

# Memorandum

February 12, 2021

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To: Dale Myers, Washington State Department of Ecology  
From: Stephen Strehl; Halah Voges, PE; and Nathan Soccorsy  
cc: Clara Chen and Hubert Chen, Tahn Associates, LLC  
Re: **Opportunistic Soil and Groundwater Results: Carson Cleaners, Inc.**

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## 1 Introduction

This memorandum reports the results of select subsurface soil and reconnaissance groundwater testing conducted on behalf of Tahn Associates (Tahn), the current owner of the property located at 4701 Brooklyn Avenue NE in Seattle, Washington (Figure 1). The property was formerly operated as a dry cleaner under the name Carson Cleaners, Inc. (Carson Cleaners).

Chlorinated volatile organic compounds (CVOCs) were discovered during environmental cleanup of the former Chevron gas station (Site ID: 90129). Following the discovery of CVOCs at the former gas station site, the Washington State Department of Ecology (Ecology) issued a letter dated November 7, 2019 (Appendix A) to neighboring property owners, including Tahn, to investigate potential vapor intrusion (VI) risk at their properties.

Concurrent with the VI work, Anchor QEA opportunistically installed a single direct push reconnaissance well in the southeast corner of the former Carson Cleaners parking lot, as shown in Figure 2. During installation, select vadose and saturated soil samples were collected and submitted for chemical analysis, followed by two rounds of groundwater reconnaissance sampling. This memorandum summarizes the field work conducted to install the well, the selection of soil samples for analysis, data quality review of the analytical results, and the results of the soil and groundwater testing.

## 2 Field Activities

This section describes the well installation process, selection of soil intervals for testing, and groundwater monitoring events.

### 2.1 Utility Clearance

On July 20, 2020, prior to the well installation, APS Locators, a professional underground utility locator licensed in the state of Washington, used ground-penetrating radar and passive utility-locating devices to check for underground utilities and clear the location for drilling.

Based on the location of identified utilities on site and monitoring wells on adjacent or nearby properties, the proposed boring location was selected on the southeast side of the property in the parking lot (Figure 2).

## 2.2 Soil Sampling, Monitoring Well Installation, and Development

On July 24, 2020, at the direction of Anchor QEA's field geologist, Holt Services, Inc., advanced a soil boring using a Geoprobe drill rig.

The boring was advanced to 30 feet below ground surface (bgs). Soils collected were visually inspected and field screened with a 11.7 eV lamp photoionization detector (PID) by the Anchor QEA field geologist. Four soil samples were collected from the soil boring based on field screening with a PID; two samples above the groundwater table and two samples below the groundwater table were collected. Samples were collected directly into pre-cleaned, laboratory-provided sample jars using stainless-steel spoons and/or a disposable U.S. Environmental Protection Agency (EPA) Method 5035 syringe (for CVOC analysis). The groundwater monitoring well was installed following the completion of the soil boring.

The observed lithology consists of approximately 13 feet of gravelly sand fill-like material, followed by a layer of poorly graded sand that appeared to be a native contact. Below the poorly graded sand is a silty sand unit extending to 25 feet bgs. Another poorly graded sand layer follows the silty sand, and below the poorly graded sand, a gravelly sand extends to the end of the boring. The observed water level at time of drilling was found at 22 feet bgs in the silty sand unit. A boring log is included in Appendix B. Soil samples were collected from 14.5 feet, 18 feet, 24 feet, and 29 feet bgs. Soil samples were analyzed for the following:

- EPA Method 8260C Northwest Total Petroleum Hydrocarbons Method for Gasoline Range Hydrocarbons (NWTPH-Gx)
- EPA Method 8260C Northwest Total Petroleum Hydrocarbons Method for Diesel Range Hydrocarbons (NWTPH-Dx)
- EPA Method 8260C for Volatile Organic Compounds (VOCs)

Well construction details are described below and a well construction log is presented in Appendix C:

- CC-MW-01 was drilled to a total depth of 30 feet bgs, and groundwater was encountered at approximately 22 feet bgs.
- The well was screened from 20 to 30 feet bgs using 0.75-inch-diameter, 0.010-slot Schedule 40 PVC with a pre-pack screen.
- Ecology Well Tag #BMP001.

The newly installed groundwater monitoring well was developed prior to groundwater sampling by purging groundwater from the well casing using a peristaltic pump. Over three well volumes were

removed until the discharged water was visibly clear. The details of the well development are presented in the field forms in Appendix D.

Soil cuttings from the well installation and water from well development were placed in 55-gallon drums, labeled, and stored on site. Drum disposal is pending. The boring location was measured from existing buildings on site and later mapped onto a georeferenced aerial photograph. The coordinates for the sampling location were queried from this aerial photograph.

## 2.3 Well Sampling

The groundwater monitoring well was sampled twice after installation, the first event on August 14, 2020, and the second event on November 18, 2020. Prior to groundwater sampling, the water level was measured to the nearest 0.01 foot relative to the top of the casing rim using an electronic water meter. Field records of water level measurements are provided in Appendix D.

Groundwater samples were obtained using a peristaltic pump, pumping at 150 milliliters per minute or less through polyethylene tubing placed within the well casing. Water quality parameters were monitored during purging using a YSI Pro DSS water quality meter connected to a flow-through cell. The following water quality parameters were recorded:

- pH
- Specific conductance (in millisiemens per centimeter [mS/cm])
- Temperature (in degrees Celsius)
- Oxidation reduction potential (ORP) (in millivolts [mV])
- Turbidity (in Nephelometric Turbidity Units [NTU])

Groundwater samples were obtained after ambient groundwater conditions were reached, such that specific conductance and turbidity were stable for three successive readings (i.e., the readings were within +/- 10%). Final water quality parameter readings are included with complete field records of water quality parameters in Appendix D.

Groundwater samples were collected directly into pre-cleaned laboratory-provided bottles after water quality parameters stabilized. The samples were subsequently placed in a cooler on ice and kept under standard chain-of-custody protocols until delivered to the analytical laboratory. All groundwater samples were analyzed for the following:

- EPA Method 8260C for NWTPH-Gx
- EPA Method 8260C for NWTPH-Dx
- EPA Method 8260C for VOCs

Samples were shipped via FedEx overnight under standard chain-of-custody procedures to ALS Environmental in Kelso, Washington.

### **3 Data Quality Assessment**

All soil and groundwater data were validated according to Level 2A (USEPA 2009) guidelines by Anchor QEA. All laboratory quality control sample results were within laboratory control limits. Data qualifiers were applied to the data during final validation as applicable. One trip blank associated with the groundwater sample collected on August 14, 2020, was rejected based on validation results; however, sample data are considered acceptable as reported and usable as qualified. Refer to the three data validation reports included in Appendix F for more information.

### **4 Analytical Results**

This section summarizes the investigation soil and groundwater results. The sampling location is depicted on Figures 2 and 3, and data are presented in Tables 1 and 2. All laboratory reports are included in Appendix E.

#### **4.1 Soil Testing Results**

Analytical results are presented in Table 1, and soil concentrations exceeding Model Toxics Control Act (MTCA) Method A Soil Screening Levels are presented in Figure 2. Laboratory data reports are included in Appendix E, and the data validation reports are included in Appendix F. Key findings were as follows:

- Tetrachloroethene (PCE) was detected in all four soil samples at concentrations ranging from 2,300 to 13,000 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ), all exceeding the MTCA Method A Soil Screening Level for Unrestricted Land Use ( $50 \mu\text{g}/\text{kg}$ ).
- Trichloroethene (TCE) was detected in the soil samples collected below the water table at concentrations of  $6.3 \mu\text{g}/\text{kg}$  and  $25 \mu\text{g}/\text{kg}$ , respectively, below the MTCA Method A Soil Screening Level for TCE ( $30 \mu\text{g}/\text{kg}$ ).
- No other VOCs were detected above the laboratory reporting limit in any sample.
- Gasoline-range hydrocarbons were detected in the saturated zone at a concentration of 11 milligrams per kilogram ( $\text{mg}/\text{kg}$ ) in the sample collected from 29 feet bgs. This result does not exceed the MTCA Method A Soil Screening Level for Unrestricted Land use ( $30 \text{mg}/\text{kg}$ ). No other petroleum hydrocarbons were detected above the laboratory reporting limit in any sample.

#### **4.2 Groundwater Testing Results**

Analytical results are presented in Table 2 and groundwater concentrations exceeding MTCA Method A Groundwater Screening Levels are presented in Figure 3. Laboratory data reports are included in Appendix E, and the data validation reports are included in Appendix F. Key findings were as follows:

- Gasoline-range hydrocarbons were detected during both monitoring events (August 14 and November 18, 2020) at concentrations of 1.86 and 2.05 milligrams per liter ( $\text{mg}/\text{L}$ ),

respectively. Both of these results exceed the MTCA Method A Groundwater Screening Level of 0.8 mg/L. No other petroleum hydrocarbons were detected above the laboratory reporting limit in any sample.

- PCE and TCE were detected during both monitoring events (August 14 and November 18, 2020) at concentrations ranging from 2,100 to 2,700 µg/L and 100 to 140 µg/L, respectively. All detections exceed MTCA Method A Groundwater Screening Levels of 5 µg/L for both PCE and TCE. No other VOCs were detected above the laboratory reporting limit in any sample.

## **5 Reference**

EPA (U.S. Environmental Protection Agency), 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use*, USEPA Office of Solid Waste and Emergency Response, EPA 540-R-08-005; OSWER 9200.1-85, January 2009.

# Tables

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**Table 1**  
**Soil Testing Results**

	Location ID	CC-MW-01	CC-MW-01	CC-MW-01	CC-MW-01	CC-MW-01
	Sample ID	CC-MW-01-124-072420	CC-MW-01-14.5-072420	CC-MW-01-18-072420	CC-MW-01-24-072420	CC-MW-01-29-072420
	Sample Date	7/24/2020 11:30	7/24/2020 10:55	7/24/2020 11:10	7/24/2020 11:25	7/24/2020 11:40
	Depth	24 - 24 ft	14.5 - 14.5 ft	18 - 18 ft	24 - 24 ft	29 - 29 ft
	Sample Type	FD	N	N	N	N
	Matrix	SO	SO	SO	SO	SO
	X	-122.3144222	-122.3144222	-122.3144222	-122.3144222	-122.3144222
	Y	47.6632	47.6632	47.6632	47.6632	47.6632
	MTCA Method A Soil Unrestricted					
Chemical						
<b>Conventional Parameters (%)</b>						
Total Solids		82.5	92.4	85.1	82.1	85
<b>Volatile Organics (µg/kg)</b>						
1,2-Dichloroethene, cis-		5.9 U	5.8 U	5.9 U	6.4 U	6.1 U
1,2-Dichloroethene, trans-		5.9 U	5.8 U	5.9 U	6.4 U	6.1 U
Tetrachloroethene (PCE)	50	<b>4200</b>	<b>2600</b>	<b>2300</b>	<b>3100</b>	<b>13000</b>
Trichloroethene (TCE)	30	<b>6.3</b>	5.8 U	5.9 U	6.4 U	<b>25</b>
Vinyl chloride		5.9 U	5.8 U	5.9 U	6.4 U	6.1 U
<b>Total Petroleum Hydrocarbons (mg/kg)</b>						
Diesel range hydrocarbons	2000	31 U	27 U	30 U	31 U	30 U
Gasoline range hydrocarbons	30	6.7 U	6.4 U	6.8 U	6.9 U	<b>11</b>
Residual range hydrocarbons	2000	130 U	110 U	120 U	130 U	120 U

Notes:

  Detected concentration is greater than MTCA Method A Soil Unrestricted screening level

**Bold: Detected result**

µg/kg: micrograms per kilogram

FD: field duplicate

mg/kg: milligrams per kilogram

MTCA: Model Toxics Control Act

N: normal sample

SO: soil

U: Compound analyzed for, but not detected above detection limit

**Table 2**  
**Groundwater Testing Results**

	Location ID	CC-MW-01	CC-MW-01	CC-MW-01
	Sample ID	CC-MW-01-20200814	CC-MW-01-20201118	CC-MW-1001-20201118
	Sample Date	8/14/2020 15:00	11/18/2020 10:55	11/18/2020 11:00
	Depth			
	Sample Type	N	N	FD
	Matrix	WG	WG	WG
	X	-122.3144222	-122.3144222	-122.3144222
	Y	47.6632	47.6632	47.6632
	MTCA Method A Groundwater			
<b>Chemical</b>				
<b>Volatile Organics (µg/L)</b>				
1,2-Dichloroethene, cis-		<b>1.3</b>	<b>63</b>	<b>66</b>
1,2-Dichloroethene, trans-		0.50 U	5.0 U	5.0 U
Tetrachloroethene (PCE)	5	<b>2100</b>	<b>2700</b>	<b>2600</b>
Trichloroethene (TCE)	5	<b>100</b>	<b>140</b>	<b>140</b>
Vinyl chloride	0.2	0.50 U	5.0 U	5.0 U
<b>Total Petroleum Hydrocarbons (mg/L)</b>				
Diesel range organics (C12 - C25)	0.5	0.25 U	0.25 U	0.25 U
Gasoline range hydrocarbons	0.8	<b>1.86</b>	<b>2.02</b>	<b>2.05</b>
Residual range organics (C25 - C36)	0.5	0.50 U	0.50 U	0.50 U

Notes:

 Detected concentration is greater than MTCA Method A Groundwater screening level

**Bold: Detected result**

µg/L: micrograms per liter

FD: field duplicate

mg/L: milligrams per liter

MTCA: Model Toxics Control Act

N: normal sample

U: Compound analyzed for, but not detected above detection limit

WG: groundwater




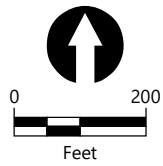
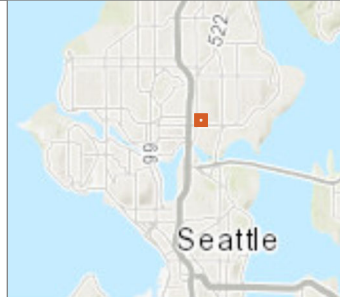
# Figures

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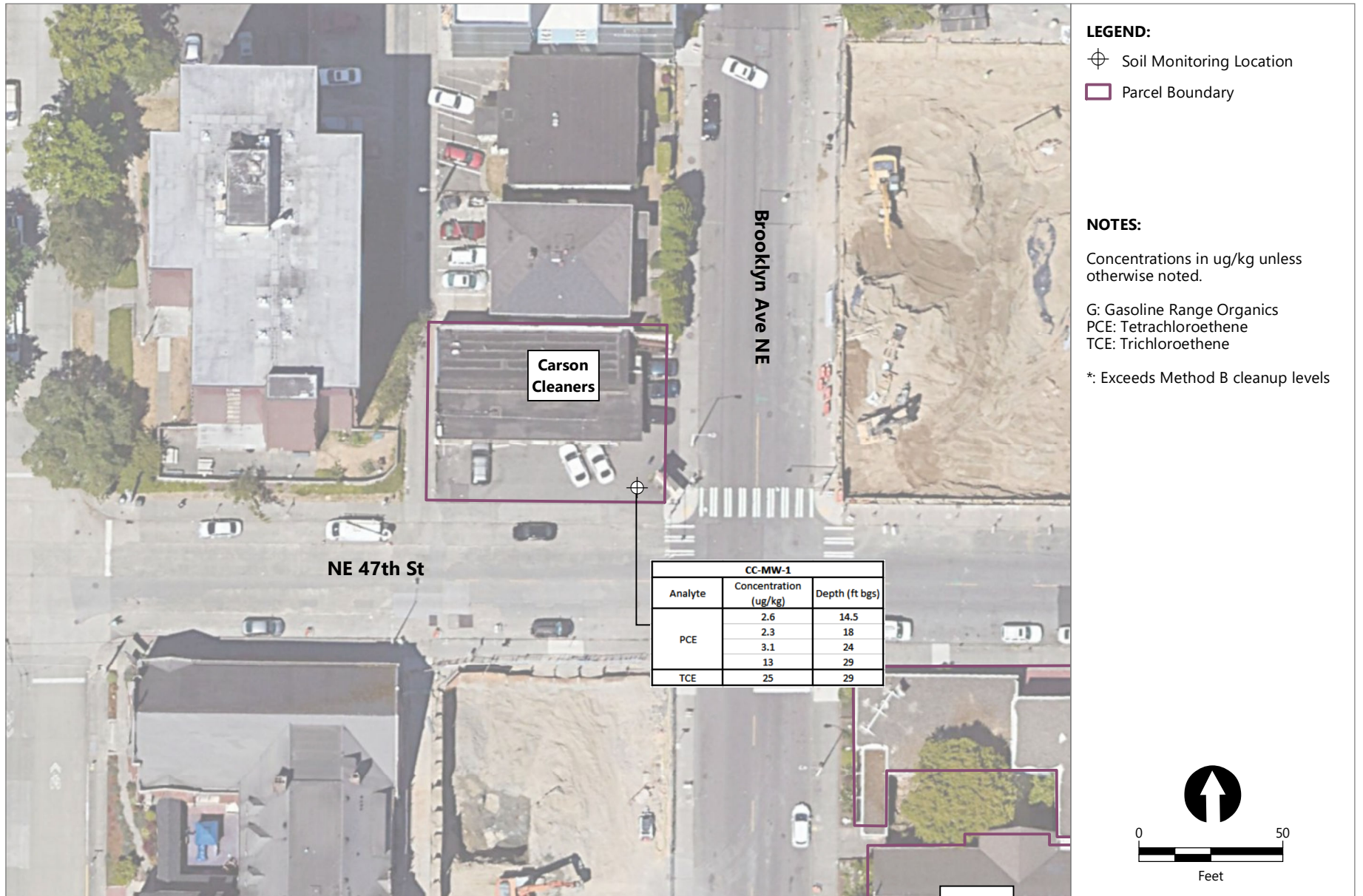
 Carson Cleaners Facility



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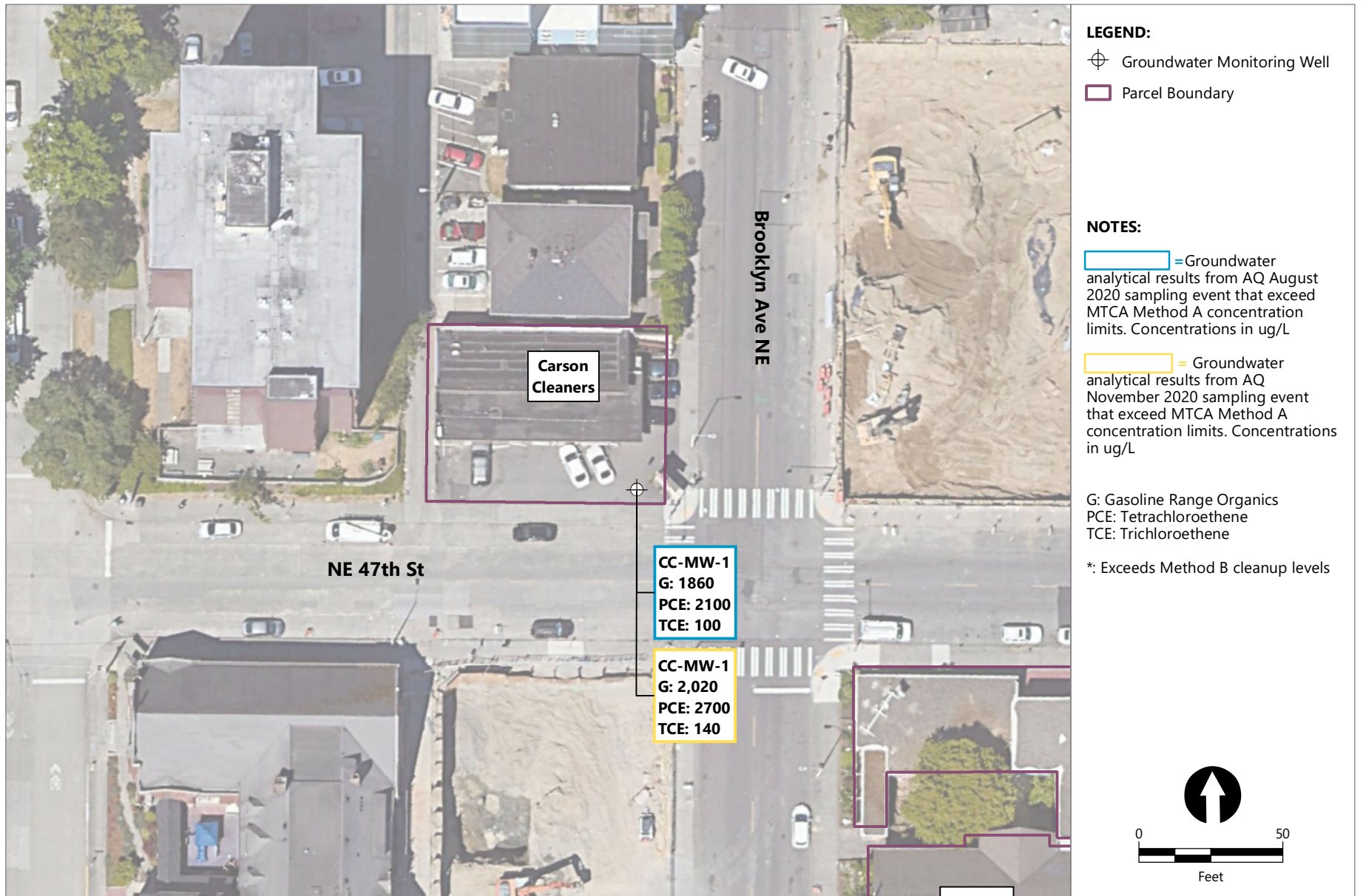
**Figure 1**  
**Vicinity Map**  
 Soil and Groundwater Testing Memorandum  
 Carson Cleaners Facility



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Filepath: \\orcas\gis\Jobs\CascadiaLawGroup\_0544\FormerCarsonCleaners\Maps\Workplan\AQ\_Fig02\_Soil\_Analytical\_Exceedance.mxd



**Figure 2**  
**Soil Analytical Exceedance Map**  
Soil and Groundwater Testing Memorandum  
Carson Cleaners Facility



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Filepath: \\orcas\gis\Jobs\CascadiaLawGroup\_0544\FormerCarsonCleaners\Maps\Workplan\AQ\_Fig03\_GW\_Analytical\_Exceedance.mxd



**Figure 3**  
**Groundwater Analytical Exceedance Map**

Soil and Groundwater Testing Memorandum  
Carson Cleaners Facility

Appendix A

Ecology Letter (November 2019)

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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000  
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

November 7, 2019

Clara Chen  
Tahn Associates, LLC  
644 164<sup>th</sup> Place NE  
Bellevue, WA 98008

**Re: Request for Evaluation of Trichloroethylene Risks at the following Site:**

- **Site Name:** Carson Cleaners
- **Site Address:** 4701 Brooklyn Ave NE, Seattle, WA 98105
- **Facility/Site No.:** 15518216
- **CSID No.:** 14878

Dear Clara Chen:

Our records indicate that this Site is contaminated with trichloroethylene (TCE), or with tetrachloroethylene (PCE) that can break down into TCE. TCE is a toxic organic chemical that can volatilize from contaminated soil or groundwater and potentially enter nearby buildings as a vapor. The presence of TCE in indoor air can result in health impacts to building occupants, the most urgent of which are to pregnant women. U.S. EPA has concluded that brief exposures to TCE in air may affect women in the first trimester of pregnancy by increasing the risk of heart malformations to a developing fetus.<sup>1</sup>

Ecology's Implementation Memo No. 22 titled "*Vapor Intrusion (VI) Investigations and Short-term Trichloroethene (TCE) Toxicity*" (attached) provides important information including indoor air action levels<sup>2</sup> (Section 4 – Table 1) as well as recommendations (Section 5) for determining whether environmental contamination is causing elevated levels of TCE in indoor air.

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<sup>1</sup> See U.S. EPA, August 2014, Office of Solid Waste and Emergency Response Memorandum: Compilation of Information Relating to Early/Interim Actions at Superfund Sites and the TCE IRIS Assessment.

<sup>2</sup> The short-term indoor air action levels are higher than Ecology's long-term indoor air cleanup levels.



