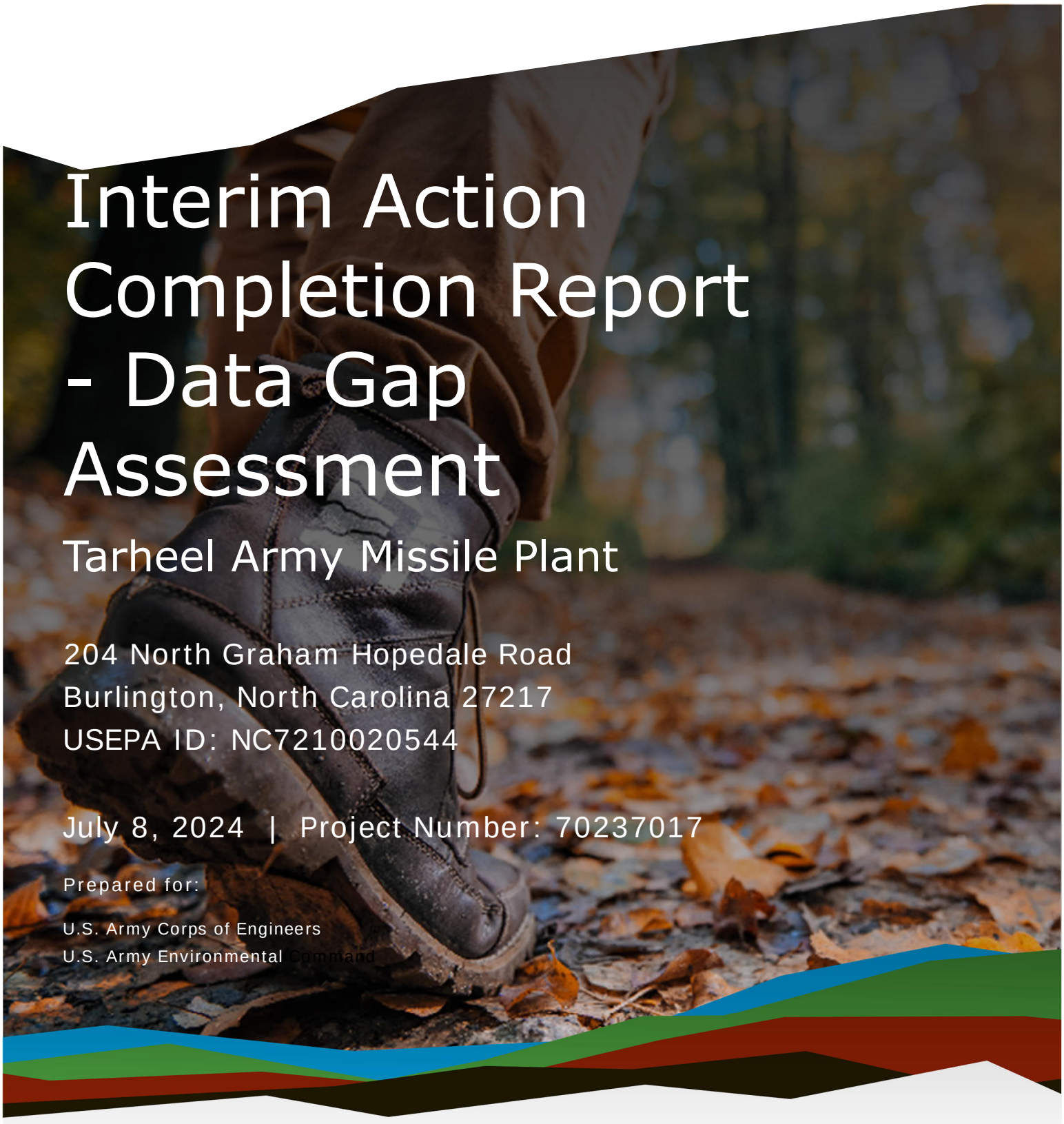


Interim Action Completion Report - Data Gap Assessment

Tarheel Army Missile Plant

204 North Graham Hopedale Road
Burlington, North Carolina 27217
USEPA ID: NC7210020544

July 8, 2024 | Project Number: 70237017

Prepared for:

U.S. Army Corps of Engineers
U.S. Army Environmental Command

NORTHWIND JACOBS JV

Terracon

Nationwide
Terracon.com

- Facilities
- Environmental
- Geotechnical
- Materials

Interim Action Completion Report – Data Gap Assessment

Tarheel Army Missile Plant

204 North Graham Hopedale Road
Burlington, North Carolina 27217
USEPA ID: NC7210020544

July 8, 2024 | Project Number: 7023701

Prepared By:

Matilynn Maltba, P.G.
Senior Staff Geologist

Donald R. Malone,
Program Manager / ultant

NORTH CAROLINA PROFESSIONAL SEAL 20195 ENGINEER DONALD R. MALONE

Terracon Consultants, Inc. is licensed to practice geology and engineering in North Carolina. The certification numbers of the corporation are C-367 and F-0869, respectively.

Prepared for:

U.S. Army Corps of Engineers
U.S. Army Environmental Command

NORTHWIND JACOBS JV

Terracon

Nationwide
Terracon.com

- Facilities
- Environmental
- Geotechnical
- Materials

2401 Brentwood Road, Suite 107
Raleigh, NC 27604
P (919) 873-2211
F (919) 873-9555
Terracon.com

July 8, 2024

U.S. Army Corps of Engineers – Savannah District
100 W Oglethorpe Avenue
Savannah, Georgia 31401-3604

Attn: Dena Thompson
P 912-652-5087
E dena.b.thompson@usace.army.mil

RE: Interim Action Completion Report – Data Gap Assessment
Tarheel Army Missile Plant
204 North Graham Hopedale Road
Burlington, North Carolina 27217
USEPA ID: NC7210020544
Terracon Project No.: 70237017

Dear Ms. Thompson:

Northwind-Jacobs Joint Venture and Terracon Consultants, Inc. appreciates the opportunity to submit this Interim Action Completion Report – Data Gap Assessment to the U.S. Army Corps of Engineers – Savannah District for the above-referenced site. This report details the results, conclusions, and recommendations from the installation and sampling of permanent soil gas monitoring points on the former Lucent Technologies facility (201 N. Cobb Ave) and a groundwater monitoring well on the western side of the Tarheel Army Missile Plant property.

Sincerely,
Terracon

Matilynn Maltba, P.G.
Senior Staff Geologist

Donald R. Malone, P.E. (NC) / RSM
Program Manager / Sr. Engineering Consultant

Table of Contents

1.0 Introduction 1-1
1.1 Purpose of Work 1-1
1.2 Report Organization 1-2
2.0 Materials and Methods for Data Gap Assessment Activities 2-1
2.1 Boring Advancement 2-2
2.2 Field Screening of Soil 2-2
2.3 Data Gap Assessments 2-2
2.3.1 Soil Gas Probe Construction 2-2
2.3.2 Groundwater Monitoring Well Construction 2-3
2.4 Sample Collection Methodologies 2-3
2.4.1 Soil Gas Samples 2-3
2.4.2 Groundwater Sample 2-4
2.5 Decontamination Methods 2-4
2.6 Elevation Survey 2-4
3.0 Summary of Results and Findings 3-1
3.1 Summary of Results for the Soil Gas Samples 3-1
3.2 Monitoring Well Results 3-1
3.2.1 Depth to Water Measurements 3-1
3.2.2 Summary of Results from Groundwater Samples 3-2
3.3 NCDEQ Risk Calculator Results 3-3
3.4 Data Validation Results 3-4
4.0 Conclusions and Recommendations 4-1
4.1 Summary of Conclusions 4-1
4.2 Summary of Recommendations 4-1
5.0 References 5-1

List of Tables

Table 1 – Soil Gas Point Construction Information

Table 2 – Well Construction Details and Depth to Groundwater Measurements

Table 3 – Soil Gas Analytical Results

Table 4 – Groundwater Analytical Results

List of Figures

Figure 1 - Site Location Map

Figure 2 – Site Diagram

Figure 3 – Soil Gas and Groundwater Data Gap Analytical Results

List of Appendices

Appendix A – Soil Gas Point Boring Logs, Sample Logs, and Photo Log

Appendix B – Monitoring Well Boring Log, Construction Record, and Sample Log

Appendix C – Topographic Survey Data

Appendix D – Laboratory Analytical Reports and Chain-of-Custody Records

Appendix E – NCDEQ Risk Calculator Results

Appendix F – Data Validation Narratives

1.0 Introduction

Northwind-Jacobs Joint Venture (Northwind) and Terracon Consultants, Inc. (Terracon) provide this Interim Action Completion Report to summarize the field activities, results, conclusions, and recommendations of the soil gas and groundwater monitoring activities that occurred from February 29 to May 8, 2024 in the western portion of the Tarheel Army Missile Plant (TAMP) site in the vicinity of the former Lucent Technologies facility (201 N. Cobb Ave). This work was authorized by Subcontract No. W912HN23F1012-001 between Northwind and Terracon dated August 2, 2023, under the Prime Contract No. W912HN21F1006 with the U.S. Army Corps of Engineers (USACE) – Savannah District Office.

1.1 Purpose of Work

The TAMP site (U.S. Environmental Protection Agency [USEPA] ID: NC7210020544), located at 204 North Graham-Hopedale Road, Burlington, North Carolina, was formerly owned and operated by the U.S. Army for the production of aircraft, missiles, and electronics. Former operations and leaking underground storage tanks on the site have contaminated soil and groundwater. Northwind and Terracon completed a Remedial Investigation (RI) Report dated May 22, 2023 that identified several constituents of concern (COCs), and multiple data gaps for the site. The following data gaps were addressed during this scope of work:

- Vapor intrusion concerns for the former Lucent Technologies facility and
- Lack of understanding of a potential western groundwater migration pathway for the COCs.

In response to the RI Report (Northwind and Terracon, 2023), the USACE submitted a Request for Task Order Proposal and Performance Work Statement dated April 27, 2023 to implement interim remedial actions to limit migration of the COCs and to control potential impacts to receptors. A Conceptual Site Model (CSM) was detailed in the Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP) Work Plan dated January 8, 2024 that provided the framework for further environmental investigation of the former TAMP facility. Additional background information, specific COCs, exposure pathways, conclusions, and recommendations are in the CSM worksheets in the RI Report (Northwind and Terracon, 2023) and the UFP-QAPP Work Plan (Northwind and Terracon, 2024). Terracon installed and sampled four permanent soil gas probes adjacent to the former Lucent Technologies Building and installed and sampled a bedrock monitoring well on the western portion of the site to address two of the data gaps.

1.2 Report Organization

This report includes five sections, including this introduction. Section 2 includes the materials and methods used to conduct the data gap assessment. Section 3 includes a discussion of the results from analytical samples, and other findings while performing the data gap assessment. Section 4 summarizes the conclusions and recommendations from this work. Section 5 includes the literature references used during the development of this report.

2.0 Materials and Methods for Data Gap Assessment Activities

The purpose of this section is to summarize the materials and methods used to conduct the data gap assessment activities in the vicinity of the former Lucent Technologies facility (201 N. Cobb Ave), on the western perimeter of the site. The following is a timeline for the activities that occurred from February to May 2024. These activities are discussed in more detail in the following subsections.

- February 2024:
  - Terracon contacted 811 to identify public utilities prior to any excavation or boring advancement on February 20.
  - Terracon utilized an electromagnetic pipe and cable locator system and a Ground Penetrating Radar system to aid in determining location and type of utilities within the work areas on February 26.
  - South Atlantic Environmental Drilling and Construction Co. (SAEDACCO) mobilized to the site on February 29 to install the four soil gas monitoring points.
- March 2024:
  - Terracon checked the vacuum of the soil gas points and reinstalled SV-15 on March 5 due to vacuum levels within the point during ambient conditions. The presence of initial vacuum levels in the soil gas points can be attributable to the presence of water in the bottom of the probe.
  - Terracon collected soil gas samples from SV-13, SV-14, and SV-15 on March 7. Soil gas point SV-16 was not sampled due to presence of water within the point.
  - SAEDACCO constructed monitoring well MW-142 on March 11 and March 12.
  - Terracon reinstalled soil gas point SV-16 on March 12.
  - Terracon collected a soil gas sample from SV-16 on March 14.
  - Terracon developed monitoring well MW-142.

- May 2024:
  - Terracon remobilized to the site to collect a groundwater sample from monitoring well MW-142.
  - Borum, Wade, and Associates, P.A. (Borum & Wade) collected horizontal coordinates and vertical elevation data on May 21 for the soil gas probes and for the new monitoring well.

2.1 Boring Advancement

SAEDACCO, a State of North Carolina licensed drilling subcontractor, performed the soil gas probe and monitoring well installation activities. Northwind and Terracon field staff performed field supervision and documentation of the drilling activities. SAEDACCO and Terracon utilized a Geoprobe® 7822DT drill rig with direct push technology (DPT) drilling methods and/or a hand auger to install the soil gas points. For screening and logging purposes, Terracon collected soil samples using 4-foot long Macro-Core® samplers and polyvinyl chloride (PVC) liners. A Gus Pech® Brute drill rig was utilized for the installation of monitoring well MW-142 using hollow-stem augers and air-rotary drilling methods.

2.2 Field Screening of Soil

Terracon field staff collected the soil samples continuously using the Macro-Core® and PVC liners, or directly from auger and rotary cuttings. Terracon observed each discrete sample to document soil lithology, color, and moisture content. The soil samples were field screened at 2-foot intervals using a photoionization detector (PID) to indicate the presence of volatile organic compounds (VOCs). The PID was calibrated in accordance with the manufacturer's recommendations before the field activities. Appendices A and B include the boring logs developed during installation of the soil gas probes and monitoring well MW-142, respectively. Each log includes Terracon's notes regarding soil lithology and field screening results, where appropriate.

2.3 Data Gap Assessments

2.3.1 Soil Gas Probe Construction

In February 2024, Terracon oversaw SAEDACCO during construction of the four shallow soil gas probes (SV-13, SV-14, SV-15, and SV-16). Each point was installed using DPT and/or a hand auger, initially to a depth of up to 9 feet below land surface (bls); although, Terracon reinstalled SV-15 and SV-16 at shallower depths in March 2024 using a hand auger because water was present in the original gas probes. The soil-gas implants consisted of a 6-inch stainless-steel screened sampling tip and Teflon® lined tubing that were placed in the boreholes. The boreholes were backfilled with No. 2 gravel pack silica sand from the bottom

of the boring to approximately 6 inches above the top of the stainless-steel screen, followed by a seal of granular bentonite hydrated with deionized water in multiple lifts to the surface, to create an air-tight seal. The soil gas points were installed as permanent probes, using flush mounted manways and concrete pads. The soil gas points were installed and constructed in general accordance with the practices outlined in the Interstate Technology Regulatory Council (ITRC) Vapor Intrusion Pathway: A Practical Guidance (ITRC, 2007) and the North Carolina Department of Environmental Quality (NCDEQ), Division of Waste Management (DWM) Vapor Intrusion Guidance (NCDEQ, 2018). A period of at least 24 hours was allowed for sample probe equilibration prior to collecting the samples from the soil gas points. Soil gas point construction details are in Table 1. The boring logs for the soil gas probes are in Appendix A.

2.3.2 Groundwater Monitoring Well Construction

In March 2023, Terracon oversaw the installation of MW-142, a Type III “bedrock” monitoring well on the western portion of the site and east of the former Lucent Technologies facility. The Type III monitoring well was constructed with a 6-inch PVC outer casing set in bedrock at a depth of 35 feet bls. The inner casing was constructed with 2-inch PVC casing and 10 feet of 0.010-inch machine slotted PVC screen installed at a depth of 40 to 50 feet bls. The well was capped with a 2-inch locking well plug. The well was finished at the surface with a flush-mount 8-inch manway set in a 2-foot by 2-foot concrete pad.

After the construction, Terracon developed the monitoring well by pumping and surging groundwater in the well using a submersible pump and well development surge block. Due to slow groundwater recharge, the monitoring well was purged dry approximately three times during the development process. Construction details and the calculated groundwater elevation for monitoring well MW-142 are in Table 2. The boring log and construction record for the monitoring well are in Appendix B.

2.4 Sample Collection Methodologies

2.4.1 Soil Gas Samples

Prior to sample collection, Terracon tested the sampling trains for leaks using vacuum shut-in testing methods. Additionally, the soil gas sampling probes were tested for leaks using a shroud filled with a helium tracer gas. Approximately three 1,000 to 2,000-millimeters (ml) volumes were purged from each soil gas probe through the sample train tubing prior to sample collection. Purged volumes were tested for the presence of helium with a field helium meter (MGD-2002) to confirm the integrity of the probes and sampling train fittings, and screened using a PID to indicate the presence of VOCs. The results of the vacuum shut-in and helium shroud leak tests did not indicate the presence of leaks.

Laboratory-supplied batch-certified 1-liter Summa® canisters provided by Eurofins Environment Testing Air Toxics (Eurofins Air Toxics) were used for sampling on March 7 and March 14, 2024. The canisters were connected to the sampling probes using dedicated Teflon® lined sample tubing and were equipped with laboratory-supplied flow regulators allowing for sample collection at a low-flow rate (i.e., <200 ml/min). Samples logs and photos taken during the soil gas sampling activities are in Appendix A.

Upon completion of sample collection, Terracon closed, secured, and appropriately labeled each Summa® canister with pertinent sample information. Canister pressures were recorded upon initiation of sample collection, after sample collection, and upon receipt at the laboratory. The sample containers were transported under chain-of-custody control to Eurofins Air Toxics located in Folsom, California for analysis of VOCs via USEPA Method TO-15 on a standard turnaround time basis.

2.4.2 Groundwater Sample

Terracon purged and sampled the monitoring well in general accordance with the monitoring program outlined in the UFP-QAPP Work Plan (Northwind and Terracon, 2024). Prior to sample collection, Terracon recorded the depth to groundwater measurement in monitoring well MW-142. Terracon purged and sampled the monitoring well using low-flow sampling techniques coupled with a submersible pump and disposal polyethylene hand bailer. Additionally, water quality parameters were collected for pH, dissolved oxygen (DO), conductivity, temperature, and oxidation-reduction potential (ORP) during purging, and the sample was collected after pH and conductivity stabilized. The groundwater sample log for MW-142 is in Appendix B. Terracon collected the groundwater directly into the laboratory supplied and preserved bottleware, which were labeled and placed on ice in a cooler. The samples were shipped under chain-of-custody control to Eurofins Environment Testing in Savannah, Georgia for analysis of VOCs via USEPA Method 8260D.

2.5 Decontamination Methods

The borehole advancement tools, and non-dedicated boring equipment were cleaned using a high-pressure washer prior to each boring. Sampling equipment such as water-level meters and submersible pumps, were decontaminated using a wash solution of Liquinox™, distilled water, and a disposable paper towels. The sampling equipment was then rinsed with distilled water. Decontamination was performed on plastic decontamination pads and in buckets and decontamination liquid was disposed of in 55-gallon drums.

2.6 Elevation Survey

Terracon subcontracted with Borum & Wade to collect horizontal coordinates and vertical elevation data for soil gas probes SV-13, SV-14, SV-15, and SV-16 and monitoring well MW--142. Borum & Wade completed the location and elevation survey using a total station

survey meter referenced to North American Vertical Datum of 1988 (NAVD-88) and North American Horizontal Datum of 1983 with 2011 adjustments (NAD 83/2011). Appendix C includes survey data provided by Borum & Wade, which includes top-of-casing (TOC) elevations for the selected locations.

3.0 Summary of Results and Findings

Analytical results for the soil gas samples and the groundwater sample are in Tables 3 and 4, respectively. The soil gas analytical results were compared to the NCDEQ-DWM Residential and Non-Residential Vapor Intrusion Soil Gas Screening Levels (SGSLs) and entered into the February 2024 version of the NCDEQ Risk Calculator to evaluate the risks for the soil gas to indoor-air exposure pathway for hypothetical residents and non-residential workers (NCDEQ, 2024a and 2024b). Groundwater samples were compared to the 15A North Carolina Administrative Code 02L Groundwater Quality Standards (2L Standards) (NCDEQ, 2022). Groundwater results were entered into the February 2024 version of the NCDEQ Risk Calculator to evaluate the risks for the groundwater to indoor-air exposure pathway for residents and non-residential workers (NCDEQ, 2024b).

3.1 Summary of Results for the Soil Gas Samples

Soil gas sample results indicated several constituents above laboratory detection limits and above the residential and/or non-residential SGSLs. A summary of the soil gas analytical results is in Table 3. The COCs that exceeded the non-residential SGSLs included:

- Tetrachloroethene (PCE) was detected in the western probe (SV-13) at 3,800 micrograms per cubic meter (µg/m^3), greater than the Non-Residential SGSL of 3,500 µg/m^3.
- Trichloroethene (TCE) was detected in the western probe (SV-13) at 390 µg/m^3, greater than the Non-Residential SGSL of 180 µg/m^3.
- Vinyl chloride was detected in the eastern probe (SV-15) at 400 µg/m^3, greater than the Non-Residential SGSL of 280 µg/m^3.

Residential SGSLs that were exceeded included:

- Benzene and TCE in the eastern (SV-15) and southern (SV-16) probes.
- Cis-1,2-dichloroethene (cis-1,2-DCE) in the eastern probe (SV-15).

A copy of the laboratory analytical reports and chain-of-custody records are in Appendix D.

3.2 Monitoring Well Results

3.2.1 Depth to Water Measurements

Depth-to-water measurement, TOC elevation, and groundwater elevation data for monitoring well MW-142 are in Table 2. Terracon converted the depth-to-water

measurements to groundwater elevations by subtracting the depth to water from the TOC elevation data, which was surveyed relative to the NAVD-88.

3.2.2 Summary of Results from Groundwater Samples

A summary of the groundwater results is in Table 4. The analytical results for the groundwater sample collected from bedrock monitoring well MW-142 indicated six VOCs were detected above the laboratory detection limits. The following constituents were detected at concentrations that exceeded the 2L Standards:

- TCE was detected at a concentration of 130 micrograms per liter (µg/L), greater than the 2L Standard of 3 µg/L.
- PCE was detected at a concentration of 3 µg/L, greater than the 2L Standard 0.7 µg/L.
- Bromodichloromethane was detected at a concentration of 0.68 µg/L, greater than the 2L Standard of 0.6 µg/L.

A copy of the laboratory analytical report and chain-of-custody record are in Appendix D.

Terracon compared the COC concentrations detected in MW-142 to the groundwater data collected from monitoring well samples collected in 2022 northwest of the TAMP site to help further define the western extents of chemicals in groundwater. During the RI activities conducted in 2022 (Northwind and Terracon, 2023), a groundwater sample collected from a monitoring well west adjacent to the former Lucent Technologies building (MW-139) indicated high concentrations of chlorinated VOCs, specifically PCE and TCE, which are inconsistent with the groundwater data collected from MW-142, east of the former Lucent Technologies building. The results are summarized below for comparison purposes:

Sample Locations	PCE (µg/L)	TCE (µg/L)	Cis-1,2-DCE µg/L)
MW-142 (eastern, hydraulically upgradient side of the Lucent Building) from May 2024	3.0	130	1.8
MW-139 (western, hydraulically downgradient side of the Lucent Building) from August 2022	77	260	87
Concentration Ratios for COCs Detected in MW-139 (Downgradient Well) versus MW-142 (Upgradient Well):	26 times	2 times	48 times

Therefore, the concentrations of PCE; TCE; and cis-1,2-DCE detected in the sample from MW-139 (i.e., the downgradient well) were at much greater concentrations than in MW-142 (i.e., the upgradient well). Also, a disparity exists between the concentration differences for TCE, and for PCE/cis-1,2-DCE. These concentration ratios indicate differing sources for the COCs in the samples from MW-139 and from MW-142.

The concentrations detected within the groundwater samples correlated with those detected in the soil gas probes at locations east (SV-15) and west (SV-13) of the former Lucent Technologies building. Of the four newly installed soil gas probes, the western probe (SV 13) adjacent to MW-139, had the greatest TCE and PCE concentrations whereas the eastern probe (SV-15) had significantly lower TCE concentrations. This is a secondary line of evidence that the concentrations in these wells may originate from different sources.

TCE is a degradation daughter product of PCE, and is also more volatile than PCE. Therefore, the greater PCE concentrations in SV-13 as well as a greater ratio of PCE in groundwater west of the former Lucent Technologies building may suggest the existence of an additional source area. As stated in the RI Report (Northwind and Terracon, 2023), potential off-site sources contributing to the groundwater impacts might be the result of:

- Former Lucent Technologies facility at 201 N. Cobb Avenue (Parcel 139443)
- Former Elder Hosiery Mills at 139 Homewood Avenue (Parcel 139434)
- Former dry cleaning city directory sites at 119 N. Cobb Avenue (Parcel 139441) and 1846 N. Church Street (Parcel 139750)
- Other potential off-site sources

3.3 NCDEQ Risk Calculator Results

Terracon utilized the February 2024 versions of the NCDEQ Risk Calculator to evaluate the potential risks for the groundwater to indoor air and soil gas to indoor air exposure pathways for residents and non-residential workers. The four soil gas points surrounding the former Lucent Technologies building and monitoring well MW-142 were managed as an individual exposure unit. The greatest concentration of each detected analyte within the exposure unit was included in the NCDEQ Risk Calculator evaluation. The NCDEQ Risk Calculator summary sheets for the March soil gas sampling event and May 2024 groundwater sampling event are in Appendix E. The table below summarizes the calculated health-risk values for the groundwater to indoor air and soil gas to indoor air pathways for hypothetical residential and non-residential workers.

NCDEQ Risk Calculator Results			May 2024
Groundwater to Indoor Air	Residential	Carcinogenic Risk	$1.2x10^{-4}$
		Hazard Index	25
	Non-Residential	Carcinogenic Risk	$2.0x10^{-5}$
		Hazard Index	6.0
Soil Gas to Indoor Air	Residential	Carcinogenic Risk	$1.1x10^{-4}$
		Hazard Index	9.6
	Non-Residential	Carcinogenic Risk	$3.8x10^{-6}$
		Hazard Index	0.76

Red values exceeded the carcinogenic risk (10^{-4}) or the hazard index (greater than or equal to 1).

Note: These values would be greater if the sample results from August 2022 for monitoring well MW-139 (i.e., located west and hydraulically downgradient of the Lucent Building) were used in the NCDEQ Risk Calculator evaluation, in lieu of the May 2024 sample results for monitoring well MW-142.

3.4 Data Validation Results

Terracon reviewed and validated the analytical data collected during this data gap assessment in accordance with the Tarheel Army Missile Plant UFP-QAPP Work Plan (Northwind and Terracon, 2024), guidance from DoD Data Validation Guidelines, and analytical method requirements. Qualified data are presented in the analytical results tables (Tables 3 and 4). The individual review narratives for each of the data packages and a summary of the PARCC parameters are in Appendix F for each matrix. The sample analytical results were considered usable as qualified based on our review of the data for the PARCC parameters and sensitivity.

4.0 Conclusions and Recommendations

4.1 Summary of Conclusions

The following summarizes the findings from the data gap assessment activities conducted in 2024:

- Vapor intrusion poses a potential risk to indoor air at the former Lucent Technologies building.
- The PCE; TCE; and cis-1,2-DCE concentrations in groundwater and soil gas are greater on the western side of the Lucent Technologies building as compared to the east side of the building.
- One or more secondary source areas might exist that could be contributing to the concentrations in monitoring well MW-139 located west of and hydraulically downgradient from the former Lucent Technologies building.

4.2 Summary of Recommendations

The recommendations from this work are consistent with the monitoring plan detailed in the UFP-QAPP Work Plan Worksheet #14/16 (Northwind and Terracon, 2024). The results from this investigation and from the additional samples planned based on the monitoring plan will be considered in a future Feasibility Study. UFP-QAPP Work Plan Worksheet #17 Area of Interest AOI-03 and AOI-04 recommends the collection of soil gas samples from the four soil gas probes. Per the UFP-QAPP Work Plan, the soil gas sampling should be conducted twice, approximately 6 months apart. Soil gas sampling should be conducted in August 2024, which is 6 months after the sampling event conducted in March 2024. Samples will be collected for analysis of VOCs using USEPA Method TO-15.

Depending on the results of these samples, NCDEQ Inactive Hazardous Sites Branch, or other entities should consider the investigation of other potential off-site sources from the TAMP facility to evaluate their contribution to the groundwater impacts. As stated in the RI Report (Northwind and Terracon, 2023), potential off-site sources that may be contributing to the groundwater impacts in this area of the site might include:

- Former Lucent Technologies facility at 201 N. Cobb Avenue (Parcel 139443)
- Former Elder Hosiery Mills at 139 Homewood Avenue (Parcel 139434)
- Former dry cleaning city directory sites at 119 N. Cobb Avenue (Parcel 139441) and 1846 N. Church Street (Parcel 139750)

- Other potential off-site sources

This investigation may include the installation of additional groundwater monitoring wells and/or a soil gas survey to map potential migration pathway(s) for groundwater based on VOCs degassing into soil gas.

5.0 References

Interstate Technology Regulatory Council (ITRC), 2007, Vapor Intrusion Pathway: A Practical Guidance, ITRC Vapor Intrusion Team, January.

North Carolina Department of Environmental Quality (NCDEQ), 2018, Vapor Intrusion Guidance, Division of Waste Management. Version 2. March.

NCDEQ, 2022, Section:15A North Carolina Administrative Code (NCAC) – 02L .00202: Groundwater Quality Standards Rule. April 1.

