

November 6, 2018

Craig Rankine, Site Manager
Washington State Department of Ecology
SWRO – Vancouver Field Office
12121 NE 99th Street, Suite 2100
Vancouver, Washington 98682-2346

**Subject: Summary of Additional Field Activities at the NuStar Facility –
March through June 2018
NuStar Terminals Services, Inc. Vancouver Main Terminal
Vancouver, Washington
0060-001-002**

Dear Mr. Rankine:

Cascadia Associates, LLC. (Cascadia) has prepared this letter on behalf of NuStar Terminals Services, Inc. (NuStar) to summarize additional field activities that were completed at the NuStar Vancouver Terminal (the Facility) and surrounding area between March and June 2018. The Facility is located at the Port of Vancouver, in Vancouver, Washington, as shown on Figure 1. A site plan depicting the Facility infrastructure and well network is shown on Figure 2. In November 2017, evidence of copper contamination was identified in condensate water from the soil vapor extraction (SVE) remedial system at the Facility. The discovery of the copper led to certain field activities, referred to as “additional” field activities herein, to better assess the source and extent of the copper. Although NuStar currently does not handle copper-containing materials, it agreed to assist the Washington Department of Ecology (Ecology) in conducting some of these additional field activities. Field activities were conducted by representatives from Ecology and NuStar (Apex Companies, LLC. [Apex] and Cascadia). Ecology requested NuStar prepare this report presenting the scope, methods, and results of the additional fieldwork completed from March through June 2018.

BACKGROUND

Interim action is ongoing at the NuStar Facility to address chlorinated solvents in the vadose-zone soil and groundwater. An SVE system is currently operating at the Facility; the extent of the SVE system is shown on Figure 3. During the November 2017 monthly SVE monitoring event, approximately 16 gallons of water were observed in the condensate knock-out drum, and the water was a bright blue rather than colorless, as is typical when water is present. The knockout drum is designed to separate liquid from vapors that have been removed from the soil vapor extraction wells, by allowing the liquid to precipitate into a drum before the vapors are drawn into the vacuum system (blower). A sample of the “condensate” was collected and shipped to ALS laboratory of Kelso, Washington, for analysis of constituents that were known to be historically or currently handled at or near the Facility, including: chlorinated VOCs, fertilizer compounds (sulfate, nitrate, nitrite, and phosphorous), and metals (copper and iron). NuStar historically handled chlorinated VOCs and

fertilizers and is currently handling fertilizers including urea and mono-ammonium phosphate. Kinder Morgan, the operator of the property to the west of NuStar, handles metal ore, including copper and iron ores. The analytical results from the knockout tank sample are provided in Table 1; the lab report is included in Attachment A. The results indicated that the knockout tank sample had elevated concentrations of copper, iron, and fertilizer constituents, although the chlorinated VOC concentrations were at or below method reporting limits.

In an attempt to investigate the possible source of metals in the SVE knockout drum water, copper analysis was ordered on groundwater samples collected during the fourth quarter 2017 groundwater monitoring event for the NuStar facility. While the groundwater samples had already been collected and analyzed for chlorinated hydrocarbons, there was surplus sample volume available at the laboratory for analysis of copper. On January 11, 2018, Apex requested that Pace Analytical (of Davis, California) analyze the groundwater samples for copper by EPA Method 6010. There was not sufficient sample remaining to analyze copper in wells MW-14 and MW-26, so groundwater samples were collected for copper from those wells on January 22, 2018. The copper analytical results from samples collected during the fourth quarter 2017 groundwater monitoring event are summarized in Table 2 and on Figure 2. A copy of the lab report is included in Attachment A.

SCOPE OF FIELD WORK

After confirmation of the presence of copper in the SVE knockout drum water and the groundwater samples, the following field activities were conducted by Ecology and/or representatives of NuStar:

- An assessment of the SVE piping and well vaults to identify the source of the blue water in the knockout drum;
- A visual assessment of NuStar monitoring well top-of-casing and monuments and sampling of monument and well bottom sediment by Ecology;
- Well monument replacement and upgrades at select Facility wells, as coordinated by Apex staff;
- Redevelopment of three NuStar monitoring wells conducted by a drilling subcontractor to Apex and overseen by Apex staff;
- Pre-development and post-development groundwater sampling of the three wells conducted by Apex staff;
- Sediment sampling from both the ground surface and a building gutter at the Facility conducted by Cascadia staff; and
- SVE knockout drum blue water source evaluation.

Results of each of these field activities are presented below.

SVE KNOCKOUT DRUM BLUE WATER SOURCE EVALUATION

As discussed above, blue water was first observed in the SVE system knockout drum during the November 2017 SVE monitoring event. Blue water continued to be observed in the knockout drum during monthly SVE monitoring events between December 2017 through April 2018. The blue water was removed from the knockout drum during each monthly event and was disposed of as

investigation derived waste (IDW). No water was observed in the knockout tank during the monitoring event in May 2018, or thereafter. SVE field monitoring forms from November 2017 through May 2018 are provided in Attachment B.

A sample of water collected from the knockout tank in November 2017 confirmed the presence of copper and fertilizer constituents in the water. Historically, larger volumes of clear water were observed in the knockout drum during the first few months of the local rainy season (typically November through January or February), although during recent years there was no significant accumulation of water in the knockout drum observed during those early rainy season months. Blue water had never been observed in the knockout drum before November 2017. After the blue water was discovered, the SVE system blower, knockout drum, piping manifold, and immediate area were inspected for obvious sources of surface water infiltration; however, nothing was observed. SVE system operating parameters remained consistent with historical results, suggesting that the piping remained intact and that there were no significant leaks in the system. Several well vaults were opened and inspected and there was no evidence of piping leaks or water pooling near the system components. It should be noted that the bolts on several of the well vaults were heavily corroded and fused shut, so not all vaults were opened during the initial inspection.

During a site visit in April 2018, a gurgling sound was noted outside of SVE well vault VE-1-2, located between NuStar warehouses 2625 and 2655 (Figure 3). The bolts were fused shut and could not be opened for inspection; however, an inspection was scheduled and conducted a few weeks later so that all well vaults could be accessed, including VE-1-2. When the vault to well VE-1-2 was opened, horizontal piping inside the vault was observed to have separated at a coupling. Photos of the well vault and separated piping are provided in Attachment C. The SVE well was immediately closed and remains inoperational. While there was no water in the monument, soil in the monument was moist, indicating the recent presence of water in the monument. There is a small, dime-sized hole at the surface of the vault used to access the vault with a prying tool. It is suspected that surface water entered through the pryhole in the vault and accumulated inside the vault during the period of heavy rainfall. Once water in the vault accumulated to the depth of the horizontal piping (approximately 5 inches above the base of the vault), water was drawn via vacuum into the system piping and ultimately into the knockout tank. A contractor has been hired to repair the well and return it to operation in September 2018.

WELLHEAD ASSESSMENT

NuStar currently stores urea and mono-ammonium phosphate at the Vancouver terminal; they currently do not handle any products containing copper. To evaluate potential sources and pathways for copper in groundwater before scheduled well monument upgrades and replacement work was done by NuStar, Ecology requested a monitoring well monument assessment be conducted on the NuStar monitoring well network. On March 27, 2018, a representative from Ecology assessed 19 monitoring wells owned by NuStar, field representatives from Apex (on behalf of NuStar) and Parametrix (on behalf of the Port of Vancouver, the property owner) were also onsite for the assessment. During the wellhead assessment, Ecology took photos of monitoring wells and recorded

information about the presence or absence of sediment in the well monuments above the well surface seal and around the upper portion of the well casing. Copies of Ecology's field notes and photos are provided in Attachment D. Of the 19 wells assessed, 12 well monuments contained sufficient sediment volume for sample collection and analysis, including monitoring wells EW-1, EX-1, MW-1, MW-6, MW-7, MW-8, MW-10, MW-12, MW-13, MW-14, MW-17, and MW-23i. Ecology collected sediment samples from each of these well monuments, as listed on Table 3. Monitoring wells MW-2, MW-3, MW-9, MW-16, MW-19, MW-25i and MW-26 did not contain enough sediment in the monument for sample collection.

A weighted tape was used to probe the bottom of 19 wells to determine if sediment had accumulated at the bottom. Sediment in wells S-1 and S-2 was assessed and sampled by Apex prior to Ecology's visit as summarized in the following paragraph. The only well with a notable amount of bottom sediment during the March 27, 2018 assessment conducted by Ecology was well MW-13. The sediment was present as murky or grainy dark water rather than a distinctly separate solid material. Apex attempted to pump out the murky water and filter out the sediment; however, not enough solid material was filterable to collect a sample for analysis. Ultimately, a murky liquid sample was collected by Ecology from peristaltic pump tubing from the bottom of well MW-13 directly into a laboratory-provided sample container.

During a field event conducted a week earlier in conjunction with well monument repair work, Apex collected sediment from the monuments of wells S-1 and S-2 (on March 22, 2018) and sediment-laden water samples from the bottom of wells S-1 and S-2 (on March 26, 2018), using a similar methodology as used by Ecology at well MW-13.

At the request of Ecology, well monument and sediment-laden well bottom samples that were collected by Ecology on March 27, 2018, and by Apex on March 22 and 26, 2018, were combined under one chain-of-custody and submitted to ALS labs of Kelso, Washington, for analysis of the metals aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, mercury, molybdenum, selenium, silver, and zinc by Method 6020A and mercury by Method 7471B. Analytical results are provided on Table 3 and shown on Figure 4. The analytical laboratory centrifuged the well bottom samples from wells MW-13, S-1, and S-2 to concentrate the solid material prior to analysis. After centrifuging, the samples still contained a significant volume of groundwater; therefore, percent solids information is reported on the sediment table and figure for supporting information. Copper concentrations in the well bottom "sediment" samples ranged from 612 milligrams per kilogram (mg/kg) in well S-2 to 20,300 mg/kg in well MW-13. Copper concentrations in sediment samples collected from the well monuments ranged from 2,060 mg/kg in well MW-1 to 23,800 mg/kg in well S-1. Analytical data reports are contained in Attachment A.

WELL MONUMENT UPGRADES AND REPLACEMENTS

In December 2017, as a part of the quarterly groundwater monitoring program for volatile organic compounds (VOCs), NuStar identified wells that would require either well monument replacement or well monument repair. The wells requiring monument replacement were located in heavy truck traffic areas that were more prone to wear and tear than other site monitoring wells. While the PVC

wells themselves were sufficiently sealed, some well monuments were aged and degraded and provided the potential for trip hazards and other safety concerns. The one exception was well S-1. The well cap for S-1 was found cracked in January 2018, although this well cap was not noted to be cracked during the November 2017 groundwater monitoring event. During the week of March 26, 2018, monuments for the wells S-1, S-2, EX-1, MW-1, MW-19, MW-12, MW-13, MW-14, MW-19i, and MW-22i were replaced by Cascade Drilling, of Clackamas, Oregon, with oversight from Apex. It should be noted that the well monument replacement and repair work had initially been scheduled approximately six weeks earlier (mid-February 2018), in anticipation of a large shipment of fertilizer at the terminal during the last two weeks of February. The offloading would involve nearly constant heavy truck traffic at the facility and NuStar hoped to replace and/or upgrade the well monuments identified above prior to the offloading event. During the preparatory activities for the monument replacements (private and public utility locating), Ecology and the Port of Vancouver requested that the well monument replacement/repairs be postponed in the event samples needed to be collected from the wells or monuments to support the copper investigation. To avoid unnecessary damage to NuStar facility monitoring wells during the fertilizer offloading event, steel plates were rented and placed over the well monuments in high traffic areas during the two-week fertilizer shipment period and for an additional four weeks until the monument replacement work was approved by Ecology for rescheduling.

Monument replacement activities included digging out the existing well monument and surrounding concrete pad and replacing the well with a new Sherwood-style monument and concrete pad. The Sherwood-style monument is designed so that the bolt holes are tapped into a solid metal ring, rather than into prongs, so that the monument can be rotated and retapped multiple times, ultimately prolonging the integrity and lifespan of the well monument. Concrete and well monument debris was disposed of as municipal waste. Any soil removed was disposed of as IDW.

On April 10, 2018, minor upgrades were made to several well monument lids, including re-tapping bolt holes, adding narrower gauge bolt clips to utilize existing bolt holes, replacing well gaskets, and pressure washing bolt holes.

WELL REDEVELOPMENT AND ASSOCIATED GROUNDWATER SAMPLING

Because sediment was identified at the bottom of wells S-1, S-2, and MW-13 during the wellhead assessment event, Ecology requested that the wells be redeveloped to remove sediment. Wells were developed on March 26, 2018 (S-1 and S-2) and on April 10, 2018 (MW-13) by Cascade Drilling with oversight by an Apex field geologist. Development activities included first removing the bottom sediment with peristaltic tubing and a bailer. Once the sediment laden water was removed from the well, the well was surged using a surge block, to displace fine material from the well pack and/or adjacent formation while simultaneously removing water from the well with a downhole pump. Wells S-1 and S-2 were surged and pumped until the water turned from cloudy to clear, removing approximately three casing volumes from each well (i.e., approximately 25 gallons for well S-1 and 15 gallons for well S-2). At well MW-13, ten well volumes of water were removed equating to approximately 87 gallons of water. The groundwater clarity improved from cloudy at the initiation of

development of well MW-13 to slightly cloudy at the end of development. The water never became clear, but, parameters such as pH, temperature, dissolved oxygen (DO) and oxidation-reduction potential (ORP) stabilized over the course of development, indicating that water in the well was representative of the surrounding formation and fines from the well pack and well had been removed. Development water was stored in 55-gallon drums and disposed of as investigation-derived waste. Well development notes are included in Attachment E.

As previously discussed, groundwater samples from the fourth quarter 2017 monitoring event were analyzed for copper and are considered “pre-development” samples. In addition, wells S-1 and S-2 were sampled for copper during the first quarterly 2018 groundwater monitoring event, on March 20, 2018, and are also considered pre-development samples. Groundwater samples were then collected after the development of the wells: post-development samples from wells S-1 and S-2 were collected on April 2, 2018 and from well MW-13 on April 10, 2018. Wells S-1 and S-2 were sampled seven days after well development and well MW-13 was sampled immediately a couple hours after well development.

Prior to sampling, monitoring wells were purged using low-flow equipment (bladder pump) and dedicated tubing until field parameters (pH, conductivity, temperature, ORP, and DO) stabilized. Low flow sampling is a technique for collecting samples that does not require the removal of large volumes of water and therefore does not overly agitate the water, suspend particles, or potentially aspirate VOCs. After purging, groundwater samples were pumped directly into laboratory-supplied containers. The samples were labeled, placed in a cooler with ice, and delivered under chain-of-custody to the laboratory for analysis. Both the pre-development and post-development groundwater samples were analyzed for total copper by Method 6010C; it should be noted that the samples were not analyzed for dissolved copper and no field or laboratory filtering was conducted on the samples. Monitoring well purging and sampling data were recorded on the field sampling data sheets provided in Attachment F.

The pre- and post- development analytical results are presented on Figure 5 and Table 2. The sample results for total copper in Intermediate Zone well S-1 decreased from a concentration of 20,900 micrograms per liter ($\mu\text{g/L}$) during fourth quarter 2017 to 370 $\mu\text{g/L}$ and 829 $\mu\text{g/L}$, respectively during the pre- and post-development monitoring events on March 20 and April 20, 2018, respectively. The post-development total copper results decreased in wells S-1 and S-2, compared to the fourth quarter 2017 result, but increased in well MW-13. It should be noted that the analytical results for the post-development sample from well MW-13 were flagged with a laboratory qualifier indicating that the associated matrix spike results from the quality control batch were out of acceptable control limits and that the sample concentration was too high to accurately evaluate spike recoveries. Analytical data reports from the analyses are contained in Attachment A. Field sampling sheets are provided in Attachment E.

SURFACE SEDIMENT AND GUTTER SAMPLING

On March 29, 2018, Apex collected a ground surface sample for analysis of copper. The sample was collected on the pavement surface where a layer of mud had accumulated adjacent to the seawall, at

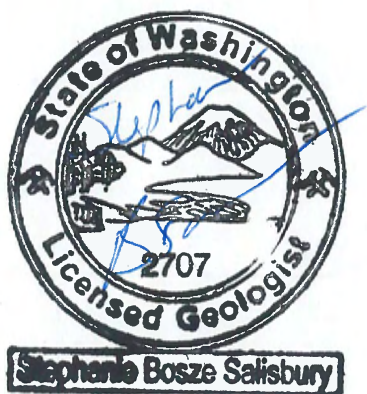
the location shown on Figure 6. NuStar terminal operations staff had collected a similar surface sediment sample from near the seawall in 2010 and copper concentrations in the 2010 sample were approximately 35,000 mg/kg. The location of the 2010 surface sediment sample is shown on Figure 6 and the associated lab report is provided in Attachment A. The 2018 sample result for copper is 10,400 mg/kg. The analytical data report from the 2018 pavement sediment sample is contained in Attachment A, and photos of the surface sediment locations are provided in Attachment G.

In addition, NuStar staff noticed red-brown staining on the roof of the northwestern corner of warehouse building #2655 (Figure 6). The staining was located above a portion of the building gutter that looked to be heavily corroded and filled with 2 to 3 inches of sediment. The stained roof and corroded gutter are located directly beneath the Kinder Morgan conveyor system, where copper ore and bentonite material are transported from storage buildings to vessels at the Port of Vancouver Berth 7, located on the Columbia River. Cascadia field staff collected a sample of the gutter sediment from two locations as shown on Figure 6. Samples were submitted to Apex Laboratories (Apex Labs) of Tigard, Oregon, for analysis of arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, selenium, silver, zinc, aluminum, and iron by EPA Method 6020A. Analytical results for the metals are provided in Table 4 and copper results are presented on Figure 6. Copper concentrations in the two gutter samples were 174,000 mg/kg and 88,200 mg/kg, respectively. The analytical report for the gutter sediment samples are included in Attachment A and photos of the gutter sediments and surrounding area and are provided in Attachment G.

If you have any questions regarding this letter please do not hesitate to call me at (503) 906-6577 or Mr. Joe Aldridge with NuStar at (210) 918-2723.

Sincerely,

Cascadia Associates, LLC



Stephanie Bosze Salisbury, L.G.
Senior Associate Geologist

ATTACHMENTS

Table 1 – SVE Knockout Drum Sample - Analytical Results

Table 2 – Groundwater Analytical Results for Metals: 2017-2018

Table 3 – Analytical Summary Table - Well Monument and Bottom Sediment

Table 4 – Analytical Summary Table - Ground Surface and Gutter Sediment

Figure 1 – Facility Location Map

Figure 2 – Copper Concentrations in Groundwater – November 2017

Figure 3 – SVE Layout

Figure 4 – Copper Concentrations in Silt at Well Monuments and Well Bottoms

Figure 5 – Copper Concentrations in Groundwater Pre- and Post- Well Development

Figure 6 – Copper in Ground Surface Sediments and Gutter Sediments

Attachment A – Laboratory Reports

Attachment B – SVE Monitoring Notes – November 2017 through May 2018

Attachment C – SVE Vault and Piping Photos

Attachment D – Wellhead Assessment - Ecology Field Notes and Photos

Attachment E – Well Development Field Notes

Attachment F – Groundwater Purging and Sampling Sheets

Attachment G – Photos of Sediment Sample Locations

cc: Mr. Joe Aldridge, NuStar Energy, L.P. (electronic deliverable)
Ms. Patty Boyden, Port of Vancouver (electronic deliverable)
Mr. Richard Roché, Parametrix (electronic deliverable)
Mr. Richard Sherman - (electronic deliverable)
Mr. Scott Heidegger - (electronic deliverable)

TABLES

Table 1
SVE Knockout Drum Sample - Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

	Sample ID:	S-SVE-KOD
	Sample Date:	11/10/2017
Analyte	Concentrations in mg/L (ppm)	
Total Metals		
Iron	0.391	
Copper	398	
Attenuation Chemistry		
Nitrate + Nitrite as Nitrogen	6.37	
Nitrite as Nitrogen	3.86	
Sulfate	8.53	
Total Phosphorus	5.54	

Notes:

SVE = Soil vapor extraction.

mg/L = milligrams per liter (or parts per million).

Bold = represents detected concentration of listed analyte.

Table 2
Groundwater Analytical Results for Metals: 2017-2018
NuStar Vancouver Facility
Vancouver, Washington

Well number:	MW-1	MW-2	MW-3	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-12	MW-13		MW-14	MW-15	MW-16	MW-17	
Sample date:	11/9/2017	11/9/2017	11/8/2017	11/7/2017	11/7/2017	11/7/2017	11/6/2017	11/7/2017	11/06/17	11/9/2017	11/7/2017	4/10/2018	1/22/2018	11/6/2017	11/6/2017	11/8/2017	
Sample event:	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM/Pre-Development	Post Development	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM
Analyte																	
Aluminum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	535	31.8	14.8	<10.0	25.7	241	<10.0	13.7	327	1,050	4,530	13,400 J3	1,510	<10.0	<10.0	267	
Iron	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Please refer to notes on last page of table.

Table 2
Groundwater Analytical Results for Metals: 2017-2018
NuStar Vancouver Facility
Vancouver, Washington

Well number:	MW-19	MW-18i	MW-19i	MW-20i	MW-21i-40	MW-21i-105	MW-22i	MW-23i	MW-24i	MW-25i	MW-26	MW-32i	MW-32s	MGMS1-43	MGMS1-60	MGMS2-40
Sample date:	11/9/2017	11/7/2017	11/8/2017	11/7/2017	11/8/2017	11/8/2017	11/7/2017	11/8/2017	11/9/2017	11/8/2017	1/22/2018	11/10/2017	11/10/2017	11/7/2017	11/7/2017	11/9/2017
Sample event	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM
Analyte																
Aluminum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	89.0	<10.0	15.6	<10.0	<10.0	16.8	27.2	<10.0	<10.0	<10.0	<10.0	<10.0	14.8	<10.0	<10.0	<10.0
Iron	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Please refer to notes on last page of table.

Table 2
Groundwater Analytical Results for Metals: 2017-2018
NuStar Vancouver Facility
Vancouver, Washington

Well number:	MGMS2-60	MGMS3-40	MGMS3-60	S-1			S-2			MP-1	EW-1
Sample date:	11/9/2017	11/10/2017	11/10/2017	11/8/2017	3/20/2018	4/2/2018	11/8/2017	3/20/2018	4/2/2018	11/9/2017	11/9/2017
Sample event	4Q17 GWM	4Q17 GWM	4Q17 GWM	4Q17 GWM/Pre-Development	1Q18 GWM/Pre-Development	Post-Development	4Q17 GWM/Pre-Development	1Q18 GWM/Pre-Development	Post-Development	4Q17 GWM	4Q17 GWM
Analyte											
Aluminum	--	--	--	--	--	18,000	--	--	18,100	--	--
Arsenic	--	--	--	--	--	7.03	--	--	23.9	--	--
Barium	--	--	--	--	--	216	--	--	2,110	--	--
Cadmium	--	--	--	--	--	1.18	--	--	0.926	--	--
Chromium	--	--	--	--	--	15.8	--	--	20.6	--	--
Copper	<10.0	<10.0	<10.0	20,900	370	829	1,620	2,480	1,050	13.7	12.0
Iron	--	--	--	--	--	33,500	--	--	134,000	--	--
Lead	--	--	--	--	--	39	--	--	21	--	--
Mercury	--	--	--	--	--	0.04 J	--	--	0.06 J	--	--
Molybdenum	--	--	--	--	--	2.82	--	--	1.92	--	--
Selenium	--	--	--	--	--	0.5 J	--	--	1.0 J	--	--
Silver	--	--	--	--	--	0.859	--	--	0.444	--	--
Zinc	--	--	--	--	--	278	--	--	235	--	--

Notes:
Concentrations in micrograms per liter (µg/L)
Bold values represents detected concentration of listed analyte.
< = Not detected at or above the specified laboratory method reporting limit (MRL).
4Q17 GWM = Fourth quarter 2017 groundwater monitoring event.
1Q18 = first quarter 2018 groundwater monitoring event.
J= Value is estimated.
J3 = Sample result is too high to accurately evaluate (matrix) spike recovery. The associated quality control batch was outside the quality control range for precision.

Table 3
Analytical Summary Table — Well Monument and Bottom Sediment
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	EW-1	EX-1	MW-01	MW-06	MW-07	MW-08	MW-10	MW-12	MW-13	MW-13	MW-14	MW-17	MW-23i	S-1	S-1	S-2	S-2
Sample Date:	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/27/2018	3/26/2018	3/22/2018	3/26/2018	3/22/2018
Sample Type:	Sediment from Well Monument	Sediment from Well Monument	Sediment from Well Monument	Sediment from Well Monument	Sediment from Well Monument	Sediment from Well Monument	Sediment from Well Monument	Sediment from Well Monument	Sediment from Well Monument	Sediment from Bottom of Well	Sediment from Well Monument	Sediment from Well Monument	Sediment from Well Monument	Sediment from Bottom of Well	Sediment from Well Monument	Sediment from Bottom of Well	Sediment from Well Monument
Analyte																	
Total Solids (Freeze Dry/ EPA Method 160.3 Mod)																	
Total Solids (as percent)	75.3	63.2	69.8	70.7	59.6	72.8	70.3	79.6	19.7	67.4	71.6	49.2	80.3	7.06	72.2	27.8	74.2
Total Metals (EPA Method 6020A/7471B)																	
	Concentration in mg/kg																
Aluminum	7,830	17,400	6,580	4,480	7,610	8,710	7,640	8,950	11,500	6,610	8,630	17,600	4,870	16,900	7,570	13,100	5,570
Arsenic	12.3	19.9	18.6	25.4	19.7	26.0	35.8	21.6	115	54.7	27.3	94.0	46.9	34.6	70.2	9.38	89.9
Barium	120	189	139	79.4	185	147	168	148	302	347	225	155	118	153	172	301	140
Cadmium	1.98	6.40	6.49	24.9	23.7	10.6	8.77	8.48	15.6	6.75	5.03	10.2	3.11	4.58	10.2	0.351	9.29
Chromium	65.6	138	81.3	470	84.7	207	102	53.1	77.7	95.8	66.7	52.6	88.8	46.4	105	17.9	111
Copper	2,790	3,730	2,060	2,200	3,560	6,870	11,000	2,790	20,300	8,800	5,360	13,600	6,080	5,120	23,800	612	24,500
Iron	47,200	45,200	44,400	246,000	38,900	126,000	117,000	67,600	64,200	87,800	42,700	42,200	144,000	41,700	119,000	122,000	91,900
Lead	45	88	64	63	89	121	134	114	508	128	101	318	102	138	223	18	253
Mercury	0.059	0.440	0.121	0.054	0.240	0.119	0.141	0.106	0.545	0.189	0.121	0.366	0.095	0.202	0.179	0.022	0.181
Molybdenum	28.0	48.0	28.5	37.6	131	67.8	128	28.0	279	105	74.3	270	80.4	140	220	6.82	284
Selenium	1.20	1.6	1.10	<0.88	1.8	2.93	5.53	1.4	12.9	5.22	3.2	10.3	4.3	4.40	10.0	<1.0	16.6
Silver	1.43	2.82	2.04	1.16	3.06	3.62	5.15	3.12	19.0	6.46	4.11	16.6	4.68	9.44	11.3	0.444	13.8
Zinc	627	2,020	792	7,580	889	3,360	2,340	2,000	2,870	1,400	1,060	1,800	737	767	2,850	126	1,980

Note:
mg/kg = milligrams per kilogram

Table 4
Analytical Summary Table — Ground Surface and Gutter Sediment
NuStar Vancouver Facility
Vancouver, Washington

Sample ID	SED-1	A-01	A-02
Sample Date:	3/29/2018	7/10/2018	7/10/2018
Sample Type:	Ground Surface - At Seawall	Sediment from A-Frame Gutter (East)	Sediment from A-Frame Gutter (West)
Analyte			
Total Solids (Freeze Dry/ EPA Method 160.3 Mod)			
Total Solids (as percent)	69.5	73.0	68.6
Total Metals (EPA Method 6020A/7471B)	Concentration in mg/kg		
Aluminum	--	2,240	6,550
Arsenic	--	623	281
Barium	--	<58.4	62.8
Cadmium	--	39.1	27.6
Chromium	--	<58.4	<61.4
Copper	10,400	174,000	88,200
Iron	--	302,000	182,000
Lead	--	1,740	882
Mercury	--	<4.67	<4.91
Molybdenum	--	3,540	1,310
Selenium	--	70.7	<61.4
Silver	--	80.6	41.9
Zinc	--	9,630	7,720

Notes:

mg/kg = milligrams per kilogram.

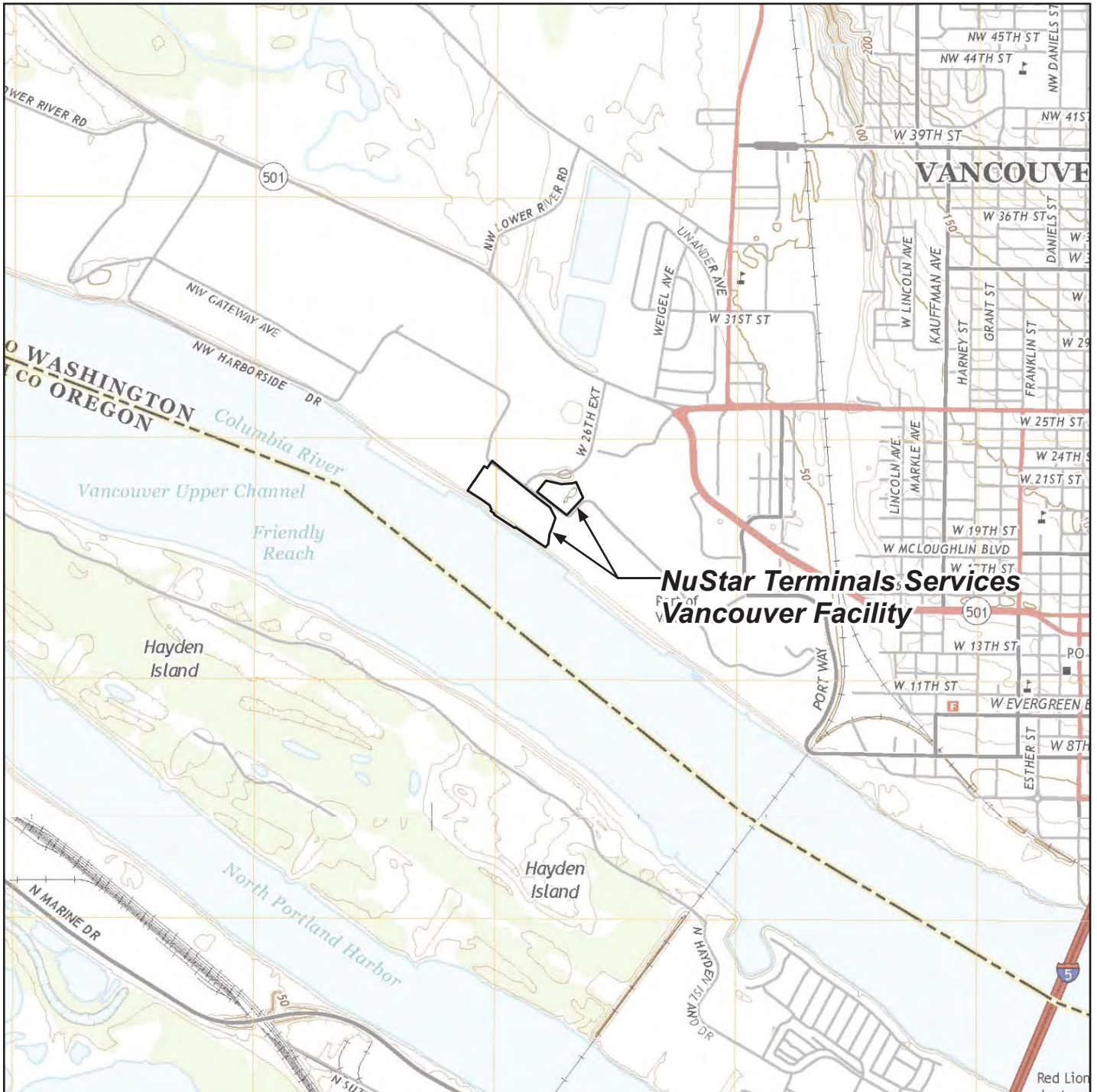
BOLD = detected above method reporting limit.

-- = sampled not analyzed for this constituent.

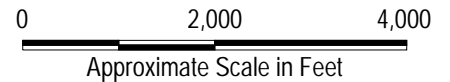
Sample SED-1 was collected by Apex on March 29, 2018 during the wellhead assessment event.

The sample was submitted to the laboratory at a later date with an incorrect sample date. The chain-of-custody and associated lab report states that the sample was collected on 3/27/2018.

FIGURES



Note: Base map prepared from USGS 7.5-minute quadrangles of Vancouver, WA and Portland, OR-WA, dated 2014 as provided by USGS.gov.



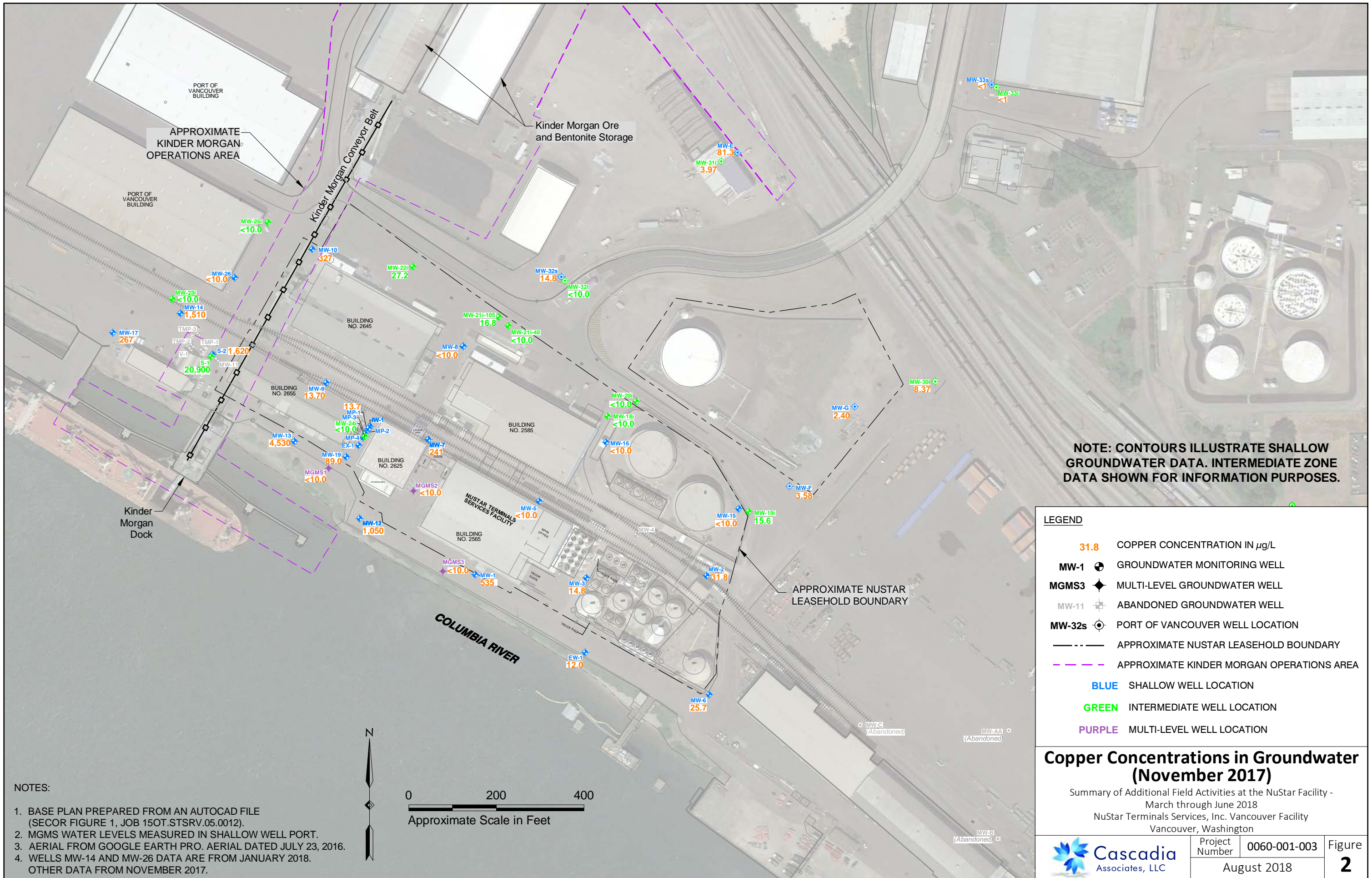
Facility Location Map

Summary of Additional Field Activities at the NuStar Facility-
 March through June 2018
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington



Project Number	0060-001-003
August 2018	

Figure
1



NOTE: CONTOURS ILLUSTRATE SHALLOW GROUNDWATER DATA. INTERMEDIATE ZONE DATA SHOWN FOR INFORMATION PURPOSES.