To protect human health, Ecology requests that:

1. Within 30 days from the date of this letter, you provide Ecology with any existing information regarding contamination at the site that you have not already submitted.
  - The only data we have received to date has been collected as part of investigations on the adjacent Chevron 90129 site (Facility/Site No. 8196648, CSID No. 10632). This data includes concentrations of chlorinated solvents, including TCE, in groundwater above cleanup levels.
2. Within 60 days, you submit a sampling and analysis plan for your vapor intrusion evaluation to Ecology for review. The goal of your evaluation is to determine whether environmental contamination at the site has resulted in TCE concentrations from vapor intrusion above the short-term indoor air action levels.
  - From the most recent data we have received (see figure below), groundwater contamination above the screening levels in Implementation Memo 22 extends down NE 47<sup>th</sup> Street to at least University Way NE. This puts multiple residential and commercial buildings within the 100 foot lateral screening distance, the area where there is the greatest risk of exposure to chlorinated solvents via vapor intrusion. All of these buildings should be considered in your evaluation.
  - Your evaluation should include a combination of soil vapor, indoor air, and ambient air sampling. General guidance on conducting a vapor intrusion evaluation including these types of samples is available online at:  
<https://fortress.wa.gov/ecy/publications/documents/0909047.pdf>.
  - We ask that you coordinate with Tim Bishop and Cheryl Cameron of Chevron Environmental Management Company, the project managers for the adjacent Chevron 90129 site, as you develop your sampling and analysis plan. They are copied on this letter, and may be reached via email at [TimBishop@chevron.com](mailto:TimBishop@chevron.com) and [Cheryl.Cameron@chevron.com](mailto:Cheryl.Cameron@chevron.com).
3. Within 90 days, you conduct sampling and submit the results of your evaluation to Ecology. Include recommendations on what actions, if any, are necessary to reduce TCE concentrations to below the appropriate short-term indoor air action level.
  - Multiple rounds of sampling may be necessary to complete the short-term TCE investigation. If that is that case, we expect that the first round of sampling will be completed within 90 days, and that a schedule for any additional sampling will be included in the sampling and analysis plan.

**Ecology's Next Steps:**

Depending on the site specific circumstances, Ecology may:

1. Continue to provide technical assistance as necessary for evaluating and/or remediating short-term TCE risks.
2. Notify appropriate local, state or Federal health agencies to discuss possible health risks and any necessary public notifications.
3. Identify potentially liable parties and require additional remedial action pursuant to RCW 70.105D, such as: a) issuing an enforcement order, b) pursuing an Ecology conducted cleanup with cost recovery, or c) seeking judicial review.
4. Pursue other options necessary to adequately cleanup contamination at the site.

**Contact Information**

Ecology is committed to working with you to accomplish the prompt and effective actions necessary at the Site. If you have any questions about this request, please contact me at (425) 649-7040 or kim.wooten@ecy.wa.gov.

Sincerely,



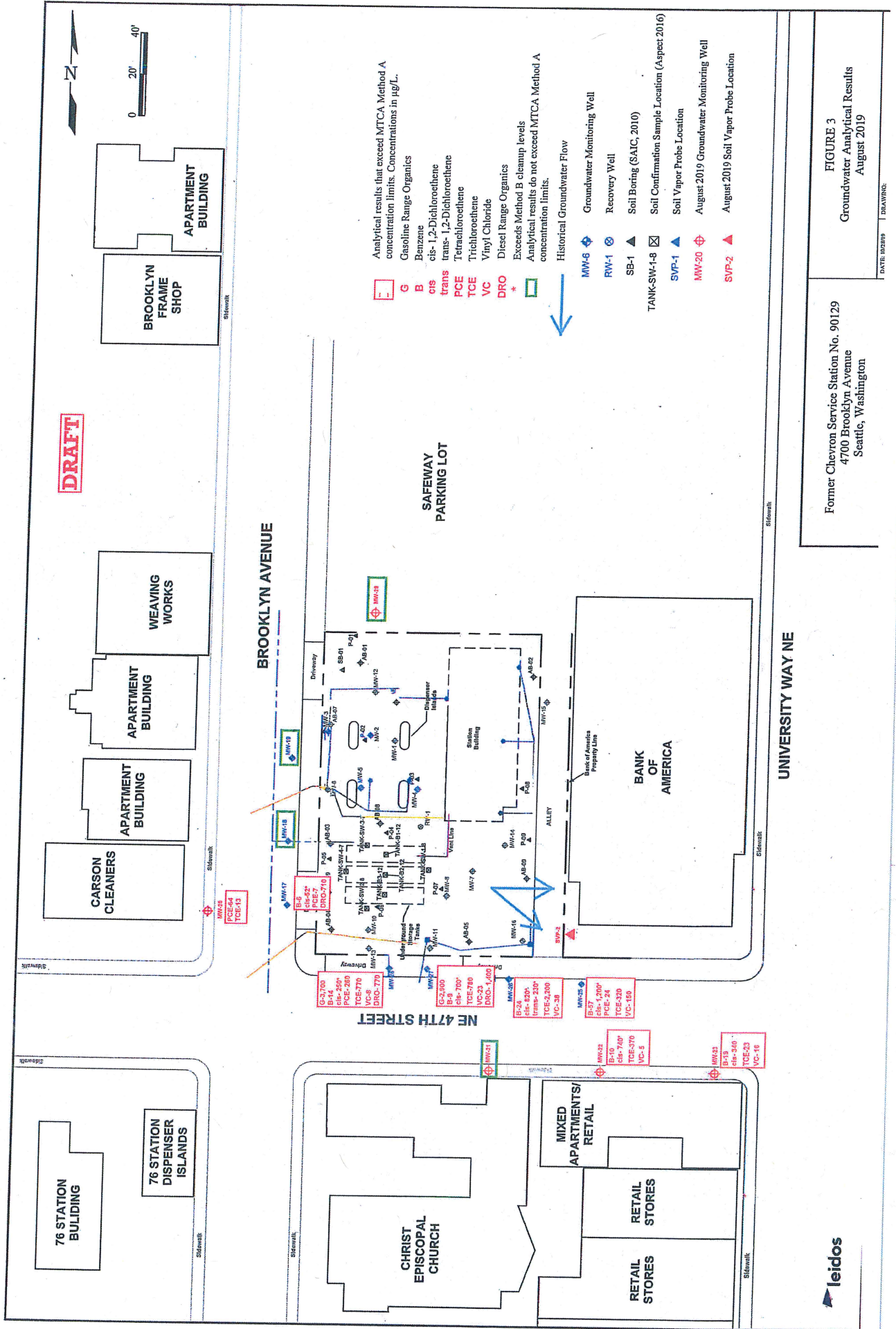
Kim Wooten  
Toxicologist  
Toxics Cleanup Program, Northwest Regional Office

Enclosure: Implementation Memo No. 22

By certified mail: 9171 9690 0935 0136 9544 72

cc: Steve Chianglin, Chianglin Law Firm PLLC  
Allyson Bazan, Assistant Attorney General  
Dale Myers, Ecology  
Eric Hetrick, Chevron Environmental Management Company  
Cheryl Cameron, Chevron Environmental Management Company  
Tim Bishop, Chevron Environmental Management Company





**FIGURE 3**  
 Groundwater Analytical Results  
 August 2019

Former Chevron Service Station No. 90129  
 4700 Brooklyn Avenue  
 Seattle, Washington

DATE: 10/28/19 | DRAWING:

# Vapor Intrusion (VI) Investigations and Short-term Trichloroethene (TCE) Toxicity

## Implementation Memorandum No. 22

*Date:* October 1, 2019

*To:* Interested Persons

*From:* Jeff Johnston, Section Manager  
Information & Policy Section  
Toxics Cleanup Program



*Contact:* Policy & Technical Support Unit, Headquarters, Lacey, WA

*Attachments:* A - Response to comments on the November 21, 2018, review draft of this memo.

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**Accommodation Requests:** To request ADA accommodation including materials in a format for the visually impaired, call Ecology at 800-826-7716. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

## Table of Contents

---

**Acronyms and Abbreviations ..... 3**

**1.0 Purpose and Applicability..... 4**

**2.0 How this Memo is Organized..... 6**

**3.0 Background ..... 7**

**4.0 VI Screening and Action Levels for TCE..... 9**

    4.1. Indoor air action levels for TCE ..... 9

    4.2. VI short-term screening levels for TCE in groundwater and soil gas .....11

**5.0 VI Investigation .....14**

    5.1. Identify any site buildings where VI may potentially result in indoor TCE concentrations above the short-term action level.....14

    5.2. Notify and involve Ecology .....16

    5.3. Prepare for indoor air sampling .....16

    5.4. Determine if 3-week average indoor air TCE concentrations exceed the short-term action level. ....18

**6.0 Responding to Exceedances of the Short-term TCE Indoor Air Action Level.....20**

**7.0 Working with people who are affected by vapor intrusion.....24**

    7.1. Outreach before indoor air sampling .....25

    7.2. Outreach after indoor air sampling .....26

**8.0 References .....28**

**Attachment A Response to comments on the November 18, 2018, review draft of Implementation Memo No. 22: Vapor Intrusion (VI) Investigations and Short-term Trichloroethene (TCE) Toxicity .....A-1**

## Acronyms and Abbreviations

Acronym or Abbreviation	Definitions
APU	air purification units
ATSDR	Agency for Toxic Substances and Disease Registry
CLARC	Ecology's Cleanup Levels and Risk Calculation data tables
COPC	contaminant of potential concern
CPF	carcinogenic potency factor
CSM	(vapor intrusion) Conceptual Site Model
DoD	United States Department of Defense
DTSC	California Department of Toxic Substances Control
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
HI	non-carcinogenic Hazard Index
HQ	non-carcinogenic Hazard Quotient
HVAC	heating, ventilation, and air conditioning
IRIS	EPA's Integrated Risk Information System
µg/l	micrograms per liter
µg/m <sup>3</sup>	micrograms per cubic meter
MTCA	Model Toxics Control Act
NAPL	non-aqueous phase liquids
QA	quality assurance
RCW	Revised Code of Washington
RfD	reference dose
RI	Remedial Investigation
RME	reasonable maximum exposure (RME) means the highest exposure that can be reasonably expected to occur for a human or other living organisms at a site under current and potential future site use
SAP	Sampling and Analysis Plan
SL	screening level
TCE	trichloroethene or trichloroethylene
TCP	Toxics Cleanup Program
Tier I	term used in Ecology's 2009 draft VI guidance to describe VI assessments employing subsurface (groundwater and soil gas) VOC measurements
Tier II	term used in Ecology's 2009 draft VI guidance to describe VI assessments employing indoor air VOC measurements
µg/l	micrograms per liter
µg/m <sup>3</sup>	micrograms per cubic meter
VI	vapor intrusion
VOC	volatile organic compound
WAC	Washington Administrative Code

## 1.0 Purpose and Applicability

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The purpose of this memorandum is to supplement the 2009 Draft Vapor Intrusion Guidance<sup>1</sup> produced by the Washington State Department of Ecology (Ecology) and provide recommendations pertaining to cleanup sites contaminated with trichloroethene (TCE).

Specifically, this memorandum:

1. Provides indoor air Action Levels that are protective of short-term exposures to TCE.
2. Provides the default (non-site-specific) subsurface vapor intrusion (VI) screening levels that are protective of the short-term indoor air TCE action levels.
3. Identifies options for effectively and rapidly responding to those situations where TCE concentrations caused by VI in indoor air are above action levels.
4. Establishes the goal to keep indoor air TCE concentrations (caused by VI) below short-term action levels at Model Toxics Cleanup Act (MTCA) cleanup sites in Washington state.
5. Provides guidance and recommendations for those scenarios where a) VI-caused TCE indoor air concentrations exceed, or may exceed, the short-term action levels, and b) the building being investigated is regularly occupied by female residents or workers of child-bearing age.

Unless otherwise specified, this document applies to any cleanup site where TCE is a subsurface contaminant of concern and a VI pathway is being, or should be, evaluated. This includes sites under direct Ecology oversight; sites where Ecology is responsible for the investigation and cleanup; and sites in the independent cleanup process. Although the memorandum refers in a number of instances to investigation and outreach activities that assume direct Ecology involvement at the site, when this is not the case (as noted in Section 5.2) the parties performing the site investigation and cleanup should independently complete the recommended steps outlined in the memorandum.<sup>2</sup>

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<sup>1</sup> *Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action* (Ecology 2009): <https://fortress.wa.gov/ecy/publications/SummaryPages/0909047.html>.

<sup>2</sup> In later portions of the memorandum, we use the term “responsible party” to refer to the party who is conducting remedial actions at the site. In many cases the responsible party will be a person meeting the statutory definition of a “potentially liable person” (see [RCW 70.105D.040](#)).

[WAC 173-340-200](#) of the MTCA rule defines the terms “cleanup,” “cleanup action,” “interim action,” and “remedial action.” Remedial action (or “remedy”) means “any action or expenditure consistent with the purposes of [MTCA statute] [Chapter 7.0.105D](#) RCW to identify, eliminate, or minimize any threat posed

NOTE: In some buildings, indoor workers are routinely exposed to elevated indoor air concentrations of volatile organic compounds (VOC) as part of a manufacturing or other business-related process. When the same VOCs are also present in subsurface contamination, these scenarios commonly pose difficulties to investigators who are attempting to quantify VI-only contributions to indoor air contamination. Another challenge: as long as manufacturing or other business-related processes result in indoor VOC levels much higher than those potentially caused by VI, the affected receptors will only minimally benefit from actions taken to curtail just the VI contributions.

Implementation Memorandum No. 22 does not provide guidance or recommendations for scenarios where business-related processes persistently contaminate the building's indoor air with TCE, and the resulting TCE concentrations significantly exceed any VI contributions. If this scenario is (or appears to be) present at the site, Ecology should be consulted before proceeding further with the VI evaluation.<sup>3</sup>

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by hazardous substances to human health or the environment including any investigative and monitoring activities with respect to any release or threatened release of a hazardous substance and any health assessments or health effects studies conducted in order to determine the risk or potential risk to human health."

<sup>3</sup> See also Ecology's Implementation Memorandum No. 21: *Frequently Asked Questions (FAQs) Regarding Vapor Intrusion (VI) and Ecology's 2009 Draft VI Guidance* (Ecology 2018b), available at: <https://fortress.wa.gov/ecy/publications/SummaryPages/1809046.html>

## 2.0 How this Memo is Organized

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When TCE is present in soils, groundwater, or soil gas, VI assessments should determine if indoor air concentrations exceed cleanup levels based on chronic exposure. Assessments should also, however, be designed to determine if indoor air concentrations are higher than action levels protective of toxic, non-cancer effects caused by short-term exposures to the chemical. This memorandum provides guidance and recommendations for such short-term exposure scenarios.

**Section 3.0** provides background on the 2009 draft vapor intrusion guidance, and the major updates to the document since.

**Section 4.0** identifies Ecology's short-term indoor air action levels. It also includes short-term TCE soil gas and groundwater screening levels, which are calculated to be protective of the indoor air action levels.

**Section 5.0** discusses VI investigations at TCE sites, and outlines Ecology's expectations regarding assessments of possible short-term, indoor air TCE, action level exceedances.

**Section 6.0** outlines Ecology's expectations regarding appropriate responses and response timeframes, when VI-caused indoor air TCE concentrations exceed action levels.

**Section 7.0** describes notifications and other outreach-related tasks that responsible parties should perform at TCE sites where VI may be resulting in indoor air concentrations that exceed action levels.

### 3.0 Background

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In 2009, Ecology prepared the draft VI guidance titled [\*Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action\*](#). A public comment period in the fall of 2009 provided an opportunity for the public to review and give us feedback on the draft document. Although a number of public comments were received, Ecology did not formally respond to the comments or revise and finalize the draft guidance. Nevertheless, the draft VI guidance has been relied on by Ecology staff, environmental consultants, and others who are responsible for assessing VI and ensuring that indoor receptors are protected from VI-related air contamination.

Since 2009, parts of the draft guidance have been updated or otherwise superseded by TCP Implementation Memoranda. Specifically:

1. **Updated and revised VI cleanup and screening levels.** Tables in Appendix B of the 2009 draft guidance contained VI indoor air cleanup levels and soil gas and groundwater screening levels. In 2009, the indoor air cleanup levels in Appendix B corresponded to standard, WAC 173-340-750 Method B and C air cleanup levels, calculated with reference doses (RfDs) and/or cancer potency factors (CPFs) obtained at that time from IRIS and other Environmental Protection Agency (EPA) toxicity databases. Soil gas and groundwater screening levels were calculated to be protective of these indoor air cleanup levels.

As of 2016, the Appendix B tables in the 2009 draft guidance are outdated and should not be relied upon. The VI indoor air cleanup and groundwater and soil gas screening levels in Ecology's Cleanup Levels and Risk Calculation (CLARC) data tables<sup>4</sup> replace the 2009 tables and should be used instead. The CLARC table values are based on the most current Method B and C air cleanup levels and, for sub-slab soil gas screening levels, an attenuation factor different (that is, lower) than the value used to generate the Appendix B tables.

2. **Updated and revised Ecology guidance related to petroleum VI (PVI) screening.** TCP Implementation Memorandum No. 14 (Ecology 2016) embodies new EPA recommendations for assessing sites where the only volatile subsurface contaminants of concern are those petroleum hydrocarbons that are associated with a fuel release. Implementation Memo No. 18 (Ecology 2018) also primarily applies to releases of petroleum-containing fuels. It establishes generic TPH air cleanup levels and

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<sup>4</sup> Available at: <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC> (Ecology 2018a)



corresponding soil gas screening levels. It provides additional guidance for developing PVI sampling plans for Tier I and Tier II, and discusses potential PVI threats to buildings that will be constructed in the future. These memoranda were specifically developed for sites where PVI is a potential concern.

3. **Developed frequently asked questions (FAQs) on whether specific portions of the 2009 draft VI guidance are still applicable.** TCP Implementation Memo No. 21 (Ecology 2018) answers a number of questions regarding technical and policy changes that have occurred since the draft guidance was issued.

Since Ecology's 2009 draft VI guidance was prepared, EPA has concluded that brief exposures to TCE may cause serious health problems.<sup>5</sup> Short-term inhalation exposures to TCE in indoor air have the potential to cause serious heart defects in a developing fetus. The damage can occur early in a pregnancy, possibly before the pregnancy is recognized.

While much of the draft 2009 guidance document is applicable to sites where TCE vapor intrusion is a possibility, there are several issues that are not considered in the draft guidance but should be evaluated, due to the potential for harm from short-term exposure. These issues are:

1. **Response speed.** Actions to protect a fetus from unacceptable TCE exposures should occur as rapidly as possible after discovering the contamination—that is, within days or weeks, depending on the likelihood and degree of potential exposure.
2. **Focus on women of childbearing age (which includes pregnant women).** The developing fetus is sensitive to the effects of short-term TCE exposure, and preventing harm to the fetus relies on reducing the mother's exposure.
3. **Public outreach.** Promptly contacting people who live and work near TCE contamination is crucial for three reasons: 1) to identify women of childbearing age; 2) to explain the potential health hazards to building occupants and, 3) if warranted by site-specific conditions, to obtain permission to access buildings for property-specific investigation and exposure-reduction activities. Whenever possible, outreach activities should be conducted in collaboration with public health departments.

This degree of urgency, and the need for more intensive outreach to specific individuals, is not typically required at most MTCA sites. These issues are further discussed in Sections 5 through 7, following the discussion of Ecology's recommended short-term TCE action and screening levels.

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<sup>5</sup> *Memorandum: Compilation of Information Relating to Early/Interim Actions at Superfund Sites and the TCE IRIS Assessment* (USEPA 2014).

## 4.0 VI Screening and Action Levels for TCE

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### 4.1. Indoor air action levels for TCE

Indoor air cleanup levels—which are used during Tier I and Tier II vapor intrusion assessments to determine whether further sampling, interim actions, or cleanup actions are indicated—are provided in the CLARC data tables.<sup>6</sup> These concentrations are the same concentrations as the standard cancer and non-cancer Method B and C air cleanup levels in CLARC’s *Air* data tables.

Air cleanup levels for TCE are lower than indoor air action levels for short-term indoor exposures. Cleanup levels apply to long-term (at least one year) average air concentrations for the entire population comprised of all genders and ages. Short-term indoor air action levels, on the other hand, only apply to three-week average concentrations for women of childbearing age. The average indoor air TCE concentration due to VI over any three-week interval should not exceed the applicable action level.

VI indoor air cleanup levels for long-term TCE exposures, and action levels for short-term exposures to women of childbearing age, are provided in Table 1 below. The table’s Indoor Air Cleanup and Action Levels are compared to average indoor air TCE concentrations that result solely from site-contaminated soil gas (that is, vapor) intrusion. In some cases, this will mean that contributions to indoor air measurements from non-VI sources, such as outdoor or indoor sources, will need to be distinguished from those due solely to subsurface sources.

The short-term Action Levels for TCE in Table 1 are based on values recommended by EPA Region 10 (December 13, 2012, memorandum) and EPA Region 9 (July 9, 2014 memorandum).<sup>7</sup> Region 10’s 2012 memorandum states that, pursuant to an IRIS toxicological review, exposure to TCE can cause fetal cardiac malformations during a 21-day gestation window. To protect against the possibility of this occurring, the average concentration of TCE in residential indoor air should not exceed 2.0  $\mu\text{g}/\text{m}^3$  during any 21-day period of time in a given year. For commercial / industrial settings, where the receptors of concern are workers, indoor air TCE should not exceed 8  $\mu\text{g}/\text{m}^3$ . The Region 9 memorandum identifies “accelerated” and “urgent response action levels” for residents and workers. The “accelerated” levels range from 2 to 8  $\mu\text{g}/\text{m}^3$ ; the “urgent” levels vary from 6 to 24  $\mu\text{g}/\text{m}^3$ . The range of levels for both categories accounts for the varied lengths of time that receptors are expected to be exposed.

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<sup>6</sup> Cleanup Levels and Risk Calculation (CLARC). <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>

<sup>7</sup> For the Region 9 and 10 memoranda, see: <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Vapor-intrusion-overview>

**Table 1.** Vapor intrusion indoor air cleanup and action levels for TCE

Level of Concern	Concentration ( $\mu\text{g}/\text{m}^3$ )	Risk Basis
<b>TCE Indoor Air Cleanup Levels</b>		
<b>Chronic (mean long-term air concentration for RME receptor)*</b>		
Method B (unrestricted land use)	<b>0.37</b>	Cancer risk 1E-6
	<b>0.91</b>	Hazard quotient 1
Method C (industrial land use)	<b>6.3</b>	Cancer risk 1E-5
	<b>2.0</b>	Hazard quotient 1
<b>TCE Indoor Air Action Levels</b>		
<b>Short-term (maximum 3-week mean concentration for women of childbearing age)</b>		
Unrestricted (residential) land use	<b>2.0</b>	Noncarcinogenic effect based on 24 hours/day, 7 days/week
Workplace scenario (commercial or industrial)	<b>7.5</b>	Noncarcinogenic effect based on 45-hour work week

\* These values are available in CLARC (Ecology 2018a).

A number of other EPA Regions and states, including Massachusetts, New Jersey, New Hampshire, Minnesota, Ohio, Alaska, and Connecticut, have also adopted short-term TCE levels and recommended responses. These levels and response timeframes vary.

Consistent with EPA Region 10, TCE Action Levels in Table 1 are intended for comparison to the highest VI-caused indoor air levels averaged over any 21-day period. Ecology recognizes, however, that the fetal health effects that potentially arise from a short-term exposure to TCE could possibly result from an exposure to action level concentrations over a period less than three weeks. As of the date of this memo, we do not know how short this period could be, or whether shorter periods would only be harmful if TCE concentrations were significantly higher than Action Levels. Therefore, while this memorandum advocates comparing our Action Levels to measurements (or estimates) of average 21-day concentrations, Ecology also recommends that, if any 24-hour or 8-hour measurements of average indoor air TCE concentrations exceed Table 1's Action Levels (for residents or workers, respectively), prompt action should be taken to either reduce those concentrations, or reduce the degree to which women of childbearing age are exposed. Ecology will revisit this recommendation as more information becomes available about health effects attributable to short-term TCE exposures.

Table 1 is limited to providing a residential short-term TCE indoor air Action Level and a short-term Action Level for commercial/industrial workers. The residential concentration is intended to protect women of childbearing age who reside in the building and are continuously exposed to indoor air contaminated by VI. The commercial/industrial Action Level is protective of women

of childbearing age who work full-time shifts up to 45 hours per week.<sup>8</sup> However, other women of childbearing age who occupy a building where VI is occurring may also be receptors of concern. For example, visitors to a building, part-time workers in a building, or students within a school building could potentially be exposed to contaminated indoor air over extended periods of time.