NCDEQ, 2024a, NCDEQ Risk Calculator User Guide. February.

NCDEQ, 2024b, Risk Calculator. Found at: https://deq.nc.gov/permits-rules/risk-based-remediation/risk-evaluation-resources. February.

Northwind Jacobs JV and Terracon Consultants, Inc. (Terracon), 2023, Final Remedial Investigation Report, Tarheel Army Missile Plant, Burlington, NC, May 22.

Northwind Jacobs JV and Terracon, 2024, Work Plan UFP-QAPP, Draft Interim Remedial Action for Tarheel Army Missile Plant, Burlington, NC, Contract Number: W912HN18D1006, Task Order Number: W912HN23F1012., January.

Tables

Table 1 - Soil Gas Point Construction Information

Location ID	Installation Date	Latitude (DD)	Longitude (DD)	Surface Elevation (ft msl)	Screen Interval (ft bls)
SV-13	2/29/2024	36.09822330	-79.41064650	580.34	4.5 - 5
SV-14	2/29/2024	36.09852700	-79.41012020	589.89	3.5 - 4
SV-15	3/5/2024	36.09826120	-79.40963200	603.68	5.5 - 6
SV-16	3/12/2024	36.09795960	-79.40993640	593.97	3.5 - 4

Notes:
From survey data, horizontal coordinates were referenced to NAD 83 \ 2011 and vertical elevation is referenced to NAVD-88.
DD: Decimal Degrees / Coordinates were converted to decimal degree from North Carolina State Plane
ft msl: feet above mean sea level
ft bls: feet below land surface

Table 2 - Well Construction Details and Depth to Groundwater Measurements

								Measurement Date	5/8/2024
Well ID	Installation Date	Latitude (DD)	Longitude (DD)	Top of Casing Elevation (ft msl)	Outer 6-inch PVC Casing Interval (ft bls)	Screen Interval (ft bls)	Depth of Well (ft bls)	Depth to Water (ft bls)	Groundwater Elevation (ft msl)
MW-142	3/12/2024	36.09838650	-79.40947130	603.54	0 - 35	40 - 50	50	45.66	557.88

Notes:
From survey data, horizontal coordinates were referenced to NAD 83 \ 2011 and vertical elevation is referenced to NAVD-88.
DD: Decimal Degrees / Coordinates were converted to decimal degree from North Carolina State Plane
ft msl: feet above mean sea level
ft bls: feet below land surface

Table 3 - Soil Gas Analytical Results

Analyte	Unit	NONRES SGSL	RES SGSL	Location: SV-13	SV-13	SV-14	SV-15	SV-16
				Sample Name: SV-13	DUP_SV_20240307	SV-14	SV-15	SV-16
				Date: 3/7/2024	3/7/2024	3/7/2024	3/7/2024	3/14/2024
Volatile Organic Compounds via USEPA Method TO-15								
1,1,1-Trichloroethane	µg/m^3	440000	35000	16	16	< 5.8	< 10	< 6.7
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m^3	440000	35000	340	340	63	< 14	< 9.4
1,1-Dichloroethene	µg/m^3	18000	1400	< 10	< 10	< 4.2	18	< 4.8
1,2,4-Trimethylbenzene	µg/m^3	5300	420	< 12	< 13	< 5.2	9.0 J	83
1,3,5-Trimethylbenzene	µg/m^3	5300	420	< 12	< 13	< 5.3	< 9.1	27
Acetone	µg/m^3	NE	NE	< 61	< 62	< 25	92	76
Benzene	µg/m^3	160	12	< 8.2	< 8.3	< 3.4	34	21
Carbon Disulfide	µg/m^3	61000	4900	< 32	< 32	< 13	< 23	48
Cis-1,2-Dichloroethene	µg/m^3	3500	280	< 10	< 10	< 4.2	1300	< 4.8
Cyclohexane	µg/m^3	530000	42000	< 8.8	< 8.9	< 3.7	58	11
Ethanol	µg/m^3	NE	NE	< 48	51	< 20	< 35	< 23
Ethylbenzene	µg/m^3	490	37	< 11	< 11	< 4.6	< 8	27
Hexane	µg/m^3	61000	4900	< 9	< 9.2	< 3.8	40	54
Isooctane	µg/m^3	NE	NE	< 12	< 12	< 5	190	18
m,p-Xylenes	µg/m^3	8800	700	< 22	< 22	< 9.3	19	110
n-Heptane	µg/m^3	35000	2800	< 10	< 11	< 4.4	26	38
n-Propylbenzene	µg/m^3	88000	7000	< 12	< 13	< 5.3	< 9.1	13
o-Xylene	µg/m^3	8800	700	< 11	< 11	< 4.6	< 8	27
p-Ethyltoluene	µg/m^3	NE	NE	< 12	< 13	< 5.3	< 9.1	55 J+
Tetrachloroethene	µg/m^3	3500	280	3800	3700	210	< 12	< 8.3
Tetrahydrofuran	µg/m^3	180000	14000	< 7.5	< 7.7	< 3.2	72	< 3.6
Toluene	µg/m^3	440000	35000	< 19	< 20	< 8.1	26	110
Trans-1,2-Dichloroethene	µg/m^3	3500	280	< 10	< 10	< 4.2	93	< 4.8
Trichloroethene	µg/m^3	180	14	390	390	< 5.8	140	130
Trichlorofluoromethane	µg/m^3	NE	NE	22	21	38	< 10	< 6.9
Vinyl Chloride	µg/m^3	280	5.6	< 6.5	< 6.6	< 2.7	400	< 3.1

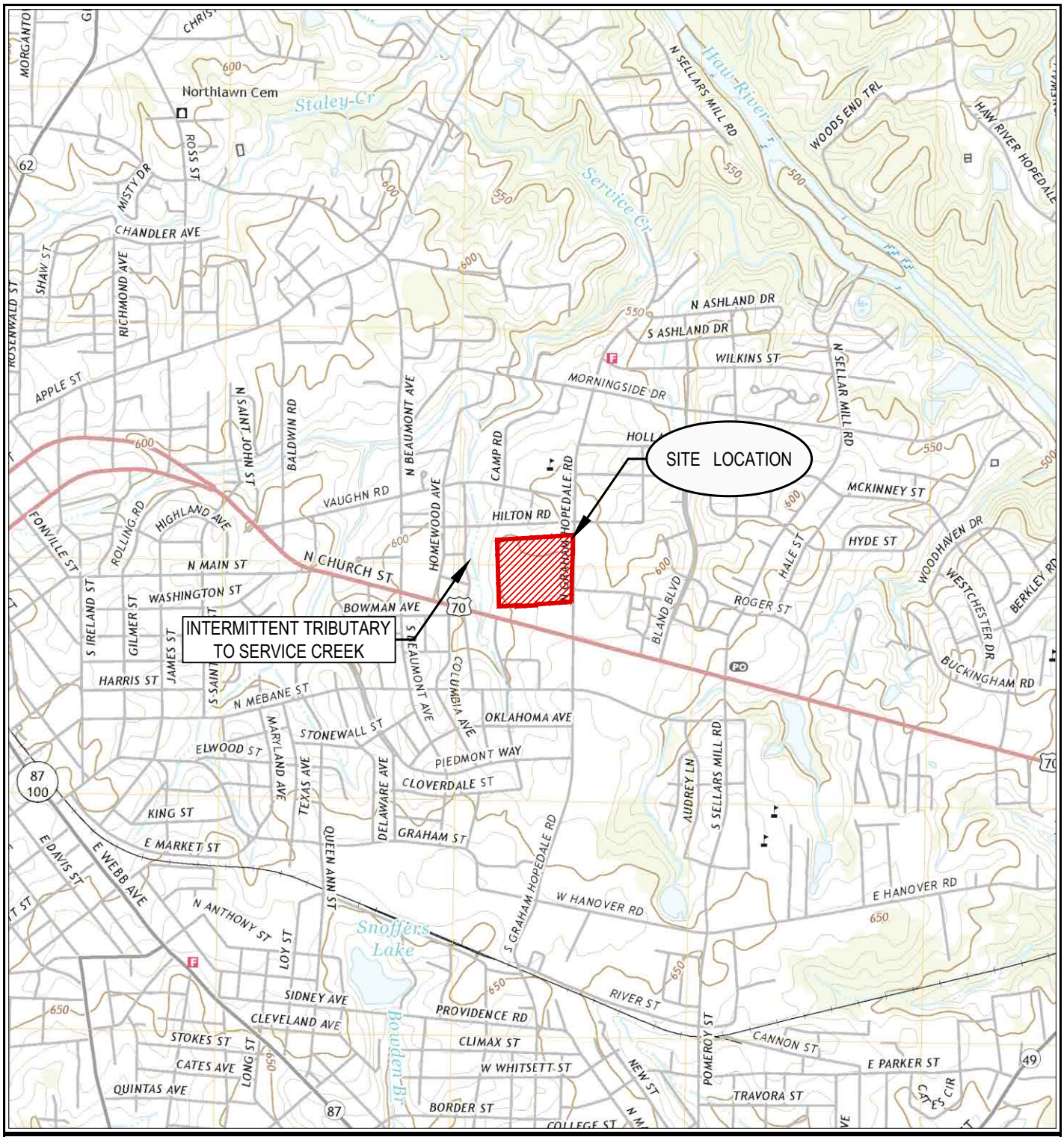
Notes:
Analytes detected in one or more samples are shown in the table. See the laboratory analytical report for full list of analytes.
SV denotes soil vapor sample location point.
NONRES SGSL: North Carolina Department of Environmental Quality Division of Waste Management Non-Residential Vapor Intrusion Soil Gas Screening Levels
RES SGSL: North Carolina Department of Environmental Quality Division of Waste Management Residential Vapor Intrusion Soil Gas Screening Levels
USEPA: United States Environmental Protection Agency
µg/m^3: micrograms per cubic meter
Values in Bold were detected above the laboratory method detection limit.
Shaded detections exceed the applicable screening level.
<: Not detected above laboratory reporting limit.
NE: Not Established
J+: The identification of the analyte is acceptable; the reported value is an estimate with a potential high bias.

Table 4 - Groundwater Analytical Results

		Location:	MW-142
		Date:	5/8/2024
Analyte	Unit	NCAC-2L	
FIELD MEASURE			
Conductivity	µmhos/cm		334.5
Dissolved Oxygen	mg/l		4.85
Oxidation-Reduction Potential	mV		-25.6
pH	SU		7.24
Temperature	C		21.1
Turbidity	NTU		
Volatile Organic Compounds by USEPA Method 8260D			
1,1-Dichloroethene	µg/l	3501	2.4
Bromodichloromethane	µg/l	0.6	0.68 J
Chloroform	µg/l	70	8.1
Cis-1,2-Dichloroethene	µg/l	70	1.8 J
Tetrachloroethene	µg/l	0.7	3.0
Trichloroethene	µg/l	3	130

Notes:
Analytes detected are shown in the table. See the laboratory analytical report for full list of analytes.
NCAC-2L: North Carolina Department of Environmental Quality 15A NCAC 02L .0202 Groundwater Quality Standards
µmhos/cm: micromhos per centimeter
mg/l: milligrams per liter
mV: millivolts
SU: Standard Units
C: Degrees Celsius
USEPA: United States Environmental Protection Agency
µg/l: micrograms per liter
Values in Bold were detected above the laboratory method detection limit.
J: The identification of the analyte is acceptable; the reported value is an estimate.
Shaded detections exceed the applicable screening level.

Figures



QUADRANGLE LOCATION

Scale 1:24000

0 1/2 1 MILE

1000 0 1000 2000 3000 FEET

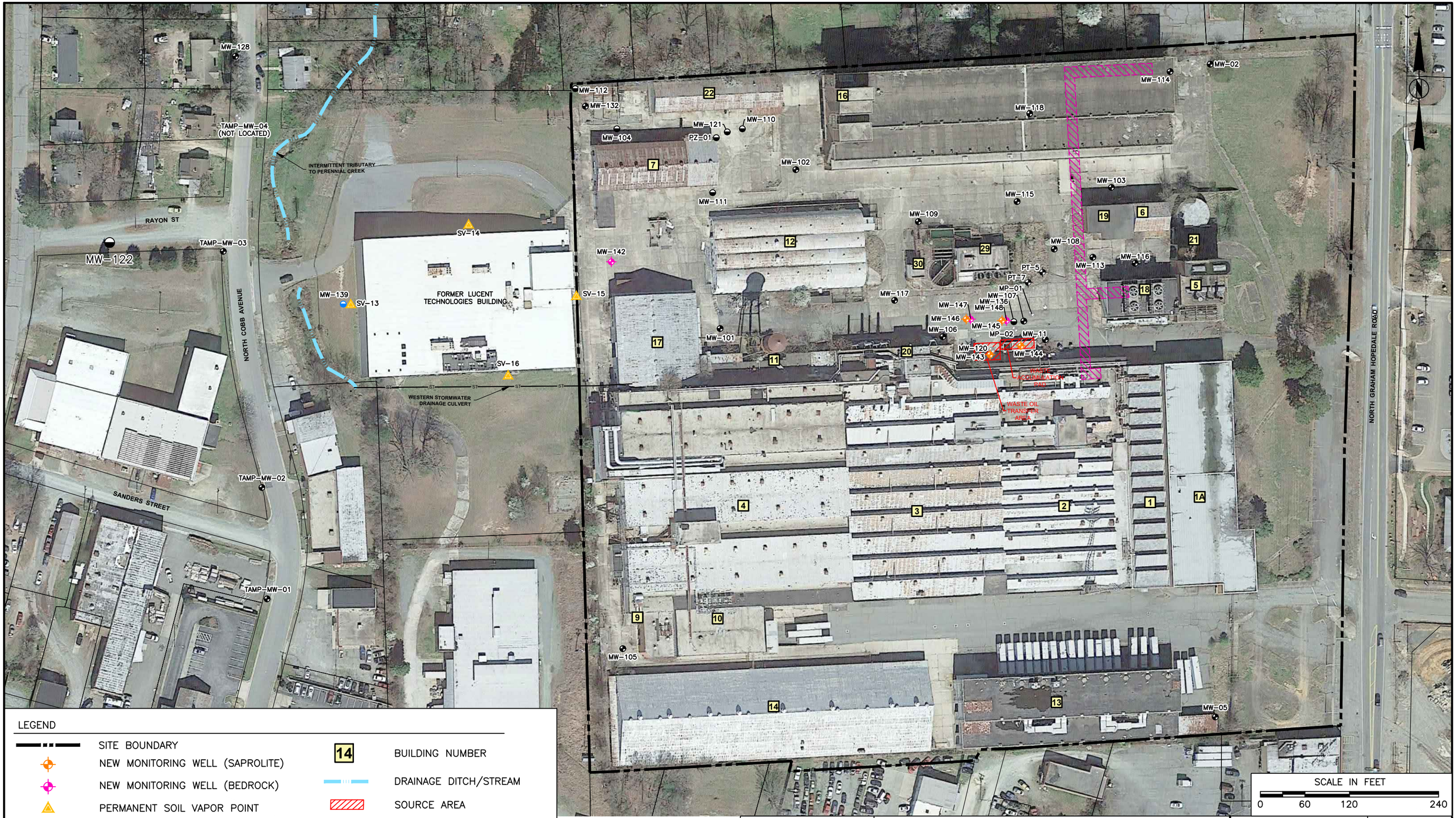
(SOURCE OF MAP IS USGS 7.5 MINUTE QUADRANGLE MAP, BURLINGTON (2019), NORTH CAROLINA)

CHECK BY	DRM
DRAWN BY	OS
DATE	7-5-24
SCALE	AS SHOWN
CAD NO.	70237017A
PRJ NO.	70237017

SITE LOCATION MAP
DATA GAP ASSESSMENT
INTERIM REMEDIAL ACTION
TARHEEL ARMY MISSILE PLANT
204 N. GRAHAM-HOPEDALE ROAD
BURLINGTON, ALMANCE COUNTY, NORTH CAROLINA

Terracon

FIGURE
1



LEGEND

- SITE BOUNDARY
- NEW MONITORING WELL (SAPROLITE)
- NEW MONITORING WELL (BEDROCK)
- PERMANENT SOIL VAPOR POINT
- MONITORING WELL (SAPROLITE)
- MONITORING WELL ASSUMED TO BE SAPROLITE
- MONITORING WELL (BEDROCK)
- MONITORING WELL (ABANDONED, DESTROYED, NOT LOCATED)
- 14 BUILDING NUMBER
- DRAINAGE DITCH/STREAM
- SOURCE AREA
- TUNNELS
- ST STORMWATER PIPE

SCALE IN FEET

0 60 120 240

CHECK BY	ECD
DRAWN BY	OS
DATE	7-5-24
SCALE	AS SHOWN
CAD NO.	70237017B
PRJ NO.	70237017

SITE DIAGRAM
DATA GAP ASSESSMENT
INTERIM REMEDIAL ACTION
TARHEEL ARMY MISSLE PLANT
204 N. GRAHAM-HOPEDALE ROAD
BURLINGTON, ALAMANCE COUNTY, NORTH CAROLINA

Terracon
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NC 27604
PHONE: (919) 873-2211

FIGURE 2

SV-14	3/7/2024
Analyte	Result (ug/m3)
1,1,2-Trichloro-1,2,2-trifluoroethane	63
Tetrachloroethene	210
Trichlorofluoromethane	22

SV-13	3/7/2024	DUP
Analyte	Result (ug/m3)	Result (ug/m3)
1,1,1-Trichloroethane	16	16
1,1,2-Trichloro-1,2,2-trifluoroethane	340	340
Ethanol	< 48 U	51
Tetrachloroethene	3800	3700
Trichloroethene	390	390
Trichlorofluoromethane	22	21

SV-16	3/14/2024
Analyte	Result (ug/m3)
1,2,4-Trimethylbenzene	83
1,3,5-Trimethylbenzene	27
Acetone	76
Benzene	21
Carbon Disulfide	48
Cyclohexane	11
Ethylbenzene	27
Hexane	54
Isooctane	18
m,p-Xylenes	110
n-Heptane	38
n-Propylbenzene	13
O-Xylene	27
Toluene	110
Trichloroethene	130

MW-142	5/8/2024
Analyte	Result (ug/L)
1,1-Dichloroethene	2.4
Bromodichloromethane	0.68 J
Chloroform	8.1
Cis-1,2-Dichloroethene	1.8 J
Tetrachloroethene	3.0
Trichloroethene	130

SV-15	3/7/2024
Analyte	Result (ug/m3)
1,1-Dichloroethene	18
1,2,4-Trimethylbenzene	9.0 J
Acetone	92
Benzene	34
Cis-1,2-Dichloroethene	1300
Cyclohexane	58
Hexane	40
Isooctane	190
m,p-Xylenes	19
n-Heptane	26
Tetrahydrofuran	72
Toluene	26
Trans-1,2-Dichloroethene	93
Trichloroethene	140
Vinyl Chloride	400

SCALE IN FEET
0 30 60 120

LEGEND

- SITE BOUNDARY
- NEW MONITORING WELL (SAPROLITE)
- NEW MONITORING WELL (BEDROCK)
- PERMANENT SOIL VAPOR POINT
- MONITORING WELL (SAPROLITE)
- MONITORING WELL ASSUMED TO BE SAPROLITE
- MONITORING WELL (BEDROCK)
- MONITORING WELL (ABANDONED, DESTROYED, NOT LOCATED)
- 14 BUILDING NUMBER
- DRAINAGE DITCH/STREAM
- SOURCE AREA
- TUNNELS
- J THE REPORTED VALUE IS AN ESTIMATE LESS THAN THE LABORATORY REPORTING LIMIT.
- EXCEEDS RESIDENTIAL SOIL GAS SCREENING LEVEL
- EXCEEDS NON–RESIDENTIAL SOIL GAS SCREENING LEVEL

CHECK BY	ECD
DRAWN BY	OS
DATE	7–9–24
SCALE	AS SHOWN
CAD NO.	70237017B
PRJ NO.	70237017

SOIL GAS AND GROUNDWATER DATA GAP ANALYTICAL RESULTS
DATA GAP ASSESSMENT
INTERIM REMEDIAL ACTION
TARHEEL ARMY MISSLE PLANT
204 N. GRAHAM–HOPEDALE ROAD
BURLINGTON, ALAMANCE COUNTY, NORTH CAROLINA

Terracon
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NC 27604
PHONE: (919) 873–2211

FIGURE
3

Appendix A
Soil Gas Point Boring Logs, Sample Logs and Photo Log

WELL LOG NO. SV-13

PROJECT: Tarheel Army Missile Plant

CLIENT: USACE - Savannah District
Savannah, GA

SITE: 204 N. Graham-Hopedale Rd
Burlington, North Carolina

DEPTH	MATERIAL DESCRIPTION	INSTALLATION DETAILS	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
0.5	**SANDY SILT (ML)**, dark brown and gray, odor and staining not observed, moist	Well Completion: Surface Mount					
4.0	**CLAY (CL)**, with gravel, reddish orange, odor and staining not observed, moist						<0.1
						72	<0.1
6.0	**SILTY CLAY (CL)**, dark brown, odor and staining not observed, saturated		5				<0.1
	Boring Terminated at 6 Feet						

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
DPT

Abandonment Method:

Notes:
SV-13 installed as permanent flush-mount soil vapor point on 2/29/2024.

WATER LEVEL OBSERVATIONS

Terracon
2401 Brentwood Rd Ste 107
Raleigh, NC

Well Started: 02-29-2024
Well Completed: 02-29-2024
Drill Rig: Geoprobe 7822
Driller: SAEDACCO
Project No.: 70237017

WELL LOG NO. SV-14

PROJECT: Tarheel Army Missile Plant

CLIENT: USACE - Savannah District
Savannah, GA

SITE: 204 N. Graham-Hopedale Rd
Burlington, North Carolina

LOCATION See Figure 2

INSTALLATION DETAILS

Well Completion:
Surface Mount

GRAPHIC LOG	DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
		SANDY SILT (ML), dark brown and gray, odor and staining not observed, moist					
	0.5	**CLAY (CL)**, with gravel, reddish orange, odor and staining not observed, moist					<0.1
						66	<0.1
	5.0						<0.1
		SILTY CLAY (CL), dark brown, odor and staining not observed, saturated	5				
	5.5	***Boring Terminated at 5.5 Feet***					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
DPT

Abandonment Method:

Notes:
SV-14 installed as permanent flush-mount soil vapor point on 2/29/2024.

WATER LEVEL OBSERVATIONS

Terracon
2401 Brentwood Rd Ste 107
Raleigh, NC

Well Started: 02-29-2024
Well Completed: 02-29-2024
Drill Rig: Geoprobe 7822
Driller: SAEDACCO
Project No.: 70237017

WELL LOG NO. SV-15

PROJECT: Tarheel Army Missile Plant

CLIENT: USACE - Savannah District
Savannah, GA

SITE: 204 N. Graham-Hopedale Rd
Burlington, North Carolina

DEPTH	MATERIAL DESCRIPTION	INSTALLATION DETAILS	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
	LOCATION See Figure 2	Well Completion: Surface Mount					
	CONCRETE						<0.1
3.0	**SANDY CLAY (CL)**, light brown, odor and staining not observed, moist					24	<0.1
			5				<0.1
						60	<0.1
10.0	**CLAY (CL)**, with sand, light brown and tan, odor and staining not observed, saturated		10				<0.1
12.0	***Boring Terminated at 12 Feet***						

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
DPT/Hand Auger

Abandonment Method:

Notes:

SV-15 was originally installed as permanent flush-mount soil vapor point on 2/29/2024 at a depth of 9 feet below land surface (bls).

Due to lack of air flow at 9 feet bls, SV-15 was re-installed via hand auger on 3/5/2024 at a depth of 6 feet bls.

WATER LEVEL OBSERVATIONS

Terracon
2401 Brentwood Rd Ste 107
Raleigh, NC

Well Started: 02-29-2024 | Well Completed: 03-05-2024

Drill Rig: Geoprobe 7822 | Driller: SAEDACCO/Terracon

Project No.: 70237017

WELL LOG NO. SV-16

PROJECT: Tarheel Army Missile Plant

CLIENT: USACE - Savannah District
Savannah, GA

SITE: 204 N. Graham-Hopedale Rd
Burlington, North Carolina

GRAPHIC LOG	DEPTH	MATERIAL DESCRIPTION	INSTALLATION DETAILS	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)
		LOCATION See Figure 2	Well Completion: Surface Mount					
		SANDY CLAY (CL), dark brown and gray, odor and staining not observed, moist						
	1.0							<0.1
		CLAY (CL), with gravel, reddish orange, odor and staining not observed, moist to saturated at 4 feet bls					60	<0.1
	5.0							<0.1
		Boring Terminated at 5 Feet		5				

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Hand Auger

Abandonment Method:

Notes:

SV-16 was originally installed as permanent flush-mount soil vapor point on 2/29/2024 at a depth of 5 feet below land surface (bls).

Due to water observed in the point on 3/7/2024, SV-16 was re-installed on 3/12/2024 at a depth of 4 feet bls.

WATER LEVEL OBSERVATIONS

Terracon
2401 Brentwood Rd Ste 107
Raleigh, NC

Well Started: 02-29-2024	Well Completed: 03-12-2024
Drill Rig: Hand Auger	Driller: SAEDACCO/Terracon
Project No.: 70237017	

Soil Vapor Tracer Test & Sampling

Sample ID: SV-13
Project : TAMP
Site Location: Burlington, NC
Field Personnel: Ethan Dinwiddie
Date: 03/07/24
Weather: Sunny, 70s F
Canister Size: 1-liter
Sample Rate: <200 mL/min
Analysis: TO-15

Terracon
2401 Brentwood Road Suite 107
Raleigh, NC 27604
919.873.2211

Parent / Duplicate
Canister No.: 2864 / 40886
Flow Controller No.: 26569

HELIUM TRACER TEST

	Purge #1	Purge #2	Purge #3
Start Shroud He %:	30	26.5	25.4
Purge Start Time:	16:38	16:35	16:45
Volume Purged (mL):	2000	2000	2000
End Shroud He %:	28.7	26.1	23.8
He in Soil Gas (ppm):	<25	<25	<25
PID Ambient Air (ppm):	<0.1	<0.1	<0.1
PID SV Point (ppm):	0.3	0.3	0.5

Note: 1% = 10,000 ppm

SAMPLE COLLECTION

Time		Vacuum (in Hg)
Start:	16:53	-27
	16:54	-24
	16:55	-22
	16:56	-18
	16:57	-16
	16:58	-13
Stop:	17:02	-6

VOLUME CALCULATION

Diameter	Gallons/ft	Liters/ft	mL or cc/ft
3	0.3672	1.39	1390
2	0.1632	0.618	617.8
1	0.04080	0.154	154.4
3/4	0.02295	0.0869	86.9
5/8	0.01594	0.0603	60.3
1/2	0.01020	0.0386	38.6
3/8	0.00574	0.0217	21.7
1/4	0.00255	0.00965	9.65

Assumed porosity: sand pack= 0.4, dry bentonite=0.5

Soil Vapor Tracer Test & Sampling

Sample ID: SV-14
Project : TAMP
Site Location: Burlington, NC
Field Personnel: Ethan Dinwiddie
Date: 03/07/24
Weather: Cloudy, 60s F
Canister Size: 1-liter
Sample Rate: <200 mL/min
Analysis: TO-15

Terracon
2401 Brentwood Road Suite 107
Raleigh, NC 27604
919.873.2211

Canister No.: 2656
Flow Controller No.: 26468

HELIUM TRACER TEST

	Purge #1	Purge #2	Purge #3
Start Shroud He %:	13.7	15	13.6
Purge Start Time:	14:50	15:00	15:10
Volume Purged (mL):	2000	2000	2000
End Shroud He %:	12.6	12.4	13.1
He in Soil Gas (ppm):	<25	<25	<25
PID Ambient Air (ppm):	<0.1	<0.1	<0.1
PID SV Point (ppm):	0.2	<0.1	<0.1

Note: 1% = 10,000 ppm

SAMPLE COLLECTION

Time		Vacuum (in Hg)
Start:	15:20	-27
	15:21	-22
	15:22	-17
	15:23	-13
	15:24	-9
Stop:	15:25	-6

VOLUME CALCULATION

Diameter	Gallons/ft	Liters/ft	mL or cc/ft
3	0.3672	1.39	1390
2	0.1632	0.618	617.8
1	0.04080	0.154	154.4
3/4	0.02295	0.0869	86.9
5/8	0.01594	0.0603	60.3
1/2	0.01020	0.0386	38.6
3/8	0.00574	0.0217	21.7
1/4	0.00255	0.00965	9.65

Assumed porosity: sand pack= 0.4, dry bentonite=0.5

Soil Vapor Tracer Test & Sampling

Sample ID: SV-15
Project : TAMP
Site Location: Burlington, NC
Field Personnel: Ethan Dinwiddie
Date: 03/07/24
Weather: Cloudy, 60s F
Canister Size: 1-liter
Sample Rate: <200 mL/min
Analysis: TO-15

Terracon
2401 Brentwood Road Suite 107
Raleigh, NC 27604
919.873.2211

Canister No.: 2655
Flow Controller No.: 26493

HELIUM TRACER TEST

	Purge #1	Purge #2	Purge #3
Start Shroud He %:	19.8	18.8	13.9
Purge Start Time:	17:21	17:26	17:30
Volume Purged (mL):	1000	1000	1000
End Shroud He %:	15.6	16	13.8
He in Soil Gas (ppm):	<25	<25	<25
PID Ambient Air (ppm):	<0.1	<0.1	<0.1
PID SV Point (ppm):	3.0	2.7	3.0

Note: 1% = 10,000 ppm

SAMPLE COLLECTION

Time		Vacuum (in Hg)
Start:	17:36	-27
	17:37	-24
	17:38	-18
	17:39	-14
	17:40	-10
Stop:	17:41	-6

VOLUME CALCULATION

Diameter	Gallons/ft	Liters/ft	mL or cc/ft
3	0.3672	1.39	1390
2	0.1632	0.618	617.8
1	0.04080	0.154	154.4
3/4	0.02295	0.0869	86.9
5/8	0.01594	0.0603	60.3
1/2	0.01020	0.0386	38.6
3/8	0.00574	0.0217	21.7
1/4	0.00255	0.00965	9.65

Assumed porosity: sand pack= 0.4, dry bentonite=0.5

Soil Vapor Tracer Test & Sampling

Sample ID: SV-16
Project : TAMP
Site Location: Burlington, NC
Field Personnel: Ethan Dinwiddie
Date: 03/14/24
Weather: Sunny, 70s F
Canister Size: 1-liter
Sample Rate: <200 mL/min
Analysis: TO-15

Terracon
2401 Brentwood Road Suite 107
Raleigh, NC 27604
919.873.2211

Canister No.: 4513
Flow Controller No.: 26237

HELIUM TRACER TEST

	Purge #1	Purge #2	Purge #3
Start Shroud He %:	15.3	22.2	19.6
Purge Start Time:	14:20	14:30	14:40
Volume Purged (mL):	2000	2000	2000
End Shroud He %:	12.4	11.6	12.3
He in Soil Gas (ppm):	<25	<25	<25
PID Ambient Air (ppm):	<0.1	<0.1	<0.1
PID SV Point (ppm):	0.4	0.2	0.2

Note: 1% = 10,000 ppm

SAMPLE COLLECTION

Time		Vacuum (in Hg)
Start:	14:50	-27
	14:51	-23
	14:52	-18
	14:53	-13
	14:54	-9
Stop:	14:55	-6

VOLUME CALCULATION

Diameter	Gallons/ft	Liters/ft	mL or cc/ft
3	0.3672	1.39	1390
2	0.1632	0.618	617.8
1	0.04080	0.154	154.4
3/4	0.02295	0.0869	86.9
5/8	0.01594	0.0603	60.3
1/2	0.01020	0.0386	38.6
3/8	0.00574	0.0217	21.7
1/4	0.00255	0.00965	9.65

Assumed porosity: sand pack= 0.4, dry bentonite=0.5

Photo 1 View of SV-13 and duplicate sample collection; facing northeast.