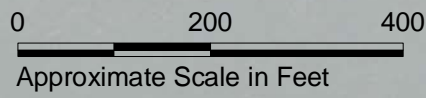
LEGEND

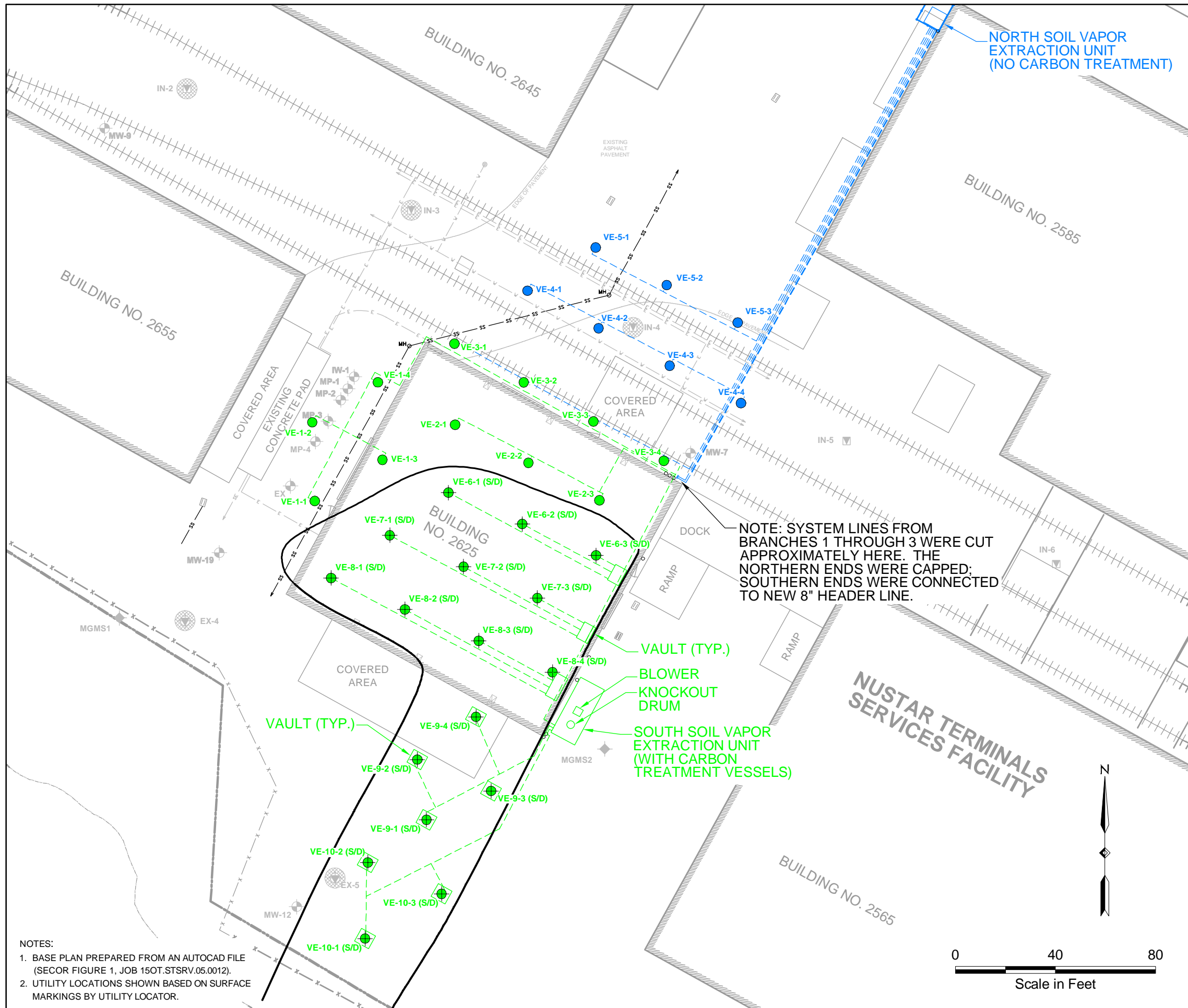
- 31.8 COPPER CONCENTRATION IN $\mu\text{g/L}$
- MW-1 GROUNDWATER MONITORING WELL
- MGMS3 MULTI-LEVEL GROUNDWATER WELL
- MW-11 ABANDONED GROUNDWATER WELL
- MW-32s PORT OF VANCOUVER WELL LOCATION
- APPROXIMATE NUSTAR LEASEHOLD BOUNDARY
- APPROXIMATE KINDER MORGAN OPERATIONS AREA
- BLUE SHALLOW WELL LOCATION
- GREEN INTERMEDIATE WELL LOCATION
- PURPLE MULTI-LEVEL WELL LOCATION

Copper Concentrations in Groundwater (November 2017)

Summary of Additional Field Activities at the NuStar Facility - March through June 2018
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

- NOTES:**
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
 2. MGMS WATER LEVELS MEASURED IN SHALLOW WELL PORT.
 3. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.
 4. WELLS MW-14 AND MW-26 DATA ARE FROM JANUARY 2018. OTHER DATA FROM NOVEMBER 2017.





LEGEND:

- VE-6-2 (S/D) 2011 WELL PAIR LOCATION (SHALLOW SCREENED FROM 5-15 FEET BGS) (DEEP SCREENED 15-25 FEET BGS)
- VE-1-2 2008 INTERIM ACTION VAPOR EXTRACTION WELL LOCATION
- VAPOR EXTRACTION WELL (2000-2005)
- EX-3 EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- IN-1 EARLY 2000s INTERIM ACTION GROUNDWATER INJECTION WELL AND VAPOR EXTRACTION WELL
- MW-1 GROUNDWATER MONITORING WELL
- MGMS3 MULTI-LEVEL GROUNDWATER WELL
- CATCH BASIN
- BUILDING
- FENCE
- ELECTRICAL
- SYSTEM ELECTRICAL
- STORM SEWER
- WATER
- MH MANHOLE
- RAILROAD TRACKS
- UNDERGROUND SOIL VAPOR EXTRACTION (SVE) PIPING
- BLUE** NORTH VAPOR EXTRACTION UNIT
- GREEN** SOUTH VAPOR EXTRACTION UNIT

NOTE: SYSTEM LINES FROM BRANCHES 1 THROUGH 3 WERE CUT APPROXIMATELY HERE. THE NORTHERN ENDS WERE CAPPED; SOUTHERN ENDS WERE CONNECTED TO NEW 8" HEADER LINE.

NOTES:
 1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.

N

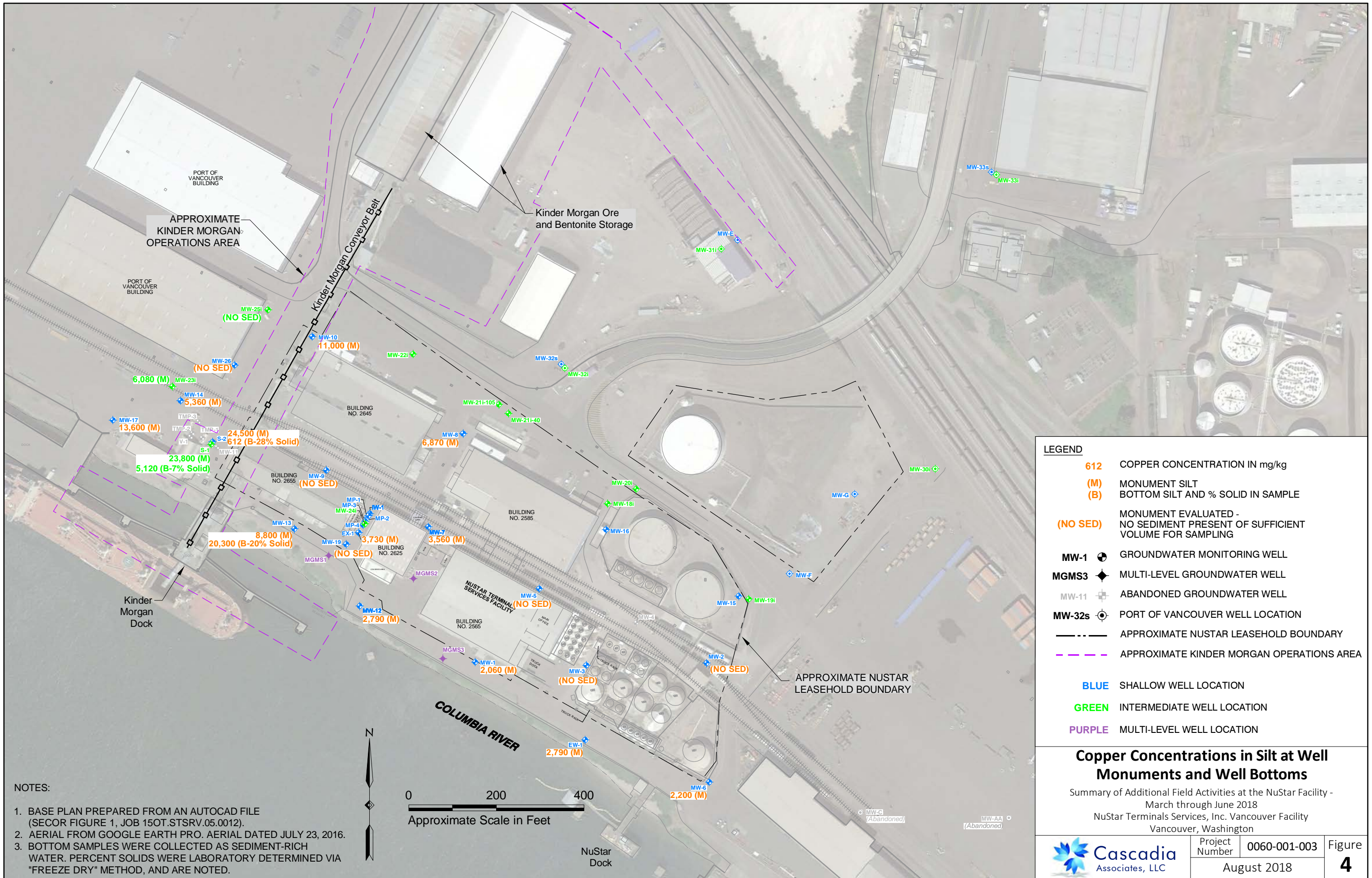
0 40 80

Scale in Feet

SVE Layout

Summary of Additional Field Activities at the NuStar Facility -
 March through June 2018
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

	Project Number	0060-001-003	Figure 3
	August 2018		



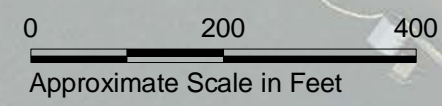
LEGEND

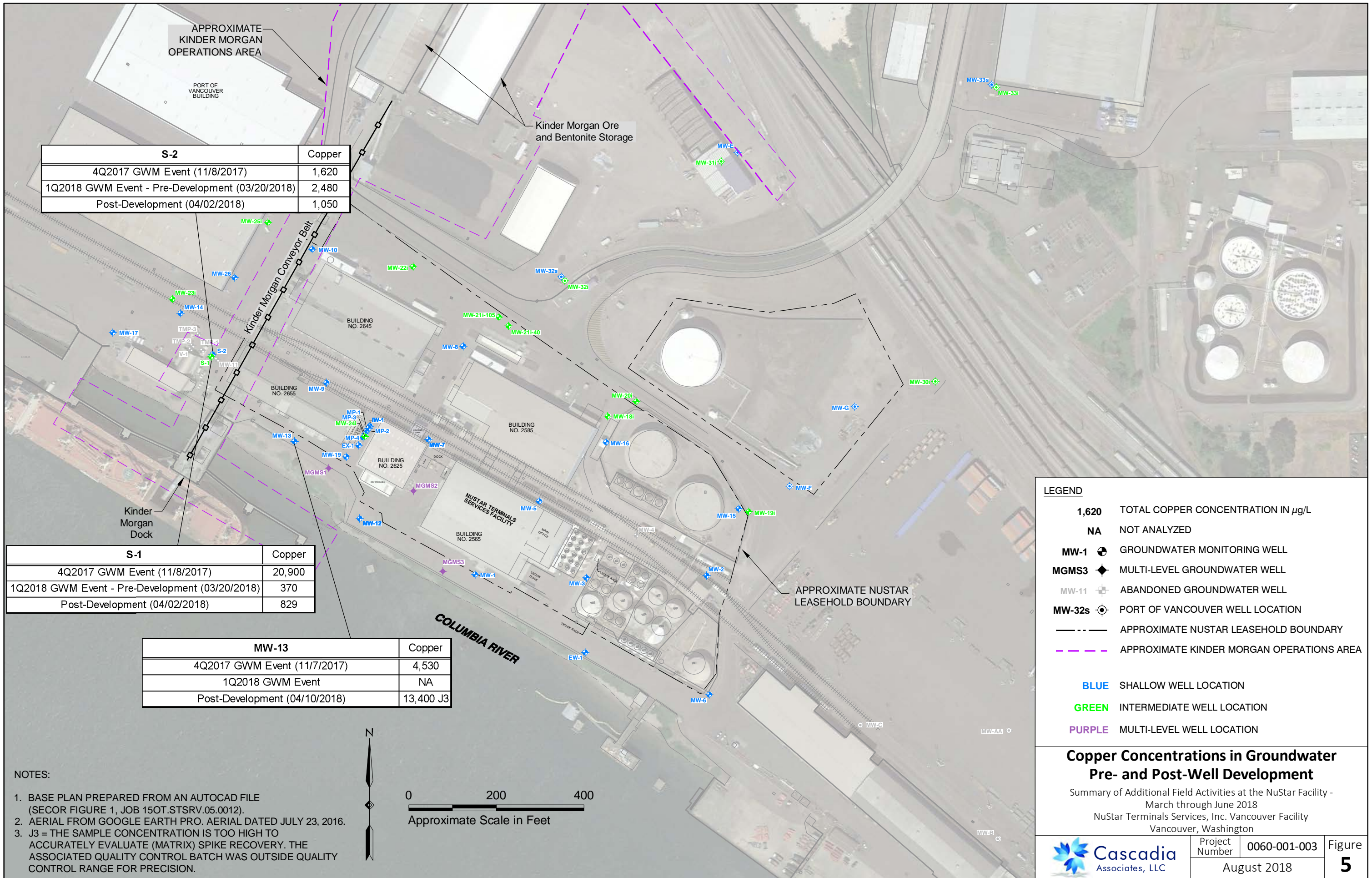
- 612** COPPER CONCENTRATION IN mg/kg
- (M)** MONUMENT SILT
- (B)** BOTTOM SILT AND % SOLID IN SAMPLE
- (NO SED)** MONUMENT EVALUATED - NO SEDIMENT PRESENT OF SUFFICIENT VOLUME FOR SAMPLING
- MW-1** GROUNDWATER MONITORING WELL
- MGMS3** MULTI-LEVEL GROUNDWATER WELL
- MW-11** ABANDONED GROUNDWATER WELL
- MW-32s** PORT OF VANCOUVER WELL LOCATION
- APPROXIMATE NUSTAR LEASEHOLD BOUNDARY
- APPROXIMATE KINDER MORGAN OPERATIONS AREA
- BLUE** SHALLOW WELL LOCATION
- GREEN** INTERMEDIATE WELL LOCATION
- PURPLE** MULTI-LEVEL WELL LOCATION

Copper Concentrations in Silt at Well Monuments and Well Bottoms

Summary of Additional Field Activities at the NuStar Facility - March through June 2018
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

- NOTES:**
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
 2. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.
 3. BOTTOM SAMPLES WERE COLLECTED AS SEDIMENT-RICH WATER. PERCENT SOLIDS WERE LABORATORY DETERMINED VIA "FREEZE DRY" METHOD, AND ARE NOTED.





S-2	Copper
4Q2017 GWM Event (11/8/2017)	1,620
1Q2018 GWM Event - Pre-Development (03/20/2018)	2,480
Post-Development (04/02/2018)	1,050

S-1	Copper
4Q2017 GWM Event (11/8/2017)	20,900
1Q2018 GWM Event - Pre-Development (03/20/2018)	370
Post-Development (04/02/2018)	829

MW-13	Copper
4Q2017 GWM Event (11/7/2017)	4,530
1Q2018 GWM Event	NA
Post-Development (04/10/2018)	13,400 J3

LEGEND

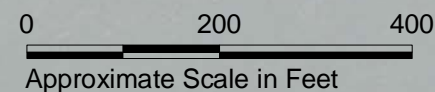
- 1,620** TOTAL COPPER CONCENTRATION IN $\mu\text{g/L}$
- NA** NOT ANALYZED
- MW-1** GROUNDWATER MONITORING WELL
- MGMS3** MULTI-LEVEL GROUNDWATER WELL
- MW-11** ABANDONED GROUNDWATER WELL
- MW-32s** PORT OF VANCOUVER WELL LOCATION
- APPROXIMATE NUSTAR LEASEHOLD BOUNDARY
- APPROXIMATE KINDER MORGAN OPERATIONS AREA
- BLUE** SHALLOW WELL LOCATION
- GREEN** INTERMEDIATE WELL LOCATION
- PURPLE** MULTI-LEVEL WELL LOCATION

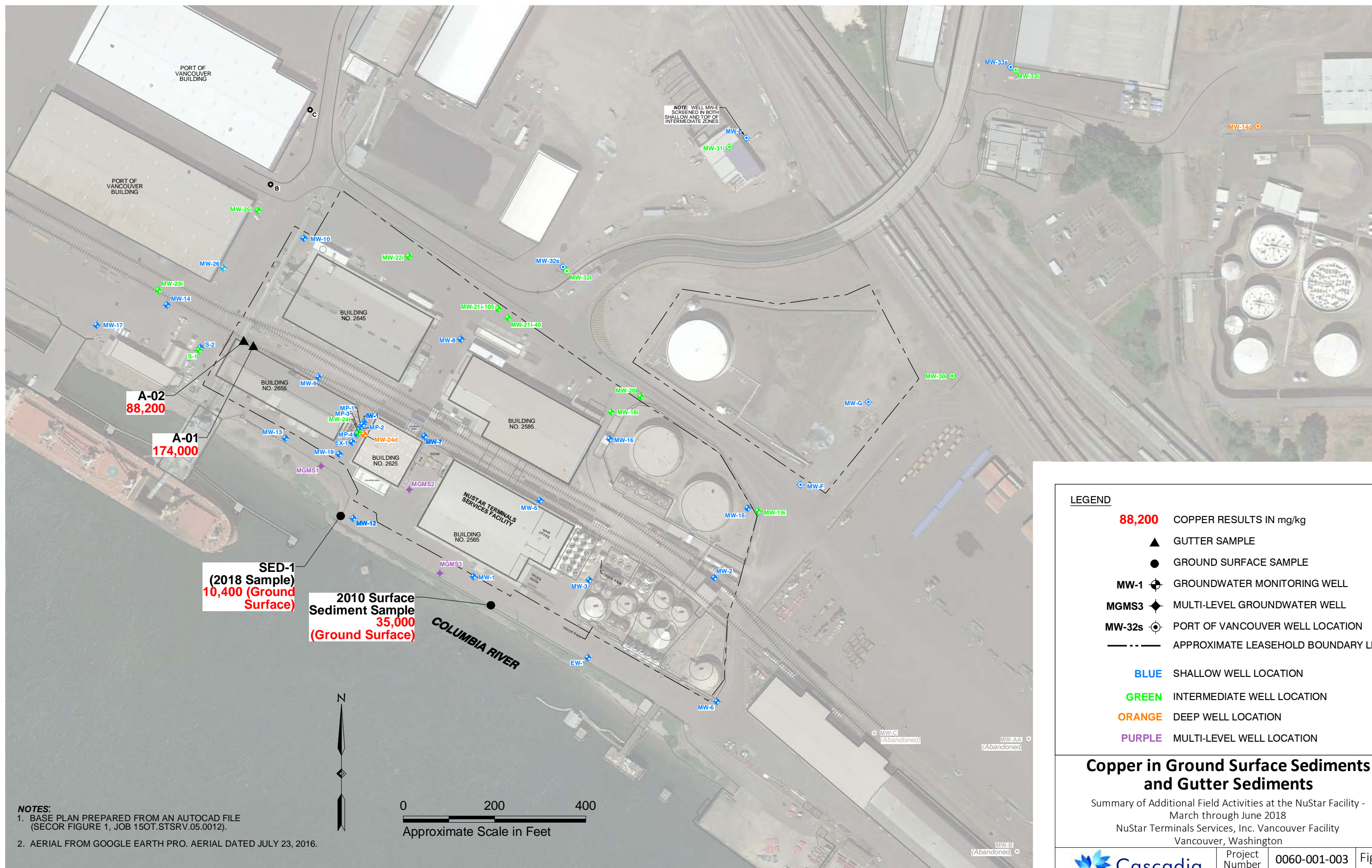
Copper Concentrations in Groundwater Pre- and Post-Well Development

Summary of Additional Field Activities at the NuStar Facility - March through June 2018
 NuStar Terminals Services, Inc. Vancouver Facility
 Vancouver, Washington

NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.
3. J3 = THE SAMPLE CONCENTRATION IS TOO HIGH TO ACCURATELY EVALUATE (MATRIX) SPIKE RECOVERY. THE ASSOCIATED QUALITY CONTROL BATCH WAS OUTSIDE QUALITY CONTROL RANGE FOR PRECISION.





ATTACHMENT A
LABORATORY REPORTS

SVE KNOCKOUT DRUM ANALYTICAL



ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

January 03, 2018

Analytical Report for Service Request No: K1712580

Stephanie Salisbury
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201-4707

RE: Vancouver 4Q17 GWM / 1126-20

Dear Stephanie,

Enclosed are the results of the sample(s) submitted to our laboratory November 20, 2017
For your reference, these analyses have been assigned our service request number **K1712580**.

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. 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.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager



ALS Environmental
ALS Group USA, Corp
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Acronyms

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Volatile Organic Compounds

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.

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**

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



Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM
Sample Matrix: Water

Service Request: K1712580
Date Received: 11/20/2017

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier I data deliverables. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 11/20/2017. The sample was received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Metals:

No significant anomalies were noted with this analysis.

General Chemistry:

Method 300.0, 12/08/2017: Sample S-SVE-KOD was received past holding time. The analysis was performed as soon as possible after receipt by the laboratory. The data was flagged to indicate the holding time violation.

Volatiles by GC/MS:

Method 8260C, : The analysis of sample S-SVE-KOD was initially performed past the recommended holding time. An error with analysis batch preparation caused the sample to appear to be analyzed within hold. The sample was placed in an analytical batch but was removed from the autosampler due to a instrument error. The sample was never removed from the LIMS analytical batch and resulted in the missed hold time. Efforts were made to analyze the sample(s) as soon as the error was identified. The data was flagged to indicate the holding time violation.

Approved by  Date 01/03/2018



Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Chain of Custody



ADDRESS 1317 South 13th Ave., Kelso, WA 98626
PHONE 1 360 577 7222 FAX 1 360 636 1068

Work Order No.:

K1712580

Part of the ALS Group A Campbell Brothers Limited Company

Project Manager: Stephanie Salisbury				Bill to: PO NUMBER: 1126-20														
Client Name: NuStar				Company: Apex Companies, LLC														
Address: 3015 SW 1st Ave				Address: 3015 SW 1st Ave														
City, State ZIP: Portland, OR 97201				City, State ZIP: Portland, OR 97201														
Email: Ssalisbury@apexcos.com			Phone: 503 924-4704	Email: Ssalisbury@apexcos.com														
Project Name: Vancouver 4Q17 GWM				REQUESTED ANALYSIS				TAT <input checked="" type="checkbox"/> Routine <input type="checkbox"/> Same Day *** <input type="checkbox"/> Next Day *** <input type="checkbox"/> 3 Day <input type="checkbox"/> 5 Day *** Please call for availability Due Date: Comments										
Project Number: 1126-20																		
P.O. Number: 1126-20																		
Sampler's Name: Megan Masterson																		
SAMPLE RECEIPT																		
Temperature (C):		Temp Blank Present		No. of Containers VOCs (8260) Nitrates Phosphates Metals - Fe, Cu TOTAL														
Received Intact:		Wet Ice / Blue Ice																
Cooler Custody Seals:		Total Containers:																
Sample Custody Seals:																		
Sample Identification	Matrix	Date Sampled	Time Sampled	Lab ID														
S-SVE-KOD	W	11/10/2017	11:00 AM 1426		1	X	X	X	X									
Dissolved		Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr										Additional Methods Available Upon Request						
Total		Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr																
RELINQUISHED BY						RECEIVED BY												
Print Name		Signature		Date/Time		Print Name		Signature		Date/Time								
Jake Munsey		<i>[Signature]</i>		11/17/17 @ 9:05		Brockman		<i>[Signature]</i>		11/17/17 @ 9:05								



PC MH

Cooler Receipt and Preservation Form

Client Nustar Service Request K17 12580
Received: 11-17-17 Opened: 11-17-17 By: [Signature] Unloaded: 11-17-17 By: [Signature]

- 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? _____
If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
7.9									

- 4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves _____
- 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 6. 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
- 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- 8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
- 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- 10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
- 11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
- 12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: Rec'd 1 125ml. plastic unpreserved Bottle for Multiple Tests.

SHORT HOLD TIME



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water
Analysis Method: 300.0
Prep Method: None

Service Request: K1712580
Date Collected: 11/10/17
Date Received: 11/20/17
Units: mg/L
Basis: NA

Sulfate

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
S-SVE-KOD	K1712580-001	8.53	0.20	2	12/08/17 01:14	
Method Blank	K1712580-MB1	ND U	0.10	1	12/07/17 15:06	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water
Analysis Method: 353.2
Prep Method: None

Service Request: K1712580
Date Collected: 11/10/17
Date Received: 11/20/17
Units: mg/L
Basis: NA

Nitrite as Nitrogen

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
S-SVE-KOD	K1712580-001	3.86	0.25	5	11/20/17 13:32	*
Method Blank	K1712580-MB1	ND U	0.050	1	11/20/17 13:32	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water
Analysis Method: 353.2
Prep Method: None

Service Request: K1712580
Date Collected: 11/10/17
Date Received: 11/20/17
Units: mg/L
Basis: NA

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
S-SVE-KOD	K1712580-001	6.37	0.50	10	11/20/17 14:39	
Method Blank	K1712580-MB1	ND U	0.050	1	11/20/17 14:39	
Method Blank	K1712580-MB2	ND U	0.050	1	11/20/17 14:39	
Method Blank	K1712580-MB3	ND U	0.050	1	11/20/17 14:39	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water
Analysis Method: 365.3
Prep Method: Method

Service Request: K1712580
Date Collected: 11/10/17
Date Received: 11/20/17
Units: mg/L
Basis: NA

Phosphorus, Total

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
S-SVE-KOD	K1712580-001	5.54	0.10	10	11/21/17 16:33	11/21/17	
Method Blank	K1712580-MB1	ND U	0.010	1	11/21/17 16:33	11/21/17	



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water
Sample Name: S-SVE-KOD
Lab Code: K1712580-001

Service Request: K1712580
Date Collected: 11/10/17 14:25
Date Received: 11/20/17 09:05
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Copper	6010C	398000	ug/L	420	100	12/05/17 15:07	12/04/17	
Iron	6010C	391	ug/L	21	1	12/05/17 14:47	12/04/17	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: KQ1717597-02

Service Request: K1712580
Date Collected: NA
Date Received: NA
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Copper	6010C	ND U	ug/L	4.2	1	12/05/17 14:07	12/04/17	
Iron	6010C	ND U	ug/L	21	1	12/05/17 14:07	12/04/17	



Volatile Organic Compounds

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Analytical Results

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water

Service Request: K1712580
Date Collected: 11/10/2017
Date Received: 11/20/2017

Volatile Organic Compounds

Sample Name: S-SVE-KOD
Lab Code: K1712580-001
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Chloromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Vinyl Chloride	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Bromomethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Chloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Trichlorofluoromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,1-Dichloroethene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Acetone	ND	U	20	1	11/28/17	11/28/17	KWG1710593	*
Carbon Disulfide	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Methylene Chloride	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
trans-1,2-Dichloroethene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,1-Dichloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
2,2-Dichloropropane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
cis-1,2-Dichloroethene	1.2		0.50	1	11/28/17	11/28/17	KWG1710593	*
2-Butanone (MEK)	ND	U	20	1	11/28/17	11/28/17	KWG1710593	*
Bromochloromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Chloroform	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Carbon Tetrachloride	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,1-Dichloropropene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Benzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,2-Dichloroethane (EDC)	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Trichloroethene (TCE)	0.51		0.50	1	11/28/17	11/28/17	KWG1710593	*
1,2-Dichloropropane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Dibromomethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Bromodichloromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
cis-1,3-Dichloropropene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	11/28/17	11/28/17	KWG1710593	*
Toluene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
trans-1,3-Dichloropropene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,1,2-Trichloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Tetrachloroethene (PCE)	2.0		0.50	1	11/28/17	11/28/17	KWG1710593	*
2-Hexanone	ND	U	20	1	11/28/17	11/28/17	KWG1710593	*
1,3-Dichloropropane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Dibromochloromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*

Comments: _____

Analytical Results

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water

Service Request: K1712580
Date Collected: 11/10/2017
Date Received: 11/20/2017

Volatile Organic Compounds

Sample Name: S-SVE-KOD
Lab Code: K1712580-001
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
Chlorobenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Ethylbenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
m,p-Xylenes	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
o-Xylene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Styrene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Bromoform	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Isopropylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Bromobenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
n-Propylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,2,3-Trichloropropane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
2-Chlorotoluene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,3,5-Trimethylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
4-Chlorotoluene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
tert-Butylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,2,4-Trimethylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
sec-Butylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
4-Isopropyltoluene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,3-Dichlorobenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,4-Dichlorobenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
n-Butylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,2-Dichlorobenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,2,4-Trichlorobenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
Hexachlorobutadiene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
Naphthalene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,2,3-Trichlorobenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*

* See Case Narrative

Comments: _____

Analytical Results

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water

Service Request: K1712580
Date Collected: 11/10/2017
Date Received: 11/20/2017

Volatile Organic Compounds

Sample Name: S-SVE-KOD
Lab Code: K1712580-001

Units: ug/L
Basis: NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	95	73-122	11/28/17	Acceptable
Toluene-d8	99	65-144	11/28/17	Acceptable
4-Bromofluorobenzene	85	68-117	11/28/17	Acceptable

Comments: _____

Analytical Results

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water

Service Request: K1712580
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1710593-3
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Chloromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Vinyl Chloride	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Bromomethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Chloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
Trichlorofluoromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
1,1-Dichloroethene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Acetone	ND	U	20	1	11/28/17	11/28/17	KWG1710593	
Carbon Disulfide	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Methylene Chloride	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
trans-1,2-Dichloroethene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
1,1-Dichloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
2,2-Dichloropropane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
cis-1,2-Dichloroethene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
2-Butanone (MEK)	ND	U	20	1	11/28/17	11/28/17	KWG1710593	
Bromochloromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Chloroform	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Carbon Tetrachloride	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
1,1-Dichloropropene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Benzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Trichloroethene (TCE)	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
1,2-Dichloropropane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Dibromomethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Bromodichloromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
cis-1,3-Dichloropropene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	11/28/17	11/28/17	KWG1710593	
Toluene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
trans-1,3-Dichloropropene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
1,1,2-Trichloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Tetrachloroethene (PCE)	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	*
2-Hexanone	ND	U	20	1	11/28/17	11/28/17	KWG1710593	
1,3-Dichloropropane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Dibromochloromethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	

Comments: _____

Analytical Results

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water

Service Request: K1712580
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1710593-3
Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,2-Dibromoethane (EDB)	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
Chlorobenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Ethylbenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
m,p-Xylenes	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
o-Xylene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Styrene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Bromoform	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Isopropylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
Bromobenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
n-Propylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
1,2,3-Trichloropropane	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
2-Chlorotoluene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
1,3,5-Trimethylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
4-Chlorotoluene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
tert-Butylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
1,2,4-Trimethylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
sec-Butylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
4-Isopropyltoluene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
1,3-Dichlorobenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
1,4-Dichlorobenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
n-Butylbenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	
1,2-Dichlorobenzene	ND	U	0.50	1	11/28/17	11/28/17	KWG1710593	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,2,4-Trichlorobenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
Hexachlorobutadiene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
Naphthalene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*
1,2,3-Trichlorobenzene	ND	U	2.0	1	11/28/17	11/28/17	KWG1710593	*

* See Case Narrative

Comments: _____

Analytical Results

Client: Apex Companies, LLC
Project: Vancouver 4Q17 GWM/1126-20
Sample Matrix: Water

Service Request: K1712580
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1710593-3

Units: ug/L
Basis: NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	98	73-122	11/28/17	Acceptable
Toluene-d8	100	65-144	11/28/17	Acceptable
4-Bromofluorobenzene	88	68-117	11/28/17	Acceptable

Comments: _____

4Q17 COPPER IN GROUNDWATER – PART 1

January 18, 2018

Stephanie Bosze-Salisbury
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

RE: Project: NuStar Vancouver GWM
Pace Project No.: 12103621

Dear Stephanie Bosze-Salisbury:

Enclosed are the analytical results for sample(s) received by the laboratory on January 11, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Julie Bowser for
Scott M Forbes
scott.forbes@pacelabs.com
(530) 297-4800
Project Manager

Enclosures

cc: Kelsi Evans, Apex Companies, LLC
Megan Masterson, Apex Companies, LLC



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: NuStar Vancouver GWM
Pace Project No.: 12103621

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: NuStar Vancouver GWM

Pace Project No.: 12103621

Lab ID	Sample ID	Matrix	Date Collected	Date Received
12103621001	EW-1	Water	11/09/17 09:15	01/11/18 16:07
12103621002	MGMS1-60	Water	11/07/17 15:41	01/11/18 16:07
12103621003	MGMS3-40	Water	11/10/17 12:25	01/11/18 16:07
12103621004	MGMS3-60	Water	11/10/17 11:52	01/11/18 16:07
12103621005	MP-1	Water	11/09/17 10:43	01/11/18 16:07
12103621006	MW-1	Water	11/09/17 10:09	01/11/18 16:07
12103621007	MW-2	Water	11/09/17 12:38	01/11/18 16:07
12103621008	MW-3	Water	11/08/17 16:45	01/11/18 16:07
12103621009	MW-5	Water	11/07/17 10:15	01/11/18 16:07
12103621010	MW-6	Water	11/07/17 13:43	01/11/18 16:07
12103621011	MW-7	Water	11/07/17 09:10	01/11/18 16:07
12103621012	MW-8	Water	11/06/17 11:12	01/11/18 16:07
12103621013	MW-9	Water	11/07/17 08:18	01/11/18 16:07
12103621014	MW-10	Water	11/06/17 13:30	01/11/18 16:07
12103621016	MW-16	Water	11/06/17 11:53	01/11/18 16:07
12103621017	MW-17	Water	11/08/17 08:08	01/11/18 16:07
12103621018	MW-18i	Water	11/07/17 12:13	01/11/18 16:07
12103621019	MW-19	Water	11/09/17 12:36	01/11/18 16:07
12103621020	MW-19i	Water	11/08/17 16:04	01/11/18 16:07
12103621021	MW-20i	Water	11/07/17 12:51	01/11/18 16:07
12103621022	MW-21i-40	Water	11/08/17 15:10	01/11/18 16:07
12103621023	MW-21i-105	Water	11/08/17 14:30	01/11/18 16:07
12103621024	MW-22I	Water	11/07/17 11:02	01/11/18 16:07
12103621025	MW-23I	Water	11/08/17 09:07	01/11/18 16:07
12103621026	MW-24I	Water	11/09/17 11:49	01/11/18 16:07
12103621027	MW-25I	Water	11/08/17 12:28	01/11/18 16:07
12103621028	MW-26	Water	11/08/17 13:07	01/11/18 16:07
12103621029	MW-32s	Water	11/10/17 09:11	01/11/18 16:07
12103621030	MW-32i	Water	11/10/17 08:32	01/11/18 16:07
12103621031	S-1	Water	11/08/17 10:53	01/11/18 16:07

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver GWM
Pace Project No.: 12103621

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
12103621001	EW-1	EPA 6010	IP	1	PASI-M
12103621002	MGMS1-60	EPA 6010	IP	1	PASI-M
12103621003	MGMS3-40	EPA 6010	IP	1	PASI-M
12103621004	MGMS3-60	EPA 6010	IP	1	PASI-M
12103621005	MP-1	EPA 6010	IP	1	PASI-M
12103621006	MW-1	EPA 6010	IP	1	PASI-M
12103621007	MW-2	EPA 6010	IP	1	PASI-M
12103621008	MW-3	EPA 6010	IP	1	PASI-M
12103621009	MW-5	EPA 6010	IP	1	PASI-M
12103621010	MW-6	EPA 6010	IP	1	PASI-M
12103621011	MW-7	EPA 6010	IP	1	PASI-M
12103621012	MW-8	EPA 6010	IP	1	PASI-M
12103621013	MW-9	EPA 6010	IP	1	PASI-M
12103621014	MW-10	EPA 6010	IP	1	PASI-M
12103621016	MW-16	EPA 6010	IP	1	PASI-M
12103621017	MW-17	EPA 6010	IP	1	PASI-M
12103621018	MW-18i	EPA 6010	IP	1	PASI-M
12103621019	MW-19	EPA 6010	IP	1	PASI-M
12103621020	MW-19i	EPA 6010	IP	1	PASI-M
12103621021	MW-20i	EPA 6010	IP	1	PASI-M
12103621022	MW-21i-40	EPA 6010	IP	1	PASI-M
12103621023	MW-21i-105	EPA 6010	IP	1	PASI-M
12103621024	MW-22I	EPA 6010	IP	1	PASI-M
12103621025	MW-23I	EPA 6010	IP	1	PASI-M
12103621026	MW-24I	EPA 6010	IP	1	PASI-M
12103621027	MW-25I	EPA 6010	IP	1	PASI-M
12103621029	MW-32s	EPA 6010	IP	1	PASI-M
12103621030	MW-32i	EPA 6010	IP	1	PASI-M
12103621031	S-1	EPA 6010	IP	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 12103621

Sample:	Lab ID:	Collected:	Received:	Matrix:				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sample: EW-1	Lab ID: 12103621001	Collected: 11/09/17 09:15	Received: 01/11/18 16:07	Matrix: Water				
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	12.0	ug/L	10.0	1	01/17/18 11:16	01/17/18 13:48	7440-50-8	
Sample: MGMS1-60	Lab ID: 12103621002	Collected: 11/07/17 15:41	Received: 01/11/18 16:07	Matrix: Water				
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:00	7440-50-8	
Sample: MGMS3-40	Lab ID: 12103621003	Collected: 11/10/17 12:25	Received: 01/11/18 16:07	Matrix: Water				
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:04	7440-50-8	
Sample: MGMS3-60	Lab ID: 12103621004	Collected: 11/10/17 11:52	Received: 01/11/18 16:07	Matrix: Water				
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:08	7440-50-8	
Sample: MP-1	Lab ID: 12103621005	Collected: 11/09/17 10:43	Received: 01/11/18 16:07	Matrix: Water				
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	13.7	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:12	7440-50-8	
Sample: MW-1	Lab ID: 12103621006	Collected: 11/09/17 10:09	Received: 01/11/18 16:07	Matrix: Water				
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	535	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:24	7440-50-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 12103621

Sample: MW-2	Lab ID: 12103621007	Collected: 11/09/17 12:38	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	31.8	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:29	7440-50-8	
Sample: MW-3	Lab ID: 12103621008	Collected: 11/08/17 16:45	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	14.8	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:33	7440-50-8	
Sample: MW-5	Lab ID: 12103621009	Collected: 11/07/17 10:15	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:37	7440-50-8	
Sample: MW-6	Lab ID: 12103621010	Collected: 11/07/17 13:43	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	25.7	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:42	7440-50-8	
Sample: MW-7	Lab ID: 12103621011	Collected: 11/07/17 09:10	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	241	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:46	7440-50-8	
Sample: MW-8	Lab ID: 12103621012	Collected: 11/06/17 11:12	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:50	7440-50-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 12103621