Table 1's short-term Action Levels should be used to determine whether prompt and protective actions like interim actions should be implemented (see [WAC 173-340-430](#)). **These Action Levels are not MTCA Method B or C air Cleanup Levels.** Furthermore, the MTCA regulations require that cleanup levels be established for one of two specific land uses: *unrestricted* or *industrial* site use.

#### 4.2. VI short-term screening levels for TCE in groundwater and soil gas

CLARC's data tables also provide groundwater and soil gas screening levels that can be used to assess the potential VI threat posed by a subsurface source. As for the VI indoor air cleanup levels, these concentrations are based on chronic exposures. CLARC's groundwater screening levels are intended to be protective of corresponding indoor air cleanup levels, and assume there will be 1,000-times attenuation between groundwater VOC concentrations (in equilibrium with vapor concentrations) and indoor air levels. CLARC's sub-slab soil gas screening levels are also expected to be protective of indoor air cleanup levels. They assume there will be 33-times attenuation between soil gas VOC concentrations just below a building's slab and indoor air levels. (For further discussion on this, see the note box following Table 2 in this section.)

VI groundwater and sub-slab soil gas screening levels protective of short-term TCE indoor air action levels are presented in Table 2 below. These screening levels embody the same attenuation assumptions used to calculate the chronic subsurface screening levels provided in CLARC (as discussed above). In summary:

- The short-term VI screening levels for groundwater and soil gas are higher than CLARC's VI TCE screening levels, which are calculated for chronic indoor exposures.
- For residential buildings, the short-term screening level for groundwater is about twice as high as CLARC's chronic-based non-carcinogenic screening level (8 µg/l versus 3.8 µg/l, respectively), and approximately five times higher than CLARC's carcinogenic screening level (8 µg/l versus 1.6 µg/l).

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<sup>8</sup> The protection this paragraph refers to is the protection of the developing fetus. Exposures to TCE can also, of course, potentially affect the health of women themselves. Indoor "protection" for the women themselves should be assessed using the indoor air cleanup levels in the CLARC data tables, not the short-term action levels.

- Similarly, the short-term screening level for TCE in soil gas is about twice as high as CLARC's chronic-based non-carcinogenic sub-slab screening level (67 µg/m³ versus 31 µg/m³), and a little more than five times higher than CLARC's carcinogenic sub-slab screening level (67 µg/m³ versus 12 µg/m³).

**Table 2.** Vapor intrusion subsurface screening levels for short-term exposures to TCE

Short-term TCE Subsurface Screening Levels	Concentration	Basis
<b>groundwater (in µg/l)</b>		
residential short-term VI Screening Level for groundwater	<b>8</b>	<ul style="list-style-type: none"> <li>• TCE as a non-carcinogen</li> <li>• receptor of concern: women of childbearing age</li> <li>• residential indoor scenarios</li> </ul>
non-residential short-term VI Screening Level for groundwater	<b>31</b> 1.	<ul style="list-style-type: none"> <li>• TCE as a non-carcinogen</li> <li>• receptor of concern: women of childbearing age</li> <li>• commercial/industrial workplace scenarios</li> </ul>
<b>soil gas (in µg/m³)</b>		
residential short-term VI Screening Level for sub-slab soil gas	<b>67</b>	<ul style="list-style-type: none"> <li>• TCE as a non-carcinogen</li> <li>• receptor of concern: women of childbearing age</li> <li>• residential indoor scenarios</li> </ul>
non-residential short-term VI Screening Level for sub-slab soil gas	<b>250</b>	<ul style="list-style-type: none"> <li>• TCE as a non-carcinogen</li> <li>• receptor of concern: women of childbearing age</li> <li>• commercial/industrial workplace scenarios</li> </ul>

**NOTE:** The 2009 draft guidance differentiates between the amount of soil gas-to-indoor air attenuation that should be assumed for soil gas VOC concentrations that are located immediately below the building (like sub-slab), versus those concentrations that are at significantly greater distances below ground surface (called “deep”). CLARC’s VI data tables also make this distinction. “Deep” soil gas screening levels in CLARC assume 100-times attenuation between soil gas VOC concentrations and indoor air levels.

However, EPA’s *Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (USEPA June 2015) does not recommend that soil gas levels be assumed to attenuate more than 33 times, regardless of depth. As a result, Ecology is re-evaluating the appropriateness of a deep soil gas VI screening level that assumes more than

33-times attenuation. At the time this memo was published, we are not withdrawing the recommended deep soil gas VI screening levels in CLARC, but:

1. These levels should not be used to assess the potential for an indoor air exceedance of the short-term TCE action level, and
2. For other assessment purposes (such as assessing the potential for an exceedance of a chronic-based indoor air cleanup level) the requisite 15-foot or greater separation distance should be applied to the depth of the vadose zone between the building foundation (not the ground surface) and the deep soil gas measurement. The short-term TCE Screening Levels identified in Table 2—referred to as “sub-slab” and calculated with an attenuation factor of 0.03—may also be compared to deeper soil gas sample measurements.

## 5.0 VI Investigation

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Ecology's 2009 draft VI Guidance should generally be followed when investigating and addressing TCE vapor intrusion. But as noted in Section 3.0 above, the draft guidance does not discuss short-term inhalation exposures to TCE. The following investigation recommendations refer specifically to sites where TCE is a potential VI concern.

### 5.1. Identify any site buildings where VI may potentially result in indoor TCE concentrations above the short-term action level.

NOTE: The discussion in Section 5.1 assumes that indoor air sampling for TCE has not been conducted. If indoor air has already been sampled, and indoor TCE concentrations due to VI exceed the applicable short-term action level, appropriate responses are described and discussed in Section 6. If indoor air was sampled and TCE concentration measurements were below the short-term action level, the VI assessment team should determine whether those measurements represent the highest 3-week average indoor TCE concentration. Please see Section 5.4.

Determining which buildings are a potential concern is commonly accomplished by mapping site areas where TCE is, or may be, present in soils or shallow groundwater. Buildings above or close to these areas can then be identified. In parts of the site where soils are contaminated with TCE, soil gas samples are typically collected and analyzed.<sup>9</sup> Ecology's 2009 VI Guidance, CLARC's VI soil gas Screening Levels, and Table 2's short-term soil gas Screening Levels above, can then be used to determine if VI could potentially result in indoor air cleanup level or action level exceedances (respectively) at nearby buildings.

Regardless of whether the potential subsurface VI source is contaminated soils or shallow groundwater, soil gas samples can be collected below or near a building, and the measured TCE levels can be used to determine the potential for an indoor exceedance of indoor air cleanup levels and/or action levels. However, if TCE concentrations in shallow groundwater are above CLARC's VI Screening Levels, or if significant soil contamination or residual non-aqueous phase liquid (NAPL) is close to a building and likely to contain elevated TCE concentrations, investigators should not delay indoor air sampling (see section 5.3). When these conditions are

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<sup>9</sup> *De minimis* levels of TCE in vadose zone soils (i.e., above the seasonal low water table) are unlikely to pose a VI threat. WAC 173-340-740(3)(b)(iii)(C)(III) defines such levels as concentrations no higher than concentrations "derived for protection of groundwater for drinking water beneficial use under [WAC 173-340-747\(4\)](#)." Concluding that TCE levels in soils are this low requires adequate characterization of vadose zone contamination.

present, the first indoor sampling event(s) should be a site priority and performed immediately, without waiting for a preliminary soil gas investigation.<sup>10</sup>

In areas where soils are not contaminated and shallow groundwater is the only potential VI source, the 2009 draft VI guidance, groundwater VI Screening Levels in CLARC, and short-term groundwater Screening Levels in Table 2 can be used to distinguish between buildings where VI could potentially result in exceedances of indoor air cleanup (chronic) or action (short-term) levels, and those where exceedances are highly unlikely.

In addition to the exceedance of subsurface VI screening levels, there may be other building- or site-specific reasons for suspecting that indoor air TCE concentrations could exceed the short-term action level. For instance, at some building locations, contaminated shallow groundwater may be the only potential VI source and TCE concentrations in this groundwater may be below the short-term screening level. However, the short-term groundwater screening levels assume a certain amount of attenuation and dilution of vapor-phase TCE between the groundwater surface and the indoor environment. While these are conservative assumptions for most buildings, they may not be if:

- There are preferential subsurface pathways that may result in higher soil gas VOC levels below the building than the short-term groundwater screening levels assume, or if
- There may be a higher soil gas flowrate into the building than the short-term groundwater (and soil gas) screening levels assume.<sup>11</sup>

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<sup>10</sup> Ecology does not recommend that soil gas sampling be initiated at this point to determine if TCE concentrations exceed short-term soil gas screening levels. This is because it takes time to prepare (and approve) soil gas SAPs; obtain access; schedule and mobilize the related work; and, review the sampling results. Indoor air sampling should not be delayed while these activities are being performed. During or immediately following the first indoor air sampling event, however, it is prudent to obtain soil gas data.

<sup>11</sup> The short-term groundwater Screening Levels assume that vapor-phase TCE concentrations will attenuate by a factor of 1000 between soil gas levels immediately above (and in equilibrium with) contaminated groundwater and indoor air. This is generally a conservative assumption, but may over-predict the degree of subsurface attenuation in certain cases. Ecology's 2009 draft VI guidance describes the conditions where this may occur (e.g., sites with a very thin vadose zone (shallow water table); the presence of subsurface conduits capable of transporting elevated soil gas levels to areas directly below the building with minimal attenuation; etc.)

The short-term soil gas Screening Levels assume that vapor-phase TCE concentrations will attenuate by a factor of at least 33 times between soil gas levels immediately below the building and indoor air. Again, this is usually a conservative assumption. However, less attenuation is possible if the building or its foundation allows soil gas to enter interior spaces relatively unimpeded (which may occur, for example, when slab or basement wall penetrations or large cracks provide preferential conduits for entry).



## 5.2. Notify and involve Ecology

This memorandum presumes that Ecology will be involved throughout the VI evaluation process, including owner/tenant notifications, the initial building visit, indoor air sampling, data analysis, and post-sampling decision-making described in the rest of this section and in Sections 6 and 7. We have therefore identified certain recommended actions and decisions below as being responsibilities of both the party conducting the remedial actions (the responsible party) and Ecology.<sup>12</sup> However, in those cases where the responsible parties are acting independently and choose not to involve Ecology during some or all of these actions and decisions, they should complete the applicable and recommended steps in this memorandum themselves.

Regardless of whether Ecology oversees the site throughout the cleanup process, or whether another party independently conducts the remedial actions:

1. Ecology should be contacted as soon as the responsible party determines that women of childbearing age are current building occupants and indoor air sampling is needed to assess the potential for a short-term TCE action level exceedance (see Section 5.3 below).
2. If an Ecology staff person has already been assigned to the site, this is the individual who should be notified. Otherwise, the responsible party should contact their local Ecology regional office. They should not wait for Ecology's response before moving to the next steps of the investigation / response process. Find Ecology's contact information at <https://ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue>

## 5.3. Prepare for indoor air sampling

As soon as one or more site buildings have been identified as a location where VI may potentially result in indoor air TCE concentrations above the short-term action level, investigators should quickly plan for the next assessment steps—unless they already know that women of child-bearing age do not regularly occupy the buildings. At this point in the investigation, it is only *potentially possible* that indoor TCE concentrations actually exceed the Action Level, but several actions should occur without delay: notify building owners/tenants, determine if exceedances are occurring, and – if needed – take actions to protect the potential receptors.

1. **Contact building owner and/or tenant.** The owner/tenant of the building should be contacted to determine if women of childbearing age are current occupants, and to schedule a building and property visit. This initial contact should occur soon after the

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<sup>12</sup> Please see footnote in Section 1.0 regarding use of the term “responsible party” in this memorandum.

building has been identified as potentially at risk. The owner and tenant(s) of these buildings should be notified that there is the *possibility* that VI-caused indoor air TCE concentrations exceed the acceptable chronic and/or short-term screening/action levels.

2. **Schedule a building visit.** If women of childbearing age are current building occupants, a building visit should be scheduled as soon as possible. During this visit Ecology and the responsible party will need to be prepared to discuss the potential TCE risk, explain how we would like to proceed, and answer exposure-related and other questions.<sup>13</sup> If the responsible party does not own the building, they should also be prepared at this time to request building access for the purpose of collecting indoor air samples. Interactions with building owners and tenants during the period preceding indoor air sampling are further discussed in Section 7.0 below.
3. **Prepare and finalize a SAP.** Following the visit to the building and property, an indoor air Sampling and Analysis Plan (SAP) should be expeditiously prepared, reviewed, and finalized.<sup>14</sup> The SAP should include a site/building-specific VI conceptual site model (CSM) that serves as the basis for the selection of data quality objectives and sampling design. The VI CSM, as discussed in our draft 2009 VI guidance document and in Section 5.4 of EPA's 2015 *Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (USEPA June 2015), is a combination of information, assumptions, and hypotheses that investigators use to support evaluations of the adequacy of available site-specific information, and guide the identification of critical data gaps.
4. **Schedule indoor air sampling.** After SAP finalization the first indoor air sampling event should be immediately scheduled. It should not be delayed to coincide with more desirable seasonal or meteorological conditions.<sup>15</sup>

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<sup>13</sup> Please see Section 7.1's discussion of VI-related risk communications.

<sup>14</sup> This assumes that: a) an exceedance of the short-term TCE indoor air action level has not yet been measured, and b) the responsible party has decided not to pursue a "preemptive" response action. If an exceedance of the action level has already been measured, no additional pre-mitigation sampling may be needed. See Section 6.0 for a description of appropriate response actions.

Preemptive mitigation is a term often used to describe VI mitigation efforts implemented without (or prior to) confirmation that VI-caused indoor air contamination exceeds acceptable levels. When preemptive mitigation has been chosen as the next step in Section 5.3, indoor air sampling is not typically conducted until after mitigation has been implemented. See Section 7.8 of EPA's OSWER VI guidance document (USEPA June 2015) for additional information about preemptive mitigation.

<sup>15</sup> The SAP should acknowledge the time-related considerations associated with determining if a short-term action level is being exceeded, and propose the respective timeframes and due dates for obtaining and reviewing data.

#### 5.4. Determine if 3-week average indoor air TCE concentrations exceed the short-term action level.

For those buildings occupied by women of child-bearing age, the VI investigation should provide sufficient information to determine whether 3-week average indoor air TCE concentrations ever exceed the short-term action level. This is unlikely to be evident from a single indoor air sampling event unless that event coincides with a period when maximum VI impacts are occurring. Because VI impacts can vary significantly over time, and because this variability cannot be easily predicted, it is essentially impossible to schedule an indoor sampling event that can be confidently assumed to coincide with, or otherwise represent, the highest 3-week average VI impact on air quality, unless the sampling program is designed to intentionally create near-maximum VI conditions.<sup>16</sup> Unless TCE concentrations measured during the first sampling event exceed the short-term indoor air action level, often the investigation will require multiple sampling events.

This memorandum does not provide indoor sampling guidance. For recommendations related to sampling methodologies, please refer to:

- Ecology's Implementation Memorandum No. 21 (Ecology 2018)
- Relevant portions of the Tier II discussion in Ecology's 2009 draft VI guidance
- Section 6.4 of EPA's VI guidance (USEPA 2015)
- Recent state guidance documents, such as New Jersey's *VI Technical Guidance* (NJDEP 2018).

When the receptor of concern is a current occupant of the building, and air samples are being analyzed at an off-site laboratory, expedited turn-around times should be requested. For at least

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<sup>16</sup> Generally, this is accomplished by inducing significant building depressurization just prior to the sampling event. Various degrees of depressurization, as well as positive pressurization, are typically induced to track indoor air concentration responses. (DOD 2017, McHugh 2017, and Johnson 2016.) The building depressurization methodologies that have utilized a blower-door approach, and have been subsequently described in the literature, can successfully meet project objectives. However, the methodology: a) is likely to be more successful at smaller and simpler buildings (architecturally, and in terms of interior design), and b) should not be assumed to result in higher, VI-caused, indoor air concentrations once significant depressurization has been achieved.

Even when conditions conducive to relatively extreme VI impacts are not intentionally created, they may fortuitously occur during a sampling event. That is, significant building depressurization may be "naturally" occurring during any given sampling event and this degree of depressurization may correspond to *worst case*-type VI-caused indoor air concentrations. At many sites and site buildings this often coincides with periods when indoor air temperatures are much higher than outdoor temperature. Continuously measuring pressure differentials of cross-slab or cross-first floor (for buildings with crawlspaces) throughout the indoor air sampling event can provide measurements that demonstrate the degree of building pressurization relative to the subsurface during the event. These measurements can be recorded regardless of the air sampling methodology used (such as canisters, passive diffusive samplers, or more real-time measuring devices).

the first sampling event, the goal should be to receive the laboratory's sampling data within three business days.

Immediately after the data have been received, they should be initially reviewed by the receiver and shared with other members of the decision-making team (such as the Ecology site manager,<sup>17</sup> if the responsible party's consultant receives the laboratory data). For at least the first indoor air sampling event the goal should be to share these results with the decision-making team within seven days from the time of sample collection. The objective of the decision-making team's review is to then determine, as soon as possible, if: 1) the relevant TCE short-term indoor air Action Levels listed in Table 1 are being exceeded, and 2) VI is the likely cause.

The immediate review, and the decisions arising from that review, will not have the benefit of a sampling-data quality assessment or validation. These activities will typically occur later, when the results of the sampling event are being integrated into some form of VI evaluation report. It is possible, then, that a later assessment of data quality will lead to a conclusion that VI is *not* causing short-term indoor air action level exceedances, and that the earlier determination was incorrect. However, if the receptors of concern are current occupants of the building, the importance of providing timely information to those receptors should outweigh the potential that the information provided might later need to be revised.

It should also be emphasized that this section (Section 5.0) is specifically devoted to recommendations related to the potential for short-term inhalation exposures to TCE. As discussed in Section 4.0, CLARC's VI Indoor Air Cleanup Levels for TCE are lower concentrations than action levels established to be protective of short-term indoor exposures. This is because the Indoor Air Cleanup Levels in CLARC are based on chronic VI-caused exposures. Remedial actions such as VI mitigation may therefore be needed to protect long-term indoor exposures, regardless of whether the short-term indoor air TCE action level is exceeded.

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<sup>17</sup> If an Ecology site manager has not been assigned to the project, the results should be sent to the designated Regional contact.

## 6.0 Responding to Exceedances of the Short-term TCE Indoor Air Action Level

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**If VI is causing an exceedance of the TCE short-term indoor air action level, prompt action is needed.** Such actions should be taken in consultation with the building's owner (and tenant, if applicable). Protecting people inside affected buildings is a high priority and any needed action should not be delayed. If additional, follow-up indoor air or other sampling is scheduled before the selected action is fully implemented, this sampling must be conducted in a manner that does not interfere with efforts to quickly and effectively reduce indoor exposures to TCE.

### Systems for mitigating vapor intrusion

VI *mitigation* generally refers to actions whose purpose is to reduce VI-caused indoor air contamination, and these actions often focus on reducing the amount of contaminated soil gas entering the building.<sup>18</sup> Mitigation systems creating **depressurization** of the sub-slab zone or crawlspace will often be the most effective approach for reducing VI impacts (until subsurface cleanup permanently remediates the source of elevated soil gas concentrations). However, these types of mitigation, which are intended to minimize entry of contaminated soil gas into the building, can take weeks to design, construct, and fully implement. Additional time is then needed to demonstrate that target VOC concentrations in indoor air have actually been achieved.

Active VI mitigation systems such as sub-slab and sub-membrane depressurization are often able to reduce VI-caused TCE indoor air contamination to concentrations below the short-term action levels. But before the mitigation system has been successfully implemented, TCE concentrations will, or may, be above these levels. If a woman of childbearing age lives or works in an area of the building where elevated TCE concentrations are present, and does not re-locate, she will continue to be exposed to them. Mitigation should therefore be designed and implemented as quickly as possible,<sup>19</sup> and other actions should be considered that would effectively reduce exposures during the interim.

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<sup>18</sup> Subsurface remediation, on the other hand, includes cleanup actions designed to reduce soil gas VOC levels. Although these actions will also reduce VI-caused indoor air contamination, they are not typically referred to as VI "mitigation" unless they can be implemented (and are successful) within a relatively short timeframe.

<sup>19</sup> The mitigator who will likely perform the work should be identified early (e.g., during the investigation's planning phase). His/her availability for constructing the mitigation system, if needed, should also be verified at this early stage.

## **EPA-recommended actions and MTCA cleanups**

Prompt actions to reduce TCE exposures include the recommended responses described in EPA Region 9's 2014 TCE Memorandum under two headings: "Implementation of early or interim measures to mitigate TCE inhalation exposure," and "Tiered response action" (USEPA 2014). Many of the recommendations in these sections of the Memorandum are appropriate to use as a guide for selecting proper response actions in Washington state. However, three of Region 9's recommendations should be clarified in terms of their applicability at MTCA cleanup sites:

### **1. The recommendation to increase building pressurization/ventilation.**

Positively pressurizing the building (with respect to the subsurface) can create a pressure barrier to advective flow of soil gas into the structure and mitigate VI impacts. However, it will not always be possible or sufficiently effective. Likewise, increasing ventilation can dilute VI impacts if the outdoor-to-indoor air exchange rate is increased. But it may not be practicable to increase the ventilation rate enough to reduce indoor air TCE below screening/action levels. Moreover, if the methods to increase the outdoor-to-indoor air exchange rate result in greater building depressurization, VI impacts may actually be exacerbated.

NOTE: At some buildings the owner/tenant may be able to quickly adjust HVAC settings to create these pressure or ventilation rate conditions. However, unless follow-up monitoring of indoor air quality is performed, there is no way to tell if TCE concentrations have been reduced to an acceptable level.

### **2. The recommendation to seal potential conduits.**

It is possible that a single foundation or building feature is primarily responsible for the degree of vapor intrusion, leading to short-term indoor air TCE action level exceedances. For instance, there could be an uncovered earthen floor in part of the building. There could be an uncovered/unsealed basement, or a first floor sump or (disconnected) floor drain. There could be unsealed utility line penetrations at ground level or sub-grade. If the building has a crawlspace, there could be relatively large and unsealed first floor openings around pipes or wiring that run between the two levels. The crawlspace could also be walled-in, preventing any significant sub-floor ventilation and dilution of soil gas emissions.

Often, however, it won't be obvious where the most significant soil gas entry points are located. For this reason, conduit sealing measures are commonly combined with more effective mitigation actions.

In terms of the prompt action needed to respond to TCE action level exceedances, Ecology recommends that sealing efforts be:

- a) Focused on any easily observable and obvious major routes by which soil gas is likely entering the building;
- b) Only undertaken as the initial response if the sealing activity can be completed quickly; and
- c) Promptly followed up with indoor air sampling to verify the sealing's effectiveness.

### **3. The recommendation to respond differently, based on whether the “urgent” response action level has been exceeded.**

The EPA Region 9 Memorandum states that the response to exceeding an “accelerated” action level should be “completed and confirmed within a few weeks.” If the higher “urgent” action level is also exceeded, the response time should be reduced to “a few days.”

Ecology agrees that, all else being equal, there should be a greater sense of urgency when TCE concentrations are much higher than the short-term action level established for the site and building. It is also true that the types of responses likely to be effective will often partly depend on how high the indoor air TCE concentrations are. But Ecology believes any exceedance of the short-term action level merits prompt action. This means that once an exceedance is apparent, the site team should quickly decide on the preferred response action, and then immediately propose this action to the building's owner/tenant.

If VI is causing an exceedance of the TCE short-term indoor air action level, the action to be taken should be quickly determined in consultation with the building's owner (and, if applicable, the tenant). The goal should be to reduce TCE exposures for women of childbearing age as soon as possible. This may require that a “stop-gap” response be taken right away, while plans for long-term mitigation proceed on a parallel track. Stop-gap responses include actions such as temporarily relocating the receptor, and installing effective indoor air treatment.