Photo 2 View of SV-14 and helium tracer test set up; facing southwest.

Photo 3 View of SV-15 and helium tracer test set up; facing west.

Photo 4 View of SV-16 sample collection following helium tracer test; facing west.

Photo 5 View of MW-142 drilling and installation; facing west.

Photo 6 View of the MW-142 following installation; facing north.

Appendix B
Monitoring Well Boring Log, Construction Record, and Sample Log

WELL LOG NO. MW-142

PROJECT: Tarheel Army Missile Plant

CLIENT: USACE - Savannah District
Savannah, GA

SITE: 204 N. Graham-Hopedale Rd
Burlington, North Carolina

DEPTH	MATERIAL DESCRIPTION
1.0	**CONCRETE**
	SILT (ML), with clay, dark brown and red, odor and staining not observed, dry
7.0	
	SILT (ML), with sand, brown and light red, odor and staining not observed, dry
12.0	
	SAND (SM), with silt, brown and tan, dry
22.0	
	PARTIALLY WEATHERED ROCK, brown and gray, (Parent material: metamorphosed granite), auger refusal at 29 feet bls
31.0	
	BEDROCK, (Metamorphosed granite)
50.0	
	Boring Terminated at 50 Feet

INSTALLATION DETAILS: Well Completion: Surface Mount

DEPTH (ft)	SPT N-VALUE	OVA/PID (ppm)
5	3-6-10-10	<0.1
10	7-10-19-14	0.5
15	10-14-17-18	0.2
20	7-13-14-20	0.1
25	8-50/3	<0.1
30	24-50/5	<0.1
	50/1	
35		
40		
45		
50		

WATER LEVEL OBSERVATIONS: ▽ at 45 ft

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
8.25-inch ID HSA/Air Rotary

Abandonment Method:

Notes:
feet bls: feet below land surface
MW-142 installed as Type III monitoring well with 6-inch outer casing from land surface to 35 feet bls.

WATER LEVEL OBSERVATIONS

▽ *Water level measured on 5/8/2024.*

Terracon
2401 Brentwood Rd Ste 107
Raleigh, NC

Well Started: 03-11-2024 | Well Completed: 03-12-2024

Drill Rig: Guspech Brute | Driller: SAEDACCO

Project No.: 70237017

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

John Eisenman
Well Contractor Name

4439
NC Well Contractor Certification Number

SAEDACCO
Company Name

2. Well Construction Permit #: WM0401509
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
- ☐ Agricultural
- ☐ Municipal/Public
- ☐ Geothermal (Heating/Cooling Supply)
- ☐ Residential Water Supply (single)
- ☐ Industrial/Commercial
- ☐ Residential Water Supply (shared)
- ☐ Irrigation

Non-Water Supply Well:
- ☒ Monitoring
- ☐ Recovery

Injection Well:
- ☐ Aquifer Recharge
- ☐ Groundwater Remediation
- ☐ Aquifer Storage and Recovery
- ☐ Salinity Barrier
- ☐ Aquifer Test
- ☐ Stormwater Drainage
- ☐ Experimental Technology
- ☐ Subsidence Control
- ☐ Geothermal (Closed Loop)
- ☐ Tracer
- ☐ Geothermal (Heating/Cooling Return)
- ☐ Other (explain under #21 Remarks)

4. Date Well(s) Completed: 3-12-24 **Well ID#** MW-142

5a. Well Location:

Former Tarheel Army Missile Plant — NC7210020544
Facility/Owner Name — Facility ID# (if applicable)

204 N. Graham Hopedale Rd., Burlington, NC, 27217
Physical Address, City, and Zip

Alamance — 139757
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

36.0983908 N 79.4094595 W

6. Is (are) the well(s): ☒ Permanent or ☐ Temporary

7. Is this a repair to an existing well: ☐ Yes or ☒ No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 50 (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)
If water level is above casing, use "+"

11. Borehole diameter: 12"/6" (in.)

12. Well construction method: HSA/AIR
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	35 ft.	6" in.	SCH-40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	40 ft.	2" in.	SCH-40	PVC
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
40 ft.	50 ft.	2" in.	.010	SCH-40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	34 ft.	Portland	pump
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
38 ft.	50 ft.	Sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

bentonite seal from 34-38'

22. Certification:

Signature of Certified Well Contractor — Date: 4/8/2024

By signing this form I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C Section .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Groundwater Sampling Log

Terracon

Site Name: TAMP
Project Number: 7023707
Site Location: Burlington, NC
Weather: SUNNY 75 °F

Well ID: MW - 142
Sample Date: 5/8/24
Sampler Initials: AM
Sample Time: 1635

GAUGING DATA

Gauging Date: 5/8/24
Screen Interval (ft bls): 40 - 50
Total Depth (ft bTOC): 50
Depth to water (ft bTOC): 45.66
Stick-up length (ft ags): —
Water column length (ft): 4.34
Well Volume: 0-7

200 mL/min x 5 min
1,000 mL

Well Diameter	Gal/ft	L/ft
6"	1.47	5.56
4"	0.653	2.47
2"	0.163	0.618
1"	0.041	0.154
¾"	0.023	0.087

Sample Method
- ■ Peristaltic
- ■ Bladder
- ■ Bailer
- ■ Grundfos
- ■ Monsoon
- ■ PDB

Purge Device
- ■ Dedicated
- ■ Disposable
- ■ Decontaminated

QA/QC Samples
- ■ Duplicate
- ■ MS/MSD
- ■ Equipment Blank

QA/QC Sample ID

FIELD PARAMETERS

Time	Purge Vol. (gal)	Temp (°C)	pH (SU)	DO (mg/L)	Cond. (µmhos/cm)	Turbidity (NTU)	ORP (mV)	Flow (ml/min)	Water Depth (ft bTOC)
1625	0.30	21.7	7.3	4.85	335.0		-25.1	200	45.65
1630	0.30	21.2	7.20	4.71	338.3		-19.2	200	
1635	0.30	21.1	7.24	4.85	334.5		-25.6	200	

LABORATORY ANALYSIS

Analytical Parameter	Method	Bottle Size/Type	No. Bottles	Preservative	Hold Time
VOCs	6200	40ml / VOA	3	HCL	14 days

Notes:

Signature: Emma Stenning Date: 5/08/24

Appendix C
Topographic Survey Data

PERMANT SOIL VAPOR POINTS

NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
32	854,905.440	1,878,671.214	580.34	MW-SV-13
30	855,015.417	1,878,835.175	589.89	MW-SV-14
28	854,918.061	1,878,978.985	603.68	MW-SV-15
33	854,808.638	1,878,888.607	593.97	MW-SV-16

HORIZONTAL NAD 83/ 2011
VERTICAL NAVD-88

BEDROCK WELL

NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION	
24	854,870.576	1,879,174.959	605.12	MW - # 101	(CHECK)
23	854,870.576	1,879,174.959	604.75	2" PVC TOP	(CHECK)
26	854,963.447	1,879,026.580	603.54	2" PVC TOP	(NEW)
25	854,963.447	1,879,026.580	603.92	MW - # 142	(NEW)

HORIZONTAL NAD 83/ 2011
VERTICAL NAVD-88

BWA Engineers Planners Surveyors
Borum, Wade and Associates, P.A.
621 Eugene Court, Suite 100, Greensboro, NC 27401-2711
PO Box 21582 Greensboro, NC 27420-1582
Phone: 336-275-0471 Fax: 336-275-3719
Web: www.borum-wade.com
N.C. License #: C-0868

SEALS:

BASIS OF SURVEY
HORIZONTAL NAD 83 \ 2011
VERTICAL NAVD-88
U.S. SURVEY FEET (SF)

PROJECT:

WELL LOCATION SURVEY OF TARHEEL ARMY MISSILE PLANT

204 N. GRAHAM-HOPEDALE ROAD
BURLINGTON TOWNSHIP, ALAMANCE COUNTY
BURLINGTON, NORTH CAROLINA

OWNER/DEVELOPER:

TERRACON
2401 BRENTWOOD ROAD, STE 107
RALEIGH, NORTH CAROLINA

DRAWN BY: PEG
DATE: MAY 28, 2024
REVISIONS:

SHEET TITLE:
WELL LOCATION

FILE NO: F:\TERRACON\ 204 GRAHAM-HOPEDALE
DRAWING SCALE: 1"= 30'

PLAN SHEET NO.
SHEET 1 of 2

Point	Northing	Easting	Elevation	Description	Latitude	Longitude	Height
1	854,896.2092	1,879,552.2870	604.38	WP-NAIL	0.000000000	0.000000000	0.00
2	854,898.9590	1,879,200.8615	604.72	WP MAG	0.000000000	0.000000000	0.00
3	854,880.6296	1,879,584.0033	604.12	U-2"PVC TOP	0.000000000	0.000000000	0.00
4	854,880.6863	1,879,584.0196	604.27	U-MWELL #107	0.000000000	0.000000000	0.00
5	854,855.8604	1,879,613.4773	604.63	U-2"PVC TOP	0.000000000	0.000000000	0.00
6	854,855.9211	1,879,613.4684	604.95	U-MWELL #11	0.000000000	0.000000000	0.00
7	854,891.0359	1,879,594.6173	604.11	U-2"PVC TOP	0.000000000	0.000000000	0.00
8	854,891.0642	1,879,594.6036	604.32	U-MWELL #MP-01	0.000000000	0.000000000	0.00
9	854,880.9398	1,879,573.0515	603.98	U-6"PVC TOP	0.000000000	0.000000000	0.00
10	854,880.6957	1,879,573.0439	604.35	U-MWELL #136	0.000000000	0.000000000	0.00
11	854,847.9921	1,879,577.0137	604.64	U-2"PVC TOP	0.000000000	0.000000000	0.00
12	854,847.9659	1,879,576.9298	604.91	U-MWELL #144	0.000000000	0.000000000	0.00
13	854,835.5686	1,879,535.7946	604.62	U-2"PVC TOP	0.000000000	0.000000000	0.00
14	854,835.5364	1,879,535.7905	604.93	U-MWELL #143	0.000000000	0.000000000	0.00
15	854,881.6729	1,879,557.5993	604.03	U-2"PVC TOP	0.000000000	0.000000000	0.00
16	854,881.6370	1,879,557.4615	604.38	U-MWELL #148	0.000000000	0.000000000	0.00
17	854,881.5169	1,879,551.9346	603.97	U-2"PVC TOP	0.000000000	0.000000000	0.00
18	854,881.5932	1,879,551.9168	604.39	U-MWELL #145	0.000000000	0.000000000	0.00
19	854,884.0538	1,879,509.5033	604.48	U-2"PVC TOP	0.000000000	0.000000000	0.00
20	854,884.0978	1,879,509.3694	604.77	U-MWELL #147	0.000000000	0.000000000	0.00
21	854,884.6341	1,879,503.3442	604.16	U-2"PVC TOP	0.000000000	0.000000000	0.00
22	854,884.7159	1,879,503.2944	604.76	U-MWELL #146	0.000000000	0.000000000	0.00
23	854,870.5552	1,879,174.9617	604.75	U-2"PVC TOP	0.000000000	0.000000000	0.00
24	854,870.5762	1,879,174.9594	605.12	U-MWELL #101	0.000000000	0.000000000	0.00
25	854,963.4670	1,879,026.6579	603.54	U-2"PVC TOP	0.000000000	0.000000000	0.00
26	854,963.4468	1,879,026.5799	603.92	U-MWELL #142	0.000000000	0.000000000	0.00
28	854,918.0614	1,878,978.9850	603.68	U-MWELL SV-15	0.000000000	0.000000000	0.00
30	855,015.4174	1,878,835.1752	589.89	U-MWELL SV#14	0.000000000	0.000000000	0.00
32	854,905.4903	1,878,679.2135	580.34	U-MWELL SV#13	0.000000000	0.000000000	0.00
33	854,808.6383	1,878,888.6071	593.97	U-MWELL SV#16	0.000000000	0.000000000	0.00

Appendix D
Laboratory Analytical Reports and Chain-of Custody Records

eurofins | Air Toxics

3/21/2024
Mr. Ethan Dinwiddie
Terracon Consulting Engineers
2401 Brentwood Road
Suite 107
Raleigh NC 27604

Project Name: TAMP Interim Remedied Action
Project #: 70237017
Workorder #: 2403265

Dear Mr. Ethan Dinwiddie

The following report includes the data for the above referenced project for sample(s) received on 3/9/2024 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Brian Whittaker at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Brian Whittaker

Project Manager

eurofins | Air Toxics

WORK ORDER #: 2403265

Work Order Summary

CLIENT:	Mr. Ethan Dinwiddie Terracon Consulting Engineers 2401 Brentwood Road Suite 107 Raleigh, NC 27604	**BILL TO:**	Mr. Ethan Dinwiddie Terracon Consulting Engineers 2401 Brentwood Road Suite 107 Raleigh, NC 27604
PHONE:	984-202-4055	**P.O. #**	70237017
FAX:	919-873-9555	**PROJECT #**	70237017 TAMP Interim Remedied Action
DATE RECEIVED:	03/09/2024	**CONTACT:**	Brian Whittaker
DATE COMPLETED:	03/21/2024		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SV-13	TO-15	6.9 "Hg	9.9 psi
02A	SV-14	TO-15	6.5 "Hg	10 psi
03A	SV-15	TO-15	7.3 "Hg	9.9 psi
04A	DUP_SV_20240307	TO-15	7.1 "Hg	10.1 psi
05A	Lab Blank	TO-15	NA	NA
06A	CCV	TO-15	NA	NA
07A	LCS	TO-15	NA	NA
07AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 03/21/24

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP – 209222, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP – T104704434-22-18, UT NELAP – CA009332022-14, VA NELAP - 12240, WA ELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) CA300005-017
Eurofins Environment Testing Northern California, LLC certifies that the test results contained in this report meet all requirements of the 2016 TNI Standard.

LABORATORY NARRATIVE
EPA Method TO-15
Terracon Consulting Engineers
Workorder# 2403265

Four 1 Liter Summa Canister samples were received on March 09, 2024. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on samples SV-13, SV-15 and DUP_SV_20240307 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

eurofins | Air Toxics

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SV-13

Lab ID#: 2403265-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	2.6	3.9	14	22
Freon 113	2.6	45	20	340
1,1,1-Trichloroethane	2.6	3.0	14	16
Trichloroethene	2.6	73	14	390
Tetrachloroethene	2.6	560	17	3800

Client Sample ID: SV-14

Lab ID#: 2403265-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	1.1	6.9	6.0	38
Freon 113	1.1	8.3	8.2	63
Tetrachloroethene	1.1	31	7.2	210

Client Sample ID: SV-15

Lab ID#: 2403265-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.8	160	4.7	400
1,1-Dichloroethene	1.8	4.6	7.3	18
Acetone	18	39	44	92
trans-1,2-Dichloroethene	1.8	24	7.3	93
Hexane	1.8	11	6.5	40
cis-1,2-Dichloroethene	1.8	330	7.3	1300
Tetrahydrofuran	1.8	24	5.4	72
Cyclohexane	1.8	17	6.4	58
2,2,4-Trimethylpentane	1.8	40	8.6	190
Benzene	1.8	10	5.9	34
Heptane	1.8	6.3	7.6	26
Trichloroethene	1.8	26	9.9	140
Toluene	3.7	6.9	14	26
m,p-Xylene	3.7	4.5	16	19
1,2,4-Trimethylbenzene	1.8	1.8 J	9.1	9.0 J

eurofins | Air Toxics

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SV-15

Lab ID#: 2403265-03A

Client Sample ID: DUP_SV_20240307

Lab ID#: 2403265-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	2.6	3.7	15	21
Ethanol	26	27	49	51
Freon 113	2.6	44	20	340
1,1,1-Trichloroethane	2.6	2.9	14	16
Trichloroethene	2.6	73	14	390
Tetrachloroethene	2.6	550	18	3700

eurofins | Air Toxics

Client Sample ID: SV-13

Lab ID#: 2403265-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032006**	**Date of Collection:**	**3/7/24 4:58:00 PM**
Dil. Factor:	**5.11**	**Date of Analysis:**	**3/20/24 03:25 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.6	Not Detected	13	Not Detected
Freon 114	2.6	Not Detected	18	Not Detected
Chloromethane	26	Not Detected	53	Not Detected
Vinyl Chloride	2.6	Not Detected	6.5	Not Detected
1,3-Butadiene	2.6	Not Detected	5.6	Not Detected
Bromomethane	26	Not Detected	99	Not Detected
Chloroethane	10	Not Detected	27	Not Detected
Freon 11	2.6	3.9	14	22
Ethanol	26	Not Detected	48	Not Detected
Freon 113	2.6	45	20	340
1,1-Dichloroethene	2.6	Not Detected	10	Not Detected
Acetone	26	Not Detected	61	Not Detected
2-Propanol	10	Not Detected	25	Not Detected
Carbon Disulfide	10	Not Detected	32	Not Detected
3-Chloropropene	10	Not Detected	32	Not Detected
Methylene Chloride	26	Not Detected	89	Not Detected
Methyl tert-butyl ether	10	Not Detected	37	Not Detected
trans-1,2-Dichloroethene	2.6	Not Detected	10	Not Detected
Hexane	2.6	Not Detected	9.0	Not Detected
1,1-Dichloroethane	2.6	Not Detected	10	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	30	Not Detected
cis-1,2-Dichloroethene	2.6	Not Detected	10	Not Detected
Tetrahydrofuran	2.6	Not Detected	7.5	Not Detected
Chloroform	2.6	Not Detected	12	Not Detected
1,1,1-Trichloroethane	2.6	3.0	14	16
Cyclohexane	2.6	Not Detected	8.8	Not Detected
Carbon Tetrachloride	2.6	Not Detected	16	Not Detected
2,2,4-Trimethylpentane	2.6	Not Detected	12	Not Detected
Benzene	2.6	Not Detected	8.2	Not Detected
1,2-Dichloroethane	2.6	Not Detected	10	Not Detected
Heptane	2.6	Not Detected	10	Not Detected
Trichloroethene	2.6	73	14	390
1,2-Dichloropropane	2.6	Not Detected	12	Not Detected
1,4-Dioxane	10	Not Detected	37	Not Detected
Bromodichloromethane	2.6	Not Detected	17	Not Detected
cis-1,3-Dichloropropene	2.6	Not Detected	12	Not Detected
4-Methyl-2-pentanone	2.6	Not Detected	10	Not Detected
Toluene	5.1	Not Detected	19	Not Detected
trans-1,3-Dichloropropene	2.6	Not Detected	12	Not Detected
1,1,2-Trichloroethane	2.6	Not Detected	14	Not Detected
Tetrachloroethene	2.6	560	17	3800
2-Hexanone	10	Not Detected	42	Not Detected

eurofins | Air Toxics

Client Sample ID: SV-13

Lab ID#: 2403265-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032006**	**Date of Collection:**	**3/7/24 4:58:00 PM**
Dil. Factor:	**5.11**	**Date of Analysis:**	**3/20/24 03:25 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	2.6	Not Detected	22	Not Detected
1,2-Dibromoethane (EDB)	2.6	Not Detected	20	Not Detected
Chlorobenzene	2.6	Not Detected	12	Not Detected
Ethyl Benzene	2.6	Not Detected	11	Not Detected
m,p-Xylene	5.1	Not Detected	22	Not Detected
o-Xylene	2.6	Not Detected	11	Not Detected
Styrene	2.6	Not Detected	11	Not Detected
Bromoform	2.6	Not Detected	26	Not Detected
Cumene	2.6	Not Detected	12	Not Detected
1,1,2,2-Tetrachloroethane	2.6	Not Detected	18	Not Detected
Propylbenzene	2.6	Not Detected	12	Not Detected
4-Ethyltoluene	2.6	Not Detected	12	Not Detected
1,3,5-Trimethylbenzene	2.6	Not Detected	12	Not Detected
1,2,4-Trimethylbenzene	2.6	Not Detected	12	Not Detected
1,3-Dichlorobenzene	2.6	Not Detected	15	Not Detected
1,4-Dichlorobenzene	2.6	Not Detected	15	Not Detected
alpha-Chlorotoluene	2.6	Not Detected	13	Not Detected
1,2-Dichlorobenzene	2.6	Not Detected	15	Not Detected
1,2,4-Trichlorobenzene	10	Not Detected	76	Not Detected
Hexachlorobutadiene	10	Not Detected	110	Not Detected
Naphthalene	5.1	Not Detected	27	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	106	70-130

eurofins | Air Toxics

Client Sample ID: SV-14

Lab ID#: 2403265-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032007**	**Date of Collection: 3/7/24 3:25:00 PM**	
Dil. Factor:	**2.14**	**Date of Analysis: 3/20/24 04:00 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.1	Not Detected	5.3	Not Detected
Freon 114	1.1	Not Detected	7.5	Not Detected
Chloromethane	11	Not Detected	22	Not Detected
Vinyl Chloride	1.1	Not Detected	2.7	Not Detected
1,3-Butadiene	1.1	Not Detected	2.4	Not Detected
Bromomethane	11	Not Detected	42	Not Detected
Chloroethane	4.3	Not Detected	11	Not Detected
Freon 11	1.1	6.9	6.0	38
Ethanol	11	Not Detected	20	Not Detected
Freon 113	1.1	8.3	8.2	63
1,1-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Acetone	11	Not Detected	25	Not Detected
2-Propanol	4.3	Not Detected	10	Not Detected
Carbon Disulfide	4.3	Not Detected	13	Not Detected
3-Chloropropene	4.3	Not Detected	13	Not Detected
Methylene Chloride	11	Not Detected	37	Not Detected
Methyl tert-butyl ether	4.3	Not Detected	15	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Hexane	1.1	Not Detected	3.8	Not Detected
1,1-Dichloroethane	1.1	Not Detected	4.3	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.3	Not Detected	13	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Tetrahydrofuran	1.1	Not Detected	3.2	Not Detected
Chloroform	1.1	Not Detected	5.2	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	5.8	Not Detected
Cyclohexane	1.1	Not Detected	3.7	Not Detected
Carbon Tetrachloride	1.1	Not Detected	6.7	Not Detected
2,2,4-Trimethylpentane	1.1	Not Detected	5.0	Not Detected
Benzene	1.1	Not Detected	3.4	Not Detected
1,2-Dichloroethane	1.1	Not Detected	4.3	Not Detected
Heptane	1.1	Not Detected	4.4	Not Detected
Trichloroethene	1.1	Not Detected	5.8	Not Detected
1,2-Dichloropropane	1.1	Not Detected	4.9	Not Detected
1,4-Dioxane	4.3	Not Detected	15	Not Detected
Bromodichloromethane	1.1	Not Detected	7.2	Not Detected
cis-1,3-Dichloropropene	1.1	Not Detected	4.8	Not Detected
4-Methyl-2-pentanone	1.1	Not Detected	4.4	Not Detected
Toluene	2.1	Not Detected	8.1	Not Detected
trans-1,3-Dichloropropene	1.1	Not Detected	4.8	Not Detected
1,1,2-Trichloroethane	1.1	Not Detected	5.8	Not Detected
Tetrachloroethene	1.1	31	7.2	210
2-Hexanone	4.3	Not Detected	18	Not Detected

eurofins | Air Toxics

Client Sample ID: SV-14

Lab ID#: 2403265-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032007**	**Date of Collection:**	**3/7/24 3:25:00 PM**
Dil. Factor:	**2.14**	**Date of Analysis:**	**3/20/24 04:00 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.1	Not Detected	9.1	Not Detected
1,2-Dibromoethane (EDB)	1.1	Not Detected	8.2	Not Detected
Chlorobenzene	1.1	Not Detected	4.9	Not Detected
Ethyl Benzene	1.1	Not Detected	4.6	Not Detected
m,p-Xylene	2.1	Not Detected	9.3	Not Detected
o-Xylene	1.1	Not Detected	4.6	Not Detected
Styrene	1.1	Not Detected	4.6	Not Detected
Bromoform	1.1	Not Detected	11	Not Detected
Cumene	1.1	Not Detected	5.2	Not Detected
1,1,2,2-Tetrachloroethane	1.1	Not Detected	7.3	Not Detected
Propylbenzene	1.1	Not Detected	5.3	Not Detected
4-Ethyltoluene	1.1	Not Detected	5.3	Not Detected
1,3,5-Trimethylbenzene	1.1	Not Detected	5.3	Not Detected
1,2,4-Trimethylbenzene	1.1	Not Detected	5.2	Not Detected
1,3-Dichlorobenzene	1.1	Not Detected	6.4	Not Detected
1,4-Dichlorobenzene	1.1	Not Detected	6.4	Not Detected
alpha-Chlorotoluene	1.1	Not Detected	5.5	Not Detected
1,2-Dichlorobenzene	1.1	Not Detected	6.4	Not Detected
1,2,4-Trichlorobenzene	4.3	Not Detected	32	Not Detected
Hexachlorobutadiene	4.3	Not Detected	46	Not Detected
Naphthalene	2.1	Not Detected	11	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	106	70-130

eurofins | Air Toxics

Client Sample ID: SV-15

Lab ID#: 2403265-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032008**	**Date of Collection:**	**3/7/24 5:41:00 PM**
Dil. Factor:	**3.69**	**Date of Analysis:**	**3/20/24 04:33 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.8	Not Detected	9.1	Not Detected
Freon 114	1.8	Not Detected	13	Not Detected
Chloromethane	18	Not Detected	38	Not Detected
Vinyl Chloride	1.8	160	4.7	400
1,3-Butadiene	1.8	Not Detected	4.1	Not Detected
Bromomethane	18	Not Detected	72	Not Detected
Chloroethane	7.4	Not Detected	19	Not Detected
Freon 11	1.8	Not Detected	10	Not Detected
Ethanol	18	Not Detected	35	Not Detected
Freon 113	1.8	Not Detected	14	Not Detected
1,1-Dichloroethene	1.8	4.6	7.3	18
Acetone	18	39	44	92
2-Propanol	7.4	Not Detected	18	Not Detected
Carbon Disulfide	7.4	Not Detected	23	Not Detected
3-Chloropropene	7.4	Not Detected	23	Not Detected
Methylene Chloride	18	Not Detected	64	Not Detected
Methyl tert-butyl ether	7.4	Not Detected	27	Not Detected
trans-1,2-Dichloroethene	1.8	24	7.3	93
Hexane	1.8	11	6.5	40
1,1-Dichloroethane	1.8	Not Detected	7.5	Not Detected
2-Butanone (Methyl Ethyl Ketone)	7.4	Not Detected	22	Not Detected
cis-1,2-Dichloroethene	1.8	330	7.3	1300
Tetrahydrofuran	1.8	24	5.4	72
Chloroform	1.8	Not Detected	9.0	Not Detected
1,1,1-Trichloroethane	1.8	Not Detected	10	Not Detected
Cyclohexane	1.8	17	6.4	58
Carbon Tetrachloride	1.8	Not Detected	12	Not Detected
2,2,4-Trimethylpentane	1.8	40	8.6	190
Benzene	1.8	10	5.9	34
1,2-Dichloroethane	1.8	Not Detected	7.5	Not Detected
Heptane	1.8	6.3	7.6	26
Trichloroethene	1.8	26	9.9	140
1,2-Dichloropropane	1.8	Not Detected	8.5	Not Detected
1,4-Dioxane	7.4	Not Detected	26	Not Detected
Bromodichloromethane	1.8	Not Detected	12	Not Detected
cis-1,3-Dichloropropene	1.8	Not Detected	8.4	Not Detected
4-Methyl-2-pentanone	1.8	Not Detected	7.6	Not Detected
Toluene	3.7	6.9	14	26
trans-1,3-Dichloropropene	1.8	Not Detected	8.4	Not Detected
1,1,2-Trichloroethane	1.8	Not Detected	10	Not Detected
Tetrachloroethene	1.8	Not Detected	12	Not Detected
2-Hexanone	7.4	Not Detected	30	Not Detected