Sample: MW-9	Lab ID: 12103621013	Collected: 11/07/17 08:18	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	13.7	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:54	7440-50-8	
Sample: MW-10	Lab ID: 12103621014	Collected: 11/06/17 13:30	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	327	ug/L	10.0	1	01/17/18 11:16	01/17/18 14:58	7440-50-8	
Sample: MW-16	Lab ID: 12103621016	Collected: 11/06/17 11:53	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 15:02	7440-50-8	
Sample: MW-17	Lab ID: 12103621017	Collected: 11/08/17 08:08	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	267	ug/L	10.0	1	01/17/18 11:16	01/17/18 15:13	7440-50-8	
Sample: MW-18i	Lab ID: 12103621018	Collected: 11/07/17 12:13	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 15:17	7440-50-8	
Sample: MW-19	Lab ID: 12103621019	Collected: 11/09/17 12:36	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	89.0	ug/L	10.0	1	01/17/18 11:16	01/17/18 15:21	7440-50-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 12103621

Sample: MW-19i	Lab ID: 12103621020	Collected: 11/08/17 16:04	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Copper	15.6	ug/L	10.0	1	01/17/18 11:16	01/17/18 15:25	7440-50-8	
Sample: MW-20i Lab ID: 12103621021 Collected: 11/07/17 12:51 Received: 01/11/18 16:07 Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 15:29	7440-50-8	
Sample: MW-21i-40 Lab ID: 12103621022 Collected: 11/08/17 15:10 Received: 01/11/18 16:07 Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 15:45	7440-50-8	
Sample: MW-21i-105 Lab ID: 12103621023 Collected: 11/08/17 14:30 Received: 01/11/18 16:07 Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Copper	16.8	ug/L	10.0	1	01/17/18 11:16	01/17/18 16:05	7440-50-8	
Sample: MW-22i Lab ID: 12103621024 Collected: 11/07/17 11:02 Received: 01/11/18 16:07 Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Copper	27.2	ug/L	10.0	1	01/17/18 11:16	01/17/18 16:09	7440-50-8	
Sample: MW-23i Lab ID: 12103621025 Collected: 11/08/17 09:07 Received: 01/11/18 16:07 Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 16:12	7440-50-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM

Pace Project No.: 12103621

Sample: MW-24I	Lab ID: 12103621026	Collected: 11/09/17 11:49	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 16:16	7440-50-8	

Sample: MW-25I	Lab ID: 12103621027	Collected: 11/08/17 12:28	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 16:20	7440-50-8	

Sample: MW-32s	Lab ID: 12103621029	Collected: 11/10/17 09:11	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	14.8	ug/L	10.0	1	01/17/18 11:16	01/17/18 16:24	7440-50-8	

Sample: MW-32i	Lab ID: 12103621030	Collected: 11/10/17 08:32	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	ND	ug/L	10.0	1	01/17/18 11:16	01/17/18 16:28	7440-50-8	

Sample: S-1	Lab ID: 12103621031	Collected: 11/08/17 10:53	Received: 01/11/18 16:07	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Copper	20900	ug/L	10.0	1	01/17/18 11:16	01/17/18 16:32	7440-50-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 12103621

QC Batch: 518233 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 12103621022, 12103621023, 12103621024, 12103621025, 12103621026, 12103621027, 12103621029, 12103621030, 12103621031

METHOD BLANK: 2814774 Matrix: Water
Associated Lab Samples: 12103621022, 12103621023, 12103621024, 12103621025, 12103621026, 12103621027, 12103621029, 12103621030, 12103621031

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	ND	10.0	01/17/18 15:33	

LABORATORY CONTROL SAMPLE & LCSD: 2814775 2814776

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Copper	ug/L	1000	914	946	91	95	80-120	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: NuStar Vancouver GWM
Pace Project No.: 12103621

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver GWM
Pace Project No.: 12103621

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
12103621001	EW-1	EPA 3010	518232	EPA 6010	518478
12103621002	MGMS1-60	EPA 3010	518232	EPA 6010	518478
12103621003	MGMS3-40	EPA 3010	518232	EPA 6010	518478
12103621004	MGMS3-60	EPA 3010	518232	EPA 6010	518478
12103621005	MP-1	EPA 3010	518232	EPA 6010	518478
12103621006	MW-1	EPA 3010	518232	EPA 6010	518478
12103621007	MW-2	EPA 3010	518232	EPA 6010	518478
12103621008	MW-3	EPA 3010	518232	EPA 6010	518478
12103621009	MW-5	EPA 3010	518232	EPA 6010	518478
12103621010	MW-6	EPA 3010	518232	EPA 6010	518478
12103621011	MW-7	EPA 3010	518232	EPA 6010	518478
12103621012	MW-8	EPA 3010	518232	EPA 6010	518478
12103621013	MW-9	EPA 3010	518232	EPA 6010	518478
12103621014	MW-10	EPA 3010	518232	EPA 6010	518478
12103621016	MW-16	EPA 3010	518232	EPA 6010	518478
12103621017	MW-17	EPA 3010	518232	EPA 6010	518478
12103621018	MW-18i	EPA 3010	518232	EPA 6010	518478
12103621019	MW-19	EPA 3010	518232	EPA 6010	518478
12103621020	MW-19i	EPA 3010	518232	EPA 6010	518478
12103621021	MW-20i	EPA 3010	518232	EPA 6010	518478
12103621022	MW-21i-40	EPA 3010	518233	EPA 6010	518480
12103621023	MW-21i-105	EPA 3010	518233	EPA 6010	518480
12103621024	MW-22i	EPA 3010	518233	EPA 6010	518480
12103621025	MW-23i	EPA 3010	518233	EPA 6010	518480
12103621026	MW-24i	EPA 3010	518233	EPA 6010	518480
12103621027	MW-25i	EPA 3010	518233	EPA 6010	518480
12103621029	MW-32s	EPA 3010	518233	EPA 6010	518480
12103621030	MW-32i	EPA 3010	518233	EPA 6010	518480
12103621031	S-1	EPA 3010	518233	EPA 6010	518480

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: _____ of _____

Section A
Required Client Information:
 Company: Apex Companies, LLC
 Address: 3015 SW 1st Ave
 Portland, OR 97201
 Email To: Ssalisbury@apexcos.com
 Phone: 503.924.4704 Fax: n/a
 Requested Due Date/TAT:

Section B
Required Project Information:
 Report To: Stephanie Salisbury
 Copy To:
 Purchase Order No.:
 Project Name: NuStar Vancouver GWM
 Project Number: 1126-20.002

Section C
Invoice Information:
 Attention:
 Company Name: Apex Companies, LLC
 Address: 3015 SW 1st Ave
 Pace Quote Reference:
 Pace Project Manager:
 Pace Profile #:

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER
 Site Location: WA STATE: WA

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WWT WATER PRODUCT WW SOIL/SOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		# OF CONTAINERS	Preservatives	Requested Analysis Filtered (Y/N)	Pace Project No./Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB				
		DATE	TIME	DATE	TIME				
1	MW-23i	WT	G	11/08/17	9:07	3	Unpreserved H ₂ SO ₄ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other		
2	MW-24i	WT	G	11/09/17	11:49	8			
3	MW-25i	WT	G	11/08/17	12:28	3			
4	MW-26	WT	G	11/08/17	13:07	8			
5	MW-32s	WT	G	11/10/17	9:11	3			
6	MW-32i	WT	G	11/10/17	8:32	3			
7	S-1	WT	G	11/08/17	10:53	3			
8									
9									
10									
11									
12									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
							Temp in °C
							Received on
							Ice (Y/N)
							Custody
							Sealed Cooler (Y/N)
							Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER:
 SIGNATURE of SAMPLER:
 DATE Signed (MM/DD/YY):



2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 12102804

Project Contact (Hardcopy or PDF To): Stephanie Bosze		California EDF Report? CRA EQUIS Required		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>						
Company / Address: Apex Companies 3015 SW 1st Ave., Portland, OR 97201		XLS Report Required		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>						
Phone Number: 503-924-4704 ext 1913		Global ID:										
Fax Number: 503-924-4707		EDD Deliverable To (Email Address): Ssalisbury@apexcoos.com										
Project #: 320001126-20		Bill to: Apex Companies										
Project Name: NuStar Vancouver GWM		Sampler Name & Signature: M. Masterson										
Project Address:		Sampling		Container		Preservative		Matrix				
Sample Designation	Date	Time	40 mL VOA	Sieve	250 mL Glass	Tedlar	HCl	HNO ₃	H ₂ O ₄	Water	Soil	Air
MW-12 DUP	11/9/2017	0806	3				3			X		
MW-12 MS	11/9/2017	0806	3				3			X		
MW-12 MSD	11/9/2017	0806	3				3			X		
MW-13	11/7/2017	1425	8				6	2		X		
MW-14	11/8/2017	0950	8				6	2		X		
MW-15	11/6/2017	1631	3				3			X		
MW-16	11/6/2017	1153	3				3			X		
MW-17	11/8/2017	0808	3				3			X		
MW-18	11/7/2017	1213	3				3			X		
MW-19	11/9/2017	1236	8				6	2		X		
MW-19 DUP	11/9/2017	1236	3				3			X		
MW-19	11/8/2017	1604	3				3			X		
MW-20	11/7/2017	1251	3				3			X		

Relinquished by:	Date	Time	Received by:	Time
			<i>[Signature]</i>	11/9/2017 09:55

Remarks:
MS/MSD is from well MW-12 (extra bottles labeled as MW-12 MS/ MW-12 MSD)

For Lab Use Only: Sample Receipt			
Temp °C	Initials	Date	Time
For Lab Use Only: Therm. ID #			
Therm. ID #	Time	Date	Coolant Present
			Yes / No

27
28
29
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2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 12100807

Project Contact (Hardcopy or PDF To):
Stephanie Bosze
Company / Address: Apex Companies
3015 SW 1st Ave., Portland, OR 97201

California EDF Report? Yes No
CRA EQUIS Required Yes No
XLS Report Required Yes No

Global ID:
EDD Deliverable To (Email Address):
Ssalisbury@apexcos.com
Bill to:
Apex Companies
Sampler Name & Signature: M. Masterson

Phone Number: 503-924-4704 ext 1913
P.O. #: 320001126-20

Fax Number: 503-924-4707

Project #: 320001126-20

Project Name: NuStar Vancouver GWM

Project Address:

Chain-of-Custody Record and Analysis Request

Analysis Request

Other: Please Specify

TAT

12 hr
 24 hr
 48hr
 72hr
 1 wk

For Lab Use Only

TOC

Methane, Ethane, Ethene

Volatile Halocarbons (EPA 8260B)

Water

Soil

Air

Matrix

Preservative

HCl

HNO₃

H₂SO₄

None

Container

40 ml VOA

Sleeve

Poly

250 ml Glass

Tedlar

Date

Time

Received by:

Time

Date

Received by:

Date

Received by:

Date

Received by:

Date

Received by:

Date

Received by:

Date

Received by:

Date

Received by:

Date

Received by:

Date

Received by:

Date

Remarks:

MS/MSD is from well MW-12 (extra bottles labeled as MW-12 MS/ MW-12 MSD)

For Lab Use Only: Sample Receipt

Temp °C	Initials	Date	Time	Therm. ID #	Coolant Present
					Yes / No

Sample Condition Upon Receipt

Client Name: Apex LLC Project #: _____

WO# : 12100804



12100804

Courier: Fed Ex UPS USPS Client
 Commercial Pace OnTrac Other: _____
 Tracking Number: 7884 4521 6375 / 0364

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermom. Used: DA1434 DA2285 Type of Ice: Wet Blue Dry Ice None Samples on ice, cooling process has begun

Cooler Temp Read(°C): 5.4/4.4 Cooler Temp Corrected(°C): 5.1/4.1 Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C Correction Factor: -0.3 Date and Initials of Person Examining Contents: Sam H. Jones, 11/15/17
 Comments: 11/17/17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1. <u>6 vial containers received, labeled</u>
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2. <u>as Trip Blank but not as COC.</u>
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4. <u>Sample 12 has no container</u>
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. <u>labeled as "110" and not "10" as</u>
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6. <u>The COC states. The time and</u>
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7. <u>date matches the COC and it</u>
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8. <u>was in the same bag as the other</u>
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9. <u>containers for sample 12. SR will</u>
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>treat this as sample 12.</u>
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Sam H. Jones

Date: 11/15/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

4Q17 COPPER IN GROUNDWATER – PART 2

January 25, 2018

Stephanie Bosze-Salisbury
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

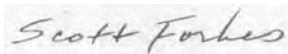
RE: Project: NuStar - Vancouver GW Monitori
Pace Project No.: 12104064

Dear Stephanie Bosze-Salisbury:

Enclosed are the analytical results for sample(s) received by the laboratory on January 24, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Scott M Forbes
scott.forbes@pacelabs.com
(530) 297-4800
Project Manager

Enclosures

cc: Kelsi Evans, Apex Companies, LLC
Megan Masterson, Apex Companies, LLC



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: NuStar - Vancouver GW Monitori
Pace Project No.: 12104064

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: NuStar - Vancouver GW Monitori

Pace Project No.: 12104064

Lab ID	Sample ID	Matrix	Date Collected	Date Received
12104064001	MW-26	Water	01/22/18 09:20	01/24/18 10:30
12104064002	MW-14	Water	01/22/18 10:10	01/24/18 10:30

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SAMPLE ANALYTE COUNT

Project: NuStar - Vancouver GW Monitori
Pace Project No.: 12104064

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
12104064001	MW-26	EPA 6010	IP	1	PASI-M
12104064002	MW-14	EPA 6010	IP	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NuStar - Vancouver GW Monitori
Pace Project No.: 12104064

Sample: MW-26		Lab ID: 12104064001	Collected: 01/22/18 09:20	Received: 01/24/18 10:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010						
Copper	ND	ug/L	10.0	1	01/24/18 16:36	01/25/18 09:27	7440-50-8	

Sample: MW-14		Lab ID: 12104064002	Collected: 01/22/18 10:10	Received: 01/24/18 10:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010						
Copper	1510	ug/L	10.0	1	01/24/18 16:36	01/25/18 09:31	7440-50-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NuStar - Vancouver GW Monitori

Pace Project No.: 12104064

QC Batch: 519610

Analysis Method: EPA 6010

QC Batch Method: EPA 3010

Analysis Description: 6010 MET

Associated Lab Samples: 12104064001, 12104064002

METHOD BLANK: 2821722

Matrix: Water

Associated Lab Samples: 12104064001, 12104064002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	ND	10.0	01/25/18 09:19	

LABORATORY CONTROL SAMPLE: 2821723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	1000	936	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2821724 2821725

Parameter	Units	12104064002		2821724		2821725		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Copper	ug/L	1510	1000	1000	2620	2570	110	105	75-125	2	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: NuStar - Vancouver GW Monitori
Pace Project No.: 12104064

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar - Vancouver GW Monitori

Pace Project No.: 12104064

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
12104064001	MW-26	EPA 3010	519610	EPA 6010	519665
12104064002	MW-14	EPA 3010	519610	EPA 6010	519665

REPORT OF LABORATORY ANALYSIS


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Sample Condition Upon Receipt **Client Name:** Apex Companies LLC **Project #:** _____

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: 7713 0451 0570

WO#: 10418114



10418114

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** **Proj. Due Date:** _____ **Proj. Name:** _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 1401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 8.9 **Cooler Temp Corrected (°C):** 8.7 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** 1/24/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2^{3/2}</u>
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Julie P. **Date:** 1/24/18

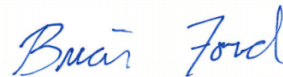
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

**1Q18 GROUNDWATER MONITORING – PRE-DEVELOPMENT
SAMPLES FOR WELLS S-1 AND S-2**

APEX Companies - Portland, OR

Sample Delivery Group: L980397
Samples Received: 03/24/2018
Project Number: 1126-21.002
Description: NuStar Vancouver Groundwater Monitoring
Site: VANCOUVER, WA
Report To: S Salisbury
3015 SW First Avenue
Portland, OR 97201-4707

Entire Report Reviewed By:



Brian Ford
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

SAMPLE SUMMARY



EX L980397-01 GW

Collected by
Megan Masterson

Collected date/time
03/21/18 11:45

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	1	03/28/18 19:07	03/28/18 19:07	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 11:12	03/27/18 11:12	BG
Volatile Organic Compounds (GC) by Method RSK175	WG1089974	10	03/27/18 14:31	03/27/18 14:31	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/27/18 21:38	03/27/18 21:38	BMB

1
Cp

2
Tc

3
Ss

4
Cn

MGMS1-43 L980397-02 GW

Collected by
Megan Masterson

Collected date/time
03/22/18 14:21

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090834	2	03/29/18 13:16	03/29/18 13:16	EG
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 11:21	03/27/18 11:21	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/27/18 21:58	03/27/18 21:58	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	50	03/30/18 02:16	03/30/18 02:16	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	50	03/30/18 22:35	03/30/18 22:35	JAH

5
Sr

6
Qc

7
Gl

8
Al

MGMS1-60 L980397-03 GW

Collected by
Megan Masterson

Collected date/time
03/22/18 13:50

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/27/18 22:18	03/27/18 22:18	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/30/18 02:36	03/30/18 02:36	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/30/18 22:55	03/30/18 22:55	JAH

9
Sc

MGMS2-40 L980397-04 GW

Collected by
Megan Masterson

Collected date/time
03/22/18 13:11

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	1	03/28/18 19:46	03/28/18 19:46	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 11:27	03/27/18 11:27	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/27/18 22:37	03/27/18 22:37	BMB

MGMS2-60 L980397-05 GW

Collected by
Megan Masterson

Collected date/time
03/22/18 12:45

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/27/18 22:57	03/27/18 22:57	BMB

MGMS3-40 L980397-06 GW

Collected by
Megan Masterson

Collected date/time
03/22/18 12:11

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	1	03/28/18 19:58	03/28/18 19:58	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 11:32	03/27/18 11:32	BG
Volatile Organic Compounds (GC) by Method RSK175	WG1089974	20	03/27/18 14:33	03/27/18 14:33	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/27/18 23:17	03/27/18 23:17	BMB

SAMPLE SUMMARY



MGMS3-60 L980397-07 GW

Collected by Megan Masterson
 Collected date/time 03/22/18 11:46
 Received date/time 03/24/18 08:45

1
Cp

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/27/18 23:37	03/27/18 23:37	BMB

2
Tc

MP-1 L980397-08 GW

Collected by Megan Masterson
 Collected date/time 03/21/18 13:16
 Received date/time 03/24/18 08:45

3
Ss

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	1	03/28/18 20:10	03/28/18 20:10	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 11:37	03/27/18 11:37	BG
Volatile Organic Compounds (GC) by Method RSK175	WG1089974	10	03/27/18 14:36	03/27/18 14:36	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/27/18 23:57	03/27/18 23:57	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	10	03/30/18 02:56	03/30/18 02:56	LRL

4
Cn

5
Sr

6
Qc

7
Gl

MW-1 L980397-09 GW

Collected by Megan Masterson
 Collected date/time 03/20/18 11:40
 Received date/time 03/24/18 08:45

8
Al

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 00:17	03/28/18 00:17	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/30/18 03:17	03/30/18 03:17	LRL

9
Sc

MW-3 L980397-10 GW

Collected by Megan Masterson
 Collected date/time 03/20/18 11:11
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 00:37	03/28/18 00:37	BMB

MW-5 L980397-11 GW

Collected by Megan Masterson
 Collected date/time 03/21/18 10:00
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 00:57	03/28/18 00:57	BMB

MW-7 L980397-12 GW

Collected by Megan Masterson
 Collected date/time 03/21/18 09:08
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	1	03/28/18 20:22	03/28/18 20:22	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 11:48	03/27/18 11:48	BG
Volatile Organic Compounds (GC) by Method RSK175	WG1089974	20	03/27/18 14:38	03/27/18 14:38	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 01:17	03/28/18 01:17	BMB

MW-7 DUP L980397-13 GW

Collected by Megan Masterson
 Collected date/time 03/21/18 09:08
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 01:37	03/28/18 01:37	BMB

SAMPLE SUMMARY



MW-8 L980397-14 GW

Collected by Megan Masterson
 Collected date/time 03/19/18 16:15
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 01:57	03/28/18 01:57	BMB

1 Cp

2 Tc

3 Ss

MW-9 L980397-15 GW

Collected by Megan Masterson
 Collected date/time 03/21/18 08:25
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 02:17	03/28/18 02:17	BMB

4 Cn

5 Sr

MW-12 L980397-16 GW

Collected by Megan Masterson
 Collected date/time 03/20/18 08:05
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	10	03/28/18 21:27	03/28/18 21:27	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 11:59	03/27/18 11:59	BG
Volatile Organic Compounds (GC) by Method RSK175	WG1089974	20	03/27/18 14:41	03/27/18 14:41	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 02:37	03/28/18 02:37	BMB

6 Qc

7 Gl

8 Al

9 Sc

MW-12 DUP L980397-17 GW

Collected by Megan Masterson
 Collected date/time 03/20/18 08:05
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 02:57	03/28/18 02:57	BMB

MW-13 L980397-18 GW

Collected by Megan Masterson
 Collected date/time 03/20/18 09:28
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	10	03/28/18 21:39	03/28/18 21:39	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 12:05	03/27/18 12:05	BG
Volatile Organic Compounds (GC) by Method RSK175	WG1089974	20	03/27/18 14:43	03/27/18 14:43	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 03:17	03/28/18 03:17	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	50	03/30/18 03:37	03/30/18 03:37	LRL

MW-14 L980397-19 GW

Collected by Megan Masterson
 Collected date/time 03/20/18 13:50
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	1	03/28/18 21:50	03/28/18 21:50	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 12:11	03/27/18 12:11	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 03:37	03/28/18 03:37	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	10	03/30/18 03:57	03/30/18 03:57	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	10	03/30/18 23:15	03/30/18 23:15	JAH

MW-16 L980397-20 GW

Collected by Megan Masterson
 Collected date/time 03/19/18 16:52
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/28/18 03:57	03/28/18 03:57	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090159	1	03/30/18 23:34	03/30/18 23:34	JAH

SAMPLE SUMMARY



MW-18I L980397-21 GW

Collected by
Megan Masterson

Collected date/time
03/21/18 15:58

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 13:02	03/28/18 13:02	BMB

1
Cp

2
Tc

3
Ss

MW-19 L980397-22 GW

Collected by
Megan Masterson

Collected date/time
03/21/18 10:47

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	1	03/28/18 22:36	03/28/18 22:36	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 12:13	03/27/18 12:13	BG
Volatile Organic Compounds (GC) by Method RSK175	WG1089974	20	03/27/18 14:45	03/27/18 14:45	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 13:22	03/28/18 13:22	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	100	03/29/18 11:39	03/29/18 11:39	DWR

4
Cn

5
Sr

6
Qc

7
Gl

MW-19 DUP L980397-23 GW

Collected by
Megan Masterson

Collected date/time
03/21/18 10:47

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 13:41	03/28/18 13:41	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	100	03/29/18 11:58	03/29/18 11:58	DWR

8
Al

9
Sc

MW-19I L980397-24 GW

Collected by
Megan Masterson

Collected date/time
03/20/18 12:24

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 14:00	03/28/18 14:00	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/29/18 12:17	03/29/18 12:17	DWR

MW-20I L980397-25 GW

Collected by
Megan Masterson

Collected date/time
03/21/18 16:30

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 14:20	03/28/18 14:20	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/29/18 12:37	03/29/18 12:37	DWR

MW-21I-40 L980397-26 GW

Collected by
Megan Masterson

Collected date/time
03/22/18 09:45

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 14:39	03/28/18 14:39	BMB

MW-21I-105 L980397-27 GW

Collected by
Megan Masterson

Collected date/time
03/22/18 08:58

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 14:58	03/28/18 14:58	BMB

SAMPLE SUMMARY



MW-22I L980397-28 GW

Collected by Megan Masterson
 Collected date/time 03/22/18 10:36
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 15:17	03/28/18 15:17	BMB

1 Cp

2 Tc

MW-23I L980397-29 GW

Collected by Megan Masterson
 Collected date/time 03/21/18 14:17
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 15:37	03/28/18 15:37	BMB

3 Ss

4 Cn

5 Sr

MW-24I L980397-30 GW

Collected by Megan Masterson
 Collected date/time 03/21/18 12:23
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	1	03/28/18 22:48	03/28/18 22:48	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 12:18	03/27/18 12:18	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 15:56	03/28/18 15:56	BMB

6 Qc

7 Gl

8 Al

9 Sc

MW-24D L980397-31 GW

Collected by Megan Masterson
 Collected date/time 03/20/18 10:26
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 16:15	03/28/18 16:15	BMB

MW-25I L980397-32 GW

Collected by Megan Masterson
 Collected date/time 03/21/18 15:17
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 16:35	03/28/18 16:35	BMB

MW-26 L980397-33 GW

Collected by Megan Masterson
 Collected date/time 03/20/18 15:56
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9060A	WG1090261	1	03/28/18 22:59	03/28/18 22:59	SJM
Volatile Organic Compounds (GC) by Method RSK175	WG1089718	1	03/27/18 12:23	03/27/18 12:23	BG
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 16:54	03/28/18 16:54	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	10	03/29/18 12:56	03/29/18 12:56	DWR

MW-32S L980397-34 GW

Collected by Megan Masterson
 Collected date/time 03/22/18 08:03
 Received date/time 03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 17:13	03/28/18 17:13	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/29/18 13:16	03/29/18 13:16	DWR

SAMPLE SUMMARY



S-1 L980397-35 GW

Collected by
Megan Masterson

Collected date/time
03/20/18 14:37

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG1089400	1	03/26/18 22:04	03/27/18 13:26	CCE
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 17:32	03/28/18 17:32	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/29/18 13:35	03/29/18 13:35	DWR

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

S-2 L980397-36 GW

Collected by
Megan Masterson

Collected date/time
03/20/18 15:10

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG1089400	1	03/26/18 22:04	03/27/18 13:30	CCE
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/28/18 17:51	03/28/18 17:51	BMB
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090417	1	03/29/18 13:55	03/29/18 13:55	DWR

FB-031918 L980397-37 GW

Collected by
Megan Masterson

Collected date/time
03/19/18 15:25

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090423	1	03/28/18 15:50	03/28/18 15:50	JAH

FB-032018 L980397-38 GW

Collected by
Megan Masterson

Collected date/time
03/20/18 07:35

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090423	1	03/28/18 16:10	03/28/18 16:10	JAH

FB-032118 L980397-39 GW

Collected by
Megan Masterson

Collected date/time
03/21/18 07:30

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090423	1	03/28/18 16:30	03/28/18 16:30	JAH

FB-0322018 L980397-40 GW

Collected by
Megan Masterson

Collected date/time
03/22/18 10:05

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090423	1	03/28/18 16:50	03/28/18 16:50	JAH

EQ BLANK L980397-41 GW

Collected by
Megan Masterson

Collected date/time
03/22/18 10:00

Received date/time
03/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1090423	1	03/28/18 17:10	03/28/18 17:10	JAH



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford
 Technical Service Representative

Sample Handling and Receiving

VOC pH outside of method requirement.

<u>ESC Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
L980397-02	MGMS1-43	8260C
L980397-19	MW-14	8260C

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Collected date/time: 03/21/18 11:45

L980397

Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	15400		102	1000	1	03/28/2018 19:07	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	7670		29.1	100	10	03/27/2018 14:31	WG1089974
Ethane	22.1		4.07	13.0	1	03/27/2018 11:12	WG1089718
Ethene	28.3		4.26	13.0	1	03/27/2018 11:12	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/27/2018 21:38	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/27/2018 21:38	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/27/2018 21:38	WG1090159
Bromoform	U		0.186	0.500	1	03/27/2018 21:38	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/27/2018 21:38	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/27/2018 21:38	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/27/2018 21:38	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/27/2018 21:38	WG1090159
Chloroethane	1.45	<u>J</u>	0.141	2.50	1	03/27/2018 21:38	WG1090159
Chloroform	U		0.0860	0.500	1	03/27/2018 21:38	WG1090159
Chloromethane	U		0.153	1.25	1	03/27/2018 21:38	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/27/2018 21:38	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/27/2018 21:38	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/27/2018 21:38	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/27/2018 21:38	WG1090159
Dibromomethane	U		0.117	0.500	1	03/27/2018 21:38	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/27/2018 21:38	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/27/2018 21:38	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/27/2018 21:38	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/27/2018 21:38	WG1090159
1,1-Dichloroethane	1.34		0.114	0.500	1	03/27/2018 21:38	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/27/2018 21:38	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/27/2018 21:38	WG1090159
cis-1,2-Dichloroethene	22.6		0.0933	0.500	1	03/27/2018 21:38	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/27/2018 21:38	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/27/2018 21:38	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/27/2018 21:38	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/27/2018 21:38	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/27/2018 21:38	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/27/2018 21:38	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/27/2018 21:38	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/27/2018 21:38	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/27/2018 21:38	WG1090159
Iodomethane	U		0.377	10.0	1	03/27/2018 21:38	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/27/2018 21:38	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/27/2018 21:38	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/27/2018 21:38	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/27/2018 21:38	WG1090159
Tetrachloroethene	1.48		0.199	0.500	1	03/27/2018 21:38	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/27/2018 21:38	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/27/2018 21:38	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/27/2018 21:38	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/27/2018 21:38	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 03/21/18 11:45

L980397

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	2.72		0.153	0.500	1	03/27/2018 21:38	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/27/2018 21:38	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/27/2018 21:38	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/27/2018 21:38	WG1090159
Vinyl chloride	10.8		0.118	0.500	1	03/27/2018 21:38	WG1090159
(S) Toluene-d8	99.8			80.0-120		03/27/2018 21:38	WG1090159
(S) Dibromofluoromethane	97.5			76.0-123		03/27/2018 21:38	WG1090159
(S) 4-Bromofluorobenzene	103			80.0-120		03/27/2018 21:38	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	13800		204	2000	2	03/29/2018 13:16	WG1090834

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	3940		2.91	10.0	1	03/27/2018 11:21	WG1089718
Ethane	23.8		4.07	13.0	1	03/27/2018 11:21	WG1089718
Ethene	U		4.26	13.0	1	03/27/2018 11:21	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/27/2018 21:58	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/27/2018 21:58	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/27/2018 21:58	WG1090159
Bromoform	U		0.186	0.500	1	03/27/2018 21:58	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/27/2018 21:58	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/27/2018 21:58	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/27/2018 21:58	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/27/2018 21:58	WG1090159
Chloroethane	U		0.141	2.50	1	03/27/2018 21:58	WG1090159
Chloroform	U		0.0860	0.500	1	03/27/2018 21:58	WG1090159
Chloromethane	U		0.153	1.25	1	03/27/2018 21:58	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/27/2018 21:58	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/27/2018 21:58	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/27/2018 21:58	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/27/2018 21:58	WG1090159
Dibromomethane	U		0.117	0.500	1	03/27/2018 21:58	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/27/2018 21:58	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/27/2018 21:58	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/27/2018 21:58	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/27/2018 21:58	WG1090159
1,1-Dichloroethane	192		0.114	0.500	1	03/27/2018 21:58	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/27/2018 21:58	WG1090159
1,1-Dichloroethene	18.0		0.188	0.500	1	03/27/2018 21:58	WG1090159
cis-1,2-Dichloroethene	2450		4.66	25.0	50	03/30/2018 22:35	WG1090159
trans-1,2-Dichloroethene	34.9		0.152	0.500	1	03/27/2018 21:58	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/27/2018 21:58	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/27/2018 21:58	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/27/2018 21:58	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/27/2018 21:58	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/27/2018 21:58	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/27/2018 21:58	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/27/2018 21:58	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/27/2018 21:58	WG1090159
Iodomethane	U		0.377	10.0	1	03/27/2018 21:58	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/27/2018 21:58	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/27/2018 21:58	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/27/2018 21:58	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/27/2018 21:58	WG1090159
Tetrachloroethene	80.1		0.199	0.500	1	03/27/2018 21:58	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/27/2018 21:58	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/27/2018 21:58	WG1090159
1,1,1-Trichloroethane	0.780		0.0940	0.500	1	03/27/2018 21:58	WG1090159
1,1,2-Trichloroethane	0.200	<u>J</u>	0.186	0.500	1	03/27/2018 21:58	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Trichloroethene	278		7.65	25.0	50	03/30/2018 02:16	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/27/2018 21:58	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/27/2018 21:58	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/27/2018 21:58	WG1090159
Vinyl chloride	236		5.90	25.0	50	03/30/2018 02:16	WG1090159
(S) Toluene-d8	97.3			80.0-120		03/30/2018 02:16	WG1090159
(S) Toluene-d8	104			80.0-120		03/27/2018 21:58	WG1090159
(S) Toluene-d8	106			80.0-120		03/30/2018 22:35	WG1090159
(S) Dibromofluoromethane	94.2			76.0-123		03/30/2018 02:16	WG1090159
(S) Dibromofluoromethane	97.2			76.0-123		03/27/2018 21:58	WG1090159
(S) Dibromofluoromethane	101			76.0-123		03/30/2018 22:35	WG1090159
(S) 4-Bromofluorobenzene	95.6			80.0-120		03/30/2018 22:35	WG1090159
(S) 4-Bromofluorobenzene	103			80.0-120		03/27/2018 21:58	WG1090159
(S) 4-Bromofluorobenzene	97.1			80.0-120		03/30/2018 02:16	WG1090159

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/27/2018 22:18	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/27/2018 22:18	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/27/2018 22:18	WG1090159
Bromoform	U		0.186	0.500	1	03/27/2018 22:18	WG1090159
Bromomethane	U	JO	0.157	2.50	1	03/27/2018 22:18	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/27/2018 22:18	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/27/2018 22:18	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/27/2018 22:18	WG1090159
Chloroethane	U		0.141	2.50	1	03/27/2018 22:18	WG1090159
Chloroform	U		0.0860	0.500	1	03/27/2018 22:18	WG1090159
Chloromethane	U		0.153	1.25	1	03/27/2018 22:18	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/27/2018 22:18	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/27/2018 22:18	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/27/2018 22:18	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/27/2018 22:18	WG1090159
Dibromomethane	U		0.117	0.500	1	03/27/2018 22:18	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/27/2018 22:18	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/27/2018 22:18	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/27/2018 22:18	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/27/2018 22:18	WG1090159
1,1-Dichloroethane	1.30		0.114	0.500	1	03/27/2018 22:18	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/27/2018 22:18	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/27/2018 22:18	WG1090159
cis-1,2-Dichloroethene	13.4		0.0933	0.500	1	03/30/2018 22:55	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/27/2018 22:18	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/27/2018 22:18	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/27/2018 22:18	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/27/2018 22:18	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/27/2018 22:18	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/27/2018 22:18	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/27/2018 22:18	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/27/2018 22:18	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/27/2018 22:18	WG1090159
Iodomethane	U		0.377	10.0	1	03/27/2018 22:18	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/27/2018 22:18	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/27/2018 22:18	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/27/2018 22:18	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/27/2018 22:18	WG1090159
Tetrachloroethene	23.3		0.199	0.500	1	03/27/2018 22:18	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/27/2018 22:18	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/27/2018 22:18	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/27/2018 22:18	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/27/2018 22:18	WG1090159
Trichloroethene	13.9		0.153	0.500	1	03/30/2018 02:36	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/27/2018 22:18	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/27/2018 22:18	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/27/2018 22:18	WG1090159
Vinyl chloride	U		0.118	0.500	1	03/30/2018 02:36	WG1090159
(S) Toluene-d8	102			80.0-120		03/30/2018 22:55	WG1090159
(S) Toluene-d8	97.6			80.0-120		03/30/2018 02:36	WG1090159
(S) Toluene-d8	99.9			80.0-120		03/27/2018 22:18	WG1090159
(S) Dibromofluoromethane	93.4			76.0-123		03/30/2018 02:36	WG1090159
(S) Dibromofluoromethane	99.4			76.0-123		03/27/2018 22:18	WG1090159
(S) Dibromofluoromethane	98.7			76.0-123		03/30/2018 22:55	WG1090159
(S) 4-Bromofluorobenzene	95.1			80.0-120		03/30/2018 22:55	WG1090159
(S) 4-Bromofluorobenzene	99.6			80.0-120		03/27/2018 22:18	WG1090159