Carbon-based indoor air VOC treatment devices (sometimes referred to as air purification units [APUs] or “air cleaners”) can be installed relatively quickly. These devices can be used for extended periods, but their typical, or niche, VI application is temporary use. Often they are operated only while a more permanent form of mitigation is being designed/constructed. As discussed in EPA's 2017 *Engineering Issue*, which describes these devices, indoor air treatment can be accomplished with portable air cleaning units or HVAC in-duct systems (USEPA 2017).

The former usually employs a built-in air circulation fan and sorbent bed, with carbon serving as the sorbent.

Indoor air treatment devices may or may not be able to quickly reduce TCE concentrations to acceptable levels within certain airspaces. Regardless of the treatment device selected, it cannot be assumed that the installed units will *sustainably* reduce indoor air TCE to concentrations below the short-term action level. As noted in EPA's 2017 *Engineering Issue*, this must be confirmed with air sampling.<sup>20</sup>

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<sup>20</sup> In the EPA 2017 *Engineering Issue* discussion of treatment systems, Attachment A lists a large number of VOC air cleaners by brand name. In 2014, California's DTSC reported use of Air Rhino and AirMedic Vocab carb stand-alone air purifiers. The New Hampshire Department of Environmental Services and Massachusetts Department of Environmental Protection reported use of portable Austin HealthMate units in 2015 and 2016, respectively. (See "TCE Vapor Intrusion Case Study" presented at the 2015 NEWMOA conference, <http://www.newmoa.org/events/event.cfm?m=157> and the October 2016 Field Assessment and Support Team (FAST): "An Expedited Approach to the Investigation and Mitigation of the Vapor Intrusion Pathway.").

Ecology does not endorse these particular products. We are including these references only to indicate that the products have been used in at least three states to reduce VI-caused indoor air contamination.



## **7.0 Working with people who are affected by vapor intrusion**

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This section, as well as Sections 5.0 and 6.0, discusses interactions with the owners and occupants of buildings where vapor intrusion is, or may be, contaminating indoor air with TCE. In the simplest case, the building is a single-family residence owned by the occupants. The responsible party and Ecology are then interacting primarily with a head of household. But various other scenarios are common, such as:

- a. The building may be a single-family residence that is owned by someone who resides elsewhere.
- b. The building may be occupied by a single business, which also owns the property.
- c. The building may be occupied by a single business, which does not own the property or building.
- d. The building may be occupied by multiple businesses, none, or only one, of which owns the property or building.

In some cases, the property where the building is located will be owned by the responsible party; in other cases, not.

Throughout this memorandum, we've used the term "building owners/tenants" when referring to notifications, access requests, information sharing, and other interactions with the affected public. We use this term for economy and simplicity, but recognize that owners are not always building occupants and receptors, and building occupants are not always owners or tenants. Women of childbearing age who occupy a building could be owners, tenants, employees or other workers, students, or visitors.

For communication purposes, it is helpful for the responsible party and Ecology to have no more than two designated "building contacts." Communications about scheduling building visits, obtaining access, sharing sampling data and data evaluations, and consultations concerning any response actions, can then be limited to a small number of individuals (who may or may not be potential "receptors"). It will be incumbent upon these building contacts to not only disseminate the information they receive from the responsible party and Ecology to (other) building occupants who are potentially being exposed, but to relay those occupants' concerns and questions back to us.

## 7.1. Outreach before indoor air sampling

As discussed in Section 5.1, any site buildings where VI may potentially result in indoor TCE concentrations above the short-term action level should be identified based on subsurface sampling and other site data. When such a building is identified and women of childbearing age are occupants, the planning, notification, and pre-sampling activities described in Section 5.3 should be performed. This includes a visit to the building itself.

In addition to obtaining the building and receptor-behavior information usually needed to prepare a VI indoor air SAP, during building visits Ecology and the responsible party should:<sup>21</sup>

1. Verify whether women of childbearing age regularly occupy the building. If they do (especially for non-residential buildings) the areas where these women spend most of their time, and the hours they are typically present in the building, should be ascertained.
2. Determine if women of childbearing age may be occupants in the foreseeable future, even if they're not currently present.
3. Discuss site contamination and how vapor intrusion can potentially contaminate indoor air; discuss what we propose to do next and the need for sampling access; answer their questions.

During the building visit, Ecology and the responsible party will need to be prepared for questions the occupants may have regarding potential short-term (and long-term) TCE health effects and how to reduce their exposures. Decisions should be made during the planning period (described in Section 5.3) about how and when this information should be provided, and who should communicate it.

Ecology staff are expected to only answer the most basic health-related VI questions. In general, the public should routinely be referred to local health departments or family physicians for the answers to questions that require toxicological or medical expertise.

Washington's state and local health departments are generally more familiar with local communities and their concerns than Ecology site management staff. Health departments also have more expertise at conveying health-related information. If women of childbearing age are potentially exposed to site-related TCE contamination, it is recommended that site managers and

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<sup>21</sup> As noted in Section 5.2, this memorandum assumes Ecology will be involved throughout the VI evaluation process. When this is not the case, parties performing the site investigation and cleanup should independently complete the recommended steps outlined in this memorandum.

the responsible party rapidly coordinate with state/local health departments. These agencies can better explain potential health hazards to building occupants and/or help gain access to buildings for investigation and remediation if needed. If Ecology has assigned a Community Outreach and Environmental Education Specialist (COEES) to the site, the site manager should additionally confer with this individual during the pre-sampling period.<sup>22</sup>

Before any indoor air sampling can occur, the party performing that sampling must obtain the owner's/tenant's consent.<sup>23</sup> Typically during VI investigations, this consent is documented in an "access agreement," which also usually specifies the conditions under which access is granted. Finalizing an access agreement can occasionally be a lengthy process for various reasons. Sometimes it is difficult to make timely contact with the building owner or tenant. Sometimes the owner will elect to get the advice of legal counsel before entering into an agreement. There can be protracted negotiations regarding considerations such as access-related payment, or other site-specific issues. While securing access is normally the duty of the responsible party, Ecology may become involved with disputes or delays when the health threat relates to a short-term exposure to site contamination. The parties must realize that Ecology will make best efforts, including—if needed—exercising its legal authorities, to ensure access agreements are finalized as soon as possible.

## **7.2. Outreach after indoor air sampling**

Indoor air sampling results, together with other lines of evidence, should indicate whether VI is causing an exceedance of the TCE short-term indoor air action level. Once the indoor air sampling data have been received from the laboratory (assuming no "real time" sampling was performed), the responsible party and Ecology should 1) discuss the results, 2) make a preliminary decision as to whether VI is likely to be resulting in a TCE short-term action level exceedance, 3) agree on next steps, and then 4) contact the building owner/tenant.

As discussed in Section 5.4, when women of childbearing age are current occupants of the building, this decision-making and outreach process should begin as soon as the data are initially received, without waiting for data quality assessment. In these cases the goal should be to quickly determine the likelihood of a TCE short-term indoor air action level exceedance and then inform building owners/tenants of the sampling results. Unless owners, tenants, and other

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<sup>22</sup> Ecology's COEESs are typically not assigned to independent cleanup sites, including those in the Voluntary Cleanup Program (VCP). However, if a COEES has been assigned to a site where VI is causing, or may potentially result in, indoor TCE concentrations above the short-term action level, their assistance can improve communications with the owners, tenants, and occupants of the affected buildings (as well as other members of the concerned public).

<sup>23</sup> With limited exceptions, such as emergency situations.

concerned building occupants would prefer to wait until the quality of sampling data has been rigorously assessed and validated, they should be notified of sampling results soon after the results arrive from the laboratory.<sup>24</sup>

The responsible party and/or Ecology should tell the building owner/tenant what the sampling results indicate and what (at that time) the next steps should be. During this discussion, it is important to:

1. Explain how we have reached our conclusions.
2. Honestly differentiate between what is known (e.g., the results from this single sampling event), what we have inferred from the information we have collected, and what is not known, and
3. Urge the owner/tenant to share and explain these results—as well as plans for follow-up actions—with concerned building occupants. This includes all women of child-bearing age who live or work in affected portions of the building.

Coordinating with the site's assigned COEES and state/local health departments is critical at this stage and can improve the effectiveness of these communications.

If sampling data indicate that VI is likely to be causing an exceedance of the TCE short-term indoor air action level, and if a woman of childbearing age is a building occupant, the proper response should be quickly determined in consultation with the building's owner (and tenant, if applicable). Section 6.0 of this memo refers to various response actions that may apply. The selected action will depend on a number of building-specific factors, such as how high the indoor air TCE concentrations appear to be, and the preferences of the building's owner/tenant and receptors of concern. Promptly reaching, and carrying out, a mutually acceptable decision may require the involvement of state/local health departments.

If measured levels of indoor air TCE are below the action level, however, the next proposed step may simply be to schedule a re-sampling event for the future.<sup>25</sup>

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<sup>24</sup> When the data are shared this quickly, the building occupants should be informed of the possibility that the implications of the sampling results could change following evaluation of the data quality. Should this occur, the owner/tenant would then be immediately notified by the responsible party and/or Ecology.

<sup>25</sup> Typically, a sampling report is prepared after the data have been quality assured (QA'ed) and validated. A copy of the report, and a copy of any Ecology response letter(s), should usually be provided to the building owner/tenant.

## 8.0 References

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## Attachment A

### Response to comments on the November 18, 2018, review draft of Implementation Memo No. 22: *Vapor Intrusion (VI) Investigations and Short-term Trichloroethene (TCE) Toxicity*

A public comment period was held from November 21, 2018, through January 7, 2019, for the review draft of this document. The comments received during that period helped inform modifications made to the final version of the document (dated October 1, 2019) and are summarized below. A number of editorial changes were also made to the review draft that are not reflected in this response to comments document.

1. Comments regarding the Environmental Protection Agency's (USEPA's) 2014 Memorandum: *Compilation of Information Relating to Early/Interim Actions at Superfund Sites and the TCE IRIS Assessment*, and the discussion of short-term inhalation exposures to TCE in Section 3 of Ecology's Implementation Memorandum 22. In particular, a commenter suggested clarifying in the third-to-last paragraph of this Section that the reference to EPA's 2014 Memorandum has limited applicability to certain statements made in later portions of the paragraph.

**Response** – To better distinguish the citation to EPA's 2014 Memorandum and that document's content from later statements in the paragraph, Ecology has made changes to the language in this part of Section 3.0, and removed the last sentence contained in the draft version of the third-to-last paragraph.

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2. Comments regarding Section 4 of Implementation Memorandum No. 22, and in particular:
    - a. The use of different default exposure assumptions—and different screening values—than used by EPA Region 9; and
    - b. Distinguishing between receptors of concern (women of child-bearing age versus the developing fetus).

**Response** – Implementation Memorandum No. 22's indoor air TCE action levels, listed in Table 1 of the document, are based the assumptions that a woman carrying a developing fetus could be exposed to indoor air TCE concentrations:

- a) In a home for 24-hours per day, every day of the week throughout the year; and,
- b) In the workplace for 45-hours per week, 260 days per year.

EPA Region 10's December 13, 2012, Memorandum, which served in part for the action levels we selected, recommends levels of 2 µg/m<sup>3</sup> for residential settings and 8.4 µg/m<sup>3</sup> for commercial/industrial settings. Ecology chose the same residential value for Implementation Memorandum 22. For the commercial/industrial action level, however, we opted to assume an additional five hours of weekly exposure. For this reason our commercial/industrial action level (7.5 µg/m<sup>3</sup>) is 12.5% lower than Region 10's corresponding level.

The commenter is correct that when Implementation Memorandum No. 22 refers in Section 4.1 to the protection of women of childbearing age against unacceptable short-term TCE exposures, our concern is for the developing fetus. The short-term action level concentrations cannot be assumed to be sufficiently protective of the woman herself. Ecology has therefore made changes to the third-to-last and second-to-last paragraphs of Section 4.1 to better clarify the action levels' applicability.

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Since the close of the public comment period, other changes were made to Implementation Memorandum No. 22 based on comments received from Seattle & King County Public Health and Ecology's Toxics Cleanup Program. Among the substantive changes:

- (1) Language was added to Section 3.0 to clarify that the "focus on women of childbearing age" includes pregnant women; and
- (2) Language was added to Section 1.0 – similar to the statements in Section 5.2 – noting that when Ecology is not directly involved in the management of a cleanup site where TCE is a contaminant of concern, the parties performing the site investigation and cleanup should independently perform the Memorandum's recommended steps; and
- (3) Language was added to Section 7.0 noting that Ecology's Community Outreach and Environmental Education Specialists (COEESs) are typically not assigned to independent cleanup sites, including those in the Voluntary Cleanup Program (VCP).

# Appendix B

## Boring Logs

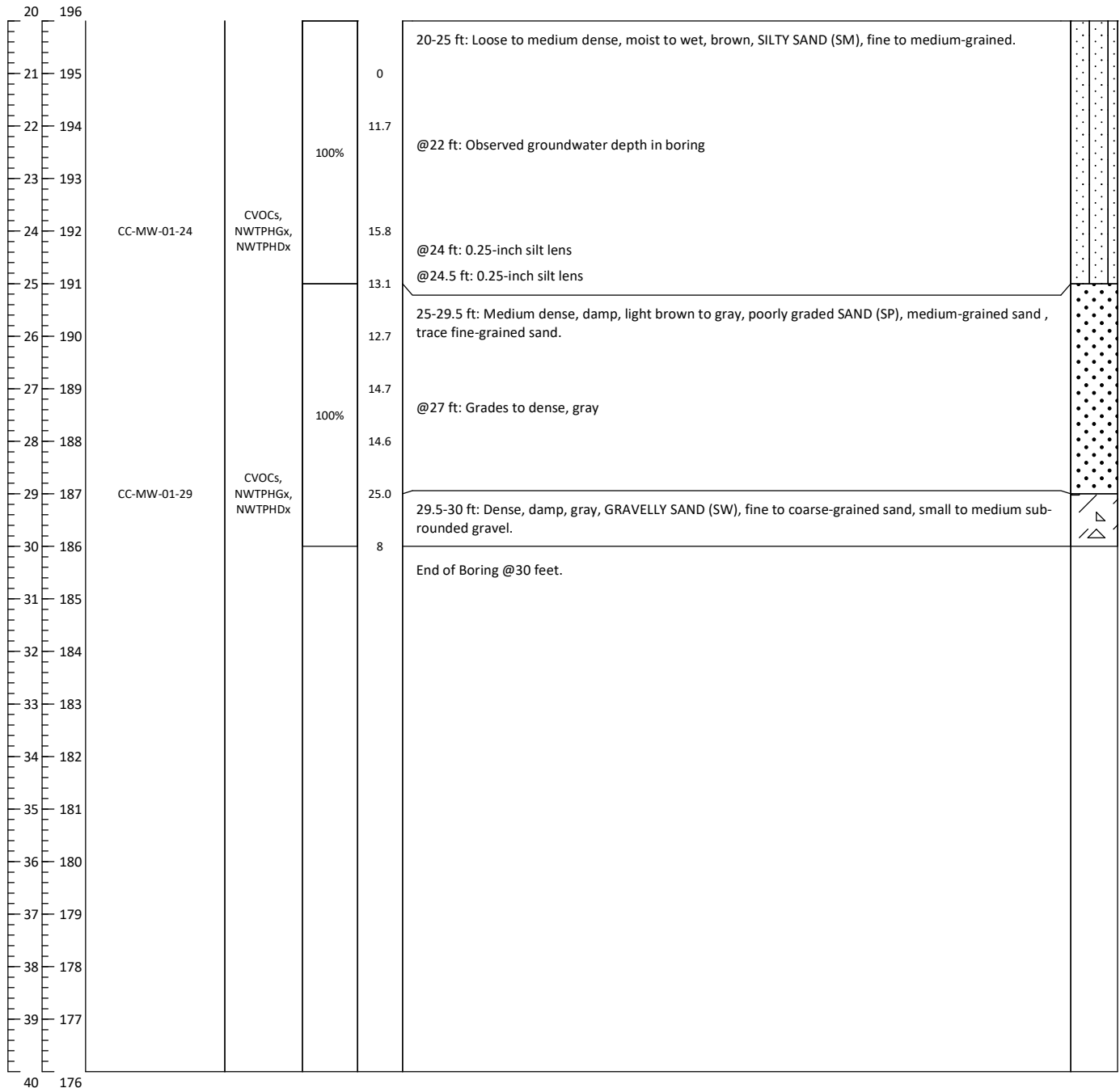
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# Boring Log CC-MW-01

Project: <b>Carson Cleaners Facility</b>	Location: <b>Seattle, WA</b>	Project #: <b>200544-01.01</b>
Client: <b>Helsell Fetterman</b>	Contractor: <b>Holt Services Inc.</b>	Drilling Equipment: <b>Geoprobe 7822DT</b>
Logged By: <b>7/24/2020</b>	Method/Core Diameter: <b>Direct Push / 2.25 inches OD</b>	Total Depth (feet): <b>30.0</b>
Northing: <b>-122.31442</b> Easting: <b>47.6632</b>	Horizontal Datum: <b>NAD 83 WA State Plane North, feet</b>	Date Started: <b>7/24/2020</b>
Observed Groundwater (ft bgs): <b>22</b>	Elevation (ft MLLW): <b>216.0</b>	Date Completed: <b>7/24/2020</b>

In-situ Depth (feet)	Elevation (feet MLLW)	Sample	Chemical Analysis	Recovery	PID	Sediment Description	In-situ Interval
						Samples and Descriptions are in in-situ depths. Classification Scheme: USCS	



# Appendix C

## Well Logs

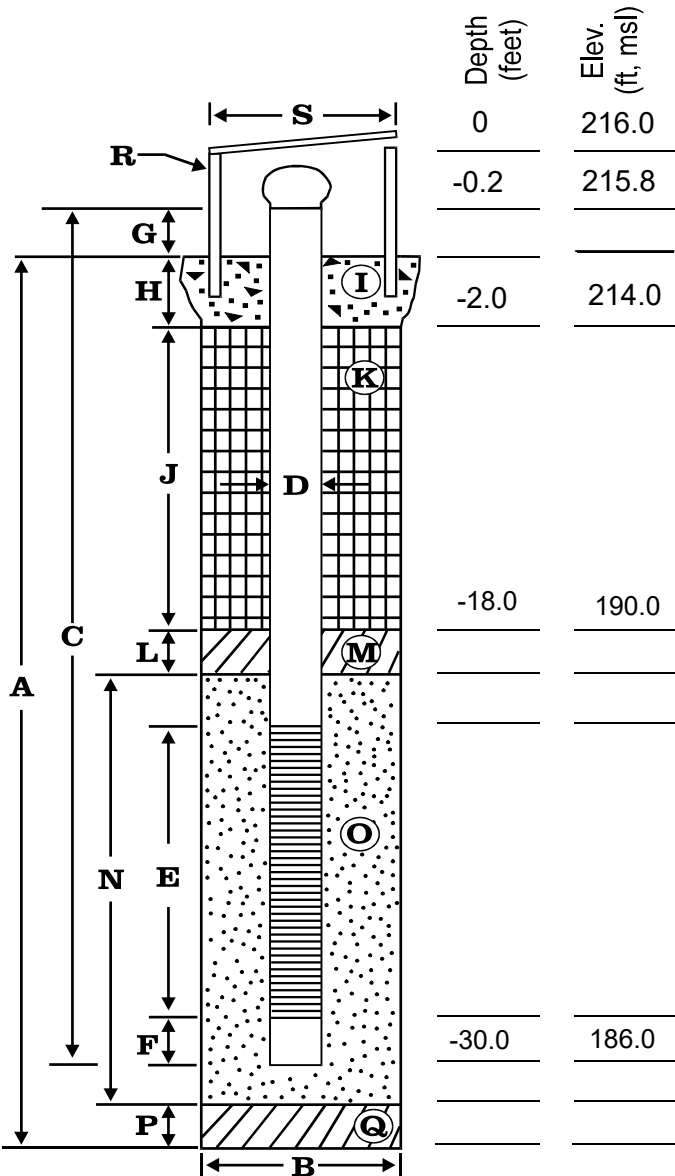
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# WELL DETAIL LOG

Project Number: 202280-01.01  
 Client Name: Helsell Fetterman  
 Project Name: Carson Cleaners Facility  
 Location: University District, Seattle, WA  
 Driller: Holt Services, Inc.

Boring/Well No.: MW-01  
 Top of Casing Elev.: 215.8  
 Ground Surface Elev.: 216.0  
 Installation Date: 07.24.2020  
 Permit/Start Card No.: BMP001



## EXPLORATORY BORING

A. Total depth: 30 ft.  
 B. Diameter: 2.25 in.  
 Drilling method: Direct-Push

## WELL CONSTRUCTION

C. Well casing length: 30 ft.  
 Well casing material: Steel  
 D. Well casing diameter: 0.75 in.  
 E. Well screen length: 10 ft.  
 Well screen type: Schedule 40 PVC  
 Well screen slot size: 0.01 in.  
 F. Well sump/end cap length: 0.1 ft.  
 G. Well casing height (stickup): 1.5 in.  
 H. Surface seal thickness: 2.0 ft.  
 I. Surface seal material: Concrete  
 J. Annular seal thickness: 16 ft.  
 K. Annular seal material: 3/8" Bentonite Chips  
 L. Filter pack seal thickness: NA ft.  
 M. Filter pack seal material: 12-20 Silica Sand  
 N. Sand pack thickness: 12 ft.  
 O. Sand pack material: 12-20 Silica Sand  
 P. Bottom material thickness: NA ft.  
 Q. Bottom material: NA  
 R. Protective casing material: Steel  
 Well centralizer depths: NA in.  
 S. Protective casing diameter: 5 in.

## NOTES:

Top of PVC well is 2-inches below grade.  
 Well mount cap is set flush with surrounding grade.