eurofins | Air Toxics

Client Sample ID: SV-15

Lab ID#: 2403265-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032008**	**Date of Collection: 3/7/24 5:41:00 PM**	
Dil. Factor:	**3.69**	**Date of Analysis: 3/20/24 04:33 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.8	Not Detected	16	Not Detected
1,2-Dibromoethane (EDB)	1.8	Not Detected	14	Not Detected
Chlorobenzene	1.8	Not Detected	8.5	Not Detected
Ethyl Benzene	1.8	Not Detected	8.0	Not Detected
m,p-Xylene	3.7	4.5	16	19
o-Xylene	1.8	Not Detected	8.0	Not Detected
Styrene	1.8	Not Detected	7.8	Not Detected
Bromoform	1.8	Not Detected	19	Not Detected
Cumene	1.8	Not Detected	9.1	Not Detected
1,1,2,2-Tetrachloroethane	1.8	Not Detected	13	Not Detected
Propylbenzene	1.8	Not Detected	9.1	Not Detected
4-Ethyltoluene	1.8	Not Detected	9.1	Not Detected
1,3,5-Trimethylbenzene	1.8	Not Detected	9.1	Not Detected
1,2,4-Trimethylbenzene	1.8	1.8 J	9.1	9.0 J
1,3-Dichlorobenzene	1.8	Not Detected	11	Not Detected
1,4-Dichlorobenzene	1.8	Not Detected	11	Not Detected
alpha-Chlorotoluene	1.8	Not Detected	9.6	Not Detected
1,2-Dichlorobenzene	1.8	Not Detected	11	Not Detected
1,2,4-Trichlorobenzene	7.4	Not Detected	55	Not Detected
Hexachlorobutadiene	7.4	Not Detected	79	Not Detected
Naphthalene	3.7	Not Detected	19	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	105	70-130

eurofins | Air Toxics

Client Sample ID: DUP_SV_20240307

Lab ID#: 2403265-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032009**	**Date of Collection: 3/7/24**	
Dil. Factor:	**5.20**	**Date of Analysis: 3/20/24 05:05 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.6	Not Detected	13	Not Detected
Freon 114	2.6	Not Detected	18	Not Detected
Chloromethane	26	Not Detected	54	Not Detected
Vinyl Chloride	2.6	Not Detected	6.6	Not Detected
1,3-Butadiene	2.6	Not Detected	5.8	Not Detected
Bromomethane	26	Not Detected	100	Not Detected
Chloroethane	10	Not Detected	27	Not Detected
Freon 11	2.6	3.7	15	21
Ethanol	26	27	49	51
Freon 113	2.6	44	20	340
1,1-Dichloroethene	2.6	Not Detected	10	Not Detected
Acetone	26	Not Detected	62	Not Detected
2-Propanol	10	Not Detected	26	Not Detected
Carbon Disulfide	10	Not Detected	32	Not Detected
3-Chloropropene	10	Not Detected	32	Not Detected
Methylene Chloride	26	Not Detected	90	Not Detected
Methyl tert-butyl ether	10	Not Detected	37	Not Detected
trans-1,2-Dichloroethene	2.6	Not Detected	10	Not Detected
Hexane	2.6	Not Detected	9.2	Not Detected
1,1-Dichloroethane	2.6	Not Detected	10	Not Detected
2-Butanone (Methyl Ethyl Ketone)	10	Not Detected	31	Not Detected
cis-1,2-Dichloroethene	2.6	Not Detected	10	Not Detected
Tetrahydrofuran	2.6	Not Detected	7.7	Not Detected
Chloroform	2.6	Not Detected	13	Not Detected
1,1,1-Trichloroethane	2.6	2.9	14	16
Cyclohexane	2.6	Not Detected	8.9	Not Detected
Carbon Tetrachloride	2.6	Not Detected	16	Not Detected
2,2,4-Trimethylpentane	2.6	Not Detected	12	Not Detected
Benzene	2.6	Not Detected	8.3	Not Detected
1,2-Dichloroethane	2.6	Not Detected	10	Not Detected
Heptane	2.6	Not Detected	11	Not Detected
Trichloroethene	2.6	73	14	390
1,2-Dichloropropane	2.6	Not Detected	12	Not Detected
1,4-Dioxane	10	Not Detected	37	Not Detected
Bromodichloromethane	2.6	Not Detected	17	Not Detected
cis-1,3-Dichloropropene	2.6	Not Detected	12	Not Detected
4-Methyl-2-pentanone	2.6	Not Detected	11	Not Detected
Toluene	5.2	Not Detected	20	Not Detected
trans-1,3-Dichloropropene	2.6	Not Detected	12	Not Detected
1,1,2-Trichloroethane	2.6	Not Detected	14	Not Detected
Tetrachloroethene	2.6	550	18	3700
2-Hexanone	10	Not Detected	43	Not Detected

eurofins | Air Toxics

Client Sample ID: DUP_SV_20240307

Lab ID#: 2403265-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032009**	**Date of Collection: 3/7/24**	
Dil. Factor:	**5.20**	**Date of Analysis: 3/20/24 05:05 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	2.6	Not Detected	22	Not Detected
1,2-Dibromoethane (EDB)	2.6	Not Detected	20	Not Detected
Chlorobenzene	2.6	Not Detected	12	Not Detected
Ethyl Benzene	2.6	Not Detected	11	Not Detected
m,p-Xylene	5.2	Not Detected	22	Not Detected
o-Xylene	2.6	Not Detected	11	Not Detected
Styrene	2.6	Not Detected	11	Not Detected
Bromoform	2.6	Not Detected	27	Not Detected
Cumene	2.6	Not Detected	13	Not Detected
1,1,2,2-Tetrachloroethane	2.6	Not Detected	18	Not Detected
Propylbenzene	2.6	Not Detected	13	Not Detected
4-Ethyltoluene	2.6	Not Detected	13	Not Detected
1,3,5-Trimethylbenzene	2.6	Not Detected	13	Not Detected
1,2,4-Trimethylbenzene	2.6	Not Detected	13	Not Detected
1,3-Dichlorobenzene	2.6	Not Detected	16	Not Detected
1,4-Dichlorobenzene	2.6	Not Detected	16	Not Detected
alpha-Chlorotoluene	2.6	Not Detected	13	Not Detected
1,2-Dichlorobenzene	2.6	Not Detected	16	Not Detected
1,2,4-Trichlorobenzene	10	Not Detected	77	Not Detected
Hexachlorobutadiene	10	Not Detected	110	Not Detected
Naphthalene	5.2	Not Detected	27	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	107	70-130

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2403265-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/24 12:42 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	5.0	Not Detected	9.4	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	2.0	Not Detected	7.2	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	1.0	Not Detected	3.8	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2403265-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/24 12:42 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	1.0	Not Detected	4.3	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected
Naphthalene	1.0	Not Detected	5.2	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	105	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 2403265-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032002**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/24 11:04 AM**

Compound	%Recovery
Freon 12	88
Freon 114	95
Chloromethane	103
Vinyl Chloride	85
1,3-Butadiene	86
Bromomethane	112
Chloroethane	88
Freon 11	97
Ethanol	92
Freon 113	104
1,1-Dichloroethene	88
Acetone	87
2-Propanol	83
Carbon Disulfide	89
3-Chloropropene	83
Methylene Chloride	89
Methyl tert-butyl ether	85
trans-1,2-Dichloroethene	86
Hexane	83
1,1-Dichloroethane	87
2-Butanone (Methyl Ethyl Ketone)	85
cis-1,2-Dichloroethene	86
Tetrahydrofuran	83
Chloroform	90
1,1,1-Trichloroethane	91
Cyclohexane	82
Carbon Tetrachloride	95
2,2,4-Trimethylpentane	87
Benzene	90
1,2-Dichloroethane	96
Heptane	83
Trichloroethene	93
1,2-Dichloropropane	87
1,4-Dioxane	86
Bromodichloromethane	96
cis-1,3-Dichloropropene	90
4-Methyl-2-pentanone	82
Toluene	91
trans-1,3-Dichloropropene	92
1,1,2-Trichloroethane	93
Tetrachloroethene	105
2-Hexanone	90

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 2403265-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032002**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/24 11:04 AM**	

Compound	%Recovery
Dibromochloromethane	104
1,2-Dibromoethane (EDB)	98
Chlorobenzene	96
Ethyl Benzene	93
m,p-Xylene	95
o-Xylene	93
Styrene	94
Bromoform	111
Cumene	98
1,1,2,2-Tetrachloroethane	94
Propylbenzene	96
4-Ethyltoluene	98
1,3,5-Trimethylbenzene	98
1,2,4-Trimethylbenzene	99
1,3-Dichlorobenzene	102
1,4-Dichlorobenzene	102
alpha-Chlorotoluene	84
1,2-Dichlorobenzene	104
1,2,4-Trichlorobenzene	106
Hexachlorobutadiene	118
Naphthalene	76

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	108	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 2403265-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/24 11:36 AM**	

Compound	%Recovery	Method Limits
Freon 12	81	70-130
Freon 114	85	70-130
Chloromethane	92	70-130
Vinyl Chloride	77	70-130
1,3-Butadiene	78	70-130
Bromomethane	95	70-130
Chloroethane	81	70-130
Freon 11	88	70-130
Ethanol	102	70-130
Freon 113	97	70-130
1,1-Dichloroethene	88	70-130
Acetone	82	70-130
2-Propanol	80	70-130
Carbon Disulfide	83	70-130
3-Chloropropene	74	70-130
Methylene Chloride	77	70-130
Methyl tert-butyl ether	84	70-130
trans-1,2-Dichloroethene	78	70-130
Hexane	76	70-130
1,1-Dichloroethane	78	70-130
2-Butanone (Methyl Ethyl Ketone)	78	70-130
cis-1,2-Dichloroethene	77	70-130
Tetrahydrofuran	79	70-130
Chloroform	80	70-130
1,1,1-Trichloroethane	87	70-130
Cyclohexane	81	70-130
Carbon Tetrachloride	91	70-130
2,2,4-Trimethylpentane	82	70-130
Benzene	84	70-130
1,2-Dichloroethane	90	70-130
Heptane	83	70-130
Trichloroethene	87	70-130
1,2-Dichloropropane	82	70-130
1,4-Dioxane	88	70-130
Bromodichloromethane	90	70-130
cis-1,3-Dichloropropene	87	70-130
4-Methyl-2-pentanone	86	70-130
Toluene	87	70-130
trans-1,3-Dichloropropene	90	70-130
1,1,2-Trichloroethane	91	70-130
Tetrachloroethene	102	70-130
2-Hexanone	96	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 2403265-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/24 11:36 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	99	70-130
1,2-Dibromoethane (EDB)	95	70-130
Chlorobenzene	95	70-130
Ethyl Benzene	95	70-130
m,p-Xylene	94	70-130
o-Xylene	94	70-130
Styrene	96	70-130
Bromoform	108	70-130
Cumene	96	70-130
1,1,2,2-Tetrachloroethane	96	70-130
Propylbenzene	97	70-130
4-Ethyltoluene	97	70-130
1,3,5-Trimethylbenzene	99	70-130
1,2,4-Trimethylbenzene	101	70-130
1,3-Dichlorobenzene	103	70-130
1,4-Dichlorobenzene	104	70-130
alpha-Chlorotoluene	101	70-130
1,2-Dichlorobenzene	105	70-130
1,2,4-Trichlorobenzene	114	70-130
Hexachlorobutadiene	117	70-130
Naphthalene	101	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	108	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 2403265-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/24 12:07 PM**	

Compound	%Recovery	Method Limits
Freon 12	80	70-130
Freon 114	84	70-130
Chloromethane	90	70-130
Vinyl Chloride	77	70-130
1,3-Butadiene	76	70-130
Bromomethane	94	70-130
Chloroethane	81	70-130
Freon 11	86	70-130
Ethanol	105	70-130
Freon 113	95	70-130
1,1-Dichloroethene	76	70-130
Acetone	80	70-130
2-Propanol	79	70-130
Carbon Disulfide	82	70-130
3-Chloropropene	73	70-130
Methylene Chloride	76	70-130
Methyl tert-butyl ether	83	70-130
trans-1,2-Dichloroethene	77	70-130
Hexane	76	70-130
1,1-Dichloroethane	78	70-130
2-Butanone (Methyl Ethyl Ketone)	76	70-130
cis-1,2-Dichloroethene	77	70-130
Tetrahydrofuran	79	70-130
Chloroform	79	70-130
1,1,1-Trichloroethane	85	70-130
Cyclohexane	80	70-130
Carbon Tetrachloride	90	70-130
2,2,4-Trimethylpentane	81	70-130
Benzene	84	70-130
1,2-Dichloroethane	88	70-130
Heptane	82	70-130
Trichloroethene	87	70-130
1,2-Dichloropropane	82	70-130
1,4-Dioxane	88	70-130
Bromodichloromethane	89	70-130
cis-1,3-Dichloropropene	85	70-130
4-Methyl-2-pentanone	86	70-130
Toluene	87	70-130
trans-1,3-Dichloropropene	88	70-130
1,1,2-Trichloroethane	90	70-130
Tetrachloroethene	100	70-130
2-Hexanone	94	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 2403265-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/20/24 12:07 PM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	97	70-130
1,2-Dibromoethane (EDB)	93	70-130
Chlorobenzene	93	70-130
Ethyl Benzene	93	70-130
m,p-Xylene	92	70-130
o-Xylene	93	70-130
Styrene	94	70-130
Bromoform	106	70-130
Cumene	96	70-130
1,1,2,2-Tetrachloroethane	94	70-130
Propylbenzene	95	70-130
4-Ethyltoluene	96	70-130
1,3,5-Trimethylbenzene	96	70-130
1,2,4-Trimethylbenzene	99	70-130
1,3-Dichlorobenzene	101	70-130
1,4-Dichlorobenzene	101	70-130
alpha-Chlorotoluene	98	70-130
1,2-Dichlorobenzene	102	70-130
1,2,4-Trichlorobenzene	111	70-130
Hexachlorobutadiene	114	70-130
Naphthalene	101	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	107	70-130

Analysis Request / Canister Chain of Custody

eurofins | Air Toxics
Eurofins Environment Testing Northern California, LLC
180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Workorder #: 2403265

Instructions

Client: Terracon Consultants
Site Name: TAMP
Project Manager: Ethan.Dinwiddie@Terracon.com
Sampler: "

Project Name: TAMP Interim Remedial Action
Project #: 70237017
PO#: —

Turnaround Time (Specify Below)
Standard X Rush _____ (Surcharges will apply, per availability)
Samples received after 3PM PST are considered to be received on the following workday.
Requested Date (mm/dd/yy):
OR Number of Days:

Lab ID	Field Sample Identification (Location)	Canister Barcode #	Flow Controller Barcode #	Start Sampling Information		Stop Sampling Information		Requested Analyses				Canister Vacuum/Pressure		Lab Use Only	
				Date	Time	Date	Time	VOCs TO-15				Initial (in "Hg)	Final (in "Hg)	Receipt (in "Hg)	Final (in psi) Gas: N2 / He
01A	SV-13 ~~2024~~ ET	2864	26569	3/7/24	1653	3/7/24	1658	X				-27	-6		
02A	SV-14	2656	26468	↓	1520	↓	1525	X				-27	-6		
03A	SV-15	2655	26493	↓	1736	↓	1741	X				-27	-6		
04A	DUP-SV_20240307	40886	—	—		—		X				-22	-6		

Special Instructions/Notes:

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
[signature]	3/8/24	1800	Armin D. SATL	3/9/24	1055
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Lab Use Only
Shipper Name: Fedex | Custody Seals Intact? Yes No (None) | Condition:

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

eurofins | Air Toxics

3/29/2024
Mr. Ethan Dinwiddie
Terracon Consulting Engineers
2401 Brentwood Road
Suite 107
Raleigh NC 27604

Project Name: Tarheel Army Missile Plant
Project #:
Workorder #: 2403548

Dear Mr. Ethan Dinwiddie

The following report includes the data for the above referenced project for sample(s) received on 3/18/2024 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Brian Whittaker at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Brian Whittaker

Project Manager

eurofins | Air Toxics

WORK ORDER #: 2403548

Work Order Summary

CLIENT:	Mr. Ethan Dinwiddie Terracon Consulting Engineers 2401 Brentwood Road Suite 107 Raleigh, NC 27604	**BILL TO:**	Mr. Ethan Dinwiddie Terracon Consulting Engineers 2401 Brentwood Road Suite 107 Raleigh, NC 27604
PHONE:	984-202-4055	**P.O. #**	70237017
FAX:	919-873-9555	**PROJECT #**	Tarheel Army Missile Plant
DATE RECEIVED:	03/18/2024	**CONTACT:**	Brian Whittaker
DATE COMPLETED:	03/29/2024		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SV-16	TO-15	9.4 "Hg	10 psi
02A	Lab Blank	TO-15	NA	NA
03A	CCV	TO-15	NA	NA
04A	LCS	TO-15	NA	NA
04AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 03/29/24

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP – 209222, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP – T104704434-22-18, UT NELAP – CA009332022-14, VA NELAP - 12240, WA ELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) CA300005-017
Eurofins Environment Testing Northern California, LLC certifies that the test results contained in this report meet all requirements of the 2016 TNI Standard.

LABORATORY NARRATIVE
EPA Method TO-15
Terracon Consulting Engineers
Workorder# 2403548

One 1 Liter Summa Canister sample was received on March 18, 2024. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

The presence of a closely eluting non-target peak in sample SV-16 is interfering with the quantitation mass ion for 4-Ethyltoluene. The reported 4-Ethyltoluene concentration is flagged with a "CN" flag to indicate a high bias due to matrix contribution.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

eurofins | Air Toxics

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SV-16

Lab ID#: 2403548-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	12	32	29	76
Carbon Disulfide	4.9	15	15	48
Hexane	1.2	15	4.3	54
Cyclohexane	1.2	3.2	4.2	11
2,2,4-Trimethylpentane	1.2	3.8	5.7	18
Benzene	1.2	6.5	3.9	21
Heptane	1.2	9.2	5.0	38
Trichloroethene	1.2	25	6.6	130
Toluene	2.4	29	9.2	110
Ethyl Benzene	1.2	6.3	5.3	27
m,p-Xylene	2.4	25	11	110
o-Xylene	1.2	6.3	5.3	27
Propylbenzene	1.2	2.6	6.0	13
4-Ethyltoluene	1.2	11 CN	6.0	55 CN
1,3,5-Trimethylbenzene	1.2	5.6	6.0	27
1,2,4-Trimethylbenzene	1.2	17	6.0	83

eurofins | Air Toxics

Client Sample ID: SV-16

Lab ID#: 2403548-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032810**	**Date of Collection:**	**3/14/24 2:55:00 PM**
Dil. Factor:	**2.45**	**Date of Analysis:**	**3/28/24 04:53 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Freon 114	1.2	Not Detected	8.6	Not Detected
Chloromethane	12	Not Detected	25	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,3-Butadiene	1.2	Not Detected	2.7	Not Detected
Bromomethane	12	Not Detected	48	Not Detected
Chloroethane	4.9	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	6.9	Not Detected
Ethanol	12	Not Detected	23	Not Detected
Freon 113	1.2	Not Detected	9.4	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	32	29	76
2-Propanol	4.9	Not Detected	12	Not Detected
Carbon Disulfide	4.9	15	15	48
3-Chloropropene	4.9	Not Detected	15	Not Detected
Methylene Chloride	12	Not Detected	42	Not Detected
Methyl tert-butyl ether	4.9	Not Detected	18	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Hexane	1.2	15	4.3	54
1,1-Dichloroethane	1.2	Not Detected	5.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.9	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	1.2	Not Detected	6.0	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Cyclohexane	1.2	3.2	4.2	11
Carbon Tetrachloride	1.2	Not Detected	7.7	Not Detected
2,2,4-Trimethylpentane	1.2	3.8	5.7	18
Benzene	1.2	6.5	3.9	21
1,2-Dichloroethane	1.2	Not Detected	5.0	Not Detected
Heptane	1.2	9.2	5.0	38
Trichloroethene	1.2	25	6.6	130
1,2-Dichloropropane	1.2	Not Detected	5.7	Not Detected
1,4-Dioxane	4.9	Not Detected	18	Not Detected
Bromodichloromethane	1.2	Not Detected	8.2	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	5.0	Not Detected
Toluene	2.4	29	9.2	110
trans-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Tetrachloroethene	1.2	Not Detected	8.3	Not Detected
2-Hexanone	4.9	Not Detected	20	Not Detected

eurofins | Air Toxics

Client Sample ID: SV-16

Lab ID#: 2403548-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032810**	**Date of Collection:**	**3/14/24 2:55:00 PM**
Dil. Factor:	**2.45**	**Date of Analysis:**	**3/28/24 04:53 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	10	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.4	Not Detected
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	6.3	5.3	27
m,p-Xylene	2.4	25	11	110
o-Xylene	1.2	6.3	5.3	27
Styrene	1.2	Not Detected	5.2	Not Detected
Bromoform	1.2	Not Detected	13	Not Detected
Cumene	1.2	Not Detected	6.0	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.4	Not Detected
Propylbenzene	1.2	2.6	6.0	13
4-Ethyltoluene	1.2	11 CN	6.0	55 CN
1,3,5-Trimethylbenzene	1.2	5.6	6.0	27
1,2,4-Trimethylbenzene	1.2	17	6.0	83
1,3-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,2,4-Trichlorobenzene	4.9	Not Detected	36	Not Detected
Hexachlorobutadiene	4.9	Not Detected	52	Not Detected
Naphthalene	2.4	Not Detected	13	Not Detected

CN =See Case Narrative explanation

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	107	70-130

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2403548-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032806d**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/24 12:58 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	5.0	Not Detected	9.4	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	2.0	Not Detected	7.2	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	1.0	Not Detected	3.8	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2403548-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032806d**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/24 12:58 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	1.0	Not Detected	4.3	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected
Naphthalene	1.0	Not Detected	5.2	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	104	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 2403548-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032803**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/24 11:17 AM**

Compound	%Recovery
Freon 12	82
Freon 114	85
Chloromethane	97
Vinyl Chloride	77
1,3-Butadiene	80
Bromomethane	96
Chloroethane	81
Freon 11	90
Ethanol	87
Freon 113	101
1,1-Dichloroethene	78
Acetone	77
2-Propanol	76
Carbon Disulfide	79
3-Chloropropene	72
Methylene Chloride	81
Methyl tert-butyl ether	84
trans-1,2-Dichloroethene	77
Hexane	77
1,1-Dichloroethane	78
2-Butanone (Methyl Ethyl Ketone)	75
cis-1,2-Dichloroethene	77
Tetrahydrofuran	72
Chloroform	81
1,1,1-Trichloroethane	90
Cyclohexane	79
Carbon Tetrachloride	94
2,2,4-Trimethylpentane	83
Benzene	82
1,2-Dichloroethane	90
Heptane	80
Trichloroethene	86
1,2-Dichloropropane	83
1,4-Dioxane	85
Bromodichloromethane	90
cis-1,3-Dichloropropene	84
4-Methyl-2-pentanone	82
Toluene	87
trans-1,3-Dichloropropene	90
1,1,2-Trichloroethane	89
Tetrachloroethene	102
2-Hexanone	92

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 2403548-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032803**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/24 11:17 AM**

Compound	%Recovery
Dibromochloromethane	102
1,2-Dibromoethane (EDB)	94
Chlorobenzene	94
Ethyl Benzene	92
m,p-Xylene	94
o-Xylene	93
Styrene	95
Bromoform	112
Cumene	98
1,1,2,2-Tetrachloroethane	95
Propylbenzene	98
4-Ethyltoluene	101
1,3,5-Trimethylbenzene	98
1,2,4-Trimethylbenzene	101
1,3-Dichlorobenzene	104
1,4-Dichlorobenzene	104
alpha-Chlorotoluene	102
1,2-Dichlorobenzene	106
1,2,4-Trichlorobenzene	110
Hexachlorobutadiene	116
Naphthalene	85

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	92-109
1,2-Dichloroethane-d4	99	65-134
4-Bromofluorobenzene	108	85-118

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 2403548-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032804**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/24 11:50 AM**	

Compound	%Recovery	Method Limits
Freon 12	88	70-130
Freon 114	90	70-130
Chloromethane	96	70-130
Vinyl Chloride	82	70-130
1,3-Butadiene	82	70-130
Bromomethane	109	70-130
Chloroethane	90	70-130
Freon 11	94	70-130
Ethanol	112	70-130
Freon 113	99	70-130
1,1-Dichloroethene	93	70-130
Acetone	85	70-130
2-Propanol	85	70-130
Carbon Disulfide	87	70-130
3-Chloropropene	79	70-130
Methylene Chloride	84	70-130
Methyl tert-butyl ether	86	70-130
trans-1,2-Dichloroethene	81	70-130
Hexane	79	70-130
1,1-Dichloroethane	83	70-130
2-Butanone (Methyl Ethyl Ketone)	81	70-130
cis-1,2-Dichloroethene	79	70-130
Tetrahydrofuran	84	70-130
Chloroform	85	70-130
1,1,1-Trichloroethane	91	70-130
Cyclohexane	81	70-130
Carbon Tetrachloride	96	70-130
2,2,4-Trimethylpentane	85	70-130
Benzene	86	70-130
1,2-Dichloroethane	97	70-130
Heptane	82	70-130
Trichloroethene	90	70-130
1,2-Dichloropropane	84	70-130
1,4-Dioxane	89	70-130
Bromodichloromethane	94	70-130
cis-1,3-Dichloropropene	88	70-130
4-Methyl-2-pentanone	86	70-130
Toluene	88	70-130
trans-1,3-Dichloropropene	93	70-130
1,1,2-Trichloroethane	91	70-130
Tetrachloroethene	103	70-130
2-Hexanone	96	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 2403548-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032804**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/24 11:50 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	102	70-130
1,2-Dibromoethane (EDB)	97	70-130
Chlorobenzene	96	70-130
Ethyl Benzene	94	70-130
m,p-Xylene	94	70-130
o-Xylene	93	70-130
Styrene	94	70-130
Bromoform	111	70-130
Cumene	97	70-130
1,1,2,2-Tetrachloroethane	95	70-130
Propylbenzene	97	70-130
4-Ethyltoluene	97	70-130
1,3,5-Trimethylbenzene	98	70-130
1,2,4-Trimethylbenzene	101	70-130
1,3-Dichlorobenzene	103	70-130
1,4-Dichlorobenzene	103	70-130
alpha-Chlorotoluene	100	70-130
1,2-Dichlorobenzene	105	70-130
1,2,4-Trichlorobenzene	112	70-130
Hexachlorobutadiene	120	70-130
Naphthalene	99	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	108	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 2403548-04AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032805**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/24 12:23 PM**	

Compound	%Recovery	Method Limits
Freon 12	87	70-130
Freon 114	91	70-130
Chloromethane	96	70-130
Vinyl Chloride	82	70-130
1,3-Butadiene	82	70-130
Bromomethane	110	70-130
Chloroethane	86	70-130
Freon 11	92	70-130
Ethanol	112	70-130
Freon 113	99	70-130
1,1-Dichloroethene	81	70-130
Acetone	87	70-130
2-Propanol	85	70-130
Carbon Disulfide	88	70-130
3-Chloropropene	80	70-130
Methylene Chloride	83	70-130
Methyl tert-butyl ether	86	70-130
trans-1,2-Dichloroethene	82	70-130
Hexane	80	70-130
1,1-Dichloroethane	83	70-130
2-Butanone (Methyl Ethyl Ketone)	82	70-130
cis-1,2-Dichloroethene	81	70-130
Tetrahydrofuran	83	70-130
Chloroform	85	70-130
1,1,1-Trichloroethane	92	70-130
Cyclohexane	82	70-130
Carbon Tetrachloride	96	70-130
2,2,4-Trimethylpentane	86	70-130
Benzene	87	70-130
1,2-Dichloroethane	96	70-130
Heptane	83	70-130
Trichloroethene	91	70-130
1,2-Dichloropropane	84	70-130
1,4-Dioxane	89	70-130
Bromodichloromethane	94	70-130
cis-1,3-Dichloropropene	88	70-130
4-Methyl-2-pentanone	88	70-130
Toluene	88	70-130
trans-1,3-Dichloropropene	92	70-130
1,1,2-Trichloroethane	92	70-130
Tetrachloroethene	102	70-130
2-Hexanone	96	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 2403548-04AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3032805**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/28/24 12:23 PM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	102	70-130
1,2-Dibromoethane (EDB)	97	70-130
Chlorobenzene	95	70-130
Ethyl Benzene	95	70-130
m,p-Xylene	93	70-130
o-Xylene	94	70-130
Styrene	96	70-130
Bromoform	111	70-130
Cumene	98	70-130
1,1,2,2-Tetrachloroethane	96	70-130
Propylbenzene	96	70-130
4-Ethyltoluene	98	70-130
1,3,5-Trimethylbenzene	98	70-130
1,2,4-Trimethylbenzene	102	70-130
1,3-Dichlorobenzene	102	70-130
1,4-Dichlorobenzene	103	70-130
alpha-Chlorotoluene	100	70-130
1,2-Dichlorobenzene	104	70-130
1,2,4-Trichlorobenzene	112	70-130
Hexachlorobutadiene	120	70-130
Naphthalene	100	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	107	70-130

eurofins | Air Toxics

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: _____ Workorder #: 2403548

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:
Canister Sampling Guide
Helium Shroud Video

Client: Terracon Consultants, Inc PID:
Project Name: Turbo! Army Missile Plant
Project Manager: Ethan.Dinwiddie@Terracon.com P.O.# 70237017
Sampler: ED
Site Name:

Special Instructions/Notes:
Please record canister pressure on receipt.