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
(S) 4-Bromofluorobenzene	99.9		ug/l	ug/l		03/30/2018 02:36	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	9580		102	1000	1	03/28/2018 19:46	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	2700		2.91	10.0	1	03/27/2018 11:27	WG1089718
Ethane	103		4.07	13.0	1	03/27/2018 11:27	WG1089718
Ethene	32.7		4.26	13.0	1	03/27/2018 11:27	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/27/2018 22:37	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/27/2018 22:37	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/27/2018 22:37	WG1090159
Bromoform	U		0.186	0.500	1	03/27/2018 22:37	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/27/2018 22:37	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/27/2018 22:37	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/27/2018 22:37	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/27/2018 22:37	WG1090159
Chloroethane	U		0.141	2.50	1	03/27/2018 22:37	WG1090159
Chloroform	U		0.0860	0.500	1	03/27/2018 22:37	WG1090159
Chloromethane	U		0.153	1.25	1	03/27/2018 22:37	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/27/2018 22:37	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/27/2018 22:37	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/27/2018 22:37	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/27/2018 22:37	WG1090159
Dibromomethane	U		0.117	0.500	1	03/27/2018 22:37	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/27/2018 22:37	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/27/2018 22:37	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/27/2018 22:37	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/27/2018 22:37	WG1090159
1,1-Dichloroethane	25.9		0.114	0.500	1	03/27/2018 22:37	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/27/2018 22:37	WG1090159
1,1-Dichloroethene	4.22		0.188	0.500	1	03/27/2018 22:37	WG1090159
cis-1,2-Dichloroethene	109		0.0933	0.500	1	03/27/2018 22:37	WG1090159
trans-1,2-Dichloroethene	0.571		0.152	0.500	1	03/27/2018 22:37	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/27/2018 22:37	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/27/2018 22:37	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/27/2018 22:37	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/27/2018 22:37	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/27/2018 22:37	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/27/2018 22:37	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/27/2018 22:37	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/27/2018 22:37	WG1090159
Iodomethane	U		0.377	10.0	1	03/27/2018 22:37	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/27/2018 22:37	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/27/2018 22:37	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/27/2018 22:37	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/27/2018 22:37	WG1090159
Tetrachloroethene	46.0		0.199	0.500	1	03/27/2018 22:37	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/27/2018 22:37	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/27/2018 22:37	WG1090159
1,1,1-Trichloroethane	0.259	<u>J</u>	0.0940	0.500	1	03/27/2018 22:37	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/27/2018 22:37	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	27.3		0.153	0.500	1	03/27/2018 22:37	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/27/2018 22:37	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/27/2018 22:37	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/27/2018 22:37	WG1090159
Vinyl chloride	122		0.118	0.500	1	03/27/2018 22:37	WG1090159
(S) Toluene-d8	100			80.0-120		03/27/2018 22:37	WG1090159
(S) Dibromofluoromethane	99.4			76.0-123		03/27/2018 22:37	WG1090159
(S) 4-Bromofluorobenzene	106			80.0-120		03/27/2018 22:37	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/27/2018 22:57	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/27/2018 22:57	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/27/2018 22:57	WG1090159
Bromoform	U		0.186	0.500	1	03/27/2018 22:57	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/27/2018 22:57	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/27/2018 22:57	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/27/2018 22:57	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/27/2018 22:57	WG1090159
Chloroethane	U		0.141	2.50	1	03/27/2018 22:57	WG1090159
Chloroform	U		0.0860	0.500	1	03/27/2018 22:57	WG1090159
Chloromethane	U		0.153	1.25	1	03/27/2018 22:57	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/27/2018 22:57	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/27/2018 22:57	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/27/2018 22:57	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/27/2018 22:57	WG1090159
Dibromomethane	U		0.117	0.500	1	03/27/2018 22:57	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/27/2018 22:57	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/27/2018 22:57	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/27/2018 22:57	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/27/2018 22:57	WG1090159
1,1-Dichloroethane	0.818		0.114	0.500	1	03/27/2018 22:57	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/27/2018 22:57	WG1090159
1,1-Dichloroethene	0.224	<u>J</u>	0.188	0.500	1	03/27/2018 22:57	WG1090159
cis-1,2-Dichloroethene	17.3		0.0933	0.500	1	03/27/2018 22:57	WG1090159
trans-1,2-Dichloroethene	0.164	<u>J</u>	0.152	0.500	1	03/27/2018 22:57	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/27/2018 22:57	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/27/2018 22:57	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/27/2018 22:57	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/27/2018 22:57	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/27/2018 22:57	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/27/2018 22:57	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/27/2018 22:57	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/27/2018 22:57	WG1090159
Iodomethane	U		0.377	10.0	1	03/27/2018 22:57	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/27/2018 22:57	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/27/2018 22:57	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/27/2018 22:57	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/27/2018 22:57	WG1090159
Tetrachloroethene	20.6		0.199	0.500	1	03/27/2018 22:57	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/27/2018 22:57	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/27/2018 22:57	WG1090159
1,1,1-Trichloroethane	0.205	<u>J</u>	0.0940	0.500	1	03/27/2018 22:57	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/27/2018 22:57	WG1090159
Trichloroethene	11.6		0.153	0.500	1	03/27/2018 22:57	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/27/2018 22:57	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/27/2018 22:57	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/27/2018 22:57	WG1090159
Vinyl chloride	1.21		0.118	0.500	1	03/27/2018 22:57	WG1090159
(S) Toluene-d8	101			80.0-120		03/27/2018 22:57	WG1090159
(S) Dibromofluoromethane	98.6			76.0-123		03/27/2018 22:57	WG1090159
(S) 4-Bromofluorobenzene	98.9			80.0-120		03/27/2018 22:57	WG1090159

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	8740		102	1000	1	03/28/2018 19:58	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	14200		58.2	200	20	03/27/2018 14:33	WG1089974
Ethane	118		4.07	13.0	1	03/27/2018 11:32	WG1089718
Ethene	242		4.26	13.0	1	03/27/2018 11:32	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/27/2018 23:17	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/27/2018 23:17	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/27/2018 23:17	WG1090159
Bromoform	U		0.186	0.500	1	03/27/2018 23:17	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/27/2018 23:17	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/27/2018 23:17	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/27/2018 23:17	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/27/2018 23:17	WG1090159
Chloroethane	U		0.141	2.50	1	03/27/2018 23:17	WG1090159
Chloroform	U		0.0860	0.500	1	03/27/2018 23:17	WG1090159
Chloromethane	U		0.153	1.25	1	03/27/2018 23:17	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/27/2018 23:17	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/27/2018 23:17	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/27/2018 23:17	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/27/2018 23:17	WG1090159
Dibromomethane	U		0.117	0.500	1	03/27/2018 23:17	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/27/2018 23:17	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/27/2018 23:17	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/27/2018 23:17	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/27/2018 23:17	WG1090159
1,1-Dichloroethane	8.57		0.114	0.500	1	03/27/2018 23:17	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/27/2018 23:17	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/27/2018 23:17	WG1090159
cis-1,2-Dichloroethene	9.81		0.0933	0.500	1	03/27/2018 23:17	WG1090159
trans-1,2-Dichloroethene	0.179	<u>J</u>	0.152	0.500	1	03/27/2018 23:17	WG1090159
1,2-Dichloropropane	0.632		0.190	0.500	1	03/27/2018 23:17	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/27/2018 23:17	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/27/2018 23:17	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/27/2018 23:17	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/27/2018 23:17	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/27/2018 23:17	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/27/2018 23:17	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/27/2018 23:17	WG1090159
Iodomethane	U		0.377	10.0	1	03/27/2018 23:17	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/27/2018 23:17	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/27/2018 23:17	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/27/2018 23:17	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/27/2018 23:17	WG1090159
Tetrachloroethene	1.45		0.199	0.500	1	03/27/2018 23:17	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/27/2018 23:17	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/27/2018 23:17	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/27/2018 23:17	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/27/2018 23:17	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	0.528		0.153	0.500	1	03/27/2018 23:17	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/27/2018 23:17	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/27/2018 23:17	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/27/2018 23:17	WG1090159
Vinyl chloride	39.8		0.118	0.500	1	03/27/2018 23:17	WG1090159
(S) Toluene-d8	103			80.0-120		03/27/2018 23:17	WG1090159
(S) Dibromofluoromethane	101			76.0-123		03/27/2018 23:17	WG1090159
(S) 4-Bromofluorobenzene	100			80.0-120		03/27/2018 23:17	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/27/2018 23:37	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/27/2018 23:37	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/27/2018 23:37	WG1090159
Bromoform	U		0.186	0.500	1	03/27/2018 23:37	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/27/2018 23:37	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/27/2018 23:37	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/27/2018 23:37	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/27/2018 23:37	WG1090159
Chloroethane	U		0.141	2.50	1	03/27/2018 23:37	WG1090159
Chloroform	U		0.0860	0.500	1	03/27/2018 23:37	WG1090159
Chloromethane	U		0.153	1.25	1	03/27/2018 23:37	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/27/2018 23:37	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/27/2018 23:37	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/27/2018 23:37	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/27/2018 23:37	WG1090159
Dibromomethane	U		0.117	0.500	1	03/27/2018 23:37	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/27/2018 23:37	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/27/2018 23:37	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/27/2018 23:37	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/27/2018 23:37	WG1090159
1,1-Dichloroethane	0.757		0.114	0.500	1	03/27/2018 23:37	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/27/2018 23:37	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/27/2018 23:37	WG1090159
cis-1,2-Dichloroethene	15.6		0.0933	0.500	1	03/27/2018 23:37	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/27/2018 23:37	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/27/2018 23:37	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/27/2018 23:37	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/27/2018 23:37	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/27/2018 23:37	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/27/2018 23:37	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/27/2018 23:37	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/27/2018 23:37	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/27/2018 23:37	WG1090159
Iodomethane	U		0.377	10.0	1	03/27/2018 23:37	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/27/2018 23:37	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/27/2018 23:37	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/27/2018 23:37	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/27/2018 23:37	WG1090159
Tetrachloroethene	2.16		0.199	0.500	1	03/27/2018 23:37	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/27/2018 23:37	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/27/2018 23:37	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/27/2018 23:37	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/27/2018 23:37	WG1090159
Trichloroethene	1.76		0.153	0.500	1	03/27/2018 23:37	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/27/2018 23:37	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/27/2018 23:37	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/27/2018 23:37	WG1090159
Vinyl chloride	5.89		0.118	0.500	1	03/27/2018 23:37	WG1090159
(S) Toluene-d8	102			80.0-120		03/27/2018 23:37	WG1090159
(S) Dibromofluoromethane	100			76.0-123		03/27/2018 23:37	WG1090159
(S) 4-Bromofluorobenzene	100			80.0-120		03/27/2018 23:37	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 03/21/18 13:16

L980397

Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	8300		102	1000	1	03/28/2018 20:10	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	9250		29.1	100	10	03/27/2018 14:36	WG1089974
Ethane	6.33	J	4.07	13.0	1	03/27/2018 11:37	WG1089718
Ethene	U		4.26	13.0	1	03/27/2018 11:37	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/27/2018 23:57	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/27/2018 23:57	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/27/2018 23:57	WG1090159
Bromoform	U		0.186	0.500	1	03/27/2018 23:57	WG1090159
Bromomethane	U	JO	0.157	2.50	1	03/27/2018 23:57	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/27/2018 23:57	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/27/2018 23:57	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/27/2018 23:57	WG1090159
Chloroethane	U		0.141	2.50	1	03/27/2018 23:57	WG1090159
Chloroform	U		0.0860	0.500	1	03/27/2018 23:57	WG1090159
Chloromethane	U		0.153	1.25	1	03/27/2018 23:57	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/27/2018 23:57	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/27/2018 23:57	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/27/2018 23:57	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/27/2018 23:57	WG1090159
Dibromomethane	U		0.117	0.500	1	03/27/2018 23:57	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/27/2018 23:57	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/27/2018 23:57	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/27/2018 23:57	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/27/2018 23:57	WG1090159
1,1-Dichloroethane	3.17		0.114	0.500	1	03/27/2018 23:57	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/27/2018 23:57	WG1090159
1,1-Dichloroethene	4.04		0.188	0.500	1	03/27/2018 23:57	WG1090159
cis-1,2-Dichloroethene	151		0.0933	0.500	1	03/27/2018 23:57	WG1090159
trans-1,2-Dichloroethene	1.02		0.152	0.500	1	03/27/2018 23:57	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/27/2018 23:57	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/27/2018 23:57	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/27/2018 23:57	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/27/2018 23:57	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/27/2018 23:57	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/27/2018 23:57	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/27/2018 23:57	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/27/2018 23:57	WG1090159
Iodomethane	U		0.377	10.0	1	03/27/2018 23:57	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/27/2018 23:57	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/27/2018 23:57	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/27/2018 23:57	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/27/2018 23:57	WG1090159
Tetrachloroethene	245		1.99	5.00	10	03/30/2018 02:56	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/27/2018 23:57	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/27/2018 23:57	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/27/2018 23:57	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/27/2018 23:57	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 03/21/18 13:16

L980397

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	64.5		0.153	0.500	1	03/27/2018 23:57	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/27/2018 23:57	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/27/2018 23:57	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/27/2018 23:57	WG1090159
Vinyl chloride	1.63		0.118	0.500	1	03/27/2018 23:57	WG1090159
(S) Toluene-d8	101			80.0-120		03/27/2018 23:57	WG1090159
(S) Toluene-d8	97.3			80.0-120		03/30/2018 02:56	WG1090159
(S) Dibromofluoromethane	94.3			76.0-123		03/27/2018 23:57	WG1090159
(S) Dibromofluoromethane	93.3			76.0-123		03/30/2018 02:56	WG1090159
(S) 4-Bromofluorobenzene	99.6			80.0-120		03/27/2018 23:57	WG1090159
(S) 4-Bromofluorobenzene	98.6			80.0-120		03/30/2018 02:56	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 03/20/18 11:40

L980397

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Bromobenzene	U		0.133	0.500	1	03/28/2018 00:17	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 00:17	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 00:17	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 00:17	WG1090159
Bromomethane	U	JO	0.157	2.50	1	03/28/2018 00:17	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 00:17	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 00:17	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 00:17	WG1090159
Chloroethane	U		0.141	2.50	1	03/28/2018 00:17	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 00:17	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 00:17	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 00:17	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 00:17	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 00:17	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 00:17	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 00:17	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 00:17	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 00:17	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 00:17	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 00:17	WG1090159
1,1-Dichloroethane	4.84		0.114	0.500	1	03/28/2018 00:17	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 00:17	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 00:17	WG1090159
cis-1,2-Dichloroethene	6.13		0.0933	0.500	1	03/28/2018 00:17	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 00:17	WG1090159
1,2-Dichloropropane	0.322	J	0.190	0.500	1	03/28/2018 00:17	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 00:17	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 00:17	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 00:17	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 00:17	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 00:17	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 00:17	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 00:17	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 00:17	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 00:17	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 00:17	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 00:17	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 00:17	WG1090159
Tetrachloroethene	2.49		0.199	0.500	1	03/30/2018 03:17	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 00:17	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 00:17	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 00:17	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 00:17	WG1090159
Trichloroethene	2.06		0.153	0.500	1	03/28/2018 00:17	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 00:17	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 00:17	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 00:17	WG1090159
Vinyl chloride	U		0.118	0.500	1	03/28/2018 00:17	WG1090159
(S) Toluene-d8	96.2			80.0-120		03/30/2018 03:17	WG1090159
(S) Toluene-d8	101			80.0-120		03/28/2018 00:17	WG1090159
(S) Dibromofluoromethane	93.6			76.0-123		03/30/2018 03:17	WG1090159
(S) Dibromofluoromethane	102			76.0-123		03/28/2018 00:17	WG1090159
(S) 4-Bromofluorobenzene	99.6			80.0-120		03/30/2018 03:17	WG1090159
(S) 4-Bromofluorobenzene	99.6			80.0-120		03/28/2018 00:17	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 00:37	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 00:37	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 00:37	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 00:37	WG1090159
Bromomethane	U	JO	0.157	2.50	1	03/28/2018 00:37	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 00:37	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 00:37	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 00:37	WG1090159
Chloroethane	U		0.141	2.50	1	03/28/2018 00:37	WG1090159
Chloroform	0.380	J	0.0860	0.500	1	03/28/2018 00:37	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 00:37	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 00:37	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 00:37	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 00:37	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 00:37	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 00:37	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 00:37	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 00:37	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 00:37	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 00:37	WG1090159
1,1-Dichloroethane	2.03		0.114	0.500	1	03/28/2018 00:37	WG1090159
1,2-Dichloroethane	0.144	J	0.108	0.500	1	03/28/2018 00:37	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 00:37	WG1090159
cis-1,2-Dichloroethene	77.8		0.0933	0.500	1	03/28/2018 00:37	WG1090159
trans-1,2-Dichloroethene	2.22		0.152	0.500	1	03/28/2018 00:37	WG1090159
1,2-Dichloropropane	1.99		0.190	0.500	1	03/28/2018 00:37	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 00:37	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 00:37	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 00:37	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 00:37	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 00:37	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 00:37	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 00:37	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 00:37	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 00:37	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 00:37	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 00:37	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 00:37	WG1090159
Tetrachloroethene	194		0.199	0.500	1	03/28/2018 00:37	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 00:37	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 00:37	WG1090159
1,1,1-Trichloroethane	3.40		0.0940	0.500	1	03/28/2018 00:37	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 00:37	WG1090159
Trichloroethene	48.6		0.153	0.500	1	03/28/2018 00:37	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 00:37	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 00:37	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 00:37	WG1090159
Vinyl chloride	U		0.118	0.500	1	03/28/2018 00:37	WG1090159
(S) Toluene-d8	103			80.0-120		03/28/2018 00:37	WG1090159
(S) Dibromofluoromethane	99.0			76.0-123		03/28/2018 00:37	WG1090159
(S) 4-Bromofluorobenzene	95.5			80.0-120		03/28/2018 00:37	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 00:57	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 00:57	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 00:57	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 00:57	WG1090159
Bromomethane	U	JO	0.157	2.50	1	03/28/2018 00:57	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 00:57	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 00:57	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 00:57	WG1090159
Chloroethane	U		0.141	2.50	1	03/28/2018 00:57	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 00:57	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 00:57	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 00:57	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 00:57	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 00:57	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 00:57	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 00:57	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 00:57	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 00:57	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 00:57	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 00:57	WG1090159
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 00:57	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 00:57	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 00:57	WG1090159
cis-1,2-Dichloroethene	1.86		0.0933	0.500	1	03/28/2018 00:57	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 00:57	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 00:57	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 00:57	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 00:57	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 00:57	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 00:57	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 00:57	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 00:57	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 00:57	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 00:57	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 00:57	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 00:57	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 00:57	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 00:57	WG1090159
Tetrachloroethene	10.6		0.199	0.500	1	03/28/2018 00:57	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 00:57	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 00:57	WG1090159
1,1,1-Trichloroethane	0.199	J	0.0940	0.500	1	03/28/2018 00:57	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 00:57	WG1090159
Trichloroethene	2.36		0.153	0.500	1	03/28/2018 00:57	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 00:57	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 00:57	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 00:57	WG1090159
Vinyl chloride	0.260	J	0.118	0.500	1	03/28/2018 00:57	WG1090159
(S) Toluene-d8	99.4			80.0-120		03/28/2018 00:57	WG1090159
(S) Dibromofluoromethane	98.9			76.0-123		03/28/2018 00:57	WG1090159
(S) 4-Bromofluorobenzene	95.9			80.0-120		03/28/2018 00:57	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 03/21/18 09:08

L980397

Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	9960		102	1000	1	03/28/2018 20:22	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	10600		58.2	200	20	03/27/2018 14:38	WG1089974
Ethane	10.9	J	4.07	13.0	1	03/27/2018 11:48	WG1089718
Ethene	U		4.26	13.0	1	03/27/2018 11:48	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 01:17	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 01:17	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 01:17	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 01:17	WG1090159
Bromomethane	U	JO	0.157	2.50	1	03/28/2018 01:17	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 01:17	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 01:17	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 01:17	WG1090159
Chloroethane	U		0.141	2.50	1	03/28/2018 01:17	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 01:17	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 01:17	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 01:17	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 01:17	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 01:17	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 01:17	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 01:17	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 01:17	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 01:17	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 01:17	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 01:17	WG1090159
1,1-Dichloroethane	0.495	J	0.114	0.500	1	03/28/2018 01:17	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 01:17	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 01:17	WG1090159
cis-1,2-Dichloroethene	17.6		0.0933	0.500	1	03/28/2018 01:17	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 01:17	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 01:17	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 01:17	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 01:17	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 01:17	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 01:17	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 01:17	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 01:17	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 01:17	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 01:17	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 01:17	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 01:17	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 01:17	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 01:17	WG1090159
Tetrachloroethene	0.228	J	0.199	0.500	1	03/28/2018 01:17	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 01:17	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 01:17	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 01:17	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 01:17	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	2.86		0.153	0.500	1	03/28/2018 01:17	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 01:17	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 01:17	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 01:17	WG1090159
Vinyl chloride	4.93		0.118	0.500	1	03/28/2018 01:17	WG1090159
(S) Toluene-d8	101			80.0-120		03/28/2018 01:17	WG1090159
(S) Dibromofluoromethane	101			76.0-123		03/28/2018 01:17	WG1090159
(S) 4-Bromofluorobenzene	99.4			80.0-120		03/28/2018 01:17	WG1090159

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 01:37	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 01:37	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 01:37	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 01:37	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/28/2018 01:37	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 01:37	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 01:37	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 01:37	WG1090159
Chloroethane	U		0.141	2.50	1	03/28/2018 01:37	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 01:37	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 01:37	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 01:37	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 01:37	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 01:37	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 01:37	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 01:37	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 01:37	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 01:37	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 01:37	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 01:37	WG1090159
1,1-Dichloroethane	0.551		0.114	0.500	1	03/28/2018 01:37	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 01:37	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 01:37	WG1090159
cis-1,2-Dichloroethene	17.2		0.0933	0.500	1	03/28/2018 01:37	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 01:37	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 01:37	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 01:37	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 01:37	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 01:37	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 01:37	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 01:37	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 01:37	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 01:37	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 01:37	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 01:37	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 01:37	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 01:37	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 01:37	WG1090159
Tetrachloroethene	0.284	<u>J</u>	0.199	0.500	1	03/28/2018 01:37	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 01:37	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 01:37	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 01:37	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 01:37	WG1090159
Trichloroethene	2.99		0.153	0.500	1	03/28/2018 01:37	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 01:37	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 01:37	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 01:37	WG1090159
Vinyl chloride	4.87		0.118	0.500	1	03/28/2018 01:37	WG1090159
(S) Toluene-d8	98.8			80.0-120		03/28/2018 01:37	WG1090159
(S) Dibromofluoromethane	99.2			76.0-123		03/28/2018 01:37	WG1090159
(S) 4-Bromofluorobenzene	97.5			80.0-120		03/28/2018 01:37	WG1090159

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Collected date/time: 03/19/18 16:15

L980397

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 01:57	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 01:57	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 01:57	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 01:57	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/28/2018 01:57	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 01:57	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 01:57	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 01:57	WG1090159
Chloroethane	U		0.141	2.50	1	03/28/2018 01:57	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 01:57	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 01:57	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 01:57	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 01:57	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 01:57	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 01:57	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 01:57	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 01:57	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 01:57	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 01:57	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 01:57	WG1090159
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 01:57	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 01:57	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 01:57	WG1090159
cis-1,2-Dichloroethene	0.562		0.0933	0.500	1	03/28/2018 01:57	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 01:57	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 01:57	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 01:57	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 01:57	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 01:57	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 01:57	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 01:57	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 01:57	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 01:57	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 01:57	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 01:57	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 01:57	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 01:57	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 01:57	WG1090159
Tetrachloroethene	4.22		0.199	0.500	1	03/28/2018 01:57	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 01:57	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 01:57	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 01:57	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 01:57	WG1090159
Trichloroethene	U		0.153	0.500	1	03/28/2018 01:57	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 01:57	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 01:57	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 01:57	WG1090159
Vinyl chloride	U		0.118	0.500	1	03/28/2018 01:57	WG1090159
(S) Toluene-d8	102			80.0-120		03/28/2018 01:57	WG1090159
(S) Dibromofluoromethane	101			76.0-123		03/28/2018 01:57	WG1090159
(S) 4-Bromofluorobenzene	97.8			80.0-120		03/28/2018 01:57	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 03/21/18 08:25

L980397

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 02:17	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 02:17	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 02:17	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 02:17	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/28/2018 02:17	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 02:17	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 02:17	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 02:17	WG1090159
Chloroethane	U		0.141	2.50	1	03/28/2018 02:17	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 02:17	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 02:17	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 02:17	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 02:17	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 02:17	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 02:17	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 02:17	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 02:17	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 02:17	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 02:17	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 02:17	WG1090159
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 02:17	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 02:17	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 02:17	WG1090159
cis-1,2-Dichloroethene	1.20		0.0933	0.500	1	03/28/2018 02:17	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 02:17	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 02:17	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 02:17	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 02:17	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 02:17	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 02:17	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 02:17	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 02:17	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 02:17	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 02:17	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 02:17	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 02:17	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 02:17	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 02:17	WG1090159
Tetrachloroethene	39.0		0.199	0.500	1	03/28/2018 02:17	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 02:17	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 02:17	WG1090159
1,1,1-Trichloroethane	1.14		0.0940	0.500	1	03/28/2018 02:17	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 02:17	WG1090159
Trichloroethene	14.9		0.153	0.500	1	03/28/2018 02:17	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 02:17	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 02:17	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 02:17	WG1090159
Vinyl chloride	U		0.118	0.500	1	03/28/2018 02:17	WG1090159
(S) Toluene-d8	98.3			80.0-120		03/28/2018 02:17	WG1090159
(S) Dibromofluoromethane	98.8			76.0-123		03/28/2018 02:17	WG1090159
(S) 4-Bromofluorobenzene	98.2			80.0-120		03/28/2018 02:17	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	89100		1020	10000	10	03/28/2018 21:27	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	16400		58.2	200	20	03/27/2018 14:41	WG1089974
Ethane	7.71	J	4.07	13.0	1	03/27/2018 11:59	WG1089718
Ethene	U		4.26	13.0	1	03/27/2018 11:59	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 02:37	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 02:37	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 02:37	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 02:37	WG1090159
Bromomethane	U	JO	0.157	2.50	1	03/28/2018 02:37	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 02:37	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 02:37	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 02:37	WG1090159
Chloroethane	7.50		0.141	2.50	1	03/28/2018 02:37	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 02:37	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 02:37	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 02:37	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 02:37	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 02:37	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 02:37	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 02:37	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 02:37	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 02:37	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 02:37	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 02:37	WG1090159
1,1-Dichloroethane	0.522		0.114	0.500	1	03/28/2018 02:37	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 02:37	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 02:37	WG1090159
cis-1,2-Dichloroethene	5.64		0.0933	0.500	1	03/28/2018 02:37	WG1090159
trans-1,2-Dichloroethene	1.33		0.152	0.500	1	03/28/2018 02:37	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 02:37	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 02:37	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 02:37	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 02:37	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 02:37	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 02:37	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 02:37	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 02:37	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 02:37	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 02:37	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 02:37	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 02:37	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 02:37	WG1090159
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 02:37	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 02:37	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 02:37	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 02:37	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 02:37	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	0.271	J	0.153	0.500	1	03/28/2018 02:37	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 02:37	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 02:37	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 02:37	WG1090159
Vinyl chloride	2.77		0.118	0.500	1	03/28/2018 02:37	WG1090159
(S) Toluene-d8	101			80.0-120		03/28/2018 02:37	WG1090159
(S) Dibromofluoromethane	98.0			76.0-123		03/28/2018 02:37	WG1090159
(S) 4-Bromofluorobenzene	98.7			80.0-120		03/28/2018 02:37	WG1090159

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U	<u>J6</u>	0.133	0.500	1	03/28/2018 02:57	WG1090159
Bromodichloromethane	U	<u>J6</u>	0.0800	0.500	1	03/28/2018 02:57	WG1090159
Bromochloromethane	U	<u>J6</u>	0.145	0.500	1	03/28/2018 02:57	WG1090159
Bromoform	U	<u>J6</u>	0.186	0.500	1	03/28/2018 02:57	WG1090159
Bromomethane	U	<u>J0</u>	0.157	2.50	1	03/28/2018 02:57	WG1090159
Carbon tetrachloride	U	<u>J6</u>	0.159	0.500	1	03/28/2018 02:57	WG1090159
Chlorobenzene	U	<u>J6</u>	0.140	0.500	1	03/28/2018 02:57	WG1090159
Chlorodibromomethane	U	<u>J6</u>	0.128	0.500	1	03/28/2018 02:57	WG1090159
Chloroethane	8.18		0.141	2.50	1	03/28/2018 02:57	WG1090159
Chloroform	U	<u>J6</u>	0.0860	0.500	1	03/28/2018 02:57	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 02:57	WG1090159
2-Chlorotoluene	U	<u>J6</u>	0.111	0.500	1	03/28/2018 02:57	WG1090159
4-Chlorotoluene	U	<u>J6</u>	0.0972	0.500	1	03/28/2018 02:57	WG1090159
1,2-Dibromo-3-Chloropropane	U	<u>J6</u>	0.325	2.50	1	03/28/2018 02:57	WG1090159
1,2-Dibromoethane	U	<u>J6</u>	0.193	0.500	1	03/28/2018 02:57	WG1090159
Dibromomethane	U	<u>J6</u>	0.117	0.500	1	03/28/2018 02:57	WG1090159
1,2-Dichlorobenzene	U	<u>J6</u>	0.101	0.500	1	03/28/2018 02:57	WG1090159
1,3-Dichlorobenzene	U	<u>J6</u>	0.130	0.500	1	03/28/2018 02:57	WG1090159
1,4-Dichlorobenzene	U	<u>J6</u>	0.121	0.500	1	03/28/2018 02:57	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 02:57	WG1090159
1,1-Dichloroethane	0.550	<u>J6</u>	0.114	0.500	1	03/28/2018 02:57	WG1090159
1,2-Dichloroethane	U	<u>J6</u>	0.108	0.500	1	03/28/2018 02:57	WG1090159
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 02:57	WG1090159
cis-1,2-Dichloroethene	5.58	<u>J6</u>	0.0933	0.500	1	03/28/2018 02:57	WG1090159
trans-1,2-Dichloroethene	1.29	<u>J6</u>	0.152	0.500	1	03/28/2018 02:57	WG1090159
1,2-Dichloropropane	U	<u>J6</u>	0.190	0.500	1	03/28/2018 02:57	WG1090159
1,1-Dichloropropene	U	<u>J6</u>	0.128	0.500	1	03/28/2018 02:57	WG1090159
1,3-Dichloropropane	U	<u>J6</u>	0.147	1.00	1	03/28/2018 02:57	WG1090159
cis-1,3-Dichloropropene	U	<u>J6</u>	0.0976	0.500	1	03/28/2018 02:57	WG1090159
trans-1,3-Dichloropropene	U	<u>J6</u>	0.222	0.500	1	03/28/2018 02:57	WG1090159
trans-1,4-Dichloro-2-butene	U	<u>J6</u>	0.257	5.00	1	03/28/2018 02:57	WG1090159
2,2-Dichloropropane	U	<u>J6</u>	0.0929	0.500	1	03/28/2018 02:57	WG1090159
Hexachloro-1,3-butadiene	U	<u>J6</u>	0.157	1.00	1	03/28/2018 02:57	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 02:57	WG1090159
Methylene Chloride	U	<u>J6</u>	1.07	2.50	1	03/28/2018 02:57	WG1090159
1,1,1,2-Tetrachloroethane	U	<u>J6</u>	0.120	0.500	1	03/28/2018 02:57	WG1090159
1,1,2,2-Tetrachloroethane	U	<u>J6</u>	0.130	0.500	1	03/28/2018 02:57	WG1090159
1,1,2-Trichlorotrifluoroethane	U	<u>J6</u>	0.164	0.500	1	03/28/2018 02:57	WG1090159
Tetrachloroethene	0.203	<u>J J6</u>	0.199	0.500	1	03/28/2018 02:57	WG1090159
1,2,3-Trichlorobenzene	U	<u>J6</u>	0.164	0.500	1	03/28/2018 02:57	WG1090159
1,2,4-Trichlorobenzene	U	<u>J6</u>	0.355	0.500	1	03/28/2018 02:57	WG1090159
1,1,1-Trichloroethane	U	<u>J6</u>	0.0940	0.500	1	03/28/2018 02:57	WG1090159
1,1,2-Trichloroethane	U	<u>J6</u>	0.186	0.500	1	03/28/2018 02:57	WG1090159
Trichloroethene	0.261	<u>J</u>	0.153	0.500	1	03/28/2018 02:57	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 02:57	WG1090159
1,2,3-Trichloropropane	U	<u>J6</u>	0.247	2.50	1	03/28/2018 02:57	WG1090159
Vinyl acetate	U	<u>J6</u>	0.645	5.00	1	03/28/2018 02:57	WG1090159
Vinyl chloride	2.60		0.118	0.500	1	03/28/2018 02:57	WG1090159
(S) Toluene-d8	100			80.0-120		03/28/2018 02:57	WG1090159
(S) Dibromofluoromethane	96.3			76.0-123		03/28/2018 02:57	WG1090159
(S) 4-Bromofluorobenzene	101			80.0-120		03/28/2018 02:57	WG1090159

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	73700		1020	10000	10	03/28/2018 21:39	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	11600		58.2	200	20	03/27/2018 14:43	WG1089974
Ethane	U		4.07	13.0	1	03/27/2018 12:05	WG1089718
Ethene	191		4.26	13.0	1	03/27/2018 12:05	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 03:17	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 03:17	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 03:17	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 03:17	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/28/2018 03:17	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 03:17	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 03:17	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 03:17	WG1090159
Chloroethane	3.29		0.141	2.50	1	03/28/2018 03:17	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 03:17	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 03:17	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 03:17	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 03:17	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 03:17	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 03:17	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 03:17	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 03:17	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 03:17	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 03:17	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 03:17	WG1090159
1,1-Dichloroethane	0.879		0.114	0.500	1	03/28/2018 03:17	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 03:17	WG1090159
1,1-Dichloroethene	2.55		0.188	0.500	1	03/28/2018 03:17	WG1090159
cis-1,2-Dichloroethene	1730		4.66	25.0	50	03/30/2018 03:37	WG1090159
trans-1,2-Dichloroethene	5.20		0.152	0.500	1	03/28/2018 03:17	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 03:17	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 03:17	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 03:17	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 03:17	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 03:17	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 03:17	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 03:17	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 03:17	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 03:17	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 03:17	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 03:17	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 03:17	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 03:17	WG1090159
Tetrachloroethene	0.396	<u>J</u>	0.199	0.500	1	03/28/2018 03:17	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 03:17	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 03:17	WG1090159
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 03:17	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 03:17	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	2.19		0.153	0.500	1	03/28/2018 03:17	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 03:17	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 03:17	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 03:17	WG1090159
Vinyl chloride	211		5.90	25.0	50	03/30/2018 03:37	WG1090159
(S) Toluene-d8	96.8			80.0-120		03/30/2018 03:37	WG1090159
(S) Toluene-d8	102			80.0-120		03/28/2018 03:17	WG1090159
(S) Dibromofluoromethane	102			76.0-123		03/28/2018 03:17	WG1090159
(S) Dibromofluoromethane	93.7			76.0-123		03/30/2018 03:37	WG1090159
(S) 4-Bromofluorobenzene	97.8			80.0-120		03/30/2018 03:37	WG1090159
(S) 4-Bromofluorobenzene	101			80.0-120		03/28/2018 03:17	WG1090159

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	8760		102	1000	1	03/28/2018 21:50	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	372		2.91	10.0	1	03/27/2018 12:11	WG1089718
Ethane	U		4.07	13.0	1	03/27/2018 12:11	WG1089718
Ethene	U		4.26	13.0	1	03/27/2018 12:11	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 03:37	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 03:37	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 03:37	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 03:37	WG1090159
Bromomethane	U	<u>JO</u>	0.157	2.50	1	03/28/2018 03:37	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 03:37	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 03:37	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 03:37	WG1090159
Chloroethane	1.67	<u>J</u>	0.141	2.50	1	03/28/2018 03:37	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 03:37	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 03:37	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 03:37	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 03:37	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 03:37	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 03:37	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 03:37	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 03:37	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 03:37	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 03:37	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 03:37	WG1090159
1,1-Dichloroethane	5.42		0.114	0.500	1	03/28/2018 03:37	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 03:37	WG1090159
1,1-Dichloroethene	3.64		0.188	0.500	1	03/28/2018 03:37	WG1090159
cis-1,2-Dichloroethene	500		0.933	5.00	10	03/30/2018 23:15	WG1090159
trans-1,2-Dichloroethene	2.56		0.152	0.500	1	03/28/2018 03:37	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 03:37	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 03:37	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 03:37	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 03:37	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 03:37	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 03:37	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 03:37	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 03:37	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 03:37	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 03:37	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 03:37	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 03:37	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 03:37	WG1090159
Tetrachloroethene	36.0		0.199	0.500	1	03/28/2018 03:37	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 03:37	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 03:37	WG1090159
1,1,1-Trichloroethane	0.579		0.0940	0.500	1	03/28/2018 03:37	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 03:37	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	150		0.153	0.500	1	03/28/2018 03:37	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 03:37	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 03:37	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 03:37	WG1090159
Vinyl chloride	1.35	J	1.18	5.00	10	03/30/2018 03:57	WG1090159
(S) Toluene-d8	97.5			80.0-120		03/28/2018 03:37	WG1090159
(S) Toluene-d8	98.2			80.0-120		03/30/2018 03:57	WG1090159
(S) Toluene-d8	104			80.0-120		03/30/2018 23:15	WG1090159
(S) Dibromofluoromethane	93.5			76.0-123		03/30/2018 03:57	WG1090159
(S) Dibromofluoromethane	97.5			76.0-123		03/30/2018 23:15	WG1090159
(S) Dibromofluoromethane	97.7			76.0-123		03/28/2018 03:37	WG1090159
(S) 4-Bromofluorobenzene	98.4			80.0-120		03/30/2018 03:57	WG1090159
(S) 4-Bromofluorobenzene	96.3			80.0-120		03/30/2018 23:15	WG1090159
(S) 4-Bromofluorobenzene	102			80.0-120		03/28/2018 03:37	WG1090159

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 03:57	WG1090159
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 03:57	WG1090159
Bromochloromethane	U		0.145	0.500	1	03/28/2018 03:57	WG1090159
Bromoform	U		0.186	0.500	1	03/28/2018 03:57	WG1090159
Bromomethane	U	JO	0.157	2.50	1	03/28/2018 03:57	WG1090159
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 03:57	WG1090159
Chlorobenzene	U		0.140	0.500	1	03/28/2018 03:57	WG1090159
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 03:57	WG1090159
Chloroethane	U		0.141	2.50	1	03/28/2018 03:57	WG1090159
Chloroform	U		0.0860	0.500	1	03/28/2018 03:57	WG1090159
Chloromethane	U		0.153	1.25	1	03/28/2018 03:57	WG1090159
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 03:57	WG1090159
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 03:57	WG1090159
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 03:57	WG1090159
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 03:57	WG1090159
Dibromomethane	U		0.117	0.500	1	03/28/2018 03:57	WG1090159
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 03:57	WG1090159
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 03:57	WG1090159
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 03:57	WG1090159
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 03:57	WG1090159
1,1-Dichloroethane	0.232	J	0.114	0.500	1	03/28/2018 03:57	WG1090159
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 03:57	WG1090159
1,1-Dichloroethene	0.190	J	0.188	0.500	1	03/28/2018 03:57	WG1090159
cis-1,2-Dichloroethene	3.82		0.0933	0.500	1	03/30/2018 23:34	WG1090159
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 03:57	WG1090159
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 03:57	WG1090159
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 03:57	WG1090159
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 03:57	WG1090159
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 03:57	WG1090159
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 03:57	WG1090159
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 03:57	WG1090159
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 03:57	WG1090159
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 03:57	WG1090159
Iodomethane	U		0.377	10.0	1	03/28/2018 03:57	WG1090159
Methylene Chloride	U		1.07	2.50	1	03/28/2018 03:57	WG1090159
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 03:57	WG1090159
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 03:57	WG1090159
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 03:57	WG1090159
Tetrachloroethene	99.7		0.199	0.500	1	03/28/2018 03:57	WG1090159
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 03:57	WG1090159
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 03:57	WG1090159
1,1,1-Trichloroethane	0.819		0.0940	0.500	1	03/28/2018 03:57	WG1090159
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 03:57	WG1090159
Trichloroethene	12.6		0.153	0.500	1	03/28/2018 03:57	WG1090159
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 03:57	WG1090159
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 03:57	WG1090159
Vinyl acetate	U		0.645	5.00	1	03/28/2018 03:57	WG1090159
Vinyl chloride	U		0.118	0.500	1	03/28/2018 03:57	WG1090159
(S) Toluene-d8	103			80.0-120		03/30/2018 23:34	WG1090159
(S) Toluene-d8	100			80.0-120		03/28/2018 03:57	WG1090159
(S) Dibromofluoromethane	96.4			76.0-123		03/28/2018 03:57	WG1090159
(S) Dibromofluoromethane	98.2			76.0-123		03/30/2018 23:34	WG1090159
(S) 4-Bromofluorobenzene	94.3			80.0-120		03/30/2018 23:34	WG1090159
(S) 4-Bromofluorobenzene	99.4			80.0-120		03/28/2018 03:57	WG1090159