Installed by: Holt Services, Inc.  
 Reviewed by: \_\_\_\_\_  
 Date: \_\_\_\_\_

Appendix D  
Field Forms

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# Daily Safety Briefing Form

Date: 8-14-2020  
 Project No: 200544-01.01  
 Project Name: Former Carson Cleaners Vapor Intrusion Evaluation

Person Conducting Meeting: STEPHEN SMETH Health & Safety Officer: DAVID TEMPLETON Project Manager: NATHAN SOCCORSO

**TOPICS COVERED:**

- Emergency Procedures and Evacuation Route
- Directions to Hospital
- HASP Review and Location
- Safety Equipment Location
- Proper Safety Equipment Use
- Employee Right-to-Know/ SDS Location
- Fire Extinguisher Location
- Eye Wash Station Location
- Buddy System
- Self and Coworker Monitoring
- Field Team Medical Conditions for Emergency Purposes (Confidential): \_\_\_\_\_
- Lines of Authority
- Communication
- Site Security
- ~~Vessel Safety Protocols~~
- Work Zones
- Vehicle Safety and Driving/ Road Conditions
- Equipment Safety and Operation
- Proper Use of PPE
- Decontamination Procedures
- Near Miss Reporting Procedures
- Lifting Techniques
- Slips, Trips, and Falls
- Hazard Exposure Routes
- Heat and Cold Stress
- Overhead and Underfoot Hazards
- Chemical Hazards
- Flammable Hazards
- Biological Hazards
- Eating/Drinking/Smoking
- Reviewed Prior Lessons Learned

Other: (OVED)

**Weather Conditions:** SUNNY, 90F

---

**Daily Work Scope:** MONITORING WELL SAMPLING

---

**Site-specific Hazards:** COC / TRANSIENTS / NEEDLES / TRAFFIC

---

**Safety Comments:** \_\_\_\_\_

---



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<b>Attendees</b>	
Printed Name	Signature
<u>STEPHEN SMETH</u>	<u>SBS</u>

**End of Day Wellness Check**








RENTALS

YSI ProDSS RENTAL CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: *OM*

DATE: *8/14/20*

RENTAL CUSTOMER: *Anchor O&F*

INSTRUMENT INFORMATION

RENTAL I.D. NUMBER: YSIPRODSS. *04*

SERIAL NUMBER: *16F102615*

CALIBRATION INFORMATION

PARAMETER:	STANDARD:	PASS ( )	LOT #
1. CONDUCTIVITY	1,000 $\mu$ Mhos	<i>X</i>	<i>55029</i>
2. pH ZERO	pH 7	<i>X</i>	<i>031274</i>
pH SLOPE	pH 4	<i>X</i>	<i>031273</i>
pH SLOPE	pH 10	<i>X</i>	<i>031273</i>
3. DISSOLVED OXYGEN	Air Calibration Barometric pressure = 760mmHg	<i>X</i>	N/A
<del>4. TURBIDITY ZERO</del>	<del>0.0 NTU's</del>	<del>---</del>	<del>N/A</del>
<del>TURBIDITY SPAN</del>	<del>20 NTU's</del>	<del>---</del>	<del>---</del>
5. REDOX (ORP)	231mV (YSI Zobell solution)	<i>X</i>	<i>121719</i>







### YSI ProDSS RENTAL CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: ON

DATE: 11/17/20

RENTAL CUSTOMER: Ancher QEA

#### INSTRUMENT INFORMATION

RENTAL I.D. NUMBER: YSIPRODSS.01

SERIAL NUMBER: 165102612

#### CALIBRATION INFORMATION

PARAMETER:	STANDARD:	PASS ( )	LOT #
1. CONDUCTIVITY	1,000 $\mu$ Mhos	X	<u>S5029</u>
2. pH ZERO	pH 7	X	<u>031274</u>
pH SLOPE	pH 4	X	<u>031273</u>
pH SLOPE	pH 10	X	<u>031275</u>
3. DISSOLVED OXYGEN	Air Calibration Barometric pressure = 760mmHg	X	N/A
<del>4. TURBIDITY ZERO</del>	<del>0.0 NTU's</del>	<del>---</del>	<del>N/A</del>
<del>TURBIDITY SPAN</del>	<del>20 NTU's</del>	<del>---</del>	<del>---</del>
5. REDOX (ORP)	231mV (YSI Zobell solution)	X	<u>121719</u>





1-888-234-5678

www.equipcoservices.com

DELIVERY SLIP

P.O. Box 5606  
Concord, CA 94524

Date: 17-Nov-20  
Transaction no: 01-50873-1

Page: 1 of 2

I Anchor QEA-Seattle  
N 1201 3rd Ave.  
V Suite 2600  
O Seattle WA 98101  
I  
C Tel: 206-287-9130  
E

S Stephen Strehl  
H  
I  
P  
P  
E  
D

Customer no	2879130	Representative	Jason Miller
Customer P.O.	202280-01.01	SHIP VIA	Will Call
Quotation no	0-0	Shipping	18-Nov-20 11/18/2020
Reservation no		Close Contract	18-Nov-20
Contract no	0-0		

Qty	Registration Code	Ret. Qty	Description
-----	-------------------	----------	-------------

MULTIP: MULTIPARAMETER INSTRUMENTS

- 1 YSI PRODSS.01 \_\_\_\_\_ YSI ProDSS
- 1 PRODSSCBL4.01 \_\_\_\_\_ YSI ProDSS Cable
- 1 PRODSSCOND.01 \_\_\_\_\_ YSI ProDSS Cond/Temp Probe
- 1 PRODSSODO.01 \_\_\_\_\_ YSI ProDSS ODO Probe
- 1 PRODSSPH.01 \_\_\_\_\_ YSI ProDSS pH/ORP Probe
- 1 \_\_\_\_\_ YSI ProDSS Probe Guard
- 1 \_\_\_\_\_ YSI ProDSS Sonde Weight, 4.9 oz
- 1 \_\_\_\_\_ YSI ProDSS Cal Cup
- 1 \_\_\_\_\_ YSI ProDSS Flow Cell
- 1 \_\_\_\_\_ YSI ProDSS Flow Cell O-Ring Kit
- 1 \_\_\_\_\_ YSI ProDSS Thumbdrive Manual/Software
- 1 \_\_\_\_\_ YSI ProDSS Manual
- 1 \_\_\_\_\_ YSI 6 foot USB Cable
- 1 \_\_\_\_\_ YSI 6 Inch USB Cable
- 1 \_\_\_\_\_ YSI ProDSS Charger
- 1 \_\_\_\_\_ YSI ProDSS Case
- 2 \_\_\_\_\_ YSI Flow Cell Fitting, 1/4" Hose Barb
- 2 \_\_\_\_\_ YSI Flow Cell Fitting, 3/8" Hose Barb

WLM: WATER LEVEL METERS



1-888-234-5678

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DELIVERY SLIP

P.O. Box 5606  
Concord, CA 94524

Date  
17-Nov-20

Transaction no  
01-50873-1

Page: 2 of 2

I Anchor QEA-Seattle  
N 1201 3rd Ave.  
V Suite 2600  
O Seattle WA 98101  
I  
C Tel: 206-287-9130  
E

S Stephen Strehl  
H  
I  
P  
P  
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D

Customer no	2879130	Representative	Jason Miller	
Customer P.O.	202280-01.01	SHIP VIA	Will Call	
Quotation no	0-0	Shipping	18-Nov-20	11/18/2020
Reservation no		Close Contract	18-Nov-20	
Contract no	0-0			

Qty	Registration Code	Ret. Qty	Description
1	WLM100P6.31	_____	Solinst Water Level Meter, 100' P6
1		_____	Solinst Tape Guide

Shipping Notes  
W/C

# Appendix E

## Laboratory Reports

---



August 11, 2020

Service Request No:K2006350

Nathan Soccorsy  
Anchor QEA, LLC  
720 Olive Way, Suite 1900  
Seattle, WA 98101

**Laboratory Results for: Carson Cleaners Vapor Intrusion Evaluation**

Dear Nathan,

Enclosed are the results of the sample(s) submitted to our laboratory July 28, 2020  
For your reference, these analyses have been assigned our service request number **K2006350**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626  
PHONE +1 360 577 7222 | FAX +1 360 636 1068  
ALS Group USA, Corp.  
dba ALS Environmental



# Narrative Documents

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation  
**Sample Matrix:** Soil, Water

**Service Request:** K2006350  
**Date Received:** 07/28/2020

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

Six soil, water samples were received for analysis at ALS Environmental on 07/28/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**Semivolatile GC:**

No significant anomalies were noted with this analysis.

**Volatiles by GC/MS:**

No significant anomalies were noted with this analysis.

Approved by \_\_\_\_\_

Date 08/11/2020



**SAMPLE DETECTION SUMMARY**

<b>CLIENT ID: CC-MW-01-14.5-072420</b>	<b>Lab ID: K2006350-001</b>
----------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Solids, Total	92.4				Percent	160.3 Modified
Tetrachloroethene (PCE)	2.6			0.064	mg/Kg	8260C

<b>CLIENT ID: CC-MW-01-18-072420</b>	<b>Lab ID: K2006350-002</b>
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Solids, Total	85.1				Percent	160.3 Modified
Tetrachloroethene (PCE)	2.3			0.068	mg/Kg	8260C

<b>CLIENT ID: CC-MW-01-24-072420</b>	<b>Lab ID: K2006350-003</b>
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Solids, Total	82.1				Percent	160.3 Modified
Tetrachloroethene (PCE)	3.1			0.070	mg/Kg	8260C

<b>CLIENT ID: CC-MW-01-124-072420</b>	<b>Lab ID: K2006350-004</b>
---------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Trichloroethene (TCE)	6.3			5.9	ug/Kg	8260C
Solids, Total	82.5				Percent	160.3 Modified
Tetrachloroethene (PCE)	4.2			0.067	mg/Kg	8260C

<b>CLIENT ID: CC-MW-01-29-072420</b>	<b>Lab ID: K2006350-005</b>
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Gasoline Range Organics-NWTPH	11			6.9	mg/Kg	NWTPH-Gx
Trichloroethene (TCE)	25			6.1	ug/Kg	8260C
Solids, Total	85.0				Percent	160.3 Modified
Tetrachloroethene (PCE)	13			0.35	mg/Kg	8260C



## Sample Receipt Information

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01

**Service Request:**K2006350

**SAMPLE CROSS-REFERENCE**

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2006350-001	CC-MW-01-14.5-072420	7/24/2020	1055
K2006350-002	CC-MW-01-18-072420	7/24/2020	1110
K2006350-003	CC-MW-01-24-072420	7/24/2020	1125
K2006350-004	CC-MW-01-124-072420	7/24/2020	1130
K2006350-005	CC-MW-01-29-072420	7/24/2020	1140
K2006350-006	TB-01-072420	7/24/2020	



CHAIN OF CUSTODY  
110425

001, 002

SR# R2006350  
COC Set 1 of 1  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Project Name <b>CARSON CLEANERS VAPOR INTRUSION EVALUATION</b>		Project Number <b>200544-01.01</b>		NUMBER OF CONTAINERS	14D	999D	2260C / VOC FP	160.3 Modified / TS	NWTPH - GP	NWTPH - D	3	4	5	Remarks
Project Manager <b>NATHAN SOCCORSY</b>														
Company <b>ANCHOR QEA</b>														
Address <b>1201 3RD AVE #2600, SEATTLE, WA 98101</b>														
Phone # <b>206-287-9130</b>		email <b>LABDATA@ANCHORQEA.COM</b>												
Sampler Signature <b>STEPHEN SMETH</b>		Sampler Printed Name <b>STEPHEN SMETH</b>												
		CHERONNE OREIRO												
CLIENT SAMPLE ID	LABID	SAMPLING Date	Time	Matrix										
1.CC-MW-01-14-072420		07-24-20	1055	So	5	X	X	X	X					
2.CC-MW-01-18-072420		07-24-20	1110	So	5	X	X	X	X					
3.CC-MW-01-24-072420		07-24-20	1125	So	5	X	X	X	X					
4.CC-MW-01-24-072420		07-24-20	1130	So	5	X	X	X	X					
5.CC-MW-01-29-072420		07-24-20	1140	So	5	X	X	X	X					
6.TB-01-072420		07-24-20		H <sub>2</sub> O	2	X		X						
7.														
8.														
9.														
10.														

<b>Report Requirements</b> <input type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input checked="" type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input checked="" type="checkbox"/> V. EDD		<b>Invoice Information</b> P.O.# <u>200544-01.01</u> Bill To: <u>ANCHOR QEA</u>		Circle which metals are to be analyzed Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg	
<b>Turnaround Requirements</b> <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input checked="" type="checkbox"/> 5 Day Standard		Special Instructions/Comments:		*Indicate State Hydrocarbon Procedure: AK CA WI <u>Northwest</u> Other _____ (Circle One)	
<b>Relinquished By:</b> Signature: Printed Name: <b>C. OREIRO</b> Firm: <b>AQ</b> Date/Time: <b>7/27/20 0930</b>		<b>Received By:</b> Signature: Printed Name: <b>CHERONNE OREIRO</b> Firm: <b>7/28/20 0920</b> Date/Time:		<b>Relinquished By:</b> Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____	
<b>Relinquished By:</b> Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____		<b>Received By:</b> Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____		<b>Relinquished By:</b> Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____	



### Cooler Receipt and Preservation Form

Client Anchovy OEA Service Request K20 06350  
 Received: 7/20/20 Opened: 7/20/20 By: PM Unloaded: 7/28/20 By: KL

- Samples were received via?  USPS  Fed Ex  UPS  DHL  PDX  Courier  Hand Delivered
- Samples were received in: (circle)  Cooler  Box  Envelope  Other \_\_\_\_\_ NA
- Were custody seals on coolers? NA  Y  N  If yes, how many and where? \_\_\_\_\_  
 If present, were custody seals intact? Y  N  If present, were they signed and dated? Y  N

Temp Blank	Sample 1	Sample 2	Sample 3	Sample 4	IR GUN	Cooler / COC ID	NA	Tracking Number	NA	Filed
<u>5.1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>IR02</u>	<u>110425</u>		<u>3952 0051 6728</u>		

- Packing material:  Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Dry Ice  Sleeves \_\_\_\_\_
- Were custody papers properly filled out (ink, signed, etc.)? NA  Y  N
- Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA  Y  N  
 If applicable, tissue samples were received:  Frozen  Partially Thawed  Thawed
- Were all sample labels complete (i.e analysis, preservation, etc.)? NA  Y  N
- Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA  Y  N
- Were appropriate bottles/containers and volumes received for the tests indicated? NA  Y  N
- Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below*  NA  Y  N
- Were VOA vials received without headspace? *Indicate in the table below.* NA  Y  N
- Was C12/Res negative?  NA  Y  N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Out of	Head-	Broke	pH	Reagent	Volume	Reagent Lot	Initials	Time
	Bottle Type	Temp	space				added	Number		

Notes, Discrepancies, & Resolutions: Vials w/ DI-H<sub>2</sub>O placed in freezer until login, shelved to a freezer



## Miscellaneous Forms

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

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Analyst Summary report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01

**Service Request:** K2006350

**Sample Name:** CC-MW-01-14.5-072420  
**Lab Code:** K2006350-001  
**Sample Matrix:** Soil

**Date Collected:** 07/24/20  
**Date Received:** 07/28/20

Analysis Method	Extracted/Digested By	Analyzed By
160.3 Modified		TANDREWS
8260C		JJAMES
8260C		KWINSTON
NWTPH-Dx	KVAN	TPOTTSCHMIDT
NWTPH-Gx		KWINSTON

---

**Sample Name:** CC-MW-01-18-072420  
**Lab Code:** K2006350-002  
**Sample Matrix:** Soil

**Date Collected:** 07/24/20  
**Date Received:** 07/28/20

Analysis Method	Extracted/Digested By	Analyzed By
160.3 Modified		TANDREWS
8260C		KWINSTON
8260C		JJAMES
NWTPH-Dx	KVAN	TPOTTSCHMIDT
NWTPH-Gx		KWINSTON

---

**Sample Name:** CC-MW-01-24-072420  
**Lab Code:** K2006350-003  
**Sample Matrix:** Soil

**Date Collected:** 07/24/20  
**Date Received:** 07/28/20

Analysis Method	Extracted/Digested By	Analyzed By
160.3 Modified		TANDREWS
8260C		KWINSTON
8260C		JJAMES
NWTPH-Dx	KVAN	TPOTTSCHMIDT
NWTPH-Gx		KWINSTON

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Analyst Summary report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01

**Service Request:** K2006350

**Sample Name:** CC-MW-01-124-072420  
**Lab Code:** K2006350-004  
**Sample Matrix:** Soil

**Date Collected:** 07/24/20  
**Date Received:** 07/28/20

Analysis Method	Extracted/Digested By	Analyzed By
160.3 Modified		TANDREWS
8260C		KWINSTON
8260C		JJAMES
NWTPH-Dx	KVAN	TPOTTSCHMIDT
NWTPH-Gx		KWINSTON

---

**Sample Name:** CC-MW-01-29-072420  
**Lab Code:** K2006350-005  
**Sample Matrix:** Soil

**Date Collected:** 07/24/20  
**Date Received:** 07/28/20

Analysis Method	Extracted/Digested By	Analyzed By
160.3 Modified		TANDREWS
8260C		KWINSTON
8260C		JJAMES
NWTPH-Dx	KVAN	TPOTTSCHMIDT
NWTPH-Gx		KWINSTON

---

**Sample Name:** CC-MW-01-29-072420  
**Lab Code:** K2006350-005.R01  
**Sample Matrix:** Soil

**Date Collected:** 07/24/20  
**Date Received:** 07/28/20

Analysis Method	Extracted/Digested By	Analyzed By
8260C		JJAMES

**Sample Name:** TB-01-072420  
**Lab Code:** K2006350-006  
**Sample Matrix:** Water

**Date Collected:** 07/24/20  
**Date Received:** 07/28/20

Analysis Method	Extracted/Digested By	Analyzed By
8260C		JJAMES
NWTPH-Gx		KWINSTON



# Sample Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



## Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-14.5-072420  
**Lab Code:** K2006350-001

**Service Request:** K2006350  
**Date Collected:** 07/24/20 10:55  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Tetrachloroethene (PCE)	2.6	0.064	1	08/06/20 19:28	7/24/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dibromofluoromethane	95	55 - 132	08/06/20 19:28	
Toluene-d8	105	81 - 124	08/06/20 19:28	
4-Bromofluorobenzene	88	64 - 132	08/06/20 19:28	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-18-072420  
**Lab Code:** K2006350-002

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:10  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

<b>Analyte Name</b>	<b>Result</b>	<b>MRL</b>	<b>Dil.</b>	<b>Date Analyzed</b>	<b>Date Extracted</b>	<b>Q</b>
Tetrachloroethene (PCE)	2.3	0.068	1	08/06/20 19:55	7/24/20	

<b>Surrogate Name</b>	<b>% Rec</b>	<b>Control Limits</b>	<b>Date Analyzed</b>	<b>Q</b>
Dibromofluoromethane	98	55 - 132	08/06/20 19:55	
Toluene-d8	104	81 - 124	08/06/20 19:55	
4-Bromofluorobenzene	88	64 - 132	08/06/20 19:55	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-24-072420  
**Lab Code:** K2006350-003

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:25  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Tetrachloroethene (PCE)	3.1	0.070	1	08/06/20 20:21	7/24/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dibromofluoromethane	92	55 - 132	08/06/20 20:21	
Toluene-d8	102	81 - 124	08/06/20 20:21	
4-Bromofluorobenzene	91	64 - 132	08/06/20 20:21	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:30  
**Date Received:** 07/28/20 09:20

**Sample Name:** CC-MW-01-124-072420  
**Lab Code:** K2006350-004

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

<b>Analyte Name</b>	<b>Result</b>	<b>MRL</b>	<b>Dil.</b>	<b>Date Analyzed</b>	<b>Date Extracted</b>	<b>Q</b>
Tetrachloroethene (PCE)	4.2	0.067	1	08/06/20 20:48	7/24/20	

<b>Surrogate Name</b>	<b>% Rec</b>	<b>Control Limits</b>	<b>Date Analyzed</b>	<b>Q</b>
Dibromofluoromethane	93	55 - 132	08/06/20 20:48	
Toluene-d8	103	81 - 124	08/06/20 20:48	
4-Bromofluorobenzene	87	64 - 132	08/06/20 20:48	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-29-072420  
**Lab Code:** K2006350-005

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:40  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

<b>Analyte Name</b>	<b>Result</b>	<b>MRL</b>	<b>Dil.</b>	<b>Date Analyzed</b>	<b>Date Extracted</b>	<b>Q</b>
Tetrachloroethene (PCE)	13	0.35	1	08/07/20 13:36	7/24/20	

<b>Surrogate Name</b>	<b>% Rec</b>	<b>Control Limits</b>	<b>Date Analyzed</b>	<b>Q</b>
Dibromofluoromethane	96	55 - 132	08/07/20 13:36	
Toluene-d8	101	81 - 124	08/07/20 13:36	
4-Bromofluorobenzene	88	64 - 132	08/07/20 13:36	



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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-14.5-072420  
**Lab Code:** K2006350-001

**Service Request:** K2006350  
**Date Collected:** 07/24/20 10:55  
**Date Received:** 07/28/20 09:20

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Trichloroethene (TCE)	ND U	5.8	1	07/30/20 13:39	
Vinyl Chloride	ND U	5.8	1	07/30/20 13:39	
cis-1,2-Dichloroethene	ND U	5.8	1	07/30/20 13:39	
trans-1,2-Dichloroethene	ND U	5.8	1	07/30/20 13:39	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	88 - 127	07/30/20 13:39	
Dibromofluoromethane	99	82 - 146	07/30/20 13:39	
Toluene-d8	101	90 - 142	07/30/20 13:39	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-18-072420  
**Lab Code:** K2006350-002

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:10  
**Date Received:** 07/28/20 09:20

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Trichloroethene (TCE)	ND U	5.9	1	07/30/20 14:00	
Vinyl Chloride	ND U	5.9	1	07/30/20 14:00	
cis-1,2-Dichloroethene	ND U	5.9	1	07/30/20 14:00	
trans-1,2-Dichloroethene	ND U	5.9	1	07/30/20 14:00	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	88 - 127	07/30/20 14:00	
Dibromofluoromethane	103	82 - 146	07/30/20 14:00	
Toluene-d8	102	90 - 142	07/30/20 14:00	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-24-072420  
**Lab Code:** K2006350-003

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:25  
**Date Received:** 07/28/20 09:20

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Trichloroethene (TCE)	ND U	6.4	1	07/30/20 14:21	
Vinyl Chloride	ND U	6.4	1	07/30/20 14:21	
cis-1,2-Dichloroethene	ND U	6.4	1	07/30/20 14:21	
trans-1,2-Dichloroethene	ND U	6.4	1	07/30/20 14:21	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	88 - 127	07/30/20 14:21	
Dibromofluoromethane	101	82 - 146	07/30/20 14:21	
Toluene-d8	101	90 - 142	07/30/20 14:21	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-124-072420  
**Lab Code:** K2006350-004

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:30  
**Date Received:** 07/28/20 09:20

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Trichloroethene (TCE)	6.3	5.9	1	07/30/20 14:42	
Vinyl Chloride	ND U	5.9	1	07/30/20 14:42	
cis-1,2-Dichloroethene	ND U	5.9	1	07/30/20 14:42	
trans-1,2-Dichloroethene	ND U	5.9	1	07/30/20 14:42	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	88 - 127	07/30/20 14:42	
Dibromofluoromethane	97	82 - 146	07/30/20 14:42	
Toluene-d8	100	90 - 142	07/30/20 14:42	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-29-072420  
**Lab Code:** K2006350-005

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:40  
**Date Received:** 07/28/20 09:20

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Trichloroethene (TCE)	25	6.1	1	07/30/20 15:02	
Vinyl Chloride	ND U	6.1	1	07/30/20 15:02	
cis-1,2-Dichloroethene	ND U	6.1	1	07/30/20 15:02	
trans-1,2-Dichloroethene	ND U	6.1	1	07/30/20 15:02	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	88 - 127	07/30/20 15:02	
Dibromofluoromethane	101	82 - 146	07/30/20 15:02	
Toluene-d8	102	90 - 142	07/30/20 15:02	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** TB-01-072420  
**Lab Code:** K2006350-006

**Service Request:** K2006350  
**Date Collected:** 07/24/20  
**Date Received:** 07/28/20 09:20

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	ND U	0.50	1	08/05/20 16:44	
Trichloroethene (TCE)	ND U	0.50	1	08/05/20 16:44	
Vinyl Chloride	ND U	0.50	1	08/05/20 16:44	
cis-1,2-Dichloroethene	ND U	0.50	1	08/05/20 16:44	
trans-1,2-Dichloroethene	ND U	0.50	1	08/05/20 16:44	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	87	68 - 117	08/05/20 16:44	
Dibromofluoromethane	97	73 - 122	08/05/20 16:44	
Toluene-d8	103	65 - 144	08/05/20 16:44	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Collected:** 07/24/20 10:55  
**Date Received:** 07/28/20 09:20

**Sample Name:** CC-MW-01-14.5-072420  
**Lab Code:** K2006350-001

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

<u>Analyte Name</u>	<u>Result</u>	<u>MRL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Gasoline Range Organics-NWTPH	ND U	6.4	59	07/29/20 18:45	

<u>Surrogate Name</u>	<u>% Rec</u>	<u>Control Limits</u>	<u>Date Analyzed</u>	<u>Q</u>
4-Bromofluorobenzene	98	50 - 150	07/29/20 18:45	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-18-072420  
**Lab Code:** K2006350-002

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:10  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

<u>Analyte Name</u>	<u>Result</u>	<u>MRL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Gasoline Range Organics-NWTPH	ND U	6.8	58	07/29/20 19:33	

<u>Surrogate Name</u>	<u>% Rec</u>	<u>Control Limits</u>	<u>Date Analyzed</u>	<u>Q</u>
4-Bromofluorobenzene	93	50 - 150	07/29/20 19:33	



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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-24-072420  
**Lab Code:** K2006350-003

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:25  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

<u>Analyte Name</u>	<u>Result</u>	<u>MRL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Gasoline Range Organics-NWTPH	ND U	6.9	57	07/29/20 19:57	

<u>Surrogate Name</u>	<u>% Rec</u>	<u>Control Limits</u>	<u>Date Analyzed</u>	<u>Q</u>
4-Bromofluorobenzene	93	50 - 150	07/29/20 19:57	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-124-072420  
**Lab Code:** K2006350-004

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:30  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics-NWTPH	ND U	6.7	55	07/29/20 20:21	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	50 - 150	07/29/20 20:21	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-29-072420  
**Lab Code:** K2006350-005

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:40  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

<u>Analyte Name</u>	<u>Result</u>	<u>MRL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Gasoline Range Organics-NWTPH	11	6.9	59	07/29/20 20:45	

<u>Surrogate Name</u>	<u>% Rec</u>	<u>Control Limits</u>	<u>Date Analyzed</u>	<u>Q</u>
4-Bromofluorobenzene	97	50 - 150	07/29/20 20:45	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2006350  
**Date Collected:** 07/24/20  
**Date Received:** 07/28/20 09:20