Turnaround Time (Rush surcharges may apply)
Select TAT from drop down box

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Information		Stop Sampling Information		Canister Vacuum/Pressure		Lab Use Only		Requested Analyses			
				Date	Time	Date	Time	Initial (in Hg)	Final (in Hg)	Receipt	Final (psig) Gas: N_2 / He	VOCs TO-15			
01A	SV-16	IL4513	26237	3/14/24	1450	3/14/24	1455	-27	-6			X			

Relinquished by: (Signature/Affiliation)	Date 3/15/24	Time 1200	Received by: (Signature/Affiliation) EATL	Date 3/18/24	Time 0928
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Lab Use Only

Shipper Name: FED EX | Custody Seals Intact? | Yes | No | None

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

eurofins | Environment Testing

1 2 3 4 5 6 7 8 9 10 11 12

ANALYTICAL REPORT

PREPARED FOR

Attn: Mr. Ethan Dinwiddie
Terracon Consultants, Inc.
2401 Brentwood Road
Suite 107
Raleigh, North Carolina 27604

Generated 5/21/2024 5:04:06 PM

JOB DESCRIPTION

Tarheel Army Missile Plant

JOB NUMBER

680-250515-1

Eurofins Savannah
5102 LaRoche Avenue
Savannah GA 31404

See page two for job notes and contact information.

myEOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization

Generated
5/21/2024 5:04:06 PM

Authorized for release by
Chad Bechtold, Project Manager
Chad.Bechtold@et.eurofinsus.com
(813)690-3563

Definitions/Glossary

Client: Terracon Consultants, Inc.
Project/Site: Tarheel Army Missile Plant

Job ID: 680-250515-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Terracon Consultants, Inc.
Project/Site: Tarheel Army Missile Plant

Job ID: 680-250515-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-250515-1	MW-148	Water	05/08/24 15:45	05/09/24 10:53
680-250515-2	MW-147	Water	05/08/24 16:05	05/09/24 10:53
680-250515-3	MW-142	Water	05/08/24 16:35	05/09/24 10:53
680-250515-4	DUP-GW-20240508	Water	05/08/24 00:00	05/09/24 10:53

Job Narrative
680-250515-1

Receipt
The samples were received on 5/9/2024 10:53 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.3°C.

GC/MS VOA
Method 8260D_DOD5: The initial calibration verification (ICV) analyzed in batch 680-836362 was outside method criteria for the following analytes: Bromoform, Carbon disulfide, Hexane and Vinyl acetate. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analytes is considered estimated.

Method 8260D_DOD5: The initial calibration verification (ICV) analyzed in batch 680-837880 was outside method criteria for the following analytes: Dichlorodifluoromethane and Vinyl acetate. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analytes is considered estimated.

Method 8260D_DOD5: The continuing calibration verification (CCV) associated with batch 680-838498 recovered above the upper control limit for Bromoform, Trichlorofluoromethane and Vinyl acetate. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8260D_DOD5: The continuing calibration verification (CCV) associated with batch 680-838498 recovered outside acceptance criteria, low biased, for Bromomethane and Dichlorodifluoromethane. A reporting limit (RL) standard was analyzed, and the target analytes are detected. Since the associated samples were non-detect for the analyte(s), the data are reported.

Method 8260D_DOD5: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 680-838498 recovered outside control limits for the following analytes: Bromoform, Trichlorofluoromethane and Vinyl acetate. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method 8260D_DOD5: The continuing calibration verification closing (CCVC) associated with batch 680-838498 recovered outside acceptance criteria, low biased, for Iodomethane. A reporting limit (RL) standard was analyzed, and the target analytes are detected. Since the associated samples were non-detect for the analyte, the data are reported.

Method 8260D_DOD5: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 680-838498.

Method 8260D_DOD5: The continuing calibration verification (CCV) associated with batch 680-838791 recovered above the upper control limit for Bromomethane and Vinyl acetate. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client: Terracon Consultants, Inc.
Project/Site: Tarheel Army Missile Plant

Job ID: 680-250515-1

Client Sample ID: MW-148
Date Collected: 05/08/24 15:45
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-1
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	25	3.7	ug/L			05/17/24 17:54	1
Benzene	1.0	U	2.0	0.27	ug/L			05/17/24 17:54	1
Bromobenzene	0.50	U	1.0	0.24	ug/L			05/17/24 17:54	1
Bromoform	2.0	U Q	2.5	0.59	ug/L			05/17/24 17:54	1
Bromomethane	10	U Q	20	3.7	ug/L			05/17/24 17:54	1
2-Butanone (MEK)	20	U	25	6.4	ug/L			05/17/24 17:54	1
Carbon disulfide	1.0	U Q	2.0	0.43	ug/L			05/17/24 17:54	1
Carbon tetrachloride	1.0	U M	2.0	0.30	ug/L			05/17/24 17:54	1
Chlorobenzene	0.50	U	1.0	0.15	ug/L			05/17/24 17:54	1
Chlorobromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 17:54	1
Chlorodibromomethane	1.0	U	2.0	0.39	ug/L			05/17/24 17:54	1
Chloroethane	10	U	20	4.6	ug/L			05/17/24 17:54	1
Chloroform	**4.6**		2.0	0.27	ug/L			05/17/24 17:54	1
Chloromethane	2.0	U M	2.5	0.54	ug/L			05/17/24 17:54	1
2-Chlorotoluene	0.50	U	1.0	0.25	ug/L			05/17/24 17:54	1
4-Chlorotoluene	1.0	U	2.0	0.41	ug/L			05/17/24 17:54	1
cis-1,2-Dichloroethene	1.0	U	2.0	0.25	ug/L			05/17/24 17:54	1
cis-1,3-Dichloropropene	1.0	U	2.0	0.26	ug/L			05/17/24 17:54	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	1.8	ug/L			05/17/24 17:54	1
Dibromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 17:54	1
1,2-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 17:54	1
1,3-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 17:54	1
1,4-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 17:54	1
Dichlorobromomethane	1.0	U	2.0	0.25	ug/L			05/17/24 17:54	1
Dichlorodifluoromethane	1.0	U Q	2.0	0.36	ug/L			05/17/24 17:54	1
1,1-Dichloroethane	1.0	U	2.0	0.33	ug/L			05/17/24 17:54	1
1,2-Dichloroethane	1.0	U	2.0	0.25	ug/L			05/17/24 17:54	1
1,1-Dichloroethene	1.0	U	2.0	0.33	ug/L			05/17/24 17:54	1
1,2-Dichloropropane	0.50	U	1.0	0.22	ug/L			05/17/24 17:54	1
1,3-Dichloropropane	1.0	U	2.0	0.36	ug/L			05/17/24 17:54	1
2,2-Dichloropropane	1.0	U	2.0	0.35	ug/L			05/17/24 17:54	1
1,1-Dichloropropene	1.0	U	2.0	0.28	ug/L			05/17/24 17:54	1
Ethyl acetate	10	U	20	5.0	ug/L			05/17/24 17:54	1
Ethylbenzene	0.50	U	1.0	0.20	ug/L			05/17/24 17:54	1
Ethylene Dibromide	1.0	U	2.0	0.33	ug/L			05/17/24 17:54	1
Hexachlorobutadiene	1.0	U	5.0	0.22	ug/L			05/17/24 17:54	1
Hexane	2.0	U Q	5.0	0.65	ug/L			05/17/24 17:54	1
2-Hexanone	10	U	20	3.2	ug/L			05/17/24 17:54	1
Iodomethane	10	U Q	20	3.9	ug/L			05/17/24 17:54	1
Isopropylbenzene	1.0	U	2.0	0.26	ug/L			05/17/24 17:54	1
Isopropyl ether	2.0	U	10	0.70	ug/L			05/17/24 17:54	1
4-Isopropyltoluene	1.0	U	2.0	0.44	ug/L			05/17/24 17:54	1
Methylene Chloride	10	U	20	3.2	ug/L			05/17/24 17:54	1
4-Methyl-2-pentanone (MIBK)	10	U	20	2.7	ug/L			05/17/24 17:54	1
Methyl tert-butyl ether	2.0	U	5.0	0.81	ug/L			05/17/24 17:54	1
m-Xylene & p-Xylene	1.0	U	2.0	0.49	ug/L			05/17/24 17:54	1
Naphthalene	5.0	U	10	2.4	ug/L			05/17/24 17:54	1
n-Butylbenzene	2.0	U	2.5	0.52	ug/L			05/17/24 17:54	1
n-Heptane	1.0	U	2.0	0.43	ug/L			05/17/24 17:54	1

Client Sample ID: MW-148

Date Collected: 05/08/24 15:45
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-1
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
N-Propylbenzene	1.0	U	2.0	0.41	ug/L			05/17/24 17:54	1
o-Xylene	1.0	U	2.0	0.26	ug/L			05/17/24 17:54	1
sec-Butylbenzene	2.0	U	2.5	0.53	ug/L			05/17/24 17:54	1
Styrene	1.0	U	2.0	0.27	ug/L			05/17/24 17:54	1
tert-Butylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 17:54	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	0.36	ug/L			05/17/24 17:54	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	0.40	ug/L			05/17/24 17:54	1
Tetrachloroethene	**0.40**	**J**	2.0	0.35	ug/L			05/17/24 17:54	1
Toluene	1.0	U	2.0	0.25	ug/L			05/17/24 17:54	1
trans-1,4-Dichloro-2-butene	5.0	U	10	1.3	ug/L			05/17/24 17:54	1
trans-1,2-Dichloroethene	1.0	U	2.0	0.34	ug/L			05/17/24 17:54	1
trans-1,3-Dichloropropene	1.0	U	2.0	0.23	ug/L			05/17/24 17:54	1
1,2,3-Trichlorobenzene	2.0	U	5.0	0.81	ug/L			05/17/24 17:54	1
1,2,4-Trichlorobenzene	2.0	U	5.0	0.53	ug/L			05/17/24 17:54	1
1,1,1-Trichloroethane	0.50	U	1.0	0.21	ug/L			05/17/24 17:54	1
1,1,2-Trichloroethane	1.0	U	2.0	0.32	ug/L			05/17/24 17:54	1
Trichloroethene	**0.30**	**J**	1.0	0.20	ug/L			05/17/24 17:54	1
Trichlorofluoromethane	1.0	U Q	2.0	0.33	ug/L			05/17/24 17:54	1
1,2,3-Trichloropropane	1.0	U	2.0	0.48	ug/L			05/17/24 17:54	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	1.0	0.23	ug/L			05/17/24 17:54	1
1,2,4-Trimethylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 17:54	1
1,3,5-Trimethylbenzene	1.0	U	2.0	0.28	ug/L			05/17/24 17:54	1
Vinyl acetate	2.0	U Q	2.5	0.69	ug/L			05/17/24 17:54	1
Vinyl chloride	1.0	U	2.0	0.40	ug/L			05/17/24 17:54	1
Xylenes, Total	1.0	U	2.0	0.49	ug/L			05/17/24 17:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*85 - 114*		*05/17/24 17:54*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 119*		*05/17/24 17:54*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*81 - 118*		*05/17/24 17:54*	*1*
Toluene-d8 (Surr)	*95*		*89 - 112*		*05/17/24 17:54*	*1*

Client Sample ID: MW-147

Date Collected: 05/08/24 16:05
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-2
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	25	3.7	ug/L			05/17/24 18:17	1
Benzene	**0.28**	**J**	2.0	0.27	ug/L			05/17/24 18:17	1
Bromobenzene	0.50	U	1.0	0.24	ug/L			05/17/24 18:17	1
Bromoform	2.0	U Q	2.5	0.59	ug/L			05/17/24 18:17	1
Bromomethane	10	U Q	20	3.7	ug/L			05/17/24 18:17	1
2-Butanone (MEK)	20	U	25	6.4	ug/L			05/17/24 18:17	1
Carbon disulfide	**0.72**	**J Q**	2.0	0.43	ug/L			05/17/24 18:17	1
Carbon tetrachloride	1.0	U	2.0	0.30	ug/L			05/17/24 18:17	1
Chlorobenzene	0.50	U	1.0	0.15	ug/L			05/17/24 18:17	1
Chlorobromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 18:17	1
Chlorodibromomethane	1.0	U	2.0	0.39	ug/L			05/17/24 18:17	1
Chloroethane	10	U	20	4.6	ug/L			05/17/24 18:17	1

Client: Terracon Consultants, Inc.
Project/Site: Tarheel Army Missile Plant

Job ID: 680-250515-1

Client Sample ID: MW-147
Date Collected: 05/08/24 16:05
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-2
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	**0.27**	**J**	2.0	0.27	ug/L			05/17/24 18:17	1
Chloromethane	2.0	U	2.5	0.54	ug/L			05/17/24 18:17	1
2-Chlorotoluene	0.50	U	1.0	0.25	ug/L			05/17/24 18:17	1
4-Chlorotoluene	1.0	U	2.0	0.41	ug/L			05/17/24 18:17	1
cis-1,2-Dichloroethene	**1.3**	**J**	2.0	0.25	ug/L			05/17/24 18:17	1
cis-1,3-Dichloropropene	1.0	U	2.0	0.26	ug/L			05/17/24 18:17	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	1.8	ug/L			05/17/24 18:17	1
Dibromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 18:17	1
1,2-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 18:17	1
1,3-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 18:17	1
1,4-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 18:17	1
Dichlorobromomethane	1.0	U	2.0	0.25	ug/L			05/17/24 18:17	1
Dichlorodifluoromethane	1.0	U Q	2.0	0.36	ug/L			05/17/24 18:17	1
1,1-Dichloroethane	1.0	U	2.0	0.33	ug/L			05/17/24 18:17	1
1,2-Dichloroethane	1.0	U	2.0	0.25	ug/L			05/17/24 18:17	1
1,1-Dichloroethene	1.0	U	2.0	0.33	ug/L			05/17/24 18:17	1
1,2-Dichloropropane	0.50	U	1.0	0.22	ug/L			05/17/24 18:17	1
1,3-Dichloropropane	1.0	U	2.0	0.36	ug/L			05/17/24 18:17	1
2,2-Dichloropropane	1.0	U	2.0	0.35	ug/L			05/17/24 18:17	1
1,1-Dichloropropene	1.0	U	2.0	0.28	ug/L			05/17/24 18:17	1
Ethyl acetate	10	U	20	5.0	ug/L			05/17/24 18:17	1
Ethylbenzene	0.50	U	1.0	0.20	ug/L			05/17/24 18:17	1
Ethylene Dibromide	1.0	U	2.0	0.33	ug/L			05/17/24 18:17	1
Hexachlorobutadiene	1.0	U	5.0	0.22	ug/L			05/17/24 18:17	1
Hexane	2.0	U Q	5.0	0.65	ug/L			05/17/24 18:17	1
2-Hexanone	10	U	20	3.2	ug/L			05/17/24 18:17	1
Iodomethane	10	U Q	20	3.9	ug/L			05/17/24 18:17	1
Isopropylbenzene	1.0	U	2.0	0.26	ug/L			05/17/24 18:17	1
Isopropyl ether	2.0	U	10	0.70	ug/L			05/17/24 18:17	1
4-Isopropyltoluene	1.0	U	2.0	0.44	ug/L			05/17/24 18:17	1
Methylene Chloride	10	U	20	3.2	ug/L			05/17/24 18:17	1
4-Methyl-2-pentanone (MIBK)	10	U	20	2.7	ug/L			05/17/24 18:17	1
Methyl tert-butyl ether	**1.5**	**J**	5.0	0.81	ug/L			05/17/24 18:17	1
m-Xylene & p-Xylene	1.0	U	2.0	0.49	ug/L			05/17/24 18:17	1
Naphthalene	5.0	U	10	2.4	ug/L			05/17/24 18:17	1
n-Butylbenzene	2.0	U	2.5	0.52	ug/L			05/17/24 18:17	1
n-Heptane	1.0	U	2.0	0.43	ug/L			05/17/24 18:17	1
N-Propylbenzene	1.0	U	2.0	0.41	ug/L			05/17/24 18:17	1
o-Xylene	1.0	U	2.0	0.26	ug/L			05/17/24 18:17	1
sec-Butylbenzene	2.0	U	2.5	0.53	ug/L			05/17/24 18:17	1
Styrene	1.0	U	2.0	0.27	ug/L			05/17/24 18:17	1
tert-Butylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 18:17	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	0.36	ug/L			05/17/24 18:17	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	0.40	ug/L			05/17/24 18:17	1
Tetrachloroethene	1.0	U	2.0	0.35	ug/L			05/17/24 18:17	1
Toluene	1.0	U	2.0	0.25	ug/L			05/17/24 18:17	1
trans-1,4-Dichloro-2-butene	5.0	U	10	1.3	ug/L			05/17/24 18:17	1
trans-1,2-Dichloroethene	1.0	U	2.0	0.34	ug/L			05/17/24 18:17	1
trans-1,3-Dichloropropene	1.0	U	2.0	0.23	ug/L			05/17/24 18:17	1

Client Sample ID: MW-147

Lab Sample ID: 680-250515-2

Date Collected: 05/08/24 16:05

Matrix: Water

Date Received: 05/09/24 10:53

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	2.0	U	5.0	0.81	ug/L			05/17/24 18:17	1
1,2,4-Trichlorobenzene	2.0	U	5.0	0.53	ug/L			05/17/24 18:17	1
1,1,1-Trichloroethane	0.50	U	1.0	0.21	ug/L			05/17/24 18:17	1
1,1,2-Trichloroethane	1.0	U	2.0	0.32	ug/L			05/17/24 18:17	1
Trichloroethene	0.50	U	1.0	0.20	ug/L			05/17/24 18:17	1
Trichlorofluoromethane	1.0	U Q	2.0	0.33	ug/L			05/17/24 18:17	1
1,2,3-Trichloropropane	1.0	U	2.0	0.48	ug/L			05/17/24 18:17	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	1.0	0.23	ug/L			05/17/24 18:17	1
1,2,4-Trimethylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 18:17	1
1,3,5-Trimethylbenzene	1.0	U	2.0	0.28	ug/L			05/17/24 18:17	1
Vinyl acetate	2.0	U Q	2.5	0.69	ug/L			05/17/24 18:17	1
Vinyl chloride	1.0	U	2.0	0.40	ug/L			05/17/24 18:17	1
Xylenes, Total	1.0	U	2.0	0.49	ug/L			05/17/24 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*85 - 114*		*05/17/24 18:17*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 119*		*05/17/24 18:17*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*81 - 118*		*05/17/24 18:17*	*1*
Toluene-d8 (Surr)	*96*		*89 - 112*		*05/17/24 18:17*	*1*

Client Sample ID: MW-142

Lab Sample ID: 680-250515-3

Date Collected: 05/08/24 16:35

Matrix: Water

Date Received: 05/09/24 10:53

Method: SW846 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	25	3.7	ug/L			05/17/24 18:40	1
Benzene	1.0	U	2.0	0.27	ug/L			05/17/24 18:40	1
Bromobenzene	0.50	U	1.0	0.24	ug/L			05/17/24 18:40	1
Bromoform	2.0	U	2.5	0.59	ug/L			05/20/24 14:31	1
Bromomethane	10	U Q	20	3.7	ug/L			05/17/24 18:40	1
2-Butanone (MEK)	20	U	25	6.4	ug/L			05/17/24 18:40	1
Carbon disulfide	1.0	U Q	2.0	0.43	ug/L			05/17/24 18:40	1
Carbon tetrachloride	1.0	U M	2.0	0.30	ug/L			05/17/24 18:40	1
Chlorobenzene	0.50	U	1.0	0.15	ug/L			05/17/24 18:40	1
Chlorobromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 18:40	1
Chlorodibromomethane	1.0	U M	2.0	0.39	ug/L			05/17/24 18:40	1
Chloroethane	10	U	20	4.6	ug/L			05/17/24 18:40	1
Chloroform	**8.1**		2.0	0.27	ug/L			05/17/24 18:40	1
Chloromethane	2.0	U	2.5	0.54	ug/L			05/17/24 18:40	1
2-Chlorotoluene	0.50	U	1.0	0.25	ug/L			05/17/24 18:40	1
4-Chlorotoluene	1.0	U	2.0	0.41	ug/L			05/17/24 18:40	1
cis-1,2-Dichloroethene	**1.8**	**J**	2.0	0.25	ug/L			05/17/24 18:40	1
cis-1,3-Dichloropropene	1.0	U	2.0	0.26	ug/L			05/17/24 18:40	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	1.8	ug/L			05/17/24 18:40	1
Dibromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 18:40	1
1,2-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 18:40	1
1,3-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 18:40	1
1,4-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 18:40	1
Dichlorobromomethane	**0.68**	**J**	2.0	0.25	ug/L			05/17/24 18:40	1

Client: Terracon Consultants, Inc.
Project/Site: Tarheel Army Missile Plant

Job ID: 680-250515-1

Client Sample ID: MW-142
Date Collected: 05/08/24 16:35
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-3
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	1.0	U Q	2.0	0.36	ug/L			05/17/24 18:40	1
1,1-Dichloroethane	1.0	U	2.0	0.33	ug/L			05/17/24 18:40	1
1,2-Dichloroethane	1.0	U	2.0	0.25	ug/L			05/17/24 18:40	1
1,1-Dichloroethene	**2.4**		2.0	0.33	ug/L			05/17/24 18:40	1
1,2-Dichloropropane	0.50	U	1.0	0.22	ug/L			05/17/24 18:40	1
1,3-Dichloropropane	1.0	U	2.0	0.36	ug/L			05/17/24 18:40	1
2,2-Dichloropropane	1.0	U	2.0	0.35	ug/L			05/17/24 18:40	1
1,1-Dichloropropene	1.0	U	2.0	0.28	ug/L			05/17/24 18:40	1
Ethyl acetate	10	U	20	5.0	ug/L			05/17/24 18:40	1
Ethylbenzene	0.50	U	1.0	0.20	ug/L			05/17/24 18:40	1
Ethylene Dibromide	1.0	U	2.0	0.33	ug/L			05/17/24 18:40	1
Hexachlorobutadiene	1.0	U	5.0	0.22	ug/L			05/17/24 18:40	1
Hexane	2.0	U Q	5.0	0.65	ug/L			05/17/24 18:40	1
2-Hexanone	10	U	20	3.2	ug/L			05/17/24 18:40	1
Iodomethane	10	U Q	20	3.9	ug/L			05/17/24 18:40	1
Isopropylbenzene	1.0	U	2.0	0.26	ug/L			05/17/24 18:40	1
Isopropyl ether	2.0	U	10	0.70	ug/L			05/17/24 18:40	1
4-Isopropyltoluene	1.0	U	2.0	0.44	ug/L			05/17/24 18:40	1
Methylene Chloride	10	U	20	3.2	ug/L			05/17/24 18:40	1
4-Methyl-2-pentanone (MIBK)	10	U	20	2.7	ug/L			05/17/24 18:40	1
Methyl tert-butyl ether	2.0	U	5.0	0.81	ug/L			05/17/24 18:40	1
m-Xylene & p-Xylene	1.0	U	2.0	0.49	ug/L			05/17/24 18:40	1
Naphthalene	5.0	U	10	2.4	ug/L			05/17/24 18:40	1
n-Butylbenzene	2.0	U	2.5	0.52	ug/L			05/17/24 18:40	1
n-Heptane	1.0	U	2.0	0.43	ug/L			05/17/24 18:40	1
N-Propylbenzene	1.0	U	2.0	0.41	ug/L			05/17/24 18:40	1
o-Xylene	1.0	U	2.0	0.26	ug/L			05/17/24 18:40	1
sec-Butylbenzene	2.0	U	2.5	0.53	ug/L			05/17/24 18:40	1
Styrene	1.0	U	2.0	0.27	ug/L			05/17/24 18:40	1
tert-Butylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 18:40	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	0.36	ug/L			05/17/24 18:40	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	0.40	ug/L			05/17/24 18:40	1
Tetrachloroethene	**3.0**		2.0	0.35	ug/L			05/17/24 18:40	1
Toluene	1.0	U	2.0	0.25	ug/L			05/17/24 18:40	1
trans-1,4-Dichloro-2-butene	5.0	U	10	1.3	ug/L			05/17/24 18:40	1
trans-1,2-Dichloroethene	1.0	U	2.0	0.34	ug/L			05/17/24 18:40	1
trans-1,3-Dichloropropene	1.0	U	2.0	0.23	ug/L			05/17/24 18:40	1
1,2,3-Trichlorobenzene	2.0	U	5.0	0.81	ug/L			05/17/24 18:40	1
1,2,4-Trichlorobenzene	2.0	U	5.0	0.53	ug/L			05/17/24 18:40	1
1,1,1-Trichloroethane	0.50	U	1.0	0.21	ug/L			05/17/24 18:40	1
1,1,2-Trichloroethane	1.0	U	2.0	0.32	ug/L			05/17/24 18:40	1
Trichloroethene	**130**		1.0	0.20	ug/L			05/17/24 18:40	1
Trichlorofluoromethane	1.0	U Q	2.0	0.33	ug/L			05/17/24 18:40	1
1,2,3-Trichloropropane	1.0	U	2.0	0.48	ug/L			05/17/24 18:40	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	1.0	0.23	ug/L			05/17/24 18:40	1
1,2,4-Trimethylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 18:40	1
1,3,5-Trimethylbenzene	1.0	U	2.0	0.28	ug/L			05/17/24 18:40	1
Vinyl acetate	2.0	U Q	2.5	0.69	ug/L			05/17/24 18:40	1
Vinyl chloride	1.0	U M	2.0	0.40	ug/L			05/17/24 18:40	1

Client Sample ID: MW-142

Lab Sample ID: 680-250515-3

Date Collected: 05/08/24 16:35

Matrix: Water

Date Received: 05/09/24 10:53

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	1.0	U	2.0	0.49	ug/L			05/17/24 18:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*85 - 114*		*05/17/24 18:40*	*1*
4-Bromofluorobenzene (Surr)	*101*		*85 - 114*		*05/20/24 14:31*	*1*
Dibromofluoromethane (Surr)	*108*		*80 - 119*		*05/17/24 18:40*	*1*
Dibromofluoromethane (Surr)	*115*		*80 - 119*		*05/20/24 14:31*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*81 - 118*		*05/17/24 18:40*	*1*
1,2-Dichloroethane-d4 (Surr)	*114*		*81 - 118*		*05/20/24 14:31*	*1*
Toluene-d8 (Surr)	*94*		*89 - 112*		*05/17/24 18:40*	*1*
Toluene-d8 (Surr)	*104*		*89 - 112*		*05/20/24 14:31*	*1*

Client Sample ID: DUP-GW-20240508

Lab Sample ID: 680-250515-4

Date Collected: 05/08/24 00:00

Matrix: Water

Date Received: 05/09/24 10:53

Method: SW846 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	25	3.7	ug/L			05/17/24 19:02	1
Benzene	1.0	U	2.0	0.27	ug/L			05/17/24 19:02	1
Bromobenzene	0.50	U	1.0	0.24	ug/L			05/17/24 19:02	1
Bromoform	2.0	U Q	2.5	0.59	ug/L			05/17/24 19:02	1
Bromomethane	10	U Q	20	3.7	ug/L			05/17/24 19:02	1
2-Butanone (MEK)	20	U	25	6.4	ug/L			05/17/24 19:02	1
Carbon disulfide	1.0	U Q	2.0	0.43	ug/L			05/17/24 19:02	1
Carbon tetrachloride	1.0	U M	2.0	0.30	ug/L			05/17/24 19:02	1
Chlorobenzene	0.50	U	1.0	0.15	ug/L			05/17/24 19:02	1
Chlorobromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 19:02	1
Chlorodibromomethane	1.0	U	2.0	0.39	ug/L			05/17/24 19:02	1
Chloroethane	10	U	20	4.6	ug/L			05/17/24 19:02	1
Chloroform	**3.6**		2.0	0.27	ug/L			05/17/24 19:02	1
Chloromethane	2.0	U M	2.5	0.54	ug/L			05/17/24 19:02	1
2-Chlorotoluene	0.50	U	1.0	0.25	ug/L			05/17/24 19:02	1
4-Chlorotoluene	1.0	U	2.0	0.41	ug/L			05/17/24 19:02	1
cis-1,2-Dichloroethene	1.0	U	2.0	0.25	ug/L			05/17/24 19:02	1
cis-1,3-Dichloropropene	1.0	U	2.0	0.26	ug/L			05/17/24 19:02	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	1.8	ug/L			05/17/24 19:02	1
Dibromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 19:02	1
1,2-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 19:02	1
1,3-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 19:02	1
1,4-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 19:02	1
Dichlorobromomethane	1.0	U	2.0	0.25	ug/L			05/17/24 19:02	1
Dichlorodifluoromethane	1.0	U Q	2.0	0.36	ug/L			05/17/24 19:02	1
1,1-Dichloroethane	1.0	U	2.0	0.33	ug/L			05/17/24 19:02	1
1,2-Dichloroethane	1.0	U	2.0	0.25	ug/L			05/17/24 19:02	1
1,1-Dichloroethene	1.0	U	2.0	0.33	ug/L			05/17/24 19:02	1
1,2-Dichloropropane	0.50	U	1.0	0.22	ug/L			05/17/24 19:02	1
1,3-Dichloropropane	1.0	U	2.0	0.36	ug/L			05/17/24 19:02	1
2,2-Dichloropropane	1.0	U	2.0	0.35	ug/L			05/17/24 19:02	1
1,1-Dichloropropene	1.0	U	2.0	0.28	ug/L			05/17/24 19:02	1