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 13:02	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 13:02	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 13:02	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 13:02	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 13:02	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 13:02	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 13:02	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 13:02	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 13:02	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 13:02	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 13:02	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 13:02	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 13:02	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 13:02	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 13:02	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 13:02	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 13:02	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 13:02	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 13:02	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 13:02	WG1090417
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 13:02	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 13:02	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 13:02	WG1090417
cis-1,2-Dichloroethene	1.43		0.0933	0.500	1	03/28/2018 13:02	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 13:02	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 13:02	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 13:02	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 13:02	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 13:02	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 13:02	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 13:02	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 13:02	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 13:02	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 13:02	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 13:02	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 13:02	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 13:02	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 13:02	WG1090417
Tetrachloroethene	1.47		0.199	0.500	1	03/28/2018 13:02	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 13:02	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 13:02	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 13:02	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 13:02	WG1090417
Trichloroethene	0.818		0.153	0.500	1	03/28/2018 13:02	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 13:02	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 13:02	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 13:02	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 13:02	WG1090417
(S) Toluene-d8	103			80.0-120		03/28/2018 13:02	WG1090417
(S) Dibromofluoromethane	99.3			76.0-123		03/28/2018 13:02	WG1090417
(S) 4-Bromofluorobenzene	94.9			80.0-120		03/28/2018 13:02	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	29900		102	1000	1	03/28/2018 22:36	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	9960		58.2	200	20	03/27/2018 14:45	WG1089974
Ethane	28.7		4.07	13.0	1	03/27/2018 12:13	WG1089718
Ethene	32.3		4.26	13.0	1	03/27/2018 12:13	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 13:22	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 13:22	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 13:22	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 13:22	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 13:22	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 13:22	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 13:22	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 13:22	WG1090417
Chloroethane	3.90		0.141	2.50	1	03/28/2018 13:22	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 13:22	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 13:22	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 13:22	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 13:22	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 13:22	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 13:22	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 13:22	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 13:22	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 13:22	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 13:22	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 13:22	WG1090417
1,1-Dichloroethane	59.0		0.114	0.500	1	03/28/2018 13:22	WG1090417
1,2-Dichloroethane	0.225	<u>J</u>	0.108	0.500	1	03/28/2018 13:22	WG1090417
1,1-Dichloroethene	31.4		0.188	0.500	1	03/28/2018 13:22	WG1090417
cis-1,2-Dichloroethene	2430		9.33	50.0	100	03/29/2018 11:39	WG1090417
trans-1,2-Dichloroethene	11.2		0.152	0.500	1	03/28/2018 13:22	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 13:22	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 13:22	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 13:22	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 13:22	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 13:22	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 13:22	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 13:22	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 13:22	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 13:22	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 13:22	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 13:22	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 13:22	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 13:22	WG1090417
Tetrachloroethene	1250		19.9	50.0	100	03/29/2018 11:39	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 13:22	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 13:22	WG1090417
1,1,1-Trichloroethane	17.0		0.0940	0.500	1	03/28/2018 13:22	WG1090417
1,1,2-Trichloroethane	0.339	<u>J</u>	0.186	0.500	1	03/28/2018 13:22	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Trichloroethene	1340		15.3	50.0	100	03/29/2018 11:39	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 13:22	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 13:22	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 13:22	WG1090417
Vinyl chloride	413		11.8	50.0	100	03/29/2018 11:39	WG1090417
(S) Toluene-d8	106			80.0-120		03/29/2018 11:39	WG1090417
(S) Toluene-d8	102			80.0-120		03/28/2018 13:22	WG1090417
(S) Dibromofluoromethane	108			76.0-123		03/29/2018 11:39	WG1090417
(S) Dibromofluoromethane	98.9			76.0-123		03/28/2018 13:22	WG1090417
(S) 4-Bromofluorobenzene	113			80.0-120		03/29/2018 11:39	WG1090417
(S) 4-Bromofluorobenzene	93.6			80.0-120		03/28/2018 13:22	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Bromobenzene	U		0.133	0.500	1	03/28/2018 13:41	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 13:41	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 13:41	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 13:41	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 13:41	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 13:41	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 13:41	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 13:41	WG1090417
Chloroethane	4.26		0.141	2.50	1	03/28/2018 13:41	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 13:41	WG1090417
Chloromethane	U	JO	0.153	1.25	1	03/28/2018 13:41	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 13:41	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 13:41	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 13:41	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 13:41	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 13:41	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 13:41	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 13:41	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 13:41	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 13:41	WG1090417
1,1-Dichloroethane	58.2		0.114	0.500	1	03/28/2018 13:41	WG1090417
1,2-Dichloroethane	0.242	J	0.108	0.500	1	03/28/2018 13:41	WG1090417
1,1-Dichloroethene	30.7		0.188	0.500	1	03/28/2018 13:41	WG1090417
cis-1,2-Dichloroethene	2470		9.33	50.0	100	03/29/2018 11:58	WG1090417
trans-1,2-Dichloroethene	10.8		0.152	0.500	1	03/28/2018 13:41	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 13:41	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 13:41	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 13:41	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 13:41	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 13:41	WG1090417
trans-1,4-Dichloro-2-butene	U	JO	0.257	5.00	1	03/28/2018 13:41	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 13:41	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 13:41	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 13:41	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 13:41	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 13:41	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 13:41	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 13:41	WG1090417
Tetrachloroethene	996		19.9	50.0	100	03/29/2018 11:58	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 13:41	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 13:41	WG1090417
1,1,1-Trichloroethane	17.0		0.0940	0.500	1	03/28/2018 13:41	WG1090417
1,1,2-Trichloroethane	0.277	J	0.186	0.500	1	03/28/2018 13:41	WG1090417
Trichloroethene	1180		15.3	50.0	100	03/29/2018 11:58	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 13:41	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 13:41	WG1090417
Vinyl acetate	U	JO	0.645	5.00	1	03/28/2018 13:41	WG1090417
Vinyl chloride	412		11.8	50.0	100	03/29/2018 11:58	WG1090417
(S) Toluene-d8	103			80.0-120		03/29/2018 11:58	WG1090417
(S) Toluene-d8	104			80.0-120		03/28/2018 13:41	WG1090417
(S) Dibromofluoromethane	102			76.0-123		03/28/2018 13:41	WG1090417
(S) Dibromofluoromethane	108			76.0-123		03/29/2018 11:58	WG1090417
(S) 4-Bromofluorobenzene	94.3			80.0-120		03/28/2018 13:41	WG1090417
(S) 4-Bromofluorobenzene	113			80.0-120		03/29/2018 11:58	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 14:00	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 14:00	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 14:00	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 14:00	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 14:00	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 14:00	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 14:00	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 14:00	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 14:00	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 14:00	WG1090417
Chloromethane	U	JO	0.153	1.25	1	03/28/2018 14:00	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 14:00	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 14:00	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 14:00	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 14:00	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 14:00	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 14:00	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 14:00	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 14:00	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 14:00	WG1090417
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 14:00	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 14:00	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 14:00	WG1090417
cis-1,2-Dichloroethene	0.228	J	0.0933	0.500	1	03/29/2018 12:17	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 14:00	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 14:00	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 14:00	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 14:00	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 14:00	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 14:00	WG1090417
trans-1,4-Dichloro-2-butene	U	JO	0.257	5.00	1	03/28/2018 14:00	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 14:00	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 14:00	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 14:00	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 14:00	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 14:00	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 14:00	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 14:00	WG1090417
Tetrachloroethene	U		0.199	0.500	1	03/29/2018 12:17	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 14:00	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 14:00	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 14:00	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 14:00	WG1090417
Trichloroethene	U		0.153	0.500	1	03/29/2018 12:17	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 14:00	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 14:00	WG1090417
Vinyl acetate	U	JO	0.645	5.00	1	03/28/2018 14:00	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/29/2018 12:17	WG1090417
(S) Toluene-d8	98.6			80.0-120		03/28/2018 14:00	WG1090417
(S) Toluene-d8	104			80.0-120		03/29/2018 12:17	WG1090417
(S) Dibromofluoromethane	103			76.0-123		03/28/2018 14:00	WG1090417
(S) Dibromofluoromethane	105			76.0-123		03/29/2018 12:17	WG1090417
(S) 4-Bromofluorobenzene	110			80.0-120		03/29/2018 12:17	WG1090417
(S) 4-Bromofluorobenzene	93.8			80.0-120		03/28/2018 14:00	WG1090417

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 14:20	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 14:20	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 14:20	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 14:20	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 14:20	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 14:20	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 14:20	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 14:20	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 14:20	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 14:20	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 14:20	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 14:20	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 14:20	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 14:20	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 14:20	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 14:20	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 14:20	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 14:20	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 14:20	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 14:20	WG1090417
1,1-Dichloroethane	0.303	<u>J</u>	0.114	0.500	1	03/28/2018 14:20	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 14:20	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 14:20	WG1090417
cis-1,2-Dichloroethene	5.65		0.0933	0.500	1	03/29/2018 12:37	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 14:20	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 14:20	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 14:20	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 14:20	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 14:20	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 14:20	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 14:20	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 14:20	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 14:20	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 14:20	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 14:20	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 14:20	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 14:20	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 14:20	WG1090417
Tetrachloroethene	1.38		0.199	0.500	1	03/29/2018 12:37	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 14:20	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 14:20	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 14:20	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 14:20	WG1090417
Trichloroethene	0.903		0.153	0.500	1	03/29/2018 12:37	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 14:20	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 14:20	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 14:20	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 14:20	WG1090417
(S) Toluene-d8	101			80.0-120		03/29/2018 12:37	WG1090417
(S) Toluene-d8	105			80.0-120		03/28/2018 14:20	WG1090417
(S) Dibromofluoromethane	103			76.0-123		03/28/2018 14:20	WG1090417
(S) Dibromofluoromethane	110			76.0-123		03/29/2018 12:37	WG1090417
(S) 4-Bromofluorobenzene	96.7			80.0-120		03/28/2018 14:20	WG1090417
(S) 4-Bromofluorobenzene	109			80.0-120		03/29/2018 12:37	WG1090417

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 14:39	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 14:39	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 14:39	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 14:39	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 14:39	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 14:39	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 14:39	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 14:39	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 14:39	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 14:39	WG1090417
Chloromethane	U	JO	0.153	1.25	1	03/28/2018 14:39	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 14:39	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 14:39	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 14:39	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 14:39	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 14:39	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 14:39	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 14:39	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 14:39	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 14:39	WG1090417
1,1-Dichloroethane	2.07		0.114	0.500	1	03/28/2018 14:39	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 14:39	WG1090417
1,1-Dichloroethene	0.643		0.188	0.500	1	03/28/2018 14:39	WG1090417
cis-1,2-Dichloroethene	55.1		0.0933	0.500	1	03/28/2018 14:39	WG1090417
trans-1,2-Dichloroethene	0.391	J	0.152	0.500	1	03/28/2018 14:39	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 14:39	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 14:39	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 14:39	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 14:39	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 14:39	WG1090417
trans-1,4-Dichloro-2-butene	U	JO	0.257	5.00	1	03/28/2018 14:39	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 14:39	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 14:39	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 14:39	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 14:39	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 14:39	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 14:39	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 14:39	WG1090417
Tetrachloroethene	22.5		0.199	0.500	1	03/28/2018 14:39	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 14:39	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 14:39	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 14:39	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 14:39	WG1090417
Trichloroethene	16.5		0.153	0.500	1	03/28/2018 14:39	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 14:39	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 14:39	WG1090417
Vinyl acetate	U	JO	0.645	5.00	1	03/28/2018 14:39	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 14:39	WG1090417
(S) Toluene-d8	102			80.0-120		03/28/2018 14:39	WG1090417
(S) Dibromofluoromethane	103			76.0-123		03/28/2018 14:39	WG1090417
(S) 4-Bromofluorobenzene	93.3			80.0-120		03/28/2018 14:39	WG1090417

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 14:58	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 14:58	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 14:58	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 14:58	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 14:58	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 14:58	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 14:58	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 14:58	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 14:58	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 14:58	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 14:58	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 14:58	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 14:58	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 14:58	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 14:58	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 14:58	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 14:58	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 14:58	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 14:58	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 14:58	WG1090417
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 14:58	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 14:58	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 14:58	WG1090417
cis-1,2-Dichloroethene	0.661		0.0933	0.500	1	03/28/2018 14:58	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 14:58	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 14:58	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 14:58	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 14:58	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 14:58	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 14:58	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 14:58	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 14:58	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 14:58	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 14:58	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 14:58	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 14:58	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 14:58	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 14:58	WG1090417
Tetrachloroethene	0.504		0.199	0.500	1	03/28/2018 14:58	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 14:58	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 14:58	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 14:58	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 14:58	WG1090417
Trichloroethene	0.477	<u>J</u>	0.153	0.500	1	03/28/2018 14:58	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 14:58	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 14:58	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 14:58	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 14:58	WG1090417
(S) Toluene-d8	100			80.0-120		03/28/2018 14:58	WG1090417
(S) Dibromofluoromethane	105			76.0-123		03/28/2018 14:58	WG1090417
(S) 4-Bromofluorobenzene	93.0			80.0-120		03/28/2018 14:58	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 15:17	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 15:17	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 15:17	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 15:17	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 15:17	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 15:17	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 15:17	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 15:17	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 15:17	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 15:17	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 15:17	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 15:17	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 15:17	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 15:17	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 15:17	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 15:17	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 15:17	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 15:17	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 15:17	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 15:17	WG1090417
1,1-Dichloroethane	0.330	<u>J</u>	0.114	0.500	1	03/28/2018 15:17	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 15:17	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 15:17	WG1090417
cis-1,2-Dichloroethene	9.59		0.0933	0.500	1	03/28/2018 15:17	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 15:17	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 15:17	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 15:17	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 15:17	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 15:17	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 15:17	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 15:17	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 15:17	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 15:17	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 15:17	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 15:17	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 15:17	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 15:17	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 15:17	WG1090417
Tetrachloroethene	1.76		0.199	0.500	1	03/28/2018 15:17	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 15:17	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 15:17	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 15:17	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 15:17	WG1090417
Trichloroethene	7.79		0.153	0.500	1	03/28/2018 15:17	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 15:17	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 15:17	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 15:17	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 15:17	WG1090417
(S) Toluene-d8	99.6			80.0-120		03/28/2018 15:17	WG1090417
(S) Dibromofluoromethane	104			76.0-123		03/28/2018 15:17	WG1090417
(S) 4-Bromofluorobenzene	95.3			80.0-120		03/28/2018 15:17	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 15:37	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 15:37	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 15:37	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 15:37	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 15:37	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 15:37	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 15:37	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 15:37	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 15:37	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 15:37	WG1090417
Chloromethane	U	JO	0.153	1.25	1	03/28/2018 15:37	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 15:37	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 15:37	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 15:37	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 15:37	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 15:37	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 15:37	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 15:37	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 15:37	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 15:37	WG1090417
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 15:37	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 15:37	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 15:37	WG1090417
cis-1,2-Dichloroethene	0.207	J	0.0933	0.500	1	03/28/2018 15:37	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 15:37	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 15:37	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 15:37	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 15:37	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 15:37	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 15:37	WG1090417
trans-1,4-Dichloro-2-butene	U	JO	0.257	5.00	1	03/28/2018 15:37	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 15:37	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 15:37	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 15:37	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 15:37	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 15:37	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 15:37	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 15:37	WG1090417
Tetrachloroethene	0.402	J	0.199	0.500	1	03/28/2018 15:37	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 15:37	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 15:37	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 15:37	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 15:37	WG1090417
Trichloroethene	0.215	J	0.153	0.500	1	03/28/2018 15:37	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 15:37	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 15:37	WG1090417
Vinyl acetate	U	JO	0.645	5.00	1	03/28/2018 15:37	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 15:37	WG1090417
(S) Toluene-d8	99.8			80.0-120		03/28/2018 15:37	WG1090417
(S) Dibromofluoromethane	103			76.0-123		03/28/2018 15:37	WG1090417
(S) 4-Bromofluorobenzene	91.7			80.0-120		03/28/2018 15:37	WG1090417

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	734	<u>BJ</u>	102	1000	1	03/28/2018 22:48	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	13.7		2.91	10.0	1	03/27/2018 12:18	WG1089718
Ethane	U		4.07	13.0	1	03/27/2018 12:18	WG1089718
Ethene	U		4.26	13.0	1	03/27/2018 12:18	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 15:56	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 15:56	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 15:56	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 15:56	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 15:56	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 15:56	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 15:56	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 15:56	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 15:56	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 15:56	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 15:56	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 15:56	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 15:56	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 15:56	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 15:56	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 15:56	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 15:56	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 15:56	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 15:56	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 15:56	WG1090417
1,1-Dichloroethane	1.42		0.114	0.500	1	03/28/2018 15:56	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 15:56	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 15:56	WG1090417
cis-1,2-Dichloroethene	13.5		0.0933	0.500	1	03/28/2018 15:56	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 15:56	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 15:56	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 15:56	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 15:56	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 15:56	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 15:56	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 15:56	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 15:56	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 15:56	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 15:56	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 15:56	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 15:56	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 15:56	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 15:56	WG1090417
Tetrachloroethene	19.1		0.199	0.500	1	03/28/2018 15:56	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 15:56	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 15:56	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 15:56	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 15:56	WG1090417

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	10.2		0.153	0.500	1	03/28/2018 15:56	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 15:56	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 15:56	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 15:56	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 15:56	WG1090417
(S) Toluene-d8	104			80.0-120		03/28/2018 15:56	WG1090417
(S) Dibromofluoromethane	101			76.0-123		03/28/2018 15:56	WG1090417
(S) 4-Bromofluorobenzene	92.0			80.0-120		03/28/2018 15:56	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 16:15	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 16:15	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 16:15	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 16:15	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 16:15	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 16:15	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 16:15	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 16:15	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 16:15	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 16:15	WG1090417
Chloromethane	U	JO	0.153	1.25	1	03/28/2018 16:15	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 16:15	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 16:15	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 16:15	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 16:15	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 16:15	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 16:15	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 16:15	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 16:15	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 16:15	WG1090417
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 16:15	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 16:15	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 16:15	WG1090417
cis-1,2-Dichloroethene	0.259	J	0.0933	0.500	1	03/28/2018 16:15	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 16:15	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 16:15	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 16:15	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 16:15	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 16:15	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 16:15	WG1090417
trans-1,4-Dichloro-2-butene	U	JO	0.257	5.00	1	03/28/2018 16:15	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 16:15	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 16:15	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 16:15	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 16:15	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 16:15	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 16:15	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 16:15	WG1090417
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 16:15	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 16:15	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 16:15	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 16:15	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 16:15	WG1090417
Trichloroethene	U		0.153	0.500	1	03/28/2018 16:15	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 16:15	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 16:15	WG1090417
Vinyl acetate	U	JO	0.645	5.00	1	03/28/2018 16:15	WG1090417
Vinyl chloride	0.199	J	0.118	0.500	1	03/28/2018 16:15	WG1090417
(S) Toluene-d8	102			80.0-120		03/28/2018 16:15	WG1090417
(S) Dibromofluoromethane	101			76.0-123		03/28/2018 16:15	WG1090417
(S) 4-Bromofluorobenzene	94.2			80.0-120		03/28/2018 16:15	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 16:35	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 16:35	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 16:35	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 16:35	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 16:35	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 16:35	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 16:35	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 16:35	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 16:35	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 16:35	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 16:35	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 16:35	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 16:35	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 16:35	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 16:35	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 16:35	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 16:35	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 16:35	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 16:35	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 16:35	WG1090417
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 16:35	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 16:35	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 16:35	WG1090417
cis-1,2-Dichloroethene	0.245	<u>J</u>	0.0933	0.500	1	03/28/2018 16:35	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 16:35	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 16:35	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 16:35	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 16:35	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 16:35	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 16:35	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 16:35	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 16:35	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 16:35	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 16:35	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 16:35	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 16:35	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 16:35	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 16:35	WG1090417
Tetrachloroethene	0.248	<u>J</u>	0.199	0.500	1	03/28/2018 16:35	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 16:35	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 16:35	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 16:35	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 16:35	WG1090417
Trichloroethene	U		0.153	0.500	1	03/28/2018 16:35	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 16:35	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 16:35	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 16:35	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 16:35	WG1090417
(S) Toluene-d8	104			80.0-120		03/28/2018 16:35	WG1090417
(S) Dibromofluoromethane	102			76.0-123		03/28/2018 16:35	WG1090417
(S) 4-Bromofluorobenzene	93.6			80.0-120		03/28/2018 16:35	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Wet Chemistry by Method 9060A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
TOC (Total Organic Carbon)	5840		102	1000	1	03/28/2018 22:59	WG1090261

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Methane	6010		2.91	10.0	1	03/27/2018 12:23	WG1089718
Ethane	U		4.07	13.0	1	03/27/2018 12:23	WG1089718
Ethene	U		4.26	13.0	1	03/27/2018 12:23	WG1089718

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 16:54	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 16:54	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 16:54	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 16:54	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 16:54	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 16:54	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 16:54	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 16:54	WG1090417
Chloroethane	0.633	J	0.141	2.50	1	03/28/2018 16:54	WG1090417
Chloroform	0.149	J	0.0860	0.500	1	03/28/2018 16:54	WG1090417
Chloromethane	U	JO	0.153	1.25	1	03/28/2018 16:54	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 16:54	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 16:54	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 16:54	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 16:54	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 16:54	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 16:54	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 16:54	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 16:54	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 16:54	WG1090417
1,1-Dichloroethane	4.85		0.114	0.500	1	03/28/2018 16:54	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 16:54	WG1090417
1,1-Dichloroethene	1.35		0.188	0.500	1	03/28/2018 16:54	WG1090417
cis-1,2-Dichloroethene	157		0.0933	0.500	1	03/28/2018 16:54	WG1090417
trans-1,2-Dichloroethene	1.85		0.152	0.500	1	03/28/2018 16:54	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 16:54	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 16:54	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 16:54	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 16:54	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 16:54	WG1090417
trans-1,4-Dichloro-2-butene	U	JO	0.257	5.00	1	03/28/2018 16:54	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 16:54	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 16:54	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 16:54	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 16:54	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 16:54	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 16:54	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 16:54	WG1090417
Tetrachloroethene	108		0.199	0.500	1	03/28/2018 16:54	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 16:54	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 16:54	WG1090417
1,1,1-Trichloroethane	1.20		0.0940	0.500	1	03/28/2018 16:54	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 16:54	WG1090417

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Trichloroethene	190		1.53	5.00	10	03/29/2018 12:56	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 16:54	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 16:54	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 16:54	WG1090417
Vinyl chloride	1.75		0.118	0.500	1	03/28/2018 16:54	WG1090417
(S) Toluene-d8	99.1			80.0-120		03/28/2018 16:54	WG1090417
(S) Toluene-d8	104			80.0-120		03/29/2018 12:56	WG1090417
(S) Dibromofluoromethane	109			76.0-123		03/29/2018 12:56	WG1090417
(S) Dibromofluoromethane	104			76.0-123		03/28/2018 16:54	WG1090417
(S) 4-Bromofluorobenzene	112			80.0-120		03/29/2018 12:56	WG1090417
(S) 4-Bromofluorobenzene	95.5			80.0-120		03/28/2018 16:54	WG1090417

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 17:13	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 17:13	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 17:13	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 17:13	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 17:13	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 17:13	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 17:13	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 17:13	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 17:13	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 17:13	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 17:13	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 17:13	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 17:13	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 17:13	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 17:13	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 17:13	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 17:13	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 17:13	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 17:13	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 17:13	WG1090417
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 17:13	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 17:13	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 17:13	WG1090417
cis-1,2-Dichloroethene	U		0.0933	0.500	1	03/28/2018 17:13	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 17:13	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 17:13	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 17:13	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 17:13	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 17:13	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 17:13	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 17:13	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 17:13	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 17:13	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 17:13	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 17:13	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 17:13	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 17:13	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 17:13	WG1090417
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 17:13	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 17:13	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 17:13	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 17:13	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 17:13	WG1090417
Trichloroethene	U		0.153	0.500	1	03/29/2018 13:16	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 17:13	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 17:13	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 17:13	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 17:13	WG1090417
(S) Toluene-d8	100			80.0-120		03/28/2018 17:13	WG1090417
(S) Toluene-d8	103			80.0-120		03/29/2018 13:16	WG1090417
(S) Dibromofluoromethane	104			76.0-123		03/28/2018 17:13	WG1090417
(S) Dibromofluoromethane	108			76.0-123		03/29/2018 13:16	WG1090417
(S) 4-Bromofluorobenzene	111			80.0-120		03/29/2018 13:16	WG1090417
(S) 4-Bromofluorobenzene	97.6			80.0-120		03/28/2018 17:13	WG1090417

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc



Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Copper	370		5.30	10.0	1	03/27/2018 13:26	WG1089400

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 17:32	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 17:32	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 17:32	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 17:32	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 17:32	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 17:32	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 17:32	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 17:32	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 17:32	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 17:32	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 17:32	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 17:32	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 17:32	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 17:32	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 17:32	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 17:32	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 17:32	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 17:32	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 17:32	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 17:32	WG1090417
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 17:32	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 17:32	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 17:32	WG1090417
cis-1,2-Dichloroethene	U		0.0933	0.500	1	03/28/2018 17:32	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 17:32	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 17:32	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 17:32	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 17:32	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 17:32	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 17:32	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 17:32	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 17:32	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 17:32	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 17:32	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 17:32	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 17:32	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 17:32	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 17:32	WG1090417
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 17:32	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 17:32	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 17:32	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 17:32	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 17:32	WG1090417
Trichloroethene	U		0.153	0.500	1	03/29/2018 13:35	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 17:32	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 17:32	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 17:32	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 17:32	WG1090417
(S) Toluene-d8	97.9			80.0-120		03/28/2018 17:32	WG1090417
(S) Toluene-d8	103			80.0-120		03/29/2018 13:35	WG1090417

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
(S) Dibromofluoromethane	102			76.0-123		03/28/2018 17:32	WG1090417
(S) Dibromofluoromethane	109			76.0-123		03/29/2018 13:35	WG1090417
(S) 4-Bromofluorobenzene	92.8			80.0-120		03/28/2018 17:32	WG1090417
(S) 4-Bromofluorobenzene	109			80.0-120		03/29/2018 13:35	WG1090417

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 03/20/18 15:10

L980397

Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Copper	2480		5.30	10.0	1	03/27/2018 13:30	WG1089400

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 17:51	WG1090417
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 17:51	WG1090417
Bromochloromethane	U		0.145	0.500	1	03/28/2018 17:51	WG1090417
Bromoform	U		0.186	0.500	1	03/28/2018 17:51	WG1090417
Bromomethane	U		0.157	2.50	1	03/28/2018 17:51	WG1090417
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 17:51	WG1090417
Chlorobenzene	U		0.140	0.500	1	03/28/2018 17:51	WG1090417
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 17:51	WG1090417
Chloroethane	U		0.141	2.50	1	03/28/2018 17:51	WG1090417
Chloroform	U		0.0860	0.500	1	03/28/2018 17:51	WG1090417
Chloromethane	U	<u>JO</u>	0.153	1.25	1	03/28/2018 17:51	WG1090417
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 17:51	WG1090417
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 17:51	WG1090417
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	03/28/2018 17:51	WG1090417
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 17:51	WG1090417
Dibromomethane	U		0.117	0.500	1	03/28/2018 17:51	WG1090417
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 17:51	WG1090417
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 17:51	WG1090417
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 17:51	WG1090417
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 17:51	WG1090417
1,1-Dichloroethane	3.70		0.114	0.500	1	03/28/2018 17:51	WG1090417
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 17:51	WG1090417
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 17:51	WG1090417
cis-1,2-Dichloroethene	5.88		0.0933	0.500	1	03/28/2018 17:51	WG1090417
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 17:51	WG1090417
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 17:51	WG1090417
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 17:51	WG1090417
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 17:51	WG1090417
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 17:51	WG1090417
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 17:51	WG1090417
trans-1,4-Dichloro-2-butene	U	<u>JO</u>	0.257	5.00	1	03/28/2018 17:51	WG1090417
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 17:51	WG1090417
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 17:51	WG1090417
Iodomethane	U		0.377	10.0	1	03/28/2018 17:51	WG1090417
Methylene Chloride	U		1.07	2.50	1	03/28/2018 17:51	WG1090417
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 17:51	WG1090417
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 17:51	WG1090417
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 17:51	WG1090417
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 17:51	WG1090417
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 17:51	WG1090417
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 17:51	WG1090417
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 17:51	WG1090417
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 17:51	WG1090417
Trichloroethene	U		0.153	0.500	1	03/29/2018 13:55	WG1090417
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 17:51	WG1090417
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 17:51	WG1090417
Vinyl acetate	U	<u>JO</u>	0.645	5.00	1	03/28/2018 17:51	WG1090417
Vinyl chloride	U		0.118	0.500	1	03/28/2018 17:51	WG1090417
(S) Toluene-d8	103			80.0-120		03/28/2018 17:51	WG1090417
(S) Toluene-d8	103			80.0-120		03/29/2018 13:55	WG1090417

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
(S) Dibromofluoromethane	105			76.0-123		03/28/2018 17:51	WG1090417
(S) Dibromofluoromethane	108			76.0-123		03/29/2018 13:55	WG1090417
(S) 4-Bromofluorobenzene	96.3			80.0-120		03/28/2018 17:51	WG1090417
(S) 4-Bromofluorobenzene	113			80.0-120		03/29/2018 13:55	WG1090417

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 15:50	WG1090423
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 15:50	WG1090423
Bromochloromethane	U		0.145	0.500	1	03/28/2018 15:50	WG1090423
Bromoform	U		0.186	0.500	1	03/28/2018 15:50	WG1090423
Bromomethane	U		0.157	2.50	1	03/28/2018 15:50	WG1090423
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 15:50	WG1090423
Chlorobenzene	U		0.140	0.500	1	03/28/2018 15:50	WG1090423
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 15:50	WG1090423
Chloroethane	U		0.141	2.50	1	03/28/2018 15:50	WG1090423
Chloroform	U		0.0860	0.500	1	03/28/2018 15:50	WG1090423
Chloromethane	U		0.153	1.25	1	03/28/2018 15:50	WG1090423
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 15:50	WG1090423
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 15:50	WG1090423
1,2-Dibromo-3-Chloropropane	U	J4	0.325	2.50	1	03/28/2018 15:50	WG1090423
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 15:50	WG1090423
Dibromomethane	U		0.117	0.500	1	03/28/2018 15:50	WG1090423
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 15:50	WG1090423
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 15:50	WG1090423
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 15:50	WG1090423
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 15:50	WG1090423
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 15:50	WG1090423
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 15:50	WG1090423
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 15:50	WG1090423
cis-1,2-Dichloroethene	U		0.0933	0.500	1	03/28/2018 15:50	WG1090423
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 15:50	WG1090423
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 15:50	WG1090423
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 15:50	WG1090423
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 15:50	WG1090423
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 15:50	WG1090423
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 15:50	WG1090423
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 15:50	WG1090423
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 15:50	WG1090423
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 15:50	WG1090423
Iodomethane	U	JO	0.377	10.0	1	03/28/2018 15:50	WG1090423
Methylene Chloride	U		1.07	2.50	1	03/28/2018 15:50	WG1090423
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 15:50	WG1090423
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 15:50	WG1090423
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 15:50	WG1090423
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 15:50	WG1090423
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 15:50	WG1090423
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 15:50	WG1090423
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 15:50	WG1090423
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 15:50	WG1090423
Trichloroethene	U		0.153	0.500	1	03/28/2018 15:50	WG1090423
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 15:50	WG1090423
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 15:50	WG1090423
Vinyl acetate	U	J4	0.645	5.00	1	03/28/2018 15:50	WG1090423
Vinyl chloride	U		0.118	0.500	1	03/28/2018 15:50	WG1090423
(S) Toluene-d8	106			80.0-120		03/28/2018 15:50	WG1090423
(S) Dibromofluoromethane	98.2			76.0-123		03/28/2018 15:50	WG1090423
(S) 4-Bromofluorobenzene	106			80.0-120		03/28/2018 15:50	WG1090423

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 16:10	WG1090423
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 16:10	WG1090423
Bromochloromethane	U		0.145	0.500	1	03/28/2018 16:10	WG1090423
Bromoform	U		0.186	0.500	1	03/28/2018 16:10	WG1090423
Bromomethane	U		0.157	2.50	1	03/28/2018 16:10	WG1090423
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 16:10	WG1090423
Chlorobenzene	U		0.140	0.500	1	03/28/2018 16:10	WG1090423
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 16:10	WG1090423
Chloroethane	U		0.141	2.50	1	03/28/2018 16:10	WG1090423
Chloroform	0.156	J	0.0860	0.500	1	03/28/2018 16:10	WG1090423
Chloromethane	U		0.153	1.25	1	03/28/2018 16:10	WG1090423
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 16:10	WG1090423
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 16:10	WG1090423
1,2-Dibromo-3-Chloropropane	U	J4	0.325	2.50	1	03/28/2018 16:10	WG1090423
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 16:10	WG1090423
Dibromomethane	U		0.117	0.500	1	03/28/2018 16:10	WG1090423
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 16:10	WG1090423
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 16:10	WG1090423
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 16:10	WG1090423
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 16:10	WG1090423
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 16:10	WG1090423
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 16:10	WG1090423
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 16:10	WG1090423
cis-1,2-Dichloroethene	U		0.0933	0.500	1	03/28/2018 16:10	WG1090423
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 16:10	WG1090423
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 16:10	WG1090423
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 16:10	WG1090423
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 16:10	WG1090423
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 16:10	WG1090423
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 16:10	WG1090423
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 16:10	WG1090423
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 16:10	WG1090423
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 16:10	WG1090423
Iodomethane	U	JO	0.377	10.0	1	03/28/2018 16:10	WG1090423
Methylene Chloride	U		1.07	2.50	1	03/28/2018 16:10	WG1090423
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 16:10	WG1090423
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 16:10	WG1090423
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 16:10	WG1090423
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 16:10	WG1090423
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 16:10	WG1090423
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 16:10	WG1090423
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 16:10	WG1090423
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 16:10	WG1090423
Trichloroethene	U		0.153	0.500	1	03/28/2018 16:10	WG1090423
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 16:10	WG1090423
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 16:10	WG1090423
Vinyl acetate	U	J4	0.645	5.00	1	03/28/2018 16:10	WG1090423
Vinyl chloride	U		0.118	0.500	1	03/28/2018 16:10	WG1090423
(S) Toluene-d8	103			80.0-120		03/28/2018 16:10	WG1090423
(S) Dibromofluoromethane	97.3			76.0-123		03/28/2018 16:10	WG1090423
(S) 4-Bromofluorobenzene	109			80.0-120		03/28/2018 16:10	WG1090423

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 16:30	WG1090423
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 16:30	WG1090423
Bromochloromethane	U		0.145	0.500	1	03/28/2018 16:30	WG1090423
Bromoform	U		0.186	0.500	1	03/28/2018 16:30	WG1090423
Bromomethane	U		0.157	2.50	1	03/28/2018 16:30	WG1090423
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 16:30	WG1090423
Chlorobenzene	U		0.140	0.500	1	03/28/2018 16:30	WG1090423
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 16:30	WG1090423
Chloroethane	U		0.141	2.50	1	03/28/2018 16:30	WG1090423
Chloroform	0.170	J	0.0860	0.500	1	03/28/2018 16:30	WG1090423
Chloromethane	U		0.153	1.25	1	03/28/2018 16:30	WG1090423
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 16:30	WG1090423
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 16:30	WG1090423
1,2-Dibromo-3-Chloropropane	U	J4	0.325	2.50	1	03/28/2018 16:30	WG1090423
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 16:30	WG1090423
Dibromomethane	U		0.117	0.500	1	03/28/2018 16:30	WG1090423
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 16:30	WG1090423
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 16:30	WG1090423
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 16:30	WG1090423
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 16:30	WG1090423
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 16:30	WG1090423
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 16:30	WG1090423
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 16:30	WG1090423
cis-1,2-Dichloroethene	U		0.0933	0.500	1	03/28/2018 16:30	WG1090423
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 16:30	WG1090423
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 16:30	WG1090423
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 16:30	WG1090423
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 16:30	WG1090423
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 16:30	WG1090423
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 16:30	WG1090423
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 16:30	WG1090423
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 16:30	WG1090423
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 16:30	WG1090423
Iodomethane	U	JO	0.377	10.0	1	03/28/2018 16:30	WG1090423
Methylene Chloride	U		1.07	2.50	1	03/28/2018 16:30	WG1090423
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 16:30	WG1090423
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 16:30	WG1090423
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 16:30	WG1090423
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 16:30	WG1090423
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 16:30	WG1090423
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 16:30	WG1090423
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 16:30	WG1090423
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 16:30	WG1090423
Trichloroethene	U		0.153	0.500	1	03/28/2018 16:30	WG1090423
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 16:30	WG1090423
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 16:30	WG1090423
Vinyl acetate	U	J4	0.645	5.00	1	03/28/2018 16:30	WG1090423
Vinyl chloride	U		0.118	0.500	1	03/28/2018 16:30	WG1090423
(S) Toluene-d8	104			80.0-120		03/28/2018 16:30	WG1090423
(S) Dibromofluoromethane	97.7			76.0-123		03/28/2018 16:30	WG1090423
(S) 4-Bromofluorobenzene	107			80.0-120		03/28/2018 16:30	WG1090423