**Sample Name:** TB-01-072420  
**Lab Code:** K2006350-006

**Units:** ug/L  
**Basis:** NA

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

<u>Analyte Name</u>	<u>Result</u>	<u>MRL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Gasoline Range Organics-NWTPH	ND U	250	1	07/29/20 13:55	

<u>Surrogate Name</u>	<u>% Rec</u>	<u>Control Limits</u>	<u>Date Analyzed</u>	<u>Q</u>
I,4-Difluorobenzene	92	50 - 150	07/29/20 13:55	



## Semivolatile Organic Compounds by GC

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-14.5-072420  
**Lab Code:** K2006350-001

**Service Request:** K2006350  
**Date Collected:** 07/24/20 10:55  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3550B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	ND U	27	1	08/05/20 20:29	7/30/20	
Residual Range Organics (RRO)	ND U	110	1	08/05/20 20:29	7/30/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	86	50 - 150	08/05/20 20:29	
n-Triacontane	88	50 - 150	08/05/20 20:29	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-18-072420  
**Lab Code:** K2006350-002

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:10  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3550B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	ND U	30	1	08/05/20 20:51	7/30/20	
Residual Range Organics (RRO)	ND U	120	1	08/05/20 20:51	7/30/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	96	50 - 150	08/05/20 20:51	
n-Triacontane	96	50 - 150	08/05/20 20:51	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-24-072420  
**Lab Code:** K2006350-003

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:25  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3550B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	ND U	31	1	08/05/20 21:34	7/30/20	
Residual Range Organics (RRO)	ND U	130	1	08/05/20 21:34	7/30/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	95	50 - 150	08/05/20 21:34	
n-Triacontane	95	50 - 150	08/05/20 21:34	



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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-124-072420  
**Lab Code:** K2006350-004

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:30  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3550B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	ND U	31	1	08/05/20 21:55	7/30/20	
Residual Range Organics (RRO)	ND U	130	1	08/05/20 21:55	7/30/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	98	50 - 150	08/05/20 21:55	
n-Triacontane	98	50 - 150	08/05/20 21:55	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-29-072420  
**Lab Code:** K2006350-005

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:40  
**Date Received:** 07/28/20 09:20

**Units:** mg/Kg  
**Basis:** Dry

**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3550B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	ND U	30	1	08/05/20 22:16	7/30/20	
Residual Range Organics (RRO)	ND U	120	1	08/05/20 22:16	7/30/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	94	50 - 150	08/05/20 22:16	
n-Triacontane	95	50 - 150	08/05/20 22:16	



## General Chemistry

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-14.5-072420  
**Lab Code:** K2006350-001

**Service Request:** K2006350  
**Date Collected:** 07/24/20 10:55  
**Date Received:** 07/28/20 09:20  
**Basis:** As Received

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Solids, Total	160.3 Modified	92.4	Percent	-	1	07/29/20 17:35	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-18-072420  
**Lab Code:** K2006350-002

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:10  
**Date Received:** 07/28/20 09:20  
**Basis:** As Received

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Solids, Total	160.3 Modified	85.1	Percent	-	1	07/29/20 17:35	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-24-072420  
**Lab Code:** K2006350-003

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:25  
**Date Received:** 07/28/20 09:20  
**Basis:** As Received

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Solids, Total	160.3 Modified	82.1	Percent	-	1	07/29/20 17:35	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-124-072420  
**Lab Code:** K2006350-004

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:30  
**Date Received:** 07/28/20 09:20  
**Basis:** As Received

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Solids, Total	160.3 Modified	82.5	Percent	-	1	07/29/20 17:35	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** CC-MW-01-29-072420  
**Lab Code:** K2006350-005

**Service Request:** K2006350  
**Date Collected:** 07/24/20 11:40  
**Date Received:** 07/28/20 09:20  
**Basis:** As Received

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Solids, Total	160.3 Modified	85.0	Percent	-	1	07/29/20 17:35	





# QC Summary Forms

**ALS Environmental—Kelso Laboratory**  
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## Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Extraction Method:** EPA 5035A/5030B

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	Toluene-d8
		64 - 132	55 - 132	81 - 124
CC-MW-01-14.5-072420	K2006350-001	88	95	105
CC-MW-01-18-072420	K2006350-002	88	98	104
CC-MW-01-24-072420	K2006350-003	91	92	102
CC-MW-01-124-072420	K2006350-004	87	93	103
CC-MW-01-29-072420	K2006350-005	88	96	101
CC-MW-01-29-072420 MS	KWG2002313-1	90	100	102
CC-MW-01-29-072420 DMS	KWG2002313-2	90	100	105
Lab Control Sample	KWG2002313-3	90	96	104
Duplicate Lab Control Sample	KWG2002313-4	93	99	102
Method Blank	KWG2002313-5	88	97	104
Lab Control Sample	KWG2002331-1	92	99	101
Duplicate Lab Control Sample	KWG2002331-2	91	98	101
Method Blank	KWG2002331-3	87	96	103

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Collected:** 07/24/20  
**Date Received:** 07/28/20  
**Date Analyzed:** 08/6/20  
**Date Extracted:** 07/24/20

**Duplicate Matrix Spike Summary**  
**Volatile Organic Compounds**

**Sample Name:** CC-MW-01-29-072420  
**Lab Code:** K2006350-005  
**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

**Units:** mg/Kg  
**Basis:** Dry

Analyte Name	Sample Result	Result	Matrix Spike KWG2002313-1		Duplicate Matrix Spike KWG2002313-2		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Tetrachloroethene (PCE)	13	12.8 E	1.39	-26	12.1 E	1.39	-75	48-125	5	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KWG2002313-5

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Tetrachloroethene (PCE)	ND U	0.050	1	08/06/20 16:49	8/6/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dibromofluoromethane	97	55 - 132	08/06/20 16:49	
Toluene-d8	104	81 - 124	08/06/20 16:49	
4-Bromofluorobenzene	88	64 - 132	08/06/20 16:49	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KWG2002331-3

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Tetrachloroethene (PCE)	ND U	0.050	1	08/07/20 13:10	8/7/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Dibromofluoromethane	96	55 - 132	08/07/20 13:10	
Toluene-d8	103	81 - 124	08/07/20 13:10	
4-Bromofluorobenzene	87	64 - 132	08/07/20 13:10	

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Analyzed:** 08/06/20  
**Date Extracted:** 08/06/20

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** KWG2002310

**Lab Control Sample**  
**KWG2002313-3**

**Duplicate Lab Control Sample**  
**KWG2002313-4**

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>RPD</u>	<u>RPD Limit</u>
Tetrachloroethene (PCE)	0.833	1.00	83	0.863	1.00	86	65-126	4	40

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Analyzed:** 08/07/20  
**Date Extracted:** 08/07/20

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds**

**Analysis Method:** 8260C  
**Prep Method:** EPA 5035A/5030B

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** KWG2002330

**Lab Control Sample**  
**KWG2002331-1**

**Duplicate Lab Control Sample**  
**KWG2002331-2**

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>RPD</u>	<u>RPD Limit</u>
Tetrachloroethene (PCE)	0.862	1.00	86	0.904	1.00	90	65-126	5	40



**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C

**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	Toluene-d8
		88-127	82-146	90-142
CC-MW-01-14.5-072420	K2006350-001	100	99	101
CC-MW-01-18-072420	K2006350-002	98	103	102
CC-MW-01-24-072420	K2006350-003	99	101	101
CC-MW-01-124-072420	K2006350-004	101	97	100
CC-MW-01-29-072420	K2006350-005	99	101	102
Method Blank	KQ2010368-05	99	97	101
Lab Control Sample	KQ2010368-03	104	106	101
Duplicate Lab Control Sample	KQ2010368-04	103	107	105

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2006350

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C

**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	Toluene-d8
		88-127	82-146	90-142
TB-01-072420	K2006350-006	87	97	103
Method Blank	KQ2010749-07	87	95	100
Lab Control Sample	KQ2010749-05	90	97	103
Duplicate Lab Control Sample	KQ2010749-06	92	99	100

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2010368-05

**Service Request:** K2006350  
**Date Collected:** NA  
**Date Received:** NA

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Trichloroethene (TCE)	ND U	5.0	1	07/30/20 10:31	
Vinyl Chloride	ND U	5.0	1	07/30/20 10:31	
cis-1,2-Dichloroethene	ND U	5.0	1	07/30/20 10:31	
trans-1,2-Dichloroethene	ND U	5.0	1	07/30/20 10:31	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	88 - 127	07/30/20 10:31	
Dibromofluoromethane	97	82 - 146	07/30/20 10:31	
Toluene-d8	101	90 - 142	07/30/20 10:31	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2010749-07

**Service Request:** K2006350  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	ND U	0.50	1	08/05/20 12:19	
Trichloroethene (TCE)	ND U	0.50	1	08/05/20 12:19	
Vinyl Chloride	ND U	0.50	1	08/05/20 12:19	
cis-1,2-Dichloroethene	ND U	0.50	1	08/05/20 12:19	
trans-1,2-Dichloroethene	ND U	0.50	1	08/05/20 12:19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	87	68 - 117	08/05/20 12:19	
Dibromofluoromethane	95	73 - 122	08/05/20 12:19	
Toluene-d8	100	65 - 144	08/05/20 12:19	

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Analyzed:** 07/30/20  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/Kg  
**Basis:** Dry  
**Analysis Lot:** 689000

**Lab Control Sample**  
**KQ2010368-03**

**Duplicate Lab Control Sample**  
**KQ2010368-04**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD</b>	<b>RPD Limit</b>
cis-1,2-Dichloroethene	48.2	50.0	96	43.5	50.0	87	62-138	10	40
trans-1,2-Dichloroethene	50.8	50.0	102	48.5	50.0	97	63-127	5	40
Trichloroethene (TCE)	48.0	50.0	96	45.3	50.0	91	67-126	6	40
Vinyl Chloride	51.0	50.0	102	48.9	50.0	98	54-127	4	40

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2006350  
**Date Analyzed:** 08/05/20  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 689764

**Lab Control Sample**  
**KQ2010749-05**

**Duplicate Lab Control Sample**  
**KQ2010749-06**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD</b>	<b>RPD Limit</b>
cis-1,2-Dichloroethene	9.69	10.0	97	9.83	10.0	98	71-118	1	30
Tetrachloroethene (PCE)	9.14	10.0	91	8.75	10.0	88	62-126	4	30
trans-1,2-Dichloroethene	9.78	10.0	98	9.72	10.0	97	67-125	<1	30
Trichloroethene (TCE)	10.2	10.0	102	9.50	10.0	95	67-128	7	30
Vinyl Chloride	9.69	10.0	97	9.41	10.0	94	55-123	3	30

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350

**SURROGATE RECOVERY SUMMARY**

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene
		50-150
CC-MW-01-14.5-072420	K2006350-001	98
CC-MW-01-18-072420	K2006350-002	93
CC-MW-01-24-072420	K2006350-003	93
CC-MW-01-124-072420	K2006350-004	96
CC-MW-01-29-072420	K2006350-005	97
CC-MW-01-14.5-072420	KQ2010348-07	87
Method Blank	KQ2010348-05	74
Lab Control Sample	KQ2010348-06	91

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2006350

**SURROGATE RECOVERY SUMMARY**

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene
		50-150
TB-01-072420	K2006350-006	92
Method Blank	KQ2010293-05	92
Lab Control Sample	KQ2010293-06	98



ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Anchor QEA, LLC
Project: Carson Cleaners Vapor Intrusion Evaluation/200544-01.01
Sample Matrix: Soil

Service Request: K2006350
Date Collected: 07/24/20
Date Received: 07/28/20
Date Analyzed: 07/29/20

Replicate Sample Summary

Volatile Petroleum Products Method for Soil and Water for the Northwest

Sample Name: CC-MW-01-14.5-072420 Units: mg/Kg
Lab Code: K2006350-001 Basis: Dry

Table with 8 columns: Analyte Name, Analysis Method, MRL, Sample Result, Duplicate Sample KQ2010348-07 Result, Average, RPD, RPD Limit. Row 1: Gasoline Range Organics-NWTPH, NWTPH-Gx, 6.4, ND U, ND U, NC, NC, 40.

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2010293-05

**Service Request:** K2006350  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

<b>Analyte Name</b>	<b>Result</b>	<b>MRL</b>	<b>Dil.</b>	<b>Date Analyzed</b>	<b>Q</b>
Gasoline Range Organics-NWTPH	ND U	250	1	07/29/20 13:07	

<b>Surrogate Name</b>	<b>% Rec</b>	<b>Control Limits</b>	<b>Date Analyzed</b>	<b>Q</b>
1,4-Difluorobenzene	92	50 - 150	07/29/20 13:07	

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dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2010348-05

**Service Request:** K2006350  
**Date Collected:** NA  
**Date Received:** NA

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

<b>Analyte Name</b>	<b>Result</b>	<b>MRL</b>	<b>Dil.</b>	<b>Date Analyzed</b>	<b>Q</b>
Gasoline Range Organics-NWTPH	ND U	5.0	50	07/29/20 17:57	

<b>Surrogate Name</b>	<b>% Rec</b>	<b>Control Limits</b>	<b>Date Analyzed</b>	<b>Q</b>
4-Bromofluorobenzene	74	50 - 150	07/29/20 17:57	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2006350  
**Date Analyzed:** 07/29/20  
**Date Extracted:** NA

**Lab Control Sample Summary**

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 688859

**Lab Control Sample**  
**KQ2010293-06**

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Gasoline Range Organics-NWTPH	470	500	94	80-119

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Analyzed:** 07/29/20  
**Date Extracted:** NA

**Lab Control Sample Summary**

**Volatile Petroleum Products Method for Soil and Water for the Northwest**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 688966

**Lab Control Sample**  
**KQ2010348-06**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Gasoline Range Organics-NWTPH	22.5	25.0	90	76-114



## Semivolatile Organic Compounds by GC

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350

**SURROGATE RECOVERY SUMMARY**  
**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx  
**Extraction Method:** EPA 3550B

Sample Name	Lab Code	n-Triacontane	o-Terphenyl
		50 - 150	50 - 150
CC-MW-01-14.5-072420	K2006350-001	88	86
CC-MW-01-18-072420	K2006350-002	96	96
CC-MW-01-24-072420	K2006350-003	95	95
CC-MW-01-124-072420	K2006350-004	98	98
CC-MW-01-29-072420	K2006350-005	95	94
CC-MW-01-18-072420 DUP	KWG2002194-1	85	84
Lab Control Sample	KWG2002194-2	103	105
Method Blank	KWG2002194-3	103	102

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Anchor QEA, LLC
Project: Carson Cleaners Vapor Intrusion Evaluation/200544-01.01
Sample Matrix: Soil

Service Request: K2006350
Date Collected: 07/24/20
Date Received: 07/28/20
Date Analyzed: 08/05/20

Replicate Sample Summary
Diesel and Residual Range Organics

Sample Name: CC-MW-01-18-072420
Lab Code: K2006350-002

Units: mg/Kg
Basis: Dry

Duplicate Sample KWG2002194-

Table with 8 columns: Analyte Name, Analysis Method, MRL, Sample Result, Duplicate Sample 1 Result, Average, RPD, RPD Limit. Rows include Diesel Range Organics (DRO) and Residual Range Organics (RRO).

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



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dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KWG2002194-3

**Service Request:** K2006350  
**Date Collected:** NA  
**Date Received:** NA

**Units:** mg/Kg  
**Basis:** Dry

**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3550B

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	ND U	25	1	08/05/20 20:07	7/30/20	
Residual Range Organics (RRO)	ND U	99	1	08/05/20 20:07	7/30/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	102	50 - 150	08/05/20 20:07	
n-Triacontane	103	50 - 150	08/05/20 20:07	

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dba ALS Environmental

QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Analyzed:** 08/05/20  
**Date Extracted:** 07/30/20

**Lab Control Sample Summary**  
**Diesel and Residual Range Organics**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3550B

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** KWG2002294

**Lab Control Sample**  
**KWG2002194-2**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Diesel Range Organics (DRO)	283	267	106	42-134
Residual Range Organics (RRO)	142	133	107	48-141



# General Chemistry

**ALS Environmental—Kelso Laboratory**  
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ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Vapor Intrusion Evaluation/200544-01.01  
**Sample Matrix:** Soil

**Service Request:** K2006350  
**Date Collected:** 07/24/20  
**Date Received:** 07/28/20  
**Date Analyzed:** 07/29/20

Replicate Sample Summary

Inorganic Parameters

**Sample Name:** CC-MW-01-14.5-072420  
**Lab Code:** K2006350-001

**Units:** Percent  
**Basis:** As Received

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>MRL</u>	<u>Sample Result</u>	<u>Duplicate Sample K2006350-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Solids, Total	160.3 Modified	-	92.4	92.3	92.4	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



September 08, 2020

Service Request No:K2007073

Nathan Soccorsy  
Anchor QEA, LLC  
720 Olive Way, Suite 1900  
Seattle, WA 98101

**Laboratory Results for: Carson Cleaners Facility**

Dear Nathan,

Enclosed are the results of the sample(s) submitted to our laboratory August 18, 2020  
For your reference, these analyses have been assigned our service request number **K2007073**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

*Kelley Lovejoy*

for Mark Harris  
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626  
PHONE +1 360 577 7222 | FAX +1 360 636 1068  
ALS Group USA, Corp.  
dba ALS Environmental



# Narrative Documents

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility  
**Sample Matrix:** Water

**Service Request:** K2007073  
**Date Received:** 08/18/2020

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

#### Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 08/18/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

#### Volatiles by GC/MS:

Method 8260C, 08/31/2020: The analysis of samples CC-TB-20200814 and CC-MW-01-20200814 for compounds Tetrachloroethane and Trichloroethene was initially performed within the recommended holding time. Reanalysis at a dilution was required. The reanalysis was performed three days past the recommended holding time. The results from the second analysis were reported.

Approved by

Kelley Lovejoy

Date

09/08/2020

**SAMPLE DETECTION SUMMARY**

<b>CLIENT ID: CC-TB-20200814</b>	<b>Lab ID: K2007073-001</b>
----------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Tetrachloroethene (PCE)	2100			50	ug/L	8260C
Trichloroethene (TCE)	110			50	ug/L	8260C
cis-1,2-Dichloroethene	40			0.50	ug/L	8260C

<b>CLIENT ID: CC-MW-01-20200814</b>	<b>Lab ID: K2007073-002</b>
-------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Gasoline Range Organics (Toluene-Naphthalene GRO)	1860			250	ug/L	NWTPH-Gx
Tetrachloroethene (PCE)	2100			50	ug/L	8260C
Trichloroethene (TCE)	100			50	ug/L	8260C
cis-1,2-Dichloroethene	1.3			0.50	ug/L	8260C





## Sample Receipt Information

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01

**Service Request:**K2007073

**SAMPLE CROSS-REFERENCE**

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2007073-001	CC-TB-20200814	8/14/2020	1400
K2007073-002	CC-MW-01-20200814	8/14/2020	1500
K2007073-003	Trip Blank	8/14/2020	



CHAIN OF CUSTODY  
110965

001

SR# K2007013  
COC Set 2 of 2  
COC# \_\_\_\_\_

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www.alsglobal.com

Project Name <u>CRANSON CLEANUP FACILITY</u>		Project Number <u>700544-01.01</u>		NUMBER OF CONTAINERS	14D					Remarks
Project Manager <u>NATHAN SOCCOVISY</u>										
Company <u>ANCLTON QEA</u>										
Address <u>1201 3RD AVE, #2600, SEATTLE, WA 98101</u>										
Phone # <u>2062879130</u>		email <u>LABDATA@ANCLTONQEA.COM</u>		B260C / VOC FP						
Sampler Signature <u>SBS</u>		Sampler Printed Name <u>STEPHEN SMELTZ</u>								
CLIENT SAMPLE ID	LABID	SAMPLING Date	Time	Matrix						
<u>1. CC-TB-20200814</u>		<u>8-14-20</u>	<u>1400</u>	<u>H2O</u>	<u>3</u>	<u>X</u>				
<u>2. CC-MW-01-20200814</u>		<u>8-14-20</u>	<u>1500</u>	<u>H2O</u>	<u>6</u>	<u>X</u>				
<u>3. <del>CC-MW-01-20200814</del></u>		<u>BAW</u>	<u>1500</u>	<u>MW</u>						
4.										
5.										
6.										
7.										
8.										
9.										
10.										

<b>Report Requirements</b> <input type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD	<b>Invoice Information</b> P.O.# <u>70544-01.01</u> Bill To: <u>L SCHUMACHER @ ANCLTON QEA.COM</u>	Circle which metals are to be analyzed Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg			
	<b>Turnaround Requirements</b> <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 Day <input checked="" type="checkbox"/> Standard	Special Instructions/Comments: <u>INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER _____ (Circle One)</u> <u>LABELS REMOVED OFF,</u> <u>MISMA EXTRA BOTTLES FOR VOC / 8260C ANALYSIS</u>			
Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature <u>SBS</u>	Signature <u>[Signature]</u>	Signature	Signature	Signature	Signature
Printed Name <u>STEPHEN SMELTZ</u>	Printed Name <u>[Name]</u>	Printed Name	Printed Name	Printed Name	Printed Name
Firm <u>ANCLTON QEA</u>	Firm <u>8/18/20 09150</u>	Firm	Firm	Firm	Firm
Date/Time <u>8-17-2020</u>	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

6900

PM MH

**Cooler Receipt and Preservation Form**

Client Anchor WETA Service Request K20 07013  
 Received: 8118120 Opened: 8118120 By: BR Unloaded: 8118120 By: BR

- Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
  - Samples were received in: (circle) Cooler Box Envelope Other NA
  - Were custody seals on coolers? NA Y N If yes, how many and where? 2 front  
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N
  - Was a Temperature Blank present in cooler? NA Y N If yes, note the temperature in the appropriate column below:  
 If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
  - Were samples received within the method specified temperature ranges? NA Y N  
 If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N
- If applicable, tissue samples were received: Frozen Partially Thawed Thawed

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified if out of temp	Tracking Number NA	Filed
<u>5.8</u> <u>6.0</u>	<u>—</u>	<u>1201</u>	<u>42</u>			<u>3958860-8507</u>	
		↓					

- Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
- Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- Were samples received in good condition (unbroken) NA Y N
- Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
- Did all sample labels and tags agree with custody papers? NA Y N
- Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
- Were VOA vials received without headspace? Indicate in the table below. NA Y N
- Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time
<u>Temp blank</u>	<u>2 of 2</u>	<u>VOA</u>	<u>+</u>							
<u>CC-MW-01-20200814</u>	<u>1 of 1</u>	<u>VOA</u>	<u>x</u>							

Notes, Discrepancies, Resolutions: Acc'd 2 samples not as marked on COC



## Miscellaneous Forms

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Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjlabs.com/">http://www.pjlabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.