Client: Terracon Consultants, Inc.
Project/Site: Tarheel Army Missile Plant

Job ID: 680-250515-1

Client Sample ID: DUP-GW-20240508
Date Collected: 05/08/24 00:00
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-4
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Ethyl acetate	10	U	20	5.0	ug/L			05/17/24 19:02	1
Ethylbenzene	0.50	U	1.0	0.20	ug/L			05/17/24 19:02	1
Ethylene Dibromide	1.0	U	2.0	0.33	ug/L			05/17/24 19:02	1
Hexachlorobutadiene	1.0	U	5.0	0.22	ug/L			05/17/24 19:02	1
Hexane	2.0	U Q	5.0	0.65	ug/L			05/17/24 19:02	1
2-Hexanone	10	U	20	3.2	ug/L			05/17/24 19:02	1
Iodomethane	10	U Q	20	3.9	ug/L			05/17/24 19:02	1
Isopropylbenzene	1.0	U	2.0	0.26	ug/L			05/17/24 19:02	1
Isopropyl ether	2.0	U	10	0.70	ug/L			05/17/24 19:02	1
4-Isopropyltoluene	1.0	U	2.0	0.44	ug/L			05/17/24 19:02	1
Methylene Chloride	10	U	20	3.2	ug/L			05/17/24 19:02	1
4-Methyl-2-pentanone (MIBK)	10	U	20	2.7	ug/L			05/17/24 19:02	1
Methyl tert-butyl ether	2.0	U	5.0	0.81	ug/L			05/17/24 19:02	1
m-Xylene & p-Xylene	1.0	U	2.0	0.49	ug/L			05/17/24 19:02	1
Naphthalene	5.0	U	10	2.4	ug/L			05/17/24 19:02	1
n-Butylbenzene	2.0	U	2.5	0.52	ug/L			05/17/24 19:02	1
n-Heptane	1.0	U	2.0	0.43	ug/L			05/17/24 19:02	1
N-Propylbenzene	1.0	U	2.0	0.41	ug/L			05/17/24 19:02	1
o-Xylene	1.0	U	2.0	0.26	ug/L			05/17/24 19:02	1
sec-Butylbenzene	2.0	U	2.5	0.53	ug/L			05/17/24 19:02	1
Styrene	1.0	U	2.0	0.27	ug/L			05/17/24 19:02	1
tert-Butylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 19:02	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	0.36	ug/L			05/17/24 19:02	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	0.40	ug/L			05/17/24 19:02	1
Tetrachloroethene	1.0	U	2.0	0.35	ug/L			05/17/24 19:02	1
Toluene	1.0	U	2.0	0.25	ug/L			05/17/24 19:02	1
trans-1,4-Dichloro-2-butene	5.0	U	10	1.3	ug/L			05/17/24 19:02	1
trans-1,2-Dichloroethene	1.0	U	2.0	0.34	ug/L			05/17/24 19:02	1
trans-1,3-Dichloropropene	1.0	U	2.0	0.23	ug/L			05/17/24 19:02	1
1,2,3-Trichlorobenzene	2.0	U	5.0	0.81	ug/L			05/17/24 19:02	1
1,2,4-Trichlorobenzene	2.0	U	5.0	0.53	ug/L			05/17/24 19:02	1
1,1,1-Trichloroethane	0.50	U	1.0	0.21	ug/L			05/17/24 19:02	1
1,1,2-Trichloroethane	1.0	U	2.0	0.32	ug/L			05/17/24 19:02	1
Trichloroethene	**0.57**	**J**	1.0	0.20	ug/L			05/17/24 19:02	1
Trichlorofluoromethane	1.0	U Q	2.0	0.33	ug/L			05/17/24 19:02	1
1,2,3-Trichloropropane	1.0	U	2.0	0.48	ug/L			05/17/24 19:02	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	1.0	0.23	ug/L			05/17/24 19:02	1
1,2,4-Trimethylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 19:02	1
1,3,5-Trimethylbenzene	1.0	U	2.0	0.28	ug/L			05/17/24 19:02	1
Vinyl acetate	2.0	U Q	2.5	0.69	ug/L			05/17/24 19:02	1
Vinyl chloride	1.0	U M	2.0	0.40	ug/L			05/17/24 19:02	1
Xylenes, Total	1.0	U	2.0	0.49	ug/L			05/17/24 19:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*85 - 114*		*05/17/24 19:02*	*1*
Dibromofluoromethane (Surr)	*108*		*80 - 119*		*05/17/24 19:02*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*81 - 118*		*05/17/24 19:02*	*1*
Toluene-d8 (Surr)	*95*		*89 - 112*		*05/17/24 19:02*	*1*

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-838498/10
Matrix: Water
Analysis Batch: 838498

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	25	3.7	ug/L			05/17/24 13:31	1
Benzene	1.0	U	2.0	0.27	ug/L			05/17/24 13:31	1
Bromobenzene	0.50	U	1.0	0.24	ug/L			05/17/24 13:31	1
Bromoform	2.0	U	2.5	0.59	ug/L			05/17/24 13:31	1
Bromomethane	10	U	20	3.7	ug/L			05/17/24 13:31	1
2-Butanone (MEK)	20	U	25	6.4	ug/L			05/17/24 13:31	1
Carbon disulfide	1.0	U	2.0	0.43	ug/L			05/17/24 13:31	1
Carbon tetrachloride	1.0	U	2.0	0.30	ug/L			05/17/24 13:31	1
Chlorobenzene	0.50	U	1.0	0.15	ug/L			05/17/24 13:31	1
Chlorobromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 13:31	1
Chlorodibromomethane	1.0	U	2.0	0.39	ug/L			05/17/24 13:31	1
Chloroethane	10	U	20	4.6	ug/L			05/17/24 13:31	1
Chloroform	1.0	U	2.0	0.27	ug/L			05/17/24 13:31	1
Chloromethane	2.0	U	2.5	0.54	ug/L			05/17/24 13:31	1
2-Chlorotoluene	0.50	U	1.0	0.25	ug/L			05/17/24 13:31	1
4-Chlorotoluene	1.0	U	2.0	0.41	ug/L			05/17/24 13:31	1
cis-1,2-Dichloroethene	1.0	U	2.0	0.25	ug/L			05/17/24 13:31	1
cis-1,3-Dichloropropene	1.0	U	2.0	0.26	ug/L			05/17/24 13:31	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	1.8	ug/L			05/17/24 13:31	1
Dibromomethane	1.0	U	2.0	0.34	ug/L			05/17/24 13:31	1
1,2-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 13:31	1
1,3-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 13:31	1
1,4-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/17/24 13:31	1
Dichlorobromomethane	1.0	U	2.0	0.25	ug/L			05/17/24 13:31	1
Dichlorodifluoromethane	1.0	U	2.0	0.36	ug/L			05/17/24 13:31	1
1,1-Dichloroethane	1.0	U	2.0	0.33	ug/L			05/17/24 13:31	1
1,2-Dichloroethane	1.0	U	2.0	0.25	ug/L			05/17/24 13:31	1
1,1-Dichloroethene	1.0	U	2.0	0.33	ug/L			05/17/24 13:31	1
1,2-Dichloropropane	0.50	U	1.0	0.22	ug/L			05/17/24 13:31	1
1,3-Dichloropropane	1.0	U	2.0	0.36	ug/L			05/17/24 13:31	1
2,2-Dichloropropane	1.0	U	2.0	0.35	ug/L			05/17/24 13:31	1
1,1-Dichloropropene	1.0	U	2.0	0.28	ug/L			05/17/24 13:31	1
Ethyl acetate	10	U	20	5.0	ug/L			05/17/24 13:31	1
Ethylbenzene	0.50	U	1.0	0.20	ug/L			05/17/24 13:31	1
Ethylene Dibromide	1.0	U	2.0	0.33	ug/L			05/17/24 13:31	1
Hexachlorobutadiene	1.0	U	5.0	0.22	ug/L			05/17/24 13:31	1
Hexane	2.0	U	5.0	0.65	ug/L			05/17/24 13:31	1
2-Hexanone	10	U	20	3.2	ug/L			05/17/24 13:31	1
Iodomethane	10	U	20	3.9	ug/L			05/17/24 13:31	1
Isopropylbenzene	1.0	U	2.0	0.26	ug/L			05/17/24 13:31	1
Isopropyl ether	2.0	U	10	0.70	ug/L			05/17/24 13:31	1
4-Isopropyltoluene	1.0	U	2.0	0.44	ug/L			05/17/24 13:31	1
Methylene Chloride	10	U	20	3.2	ug/L			05/17/24 13:31	1
4-Methyl-2-pentanone (MIBK)	10	U	20	2.7	ug/L			05/17/24 13:31	1
Methyl tert-butyl ether	2.0	U	5.0	0.81	ug/L			05/17/24 13:31	1
m-Xylene & p-Xylene	1.0	U	2.0	0.49	ug/L			05/17/24 13:31	1
Naphthalene	5.0	U	10	2.4	ug/L			05/17/24 13:31	1
n-Butylbenzene	2.0	U	2.5	0.52	ug/L			05/17/24 13:31	1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-838498/10
Matrix: Water
Analysis Batch: 838498

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
n-Heptane	1.0	U	2.0	0.43	ug/L			05/17/24 13:31	1
N-Propylbenzene	1.0	U M	2.0	0.41	ug/L			05/17/24 13:31	1
o-Xylene	1.0	U	2.0	0.26	ug/L			05/17/24 13:31	1
sec-Butylbenzene	2.0	U	2.5	0.53	ug/L			05/17/24 13:31	1
Styrene	1.0	U	2.0	0.27	ug/L			05/17/24 13:31	1
tert-Butylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 13:31	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	0.36	ug/L			05/17/24 13:31	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	0.40	ug/L			05/17/24 13:31	1
Tetrachloroethene	1.0	U	2.0	0.35	ug/L			05/17/24 13:31	1
Toluene	1.0	U	2.0	0.25	ug/L			05/17/24 13:31	1
trans-1,4-Dichloro-2-butene	5.0	U	10	1.3	ug/L			05/17/24 13:31	1
trans-1,2-Dichloroethene	1.0	U	2.0	0.34	ug/L			05/17/24 13:31	1
trans-1,3-Dichloropropene	1.0	U	2.0	0.23	ug/L			05/17/24 13:31	1
1,2,3-Trichlorobenzene	2.0	U	5.0	0.81	ug/L			05/17/24 13:31	1
1,2,4-Trichlorobenzene	2.0	U	5.0	0.53	ug/L			05/17/24 13:31	1
1,1,1-Trichloroethane	0.50	U	1.0	0.21	ug/L			05/17/24 13:31	1
1,1,2-Trichloroethane	1.0	U	2.0	0.32	ug/L			05/17/24 13:31	1
Trichloroethene	0.50	U	1.0	0.20	ug/L			05/17/24 13:31	1
Trichlorofluoromethane	1.0	U	2.0	0.33	ug/L			05/17/24 13:31	1
1,2,3-Trichloropropane	1.0	U	2.0	0.48	ug/L			05/17/24 13:31	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	1.0	0.23	ug/L			05/17/24 13:31	1
1,2,4-Trimethylbenzene	1.0	U	2.0	0.43	ug/L			05/17/24 13:31	1
1,3,5-Trimethylbenzene	1.0	U	2.0	0.28	ug/L			05/17/24 13:31	1
Vinyl acetate	2.0	U	2.5	0.69	ug/L			05/17/24 13:31	1
Vinyl chloride	1.0	U	2.0	0.40	ug/L			05/17/24 13:31	1
Xylenes, Total	1.0	U	2.0	0.49	ug/L			05/17/24 13:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*85 - 114*		*05/17/24 13:31*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 119*		*05/17/24 13:31*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*81 - 118*		*05/17/24 13:31*	*1*
Toluene-d8 (Surr)	*98*		*89 - 112*		*05/17/24 13:31*	*1*

Lab Sample ID: LCS 680-838498/4
Matrix: Water
Analysis Batch: 838498

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	250	246		ug/L		98	39 - 160
Benzene	50.0	52.3		ug/L		105	79 - 120
Bromobenzene	50.0	50.2		ug/L		100	80 - 120
Bromoform	50.0	66.3	J1 Q	ug/L		133	66 - 130
Bromomethane	50.0	29.4		ug/L		59	53 - 141
2-Butanone (MEK)	250	248		ug/L		99	56 - 143
Carbon disulfide	50.0	53.1		ug/L		106	64 - 133
Carbon tetrachloride	50.0	54.5		ug/L		109	72 - 136
Chlorobenzene	50.0	47.6		ug/L		95	82 - 118
Chlorobromomethane	50.0	51.8		ug/L		104	78 - 123

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-838498/4
Matrix: Water
Analysis Batch: 838498

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chlorodibromomethane	50.0	55.0		ug/L		110	74 - 126
Chloroethane	50.0	44.7		ug/L		89	60 - 138
Chloroform	50.0	51.6		ug/L		103	79 - 124
Chloromethane	50.0	41.6		ug/L		83	50 - 139
2-Chlorotoluene	50.0	49.6		ug/L		99	79 - 122
4-Chlorotoluene	50.0	48.7		ug/L		97	78 - 122
cis-1,2-Dichloroethene	50.0	52.9		ug/L		106	78 - 123
cis-1,3-Dichloropropene	50.0	51.6		ug/L		103	75 - 124
1,2-Dibromo-3-Chloropropane	50.0	50.6		ug/L		101	62 - 128
Dibromomethane	50.0	51.0		ug/L		102	79 - 123
1,2-Dichlorobenzene	50.0	50.0		ug/L		100	80 - 119
1,3-Dichlorobenzene	50.0	50.4		ug/L		101	80 - 119
1,4-Dichlorobenzene	50.0	49.5		ug/L		99	79 - 118
Dichlorobromomethane	50.0	51.2		ug/L		102	79 - 125
Dichlorodifluoromethane	50.0	34.8		ug/L		70	32 - 152
1,1-Dichloroethane	50.0	53.1		ug/L		106	77 - 125
1,2-Dichloroethane	50.0	50.2		ug/L		100	73 - 128
1,1-Dichloroethene	50.0	55.0		ug/L		110	71 - 131
1,2-Dichloropropane	50.0	51.3		ug/L		103	78 - 122
1,3-Dichloropropane	50.0	51.4		ug/L		103	80 - 119
2,2-Dichloropropane	50.0	57.1		ug/L		114	60 - 139
1,1-Dichloropropene	50.0	55.1		ug/L		110	79 - 125
Ethylbenzene	50.0	47.9		ug/L		96	79 - 121
Ethylene Dibromide	50.0	51.8		ug/L		104	75 - 127
Hexachlorobutadiene	50.0	54.7		ug/L		109	66 - 134
Hexane	50.0	55.3		ug/L		111	48 - 143
2-Hexanone	250	269		ug/L		108	57 - 139
Iodomethane	50.0	46.8		ug/L		94	69 - 131
Isopropylbenzene	50.0	49.2		ug/L		98	72 - 131
4-Isopropyltoluene	50.0	49.2		ug/L		98	77 - 127
Methylene Chloride	50.0	53.5		ug/L		107	74 - 124
4-Methyl-2-pentanone (MIBK)	250	271		ug/L		109	67 - 130
Methyl tert-butyl ether	50.0	51.5		ug/L		103	71 - 124
m-Xylene & p-Xylene	50.0	49.0		ug/L		98	80 - 121
Naphthalene	50.0	49.1		ug/L		98	61 - 128
n-Butylbenzene	50.0	49.9		ug/L		100	75 - 128
n-Heptane	50.0	59.3		ug/L		119	49 - 140
N-Propylbenzene	50.0	50.0		ug/L		100	76 - 126
o-Xylene	50.0	49.8		ug/L		100	78 - 122
sec-Butylbenzene	50.0	49.0		ug/L		98	77 - 126
Styrene	50.0	50.4		ug/L		101	78 - 123
tert-Butylbenzene	50.0	48.6		ug/L		97	78 - 124
1,1,1,2-Tetrachloroethane	50.0	49.2		ug/L		98	78 - 124
1,1,2,2-Tetrachloroethane	50.0	59.0		ug/L		118	71 - 121
Tetrachloroethene	50.0	53.7		ug/L		107	74 - 129
Toluene	50.0	50.5		ug/L		101	80 - 121
trans-1,4-Dichloro-2-butene	50.0	54.7		ug/L		109	43 - 140
trans-1,2-Dichloroethene	50.0	54.5		ug/L		109	75 - 124
trans-1,3-Dichloropropene	50.0	51.1		ug/L		102	73 - 127

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-838498/4
Matrix: Water
Analysis Batch: 838498

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2,3-Trichlorobenzene	50.0	48.7		ug/L		97	69 - 129
1,2,4-Trichlorobenzene	50.0	51.3		ug/L		103	69 - 130
1,1,1-Trichloroethane	50.0	54.5		ug/L		109	74 - 131
1,1,2-Trichloroethane	50.0	51.3		ug/L		103	80 - 119
Trichloroethene	50.0	49.8		ug/L		100	79 - 123
Trichlorofluoromethane	50.0	103	Q	ug/L		206	65 - 141
1,2,3-Trichloropropane	50.0	49.1		ug/L		98	73 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	59.4		ug/L		119	70 - 136
1,2,4-Trimethylbenzene	50.0	50.4		ug/L		101	76 - 124
1,3,5-Trimethylbenzene	50.0	50.9		ug/L		102	75 - 124
Vinyl acetate	100	296	J1 Q	ug/L		296	54 - 146
Vinyl chloride	50.0	42.4		ug/L		85	58 - 137
Xylenes, Total	100	98.8		ug/L		99	79 - 121

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*85 - 114*
Dibromofluoromethane (Surr)	*105*		*80 - 119*
1,2-Dichloroethane-d4 (Surr)	*99*		*81 - 118*
Toluene-d8 (Surr)	*91*		*89 - 112*

Lab Sample ID: LCSD 680-838498/5
Matrix: Water
Analysis Batch: 838498

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acetone	250	251		ug/L		101	39 - 160	2	20
Benzene	50.0	52.1		ug/L		104	79 - 120	0	20
Bromobenzene	50.0	51.9		ug/L		104	80 - 120	3	20
Bromoform	50.0	66.7	J1 Q	ug/L		133	66 - 130	1	20
Bromomethane	50.0	30.7		ug/L		61	53 - 141	4	20
2-Butanone (MEK)	250	259		ug/L		103	56 - 143	4	20
Carbon disulfide	50.0	51.4		ug/L		103	64 - 133	3	20
Carbon tetrachloride	50.0	50.2		ug/L		100	72 - 136	8	20
Chlorobenzene	50.0	48.6		ug/L		97	82 - 118	2	20
Chlorobromomethane	50.0	52.1		ug/L		104	78 - 123	0	20
Chlorodibromomethane	50.0	54.4		ug/L		109	74 - 126	1	20
Chloroethane	50.0	46.9		ug/L		94	60 - 138	5	20
Chloroform	50.0	50.4		ug/L		101	79 - 124	2	20
Chloromethane	50.0	44.8		ug/L		90	50 - 139	7	20
2-Chlorotoluene	50.0	49.5		ug/L		99	79 - 122	0	20
4-Chlorotoluene	50.0	48.9		ug/L		98	78 - 122	0	20
cis-1,2-Dichloroethene	50.0	51.5		ug/L		103	78 - 123	3	20
cis-1,3-Dichloropropene	50.0	51.2		ug/L		102	75 - 124	1	20
1,2-Dibromo-3-Chloropropane	50.0	52.4		ug/L		105	62 - 128	3	20
Dibromomethane	50.0	51.0		ug/L		102	79 - 123	0	20
1,2-Dichlorobenzene	50.0	49.9		ug/L		100	80 - 119	0	20
1,3-Dichlorobenzene	50.0	49.1		ug/L		98	80 - 119	3	20
1,4-Dichlorobenzene	50.0	49.2		ug/L		98	79 - 118	1	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-838498/5
Matrix: Water
Analysis Batch: 838498

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Dichlorobromomethane	50.0	50.0		ug/L		100	79 - 125	2	20
Dichlorodifluoromethane	50.0	37.2		ug/L		74	32 - 152	7	20
1,1-Dichloroethane	50.0	51.8		ug/L		104	77 - 125	2	20
1,2-Dichloroethane	50.0	47.6		ug/L		95	73 - 128	5	20
1,1-Dichloroethene	50.0	53.1		ug/L		106	71 - 131	4	20
1,2-Dichloropropane	50.0	52.3		ug/L		105	78 - 122	2	20
1,3-Dichloropropane	50.0	52.0		ug/L		104	80 - 119	1	20
2,2-Dichloropropane	50.0	53.1		ug/L		106	60 - 139	7	20
1,1-Dichloropropene	50.0	53.0		ug/L		106	79 - 125	4	20
Ethylbenzene	50.0	47.7		ug/L		95	79 - 121	0	20
Ethylene Dibromide	50.0	52.7		ug/L		105	75 - 127	2	20
Hexachlorobutadiene	50.0	55.1		ug/L		110	66 - 134	1	20
Hexane	50.0	55.0		ug/L		110	48 - 143	1	20
2-Hexanone	250	276		ug/L		110	57 - 139	2	20
Iodomethane	50.0	45.7		ug/L		91	69 - 131	2	20
Isopropylbenzene	50.0	49.5		ug/L		99	72 - 131	1	20
4-Isopropyltoluene	50.0	48.4		ug/L		97	77 - 127	2	20
Methylene Chloride	50.0	53.1		ug/L		106	74 - 124	1	20
4-Methyl-2-pentanone (MIBK)	250	278		ug/L		111	67 - 130	2	20
Methyl tert-butyl ether	50.0	51.0		ug/L		102	71 - 124	1	20
m-Xylene & p-Xylene	50.0	48.7		ug/L		97	80 - 121	0	20
Naphthalene	50.0	50.5		ug/L		101	61 - 128	3	20
n-Butylbenzene	50.0	48.5		ug/L		97	75 - 128	3	20
n-Heptane	50.0	58.0		ug/L		116	49 - 140	2	20
N-Propylbenzene	50.0	50.0		ug/L		100	76 - 126	0	20
o-Xylene	50.0	50.2		ug/L		100	78 - 122	1	20
sec-Butylbenzene	50.0	49.5		ug/L		99	77 - 126	1	20
Styrene	50.0	51.0		ug/L		102	78 - 123	1	20
tert-Butylbenzene	50.0	49.0		ug/L		98	78 - 124	1	20
1,1,1,2-Tetrachloroethane	50.0	49.7		ug/L		99	78 - 124	1	20
1,1,2,2-Tetrachloroethane	50.0	58.5		ug/L		117	71 - 121	1	20
Tetrachloroethene	50.0	54.1		ug/L		108	74 - 129	1	20
Toluene	50.0	50.6		ug/L		101	80 - 121	0	20
trans-1,4-Dichloro-2-butene	50.0	53.4		ug/L		107	43 - 140	2	20
trans-1,2-Dichloroethene	50.0	53.3		ug/L		107	75 - 124	2	20
trans-1,3-Dichloropropene	50.0	51.4		ug/L		103	73 - 127	1	20
1,2,3-Trichlorobenzene	50.0	49.3		ug/L		99	69 - 129	1	20
1,2,4-Trichlorobenzene	50.0	52.3		ug/L		105	69 - 130	2	20
1,1,1-Trichloroethane	50.0	51.0		ug/L		102	74 - 131	7	20
1,1,2-Trichloroethane	50.0	52.1		ug/L		104	80 - 119	1	20
Trichloroethene	50.0	49.7		ug/L		99	79 - 123	0	20
Trichlorofluoromethane	50.0	104	Q	ug/L		209	65 - 141	1	20
1,2,3-Trichloropropane	50.0	50.4		ug/L		101	73 - 122	3	20
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	58.2		ug/L		116	70 - 136	2	20
1,2,4-Trimethylbenzene	50.0	50.9		ug/L		102	76 - 124	1	20
1,3,5-Trimethylbenzene	50.0	51.1		ug/L		102	75 - 124	1	20
Vinyl acetate	100	285	J1 Q	ug/L		285	54 - 146	4	20
Vinyl chloride	50.0	46.1		ug/L		92	58 - 137	8	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-838498/5
Matrix: Water
Analysis Batch: 838498

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Xylenes, Total			100	98.9		ug/L		99	79 - 121	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*85 - 114*
Dibromofluoromethane (Surr)	*103*		*80 - 119*
1,2-Dichloroethane-d4 (Surr)	*92*		*81 - 118*
Toluene-d8 (Surr)	*92*		*89 - 112*

Lab Sample ID: MB 680-838791/8
Matrix: Water
Analysis Batch: 838791

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	25	3.7	ug/L			05/20/24 12:40	1
Benzene	1.0	U	2.0	0.27	ug/L			05/20/24 12:40	1
Bromobenzene	0.50	U	1.0	0.24	ug/L			05/20/24 12:40	1
Bromoform	2.0	U	2.5	0.59	ug/L			05/20/24 12:40	1
Bromomethane	10	U	20	3.7	ug/L			05/20/24 12:40	1
2-Butanone (MEK)	20	U	25	6.4	ug/L			05/20/24 12:40	1
Carbon disulfide	1.0	U	2.0	0.43	ug/L			05/20/24 12:40	1
Carbon tetrachloride	1.0	U	2.0	0.30	ug/L			05/20/24 12:40	1
Chlorobenzene	0.50	U	1.0	0.15	ug/L			05/20/24 12:40	1
Chlorobromomethane	1.0	U	2.0	0.34	ug/L			05/20/24 12:40	1
Chlorodibromomethane	1.0	U	2.0	0.39	ug/L			05/20/24 12:40	1
Chloroethane	10	U	20	4.6	ug/L			05/20/24 12:40	1
Chloroform	1.0	U	2.0	0.27	ug/L			05/20/24 12:40	1
Chloromethane	2.0	U	2.5	0.54	ug/L			05/20/24 12:40	1
2-Chlorotoluene	0.50	U	1.0	0.25	ug/L			05/20/24 12:40	1
4-Chlorotoluene	1.0	U	2.0	0.41	ug/L			05/20/24 12:40	1
cis-1,2-Dichloroethene	1.0	U	2.0	0.25	ug/L			05/20/24 12:40	1
cis-1,3-Dichloropropene	1.0	U	2.0	0.26	ug/L			05/20/24 12:40	1
1,2-Dibromo-3-Chloropropane	5.0	U	10	1.8	ug/L			05/20/24 12:40	1
Dibromomethane	1.0	U	2.0	0.34	ug/L			05/20/24 12:40	1
1,2-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/20/24 12:40	1
1,3-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/20/24 12:40	1
1,4-Dichlorobenzene	1.0	U	2.0	0.31	ug/L			05/20/24 12:40	1
Dichlorobromomethane	1.0	U	2.0	0.25	ug/L			05/20/24 12:40	1
Dichlorodifluoromethane	1.0	U	2.0	0.36	ug/L			05/20/24 12:40	1
1,1-Dichloroethane	1.0	U	2.0	0.33	ug/L			05/20/24 12:40	1
1,2-Dichloroethane	1.0	U M	2.0	0.25	ug/L			05/20/24 12:40	1
1,1-Dichloroethene	1.0	U	2.0	0.33	ug/L			05/20/24 12:40	1
1,2-Dichloropropane	0.50	U	1.0	0.22	ug/L			05/20/24 12:40	1
1,3-Dichloropropane	1.0	U	2.0	0.36	ug/L			05/20/24 12:40	1
2,2-Dichloropropane	1.0	U	2.0	0.35	ug/L			05/20/24 12:40	1
1,1-Dichloropropene	1.0	U	2.0	0.28	ug/L			05/20/24 12:40	1
Ethyl acetate	NC		20	5.0	ug/L			05/20/24 12:40	1
Ethylbenzene	0.50	U M	1.0	0.20	ug/L			05/20/24 12:40	1
Ethylene Dibromide	1.0	U	2.0	0.33	ug/L			05/20/24 12:40	1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-838791/8
Matrix: Water
Analysis Batch: 838791