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 16:50	WG1090423
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 16:50	WG1090423
Bromochloromethane	U		0.145	0.500	1	03/28/2018 16:50	WG1090423
Bromoform	U		0.186	0.500	1	03/28/2018 16:50	WG1090423
Bromomethane	U		0.157	2.50	1	03/28/2018 16:50	WG1090423
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 16:50	WG1090423
Chlorobenzene	U		0.140	0.500	1	03/28/2018 16:50	WG1090423
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 16:50	WG1090423
Chloroethane	U		0.141	2.50	1	03/28/2018 16:50	WG1090423
Chloroform	0.142	J	0.0860	0.500	1	03/28/2018 16:50	WG1090423
Chloromethane	U		0.153	1.25	1	03/28/2018 16:50	WG1090423
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 16:50	WG1090423
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 16:50	WG1090423
1,2-Dibromo-3-Chloropropane	U	J4	0.325	2.50	1	03/28/2018 16:50	WG1090423
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 16:50	WG1090423
Dibromomethane	U		0.117	0.500	1	03/28/2018 16:50	WG1090423
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 16:50	WG1090423
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 16:50	WG1090423
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 16:50	WG1090423
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 16:50	WG1090423
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 16:50	WG1090423
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 16:50	WG1090423
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 16:50	WG1090423
cis-1,2-Dichloroethene	U		0.0933	0.500	1	03/28/2018 16:50	WG1090423
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 16:50	WG1090423
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 16:50	WG1090423
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 16:50	WG1090423
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 16:50	WG1090423
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 16:50	WG1090423
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 16:50	WG1090423
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 16:50	WG1090423
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 16:50	WG1090423
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 16:50	WG1090423
Iodomethane	U	JO	0.377	10.0	1	03/28/2018 16:50	WG1090423
Methylene Chloride	U		1.07	2.50	1	03/28/2018 16:50	WG1090423
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 16:50	WG1090423
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 16:50	WG1090423
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 16:50	WG1090423
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 16:50	WG1090423
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 16:50	WG1090423
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 16:50	WG1090423
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 16:50	WG1090423
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 16:50	WG1090423
Trichloroethene	U		0.153	0.500	1	03/28/2018 16:50	WG1090423
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 16:50	WG1090423
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 16:50	WG1090423
Vinyl acetate	U	J4	0.645	5.00	1	03/28/2018 16:50	WG1090423
Vinyl chloride	U		0.118	0.500	1	03/28/2018 16:50	WG1090423
(S) Toluene-d8	106			80.0-120		03/28/2018 16:50	WG1090423
(S) Dibromofluoromethane	98.4			76.0-123		03/28/2018 16:50	WG1090423
(S) 4-Bromofluorobenzene	106			80.0-120		03/28/2018 16:50	WG1090423

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Bromobenzene	U		0.133	0.500	1	03/28/2018 17:10	WG1090423
Bromodichloromethane	U		0.0800	0.500	1	03/28/2018 17:10	WG1090423
Bromochloromethane	U		0.145	0.500	1	03/28/2018 17:10	WG1090423
Bromoform	U		0.186	0.500	1	03/28/2018 17:10	WG1090423
Bromomethane	U		0.157	2.50	1	03/28/2018 17:10	WG1090423
Carbon tetrachloride	U		0.159	0.500	1	03/28/2018 17:10	WG1090423
Chlorobenzene	U		0.140	0.500	1	03/28/2018 17:10	WG1090423
Chlorodibromomethane	U		0.128	0.500	1	03/28/2018 17:10	WG1090423
Chloroethane	U		0.141	2.50	1	03/28/2018 17:10	WG1090423
Chloroform	0.139	J	0.0860	0.500	1	03/28/2018 17:10	WG1090423
Chloromethane	U		0.153	1.25	1	03/28/2018 17:10	WG1090423
2-Chlorotoluene	U		0.111	0.500	1	03/28/2018 17:10	WG1090423
4-Chlorotoluene	U		0.0972	0.500	1	03/28/2018 17:10	WG1090423
1,2-Dibromo-3-Chloropropane	U	J4	0.325	2.50	1	03/28/2018 17:10	WG1090423
1,2-Dibromoethane	U		0.193	0.500	1	03/28/2018 17:10	WG1090423
Dibromomethane	U		0.117	0.500	1	03/28/2018 17:10	WG1090423
1,2-Dichlorobenzene	U		0.101	0.500	1	03/28/2018 17:10	WG1090423
1,3-Dichlorobenzene	U		0.130	0.500	1	03/28/2018 17:10	WG1090423
1,4-Dichlorobenzene	U		0.121	0.500	1	03/28/2018 17:10	WG1090423
Dichlorodifluoromethane	U		0.127	2.50	1	03/28/2018 17:10	WG1090423
1,1-Dichloroethane	U		0.114	0.500	1	03/28/2018 17:10	WG1090423
1,2-Dichloroethane	U		0.108	0.500	1	03/28/2018 17:10	WG1090423
1,1-Dichloroethene	U		0.188	0.500	1	03/28/2018 17:10	WG1090423
cis-1,2-Dichloroethene	U		0.0933	0.500	1	03/28/2018 17:10	WG1090423
trans-1,2-Dichloroethene	U		0.152	0.500	1	03/28/2018 17:10	WG1090423
1,2-Dichloropropane	U		0.190	0.500	1	03/28/2018 17:10	WG1090423
1,1-Dichloropropene	U		0.128	0.500	1	03/28/2018 17:10	WG1090423
1,3-Dichloropropane	U		0.147	1.00	1	03/28/2018 17:10	WG1090423
cis-1,3-Dichloropropene	U		0.0976	0.500	1	03/28/2018 17:10	WG1090423
trans-1,3-Dichloropropene	U		0.222	0.500	1	03/28/2018 17:10	WG1090423
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	03/28/2018 17:10	WG1090423
2,2-Dichloropropane	U		0.0929	0.500	1	03/28/2018 17:10	WG1090423
Hexachloro-1,3-butadiene	U		0.157	1.00	1	03/28/2018 17:10	WG1090423
Iodomethane	U	JO	0.377	10.0	1	03/28/2018 17:10	WG1090423
Methylene Chloride	U		1.07	2.50	1	03/28/2018 17:10	WG1090423
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	03/28/2018 17:10	WG1090423
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	03/28/2018 17:10	WG1090423
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	03/28/2018 17:10	WG1090423
Tetrachloroethene	U		0.199	0.500	1	03/28/2018 17:10	WG1090423
1,2,3-Trichlorobenzene	U		0.164	0.500	1	03/28/2018 17:10	WG1090423
1,2,4-Trichlorobenzene	U		0.355	0.500	1	03/28/2018 17:10	WG1090423
1,1,1-Trichloroethane	U		0.0940	0.500	1	03/28/2018 17:10	WG1090423
1,1,2-Trichloroethane	U		0.186	0.500	1	03/28/2018 17:10	WG1090423
Trichloroethene	U		0.153	0.500	1	03/28/2018 17:10	WG1090423
Trichlorofluoromethane	U		0.130	2.50	1	03/28/2018 17:10	WG1090423
1,2,3-Trichloropropane	U		0.247	2.50	1	03/28/2018 17:10	WG1090423
Vinyl acetate	U	J4	0.645	5.00	1	03/28/2018 17:10	WG1090423
Vinyl chloride	U		0.118	0.500	1	03/28/2018 17:10	WG1090423
(S) Toluene-d8	104			80.0-120		03/28/2018 17:10	WG1090423
(S) Dibromofluoromethane	98.7			76.0-123		03/28/2018 17:10	WG1090423
(S) 4-Bromofluorobenzene	106			80.0-120		03/28/2018 17:10	WG1090423

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3297268-1 03/28/18 15:46

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
TOC (Total Organic Carbon)	425	↓	102	1000

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L980397-01 Original Sample (OS) • Duplicate (DUP)

(OS) L980397-01 03/28/18 19:07 • (DUP) R3297268-3 03/28/18 19:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
TOC (Total Organic Carbon)	15400	14800	1	4.10		20

L980496-03 Original Sample (OS) • Duplicate (DUP)

(OS) L980496-03 03/29/18 00:39 • (DUP) R3297268-7 03/29/18 00:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
TOC (Total Organic Carbon)	3610	3650	1	0.965		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3297268-2 03/28/18 16:27 • (LCSD) R3297268-4 03/28/18 20:38

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
TOC (Total Organic Carbon)	75000	78400	80900	104	108	85.0-115			3.13	20

L980397-19 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L980397-19 03/28/18 21:50 • (MS) R3297268-5 03/28/18 22:06 • (MSD) R3297268-6 03/28/18 22:22

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
TOC (Total Organic Carbon)	50000	8760	58900	58900	100	100	1	80.0-120			0.0170	20



Method Blank (MB)

(MB) R3297643-1 03/29/18 10:08

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
TOC (Total Organic Carbon)	U		102	1000

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

L980730-01 Original Sample (OS) • Duplicate (DUP)

(OS) L980730-01 03/29/18 18:30 • (DUP) R3297643-7 03/29/18 18:48

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
TOC (Total Organic Carbon)	227	268	1	16.4	↓	20

⁶ Qc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3297643-2 03/29/18 11:14 • (LCSD) R3297643-4 03/29/18 14:43

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
TOC (Total Organic Carbon)	75000	79100	78800	105	105	85.0-115			0.469	20

⁷ Gl

⁸ Al

L980523-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L980523-04 03/29/18 15:49 • (MS) R3297643-5 03/29/18 16:05 • (MSD) R3297643-6 03/29/18 16:23

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
TOC (Total Organic Carbon)	50000	1670	57200	57300	111	111	1	80.0-120			0.227	20

⁹ Sc



Method Blank (MB)

(MB) R3296580-1 03/27/18 09:41

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Copper	U		5.30	10.0

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3296580-2 03/27/18 09:43 • (LCSD) R3296580-3 03/27/18 09:46

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Copper	1000	999	990	99.9	99.0	80.0-120			0.981	20

L979872-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L979872-04 03/27/18 09:49 • (MS) R3296580-5 03/27/18 10:02 • (MSD) R3296580-6 03/27/18 10:05

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Copper	1000	ND	1030	1050	102	104	1	75.0-125			2.04	20

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3296603-1 03/27/18 10:36

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Methane	U		2.91	10.0
Ethane	U		4.07	13.0
Ethene	U		4.26	13.0

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L980397-04 Original Sample (OS) • Duplicate (DUP)

(OS) L980397-04 03/27/18 11:27 • (DUP) R3296603-2 03/27/18 11:54

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Methane	2700	2580	1	4.54		20
Ethane	103	96.9	1	6.01		20
Ethene	32.7	30.7	1	6.24		20

L980196-01 Original Sample (OS) • Duplicate (DUP)

(OS) L980196-01 03/27/18 12:28 • (DUP) R3296603-3 03/27/18 13:54

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Methane	1880	1720	1	9.03		20
Ethane	ND	4.38	1	10.7	↓	20
Ethene	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3296603-4 03/27/18 13:58 • (LCSD) R3296603-5 03/27/18 14:02

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Methane	67.8	75.0	75.6	111	111	85.0-115			0.795	20
Ethane	129	121	121	93.5	93.8	85.0-115			0.286	20
Ethene	127	124	124	97.8	98.0	85.0-115			0.113	20



Method Blank (MB)

(MB) R3296733-1 03/27/18 14:28

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Methane	U		2.91	10.0

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L980397-12 Original Sample (OS) • Duplicate (DUP)

(OS) L980397-12 03/27/18 14:38 • (DUP) R3296733-2 03/27/18 14:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Methane	10600	10500	20	0.733		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3296733-3 03/27/18 14:59 • (LCSD) R3296733-4 03/27/18 15:01

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Methane	67.8	74.4	73.5	110	108	85.0-115			1.22	20



Method Blank (MB)

(MB) R3297519-3 03/27/18 19:07

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Bromobenzene	U		0.133	0.500
Bromodichloromethane	U		0.0800	0.500
Bromochloromethane	U		0.145	0.500
Bromoform	U		0.186	0.500
Bromomethane	U		0.157	2.50
Carbon tetrachloride	U		0.159	0.500
Chlorobenzene	U		0.140	0.500
Chlorodibromomethane	U		0.128	0.500
Chloroethane	U		0.141	2.50
Chloroform	U		0.0860	0.500
Chloromethane	U		0.153	1.25
2-Chlorotoluene	U		0.111	0.500
4-Chlorotoluene	U		0.0972	0.500
1,2-Dibromo-3-Chloropropane	U		0.325	2.50
1,2-Dibromoethane	U		0.193	0.500
Dibromomethane	U		0.117	0.500
1,2-Dichlorobenzene	U		0.101	0.500
1,3-Dichlorobenzene	U		0.130	0.500
1,4-Dichlorobenzene	U		0.121	0.500
Dichlorodifluoromethane	U		0.127	2.50
1,1-Dichloroethane	U		0.114	0.500
1,2-Dichloroethane	U		0.108	0.500
1,1-Dichloroethene	U		0.188	0.500
cis-1,2-Dichloroethene	U		0.0933	0.500
trans-1,2-Dichloroethene	U		0.152	0.500
1,2-Dichloropropane	U		0.190	0.500
1,1-Dichloropropene	U		0.128	0.500
1,3-Dichloropropane	U		0.147	1.00
cis-1,3-Dichloropropene	U		0.0976	0.500
trans-1,3-Dichloropropene	U		0.222	0.500
trans-1,4-Dichloro-2-butene	U		0.257	5.00
2,2-Dichloropropane	U		0.0929	0.500
Hexachloro-1,3-butadiene	U		0.157	1.00
Iodomethane	U		0.377	10.0
Methylene Chloride	U		1.07	2.50
1,1,1,2-Tetrachloroethane	U		0.120	0.500
1,1,2,2-Tetrachloroethane	U		0.130	0.500
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500
Tetrachloroethene	U		0.199	0.500
1,2,3-Trichlorobenzene	U		0.164	0.500

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3297519-3 03/27/18 19:07

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
1,2,4-Trichlorobenzene	U		0.355	0.500
1,1,1-Trichloroethane	U		0.0940	0.500
1,1,2-Trichloroethane	U		0.186	0.500
Trichloroethene	U		0.153	0.500
Trichlorofluoromethane	U		0.130	2.50
1,2,3-Trichloropropane	U		0.247	2.50
Vinyl acetate	U		0.645	5.00
Vinyl chloride	U		0.118	0.500
(S) Toluene-d8	105			80.0-120
(S) Dibromofluoromethane	99.4			76.0-123
(S) 4-Bromofluorobenzene	102			80.0-120

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3297519-1 03/27/18 18:07 • (LCSD) R3297519-2 03/27/18 18:27

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Bromobenzene	25.0	20.0	20.5	80.2	81.8	79.0-120			2.02	20
Bromodichloromethane	25.0	22.8	22.5	91.4	89.8	76.0-120			1.74	20
Bromochloromethane	25.0	23.3	22.4	93.3	89.4	76.0-122			4.24	20
Bromoform	25.0	22.6	22.5	90.4	90.1	67.0-132			0.306	20
Bromomethane	25.0	19.5	20.6	78.1	82.4	18.0-160			5.35	20
Carbon tetrachloride	25.0	22.5	21.3	89.8	85.2	63.0-122			5.25	20
Chlorobenzene	25.0	23.0	23.6	91.9	94.5	79.0-121			2.80	20
Chlorodibromomethane	25.0	24.5	24.1	98.1	96.3	75.0-125			1.84	20
Chloroethane	25.0	21.4	21.2	85.6	84.6	47.0-152			1.11	20
Chloroform	25.0	23.7	23.1	95.0	92.2	72.0-121			2.91	20
Chloromethane	25.0	25.8	25.0	103	100	48.0-139			3.11	20
2-Chlorotoluene	25.0	22.1	21.6	88.3	86.4	74.0-122			2.26	20
4-Chlorotoluene	25.0	20.7	21.0	82.9	83.8	79.0-120			1.14	20
1,2-Dibromo-3-Chloropropane	25.0	20.4	20.2	81.5	80.8	64.0-127			0.855	20
1,2-Dibromoethane	25.0	22.7	22.2	90.9	88.9	77.0-123			2.30	20
Dibromomethane	25.0	23.0	22.9	91.8	91.5	78.0-120			0.373	20
1,2-Dichlorobenzene	25.0	21.7	21.5	86.9	86.2	80.0-120			0.809	20
1,3-Dichlorobenzene	25.0	21.4	22.4	85.5	89.7	72.0-123			4.82	20
1,4-Dichlorobenzene	25.0	22.1	22.1	88.2	88.3	77.0-120			0.0707	20
Dichlorodifluoromethane	25.0	21.7	21.8	87.0	87.1	49.0-155			0.200	20
1,1-Dichloroethane	25.0	23.8	23.2	95.2	93.0	70.0-126			2.34	20
1,2-Dichloroethane	25.0	23.4	22.7	93.7	91.0	67.0-126			2.94	20



Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3297519-1 03/27/18 18:07 • (LCSD) R3297519-2 03/27/18 18:27

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
1,1-Dichloroethene	25.0	22.4	22.3	89.5	89.0	64.0-129			0.548	20
cis-1,2-Dichloroethene	25.0	22.0	22.0	88.0	87.8	73.0-120			0.223	20
trans-1,2-Dichloroethene	25.0	22.3	22.3	89.0	89.3	71.0-121			0.306	20
1,2-Dichloropropane	25.0	24.2	23.8	96.9	95.2	75.0-125			1.75	20
1,1-Dichloropropene	25.0	22.8	22.6	91.1	90.4	71.0-129			0.772	20
1,3-Dichloropropane	25.0	22.9	23.2	91.4	92.8	80.0-121			1.52	20
cis-1,3-Dichloropropene	25.0	23.1	23.4	92.4	93.8	79.0-123			1.51	20
trans-1,3-Dichloropropene	25.0	22.7	23.7	90.7	94.8	74.0-127			4.37	20
trans-1,4-Dichloro-2-butene	25.0	24.0	24.1	96.0	96.3	55.0-134			0.356	20
2,2-Dichloropropane	25.0	22.4	21.7	89.8	86.9	60.0-125			3.26	20
Hexachloro-1,3-butadiene	25.0	20.9	20.9	83.7	83.7	64.0-131			0.0993	20
Iodomethane	125	115	112	91.8	89.6	57.0-140			2.41	20
Methylene Chloride	25.0	22.3	21.4	89.1	85.5	66.0-121			4.09	20
1,1,1,2-Tetrachloroethane	25.0	22.3	21.2	89.1	84.6	75.0-122			5.15	20
1,1,2,2-Tetrachloroethane	25.0	20.6	21.2	82.2	84.6	71.0-122			2.90	20
1,1,2-Trichlorotrifluoroethane	25.0	24.2	23.5	96.7	93.8	61.0-136			3.03	20
Tetrachloroethene	25.0	22.6	21.9	90.5	87.5	70.0-127			3.43	20
1,2,3-Trichlorobenzene	25.0	21.8	21.6	87.4	86.5	61.0-133			1.08	20
1,2,4-Trichlorobenzene	25.0	21.1	22.6	84.6	90.4	69.0-129			6.62	20
1,1,1-Trichloroethane	25.0	23.1	21.7	92.3	86.9	68.0-122			6.12	20
1,1,2-Trichloroethane	25.0	23.4	23.6	93.5	94.4	78.0-120			0.878	20
Trichloroethene	25.0	22.6	22.2	90.5	88.8	78.0-120			1.86	20
Trichlorofluoromethane	25.0	24.5	23.3	97.9	93.0	56.0-137			5.12	20
1,2,3-Trichloropropane	25.0	20.0	21.5	80.1	85.9	72.0-124			6.92	20
Vinyl acetate	125	120	109	95.6	87.4	46.0-160			8.94	20
Vinyl chloride	25.0	23.2	24.0	92.9	95.9	64.0-133			3.14	20
(S) Toluene-d8				101	102	80.0-120				
(S) Dibromofluoromethane				101	97.3	76.0-123				
(S) 4-Bromofluorobenzene				95.8	95.4	80.0-120				

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

L980397-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L980397-17 03/28/18 02:57 • (MS) R3297519-4 03/28/18 04:17 • (MSD) R3297519-5 03/28/18 04:37

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Bromobenzene	25.0	U	7.75	8.15	31.0	32.6	1	51.0-137	J6	J6	5.08	20
Bromodichloromethane	25.0	U	8.77	9.12	35.1	36.5	1	52.0-135	J6	J6	3.83	20
Bromochloromethane	25.0	U	8.79	9.12	35.1	36.5	1	53.0-138	J6	J6	3.71	20
Bromoform	25.0	U	7.11	6.26	28.4	25.0	1	50.0-146	J6	J6	12.8	20



L980397-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L980397-17 03/28/18 02:57 • (MS) R3297519-4 03/28/18 04:17 • (MSD) R3297519-5 03/28/18 04:37

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromomethane	25.0	U	7.43	7.99	29.7	31.9	1	10.0-160			7.20	23
Carbon tetrachloride	25.0	U	9.03	8.67	36.1	34.7	1	41.0-138	J6	J6	3.99	20
Chlorobenzene	25.0	U	8.92	9.67	35.7	38.7	1	52.0-141	J6	J6	8.11	20
Chlorodibromomethane	25.0	U	8.74	7.94	35.0	31.8	1	54.0-142	J6	J6	9.62	20
Chloroethane	25.0	8.18	15.8	16.0	30.6	31.1	1	23.0-160			0.771	20
Chloroform	25.0	U	9.13	9.82	36.5	39.3	1	50.0-139	J6	J6	7.30	20
Chloromethane	25.0	U	8.74	9.19	34.9	36.8	1	14.0-151			5.06	20
2-Chlorotoluene	25.0	U	7.83	8.86	31.3	35.4	1	48.0-142	J6	J6	12.3	20
4-Chlorotoluene	25.0	U	7.42	8.42	29.7	33.7	1	52.0-139	J6	J6	12.6	20
1,2-Dibromo-3-Chloropropane	25.0	U	6.04	6.13	24.1	24.5	1	49.0-144	J6	J6	1.57	24
1,2-Dibromoethane	25.0	U	8.70	9.22	34.8	36.9	1	54.0-140	J6	J6	5.80	20
Dibromomethane	25.0	U	8.98	9.57	35.9	38.3	1	53.0-138	J6	J6	6.32	20
1,2-Dichlorobenzene	25.0	U	7.46	8.78	29.8	35.1	1	56.0-139	J6	J6	16.3	20
1,3-Dichlorobenzene	25.0	U	8.20	8.56	32.8	34.2	1	50.0-141	J6	J6	4.31	20
1,4-Dichlorobenzene	25.0	U	7.89	9.05	31.5	36.2	1	53.0-136	J6	J6	13.7	20
Dichlorodifluoromethane	25.0	U	6.75	7.87	27.0	31.5	1	20.0-160			15.4	21
1,1-Dichloroethane	25.0	0.550	10.0	10.1	37.9	38.4	1	47.0-143	J6	J6	1.23	20
1,2-Dichloroethane	25.0	U	9.55	9.69	38.2	38.8	1	47.0-141	J6	J6	1.50	20
1,1-Dichloroethene	25.0	U	8.28	8.70	33.1	34.8	1	31.0-148			5.01	20
cis-1,2-Dichloroethene	25.0	5.58	15.0	15.3	37.7	38.8	1	43.0-142	J6	J6	1.79	20
trans-1,2-Dichloroethene	25.0	1.29	10.2	10.7	35.7	37.5	1	36.0-141	J6	J6	4.22	20
1,2-Dichloropropane	25.0	U	9.23	9.90	36.9	39.6	1	51.0-141	J6	J6	6.97	20
1,1-Dichloropropene	25.0	U	8.77	9.58	35.1	38.3	1	42.0-146	J6	J6	8.89	20
1,3-Dichloropropane	25.0	U	8.93	9.39	35.7	37.5	1	58.0-139	J6	J6	5.01	20
cis-1,3-Dichloropropene	25.0	U	8.67	9.14	34.7	36.6	1	53.0-139	J6	J6	5.23	20
trans-1,3-Dichloropropene	25.0	U	8.35	9.07	33.4	36.3	1	51.0-143	J6	J6	8.26	20
trans-1,4-Dichloro-2-butene	25.0	U	6.32	6.89	25.3	27.6	1	40.0-150	J6	J6	8.64	21
2,2-Dichloropropane	25.0	U	9.08	9.02	36.3	36.1	1	43.0-139	J6	J6	0.675	20
Hexachloro-1,3-butadiene	25.0	U	7.08	8.56	28.3	34.2	1	44.0-146	J6	J6	18.9	21
Iodomethane	125	U	42.6	43.2	34.1	34.5	1	30.0-151			1.21	20
Methylene Chloride	25.0	U	8.33	9.02	33.3	36.1	1	42.0-135	J6	J6	7.95	20
1,1,1,2-Tetrachloroethane	25.0	U	8.32	8.94	33.3	35.8	1	52.0-140	J6	J6	7.17	20
1,1,2,2-Tetrachloroethane	25.0	U	9.15	10.0	36.6	40.2	1	46.0-149	J6	J6	9.38	20
1,1,2-Trichlorotrifluoroethane	25.0	U	8.34	8.28	33.4	33.1	1	40.0-151	J6	J6	0.692	21
Tetrachloroethene	25.0	0.203	8.26	8.38	32.2	32.7	1	38.0-147	J6	J6	1.39	20
1,2,3-Trichlorobenzene	25.0	U	6.94	8.09	27.8	32.4	1	45.0-145	J6	J6	15.2	22
1,2,4-Trichlorobenzene	25.0	U	7.30	8.41	29.2	33.6	1	49.0-147	J6	J6	14.1	21
1,1,1-Trichloroethane	25.0	U	9.15	9.13	36.6	36.5	1	46.0-140	J6	J6	0.157	20
1,1,2-Trichloroethane	25.0	U	9.19	9.58	36.7	38.3	1	54.0-139	J6	J6	4.21	20
Trichloroethene	25.0	0.261	8.63	9.12	33.5	35.5	1	32.0-156			5.60	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



L980397-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L980397-17 03/28/18 02:57 • (MS) R3297519-4 03/28/18 04:17 • (MSD) R3297519-5 03/28/18 04:37

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Trichlorofluoromethane	25.0	U	8.34	9.05	33.4	36.2	1	32.0-152			8.09	20
1,2,3-Trichloropropane	25.0	U	7.32	8.29	29.3	33.2	1	54.0-143	<u>J6</u>	<u>J6</u>	12.4	21
Vinyl acetate	125	U	23.7	27.1	19.0	21.7	1	30.0-160	<u>J6</u>	<u>J6</u>	13.3	20
Vinyl chloride	25.0	2.60	11.4	12.2	35.1	38.3	1	24.0-153			6.76	20
(S) Toluene-d8					100	99.5		80.0-120				
(S) Dibromofluoromethane					104	99.1		76.0-123				
(S) 4-Bromofluorobenzene					95.0	97.8		80.0-120				

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Method Blank (MB)

(MB) R3297224-2 03/28/18 10:29

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Bromobenzene	U		0.133	0.500
Bromodichloromethane	U		0.0800	0.500
Bromochloromethane	U		0.145	0.500
Bromoform	U		0.186	0.500
Bromomethane	U		0.157	2.50
Carbon tetrachloride	U		0.159	0.500
Chlorobenzene	U		0.140	0.500
Chlorodibromomethane	U		0.128	0.500
Chloroethane	U		0.141	2.50
2-Chlorotoluene	U		0.111	0.500
Chloroform	U		0.0860	0.500
4-Chlorotoluene	U		0.0972	0.500
Chloromethane	U		0.153	1.25
Dibromomethane	U		0.117	0.500
1,2-Dibromo-3-Chloropropane	U		0.325	2.50
1,2-Dibromoethane	U		0.193	0.500
1,2-Dichlorobenzene	U		0.101	0.500
1,3-Dichlorobenzene	U		0.130	0.500
1,4-Dichlorobenzene	U		0.121	0.500
Dichlorodifluoromethane	U		0.127	2.50
1,1-Dichloroethane	U		0.114	0.500
1,1-Dichloropropene	U		0.128	0.500
1,2-Dichloroethane	U		0.108	0.500
1,1-Dichloroethene	U		0.188	0.500
1,3-Dichloropropane	U		0.147	1.00
cis-1,2-Dichloroethene	U		0.0933	0.500
trans-1,2-Dichloroethene	U		0.152	0.500
1,2-Dichloropropane	U		0.190	0.500
trans-1,4-Dichloro-2-butene	U		0.257	5.00
2,2-Dichloropropane	U		0.0929	0.500
cis-1,3-Dichloropropene	U		0.0976	0.500
Hexachloro-1,3-butadiene	U		0.157	1.00
trans-1,3-Dichloropropene	U		0.222	0.500
Iodomethane	U		0.377	10.0
1,1,1,2-Tetrachloroethane	U		0.120	0.500
Methylene Chloride	U		1.07	2.50
1,2,3-Trichloropropane	U		0.247	2.50
1,1,2,2-Tetrachloroethane	U		0.130	0.500
Tetrachloroethene	U		0.199	0.500
Vinyl acetate	U		0.645	5.00

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3297224-2 03/28/18 10:29

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500
1,2,3-Trichlorobenzene	U		0.164	0.500
1,2,4-Trichlorobenzene	U		0.355	0.500
1,1,1-Trichloroethane	U		0.0940	0.500
1,1,2-Trichloroethane	U		0.186	0.500
Trichloroethene	U		0.153	0.500
Trichlorofluoromethane	U		0.130	2.50
Vinyl chloride	U		0.118	0.500
(S) Toluene-d8	105			80.0-120
(S) Dibromofluoromethane	100			76.0-123
(S) 4-Bromofluorobenzene	93.0			80.0-120

Laboratory Control Sample (LCS)

(LCS) R3297224-1 03/28/18 09:30

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Bromobenzene	25.0	22.5	89.9	79.0-120	
2-Chlorotoluene	25.0	21.7	86.8	74.0-122	
4-Chlorotoluene	25.0	21.8	87.4	79.0-120	
Dibromomethane	25.0	21.3	85.2	78.0-120	
1,1-Dichloropropene	25.0	23.5	93.8	71.0-129	
1,3-Dichloropropane	25.0	25.3	101	80.0-121	
trans-1,4-Dichloro-2-butene	25.0	18.1	72.5	55.0-134	
2,2-Dichloropropane	25.0	21.7	86.9	60.0-125	
Bromodichloromethane	25.0	21.3	85.0	76.0-120	
Bromochloromethane	25.0	26.3	105	76.0-122	
Bromoform	25.0	21.0	84.0	67.0-132	
Hexachloro-1,3-butadiene	25.0	22.9	91.6	64.0-131	
Bromomethane	25.0	21.7	87.0	18.0-160	
Iodomethane	125	116	92.5	57.0-140	
Carbon tetrachloride	25.0	24.2	96.7	63.0-122	
Chlorobenzene	25.0	25.8	103	79.0-121	
Chlorodibromomethane	25.0	26.2	105	75.0-125	
Chloroethane	25.0	22.0	88.0	47.0-152	
Chloroform	25.0	22.1	88.2	72.0-121	
1,1,1,2-Tetrachloroethane	25.0	26.5	106	75.0-122	
Chloromethane	25.0	18.6	74.3	48.0-139	
1,2-Dibromo-3-Chloropropane	25.0	24.8	99.4	64.0-127	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Laboratory Control Sample (LCS)

(LCS) R3297224-1 03/28/18 09:30

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
1,2-Dibromoethane	25.0	26.0	104	77.0-123	
1,2-Dichlorobenzene	25.0	26.3	105	80.0-120	
1,3-Dichlorobenzene	25.0	25.2	101	72.0-123	
1,4-Dichlorobenzene	25.0	25.8	103	77.0-120	
Dichlorodifluoromethane	25.0	22.3	89.3	49.0-155	
1,2,3-Trichloropropane	25.0	23.4	93.5	72.0-124	
1,1-Dichloroethane	25.0	21.9	87.5	70.0-126	
1,2-Dichloroethane	25.0	23.7	94.7	67.0-126	
1,1-Dichloroethene	25.0	20.4	81.5	64.0-129	
cis-1,2-Dichloroethene	25.0	20.6	82.6	73.0-120	
Vinyl acetate	125	96.6	77.3	46.0-160	
trans-1,2-Dichloroethene	25.0	20.2	80.8	71.0-121	
1,2-Dichloropropane	25.0	22.0	88.0	75.0-125	
cis-1,3-Dichloropropene	25.0	24.2	96.9	79.0-123	
trans-1,3-Dichloropropene	25.0	23.6	94.5	74.0-127	
Methylene Chloride	25.0	20.8	83.1	66.0-121	
1,1,2,2-Tetrachloroethane	25.0	22.0	88.1	71.0-122	
Tetrachloroethene	25.0	25.6	102	70.0-127	
1,1,2-Trichlorotrifluoroethane	25.0	22.8	91.4	61.0-136	
1,2,3-Trichlorobenzene	25.0	25.0	99.9	61.0-133	
1,2,4-Trichlorobenzene	25.0	24.1	96.3	69.0-129	
1,1,1-Trichloroethane	25.0	21.8	87.1	68.0-122	
1,1,2-Trichloroethane	25.0	23.3	93.4	78.0-120	
Trichloroethene	25.0	23.7	94.8	78.0-120	
Trichlorofluoromethane	25.0	27.0	108	56.0-137	
Vinyl chloride	25.0	25.3	101	64.0-133	
(S) Toluene-d8			105	80.0-120	
(S) Dibromofluoromethane			103	76.0-123	
(S) 4-Bromofluorobenzene			93.9	80.0-120	

- ¹Cp
- ²Tc
- ³Ss
- ⁴Cn
- ⁵Sr
- ⁶Qc
- ⁷Gl
- ⁸Al
- ⁹Sc



Method Blank (MB)

(MB) R3297327-3 03/28/18 10:40

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Bromobenzene	U		0.133	0.500
Bromochloromethane	U		0.145	0.500
Bromodichloromethane	U		0.0800	0.500
Bromoform	U		0.186	0.500
Bromomethane	U		0.157	2.50
Carbon tetrachloride	U		0.159	0.500
Chlorobenzene	U		0.140	0.500
Chlorodibromomethane	U		0.128	0.500
Chloroethane	U		0.141	2.50
Chloroform	U		0.0860	0.500
Chloromethane	U		0.153	1.25
2-Chlorotoluene	U		0.111	0.500
4-Chlorotoluene	U		0.0972	0.500
1,2-Dibromo-3-Chloropropane	U		0.325	2.50
1,2-Dibromoethane	U		0.193	0.500
Dibromomethane	U		0.117	0.500
1,2-Dichlorobenzene	U		0.101	0.500
1,3-Dichlorobenzene	U		0.130	0.500
1,4-Dichlorobenzene	U		0.121	0.500
Dichlorodifluoromethane	U		0.127	2.50
1,1-Dichloroethane	U		0.114	0.500
1,2-Dichloroethane	U		0.108	0.500
1,1-Dichloroethene	U		0.188	0.500
cis-1,2-Dichloroethene	U		0.0933	0.500
trans-1,2-Dichloroethene	U		0.152	0.500
1,2-Dichloropropane	U		0.190	0.500
trans-1,4-Dichloro-2-butene	U		0.257	5.00
1,1-Dichloropropene	U		0.128	0.500
1,3-Dichloropropane	U		0.147	1.00
cis-1,3-Dichloropropene	U		0.0976	0.500
trans-1,3-Dichloropropene	U		0.222	0.500
2,2-Dichloropropane	U		0.0929	0.500
Iodomethane	U		0.377	10.0
Hexachloro-1,3-butadiene	0.504	U	0.157	1.00
Methylene Chloride	U		1.07	2.50
Vinyl acetate	U		0.645	5.00
1,1,1,2-Tetrachloroethane	U		0.120	0.500
1,1,2,2-Tetrachloroethane	U		0.130	0.500
Tetrachloroethene	U		0.199	0.500
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3297327-3 03/28/18 10:40

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
1,2,3-Trichlorobenzene	U		0.164	0.500
1,2,4-Trichlorobenzene	U		0.355	0.500
1,1,1-Trichloroethane	U		0.0940	0.500
1,1,2-Trichloroethane	U		0.186	0.500
Trichloroethene	U		0.153	0.500
Trichlorofluoromethane	U		0.130	2.50
1,2,3-Trichloropropane	U		0.247	2.50
Vinyl chloride	U		0.118	0.500
(S) Toluene-d8	104			80.0-120
(S) Dibromofluoromethane	97.3			76.0-123
(S) 4-Bromofluorobenzene	107			80.0-120

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS)

(LCS) R3297327-1 03/28/18 09:41

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromochloromethane	25.0	24.2	96.9	76.0-122	
trans-1,4-Dichloro-2-butene	25.0	27.8	111	55.0-134	
Bromobenzene	25.0	24.1	96.6	79.0-120	
Bromodichloromethane	25.0	19.6	78.6	76.0-120	
Bromoform	25.0	30.1	120	67.0-132	
Bromomethane	25.0	21.3	85.3	18.0-160	
Iodomethane	125	113	90.7	57.0-140	
Carbon tetrachloride	25.0	23.8	95.3	63.0-122	
Chlorobenzene	25.0	24.3	97.3	79.0-121	
Chlorodibromomethane	25.0	25.4	101	75.0-125	
Chloroethane	25.0	21.0	84.0	47.0-152	
Chloroform	25.0	21.8	87.4	72.0-121	
Chloromethane	25.0	20.9	83.7	48.0-139	
2-Chlorotoluene	25.0	23.2	92.8	74.0-122	
4-Chlorotoluene	25.0	22.9	91.7	79.0-120	
1,2-Dibromo-3-Chloropropane	25.0	32.5	130	64.0-127	<u>J4</u>
1,2-Dibromoethane	25.0	26.7	107	77.0-123	
Dibromomethane	25.0	24.3	97.3	78.0-120	
1,2-Dichlorobenzene	25.0	25.1	101	80.0-120	
1,3-Dichlorobenzene	25.0	23.3	93.3	72.0-123	
1,4-Dichlorobenzene	25.0	23.7	94.7	77.0-120	
Dichlorodifluoromethane	25.0	23.1	92.5	49.0-155	



Laboratory Control Sample (LCS)