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Analyst Summary report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01

**Service Request:** K2007073

**Sample Name:** CC-TB-20200814  
**Lab Code:** K2007073-001  
**Sample Matrix:** Water

**Date Collected:** 08/14/20  
**Date Received:** 08/18/20

**Analysis Method**  
8260C

**Extracted/Digested By**

**Analyzed By**  
HJACKY

**Sample Name:** CC-TB-20200814  
**Lab Code:** K2007073-001.R01  
**Sample Matrix:** Water

**Date Collected:** 08/14/20  
**Date Received:** 08/18/20

**Analysis Method**  
8260C

**Extracted/Digested By**

**Analyzed By**  
HJACKY

**Sample Name:** CC-TB-20200814  
**Lab Code:** K2007073-001.R02  
**Sample Matrix:** Water

**Date Collected:** 08/14/20  
**Date Received:** 08/18/20

**Analysis Method**  
8260C

**Extracted/Digested By**

**Analyzed By**  
HJACKY

**Sample Name:** CC-MW-01-20200814  
**Lab Code:** K2007073-002  
**Sample Matrix:** Water

**Date Collected:** 08/14/20  
**Date Received:** 08/18/20

**Analysis Method**  
8260C  
NWTPH-Gx

**Extracted/Digested By**

**Analyzed By**  
HJACKY  
KWINSTON

ALS Group USA, Corp.  
dba ALS Environmental

Analyst Summary report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01

**Service Request:** K2007073

**Sample Name:** CC-MW-01-20200814  
**Lab Code:** K2007073-002.R01  
**Sample Matrix:** Water

**Date Collected:** 08/14/20  
**Date Received:** 08/18/20

**Analysis Method**  
8260C  
NWTPH-Gx

**Extracted/Digested By**

**Analyzed By**  
HJACKY  
KWINSTON

**Sample Name:** CC-MW-01-20200814  
**Lab Code:** K2007073-002.R02  
**Sample Matrix:** Water

**Date Collected:** 08/14/20  
**Date Received:** 08/18/20

**Analysis Method**  
8260C

**Extracted/Digested By**

**Analyzed By**  
HJACKY

**Sample Name:** Trip Blank  
**Lab Code:** K2007073-003  
**Sample Matrix:** Water

**Date Collected:** 08/14/20  
**Date Received:** 08/18/20

**Analysis Method**  
NWTPH-Gx

**Extracted/Digested By**

**Analyzed By**  
KWINSTON

**Sample Name:** Trip Blank  
**Lab Code:** K2007073-003.R01  
**Sample Matrix:** Water

**Date Collected:** 08/14/20  
**Date Received:** 08/18/20

**Analysis Method**  
NWTPH-Gx

**Extracted/Digested By**

**Analyzed By**  
KWINSTON



# Sample Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



## Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** CC-TB-20200814  
**Lab Code:** K2007073-001

**Service Request:** K2007073  
**Date Collected:** 08/14/20 14:00  
**Date Received:** 08/18/20 09:50

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	2100	50	100	08/31/20 15:01	*
Trichloroethene (TCE)	110	50	100	08/31/20 15:01	*
Vinyl Chloride	ND U	0.50	1	08/26/20 19:21	
cis-1,2-Dichloroethene	40	0.50	1	08/26/20 19:21	
trans-1,2-Dichloroethene	ND U	0.50	1	08/26/20 19:21	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	68 - 117	08/26/20 19:21	
Dibromofluoromethane	102	73 - 122	08/26/20 19:21	
Toluene-d8	111	65 - 144	08/26/20 19:21	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** CC-MW-01-20200814  
**Lab Code:** K2007073-002

**Service Request:** K2007073  
**Date Collected:** 08/14/20 15:00  
**Date Received:** 08/18/20 09:50

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	2100	50	100	08/31/20 15:21	*
Trichloroethene (TCE)	100	50	100	08/31/20 15:21	*
Vinyl Chloride	ND U	0.50	1	08/26/20 20:21	
cis-1,2-Dichloroethene	1.3	0.50	1	08/26/20 20:21	
trans-1,2-Dichloroethene	ND U	0.50	1	08/26/20 20:21	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	68 - 117	08/26/20 20:21	
Dibromofluoromethane	104	73 - 122	08/26/20 20:21	
Toluene-d8	106	65 - 144	08/26/20 20:21	

ALS Group USA, Corp.  
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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** CC-MW-01-20200814  
**Lab Code:** K2007073-002

**Service Request:** K2007073  
**Date Collected:** 08/14/20 15:00  
**Date Received:** 08/18/20 09:50  
**Units:** ug/L  
**Basis:** NA

Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics (Toluene-Naphthalene GRO)	1860	250	1	08/25/20 13:55	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Difluorobenzene	103	50 - 150	08/25/20 13:55	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** Trip Blank  
**Lab Code:** K2007073-003

**Service Request:** K2007073  
**Date Collected:** 08/14/20  
**Date Received:** 08/18/20 09:50  
**Units:** ug/L  
**Basis:** NA

Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics (Toluene-Naphthalene GRO)	ND U	250	1	08/25/20 14:42	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Difluorobenzene	101	50 - 150	08/25/20 14:42	





# QC Summary Forms

**ALS Environmental—Kelso Laboratory**  
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[www.alsglobal.com](http://www.alsglobal.com)



## Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2007073

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	Toluene-d8
		68-117	73-122	65-144
CC-TB-20200814	K2007073-001	100	102	111
CC-MW-01-20200814	K2007073-002	99	104	106
Method Blank	KQ2012140-08	98	100	106
Method Blank	KQ2012395-01	96	102	114
Lab Control Sample	KQ2012140-10	103	105	109
Duplicate Lab Control Sample	KQ2012140-11	101	105	106
Lab Control Sample	KQ2012395-05	103	102	107
Duplicate Lab Control Sample	KQ2012395-06	101	102	108

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2012140-08

**Service Request:** K2007073  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	ND U	0.50	1	08/26/20 15:21	
Trichloroethene (TCE)	ND U	0.50	1	08/26/20 15:21	
Vinyl Chloride	ND U	0.50	1	08/26/20 15:21	
cis-1,2-Dichloroethene	ND U	0.50	1	08/26/20 15:21	
trans-1,2-Dichloroethene	ND U	0.50	1	08/26/20 15:21	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	68 - 117	08/26/20 15:21	
Dibromofluoromethane	100	73 - 122	08/26/20 15:21	
Toluene-d8	106	65 - 144	08/26/20 15:21	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2012395-01

**Service Request:** K2007073  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	ND U	0.50	1	08/31/20 12:41	
Trichloroethene (TCE)	ND U	0.50	1	08/31/20 12:41	
Vinyl Chloride	ND U	0.50	1	08/31/20 12:41	
cis-1,2-Dichloroethene	ND U	0.50	1	08/31/20 12:41	
trans-1,2-Dichloroethene	ND U	0.50	1	08/31/20 12:41	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	68 - 117	08/31/20 12:41	
Dibromofluoromethane	102	73 - 122	08/31/20 12:41	
Toluene-d8	114	65 - 144	08/31/20 12:41	

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2007073  
**Date Analyzed:** 08/26/20  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 692734

**Lab Control Sample**  
**KQ2012140-10**

**Duplicate Lab Control Sample**  
**KQ2012140-11**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD</b>	<b>RPD Limit</b>
cis-1,2-Dichloroethene	9.09	10.0	91	9.66	10.0	97	71-118	6	30
Tetrachloroethene (PCE)	9.69	10.0	97	9.78	10.0	98	62-126	<1	30
trans-1,2-Dichloroethene	9.15	10.0	92	9.36	10.0	94	67-125	2	30
Trichloroethene (TCE)	9.54	10.0	95	9.58	10.0	96	67-128	<1	30
Vinyl Chloride	9.72	10.0	97	10.0	10.0	100	55-123	3	30

**ALS Group USA, Corp.**  
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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2007073  
**Date Analyzed:** 08/31/20  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 693379

**Lab Control Sample**  
**KQ2012395-05**

**Duplicate Lab Control Sample**  
**KQ2012395-06**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD</b>	<b>RPD Limit</b>
cis-1,2-Dichloroethene	8.74	10.0	87	8.71	10.0	87	71-118	<1	30
Tetrachloroethene (PCE)	9.04	10.0	90	8.81	10.0	88	62-126	3	30
trans-1,2-Dichloroethene	8.65	10.0	87	8.48	10.0	85	67-125	2	30
Trichloroethene (TCE)	8.87	10.0	89	8.79	10.0	88	67-128	<1	30
Vinyl Chloride	8.83	10.0	88	8.83	10.0	88	55-123	<1	30

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2007073

**SURROGATE RECOVERY SUMMARY**  
**Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Gx  
**Extraction Method:** None

Sample Name	Lab Code	1,4-Difluorobenzene
		50-150
CC-MW-01-20200814	K2007073-002	103
Trip Blank	K2007073-003	101
CC-MW-01-20200814	KQ2011831-10	108
CC-MW-01-20200814	KQ2011993-07	104
Method Blank	KQ2011993-05	104
Lab Control Sample	KQ2011993-06	106



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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2007073  
**Date Collected:** 08/14/20  
**Date Received:** 08/18/20  
**Date Analyzed:** 08/24/20

**Replicate Sample Summary**  
**Volatile Petroleum Products by GC/FID**

**Sample Name:** CC-MW-01-20200814  
**Lab Code:** K2007073-002

**Units:** ug/L  
**Basis:** NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>MRL</u>	<u>Sample Result</u>	<u>Duplicate Sample KQ2011831-10 Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Gasoline Range Organics (Toluene-Naphthalene GRO)	NWTPH-Gx	250	1860	1600	1730	15	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2007073  
**Date Collected:** 08/14/20  
**Date Received:** 08/18/20  
**Date Analyzed:** 08/25/20

**Replicate Sample Summary**  
**Volatile Petroleum Products by GC/FID**

**Sample Name:** CC-MW-01-20200814  
**Lab Code:** K2007073-002

**Units:** ug/L  
**Basis:** NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>MRL</u>	<u>Sample Result</u>	<u>Duplicate Sample KQ2011993-07 Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Gasoline Range Organics (Toluene-Naphthalene GRO)	NWTPH-Gx	250	1860	1810	1840	3	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2011993-05

**Service Request:** K2007073  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics (Toluene-Naphthalene GRO)	ND U	250	1	08/25/20 12:44	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Difluorobenzene	104	50 - 150	08/25/20 12:44	

ALS Group USA, Corp.  
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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2007073  
**Date Analyzed:** 08/25/20  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 692636

**Lab Control Sample**  
**KQ2011993-06**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Gasoline Range Organics (Toluene-Naphthalene GRO)	498	500	100	80-119



August 25, 2020

Service Request No:K2007075

Nathan Soccorsy  
Anchor QEA, LLC  
720 Olive Way, Suite 1900  
Seattle, WA 98101

**Laboratory Results for: Carson Cleaners Facility**

Dear Nathan,

Enclosed are the results of the sample(s) submitted to our laboratory August 18, 2020  
For your reference, these analyses have been assigned our service request number **K2007075**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626  
PHONE +1 360 577 7222 | FAX +1 360 636 1068  
ALS Group USA, Corp.  
dba ALS Environmental



# Narrative Documents

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility  
**Sample Matrix:** Water

**Service Request:** K2007075  
**Date Received:** 08/18/2020

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

One water sample was received for analysis at ALS Environmental on 08/18/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

**Semivoa GC:**

No significant anomalies were noted with this analysis.

*Noel D. O'Connell*

Approved by \_\_\_\_\_

Date 08/25/2020



## Sample Receipt Information

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01

**Service Request:**K2007075

**SAMPLE CROSS-REFERENCE**

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2007075-001	CC-MW-01-20200814	8/14/2020	1500



CHAIN OF CUSTODY  
110984

001

SR# K2607075  
COC Set 1 of 2  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Project Name <u>CARSON CLEANERS INTER</u>		Project Number <u>200544-01.01</u>		NUMBER OF CONTAINERS 14D	NWTPH-Dry/NW_TPH (5X)	1	2	3	4	5	Remarks
Project Manager <u>NATHAN SOCCORSY</u>											
Company <u>ANCHOR QEA</u>											
Address <u>1201 3RD AVE, #2600, SEATTLE WA 98101</u>											
Phone # <u>206 287 9130</u>		email <u>LABDATA@ANCHORQEA.COM</u>									
Sampler Signature <u>SBS</u>		Sampler Printed Name <u>STEPHEN STRETZ</u>									
CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix							
<u>EC-MW-01-20200814</u>		<u>8-14-2020</u>	<u>1500</u>	<u>U20</u>	<u>5</u>	<u>X</u>					
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											

<b>Report Requirements</b> <input type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD	<b>Invoice Information</b> P.O.# <u>200544-01.01</u> Bill To: <u>LEESA SCHUMACHER</u> <u>Schumacher @</u> <u>ANCHOR QEA - COM</u>	Circle which metals are to be analyzed Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg			
	<b>Turnaround Requirements</b> <input type="checkbox"/> 24 hr. _____ 48 hr. <input type="checkbox"/> 5 Day _____ <input checked="" type="checkbox"/> Standard _____ Requested Report Date _____	Special Instructions/Comments: _____ *Indicate State Hydrocarbon Procedure: AK CA WI <u>Northwest</u> Other _____ (Circle One)			
Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature <u>SBS</u>	Signature <u>[Signature]</u>	Signature	Signature	Signature	Signature
Printed Name <u>STEPHEN STRETZ</u>	Printed Name <u>[Name]</u>	Printed Name	Printed Name	Printed Name	Printed Name
Firm <u>ANCHOR QEA</u>	Firm <u>ALS</u>	Firm	Firm	Firm	Firm
Date/Time <u>8-17-2020</u> <u>0900</u>	Date/Time <u>8/18/20 0915U</u>	Date/Time	Date/Time	Date/Time	Date/Time

PM MH

### Cooler Receipt and Preservation Form

Client Anchor QEA Service Request K20 07075  
Received: 8/18/20 Opened: 8/18/20 By: BR Unloaded: 8/18/20 By: BR

- 1. Samples were received via?  USPS  Fed Ex  UPS  DHL  PDX  Courier  Hand Delivered
  - 2. Samples were received in: (circle)  Cooler  Box  Envelope  Other  NA
  - 3. Were custody seals on coolers? NA  Y  N If yes, how many and where? 2 front  
If present, were custody seals intact?  Y  N If present, were they signed and dated?  Y  N
  - 4. Was a Temperature Blank present in cooler? NA  Y  N If yes, notate the temperature in the appropriate column below:  
If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
  - 5. Were samples received within the method specified temperature ranges? NA  Y  N  
If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA  Y  N
- If applicable, tissue samples were received: Frozen Partially Thawed Thawed

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
<u>5.8</u> <u>6.0</u>	<u>—</u>	<u>W01</u>	<u>42</u>			<u>3958880 8527</u>	
		↓					

- 6. Packing material:  Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Dry Ice  Sleeves
- 7. Were custody papers properly filled out (ink, signed, etc.)? NA  Y  N
- 8. Were samples received in good condition (unbroken) NA  Y  N
- 9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA  Y  N
- 10. Did all sample labels and tags agree with custody papers? NA  Y  N
- 11. Were appropriate bottles/containers and volumes received for the tests indicated? NA  Y  N
- 12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below  NA  Y  N
- 13. Were VOA vials received without headspace? Indicate in the table below  NA  Y  N
- 14. Was C12/Res negative?  NA  Y  N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Rec'd 2 samples, not 5 as marked on COC



## Miscellaneous Forms

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[www.alsglobal.com](http://www.alsglobal.com)

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

**ALS Group USA, Corp.**

dba ALS Environmental

Analyst Summary report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01

**Service Request:** K2007075

**Sample Name:** CC-MW-01-20200814  
**Lab Code:** K2007075-001  
**Sample Matrix:** Water

**Date Collected:** 08/14/20  
**Date Received:** 08/18/20

**Analysis Method**  
NWTPH-Dx

**Extracted/Digested By**  
WVANDERHOFF

**Analyzed By**  
TPOTTSCHMIDT





# Sample Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



## Semivolatile Organic Compounds by GC

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** CC-MW-01-20200814  
**Lab Code:** K2007075-001

**Service Request:** K2007075  
**Date Collected:** 08/14/20 15:00  
**Date Received:** 08/18/20 09:50

**Units:** ug/L  
**Basis:** NA

Semi-Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	ND U	250	1	08/21/20 12:28	8/19/20	
Residual Range Organics (C25 - C36 RRO)	ND U	500	1	08/21/20 12:28	8/19/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	67	50 - 150	08/21/20 12:28	
n-Triacontane	71	50 - 150	08/21/20 12:28	



# QC Summary Forms

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



## Semivolatile Organic Compounds by GC

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2007075

**SURROGATE RECOVERY SUMMARY**  
**Semi-Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Dx  
**Extraction Method:** EPA 3510C

Sample Name	Lab Code	o-Terphenyl	n-Triacontane
		50-150	50-150
CC-MW-01-20200814	K2007075-001	67	71
Method Blank	KQ2011562-03	79	84
Lab Control Sample	KQ2011562-01	73	74
Duplicate Lab Control Sample	KQ2011562-02	86	87

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2011562-03

**Service Request:** K2007075  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Semi-Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	ND U	250	1	08/21/20 12:06	8/19/20	
Residual Range Organics (C25 - C36 RRO)	ND U	500	1	08/21/20 12:06	8/19/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	79	50 - 150	08/21/20 12:06	
n-Triacontane	84	50 - 150	08/21/20 12:06	

**ALS Group USA, Corp.**  
dba ALS Environmental

QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2007075  
**Date Analyzed:** 08/21/20  
**Date Extracted:** 08/19/20

**Duplicate Lab Control Sample Summary**  
**Semi-Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3510C

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 691921

Analyte Name	Lab Control Sample KQ2011562-01			Duplicate Lab Control Sample KQ2011562-02			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Diesel Range Organics (C12 - C25 DRO)	2580	3200	81	3070	3200	96	46-140	17	30
Residual Range Organics (C25 - C36 RRO)	1280	1600	80	1530	1600	95	45-159	18	30





December 07, 2020

Service Request No:K2010780

Nathan Soccorsy  
Anchor QEA, LLC  
720 Olive Way, Suite 1900  
Seattle, WA 98101

**Laboratory Results for: Carson Cleaners Facility**

Dear Nathan,

Enclosed are the results of the sample(s) submitted to our laboratory November 19, 2020  
For your reference, these analyses have been assigned our service request number **K2010780**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626  
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ALS Group USA, Corp.  
dba ALS Environmental



# Narrative Documents

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility  
**Sample Matrix:** Water, Ground Water

**Service Request:** K2010780  
**Date Received:** 11/19/2020

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

Three water, ground water samples were received for analysis at ALS Environmental on 11/19/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**Semivolatile GC:**

No significant anomalies were noted with this analysis.

**Volatiles by GC/MS:**

No significant anomalies were noted with this analysis.

*Noel D. O'Connell*

Approved by \_\_\_\_\_

Date 12/07/2020

**SAMPLE DETECTION SUMMARY**

<b>CLIENT ID: CC-MW-01-20201118</b>	<b>Lab ID: K2010780-001</b>
-------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Gasoline Range Organics (Toluene-Naphthalene GRO)	2020			250	ug/L	NWTPH-Gx
Tetrachloroethene (PCE)	2700			50	ug/L	8260C
Trichloroethene (TCE)	140			5.0	ug/L	8260C
cis-1,2-Dichloroethene	63			5.0	ug/L	8260C

<b>CLIENT ID: CC-MW-1001-20201118</b>	<b>Lab ID: K2010780-002</b>
---------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Gasoline Range Organics (Toluene-Naphthalene GRO)	2050			250	ug/L	NWTPH-Gx
Tetrachloroethene (PCE)	2600			50	ug/L	8260C
Trichloroethene (TCE)	140			5.0	ug/L	8260C
cis-1,2-Dichloroethene	66			5.0	ug/L	8260C



## Sample Receipt Information

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01

**Service Request:**K2010780

**SAMPLE CROSS-REFERENCE**

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2010780-001	CC-MW-01-20201118	11/18/2020	1055
K2010780-002	CC-MW-1001-20201118	11/18/2020	1100
K2010780-003	CC-TB-20201118	11/18/2020	1000



CHAIN OF CUSTODY  
113280

001

SR# 122010780  
COC Set 1 of 1  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Project Name <b>CARSON CLEANERS FACILITY</b>		Project Number <b>200544-01.01</b>		NUMBER OF CONTAINERS	14D					Remarks		
Project Manager <b>NATHAN SOCCORSY</b>												
Company <b>ANCHOR QEA</b>												
Address <b>1201 3RD AVE #2000, SEATTLE, WA, 98101</b>												
Phone # <b>206 287 9130</b>		email <b>LABDATA@ANCHORQEA.COM</b>										
Sampler Signature <i>Stephen Streetz</i>		Sampler Printed Name <b>STEPHEN STREETZ</b>		260C / VOC FP	NWTPH-Dx / NW_TPH	NWTPH-Gx / NW_GAS	1	2	3	4	5	
CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix								
1. CC-MW-01-2020118		11-18-2020	1055	GW	8	X	X	X				
2. CC-MW-1001-2020118		11-18-2020	1100	GW	8	X	X	X				
3. CC-TB-2020118		11-18-2020	1000	WR	2	X		X				
4.												
5.												
6.												
7.												
8.												
9.												
10.												

<b>Report Requirements</b> <input checked="" type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input checked="" type="checkbox"/> V. EDD	<b>Invoice Information</b> P.O.# <u>200544-01.01</u> Bill To: _____ <u>LSCHUMACHER@ANCHORQEA.COM</u>	Circle which metals are to be analyzed Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg			
	<b>Turnaround Requirements</b> <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 Day <input checked="" type="checkbox"/> Standard	Special Instructions/Comments: _____		*Indicate State Hydrocarbon Procedure: AK CA WI (Northwest) Other _____ (Circle One)	
	Requested Report Date: _____				
Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature <i>Stephen Streetz</i>	Signature <i>Nathan Socorsy</i>	Signature	Signature	Signature	Signature
Printed Name <b>STEPHEN STREETZ</b>	Printed Name <b>NATHAN SOCCORSY</b>	Printed Name	Printed Name	Printed Name	Printed Name
Firm <b>ANCHOR QEA</b>	Firm <b>ANCHOR QEA</b>	Firm	Firm	Firm	Firm
Date/Time <u>11/18/2020 1330</u>	Date/Time <u>11/19/20 1030</u>	Date/Time	Date/Time	Date/Time	Date/Time

### Cooler Receipt and Preservation Form

PM MH

Client Anchor QEA Service Request K20 10780  
 Received: 11/19/20 Opened: 11/19/20 By: BR Unloaded: 11/19/20 By: BR

1. Samples were received via?  USPS  Fed Ex  UPS  DHL  PDX  Courier  Hand Delivered
  2. Samples were received in: (circle)  Cooler  Box  Envelope  Other  NA
  3. Were custody seals on coolers?  NA  Y  N If yes, how many and where? 1 front  
 If present, were custody seals intact?  NA  Y  N If present, were they signed and dated?  Y  N
  4. Was a Temperature Blank present in cooler?  NA  Y  N If yes, note the temperature in the appropriate column below:  
 If no, take the temperature of a representative sample bottle contained within the cooler; note in the column "Sample Temp":
  5. Were samples received within the method specified temperature ranges?  NA  Y  N  
 If no, were they received on ice and same day as collected? If not, note the cooler # below and notify the PM.  NA  Y  N
- If applicable, tissue samples were received:  Frozen  Partially Thawed  Thawed

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID/ NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
2.4	—	1B01		—		399101887350	

6. Packing material:  Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Dry Ice  Sleeves
7. Were custody papers properly filled out (ink, signed, etc.)?  NA  Y  N
8. Were samples received in good condition (unbroken)  NA  Y  N
9. Were all sample labels complete (ie, analysis, preservation, etc.)?  NA  Y  N
10. Did all sample labels and tags agree with custody papers?  NA  Y  N
11. Were appropriate bottles/containers and volumes received for the tests indicated?  NA  Y  N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below*  NA  Y  N
13. Were VOA vials received without headspace? *Indicate in the table below.*  NA  Y  N
14. Was C12/Res negative?  NA  Y  N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_





## Miscellaneous Forms

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.  
dba ALS Environmental

Analyst Summary report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01

**Service Request:** K2010780

**Sample Name:** CC-MW-01-20201118  
**Lab Code:** K2010780-001  
**Sample Matrix:** Ground Water

**Date Collected:** 11/18/20  
**Date Received:** 11/19/20

**Analysis Method**  
8260C  
NWTPH-Dx  
NWTPH-Gx

**Extracted/Digested By**  
  
WVANDERHOFF

**Analyzed By**  
JJAMES  
TPOTTSCHMIDT  
GGARBAI

**Sample Name:** CC-MW-01-20201118  
**Lab Code:** K2010780-001.R01  
**Sample Matrix:** Ground Water

**Date Collected:** 11/18/20  
**Date Received:** 11/19/20

**Analysis Method**  
8260C

**Extracted/Digested By**

**Analyzed By**  
JJAMES

**Sample Name:** CC-MW-1001-20201118  
**Lab Code:** K2010780-002  
**Sample Matrix:** Ground Water

**Date Collected:** 11/18/20  
**Date Received:** 11/19/20

**Analysis Method**  
8260C  
NWTPH-Dx  
NWTPH-Gx

**Extracted/Digested By**  
  
WVANDERHOFF

**Analyzed By**  
JJAMES  
TPOTTSCHMIDT  
GGARBAI

**Sample Name:** CC-MW-1001-20201118  
**Lab Code:** K2010780-002.R01  
**Sample Matrix:** Ground Water

**Date Collected:** 11/18/20  
**Date Received:** 11/19/20

**Analysis Method**  
8260C

**Extracted/Digested By**

**Analyzed By**  
JJAMES

**ALS Group USA, Corp.**  
dba ALS Environmental

Analyst Summary report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01

**Service Request:** K2010780

**Sample Name:** CC-TB-20201118  
**Lab Code:** K2010780-003  
**Sample Matrix:** Water

**Date Collected:** 11/18/20  
**Date Received:** 11/19/20

**Analysis Method**  
8260C  
NWTPH-Gx

**Extracted/Digested By**

**Analyzed By**  
JJAMES  
GGARBAI



# Sample Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



## Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** CC-MW-01-20201118  
**Lab Code:** K2010780-001