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachlorobutadiene	1.0	U	5.0	0.22	ug/L			05/20/24 12:40	1
Hexane	2.0	U	5.0	0.65	ug/L			05/20/24 12:40	1
2-Hexanone	10	U	20	3.2	ug/L			05/20/24 12:40	1
Iodomethane	10	U	20	3.9	ug/L			05/20/24 12:40	1
Isopropylbenzene	1.0	U	2.0	0.26	ug/L			05/20/24 12:40	1
Isopropyl ether	NC		10	0.70	ug/L			05/20/24 12:40	1
4-Isopropyltoluene	1.0	U	2.0	0.44	ug/L			05/20/24 12:40	1
Methylene Chloride	10	U	20	3.2	ug/L			05/20/24 12:40	1
4-Methyl-2-pentanone (MIBK)	10	U	20	2.7	ug/L			05/20/24 12:40	1
Methyl tert-butyl ether	2.0	U	5.0	0.81	ug/L			05/20/24 12:40	1
m-Xylene & p-Xylene	1.0	U	2.0	0.49	ug/L			05/20/24 12:40	1
Naphthalene	5.0	U	10	2.4	ug/L			05/20/24 12:40	1
n-Butylbenzene	2.0	U	2.5	0.52	ug/L			05/20/24 12:40	1
n-Heptane	1.0	U	2.0	0.43	ug/L			05/20/24 12:40	1
N-Propylbenzene	1.0	U	2.0	0.41	ug/L			05/20/24 12:40	1
o-Xylene	1.0	U	2.0	0.26	ug/L			05/20/24 12:40	1
sec-Butylbenzene	2.0	U	2.5	0.53	ug/L			05/20/24 12:40	1
Styrene	1.0	U	2.0	0.27	ug/L			05/20/24 12:40	1
tert-Butylbenzene	1.0	U	2.0	0.43	ug/L			05/20/24 12:40	1
1,1,1,2-Tetrachloroethane	1.0	U	2.0	0.36	ug/L			05/20/24 12:40	1
1,1,2,2-Tetrachloroethane	1.0	U	2.0	0.40	ug/L			05/20/24 12:40	1
Tetrachloroethene	1.0	U	2.0	0.35	ug/L			05/20/24 12:40	1
Toluene	1.0	U	2.0	0.25	ug/L			05/20/24 12:40	1
trans-1,4-Dichloro-2-butene	5.0	U	10	1.3	ug/L			05/20/24 12:40	1
trans-1,2-Dichloroethene	1.0	U	2.0	0.34	ug/L			05/20/24 12:40	1
trans-1,3-Dichloropropene	1.0	U	2.0	0.23	ug/L			05/20/24 12:40	1
1,2,3-Trichlorobenzene	2.0	U	5.0	0.81	ug/L			05/20/24 12:40	1
1,2,4-Trichlorobenzene	2.0	U	5.0	0.53	ug/L			05/20/24 12:40	1
1,1,1-Trichloroethane	0.50	U	1.0	0.21	ug/L			05/20/24 12:40	1
1,1,2-Trichloroethane	1.0	U	2.0	0.32	ug/L			05/20/24 12:40	1
Trichloroethene	0.50	U	1.0	0.20	ug/L			05/20/24 12:40	1
Trichlorofluoromethane	1.0	U	2.0	0.33	ug/L			05/20/24 12:40	1
1,2,3-Trichloropropane	1.0	U	2.0	0.48	ug/L			05/20/24 12:40	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	1.0	0.23	ug/L			05/20/24 12:40	1
1,2,4-Trimethylbenzene	1.0	U	2.0	0.43	ug/L			05/20/24 12:40	1
1,3,5-Trimethylbenzene	1.0	U	2.0	0.28	ug/L			05/20/24 12:40	1
Vinyl acetate	2.0	U M	2.5	0.69	ug/L			05/20/24 12:40	1
Vinyl chloride	1.0	U	2.0	0.40	ug/L			05/20/24 12:40	1
Xylenes, Total	1.0	U	2.0	0.49	ug/L			05/20/24 12:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*85 - 114*		*05/20/24 12:40*	*1*
Dibromofluoromethane (Surr)	*112*		*80 - 119*		*05/20/24 12:40*	*1*
1,2-Dichloroethane-d4 (Surr)	*112*		*81 - 118*		*05/20/24 12:40*	*1*
Toluene-d8 (Surr)	*107*		*89 - 112*		*05/20/24 12:40*	*1*

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-838791/4
Matrix: Water
Analysis Batch: 838791

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	250	205		ug/L		82	39 - 160
Benzene	50.0	54.5		ug/L		109	79 - 120
Bromobenzene	50.0	49.6		ug/L		99	80 - 120
Bromoform	50.0	42.6		ug/L		85	66 - 130
Bromomethane	50.0	49.6		ug/L		99	53 - 141
2-Butanone (MEK)	250	235		ug/L		94	56 - 143
Carbon disulfide	50.0	51.6		ug/L		103	64 - 133
Carbon tetrachloride	50.0	56.4		ug/L		113	72 - 136
Chlorobenzene	50.0	48.6		ug/L		97	82 - 118
Chlorobromomethane	50.0	55.9		ug/L		112	78 - 123
Chlorodibromomethane	50.0	49.7		ug/L		99	74 - 126
Chloroethane	50.0	53.4		ug/L		107	60 - 138
Chloroform	50.0	56.3		ug/L		113	79 - 124
Chloromethane	50.0	51.9		ug/L		104	50 - 139
2-Chlorotoluene	50.0	49.8		ug/L		100	79 - 122
4-Chlorotoluene	50.0	49.1		ug/L		98	78 - 122
cis-1,2-Dichloroethene	50.0	56.0		ug/L		112	78 - 123
cis-1,3-Dichloropropene	50.0	52.8		ug/L		106	75 - 124
1,2-Dibromo-3-Chloropropane	50.0	41.4		ug/L		83	62 - 128
Dibromomethane	50.0	50.4		ug/L		101	79 - 123
1,2-Dichlorobenzene	50.0	45.8		ug/L		92	80 - 119
1,3-Dichlorobenzene	50.0	46.7		ug/L		93	80 - 119
1,4-Dichlorobenzene	50.0	46.3		ug/L		93	79 - 118
Dichlorobromomethane	50.0	53.4		ug/L		107	79 - 125
Dichlorodifluoromethane	50.0	47.8		ug/L		96	32 - 152
1,1-Dichloroethane	50.0	54.7		ug/L		109	77 - 125
1,2-Dichloroethane	50.0	56.1		ug/L		112	73 - 128
1,1-Dichloroethene	50.0	58.0		ug/L		116	71 - 131
1,2-Dichloropropane	50.0	54.0		ug/L		108	78 - 122
1,3-Dichloropropane	50.0	51.9		ug/L		104	80 - 119
2,2-Dichloropropane	50.0	56.4		ug/L		113	60 - 139
1,1-Dichloropropene	50.0	55.0		ug/L		110	79 - 125
Ethylbenzene	50.0	49.4		ug/L		99	79 - 121
Ethylene Dibromide	50.0	50.4		ug/L		101	75 - 127
Hexachlorobutadiene	50.0	50.2		ug/L		100	66 - 134
Hexane	50.0	53.7		ug/L		107	48 - 143
2-Hexanone	250	249		ug/L		100	57 - 139
Iodomethane	50.0	56.8		ug/L		114	69 - 131
Isopropylbenzene	50.0	49.5		ug/L		99	72 - 131
4-Isopropyltoluene	50.0	47.0		ug/L		94	77 - 127
Methylene Chloride	50.0	53.2		ug/L		106	74 - 124
4-Methyl-2-pentanone (MIBK)	250	255		ug/L		102	67 - 130
Methyl tert-butyl ether	50.0	55.6		ug/L		111	71 - 124
m-Xylene & p-Xylene	50.0	50.0		ug/L		100	80 - 121
Naphthalene	50.0	43.2		ug/L		86	61 - 128
n-Butylbenzene	50.0	52.0		ug/L		104	75 - 128
n-Heptane	50.0	52.5		ug/L		105	49 - 140
N-Propylbenzene	50.0	49.1		ug/L		98	76 - 126

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-838791/4
Matrix: Water
Analysis Batch: 838791

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
o-Xylene	50.0	49.1		ug/L		98	78 - 122
sec-Butylbenzene	50.0	52.8		ug/L		106	77 - 126
Styrene	50.0	49.9		ug/L		100	78 - 123
tert-Butylbenzene	50.0	52.9		ug/L		106	78 - 124
1,1,1,2-Tetrachloroethane	50.0	49.5		ug/L		99	78 - 124
1,1,2,2-Tetrachloroethane	50.0	44.0		ug/L		88	71 - 121
Tetrachloroethene	50.0	51.7		ug/L		103	74 - 129
Toluene	50.0	50.9		ug/L		102	80 - 121
trans-1,4-Dichloro-2-butene	50.0	46.3		ug/L		93	43 - 140
trans-1,2-Dichloroethene	50.0	56.4		ug/L		113	75 - 124
trans-1,3-Dichloropropene	50.0	51.2		ug/L		102	73 - 127
1,2,3-Trichlorobenzene	50.0	46.3		ug/L		93	69 - 129
1,2,4-Trichlorobenzene	50.0	44.2		ug/L		88	69 - 130
1,1,1-Trichloroethane	50.0	55.1		ug/L		110	74 - 131
1,1,2-Trichloroethane	50.0	51.5		ug/L		103	80 - 119
Trichloroethene	50.0	55.7		ug/L		111	79 - 123
Trichlorofluoromethane	50.0	48.3		ug/L		97	65 - 141
1,2,3-Trichloropropane	50.0	44.6		ug/L		89	73 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	50.0	57.1		ug/L		114	70 - 136
1,2,4-Trimethylbenzene	50.0	47.6		ug/L		95	76 - 124
1,3,5-Trimethylbenzene	50.0	51.5		ug/L		103	75 - 124
Vinyl acetate	100	139		ug/L		139	54 - 146
Vinyl chloride	50.0	51.2		ug/L		102	58 - 137
Xylenes, Total	100	99.1		ug/L		99	79 - 121

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*91*		*85 - 114*
Dibromofluoromethane (Surr)	*111*		*80 - 119*
1,2-Dichloroethane-d4 (Surr)	*108*		*81 - 118*
Toluene-d8 (Surr)	*108*		*89 - 112*

Lab Sample ID: LCSD 680-838791/5
Matrix: Water
Analysis Batch: 838791

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acetone	250	216		ug/L		87	39 - 160	5	20
Benzene	50.0	54.5		ug/L		109	79 - 120	0	20
Bromobenzene	50.0	49.2		ug/L		98	80 - 120	1	20
Bromoform	50.0	43.4		ug/L		87	66 - 130	2	20
Bromomethane	50.0	52.0		ug/L		104	53 - 141	5	20
2-Butanone (MEK)	250	244		ug/L		98	56 - 143	4	20
Carbon disulfide	50.0	49.4		ug/L		99	64 - 133	4	20
Carbon tetrachloride	50.0	53.6		ug/L		107	72 - 136	5	20
Chlorobenzene	50.0	47.5		ug/L		95	82 - 118	2	20
Chlorobromomethane	50.0	56.5		ug/L		113	78 - 123	1	20
Chlorodibromomethane	50.0	50.5		ug/L		101	74 - 126	2	20
Chloroethane	50.0	52.3		ug/L		105	60 - 138	2	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-838791/5
Matrix: Water
Analysis Batch: 838791

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloroform	50.0	55.5		ug/L		111	79 - 124	1	20
Chloromethane	50.0	51.1		ug/L		102	50 - 139	2	20
2-Chlorotoluene	50.0	48.4		ug/L		97	79 - 122	3	20
4-Chlorotoluene	50.0	48.9		ug/L		98	78 - 122	0	20
cis-1,2-Dichloroethene	50.0	54.7		ug/L		109	78 - 123	2	20
cis-1,3-Dichloropropene	50.0	53.3		ug/L		107	75 - 124	1	20
1,2-Dibromo-3-Chloropropane	50.0	43.4		ug/L		87	62 - 128	5	20
Dibromomethane	50.0	51.4		ug/L		103	79 - 123	2	20
1,2-Dichlorobenzene	50.0	46.2		ug/L		92	80 - 119	1	20
1,3-Dichlorobenzene	50.0	46.6		ug/L		93	80 - 119	0	20
1,4-Dichlorobenzene	50.0	46.9		ug/L		94	79 - 118	1	20
Dichlorobromomethane	50.0	53.0		ug/L		106	79 - 125	1	20
Dichlorodifluoromethane	50.0	46.5		ug/L		93	32 - 152	3	20
1,1-Dichloroethane	50.0	53.4		ug/L		107	77 - 125	3	20
1,2-Dichloroethane	50.0	55.0		ug/L		110	73 - 128	2	20
1,1-Dichloroethene	50.0	55.7		ug/L		111	71 - 131	4	20
1,2-Dichloropropane	50.0	53.4		ug/L		107	78 - 122	1	20
1,3-Dichloropropane	50.0	53.1		ug/L		106	80 - 119	2	20
2,2-Dichloropropane	50.0	54.1		ug/L		108	60 - 139	4	20
1,1-Dichloropropene	50.0	54.1		ug/L		108	79 - 125	2	20
Ethylbenzene	50.0	48.5		ug/L		97	79 - 121	2	20
Ethylene Dibromide	50.0	52.2		ug/L		104	75 - 127	4	20
Hexachlorobutadiene	50.0	48.7		ug/L		97	66 - 134	3	20
Hexane	50.0	50.2		ug/L		100	48 - 143	7	20
2-Hexanone	250	260		ug/L		104	57 - 139	4	20
Iodomethane	50.0	54.7		ug/L		109	69 - 131	4	20
Isopropylbenzene	50.0	47.7		ug/L		95	72 - 131	4	20
4-Isopropyltoluene	50.0	45.4		ug/L		91	77 - 127	4	20
Methylene Chloride	50.0	52.9		ug/L		106	74 - 124	1	20
4-Methyl-2-pentanone (MIBK)	250	263		ug/L		105	67 - 130	3	20
Methyl tert-butyl ether	50.0	56.4		ug/L		113	71 - 124	1	20
m-Xylene & p-Xylene	50.0	48.3		ug/L		97	80 - 121	3	20
Naphthalene	50.0	44.0		ug/L		88	61 - 128	2	20
n-Butylbenzene	50.0	49.5		ug/L		99	75 - 128	5	20
n-Heptane	50.0	48.7		ug/L		97	49 - 140	8	20
N-Propylbenzene	50.0	47.8		ug/L		96	76 - 126	3	20
o-Xylene	50.0	48.0		ug/L		96	78 - 122	2	20
sec-Butylbenzene	50.0	50.3		ug/L		101	77 - 126	5	20
Styrene	50.0	49.4		ug/L		99	78 - 123	1	20
tert-Butylbenzene	50.0	50.8		ug/L		102	78 - 124	4	20
1,1,1,2-Tetrachloroethane	50.0	49.2		ug/L		98	78 - 124	1	20
1,1,2,2-Tetrachloroethane	50.0	45.6		ug/L		91	71 - 121	4	20
Tetrachloroethene	50.0	50.3		ug/L		101	74 - 129	3	20
Toluene	50.0	49.7		ug/L		99	80 - 121	2	20
trans-1,4-Dichloro-2-butene	50.0	45.9		ug/L		92	43 - 140	1	20
trans-1,2-Dichloroethene	50.0	53.9		ug/L		108	75 - 124	4	20
trans-1,3-Dichloropropene	50.0	51.3		ug/L		103	73 - 127	0	20
1,2,3-Trichlorobenzene	50.0	47.4		ug/L		95	69 - 129	2	20
1,2,4-Trichlorobenzene	50.0	44.5		ug/L		89	69 - 130	0	20

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-838791/5
Matrix: Water
Analysis Batch: 838791

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane			50.0	53.6		ug/L		107	74 - 131	3	20
1,1,2-Trichloroethane			50.0	51.5		ug/L		103	80 - 119	0	20
Trichloroethene			50.0	54.4		ug/L		109	79 - 123	2	20
Trichlorofluoromethane			50.0	41.9		ug/L		84	65 - 141	14	20
1,2,3-Trichloropropane			50.0	46.1		ug/L		92	73 - 122	3	20
1,1,2-Trichloro-1,2,2-trifluoroethane			50.0	53.8		ug/L		108	70 - 136	6	20
1,2,4-Trimethylbenzene			50.0	46.6		ug/L		93	76 - 124	2	20
1,3,5-Trimethylbenzene			50.0	49.4		ug/L		99	75 - 124	4	20
Vinyl acetate			100	137		ug/L		137	54 - 146	1	20
Vinyl chloride			50.0	50.0		ug/L		100	58 - 137	2	20
Xylenes, Total			100	96.3		ug/L		96	79 - 121	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*91*		*85 - 114*
Dibromofluoromethane (Surr)	*113*		*80 - 119*
1,2-Dichloroethane-d4 (Surr)	*107*		*81 - 118*
Toluene-d8 (Surr)	*107*		*89 - 112*

QC Association Summary

Client: Terracon Consultants, Inc.
Project/Site: Tarheel Army Missile Plant

Job ID: 680-250515-1

GC/MS VOA

Analysis Batch: 838498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-250515-1	MW-148	Total/NA	Water	8260D	
680-250515-2	MW-147	Total/NA	Water	8260D	
680-250515-3	MW-142	Total/NA	Water	8260D	
680-250515-4	DUP-GW-20240508	Total/NA	Water	8260D	
MB 680-838498/10	Method Blank	Total/NA	Water	8260D	
LCS 680-838498/4	Lab Control Sample	Total/NA	Water	8260D	
LCSD 680-838498/5	Lab Control Sample Dup	Total/NA	Water	8260D	

Analysis Batch: 838791

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-250515-3	MW-142	Total/NA	Water	8260D	
MB 680-838791/8	Method Blank	Total/NA	Water	8260D	
LCS 680-838791/4	Lab Control Sample	Total/NA	Water	8260D	
LCSD 680-838791/5	Lab Control Sample Dup	Total/NA	Water	8260D	

Lab Chronicle

Client: Terracon Consultants, Inc.
Project/Site: Tarheel Army Missile Plant

Job ID: 680-250515-1

Client Sample ID: MW-148

Date Collected: 05/08/24 15:45
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	5 mL	5 mL	838498	05/17/24 17:54	P1C	EET SAV
	Instrument ID: CMSAB									

Client Sample ID: MW-147

Date Collected: 05/08/24 16:05
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	5 mL	5 mL	838498	05/17/24 18:17	P1C	EET SAV
	Instrument ID: CMSAB									

Client Sample ID: MW-142

Date Collected: 05/08/24 16:35
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	5 mL	5 mL	838498	05/17/24 18:40	P1C	EET SAV
	Instrument ID: CMSAB									
Total/NA	Analysis	8260D		1	5 mL	5 mL	838791	05/20/24 14:31	P1C	EET SAV
	Instrument ID: CMSAH									

Client Sample ID: DUP-GW-20240508

Date Collected: 05/08/24 00:00
Date Received: 05/09/24 10:53

Lab Sample ID: 680-250515-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	5 mL	5 mL	838498	05/17/24 19:02	P1C	EET SAV
	Instrument ID: CMSAB									

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Terracon Consultants, Inc.
Job ID: 680-250515-1
Project/Site: Tarheel Army Missile Plant

Laboratory: Eurofins Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
North Carolina (WW/SW)	State	269	12-31-24

Method Summary

Client: Terracon Consultants, Inc.
Project/Site: Tarheel Army Missile Plant

Job ID: 680-250515-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds (GC/MS)	SW846	EET SAV
5030C	Purge and Trap	SW846	EET SAV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Eurofins Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

* send results to ethan.dinwiddie@terracon.com *

eurofins | Environment Testing

Client Information	Sampler: Alexander Manoiukas	Lab PM: Bechtold, Chad	Carrier Tracking No(s):	COC No: 680-156305-56029.1
Client Contact: Mr. Ethan Dinwiddie	Phone:	E-Mail: Chad.Bechtold@et.eurofinsus.com	State of Origin: NC	Page: Page 1 of 1
Company: Terracon Consultants, Inc.	PWSID:	Analysis Requested		Job #:
Address: 2401 Brentwood Road Suite 107	Due Date Requested:			Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:
City: Raleigh	TAT Requested (days):			
State, Zip: NC, 27604	Compliance Project: Δ Yes Δ No			
Phone: 919-436-2965(Tel)	PO #: 70237017			
Email: ethan.dinwiddie@terracon.com	WO #: 70237017			
Project Name: Tarheel Army Missile Plant	Project #: 68030576			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260D - VOCs-NC 02L List - Water	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A		
MW-148	5/8/24	1545	G	W			X		
MW-147	"	1605	G	W			X		
MW-142	"	1635	G	W			X		
DUP - GW - 20240508	"	—	G	W			X		
Trip Blank	—	—	—	W			X		On hold

680-250515 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed
☐ Return To Client ☐ Disposal By ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	5-8-24 / 1845	Terracon		5-9-24 1053	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.2 / 1.3

Login Sample Receipt Checklist

Client: Terracon Consultants, Inc.

Job Number: 680-250515-1

Login Number: 250515

List Source: Eurofins Savannah

List Number: 1

Creator: Sims, Robert D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix E

NCDEQ Risk Calculator Results

North Carolina Department of Environmental Quality
Risk Calculator

Version Date:	February 2024
Basis:	November 2023 EPA RSL Table
Site Name:	TAMP - Interim Action Completion Report Data Gap Assessment
Site Address:	204 N. Graham-Hopedale Road, Burlington, North Carolina
DEQ Section:	Federal Remediation Branch
Site ID:	NC7210020544
Exposure Unit ID:	Former Lucent Technologies Building (201 N. Cobb Ave)
Submittal Date:	7/8/2024
Prepared By:	Matilynn Maltba, PG
Reviewed By:	Donald Malone, PE

Table of Contents **TOC**

Version Date: February 2024
Basis: November 2023 EPA RSL Table

Site ID: NC7210020544

Exposure Unit ID: Former Lucent Technologies Building (201 N. Cobb Ave)

Form No.	Description	Check box if included
	DATA INPUT SHEETS	
	Input Section 1 - Exposure Pathways & Parameters	
Input Form 1A	Complete Exposure Pathways	☐
Input Form 1B	Exposure Factors and Target Risks	☐
Input Form 1C	Contaminant Migration Parameters	☐
Input Form 1D	Sample Statistics	☐
	Input Section 2 - Exposure Point Concentrations	
Input Form 2A	Soil Exposure Point Concentration Table	☐
Input Form 2B	Groundwater Exposure Point Concentration Table	☑
Input Form 2C	Surface Water Exposure Point Concentration Table	☐
Input Form 2D	Soil Gas Exposure Point Concentration Table	☑
Input Form 2E	Indoor Air Exposure Point Concentration Table	☐
	DATA OUTPUT SHEETS	
	Output Section 1 - Summary Output for All Calculators	
Output Form 1A	Risk for Individual Pathways	☑
Output Form 1B	Sitewide Risk	☐
	Output Section 2 - Direct Contact Soil and Groundwater Calculators	
Output Form 2A	Resident Soil	☐
Output Form 2B	Resident Groundwater Use	☐
Output Form 2C	Non-Residential Worker Soil	☐
Output Form 2D	Non-Residential Worker Groundwater Use	☐
Output Form 2E	Construction Worker Soil	☐
Output Form 2F	Recreator/Trespasser Soil	☐
Output Form 2G	Recreator/Trespasser Surface Water	☐
	Output Section 3 - Vapor Intrusion Calculators	
Output Form 3A	Resident Groundwater to Indoor Air	☑
Output Form 3B	Resident Soil Gas to Indoor Air	☑
Output Form 3C	Resident Indoor Air	☐
Output Form 3D	Non-Residential Worker Groundwater to Indoor Air	☑
Output Form 3E	Non-Residential Worker Soil Gas to Indoor Air	☑
Output Form 3F	Non-Residential Worker Indoor Air	☐
	Output Section 4 - Contaminant Migration Worksheets	
Output Form 4A	Soil to Groundwater - Forward Mode	☐
Output Form 4B	Groundwater to Groundwater - Forward Mode	☐
Output Form 4C	Soil to Surface Water - Forward Mode	☐
Output Form 4D	Groundwater to Surface Water - Forward Mode	☐
Output Form 4E	Soil to Groundwater - Backward Mode	☐
Output Form 4F	Groundwater to Groundwater - Backward Mode	☐
Output Form 4G	Soil to Surface Water - Backward Mode	☐
Output Form 4H	Groundwater to Surface Water - Backward Mode	☐

Complete Exposure Pathways	Input Form 1A

Version Date: February 2024
Basis: November 2023 EPA RSL Table
Site ID: NC7210020544

Exposure Unit ID: Former Lucent Technologies Building (201 N. Cobb Ave)

Note: Risk output will only be calculated for complete exposure pathways.

Receptor	Pathway	Check box if pathway complete
DIRECT CONTACT SOIL AND WATER PATHWAYS		
Resident	Soil	☐
	Groundwater Use	☐
Non-Residential Worker	Soil	☐
	Groundwater Use	☐
Construction Worker	Soil	☐
Recreator/Trespasser	Soil	☐
	Surface Water	☐
VAPOR INTRUSION PATHWAYS		
Resident	Groundwater to Indoor Air	☑
	Soil Gas to Indoor Air	☑
	Indoor Air	☐
Non-Residential Worker	Groundwater to Indoor Air	☑
	Soil Gas to Indoor Air	☑
	Indoor Air	☐
CONTAMINANT MIGRATION PATHWAYS		
Groundwater	Source Soil	☐
	Source Groundwater	☐
Surface Water	Source Soil	☐
	Source Groundwater	☐

Exposure Point Concentrations **Input Form 2D**

Version Date: February 2024

Basis: November 2023 EPA RSL Table

Site ID: NC7210020544

Exposure Unit ID: Former Lucent Technologies Building (201 N. Cobb Ave)

Soil Gas Exposure Point Concentration Table

Description of Exposure Point Concentration Selection:

Maximum concentrations for each detected analyte from soil gas sample collected in March 2024.

Note: Chemicals highlighted in orange are non-volatile chemicals. Since these chemicals do not pose a vapor intrusion risk, no risk values are calculated for these chemicals.

If the chemical list is changed from a prior calculator run, remember to select "See All Chemicals" on the data output sheet or newly added chemicals will not be included in risk calculations

Exposure Point Concentration (ug/m^3)	Notes:	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value	Screening Toxicity Value (Screening Level) (n/c)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
92		67-64-1	Acetone			ug/m^3	SV-15									
34		71-43-2	Benzene			ug/m^3	SV-15									
48		75-15-0	Carbon Disulfide			ug/m^3	SV-16									
58		110-82-7	Cyclohexane			ug/m^3	SV-15									
18		75-35-4	Dichloroethylene, 1,1-			ug/m^3	SV-15									
1300		156-59-2	Dichloroethylene, cis-1,2-			ug/m^3	SV-15									
93		156-60-5	Dichloroethylene, trans-1,2-			ug/m^3	SV-15									
27		100-41-4	Ethylbenzene			ug/m^3	SV-16									
72		109-99-9	~Tetrahydrofuran			ug/m^3	SV-15									
38		142-82-5	Heptane, N-			ug/m^3	SV-16									
54		110-54-3	Hexane, N-			ug/m^3	SV-16									
13		103-65-1	Propyl benzene			ug/m^3	SV-16									
3800		127-18-4	Tetrachloroethylene			ug/m^3	SV-13									
110		108-88-3	Toluene			ug/m^3	SV-16									
340		76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-			ug/m^3	SV-13									
16		71-55-6	Trichloroethane, 1,1,1-			ug/m^3	SV-13									
390		79-01-6	Trichloroethylene			ug/m^3	SV-13									
38		75-69-4	Trichlorofluoromethane			ug/m^3	SV-14									
83		95-63-6	Trimethylbenzene, 1,2,4-			ug/m^3	SV-16									
27		108-67-8	Trimethylbenzene, 1,3,5-			ug/m^3	SV-16									
400		75-01-4	Vinyl Chloride			ug/m^3	SV-15									
110		108-38-3	Xylene, m-			ug/m^3	SV-16									
27		95-47-6	Xylene, o-			ug/m^3	SV-16									

Risk for Individual Pathways **Output Form 1A**

Version Date: February 2024

Basis: November 2023 EPA RSL Table

Site ID: NC7210020544

Exposure Unit ID: Former Lucent Technologies Building (201 N. Cobb Ave)

DIRECT CONTACT SOIL AND WATER CALCULATORS

Receptor	Pathway	Carcinogenic Risk	Hazard Index	Risk exceeded?
Resident	Soil	NC	NC	NC
	Groundwater Use*	NC	NC	NC
Non-Residential Worker	Soil	NC	NC	NC
	Groundwater Use*	NC	NC	NC
Construction Worker	Soil	NC	NC	NC
Recreator/Trespasser	Soil	NC	NC	NC
	Surface Water*	NC	NC	NC

VAPOR INTRUSION CALCULATORS

Receptor	Pathway	Carcinogenic Risk	Hazard Index	Risk exceeded?
Resident	Groundwater to Indoor Air	1.2E-04	2.5E+01	YES
	Soil Gas to Indoor Air	1.1E-04	9.6E+00	YES
	Indoor Air	NC	NC	NC
Non-Residential Worker	Groundwater to Indoor Air	2.0E-05	6.0E+00	YES
	Soil Gas to Indoor Air	3.8E-06	7.6E-01	NO
	Indoor Air	NC	NC	NC

CONTAMINANT MIGRATION CALCULATORS

Pathway	Source	Target Receptor Concentrations Exceeded?	
Groundwater	Source Soil	Exceedence of 2L at Receptor?	NC
	Source Groundwater	Exceedence of 2L at Receptor?	NC
Surface Water	Source Soil	Exceedence of 2B at Receptor?	NC
	Source Groundwater	Exceedence of 2B at Receptor?	NC

Notes:

1. If lead concentrations were entered in the exposure point concentration tables, see the individual calculator sheets for lead concentrations in comparison to screening levels. Note that lead is not included in cumulative risk calculations.