(LCS) R3297327-1 03/28/18 09:41

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
1,1-Dichloroethane	25.0	23.0	91.9	70.0-126	
1,2-Dichloroethane	25.0	22.9	91.8	67.0-126	
1,1-Dichloroethene	25.0	22.1	88.5	64.0-129	
Vinyl acetate	125	272	218	46.0-160	J4
cis-1,2-Dichloroethene	25.0	21.3	85.2	73.0-120	
trans-1,2-Dichloroethene	25.0	22.7	90.7	71.0-121	
1,2-Dichloropropane	25.0	22.1	88.3	75.0-125	
1,1-Dichloropropene	25.0	24.5	97.9	71.0-129	
1,3-Dichloropropane	25.0	25.3	101	80.0-121	
cis-1,3-Dichloropropene	25.0	27.8	111	79.0-123	
trans-1,3-Dichloropropene	25.0	27.4	110	74.0-127	
2,2-Dichloropropane	25.0	23.5	94.2	60.0-125	
Hexachloro-1,3-butadiene	25.0	28.9	116	64.0-131	
Methylene Chloride	25.0	22.3	89.1	66.0-121	
1,1,1,2-Tetrachloroethane	25.0	24.1	96.3	75.0-122	
1,1,2,2-Tetrachloroethane	25.0	27.0	108	71.0-122	
Tetrachloroethene	25.0	25.9	104	70.0-127	
1,1,2-Trichlorotrifluoroethane	25.0	24.7	98.8	61.0-136	
1,2,3-Trichlorobenzene	25.0	30.9	124	61.0-133	
1,2,4-Trichlorobenzene	25.0	30.2	121	69.0-129	
1,1,1-Trichloroethane	25.0	22.1	88.3	68.0-122	
1,1,2-Trichloroethane	25.0	23.2	92.9	78.0-120	
Trichloroethene	25.0	24.1	96.3	78.0-120	
Trichlorofluoromethane	25.0	25.6	102	56.0-137	
1,2,3-Trichloropropane	25.0	31.0	124	72.0-124	
Vinyl chloride	25.0	24.5	97.9	64.0-133	
(S) Toluene-d8			105	80.0-120	
(S) Dibromofluoromethane			97.8	76.0-123	
(S) 4-Bromofluorobenzene			109	80.0-120	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J0	J0: Calibration verification outside of acceptance limits. Result is estimated.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana ¹	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

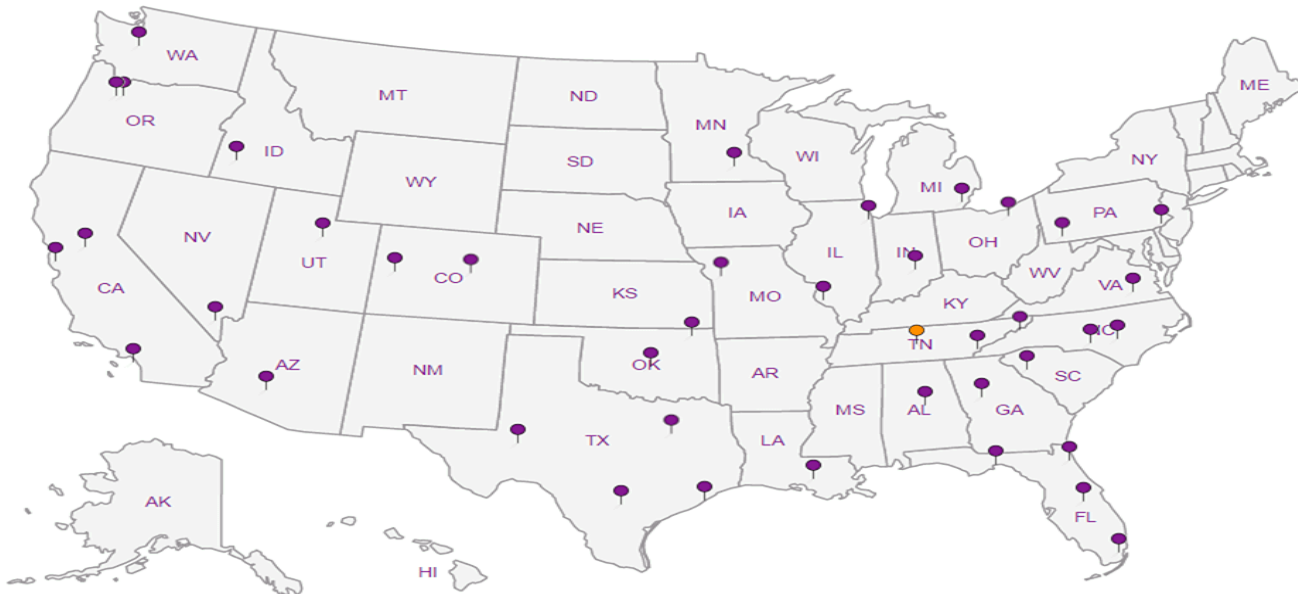
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

L980397

Page: 2 of 4

Section A

Required Client Information:

Company: Apex Companies, LLC

Address: 3015 SW 1st Ave
Portland, OR 97201

Email To: Ssalisbury@apexcos.com

Phone: 503.924.4704 Fax: n/a

Requested Due Date/TAT:

Section B

Required Project Information:

Report To: Stephanie Salisbury

Copy To: Ssalisbury@apexcos.com

Purchase Order No.:

Project Name: NuStar Vancouver GWM

Project Number: 1126-21.002

Section C

Invoice Information:

Attention:

Company Name: Apex Companies, LLC

Address: 3015 SW 1st Ave

Pace Quote Reference:

Pace Project Manager:

Pace Profile #:

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER

Site Location

STATE: WA

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Requested Analysis Filtered (Y/N)			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.					
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	Analysis Test #	Requested Analysis Filtered (Y/N)							
					DATE	TIME	DATE	TIME												Volatile Halocarbons (EPA 8260B)			TOC	Methane, Ethane, Ethene	Cu (EPA 6010)		
1	MW-7 DUP	WT	G				3/21/18	9:08																			
2	MW-8	WT	G				3/19/18	16:15																			-13
3	MW-9	WT	G				3/21/18	8:25																			-14
4	MW-12	WT	G				3/20/18	8:05																			-15
5	MW-12 DUP	WT	G				3/20/18	8:05																			-16
6	MW-12 MS	WT	G				3/20/18	8:05																			-17
7	MW-12 MSD	WT	G				3/20/18	8:05																			
8	MW-13	WT	G				3/20/18	9:28																			
9	MW-14	WT	G				3/20/18	13:50																			-18
10	MW-16	WT	G				3/19/18	16:52																			-19
11	MW-18i	WT	G				3/21/18	15:56																			-20
12	MW-19	WT	G				3/21/18	10:47																			-21
ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION		DATE		TIME		ACCEPTED BY / AFFILIATION		DATE		TIME		SAMPLE CONDITIONS													
								<i>Megan Masterson</i>		3/21/18		08:55															

4196 3255 8949/8950

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Megan Masterson

SIGNATURE of SAMPLER: *Megan Masterson*

DATE Signed (MM/DD/YY): 3/23/18

Temp in °C: 13.0

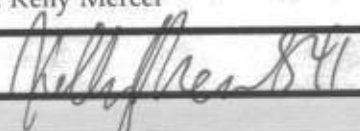
Received on Ice (Y/N): 4-25

Custody Sealed Cooler (Y/N):

Samples Intact (Y/N):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

ESC LAB SCIENCES Cooler Receipt Form

Client: <u>ASHCREPOR</u>	SDG#	<u>L980397</u>	
Cooler Received/Opened On: <u>3/27/18</u>	Temperature:	<u>1.3, 4.2</u>	
Received By: <u>Kelly Mercer</u>			
Signature: 			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?			
COC Signed / Accurate?		<input checked="" type="checkbox"/>	
Bottles arrive intact?		<input checked="" type="checkbox"/>	
Correct bottles used?		<input checked="" type="checkbox"/>	
Sufficient volume sent?		<input checked="" type="checkbox"/>	
If Applicable			
VOA Zero headspace?		<input checked="" type="checkbox"/>	
Preservation Correct / Checked?		<input checked="" type="checkbox"/>	

WELL MONUMENT AND BOTTOM SAMPLES, AND
POST DEVELOPMENT RESULTS FOR S-1 AND S-2



ALS Environmental
ALS Group USA, Corp
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www.alsglobal.com

June 05, 2018

Analytical Report for Service Request No: K1803036
Revised Service Request No: K1803036.01

Stephanie Salisbury
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201-4707

RE: NuStar Vancouver / 1126-21

Dear Stephanie,

Enclosed is the revised report for the sample(s) submitted to our laboratory April 03, 2018
For your reference, these analyses have been assigned our service request number **K1803036**.

This report has been revised to include lead.

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. 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.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager



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Kelso, WA 98626
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www.alsglobal.com

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Case Narrative
Chain of Custody
Total Solids
Metals

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.

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**

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



Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com



Client: Apex Companies, LLC
Project: NuStar Vancouver
Sample Matrix: Ground Water, Soil

Service Request: K1803036
Date Received: 04/03/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt:

Seventeen soil samples and two ground water samples were received for analysis at ALS Environmental on 04/03/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Metals:

Method 6020A: The Relative Percent Difference (RPD) for the replicate analysis of Chromium in sample S-1 Monument Silt was outside the normal ALS control limits. The variability in the results was attributed to the heterogeneous character of the sample. Standard mixing techniques were used, but were not sufficient for complete homogenization of this sample.

Method 6020A: The matrix spike recovery of Chromium for sample name was outside the ALS control criteria as a result of the heterogeneous character of the sample. The Relative Percent Difference (RPD) for the replicate analysis supported this. Since the unspiked samples contained high analyte concentrations relative to the amount spiked, the variability between replicates was sufficient to bias the percent recovery outside normal ALS control criteria. The associated QA/QC results (e.g. control sample, calibration standards, etc.) indicated the analysis was in control. No further corrective action was appropriate.

Approved by _____

Date 04/27/2018



Chain of Custody

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Phone (360)577-7222 Fax (360)636-1068
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88267

CHAIN OF CUSTODY

88267

001, 002

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SR# KI 803036
COC Set ___ of ___
COC# _____

Page 1 of 1

Project Name <u>Mustar Vancouver</u>		Project Number <u>1106-21</u>		NUMBER OF CONTAINERS	7D	180D	999D					Remarks		
Project Manager <u>Stephanie Salisbury</u>					350.1M / Ammonia	200.8 / Metals T	3010C / Metals T	160.3 Modified / TS	16030 Metals					
Company <u>Apex companies</u>														
Address <u>3015 SW 1st Ave.</u>														
Phone # <u>503 924 4704</u>		Email <u>ssalisbury@apexcos.com</u>												
Sampler Signature <u>[Signature]</u>		Sampler Printed Name <u>Kyle Kline</u>												
CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix										
1. S-1		4/3/18	835	GW	2	X						Extra volume		
2. S-2		4/3/18	915	GW	2	X						Extra volume		
3. S-1 Bottom silt		3/30/18	1130	Solid	1			X				Defined as silt. Run as solid.		
4. S-2 Bottom silt		3/30/18	1406	Solid	1			X				Defined as silt. Run as solid.		
5. S-1 monument silt		3/30/18	1353	Solid	1			X						
6. S-2 monument silt		3/30/18	1349	Solid	1			X						
7.														
8.														
9.														
10.														

Report Requirements <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 checked="" type="checkbox"/> V. EDD	Invoice Information P.O.# _____ Bill To: _____ _____ _____	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	
	Turnaround Requirements <input type="checkbox"/> 24 hr. _____ 48 hr. _____ <input checked="" type="checkbox"/> 5 Day <input checked="" type="checkbox"/> Standard	Special Instructions/Comments: _____ *Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other _____ (Circle One)	S-1 + S-2 Bottom silt, dirty water to be run as a solid.
	Requested Report Date _____		

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
<u>[Signature]</u>	<u>[Signature]</u>		<u>[Signature]</u>		
Signature <u>Kyle Kline</u>	Signature <u>[Signature]</u>	Signature	Signature <u>[Signature]</u>	Signature	Signature
Printed Name <u>Apex companies</u>	Printed Name <u>[Signature]</u>	Printed Name	Printed Name <u>Apex</u>	Printed Name	Printed Name
Firm <u>4/3/18 0750</u>	Firm <u>4/3/18 1000</u>	Firm	Firm <u>4/3/18 1320</u>	Firm	Firm
Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time



PC MH

Cooler Receipt and Preservation Form

Client Apex / NuStar Service Request K18 03037
 Received: 4/3/18 Opened: 4/3/18 By: [Signature] Unloaded: 4/3/18 By: [Signature]

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? _____
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	Filed
0.2	0.1	1.6	1.5	-0.1	391	NA	NA	

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
 6. 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
 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
 8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
 10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
 11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
 12. Was Cl2/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____



Total Solids

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Analysis Method: Freeze Dry
Prep Method: None

Service Request: K1803036
Date Collected: 03/26/18 - 03/27/18
Date Received: 04/3/18
Units: Percent
Basis: Wet

Total Solids

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
S-1 Bottom Silt	K1803036-003	7.06	-	1	04/09/18 16:44	
S-2 Bottom Silt	K1803036-004	27.8	-	1	04/09/18 16:44	
MW-13BS	K1803036-011	19.7	-	1	04/09/18 16:44	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Analysis Method: Freeze Dry
Prep Method: None

Service Request: K1803036
Date Collected: 03/26/18 - 03/27/18
Date Received: 04/3/18
Units: Percent
Basis: Wet

Total Solids

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
S-1 Bottom Silt	K1803036-003	7.06	-	1	04/09/18 16:44	
S-2 Bottom Silt	K1803036-004	27.8	-	1	04/09/18 16:44	
MW-13BS	K1803036-011	19.7	-	1	04/09/18 16:44	

ALS Group USA, Corp.
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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Analysis Method: 160.3 Modified
Prep Method: None

Service Request: K1803036
Date Collected: 03/22/18 - 03/27/18
Date Received: 04/3/18
Units: Percent
Basis: As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
S-1 Monument Silt	K1803036-005	72.2	-	1	04/09/18 13:59	
S-2 Monument Silt	K1803036-006	74.2	-	1	04/09/18 13:59	
MW-17TS	K1803036-007	49.2	-	1	04/09/18 13:59	
MW-23ITS	K1803036-008	80.3	-	1	04/09/18 13:59	
MW-14TS	K1803036-009	71.6	-	1	04/09/18 13:59	
MW-10TS	K1803036-010	70.3	-	1	04/09/18 13:59	
MW-13TS	K1803036-012	67.4	-	1	04/09/18 13:59	
MW-12TS	K1803036-013	79.6	-	1	04/09/18 13:59	
EX-TS	K1803036-014	63.2	-	1	04/09/18 13:59	
MW-01TS	K1803036-015	69.8	-	1	04/09/18 13:59	
EW-1TS	K1803036-016	75.3	-	1	04/09/18 13:59	
MW-06TS	K1803036-017	70.7	-	1	04/09/18 13:59	
MW-07TS	K1803036-018	59.6	-	1	04/09/18 13:59	
MW-08TS	K1803036-019	72.8	-	1	04/09/18 13:59	



Metals

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water
Sample Name: S-1
Lab Code: K1803036-001

Service Request: K1803036
Date Collected: 04/02/18 08:35
Date Received: 04/03/18 13:20
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	18000	ug/L	4.0	1	04/05/18 13:26	04/04/18	
Arsenic	200.8	7.03	ug/L	0.50	1	04/05/18 13:26	04/04/18	
Barium	200.8	216	ug/L	0.050	1	04/05/18 13:26	04/04/18	
Cadmium	200.8	1.18	ug/L	0.020	1	04/05/18 13:26	04/04/18	
Chromium	200.8	15.8	ug/L	0.20	1	04/05/18 13:26	04/04/18	
Copper	200.8	829	ug/L	0.10	1	04/05/18 13:26	04/04/18	
Iron	200.8	33500	ug/L	200	100	04/27/18 08:26	04/26/18	
Lead	200.8	38.9	ug/L	0.020	1	04/05/18 13:26	04/04/18	
Mercury	7470A	0.04 J	ug/L	0.20	1	04/16/18 09:56	04/13/18	
Molybdenum	200.8	2.82	ug/L	0.10	1	04/05/18 13:26	04/04/18	
Selenium	200.8	0.5 J	ug/L	1.0	1	04/05/18 13:26	04/04/18	
Silver	200.8	0.859	ug/L	0.020	1	04/05/18 13:26	04/04/18	
Zinc	200.8	278	ug/L	2.0	1	04/05/18 13:26	04/04/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water
Sample Name: S-2
Lab Code: K1803036-002

Service Request: K1803036
Date Collected: 04/02/18 09:15
Date Received: 04/03/18 13:20
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	18100	ug/L	4.0	1	04/05/18 13:33	04/04/18	
Arsenic	200.8	23.9	ug/L	0.50	1	04/05/18 13:33	04/04/18	
Barium	200.8	2110	ug/L	0.050	1	04/05/18 13:33	04/04/18	
Cadmium	200.8	0.926	ug/L	0.020	1	04/05/18 13:33	04/04/18	
Chromium	200.8	20.6	ug/L	0.20	1	04/05/18 13:33	04/04/18	
Copper	200.8	1050	ug/L	0.10	1	04/05/18 13:33	04/04/18	
Iron	200.8	134000	ug/L	200	100	04/27/18 08:27	04/26/18	
Lead	200.8	21.4	ug/L	0.020	1	04/05/18 13:33	04/04/18	
Mercury	7470A	0.06 J	ug/L	0.20	1	04/16/18 09:57	04/13/18	
Molybdenum	200.8	1.92	ug/L	0.10	1	04/05/18 13:33	04/04/18	
Selenium	200.8	1.0 J	ug/L	1.0	1	04/05/18 13:33	04/04/18	
Silver	200.8	0.444	ug/L	0.020	1	04/05/18 13:33	04/04/18	
Zinc	200.8	235	ug/L	2.0	1	04/05/18 13:33	04/04/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/26/18 11:30
Date Received: 04/03/18 13:20

Sample Name: S-1 Bottom Silt
Lab Code: K1803036-003

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	16900	mg/Kg	200	500	04/19/18 09:03	04/16/18	
Arsenic	6020A	34.6	mg/Kg	0.50	5	04/18/18 11:51	04/16/18	
Barium	6020A	153	mg/Kg	0.050	5	04/18/18 11:51	04/16/18	
Cadmium	6020A	4.58	mg/Kg	0.020	5	04/18/18 11:51	04/16/18	
Chromium	6020A	46.4	mg/Kg	0.20	5	04/18/18 11:51	04/16/18	
Copper	6020A	5120	mg/Kg	9.9	500	04/19/18 09:03	04/16/18	
Iron	6020A	41700	mg/Kg	99	500	04/19/18 09:03	04/16/18	
Lead	6020A	138	mg/Kg	0.050	5	05/07/18 11:31	04/16/18	
Mercury	7471B	0.202	mg/Kg	0.020	1	04/23/18 13:00	04/20/18	
Molybdenum	6020A	140	mg/Kg	0.050	5	04/18/18 11:51	04/16/18	
Selenium	6020A	4.40	mg/Kg	0.99	5	04/18/18 11:51	04/16/18	
Silver	6020A	9.44	mg/Kg	0.020	5	04/18/18 11:51	04/16/18	
Zinc	6020A	767	mg/Kg	50	500	04/19/18 09:03	04/16/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: S-2 Bottom Silt
Lab Code: K1803036-004

Service Request: K1803036
Date Collected: 03/26/18 14:06
Date Received: 04/03/18 13:20

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	13100	mg/Kg	200	500	04/19/18 09:05	04/16/18	
Arsenic	6020A	9.38	mg/Kg	0.50	5	04/18/18 11:54	04/16/18	
Barium	6020A	301	mg/Kg	0.050	5	04/18/18 11:54	04/16/18	
Cadmium	6020A	0.351	mg/Kg	0.020	5	04/18/18 11:54	04/16/18	
Chromium	6020A	17.9	mg/Kg	0.20	5	04/18/18 11:54	04/16/18	
Copper	6020A	612	mg/Kg	10	500	04/19/18 09:05	04/16/18	
Iron	6020A	122000	mg/Kg	100	500	04/19/18 09:05	04/16/18	
Lead	6020A	17.5	mg/Kg	0.050	5	05/07/18 11:32	04/16/18	
Mercury	7471B	0.022	mg/Kg	0.020	1	04/23/18 13:02	04/20/18	
Molybdenum	6020A	6.82	mg/Kg	0.050	5	04/18/18 11:54	04/16/18	
Selenium	6020A	ND U	mg/Kg	1.0	5	04/18/18 11:54	04/16/18	
Silver	6020A	0.444	mg/Kg	0.020	5	04/18/18 11:54	04/16/18	
Zinc	6020A	126	mg/Kg	5.0	50	04/19/18 09:25	04/16/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/22/18 13:53
Date Received: 04/03/18 13:20

Sample Name: S-1 Monument Silt
Lab Code: K1803036-005

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	7570	mg/Kg	220	500	04/19/18 08:19	04/09/18	
Arsenic	6020A	70.2	mg/Kg	0.55	5	04/18/18 10:44	04/09/18	
Barium	6020A	172	mg/Kg	0.055	5	04/18/18 10:44	04/09/18	
Cadmium	6020A	10.2	mg/Kg	0.022	5	04/18/18 10:44	04/09/18	
Chromium	6020A	105	mg/Kg	0.22	5	04/18/18 10:44	04/09/18	
Copper	6020A	23800	mg/Kg	11	500	04/19/18 08:19	04/09/18	
Iron	6020A	119000	mg/Kg	110	500	04/19/18 08:19	04/09/18	
Lead	6020A	223	mg/Kg	0.055	5	05/07/18 10:49	04/09/18	
Mercury	7471B	0.179	mg/Kg	0.026	1	04/11/18 12:14	04/10/18	
Molybdenum	6020A	220	mg/Kg	0.055	5	04/18/18 10:44	04/09/18	
Selenium	6020A	10.0	mg/Kg	1.1	5	04/18/18 10:44	04/09/18	
Silver	6020A	11.3	mg/Kg	0.022	5	04/18/18 10:44	04/09/18	
Zinc	6020A	2850	mg/Kg	55	500	04/19/18 08:19	04/09/18	

ALS Group USA, Corp.
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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/22/18 13:49
Date Received: 04/03/18 13:20

Sample Name: S-2 Monument Silt
Lab Code: K1803036-006

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	5570	mg/Kg	230	500	04/19/18 08:24	04/09/18	
Arsenic	6020A	89.9	mg/Kg	0.57	5	04/18/18 10:55	04/09/18	
Barium	6020A	140	mg/Kg	0.057	5	04/18/18 10:55	04/09/18	
Cadmium	6020A	9.29	mg/Kg	0.023	5	04/18/18 10:55	04/09/18	
Chromium	6020A	111	mg/Kg	0.23	5	04/18/18 10:55	04/09/18	
Copper	6020A	24500	mg/Kg	11	500	04/19/18 08:24	04/09/18	
Iron	6020A	91900	mg/Kg	110	500	04/19/18 08:24	04/09/18	
Lead	6020A	253	mg/Kg	0.057	5	05/07/18 10:57	04/09/18	
Mercury	7471B	0.181	mg/Kg	0.024	1	04/11/18 12:24	04/10/18	
Molybdenum	6020A	284	mg/Kg	0.057	5	04/18/18 10:55	04/09/18	
Selenium	6020A	16.6	mg/Kg	1.1	5	04/18/18 10:55	04/09/18	
Silver	6020A	13.8	mg/Kg	0.023	5	04/18/18 10:55	04/09/18	
Zinc	6020A	1980	mg/Kg	57	500	04/19/18 08:24	04/09/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-17TS
Lab Code: K1803036-007

Service Request: K1803036
Date Collected: 03/27/18 11:10
Date Received: 04/03/18 13:20

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	17600	mg/Kg	320	500	04/19/18 08:25	04/09/18	
Arsenic	6020A	94.0	mg/Kg	0.80	5	04/18/18 10:58	04/09/18	
Barium	6020A	155	mg/Kg	0.080	5	04/18/18 10:58	04/09/18	
Cadmium	6020A	10.2	mg/Kg	0.032	5	04/18/18 10:58	04/09/18	
Chromium	6020A	52.6	mg/Kg	0.32	5	04/18/18 10:58	04/09/18	
Copper	6020A	13600	mg/Kg	16	500	04/19/18 08:25	04/09/18	
Iron	6020A	42200	mg/Kg	160	500	04/19/18 08:25	04/09/18	
Lead	6020A	318	mg/Kg	0.080	5	05/07/18 10:58	04/09/18	
Mercury	7471B	0.366	mg/Kg	0.036	1	04/11/18 12:26	04/10/18	
Molybdenum	6020A	270	mg/Kg	0.080	5	04/18/18 10:58	04/09/18	
Selenium	6020A	10.3	mg/Kg	1.6	5	04/18/18 10:58	04/09/18	
Silver	6020A	16.6	mg/Kg	0.032	5	04/18/18 10:58	04/09/18	
Zinc	6020A	1800	mg/Kg	80	500	04/19/18 08:25	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/27/18 11:47
Date Received: 04/03/18 13:20

Sample Name: MW-23ITS
Lab Code: K1803036-008

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	4870	mg/Kg	220	500	04/19/18 08:27	04/09/18	
Arsenic	6020A	46.9	mg/Kg	0.55	5	04/18/18 11:00	04/09/18	
Barium	6020A	118	mg/Kg	0.055	5	04/18/18 11:00	04/09/18	
Cadmium	6020A	3.11	mg/Kg	0.022	5	04/18/18 11:00	04/09/18	
Chromium	6020A	88.8	mg/Kg	0.22	5	04/18/18 11:00	04/09/18	
Copper	6020A	6080	mg/Kg	11	500	04/19/18 08:27	04/09/18	
Iron	6020A	144000	mg/Kg	110	500	04/19/18 08:27	04/09/18	
Lead	6020A	102	mg/Kg	0.055	5	05/07/18 10:59	04/09/18	
Mercury	7471B	0.095	mg/Kg	0.022	1	04/11/18 12:27	04/10/18	
Molybdenum	6020A	80.4	mg/Kg	0.055	5	04/18/18 11:00	04/09/18	
Selenium	6020A	4.3	mg/Kg	1.1	5	04/18/18 11:00	04/09/18	
Silver	6020A	4.68	mg/Kg	0.022	5	04/18/18 11:00	04/09/18	
Zinc	6020A	737	mg/Kg	55	500	04/19/18 08:27	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-14TS
Lab Code: K1803036-009

Service Request: K1803036
Date Collected: 03/27/18 11:42
Date Received: 04/03/18 13:20

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	8630	mg/Kg	210	500	04/19/18 08:29	04/09/18	
Arsenic	6020A	27.3	mg/Kg	0.52	5	04/18/18 11:11	04/09/18	
Barium	6020A	225	mg/Kg	0.052	5	04/18/18 11:11	04/09/18	
Cadmium	6020A	5.03	mg/Kg	0.021	5	04/18/18 11:11	04/09/18	
Chromium	6020A	66.7	mg/Kg	0.21	5	04/18/18 11:11	04/09/18	
Copper	6020A	5360	mg/Kg	10	500	04/19/18 08:29	04/09/18	
Iron	6020A	42700	mg/Kg	100	500	04/19/18 08:29	04/09/18	
Lead	6020A	101	mg/Kg	0.052	5	05/07/18 11:10	04/09/18	
Mercury	7471B	0.121	mg/Kg	0.024	1	04/11/18 12:29	04/10/18	
Molybdenum	6020A	74.3	mg/Kg	0.052	5	04/18/18 11:11	04/09/18	
Selenium	6020A	3.2	mg/Kg	1.0	5	04/18/18 11:11	04/09/18	
Silver	6020A	4.11	mg/Kg	0.021	5	04/18/18 11:11	04/09/18	
Zinc	6020A	1060	mg/Kg	52	500	04/19/18 08:29	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-10TS
Lab Code: K1803036-010

Service Request: K1803036
Date Collected: 03/27/18 12:22
Date Received: 04/03/18 13:20

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	7640	mg/Kg	200	500	04/19/18 08:38	04/09/18	
Arsenic	6020A	35.8	mg/Kg	0.50	5	04/18/18 11:13	04/09/18	
Barium	6020A	168	mg/Kg	0.050	5	04/18/18 11:13	04/09/18	
Cadmium	6020A	8.77	mg/Kg	0.020	5	04/18/18 11:13	04/09/18	
Chromium	6020A	102	mg/Kg	0.20	5	04/18/18 11:13	04/09/18	
Copper	6020A	11000	mg/Kg	9.9	500	04/19/18 08:38	04/09/18	
Iron	6020A	117000	mg/Kg	99	500	04/19/18 08:38	04/09/18	
Lead	6020A	134	mg/Kg	0.050	5	05/07/18 11:11	04/09/18	
Mercury	7471B	0.141	mg/Kg	0.021	1	04/11/18 12:31	04/10/18	
Molybdenum	6020A	128	mg/Kg	0.050	5	04/18/18 11:13	04/09/18	
Selenium	6020A	5.53	mg/Kg	0.99	5	04/18/18 11:13	04/09/18	
Silver	6020A	5.15	mg/Kg	0.020	5	04/18/18 11:13	04/09/18	
Zinc	6020A	2340	mg/Kg	50	500	04/19/18 08:38	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-13BS
Lab Code: K1803036-011

Service Request: K1803036
Date Collected: 03/27/18 13:05
Date Received: 04/03/18 13:20
Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	11500	mg/Kg	190	500	04/19/18 09:10	04/16/18	
Arsenic	6020A	115	mg/Kg	0.49	5	04/18/18 12:10	04/16/18	
Barium	6020A	302	mg/Kg	0.049	5	04/18/18 12:10	04/16/18	
Cadmium	6020A	15.6	mg/Kg	0.019	5	04/18/18 12:10	04/16/18	
Chromium	6020A	77.7	mg/Kg	0.19	5	04/18/18 12:10	04/16/18	
Copper	6020A	20300	mg/Kg	9.7	500	04/19/18 09:10	04/16/18	
Iron	6020A	64200	mg/Kg	97	500	04/19/18 09:10	04/16/18	
Lead	6020A	508	mg/Kg	0.049	5	05/07/18 11:39	04/16/18	
Mercury	7471B	0.545	mg/Kg	0.019	1	04/23/18 13:03	04/20/18	
Molybdenum	6020A	279	mg/Kg	0.049	5	04/18/18 12:10	04/16/18	
Selenium	6020A	12.9	mg/Kg	0.97	5	04/18/18 12:10	04/16/18	
Silver	6020A	19.0	mg/Kg	0.019	5	04/18/18 12:10	04/16/18	
Zinc	6020A	2870	mg/Kg	49	500	04/19/18 09:10	04/16/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-13TS
Lab Code: K1803036-012

Service Request: K1803036
Date Collected: 03/27/18 13:10
Date Received: 04/03/18 13:20
Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	6610	mg/Kg	140	500	04/19/18 08:40	04/09/18	
Arsenic	6020A	54.7	mg/Kg	0.34	5	04/18/18 11:15	04/09/18	
Barium	6020A	347	mg/Kg	0.034	5	04/18/18 11:15	04/09/18	
Cadmium	6020A	6.75	mg/Kg	0.014	5	04/18/18 11:15	04/09/18	
Chromium	6020A	95.8	mg/Kg	0.14	5	04/18/18 11:15	04/09/18	
Copper	6020A	8800	mg/Kg	6.8	500	04/19/18 08:40	04/09/18	
Iron	6020A	87800	mg/Kg	68	500	04/19/18 08:40	04/09/18	
Lead	6020A	128	mg/Kg	0.034	5	05/07/18 11:13	04/09/18	
Mercury	7471B	0.189	mg/Kg	0.011	1	04/11/18 12:32	04/10/18	
Molybdenum	6020A	105	mg/Kg	0.034	5	04/18/18 11:15	04/09/18	
Selenium	6020A	5.22	mg/Kg	0.68	5	04/18/18 11:15	04/09/18	
Silver	6020A	6.46	mg/Kg	0.014	5	04/18/18 11:15	04/09/18	
Zinc	6020A	1400	mg/Kg	34	500	04/19/18 08:40	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-12TS
Lab Code: K1803036-013

Service Request: K1803036
Date Collected: 03/27/18 13:43
Date Received: 04/03/18 13:20

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	8950	mg/Kg	210	500	04/19/18 08:41	04/09/18	
Arsenic	6020A	21.6	mg/Kg	0.52	5	04/18/18 11:18	04/09/18	
Barium	6020A	148	mg/Kg	0.052	5	04/18/18 11:18	04/09/18	
Cadmium	6020A	8.48	mg/Kg	0.021	5	04/18/18 11:18	04/09/18	
Chromium	6020A	53.1	mg/Kg	0.21	5	04/18/18 11:18	04/09/18	
Copper	6020A	2790	mg/Kg	10	500	04/19/18 08:41	04/09/18	
Iron	6020A	67600	mg/Kg	100	500	04/19/18 08:41	04/09/18	
Lead	6020A	114	mg/Kg	0.052	5	05/07/18 11:14	04/09/18	
Mercury	7471B	0.106	mg/Kg	0.022	1	04/11/18 12:34	04/10/18	
Molybdenum	6020A	28.0	mg/Kg	0.052	5	04/18/18 11:18	04/09/18	
Selenium	6020A	1.4	mg/Kg	1.0	5	04/18/18 11:18	04/09/18	
Silver	6020A	3.12	mg/Kg	0.021	5	04/18/18 11:18	04/09/18	
Zinc	6020A	2000	mg/Kg	52	500	04/19/18 08:41	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/27/18 14:09
Date Received: 04/03/18 13:20

Sample Name: EX-TS
Lab Code: K1803036-014

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	17400	mg/Kg	220	500	04/19/18 08:43	04/09/18	
Arsenic	6020A	19.9	mg/Kg	0.56	5	04/18/18 11:20	04/09/18	
Barium	6020A	189	mg/Kg	0.056	5	04/18/18 11:20	04/09/18	
Cadmium	6020A	6.40	mg/Kg	0.022	5	04/18/18 11:20	04/09/18	
Chromium	6020A	138	mg/Kg	0.22	5	04/18/18 11:20	04/09/18	
Copper	6020A	3730	mg/Kg	11	500	04/19/18 08:43	04/09/18	
Iron	6020A	45200	mg/Kg	110	500	04/19/18 08:43	04/09/18	
Lead	6020A	87.6	mg/Kg	0.056	5	05/07/18 11:16	04/09/18	
Mercury	7471B	0.440	mg/Kg	0.025	1	04/11/18 12:35	04/10/18	
Molybdenum	6020A	48.0	mg/Kg	0.056	5	04/18/18 11:20	04/09/18	
Selenium	6020A	1.6	mg/Kg	1.1	5	04/18/18 11:20	04/09/18	
Silver	6020A	2.82	mg/Kg	0.022	5	04/18/18 11:20	04/09/18	
Zinc	6020A	2020	mg/Kg	56	500	04/19/18 08:43	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-01TS
Lab Code: K1803036-015

Service Request: K1803036
Date Collected: 03/27/18 14:27
Date Received: 04/03/18 13:20

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	6580	mg/Kg	140	500	04/19/18 08:44	04/09/18	
Arsenic	6020A	18.6	mg/Kg	0.35	5	04/18/18 11:22	04/09/18	
Barium	6020A	139	mg/Kg	0.035	5	04/18/18 11:22	04/09/18	
Cadmium	6020A	6.49	mg/Kg	0.014	5	04/18/18 11:22	04/09/18	
Chromium	6020A	81.3	mg/Kg	0.14	5	04/18/18 11:22	04/09/18	
Copper	6020A	2060	mg/Kg	7.1	500	04/19/18 08:44	04/09/18	
Iron	6020A	44400	mg/Kg	71	500	04/19/18 08:44	04/09/18	
Lead	6020A	63.8	mg/Kg	0.035	5	05/07/18 11:17	04/09/18	
Mercury	7471B	0.121	mg/Kg	0.013	1	04/11/18 12:37	04/10/18	
Molybdenum	6020A	28.5	mg/Kg	0.035	5	04/18/18 11:22	04/09/18	
Selenium	6020A	1.10	mg/Kg	0.71	5	04/18/18 11:22	04/09/18	
Silver	6020A	2.04	mg/Kg	0.014	5	04/18/18 11:22	04/09/18	
Zinc	6020A	792	mg/Kg	35	500	04/19/18 08:44	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/27/18 14:39
Date Received: 04/03/18 13:20

Sample Name: EW-1TS
Lab Code: K1803036-016

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	7830	mg/Kg	190	500	04/19/18 08:57	04/09/18	
Arsenic	6020A	12.3	mg/Kg	0.47	5	04/18/18 11:25	04/09/18	
Barium	6020A	120	mg/Kg	0.047	5	04/18/18 11:25	04/09/18	
Cadmium	6020A	1.98	mg/Kg	0.019	5	04/18/18 11:25	04/09/18	
Chromium	6020A	65.6	mg/Kg	0.19	5	04/18/18 11:25	04/09/18	
Copper	6020A	2790	mg/Kg	9.3	500	04/19/18 08:57	04/09/18	
Iron	6020A	47200	mg/Kg	93	500	04/19/18 08:57	04/09/18	
Lead	6020A	45.0	mg/Kg	0.047	5	05/07/18 11:19	04/09/18	
Mercury	7471B	0.059	mg/Kg	0.020	1	04/11/18 12:39	04/10/18	
Molybdenum	6020A	28.0	mg/Kg	0.047	5	04/18/18 11:25	04/09/18	
Selenium	6020A	1.20	mg/Kg	0.93	5	04/18/18 11:25	04/09/18	
Silver	6020A	1.43	mg/Kg	0.019	5	04/18/18 11:25	04/09/18	
Zinc	6020A	627	mg/Kg	47	500	04/19/18 08:57	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-06TS
Lab Code: K1803036-017

Service Request: K1803036
Date Collected: 03/27/18 15:03
Date Received: 04/03/18 13:20

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	4480	mg/Kg	180	500	04/19/18 08:58	04/09/18	
Arsenic	6020A	25.4	mg/Kg	0.44	5	04/18/18 11:27	04/09/18	
Barium	6020A	79.4	mg/Kg	0.044	5	04/18/18 11:27	04/09/18	
Cadmium	6020A	24.9	mg/Kg	0.018	5	04/18/18 11:27	04/09/18	
Chromium	6020A	470	mg/Kg	0.18	5	04/18/18 11:27	04/09/18	
Copper	6020A	2200	mg/Kg	8.8	500	04/19/18 08:58	04/09/18	
Iron	6020A	246000	mg/Kg	88	500	04/19/18 08:58	04/09/18	
Lead	6020A	63.1	mg/Kg	0.044	5	05/07/18 11:20	04/09/18	
Mercury	7471B	0.054	mg/Kg	0.019	1	04/11/18 12:43	04/10/18	
Molybdenum	6020A	37.6	mg/Kg	0.044	5	04/18/18 11:27	04/09/18	
Selenium	6020A	ND U	mg/Kg	0.88	5	04/18/18 11:27	04/09/18	
Silver	6020A	1.16	mg/Kg	0.018	5	04/18/18 11:27	04/09/18	
Zinc	6020A	7580	mg/Kg	44	500	04/19/18 08:58	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-07TS
Lab Code: K1803036-018