**Service Request:** K2010780  
**Date Collected:** 11/18/20 10:55  
**Date Received:** 11/19/20 10:30

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	<b>2700</b>	50	100	11/24/20 20:17	
Trichloroethene (TCE)	<b>140</b>	5.0	10	11/24/20 19:50	
Vinyl Chloride	ND U	5.0	10	11/24/20 19:50	
cis-1,2-Dichloroethene	<b>63</b>	5.0	10	11/24/20 19:50	
trans-1,2-Dichloroethene	ND U	5.0	10	11/24/20 19:50	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	68 - 117	11/24/20 19:50	
Dibromofluoromethane	92	73 - 122	11/24/20 19:50	
Toluene-d8	94	65 - 144	11/24/20 19:50	

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** CC-MW-1001-20201118  
**Lab Code:** K2010780-002

**Service Request:** K2010780  
**Date Collected:** 11/18/20 11:00  
**Date Received:** 11/19/20 10:30

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	<b>2600</b>	50	100	11/24/20 21:10	
Trichloroethene (TCE)	<b>140</b>	5.0	10	11/24/20 20:43	
Vinyl Chloride	ND U	5.0	10	11/24/20 20:43	
cis-1,2-Dichloroethene	<b>66</b>	5.0	10	11/24/20 20:43	
trans-1,2-Dichloroethene	ND U	5.0	10	11/24/20 20:43	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	68 - 117	11/24/20 20:43	
Dibromofluoromethane	101	73 - 122	11/24/20 20:43	
Toluene-d8	99	65 - 144	11/24/20 20:43	

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** CC-TB-20201118  
**Lab Code:** K2010780-003

**Service Request:** K2010780  
**Date Collected:** 11/18/20 10:00  
**Date Received:** 11/19/20 10:30

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	ND U	0.50	1	11/24/20 19:24	
Trichloroethene (TCE)	ND U	0.50	1	11/24/20 19:24	
Vinyl Chloride	ND U	0.50	1	11/24/20 19:24	
cis-1,2-Dichloroethene	ND U	0.50	1	11/24/20 19:24	
trans-1,2-Dichloroethene	ND U	0.50	1	11/24/20 19:24	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	68 - 117	11/24/20 19:24	
Dibromofluoromethane	99	73 - 122	11/24/20 19:24	
Toluene-d8	99	65 - 144	11/24/20 19:24	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** CC-MW-01-20201118  
**Lab Code:** K2010780-001

**Service Request:** K2010780  
**Date Collected:** 11/18/20 10:55  
**Date Received:** 11/19/20 10:30

**Units:** ug/L  
**Basis:** NA

Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics (Toluene-Naphthalene GRO)	2020	250	1	11/24/20 03:36	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Difluorobenzene	93	50 - 150	11/24/20 03:36	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** CC-MW-1001-20201118  
**Lab Code:** K2010780-002

**Service Request:** K2010780  
**Date Collected:** 11/18/20 11:00  
**Date Received:** 11/19/20 10:30

**Units:** ug/L  
**Basis:** NA

Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics (Toluene-Naphthalene GRO)	2050	250	1	11/24/20 04:00	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Difluorobenzene	92	50 - 150	11/24/20 04:00	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water  
**Sample Name:** CC-TB-20201118  
**Lab Code:** K2010780-003

**Service Request:** K2010780  
**Date Collected:** 11/18/20 10:00  
**Date Received:** 11/19/20 10:30

**Units:** ug/L  
**Basis:** NA

Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics (Toluene-Naphthalene GRO)	ND U	250	1	11/24/20 01:15	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Difluorobenzene	88	50 - 150	11/24/20 01:15	



## Semivolatile Organic Compounds by GC

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
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dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** CC-MW-01-20201118  
**Lab Code:** K2010780-001

**Service Request:** K2010780  
**Date Collected:** 11/18/20 10:55  
**Date Received:** 11/19/20 10:30

**Units:** ug/L  
**Basis:** NA

Semi-Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	ND U	250	1	12/01/20 01:46	11/20/20	
Residual Range Organics (C25 - C36 RRO)	ND U	500	1	12/01/20 01:46	11/20/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	89	50 - 150	12/01/20 01:46	
n-Triacontane	102	50 - 150	12/01/20 01:46	



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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** CC-MW-1001-20201118  
**Lab Code:** K2010780-002

**Service Request:** K2010780  
**Date Collected:** 11/18/20 11:00  
**Date Received:** 11/19/20 10:30

**Units:** ug/L  
**Basis:** NA

**Semi-Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	ND U	250	1	12/01/20 02:07	11/20/20	
Residual Range Organics (C25 - C36 RRO)	ND U	500	1	12/01/20 02:07	11/20/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	91	50 - 150	12/01/20 02:07	
n-Triacontane	105	50 - 150	12/01/20 02:07	



## QC Summary Forms

**ALS Environmental—Kelso Laboratory**  
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## Volatile Organic Compounds by GC/MS

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**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water

**Service Request:** K2010780

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	Toluene-d8
		68-117	73-122	65-144
CC-MW-01-20201118	K2010780-001	94	92	94
CC-MW-1001-20201118	K2010780-002	94	101	99
Method Blank	KQ2018881-05	94	98	100
Lab Control Sample	KQ2018881-03	91	99	98
Duplicate Lab Control Sample	KQ2018881-04	96	103	102

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2010780

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

<b>Sample Name</b>	<b>Lab Code</b>	<b>4-Bromofluorobenzene 68-117</b>	<b>Dibromofluoromethane 73-122</b>	<b>Toluene-d8 65-144</b>
CC-TB-20201118	K2010780-003	90	99	99

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2018881-05

**Service Request:** K2010780  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Tetrachloroethene (PCE)	ND U	0.50	1	11/24/20 13:39	
Trichloroethene (TCE)	ND U	0.50	1	11/24/20 13:39	
Vinyl Chloride	ND U	0.50	1	11/24/20 13:39	
cis-1,2-Dichloroethene	ND U	0.50	1	11/24/20 13:39	
trans-1,2-Dichloroethene	ND U	0.50	1	11/24/20 13:39	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	68 - 117	11/24/20 13:39	
Dibromofluoromethane	98	73 - 122	11/24/20 13:39	
Toluene-d8	100	65 - 144	11/24/20 13:39	

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water

**Service Request:** K2010780  
**Date Analyzed:** 11/24/20  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 704820

**Lab Control Sample**  
**KQ2018881-03**

**Duplicate Lab Control Sample**  
**KQ2018881-04**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD</b>	<b>RPD Limit</b>
cis-1,2-Dichloroethene	9.90	10.0	99	10.3	10.0	103	71-118	4	30
Tetrachloroethene (PCE)	10.2	10.0	102	10.5	10.0	105	62-126	3	30
trans-1,2-Dichloroethene	9.59	10.0	96	9.76	10.0	98	67-125	2	30
Trichloroethene (TCE)	10.4	10.0	104	10.6	10.0	106	67-128	2	30
Vinyl Chloride	9.24	10.0	92	10.0	10.0	100	55-123	8	30

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water

**Service Request:** K2010780

**SURROGATE RECOVERY SUMMARY**  
**Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Gx  
**Extraction Method:** None

Sample Name	Lab Code	1,4-Difluorobenzene
		50-150
CC-MW-01-20201118	K2010780-001	93
CC-MW-1001-20201118	K2010780-002	92
Method Blank	KQ2018876-03	91
Method Blank	KQ2018876-09	89
Method Blank	KQ2018876-14	91
Lab Control Sample	KQ2018876-17	89
Lab Control Sample	KQ2018876-19	96
Duplicate Lab Control Sample	KQ2018876-20	95



**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Water

**Service Request:** K2010780

**SURROGATE RECOVERY SUMMARY**  
**Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Gx  
**Extraction Method:** None

<b>Sample Name</b>	<b>Lab Code</b>	<b>1,4-Difluorobenzene</b> <b>50-150</b>
CC-TB-20201118	K2010780-003	88

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2018876-03

**Service Request:** K2010780  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics (Toluene-Naphthalene GRO)	ND U	250	1	11/23/20 18:10	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Difluorobenzene	91	50 - 150	11/23/20 18:10	

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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2018876-09

**Service Request:** K2010780  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics (Toluene-Naphthalene GRO)	ND U	250	1	11/24/20 00:52	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Difluorobenzene	89	50 - 150	11/24/20 00:52	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2018876-14

**Service Request:** K2010780  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Q
Gasoline Range Organics (Toluene-Naphthalene GRO)	ND U	250	1	11/24/20 10:41	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Difluorobenzene	91	50 - 150	11/24/20 10:41	

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water

**Service Request:** K2010780  
**Date Analyzed:** 11/24/20  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 704350

**Lab Control Sample**  
**KQ2018876-17**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Gasoline Range Organics (Toluene-Naphthalene GRO)	418	500	84	80-119

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QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water

**Service Request:** K2010780  
**Date Analyzed:** 11/23/20  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Gx  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 704350

**Lab Control Sample**  
**KQ2018876-19**

**Duplicate Lab Control Sample**  
**KQ2018876-20**

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>RPD</u>	<u>RPD Limit</u>
Gasoline Range Organics (Toluene-Naphthalene GRO)	449	500	90	440	500	88	80-119	2	30



## Semivolatile Organic Compounds by GC

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**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water

**Service Request:** K2010780

**SURROGATE RECOVERY SUMMARY**  
**Semi-Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Dx  
**Extraction Method:** EPA 3510C

Sample Name	Lab Code	o-Terphenyl	n-Triacontane
		50-150	50-150
CC-MW-01-20201118	K2010780-001	89	102
CC-MW-1001-20201118	K2010780-002	91	105
Method Blank	KQ2018393-04	93	106
Lab Control Sample	KQ2018393-03	91	99



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Analytical Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2018393-04

**Service Request:** K2010780  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Semi-Volatile Petroleum Products by GC/FID

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	ND U	250	1	11/30/20 17:55	11/20/20	
Residual Range Organics (C25 - C36 RRO)	ND U	500	1	11/30/20 17:55	11/20/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	93	50 - 150	11/30/20 17:55	
n-Triacontane	106	50 - 150	11/30/20 17:55	

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dba ALS Environmental

QA/QC Report

**Client:** Anchor QEA, LLC  
**Project:** Carson Cleaners Facility/200544-01.01  
**Sample Matrix:** Ground Water

**Service Request:** K2010780  
**Date Analyzed:** 11/30/20  
**Date Extracted:** 11/20/20

**Lab Control Sample Summary**  
**Semi-Volatile Petroleum Products by GC/FID**

**Analysis Method:** NWTPH-Dx  
**Prep Method:** EPA 3510C

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 705277

**Lab Control Sample**  
**KQ2018393-03**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Diesel Range Organics (C12 - C25 DRO)	3070	3200	96	46-140
Residual Range Organics (C25 - C36 RRO)	1530	1600	96	45-159

# Appendix F

## Data Validation Reports

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# Data Validation Report – EPA Stage 2A

September 15, 2020

Project: Carson Cleaners Vapors Intrusion Evaluation

Project Number: 200544-01.01

This report summarizes the review of analytical results for eleven air samples collected on July 23 and 24, 2020. The samples were collected by Anchor QEA, LLC, and submitted to ALS Environmental (ALS) in Simi Valley, California. The samples were analyzed for the following parameters:

- Volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) method TO-15

ALS sample data group (SDG) number P2004153 were reviewed in this report. Sample IDs, matrices, and analyses are presented in Table 1.

**Table 1**  
**Sample IDs, Matrices, and Analyses**

Sample ID	Lab Sample ID	Matrix	Analysis
CC-SS-01-072320	P2004153-001	Air	VOCs
CC-IA-01-072320	P2004153-002	Air	VOCs
CC-SG-01-072420	P2004153-003	Air	VOCs
CC-SS-02-072320	P2004153-004	Air	VOCs
CC-IA-02-072320	P2004153-005	Air	VOCs
CC-SS-03-072320	P2004153-006	Air	VOCs
CC-IA-03-072320	P2004153-007	Air	VOCs
CC-SG-03-072420	P2004153-008	Air	VOCs
CC-IA-04-072320	P2004153-009	Air	VOCs
CC-SG-04-072420	P2004153-010	Air	VOCs
CC-AA-00-072420	P2004153-011	Air	VOCs

## Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control guidelines outlined in the analytical procedures. Laboratory results were reviewed using the laboratory control limits and the following guidelines:

- USEPA National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2017a)

Unless noted in this report, laboratory results for the samples listed in Table 1 were within quality control criteria.

## **Field Documentation**

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by ALS at the time of sample receipt.

## **Holding Times and Sample Preservation**

Samples were appropriately preserved and analyzed within holding time.

## **Laboratory Method Blanks**

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

## **Field Quality Control**

No field quality control samples were required to be collected with these samples sets.

## **Laboratory Control Samples and Laboratory Control Sample Duplicates**

Laboratory control samples (LCSs) were analyzed at the required frequencies. All analyses resulted in recovery values within laboratory control limits. No laboratory control sample duplicates (LCSDs) were analyzed with these sample sets.

## **Matrix Spike and Matrix Spike Duplicate Samples**

LCS were analyzed in place of Matrix spike (MS). Recoveries were within laboratory control limits. No matrix spike duplicate samples (MSDs) were analyzed with these sample sets.

## **Laboratory Duplicates**

Laboratory duplicates were not analyzed with these sample sets.

## **Method Reporting Limits**

Reporting limits were acceptable as reported. Values were reported as undiluted, or when reported as diluted, the reporting limit accurately reflects the dilution factor.

## **Overall Assessment**

As was determined by this evaluation, the laboratory followed the specified analytical methods, and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the laboratory control sample recovery values. Precision could not be determined for this data. All data are acceptable as reported.

## References

USEPA. 2017a. National Functional Guidelines for Superfund Organic Methods Data Review. Office of Superfund Remediation and Technology Innovation. United States Environmental Protection Agency. EPA-540-R-2017-001. January 2017.

# Data Validation Report – EPA Stage 2A

October 6, 2020

Project: Carson Cleaners Vapors Intrusion Evaluation

Project Number: 200544-01.01

This report summarizes the review of analytical results for 5 soil samples, one water sample, and two trip blanks collected on July 24 and August 14, 2020. The samples were collected by Anchor QEA, LLC, and submitted to ALS Environmental (ALS) in Kelso, Washington. The samples were analyzed for the following parameters:

- Volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (USEPA) method 8260C
- Gasoline range organics (GRO) by Northwest Total Petroleum Hydrocarbons – Gasoline Range Extended (NWTPHGx)
- Diesel range organics (DRO) by Northwest Total Petroleum Hydrocarbons – Diesel Range Extended (NWTPHDx)
- Total solids (TS) by USEPA Method 160.3 modified

ALS sample data groups (SDGs) K2006350, K2007073, and K2007075 were reviewed in this report. Sample IDs, matrices, and analyses are presented in Table 1.

**Table 1**  
**Sample IDs, Matrices, and Analyses**

Sample ID	Lab Sample ID	Matrix	Analyses
CC-MW-01-14.5-072420	K2006350-001	Soil	DRO, GRO, VOCs, TS
CC-MW-01-18-072420	K2006350-002	Soil	DRO, GRO, VOCs, TS
CC-MW-01-24-072420	K2006350-003	Soil	DRO, GRO, VOCs, TS
CC-MW-01-124-072420	K2006350-004	Soil	DRO, GRO, VOCs, TS
CC-MW-01-29-072420	K2006350-005	Soil	DRO, GRO, VOCs, TS
TB-01-072420	K2006350-006	Water	GRO, VOCs
CC-MW-01-20200814	K2007075-001	Water	DRO
	K2007073-002		GRO, VOCs
CC-TB-20200814	K2007073-001	Water	VOCs
	K2007073-003		GRO

## **Data Validation and Qualifications**

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control guidelines outlined in the analytical procedures. Laboratory results were reviewed using the laboratory control limits and the following guidelines:

- USEPA 1986 (SW-846, Third Edition), Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.
- USEPA National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2017b)
- USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA 2017a)

Unless noted in this report, laboratory results for the samples listed in Table 1 were within quality control criteria.

## **Field Documentation**

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by ALS at the time of sample receipt. Samples were received in good condition and within the recommended temperature range.

## **Holding Times and Sample Preservation and Analytical Methods**

Samples were appropriately preserved and analyzed within the recommended holding times, with the exception of CC-TB-20200814, which was analyzed for tetrachloroethene and trichloroethene three days outside the recommended fourteen-day hold time. Due to label discrepancies and laboratory error, results for these analytes were rejected, as discussed in the sections below.

See Table 3 for a summary of qualified results.

## **Laboratory Method Blanks**

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

## **Field Quality Control**

### **Trip Blanks**

Two trip blank samples were collected and analyzed in association with these samples sets. The trip blank associated with the soil samples was free of target analytes. The trip blank associated with the water samples, CC-TB-20200814, had high detections of tetrachloroethene and trichloroethene. Due to sample label discrepancies and laboratory error, it could not be determined if sample CC-TB-20200814 was analyzed for VOCs and GRO from trip blank vials or a sample vials; therefore VOC and GRO results were rejected.



See Table 3 for a summary of qualified results.

## Field Duplicates

One soil field duplicate sample was collected in association with this sample set. Detected results are summarized in Table 2.

**Table 2**  
**Field Duplicate Summary**

Analyte	CC-MW-01-24-072420	CC-MW-01-124-072420	RPD	Difference	Control Limit
Tetrachloroethene (PCE)	3.1 mg/kg	4.2 mg/kg	30%	--	--
Total Solids	82.1%	82.5%	0%	--	--
Trichloroethene (TCE)	6.4U ug/kg	6.3 ug/kg	--	0.100ug/kg	12.8 ug/kg

Notes:

mg/kg: milligrams per kilogram

µg/kg: micrograms per kilogram

Results were evaluated using a control limit of less than or equal to 30% relative percent difference (RPD) value. Parent and duplicate sample results that were less than five times the reporting limit (RL) may have exaggerated RPDs, so these results were assessed by the difference between them using the two times ± the parent RL as the control limit. All duplicate RPD and/or difference values were within control limits

## Surrogate Recoveries

Surrogate recoveries were within the laboratory control limits listed.

## Laboratory Control Samples and Laboratory Control Duplicate Samples

Laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs) were analyzed at the required frequencies. All LCS/LCSD recoveries and/or RPD values were within laboratory control limits.

## Matrix Spike and Matrix Spike Duplicate Samples

Matrix spike (MS) and matrix spike duplicate (MSD) samples were not required to be analyzed for these

## Laboratory Duplicates

Laboratory duplicates were analyzed at the required frequency and RPDs were within laboratory control limits.

## Reporting Limits

RLs were acceptable as reported. Values were reported as undiluted, or when diluted, the RL reflects the dilution factor.

## Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the surrogate, LCS/LCSD, and MS/MSD recovery values. Precision was acceptable as demonstrated by the LCS/LCSD, MS/MSD, laboratory, and field duplicate RPD values or difference values. Most data are acceptable as reported. Five VOC results and one GRO result for sample CC-TB-200814 (trip blank) were rejected. Data are not expected to be impacted since method QC were within laboratory control limits.

See Table 3 for a summary of qualified results.

## Data Qualifier Definitions

R Data is rejected and unusable.

**Table 3**  
**Data Qualification Summary**

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
CC-TB-20200814	VOCs	1,2-Dichloroethene, cis-	40 ug/L	R	Sample label discrepancies
		1,2-Dichloroethene, trans-	0.5U ug/L		
		Vinyl chloride	0.5U ug/L		
		Tetrachloroethene (PCE)	2100 ug/L		
		Trichloroethene (TCE)	110 ug/L		
	GRO	Gasoline range hydrocarbons	250U ug/L	R	Sample label discrepancies

## References

- USEPA. 1986. Test methods for Evaluating Solid Waste: Physical/Chemical Methods. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA-530/SW-846.
- USEPA. 2016a. National Functional Guidelines for Superfund Organic Methods Data Review. Office of Superfund Remediation and Technology Innovation. United States Environmental Protection Agency. EPA-540-R-2017-002. January 2017.
- USEPA 2016b. National Functional Guidelines for Inorganic Superfund Data Review. Office of Superfund Remediation and Technology Innovation. United States Environmental Protection Agency. EPA-540-R-2017-001. January 2017.

# Data Validation Report – EPA Stage 2A

January 27, 2021

Project: Carson Cleaners Vapors Intrusion Evaluation

Project Number: 202280-01.01

This report summarizes the review of analytical results for one water sample, one duplicate, and one trip blank collected on November 18, 2020. The samples were collected by Anchor QEA, LLC, and submitted to ALS Environmental (ALS) in Kelso, Washington. The samples were analyzed for the following parameters:

- Volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (USEPA) method 8260C
- Gasoline range organics (GRO) by Northwest Total Petroleum Hydrocarbons – Gasoline Range Extended (NWTPHGx)
- Diesel range organics (DRO) by Northwest Total Petroleum Hydrocarbons – Diesel Range Extended (NWTPHDx)

ALS sample data group (SDG) K2010780 was reviewed in this report. Sample IDs, matrix, and analyses are presented in Table 1.

**Table 1**  
**Sample IDs, Matrix, and Analyses**

Sample ID	Lab Sample ID	Matrix	Analyses
CC-MW-01-20201118	K2010780-001	Water	DRO, GRO, VOCs
CC-MW-1001-20201118	K2010780-002	Water	DRO, GRO, VOCs
CC-TB-20201118	K2010780-003	Water	GRO, VOCs

## Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control guidelines outlined in the analytical procedures. Laboratory results were reviewed using the laboratory control limits and the USEPA National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2017).

Unless noted in this report, laboratory results for the samples listed in Table 1 were within quality control criteria.

## Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody form was signed by ALS at the time of sample receipt. Samples were received in good condition and within the recommended temperature range.

## Holding Times and Sample Preservation

Samples were appropriately preserved and analyzed within the recommended holding times.

## Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

## Field Quality Control

### Field Duplicate

One field duplicate was collected with this sample set. Results were evaluated using a control limit of less than or equal to 50% relative percent difference (RPD). All RPD values were within control limits.

Analyte	CC-MW-01-20201118	CC-MW-1001-20201118	RPD
Gasoline range hydrocarbons	2020 µg/L	2050 µg/L	1.5%
1,2-Dichloroethene, cis-	63 µg/L	66 µg/L	4.7%
Trichloroethene (TCE)	140 µg/L	140 µg/L	0%
Tetrachloroethene (PCE)	2700 µg/L	2600 µg/L	3.8%

### Trip Blanks

One trip blank sample was collected and analyzed in association with this sample set and was free of target analytes.

## Surrogate Recoveries

Surrogate recoveries were within the laboratory control limits listed.

## **Laboratory Control Samples and Laboratory Control Duplicate Samples**

Laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs) were analyzed at the required frequencies. All LCS/LCSD recoveries and/or RPD values were within laboratory control limits.

## **Matrix Spike and Matrix Spike Duplicate Samples**

LCS and LCSDs were analyzed in place of matrix spike (MS) and matrix spike duplicate (MSD) samples for the VOC and GRO analyses. A LCS was reported in association with the DRO analyses. No MS/MSDs were analyzed with this sample set.

## **Laboratory Duplicates**

Laboratory duplicates were not analyzed with this sample set.

## **Method Reporting Limits**

Reporting limits were acceptable as reported. Values were reported as undiluted, or when reported as diluted, the reporting limit accurately reflects the dilution factor.

## **Overall Assessment**

As was determined by this evaluation, the laboratory followed the specified analytical methods, and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the LCS/LCSD recovery values. Precision was acceptable as demonstrated by the field duplicate and LCSD RPD values. All data are acceptable as reported.

## **Reference**

USEPA. 2017. National Functional Guidelines for Superfund Organic Methods Data Review. Office of Superfund Remediation and Technology Innovation. United States Environmental Protection Agency. EPA-540-R-2017-001. January 201