2. * = If concentrations in groundwater exceed the NC 2L Standards or IMAC, or concentrations in surface water exceed the NC 2B Standards, appropriate remediation and/or institutional control measures will be necessary to be eligible for a risk-based closure.
3. NM = Not modeled, user did not check this pathway as complete.
4. NC = Pathway not calculated, required contaminant migration parameters were not entered.

DEQ Risk Calculator - Vapor Intrusion - Resident Groundwater to Indoor Air **Output Form 3A**

Version Date: February 2024

Basis: November 2023 EPA RSL Table

Site ID: NC7210020544

Exposure Unit ID: Former Lucent Technologies Building (201 N. Cobb Ave)

Carcinogenic risk and hazard quotient cells highlighted in orange are associated with non-volatile chemicals. Since these chemicals do not pose a vapor intrusion risk, no risk values are calculated for these chemicals.

Groundwater concentrations are in ug/L. Air concentrations are in ug/m^3.

CAS #	Chemical Name:	Groundwater Concentration (ug/L)	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 0.2	Calculated Carcinogenic Risk	Calculated Non-Carcinogenic Hazard Quotient
75-27-4	Bromodichloromethane	0.68	7.6E-02	-	7.8E-07	
67-66-3	Chloroform	8.1	1.2E-01	2.0E+01	**1.0E-05**	1.2E-02
75-35-4	Dichloroethylene, 1,1-	2.4	-	4.2E+01		1.2E-02
156-59-2	Dichloroethylene, cis-1,2-	1.8	-	8.3E+00		7.2E-03
127-18-4	Tetrachloroethylene	3	1.1E+01	8.3E+00	2.0E-07	5.2E-02
79-01-6	Trichloroethylene	130	4.8E-01	4.2E-01	**1.1E-04**	**2.5E+01**
				Cumulative:	**1.2E-04**	**2.5E+01**

DEQ Risk Calculator - Vapor Intrusion - Resident Soil Gas to Indoor Air **Output Form 3B**

Version Date: February 2024

Basis: November 2023 EPA RSL Table

Site ID: NC7210020544

Exposure Unit ID: Former Lucent Technologies Building (201 N. Cobb Ave)

Carcinogenic risk and hazard quotient cells highlighted in orange are associated with non-volatile chemicals. Since these chemicals do not pose a vapor intrusion risk, no risk values are calculated for these chemicals.

All concentrations are in ug/m^3

CAS #	Chemical Name:	Soil Gas Concentration (ug/m^3)	Calculated Indoor Air Concentration (ug/m^3)	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 0.2	Calculated Carcinogenic Risk	Calculated Non-Carcinogenic Hazard Quotient
67-64-1	Acetone	92	2.76	-	-		
71-43-2	Benzene	34	1.02	3.6E-01	6.3E+00	**2.8E-06**	3.3E-02
75-15-0	Carbon Disulfide	48	1.44	-	1.5E+02		2.0E-03
110-82-7	Cyclohexane	58	1.74	-	1.3E+03		2.8E-04
75-35-4	Dichloroethylene, 1,1-	18	0.54	-	4.2E+01		2.6E-03
156-59-2	Dichloroethylene, cis-1,2-	1300	39	-	8.3E+00		**9.3E-01**
156-60-5	Dichloroethylene, trans-1,2-	93	2.79	-	8.3E+00		6.7E-02
100-41-4	Ethylbenzene	27	0.81	1.1E+00	2.1E+02	7.2E-07	7.8E-04
109-99-9	~Tetrahydrofuran	72	2.16	-	4.2E+02		1.0E-03
142-82-5	Heptane, N-	38	1.14	-	8.3E+01		2.7E-03
110-54-3	Hexane, N-	54	1.62	-	1.5E+02		2.2E-03
103-65-1	Propyl benzene	13	0.39	-	2.1E+02		3.7E-04
127-18-4	Tetrachloroethylene	3800	114	1.1E+01	8.3E+00	**1.1E-05**	**2.7E+00**
108-88-3	Toluene	110	3.3	-	1.0E+03		6.3E-04
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	340	10.2	-	1.0E+03		2.0E-03
71-55-6	Trichloroethane, 1,1,1-	16	0.48	-	1.0E+03		9.2E-05
79-01-6	Trichloroethylene	390	11.7	4.8E-01	4.2E-01	**2.4E-05**	**5.6E+00**
75-69-4	Trichlorofluoromethane	38	1.14	-	-		
95-63-6	Trimethylbenzene, 1,2,4-	83	2.49	-	1.3E+01		4.0E-02
108-67-8	Trimethylbenzene, 1,3,5-	27	0.81	-	1.3E+01		1.3E-02
75-01-4	Vinyl Chloride	400	12	1.7E-01	2.1E+01	**7.2E-05**	1.2E-01
108-38-3	Xylene, m-	110	3.3	-	2.1E+01		3.2E-02
95-47-6	Xylene, o-	27	0.81	-	2.1E+01		7.8E-03

Cumulative:	**1.1E-04**	**9.6E+00**

DEQ Risk Calculator - Vapor Intrusion - Non-Residential Worker Groundwater to Indoor Air **Output Form 3D**

Version Date: February 2024

Basis: November 2023 EPA RSL Table

Site ID: NC7210020544

Exposure Unit ID: Former Lucent Technologies Building (201 N. Cobb Ave)

Carcinogenic risk and hazard quotient cells highlighted in orange are associated with non-volatile chemicals. Since these chemicals do not pose a vapor intrusion risk, no risk values are calculated for these chemicals.

Groundwater concentrations are in ug/L. Air concentrations are in ug/m^3.

CAS #	Chemical Name:	Groundwater Concentration (ug/L)	Calculated Indoor Air Concentration (ug/m^3)	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 0.2	Calculated Carcinogenic Risk	Calculated Non-Carcinogenic Hazard Quotient
75-27-4	Bromodichloromethane	0.68	0.05893704	3.3E-01	-	1.8E-07	
67-66-3	Chloroform	8.1	1.215331153	5.3E-01	8.6E+01	**2.3E-06**	2.8E-03
75-35-4	Dichloroethylene, 1,1-	2.4	2.560915781	-	1.8E+02		2.9E-03
156-59-2	Dichloroethylene, cis-1,2-	1.8	0.300245298	-	3.5E+01		1.7E-03
127-18-4	Tetrachloroethylene	3	2.170891251	4.7E+01	3.5E+01	4.6E-08	1.2E-02
79-01-6	Trichloroethylene	130	52.35077678	3.0E+00	1.8E+00	**1.8E-05**	**6.0E+00**
					Cumulative:	2.0E-05	**6.0E+00**

DEQ Risk Calculator - Vapor Intrusion - Non-Residential Worker Soil Gas to Indoor Air **Output Form 3E**

Version Date: February 2024

Basis: November 2023 EPA RSL Table

Site ID: NC7210020544

Exposure Unit ID: Former Lucent Technologies Building (201 N. Cobb Ave)

Carcinogenic risk and hazard quotient cells highlighted in orange are associated with non-volatile chemicals. Since these chemicals do not pose a vapor intrusion risk, no risk values are calculated for these chemicals.

All concentrations are in ug/m^3

CAS #	Chemical Name:	Soil Gas Concentration (ug/m^3)	Calculated Indoor Air Concentration (ug/m^3)	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 0.2	Calculated Carcinogenic Risk	Calculated Non-Carcinogenic Hazard Quotient
67-64-1	Acetone	92	0.92	-	-		
71-43-2	Benzene	34	0.34	1.6E+00	2.6E+01	2.2E-07	2.6E-03
75-15-0	Carbon Disulfide	48	0.48	-	6.1E+02		1.6E-04
110-82-7	Cyclohexane	58	0.58	-	5.3E+03		2.2E-05
75-35-4	Dichloroethylene, 1,1-	18	0.18	-	1.8E+02		2.1E-04
156-59-2	Dichloroethylene, cis-1,2-	1300	13	-	3.5E+01		7.4E-02
156-60-5	Dichloroethylene, trans-1,2-	93	0.93	-	3.5E+01		5.3E-03
100-41-4	Ethylbenzene	27	0.27	4.9E+00	8.8E+02	5.5E-08	6.2E-05
109-99-9	~Tetrahydrofuran	72	0.72	-	1.8E+03		8.2E-05
142-82-5	Heptane, N-	38	0.38	-	3.5E+02		2.2E-04
110-54-3	Hexane, N-	54	0.54	-	6.1E+02		1.8E-04
103-65-1	Propyl benzene	13	0.13	-	8.8E+02		3.0E-05
127-18-4	Tetrachloroethylene	3800	38	4.7E+01	3.5E+01	8.1E-07	**2.2E-01**
108-88-3	Toluene	110	1.1	-	4.4E+03		5.0E-05
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-	340	3.4	-	4.4E+03		1.6E-04
71-55-6	Trichloroethane, 1,1,1-	16	0.16	-	4.4E+03		7.3E-06
79-01-6	Trichloroethylene	390	3.9	3.0E+00	1.8E+00	**1.3E-06**	**4.5E-01**
75-69-4	Trichlorofluoromethane	38	0.38	-	-		
95-63-6	Trimethylbenzene, 1,2,4-	83	0.83	-	5.3E+01		3.2E-03
108-67-8	Trimethylbenzene, 1,3,5-	27	0.27	-	5.3E+01		1.0E-03
75-01-4	Vinyl Chloride	400	4	2.8E+00	8.8E+01	**1.4E-06**	9.1E-03
108-38-3	Xylene, m-	110	1.1	-	8.8E+01		2.5E-03
95-47-6	Xylene, o-	27	0.27	-	8.8E+01		6.2E-04
					Cumulative:	3.8E-06	7.6E-01

Appendix F

Data Validation Narratives

Tarheel Army Missile Plant
Soil Gas Data Validation Summary

The data review was conducted in accordance with the Tarheel Army Missile Plant Uniform Federal Policy Quality Assurance Project Plan (QAPP) REV. 1.0 (January 2024), guidance from DoD Data Validation Guidelines, method requirements and using the laboratory acceptance limits as the laboratory analyzed the samples following the requested methods instead of the DoD QSM. However, this deviation is not considered to impact the quality of the data and the results are considered usable as qualified. This section presents the overall assessment of the data with respect to the PARCC parameters (precision, accuracy, representativeness, completeness, comparability) and sensitivity. The individual review narratives are attached.

TABLE 1: SUMMARY OF SAMPLES

Data Package	Sample ID	Laboratory ID	QC Designation	Analyses
2403265	SV-13	2403265-01A		VOCs
	SV-14	2403265-02A		
	SV-15	2403265-03A		
	DUP_SV_20240307	2403265-04A	Fiel Duplicate to sample SV-13	
2403548	SV-16	2403548-01A		VOCs

ID – Identification QC – Quality Control VOCs – Volatile Organic Compounds

1.1 PRECISION

Precision is a measure of agreement among replicate (or between duplicate) or co-located sample measurements of the same analyte. The closer the numerical values of the measurements are to each other, the more precise the measurement. Precision for a single analyte was expressed as a relative percent difference (RPD) or absolute difference between matrix spike (MS) and matrix spike duplicate (MSD) results, laboratory duplicate samples, and field duplicate results.

MS/MSDs were not performed on site-specific samples for this sampling event. The following field duplicate samples were collected in association with this event.

Data Package	Parent Identification	Analyses	Field Duplicate Identification
2403265	SV-13	VOCs	DUP_SV_20240307

The comparison between results of the field duplicate pairs met the applicable evaluation criteria. No results were rejected or qualified based on the precision between the field duplicate results indicating acceptable precision was demonstrated.

1.2 ACCURACY

Accuracy is a measure of bias in a measurement system. The closer the value of the measurement agrees with the true value, the more accurate the measurement. This was expressed as the percent recoveries of surrogate recoveries and recoveries of target analytes in

the laboratory control samples (LCS) and site-specific MS/MSD samples. MS/MSD were not performed on site-specific samples for this sampling event.

All of the surrogate recoveries reported and all of the LCS recoveries reported were within the acceptance limits.

No results were qualified as unusable based on accuracy. Result qualified as estimated based on the LCS and surrogate recoveries are considered usable as qualified; indicating acceptable accuracy was demonstrated with respect to the analytical method and matrix.

1.3 REPRESENTATIVENESS

Representativeness is the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. The design of, and rationale for, the sampling program (in terms of the purpose for sampling, selecting the sampling locations, the number of samples to be collected, the ambient conditions for sample collection, the frequencies and timing for sampling, and the sampling techniques) assures that the environmental condition has been sufficiently represented. Representativeness was maintained during the sampling effort by completing the sampling using similar sampling procedures and in accordance with the approved QAPP and work plan.

The agreement between the field duplicate results was also used to assess representativeness. The close agreement between the duplicate results is considered to indicate that the samples collected are adequately representative of the medium sampled.

1.4 COMPARABILITY

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. For this project, comparability was achieved by collecting samples following the approved QAPP; analyzing the samples using standard analytical methodologies with reporting limits that met screening level criteria to the extent attainable, using common traceable calibration and reference materials; and reporting the analytical results in appropriate and consistent units.

1.5 COMPLETENESS

Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements to planned measurements. The data are considered usable as qualified. The completeness for this sampling event was 100% satisfying the QAPP requirement of 90%.

1.6 SENSITIVITY

Several samples were analyzed at dilutions due to target analyte concentrations or matrix interferences. The RLs have been elevated to reflect the dilution; therefore, results reported as nondetect at elevated RLs will need to be evaluated with respect to project objectives.

Tarheel Army Missile Plant
Data Validation Summary

Data Package Number: 2403265
Sampling Event Dates: March 7, 2024

The table below summarizes the data package and sample identifications discussed in this data review.

Field Identification	Sample Type	Laboratory Identification	Matrix	Analyses
				TO-15
SV-13	SA	2403265-01A	Soil-Gas	X
SV-14	SA	2403265-02A	Soil-Gas	X
SV-15	SA	2403265-03A	Soil-Gas	X
DUP_SV_20240307	FD	2403265-04A	Soil-Gas	X

Sample Type: SA – Sample FD- Field Duplicate
Analyses: EPA Method TO-15 - Volatile Organic Compounds -- not analyzed

The data review was conducted in accordance with the Tarheel Army Missile Plant Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) REV. 1.0 (January 2024) and method requirements.

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification
_____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Comments: Any laboratory case narrative comments concerning data qualification were addressed in the table below.

Review Parameter	Criteria Met?	Comment
Chain of Custody & Sample Receipt	Yes	The samples were received by Eurofins in good condition and were consistent with the accompanying chain of custody (COC).
Holding Times	Yes	The analysis was conducted within the holding time requirements for the methods.
Laboratory Blanks • Method Blank	Yes	No target analytes were detected within the method blanks.
Matrix Quality Control • Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	Yes	**Matrix Spike/ Matrix Spike Duplicate** A MS/MSD was not reported in this data package.

Review Parameter	Criteria Met?	Comment
None in this data package • Laboratory Duplicate None in this data package		**Laboratory Duplicate** A laboratory duplicate was not reported in this data package.
Method Quality Control • Surrogates - Volatile Organic Compounds (VOCs)	Yes	The surrogate recoveries were within the laboratory acceptance limits.
Field Quality Control • Trip Blank None reported in this data package • Field Duplicate DUP_SV_20240307 (SV-13)	Yes	**Trip Blank** A trip blank was not required. **Field Duplicate** The comparison between results of the field duplicate pairs met the applicable evaluation criteria listed below: • If the parent sample and duplicate values are >5x reporting limit (RL), then <30% RPD for water and vapor samples (<50% soil). • If the parent sample or duplicate sample value is <5xRL, then absolute difference is <2xRLfor water (<3.5xRL for soil and soil vapor).
LOQs met?	No	With the following exceptions, no results were reported as non-detect at elevated reporting limits (RLs). For VOCs the following samples were reported with results as non-detect at elevated RLs and will need to be evaluated with respect to project objectives: SV-13 (5.11x), SV-14 (2.14x), SV-15 (3.69x), and DUP-SV-20240307 (5.20x).
Laboratory Control Sample (LCS)	Yes	The LCS recoveries were within laboratory acceptance limits.
Other issues identified in the Case Narrative: None	NA	None

> - Greater Than
< - Less Than
≤ - Less Than or Equal To
± - Plus or Minus
°C – Degrees Celsius
% - Percent
µg/m³ - microgram per meter cubed
COC – Chain of Custody
DL – Detection Limit
LCS – Laboratory Control Sample
J - Estimated
MS/MSD – Matrix Spike/ Matrix Spike Duplicate
NA – Not Applicable
RPDs – Relative Percent Differences
VOCs – Volatile Organic Compounds

Tarheel Army Missile Plant
Data Validation Summary

Data Package Number: 240548
Sampling Event Dates: March 14, 2024

The table below summarizes the data package and sample identifications discussed in this data review.

Field Identification	Sample Type	Laboratory Identification	Matrix	Analyses
				TO-15
SV-16	SA	2403548-01A	Soil-Gas	X

Sample Type: SA – Sample
Analyses: EPA Method TO-15 - Volatile Organic Compounds -- not analyzed

The data review was conducted in accordance with the Tarheel Army Missile Plant Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) REV. 1.0 (January 2024) and method requirements.

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification
_____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Comments: Any laboratory case narrative comments concerning data qualification were addressed in the table below.

Review Parameter	Criteria Met?	Comment
Chain of Custody & Sample Receipt	Yes	The samples were received by Eurofins in good condition and were consistent with the accompanying chain of custody (COC).
Holding Times	Yes	The analysis was conducted within the holding time requirements for the methods.
Laboratory Blanks • Method Blank	Yes	No target analytes were detected within the method blanks.
Matrix Quality Control • Matrix Spike/ Matrix Spike Duplicate (MS/MSD) None in this data package • Laboratory Duplicate None in this data package	N/A	**Matrix Spike/ Matrix Spike Duplicate** A MS/MSD was not reported in this data package. **Laboratory Duplicate** A laboratory duplicate was not reported in this data package.

Review Parameter	Criteria Met?	Comment
Method Quality Control • Surrogates - Volatile Organic Compounds (VOCs)	Yes	The surrogate recoveries were within the laboratory acceptance limits.
Field Quality Control • Trip Blank None reported in this data package • Field Duplicate None reported in this data package	NA	**Trip Blank** A trip blank was not required. **Field Duplicate** A field duplicate was not reported in this data package.
RLs met?	No	With the following exceptions, no results were reported as non-detect at elevated reporting limits (RLs). For VOCs the following sample was reported with results as non-detect at elevated RLs and will need to be evaluated with respect to project objectives: SV-16 (2.45x).
Laboratory Control Sample (LCS)	Yes	The LCS recoveries were within laboratory acceptance limits.
Other issues identified in the Case Narrative: • Interference	No	The presence of a closely eluting non-target peak in sample SV-16 was interfering with the quantitation of the mass ion for 4-Ethyltoluene. Therefore, the associated result was qualified as estimated (J+) to reflect the potential high bias.

> - Greater Than
< - Less Than
≤ - Less Than or Equal To
± - Plus or Minus
°C – Degrees Celsius
% - Percent
µg/m³ - microgram per meter cubed
COC – Chain of Custody
DL – Detection Limit
LCS – Laboratory Control Sample
J – Estimated
J+ - Estimated with a potential high bias
MS/MSD – Matrix Spike/ Matrix Spike Duplicate
NA – Not Applicable
RPDs – Relative Percent Differences
VOCs – Volatile Organic Compounds

Tarheel Army Missile Plant
Water Data Validation Summary

The data review was conducted in accordance with the Tarheel Army Missile Plant Uniform Federal Policy Quality Assurance Project Plan (QAPP) REV 1.0 (January 2024), guidance from DoD Data Validation Guidelines, method requirements and Department of Defense (DoD) Quality Systems Manual (QSM) for data package 680-250515-1 and using the laboratory acceptance limits for data package 680-249346-1 as the laboratory analyzed the samples following the requested method instead of the DoD QSM. However, this deviation is not considered to impact the quality of the data and the results are considered usable as qualified. This section presents the overall assessment of the data with respect to the PARCC parameters (precision, accuracy, representativeness, completeness, comparability) and sensitivity. The individual review narratives are attached.

TABLE 1: SUMMARY OF SAMPLES

Data Package	Sample ID	Laboratory ID	QC Designation	Analyses
680-249346-1	MW-143	680-249346-1		VOCs
	MW-144	680-249346-2		
	MW-145	680-249346-3		
	MW-146	680-249346-4		
	DUP-GW-20240410	680-249346-9	Field Duplicate to MW-143	
680-250515-1	MW-148	680-250525-1		VOCs
	MW-147	680-250525-2		
	MW-142	680-250525-3		
	DUP-GW-20240508	680-250525-4	Field Duplicate to MW-148	

ID – Identification QC – Quality Control VOCs – Volatile Organic Compounds

1.1 PRECISION

Precision is a measure of agreement among replicate (or between duplicate) or co-located sample measurements of the same analyte. The closer the numerical values of the measurements are to each other, the more precise the measurement. Precision for a single analyte was expressed as a relative percent difference (RPD) or absolute difference between matrix spike (MS) and matrix spike duplicate (MSD) results, laboratory duplicate samples, and field duplicate results.

MS/MSDs were not performed on site-specific samples for this sampling event. The following field duplicate samples were collected in association with this event.

Data Package	Parent Identification	Analyses	Field Duplicate Identification
680-249346-1	MW-143	VOCs	DUP-GW-20240410
680-250515-1	MW-148	VOCs	DUP-GW-20240508

The comparison between results of the field duplicate pairs met the applicable evaluation criteria. No results were qualified as estimated or rejected based on the precision between the field duplicate results indicating acceptable precision was demonstrated.

1.2 ACCURACY

Accuracy is a measure of bias in a measurement system. The closer the value of the measurement agrees with the true value, the more accurate the measurement. This was expressed as the percent recoveries of surrogate recoveries and recoveries of target analytes in the laboratory control samples (LCS) and site-specific MS/MSD samples. MS/MSD were not performed on site-specific samples for this sampling event.

All of the reported surrogate recoveries and approximately 97% of the LCS recoveries were within the acceptance limits. No results were qualified as unusable based on accuracy. Result qualified as estimated based on the LCS and surrogate recoveries are considered usable as qualified; indicating acceptable accuracy was demonstrated with respect to the analytical method and matrix.

1.3 REPRESENTATIVENESS

Representativeness is the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. The design of, and rationale for, the sampling program (in terms of the purpose for sampling, selecting the sampling locations, the number of samples to be collected, the ambient conditions for sample collection, the frequencies and timing for sampling, and the sampling techniques) assures that the environmental condition has been sufficiently represented. Representativeness was maintained during the sampling effort by completing the sampling using similar sampling procedures and in accordance with the approved QAPP and work plan.

The agreement between the field duplicate results was also used to assess representativeness. The close agreement between the duplicate results is considered to indicate that the samples collected are adequately representative of the medium sampled.

1.4 COMPARABILITY

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. For this project, comparability was achieved by collecting samples following the approved QAPP; analyzing the samples using standard analytical methodologies with reporting limits that met screening level criteria to the extent attainable, using common traceable calibration and reference materials; and reporting the analytical results in appropriate and consistent units.

1.5 COMPLETENESS

Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or

usable measurements to planned measurements. The data are considered usable as qualified. The completeness for this sampling event was 100% satisfying the QAPP requirement of 90%.

1.6 SENSITIVITY

The laboratory reported detectable results between the method detection limit (MDL) or detection limit (DL) and the reporting limit (RL) or limit of quantitation (LOQ). To reflect the higher degree of uncertainty associated with values reported between the MDL (DL) and RL (LOQ), these results were qualified as ("J"). Several samples were analyzed at dilutions due to target analyte concentrations or matrix interferences. The RLs (LOQs) have been elevated to reflect the dilution; therefore, results reported as nondetect at elevated RLs (LOQs) will need to be evaluated with respect to project objectives.

Tarheel Army Missile Plant
Data Validation Summary

Data Package Number: 680-250515-1
Sampling Event Dates: May 8, 2024

The table below summarizes the data package and sample identifications discussed in this data review.

Field Identification	Sample Type	Laboratory Identification	Matrix	Analysis
				VOCs
MW-148	SA	680-250525-1	Water	X
MW-147	SA	680-250525-2	Water	X
MW-142	SA	680-250525-3	Water	X
DUP-GW-20240508	FD	680-250525-4	Water	X

Sample Type: FD- Field Duplicate SA – Sample
Analyses: VOCs (Method 8260D)– Volatile Organic Compounds -- not analyzed

The data review was conducted in accordance with the Tarheel Army Missile Plant Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) REV. 1.0 (January 2024), Department of Defense (DoD) Quality Systems Manual (QSM), and method requirements.

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification
_____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Comments: Any laboratory case narrative comments concerning data qualification were addressed in the table below.

Trace level detections reported between the detection limit (DL) and the limit of quantitation (LOQ) have been qualified as estimated (J). The other occurrences of data qualification are covered in the following table.

Review Parameter	Criteria Met?	Comment
Chain of Custody & Sample Receipt	Yes	The samples were received by Eurofins Savannah (Eurofins) Savannah, Georgia in good condition and were consistent with the accompanying chain of custody (COC). The cooler temperature upon receipt was within the recommended ≤6 degrees Celsius (°C) temperature criterion.
Holding Times	Yes	The analysis was conducted within the holding time requirements for the methods.

Review Parameter	Criteria Met?	Comment
Laboratory Blanks • Method Blank	Yes	No target analytes were detected within the method blanks.
Matrix Quality Control • Matrix Spike/ Matrix Spike Duplicate (MS/MSD) None in this data package • Laboratory Duplicate None in this data package	N/A	**Matrix Spike/ Matrix Spike Duplicate (MS/MSD)** A MS/MSD was not reported in this data package. **Laboratory Duplicate** A laboratory duplicate was not reported in this data package.
Method Quality Control • Surrogates - Volatile Organic Compounds (VOCs)	Yes	The surrogate recoveries were within the Department of Defense (DoD) Quality Systems Manual (QSM) limits.
Field Quality Control • Trip Blank None reported in this data package • Field Duplicate DUP-GW-20240508 (MW-148) • Equipment Blank None in this data package • Field Blank None reported in this data package	No	**Trip Blank (VOCs Only)** A trip blank was not reported in this data package. Therefore, contamination introduced during shipment could not be assessed. **Field Duplicate** The comparison between results of the field duplicate pairs met the applicable evaluation criteria listed below: • If the parent sample and duplicate values are >5x reporting limit (RL), then <30% RPD for water and vapor samples (<50% soil). • If the parent sample or duplicate sample value is <5xRL, then absolute difference is <2xRLfor water (<3.5xRL for soil and soil vapor). **Equipment Blank** An equipment blank was not reported in this data package. **Field Blank** A field blank was not reported in this data package.
LOQ met?	Yes	No results were reported as non-detect at elevated limit of quantitation (LOQ).
Laboratory Control Sample (LCS)	No	With the exceptions listed in Table 1, the LCS recoveries were within the DoD QSM limits.
Other issues identified in the Case Narrative: • Initial Calibration Verification (ICV) • Continuing Calibration Verification (CCV)	No	The ICV was outside the acceptance criteria for the following batches and analytes and the associated sample results were qualified estimated (J/UJ): • Batch 680-836362: Bromoform, Carbon disulfide, Hexane and Vinyl acetate. • Batch 680-837880: Dichlorodifluoromethane and Vinyl acetate. The CCV was above the acceptance criteria for the following batches and analytes. This is not considered to impact the results as the results are reported as non-detect and potential bias is considered to be high. • Batch 680-838498: bromoform, trichlorofluoromethane, and vinyl acetate.

Review Parameter	Criteria Met?	Comment
		• Batch 680-838791: bromomethane and vinyl acetate. The CCV and/or closing CCV was below the acceptance criteria for the following batches and analytes. Associated results were qualified as estimated (J-/UJ) to reflect the potential low bias. • Batch 680-838498: bromomethane, dichlorodifluoromethane, and iodomethane.

> - Greater Than
< - Less Than
≤ - Less Than or Equal To
± - Plus or Minus
°C – Degrees Celsius
% - Percent
CCV – Continuing Calibration Verification
COC – Chain of Custody
DL – Detection Limit
DoD – Department of defense
ICV – Initial Calibration Verification
J – Estimated with an indeterminate bias
J+ - Estimated with a potential high bias
J - Estimated with a potential low bias
LCS – Laboratory Control Sample
QSM – Quality System Manual
LOQ - LOQ – Limit of Quantitation
MS/MSD – Matrix Spike/ Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPDs – Relative Percent Differences
VOCs – Volatile Organic Compounds
UJ – Estimated Non-detect
CCV – Continuing Calibration Verification

Table 1: Laboratory Control Sample & Laboratory Control Sample Duplicate Recovery and Resultant Data Qualification

Associated Samples	Analyte	LCS/LCSD %R	LCS & LCSD %R (Limits)	Data Qualification
VOCs				
LCS 680-838498 MW-148 MW-147 MW-142 DUP-GW-20240508	Bromoform	**133/133**	66-130	None. The potential bias is considered to be high, and the associated sample results were reported as non-detect.
	Trichlorofluoromethane	**206/209**	65-141	
	Vinyl acetate	**296/285**	54-146	

LCS – Laboratory Control Sample
%R – Percent Recovery
LCSD – Laboratory Control Sample Duplicate
VOCs – Volatile Organic Compounds