Service Request: K1803036
Date Collected: 03/27/18 15:25
Date Received: 04/03/18 13:20

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	7610	mg/Kg	240	500	04/19/18 08:49	04/09/18	
Arsenic	6020A	19.7	mg/Kg	0.60	5	04/18/18 11:29	04/09/18	
Barium	6020A	185	mg/Kg	0.060	5	04/18/18 11:29	04/09/18	
Cadmium	6020A	23.7	mg/Kg	0.024	5	04/18/18 11:29	04/09/18	
Chromium	6020A	84.7	mg/Kg	0.24	5	04/18/18 11:29	04/09/18	
Copper	6020A	3560	mg/Kg	12	500	04/19/18 08:49	04/09/18	
Iron	6020A	38900	mg/Kg	120	500	04/19/18 08:49	04/09/18	
Lead	6020A	88.7	mg/Kg	0.060	5	05/07/18 11:22	04/09/18	
Mercury	7471B	0.240	mg/Kg	0.022	1	04/11/18 12:45	04/10/18	
Molybdenum	6020A	131	mg/Kg	0.060	5	04/18/18 11:29	04/09/18	
Selenium	6020A	1.8	mg/Kg	1.2	5	04/18/18 11:29	04/09/18	
Silver	6020A	3.06	mg/Kg	0.024	5	04/18/18 11:29	04/09/18	
Zinc	6020A	889	mg/Kg	60	500	04/19/18 08:49	04/09/18	

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Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: MW-08TS
Lab Code: K1803036-019

Service Request: K1803036
Date Collected: 03/27/18 16:13
Date Received: 04/03/18 13:20

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	8710	mg/Kg	180	500	04/19/18 08:52	04/09/18	
Arsenic	6020A	26.0	mg/Kg	0.44	5	04/18/18 11:32	04/09/18	
Barium	6020A	147	mg/Kg	0.044	5	04/18/18 11:32	04/09/18	
Cadmium	6020A	10.6	mg/Kg	0.018	5	04/18/18 11:32	04/09/18	
Chromium	6020A	207	mg/Kg	0.18	5	04/18/18 11:32	04/09/18	
Copper	6020A	6870	mg/Kg	8.9	500	04/19/18 08:52	04/09/18	
Iron	6020A	126000	mg/Kg	89	500	04/19/18 08:52	04/09/18	
Lead	6020A	121	mg/Kg	0.044	5	05/07/18 11:23	04/09/18	
Mercury	7471B	0.119	mg/Kg	0.025	1	04/11/18 12:47	04/10/18	
Molybdenum	6020A	67.8	mg/Kg	0.044	5	04/18/18 11:32	04/09/18	
Selenium	6020A	2.93	mg/Kg	0.89	5	04/18/18 11:32	04/09/18	
Silver	6020A	3.62	mg/Kg	0.018	5	04/18/18 11:32	04/09/18	
Zinc	6020A	3360	mg/Kg	44	500	04/19/18 08:52	04/09/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water
Sample Name: Method Blank
Lab Code: KQ1804228-01

Service Request: K1803036
Date Collected: NA
Date Received: NA
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	200.8	ND U	ug/L	4.0	1	04/05/18 12:32	04/04/18	
Arsenic	200.8	ND U	ug/L	0.50	1	04/05/18 12:32	04/04/18	
Barium	200.8	ND U	ug/L	0.050	1	04/05/18 12:32	04/04/18	
Cadmium	200.8	ND U	ug/L	0.020	1	04/05/18 12:32	04/04/18	
Chromium	200.8	ND U	ug/L	0.20	1	04/05/18 12:32	04/04/18	
Copper	200.8	ND U	ug/L	0.10	1	04/05/18 12:32	04/04/18	
Lead	200.8	ND U	ug/L	0.020	1	04/05/18 12:32	04/04/18	
Molybdenum	200.8	ND U	ug/L	0.10	1	04/05/18 12:32	04/04/18	
Selenium	200.8	ND U	ug/L	1.0	1	04/05/18 12:32	04/04/18	
Silver	200.8	ND U	ug/L	0.020	1	04/05/18 12:32	04/04/18	
Zinc	200.8	ND U	ug/L	2.0	1	04/05/18 12:32	04/04/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water
Sample Name: Method Blank
Lab Code: KQ1805300-01

Service Request: K1803036
Date Collected: NA
Date Received: NA
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Iron	200.8	ND U	ug/L	2.0	1	04/27/18 08:14	04/26/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: KQ1804487-03

Service Request: K1803036
Date Collected: NA
Date Received: NA
Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	ND U	mg/Kg	2.0	5	04/19/18 09:17	04/09/18	
Arsenic	6020A	ND U	mg/Kg	0.5	5	04/18/18 10:39	04/09/18	
Barium	6020A	ND U	mg/Kg	0.05	5	04/18/18 10:39	04/09/18	
Cadmium	6020A	ND U	mg/Kg	0.020	5	04/18/18 10:39	04/09/18	
Chromium	6020A	ND U	mg/Kg	0.20	5	04/18/18 10:39	04/09/18	
Copper	6020A	ND U	mg/Kg	0.10	5	04/19/18 09:17	04/09/18	
Iron	6020A	1.2	mg/Kg	1.0	5	04/19/18 09:17	04/09/18	
Lead	6020A	ND U	mg/Kg	0.05	5	05/07/18 10:46	04/09/18	
Molybdenum	6020A	ND U	mg/Kg	0.05	5	04/18/18 10:39	04/09/18	
Selenium	6020A	ND U	mg/Kg	1.0	5	04/18/18 10:39	04/09/18	
Silver	6020A	ND U	mg/Kg	0.020	5	04/18/18 10:39	04/09/18	
Zinc	6020A	ND U	mg/Kg	0.5	5	04/19/18 09:17	04/09/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: KQ1804795-01

Service Request: K1803036
Date Collected: NA
Date Received: NA
Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	ND U	mg/Kg	2.0	5	04/19/18 09:18	04/16/18	
Arsenic	6020A	ND U	mg/Kg	0.5	5	04/18/18 11:47	04/16/18	
Barium	6020A	ND U	mg/Kg	0.05	5	04/18/18 11:47	04/16/18	
Cadmium	6020A	ND U	mg/Kg	0.020	5	04/18/18 11:47	04/16/18	
Chromium	6020A	ND U	mg/Kg	0.20	5	04/18/18 11:47	04/16/18	
Copper	6020A	0.37	mg/Kg	0.10	5	04/19/18 09:18	04/16/18	
Iron	6020A	1.5	mg/Kg	1.0	5	04/19/18 09:18	04/16/18	
Lead	6020A	0.067	mg/Kg	0.05	5	05/07/18 11:28	04/16/18	
Molybdenum	6020A	ND U	mg/Kg	0.05	5	04/18/18 11:47	04/16/18	
Selenium	6020A	ND U	mg/Kg	1.0	5	04/18/18 11:47	04/16/18	
Silver	6020A	ND U	mg/Kg	0.020	5	04/18/18 11:47	04/16/18	
Zinc	6020A	0.69	mg/Kg	0.5	5	04/19/18 09:18	04/16/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water
Sample Name: Method Blank
Lab Code: KQ1804353-01

Service Request: K1803036
Date Collected: NA
Date Received: NA
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	7470A	ND U	ug/L	0.20	1	04/16/18 09:52	04/13/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: KQ1804486-03

Service Request: K1803036
Date Collected: NA
Date Received: NA
Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	7471B	ND U	mg/Kg	0.02	1	04/11/18 12:11	04/10/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: KQ1805018-03

Service Request: K1803036
Date Collected: NA
Date Received: NA
Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	7471B	ND U	mg/Kg	0.02	1	04/23/18 12:45	04/20/18	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water

Service Request: K1803036
Date Collected: 04/02/18
Date Received: 04/03/18
Date Analyzed: 04/05/18

Replicate Sample Summary

Total Metals

Sample Name: S-1
Lab Code: K1803036-001

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample		Average	RPD	RPD Limit
				KQ1804228-05				
				Result	Result			
Aluminum	200.8	4.0	18000	18200	18100	1	20	
Arsenic	200.8	0.50	7.03	7.20	7.12	2	20	
Barium	200.8	0.050	216	215	216	<1	20	
Cadmium	200.8	0.020	1.18	1.12	1.15	5	20	
Chromium	200.8	0.20	15.8	15.9	15.9	<1	20	
Copper	200.8	0.10	829	822	826	<1	20	
Lead	200.8	0.020	38.9	38.7	38.8	<1	20	
Molybdenum	200.8	0.10	2.82	2.88	2.85	2	20	
Selenium	200.8	1.0	ND U	ND U	ND	-	20	
Silver	200.8	0.020	0.859	0.857	0.858	<1	20	
Zinc	200.8	2.0	278	275	277	1	20	

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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

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water

Service Request: K1803036
Date Collected: 04/02/18
Date Received: 04/03/18
Date Analyzed: 04/27/18

Replicate Sample Summary

Total Metals

Sample Name: S-2
Lab Code: K1803036-002

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
				KQ1805300-03 Result			
Iron	200.8	200	134000	137000	136000	2	20

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ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/22/18
Date Received: 04/03/18
Date Analyzed: 04/18/18 - 05/07/18

Replicate Sample Summary

Total Metals

Sample Name: S-1 Monument Silt
Lab Code: K1803036-005

Units: mg/Kg
Basis: Dry

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample		Average	RPD	RPD Limit
				KQ1804487-01				
				Result	Result			
Aluminum	6020A	230	7570	8150	7860	7	20	
Arsenic	6020A	0.58	70.2	73.2	71.7	4	20	
Barium	6020A	0.058	172	196	184	13	20	
Cadmium	6020A	0.023	10.2	10.8	10.5	6	20	
Chromium	6020A	0.23	105	75.5	90.3	32 *	20	
Copper	6020A	12	23800	24000	23900	<1	20	
Iron	6020A	120	119000	107000	113000	10	20	
Lead	6020A	0.058	223	225	224	1	20	
Molybdenum	6020A	0.058	220	216	218	2	20	
Selenium	6020A	1.2	10.0	10.4	10.2	4	20	
Silver	6020A	0.023	11.3	11.1	11.2	3	20	
Zinc	6020A	58	2850	2970	2910	5	20	

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ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/26/18
Date Received: 04/03/18
Date Analyzed: 04/18/18 - 05/07/18

Replicate Sample Summary

Total Metals

Sample Name: S-2 Bottom Silt
Lab Code: K1803036-004

Units: mg/Kg
Basis: Dry

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample		Average	RPD	RPD Limit
				KQ1804795-07				
Aluminum	6020A	190	13100	14100	13600	7	20	
Arsenic	6020A	0.5	9.38	9.55	9.47	2	20	
Barium	6020A	0.05	301	309	305	3	20	
Cadmium	6020A	0.019	0.351	0.363	0.357	3	20	
Chromium	6020A	0.19	17.9	18.1	18.0	1	20	
Copper	6020A	9.7	612	635	624	4	20	
Iron	6020A	97	122000	129000	126000	6	20	
Lead	6020A	0.05	17.5	18.3	17.9	4	20	
Molybdenum	6020A	0.05	6.82	7.15	6.99	5	20	
Selenium	6020A	1.0	ND U	ND U	ND	-	20	
Silver	6020A	0.019	0.444	0.393	0.419	12	20	
Zinc	6020A	4.9	126	131	129	4	20	

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ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Water

Service Request: K1803036
Date Collected: NA
Date Received: NA
Date Analyzed: 04/16/18

Replicate Sample Summary

Total Metals

Sample Name: Batch QC
Lab Code: K1803253-015

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
				KQ1804353-05 Result			
Mercury	7470A	0.20	ND U	ND U	ND	-	20

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ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/22/18
Date Received: 04/03/18
Date Analyzed: 04/11/18

Replicate Sample Summary

Total Metals

Sample Name: S-1 Monument Silt
Lab Code: K1803036-005

Units: mg/Kg
Basis: Dry

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample		Average	RPD	RPD Limit
				KQ1804486-01				
				Result				
Mercury	7471B	0.026	0.179	0.178		0.179	<1	20

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ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Sediment

Service Request: K1803036
Date Collected: NA
Date Received: NA
Date Analyzed: 04/23/18

Replicate Sample Summary

Total Metals

Sample Name: Batch QC
Lab Code: K1803253-014

Units: mg/Kg
Basis: Dry

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
				KQ1805018-07 Result			
Mercury	7471B	0.02	0.037	0.038	0.038	3	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water

Service Request: K1803036
Date Collected: 04/02/18
Date Received: 04/03/18
Date Analyzed: 04/5/18
Date Extracted: 04/4/18

Matrix Spike Summary
Total Metals

Sample Name: S-1
Lab Code: K1803036-001
Analysis Method: 200.8
Prep Method: EPA CLP-METALS ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ1804228-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	18000	19000	100	950 #	70-130
Arsenic	7.03	52.7	50.0	91	70-130
Barium	216	323	100	107	70-130
Cadmium	1.18	26.8	25.0	102	70-130
Chromium	15.8	25.7	10.0	99	70-130
Copper	829	832	12.5	22 #	70-130
Lead	38.9	89.5	50.0	101	70-130
Molybdenum	2.82	18.7	20.0	80	70-130
Selenium	ND U	49.5	50.0	98	70-130
Silver	0.859	13.6	12.5	102	70-130
Zinc	278	291	25.0	52 #	70-130

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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

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water

Service Request: K1803036
Date Collected: 04/02/18
Date Received: 04/03/18
Date Analyzed: 04/27/18
Date Extracted: 04/26/18

Matrix Spike Summary
Total Metals

Sample Name: S-2
Lab Code: K1803036-002
Analysis Method: 200.8
Prep Method: EPA CLP-METALS ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ1805300-04

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Iron	134000	143000	50	18262 #	70-130

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/22/18
Date Received: 04/03/18
Date Analyzed: 04/18/18 - 05/07/18
Date Extracted: 04/9/18

Matrix Spike Summary
Total Metals

Sample Name: S-1 Monument Silt
Lab Code: K1803036-005
Analysis Method: 6020A
Prep Method: EPA 3050B

Units: mg/Kg
Basis: Dry

Matrix Spike
KQ1804487-02

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	7570	8090	460	115 #	75-125
Arsenic	70.2	191	113	107	75-125
Barium	172	406	226	104	75-125
Cadmium	10.2	22.3	11.3	108	75-125
Chromium	105	126	45.0	47 N	75-125
Copper	23800	24100	56	597 #	75-125
Iron	119000	93200	230	-11266 #	75-125
Lead	223	330	113	94	75-125
Molybdenum	220	356	113	120	75-125
Selenium	10.0	130	113	107	75-125
Silver	11.3	22.1	11.3	95	75-125
Zinc	2850	2770	112	-67 #	75-125

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/26/18
Date Received: 04/03/18
Date Analyzed: 04/18/18 - 05/07/18
Date Extracted: 04/16/18

Matrix Spike Summary
Total Metals

Sample Name: S-2 Bottom Silt
Lab Code: K1803036-004
Analysis Method: 6020A
Prep Method: EPA 3050B

Units: mg/Kg
Basis: Dry

Matrix Spike
KQ1804795-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	13100	14300	400	291 #	75-125
Arsenic	9.38	112	99.0	104	75-125
Barium	301	542	198	121	75-125
Cadmium	0.351	10.9	9.90	106	75-125
Chromium	17.9	59.9	39.6	106	75-125
Copper	612	647	49.5	70 #	75-125
Iron	122000	120000	198	-1009 #	75-125
Lead	17.5	104	99.0	87	75-125
Molybdenum	6.82	504	495	100	75-125
Selenium	ND U	103	99.0	104	75-125
Silver	0.444	10.2	9.90	99	75-125
Zinc	126	229	99.0	104	75-125

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Water

Service Request: K1803036
Date Collected: N/A
Date Received: N/A
Date Analyzed: 04/16/18
Date Extracted: 04/13/18

Matrix Spike Summary
Total Metals

Sample Name: Batch QC
Lab Code: K1803253-015
Analysis Method: 7470A
Prep Method: Method

Units: ug/L
Basis: NA

Matrix Spike
KQ1804353-06

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Mercury	ND U	5.31	5.00	106	75-125

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Collected: 03/22/18
Date Received: 04/03/18
Date Analyzed: 04/11/18
Date Extracted: 04/10/18

Matrix Spike Summary
Total Metals

Sample Name: S-1 Monument Silt
Lab Code: K1803036-005
Analysis Method: 7471B
Prep Method: Method

Units: mg/Kg
Basis: Dry

Matrix Spike
KQ1804486-02

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Mercury	0.179	0.809	0.632	100	80-120

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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

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Sediment

Service Request: K1803036
Date Collected: N/A
Date Received: N/A
Date Analyzed: 04/23/18
Date Extracted: 04/20/18

Matrix Spike Summary
Total Metals

Sample Name: Batch QC
Lab Code: K1803253-014
Analysis Method: 7471B
Prep Method: Method

Units: mg/Kg
Basis: Dry

Matrix Spike
KQ1805018-08

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Mercury	0.037	0.479	0.456	97	80-120

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water

Service Request: K1803036
Date Analyzed: 04/05/18

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ1804228-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	200.8	104	100	104	85-115
Arsenic	200.8	51.5	50.0	103	85-115
Barium	200.8	102	100	102	85-115
Cadmium	200.8	26.1	25.0	105	85-115
Chromium	200.8	10.6	10.0	106	85-115
Copper	200.8	13.2	12.5	106	85-115
Lead	200.8	52.2	50.0	104	85-115
Molybdenum	200.8	21.5	20.0	108	85-115
Selenium	200.8	52.8	50.0	106	85-115
Silver	200.8	12.9	12.5	103	85-115
Zinc	200.8	27.5	25.0	110	85-115

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water

Service Request: K1803036
Date Analyzed: 04/27/18

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ1805300-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Iron	200.8	52.8	50.0	106	85-115

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Analyzed: 04/18/18 - 05/07/18

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ1804487-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6020A	6690	7930	84	39-161
Arsenic	6020A	100	98.5	102	69-145
Barium	6020A	318	308	103	74-126
Cadmium	6020A	154	146	106	73-127
Chromium	6020A	184	182	101	71-130
Copper	6020A	105	106	99	75-125
Iron	6020A	12100	14400	84	36-164
Lead	6020A	141	130	109	72-127
Molybdenum	6020A	172	164	105	71-129
Selenium	6020A	157	154	102	68-132
Silver	6020A	41.7	40.9	102	66-134
Zinc	6020A	184	191	97	70-130

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Analyzed: 04/18/18 - 05/07/18

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ1804795-05

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6020A	6440	7930	81	39-161
Arsenic	6020A	99.6	98.5	101	69-145
Barium	6020A	323	308	105	74-126
Cadmium	6020A	156	146	107	73-127
Chromium	6020A	180	182	99	71-130
Copper	6020A	110	106	103	75-125
Iron	6020A	11700	14400	82	36-164
Lead	6020A	150	130	115	72-127
Molybdenum	6020A	172	164	105	71-129
Selenium	6020A	162	154	105	68-132
Silver	6020A	42.2	40.9	103	66-134
Zinc	6020A	188	191	98	70-130

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Ground Water

Service Request: K1803036
Date Analyzed: 04/16/18

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ1804353-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Mercury	7470A	5.21	5.00	104	80-120

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Analyzed: 04/11/18

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ1804486-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Mercury	7471B	6.47	7.10	91	51-149

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126-21
Sample Matrix: Soil

Service Request: K1803036
Date Analyzed: 04/23/18

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ1805018-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Mercury	7471B	7.25	7.10	102	51-149

SURFACE SEDIMENT

APEX Companies - Portland, OR

Sample Delivery Group: L983210
Samples Received: 04/05/2018
Project Number: 1126-21.002
Description: NuStar Vancouver GWM
Site: VANCOUVER, WA
Report To: Stephanie Salisbury
3015 SW First Avenue
Portland, OR 97201-4707

Entire Report Reviewed By:



Brian Ford
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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SAMPLE SUMMARY



SED-1 L983210-01 Solid

Collected by: Kyle Kline
 Collected date/time: 03/27/18 14:00
 Received date/time: 04/05/18 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1095515	1	04/09/18 12:49	04/09/18 12:58	JD
Metals (ICPMS) by Method 6020A	WG1096864	100	04/11/18 22:10	04/12/18 12:01	JPD

1
Cp

2
Tc

3
Ss

IDW SOIL DRUM L983210-02 Solid

Collected by: Kyle Kline
 Collected date/time: 04/02/18 10:05
 Received date/time: 04/05/18 09:40

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1095515	1	04/09/18 12:49	04/09/18 12:58	JD
Mercury by Method 7471B	WG1095578	1	04/09/18 11:52	04/09/18 16:25	EL
Metals (ICP) by Method 6010C	WG1095327	1	04/08/18 08:06	04/09/18 11:33	CCE
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1094855	1	04/07/18 00:15	04/09/18 13:54	ACG

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford
Technical Service Representative

Sample Handling and Receiving

The following sample(s) were received at greater than 6 degrees C.

<u>ESC Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
L983210-02	IDW SOIL DRUM	7471B, 8260C

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	69.5		1	04/09/2018 12:58	WG1095515

1 Cp

2 Tc

Metals (ICPMS) by Method 6020A

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Copper	10400	<u>V</u>	7.49	14.4	100	04/12/2018 12:01	WG1096864

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
Total Solids	90.0		1	04/09/2018 12:58	WG1095515

Mercury by Method 7471B

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
Mercury	0.0115	J	0.00311	0.0222	1	04/09/2018 16:25	WG1095578

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
Arsenic	2.21	J	0.722	2.22	1	04/09/2018 11:33	WG1095327
Barium	44.4		0.189	0.555	1	04/09/2018 11:33	WG1095327
Cadmium	0.210	J	0.0778	0.555	1	04/09/2018 11:33	WG1095327
Chromium	6.63		0.156	1.11	1	04/09/2018 11:33	WG1095327
Lead	7.70		0.211	0.555	1	04/09/2018 11:33	WG1095327
Selenium	U		0.822	2.22	1	04/09/2018 11:33	WG1095327
Silver	U		0.311	1.11	1	04/09/2018 11:33	WG1095327

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
Acetone	U	JO	0.0111	0.0555	1	04/09/2018 13:54	WG1094855
Acrylonitrile	U		0.00199	0.0111	1	04/09/2018 13:54	WG1094855
Benzene	U		0.000300	0.00111	1	04/09/2018 13:54	WG1094855
Bromobenzene	U		0.000315	0.00111	1	04/09/2018 13:54	WG1094855
Bromodichloromethane	U		0.000282	0.00111	1	04/09/2018 13:54	WG1094855
Bromoform	U	JO	0.000471	0.00111	1	04/09/2018 13:54	WG1094855
Bromomethane	U		0.00149	0.00555	1	04/09/2018 13:54	WG1094855
n-Butylbenzene	U		0.000287	0.00111	1	04/09/2018 13:54	WG1094855
sec-Butylbenzene	U		0.000223	0.00111	1	04/09/2018 13:54	WG1094855
tert-Butylbenzene	U		0.000229	0.00111	1	04/09/2018 13:54	WG1094855
Carbon tetrachloride	U		0.000364	0.00111	1	04/09/2018 13:54	WG1094855
Chlorobenzene	U		0.000235	0.00111	1	04/09/2018 13:54	WG1094855
Chlorodibromomethane	U		0.000414	0.00111	1	04/09/2018 13:54	WG1094855
Chloroethane	U		0.00105	0.00555	1	04/09/2018 13:54	WG1094855
Chloroform	U		0.000254	0.00555	1	04/09/2018 13:54	WG1094855
Chloromethane	U	JO	0.000417	0.00278	1	04/09/2018 13:54	WG1094855
2-Chlorotoluene	U		0.000334	0.00111	1	04/09/2018 13:54	WG1094855
4-Chlorotoluene	U		0.000267	0.00111	1	04/09/2018 13:54	WG1094855
1,2-Dibromo-3-Chloropropane	U		0.00117	0.00555	1	04/09/2018 13:54	WG1094855
1,2-Dibromoethane	U		0.000381	0.00111	1	04/09/2018 13:54	WG1094855
Dibromomethane	U		0.000424	0.00111	1	04/09/2018 13:54	WG1094855
1,2-Dichlorobenzene	U		0.000339	0.00111	1	04/09/2018 13:54	WG1094855
1,3-Dichlorobenzene	U		0.000265	0.00111	1	04/09/2018 13:54	WG1094855
1,4-Dichlorobenzene	U		0.000251	0.00111	1	04/09/2018 13:54	WG1094855
Dichlorodifluoromethane	U	JO	0.000792	0.00555	1	04/09/2018 13:54	WG1094855
1,1-Dichloroethane	U		0.000221	0.00111	1	04/09/2018 13:54	WG1094855
1,2-Dichloroethane	U		0.000294	0.00111	1	04/09/2018 13:54	WG1094855
1,1-Dichloroethene	U		0.000337	0.00111	1	04/09/2018 13:54	WG1094855
cis-1,2-Dichloroethene	U		0.000261	0.00111	1	04/09/2018 13:54	WG1094855
trans-1,2-Dichloroethene	U		0.000293	0.00111	1	04/09/2018 13:54	WG1094855
1,2-Dichloropropane	U		0.000398	0.00111	1	04/09/2018 13:54	WG1094855
1,1-Dichloropropene	U		0.000352	0.00111	1	04/09/2018 13:54	WG1094855
1,3-Dichloropropane	U		0.000230	0.00111	1	04/09/2018 13:54	WG1094855

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 04/02/18 10:05

L983210

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
cis-1,3-Dichloropropene	U		0.000291	0.0011	1	04/09/2018 13:54	WG1094855
trans-1,3-Dichloropropene	U		0.000297	0.0011	1	04/09/2018 13:54	WG1094855
2,2-Dichloropropane	U		0.000310	0.0011	1	04/09/2018 13:54	WG1094855
Di-isopropyl ether	U	<u>JO</u>	0.000275	0.0011	1	04/09/2018 13:54	WG1094855
Ethylbenzene	U		0.000330	0.0011	1	04/09/2018 13:54	WG1094855
Hexachloro-1,3-butadiene	U		0.000380	0.0011	1	04/09/2018 13:54	WG1094855
Isopropylbenzene	U		0.000270	0.0011	1	04/09/2018 13:54	WG1094855
p-Isopropyltoluene	U		0.000227	0.0011	1	04/09/2018 13:54	WG1094855
2-Butanone (MEK)	U	<u>JO</u>	0.00520	0.011	1	04/09/2018 13:54	WG1094855
Methylene Chloride	U		0.0011	0.00555	1	04/09/2018 13:54	WG1094855
4-Methyl-2-pentanone (MIBK)	U		0.00209	0.011	1	04/09/2018 13:54	WG1094855
Methyl tert-butyl ether	U		0.000235	0.0011	1	04/09/2018 13:54	WG1094855
Naphthalene	U		0.0011	0.00555	1	04/09/2018 13:54	WG1094855
n-Propylbenzene	U		0.000229	0.0011	1	04/09/2018 13:54	WG1094855
Styrene	U		0.000260	0.0011	1	04/09/2018 13:54	WG1094855
1,1,1,2-Tetrachloroethane	U		0.000293	0.0011	1	04/09/2018 13:54	WG1094855
1,1,2,2-Tetrachloroethane	U		0.000405	0.0011	1	04/09/2018 13:54	WG1094855
1,1,2-Trichlorotrifluoroethane	U		0.000405	0.0011	1	04/09/2018 13:54	WG1094855
Tetrachloroethene	U		0.000307	0.0011	1	04/09/2018 13:54	WG1094855
Toluene	U		0.000482	0.00555	1	04/09/2018 13:54	WG1094855
1,2,3-Trichlorobenzene	U		0.000340	0.0011	1	04/09/2018 13:54	WG1094855
1,2,4-Trichlorobenzene	U		0.000431	0.0011	1	04/09/2018 13:54	WG1094855
1,1,1-Trichloroethane	U		0.000318	0.0011	1	04/09/2018 13:54	WG1094855
1,1,2-Trichloroethane	U		0.000308	0.0011	1	04/09/2018 13:54	WG1094855
Trichloroethene	U		0.000310	0.0011	1	04/09/2018 13:54	WG1094855
Trichlorofluoromethane	U		0.000424	0.00555	1	04/09/2018 13:54	WG1094855
1,2,3-Trichloropropane	U		0.000823	0.00278	1	04/09/2018 13:54	WG1094855
1,2,4-Trimethylbenzene	U		0.000234	0.0011	1	04/09/2018 13:54	WG1094855
1,2,3-Trimethylbenzene	U		0.000319	0.0011	1	04/09/2018 13:54	WG1094855
Vinyl chloride	U		0.000323	0.0011	1	04/09/2018 13:54	WG1094855
1,3,5-Trimethylbenzene	U		0.000295	0.0011	1	04/09/2018 13:54	WG1094855
Xylenes, Total	U		0.000775	0.00333	1	04/09/2018 13:54	WG1094855
(S) Toluene-d8	107			80.0-120		04/09/2018 13:54	WG1094855
(S) Dibromofluoromethane	102			74.0-131		04/09/2018 13:54	WG1094855
(S) 4-Bromofluorobenzene	91.0			64.0-132		04/09/2018 13:54	WG1094855

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3300355-1 04/09/18 12:58

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.00100			

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

L983958-01 Original Sample (OS) • Duplicate (DUP)

(OS) L983958-01 04/09/18 12:58 • (DUP) R3300355-3 04/09/18 12:58

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	%	%		%		%
Total Solids	78.4	78.5	1	0.0860		5

6 Qc

Laboratory Control Sample (LCS)

(LCS) R3300355-2 04/09/18 12:58

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3300318-1 04/09/18 16:08

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.00280	0.0200

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3300318-2 04/09/18 16:10 • (LCSD) R3300318-3 04/09/18 16:12

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury	0.300	0.282	0.279	94.1	92.9	80.0-120			1.31	20

L983649-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L983649-03 04/09/18 16:14 • (MS) R3300318-4 04/09/18 16:16 • (MSD) R3300318-5 04/09/18 16:18

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury	0.300	0.200	0.436	0.558	78.9	119	1	75.0-125		J3	24.5	20

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3300155-1 04/09/18 11:08

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.650	2.00
Barium	U		0.170	0.500
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Lead	0.207	↓	0.190	0.500
Selenium	U		0.740	2.00
Silver	U		0.280	1.00

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3300155-2 04/09/18 11:11 • (LCSD) R3300155-3 04/09/18 11:14

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	98.0	98.2	98.0	98.2	80.0-120			0.182	20
Barium	100	104	104	104	104	80.0-120			0.255	20
Cadmium	100	97.7	98.0	97.7	98.0	80.0-120			0.370	20
Chromium	100	101	100	101	100	80.0-120			0.434	20
Lead	100	99.9	100	99.9	100	80.0-120			0.306	20
Selenium	100	97.6	98.0	97.6	98.0	80.0-120			0.370	20
Silver	20.0	18.4	18.4	92.1	91.8	80.0-120			0.383	20

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L983631-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L983631-02 04/09/18 11:17 • (MS) R3300155-6 04/09/18 11:27 • (MSD) R3300155-7 04/09/18 11:30

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	138	10.1	136	138	90.9	92.5	1	75.0-125			1.60	20
Barium	138	110	237	242	91.9	95.0	1	75.0-125			1.80	20
Cadmium	138	ND	128	131	92.7	94.4	1	75.0-125			1.82	20
Chromium	138	33.1	161	163	92.6	94.2	1	75.0-125			1.43	20
Lead	138	10.9	145	148	97.1	99.2	1	75.0-125			1.99	20
Selenium	138	ND	124	126	89.9	91.0	1	75.0-125			1.17	20
Silver	27.6	ND	24.0	24.5	86.8	88.5	1	75.0-125			1.94	20



Method Blank (MB)

(MB) R3301220-1 04/12/18 10:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Copper	U		0.260	0.500

¹ Cp

² Tc

³ Ss

⁴ Cn

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3301220-2 04/12/18 11:03 • (LCSD) R3301220-3 04/12/18 11:08

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Copper	100	102	101	102	101	80.0-120			1.19	20

⁵ Sr

⁶ Qc

L983210-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L983210-01 04/12/18 11:12 • (MS) R3301220-6 04/12/18 11:24 • (MSD) R3301220-7 04/12/18 11:28

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Copper	28.8	9090	14400	15300	3670	4310	5	75.0-125	<u>EV</u>	<u>EV</u>	6.20	20

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3300455-4 04/09/18 11:24

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acetone	U		0.0100	0.0500
Acrylonitrile	U		0.00179	0.0100
Benzene	U		0.000270	0.00100
Bromobenzene	U		0.000284	0.00100
Bromodichloromethane	U		0.000254	0.00100
Bromoform	U		0.000424	0.00100
Bromomethane	U		0.00134	0.00500
n-Butylbenzene	U		0.000258	0.00100
sec-Butylbenzene	U		0.000201	0.00100
tert-Butylbenzene	U		0.000206	0.00100
Carbon tetrachloride	U		0.000328	0.00100
Chlorobenzene	U		0.000212	0.00100
Chlorodibromomethane	U		0.000373	0.00100
Chloroethane	U		0.000946	0.00500
Chloroform	U		0.000229	0.00500
Chloromethane	U		0.000375	0.00250
2-Chlorotoluene	U		0.000301	0.00100
4-Chlorotoluene	U		0.000240	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00105	0.00500
1,2-Dibromoethane	U		0.000343	0.00100
Dibromomethane	U		0.000382	0.00100
1,2-Dichlorobenzene	U		0.000305	0.00100
1,3-Dichlorobenzene	U		0.000239	0.00100
1,4-Dichlorobenzene	U		0.000226	0.00100
Dichlorodifluoromethane	U		0.000713	0.00500
1,1-Dichloroethane	U		0.000199	0.00100
1,2-Dichloroethane	U		0.000265	0.00100
1,1-Dichloroethene	U		0.000303	0.00100
cis-1,2-Dichloroethene	U		0.000235	0.00100
trans-1,2-Dichloroethene	U		0.000264	0.00100
1,2-Dichloropropane	U		0.000358	0.00100
1,1-Dichloropropene	U		0.000317	0.00100
1,3-Dichloropropane	U		0.000207	0.00100
cis-1,3-Dichloropropene	U		0.000262	0.00100
trans-1,3-Dichloropropene	U		0.000267	0.00100
2,2-Dichloropropane	U		0.000279	0.00100
Di-isopropyl ether	U		0.000248	0.00100
Ethylbenzene	U		0.000297	0.00100
Hexachloro-1,3-butadiene	U		0.000342	0.00100
Isopropylbenzene	U		0.000243	0.00100

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3300455-4 04/09/18 11:24

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
p-Isopropyltoluene	U		0.000204	0.00100
2-Butanone (MEK)	U		0.00468	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00188	0.0100
Methyl tert-butyl ether	U		0.000212	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000206	0.00100
Styrene	U		0.000234	0.00100
1,1,1,2-Tetrachloroethane	U		0.000264	0.00100
1,1,2,2-Tetrachloroethane	U		0.000365	0.00100
Tetrachloroethene	U		0.000276	0.00100
Toluene	U		0.000434	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000365	0.00100
1,2,3-Trichlorobenzene	U		0.000306	0.00100
1,2,4-Trichlorobenzene	U		0.000388	0.00100
1,1,1-Trichloroethane	U		0.000286	0.00100
1,1,2-Trichloroethane	U		0.000277	0.00100
Trichloroethene	U		0.000279	0.00100
Trichlorofluoromethane	U		0.000382	0.00500
1,2,3-Trichloropropane	U		0.000741	0.00250
1,2,3-Trimethylbenzene	U		0.000287	0.00100
1,2,4-Trimethylbenzene	U		0.000211	0.00100
1,3,5-Trimethylbenzene	U		0.000266	0.00100
Vinyl chloride	U		0.000291	0.00100
Xylenes, Total	U		0.000698	0.00300
(S) Toluene-d8	112			80.0-120
(S) Dibromofluoromethane	97.4			74.0-131
(S) 4-Bromofluorobenzene	90.2			64.0-132

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3300455-1 04/09/18 09:45 • (LCSD) R3300455-2 04/09/18 10:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.0605	0.0593	48.4	47.5	11.0-160			2.03	23
Acrylonitrile	0.125	0.109	0.113	87.6	90.6	61.0-143			3.45	20
Benzene	0.0250	0.0241	0.0246	96.4	98.5	71.0-124			2.25	20
Bromobenzene	0.0250	0.0224	0.0220	89.8	88.1	78.0-120			1.83	20
Bromodichloromethane	0.0250	0.0213	0.0218	85.1	87.2	75.0-120			2.43	20



Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3300455-1 04/09/18 09:45 • (LCSD) R3300455-2 04/09/18 10:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromoform	0.0250	0.0195	0.0194	77.9	77.6	65.0-133			0.416	20
Bromomethane	0.0250	0.0258	0.0263	103	105	26.0-160			1.71	20
n-Butylbenzene	0.0250	0.0256	0.0247	102	98.9	73.0-126			3.31	20
sec-Butylbenzene	0.0250	0.0262	0.0259	105	104	75.0-121			0.963	20
tert-Butylbenzene	0.0250	0.0262	0.0255	105	102	74.0-122			2.54	20
Carbon tetrachloride	0.0250	0.0246	0.0242	98.3	96.8	66.0-123			1.57	20
Chlorobenzene	0.0250	0.0295	0.0291	118	116	79.0-121			1.41	20
Chlorodibromomethane	0.0250	0.0246	0.0242	98.2	96.8	74.0-128			1.47	20
Chloroethane	0.0250	0.0238	0.0244	95.4	97.6	51.0-147			2.27	20
Chloroform	0.0250	0.0232	0.0240	92.6	96.0	73.0-123			3.58	20
Chloromethane	0.0250	0.0186	0.0189	74.3	75.5	51.0-138			1.63	20
2-Chlorotoluene	0.0250	0.0244	0.0243	97.7	97.0	72.0-124			0.667	20
4-Chlorotoluene	0.0250	0.0245	0.0241	98.2	96.4	78.0-120			1.80	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0235	0.0221	94.0	88.4	65.0-126			6.16	20
1,2-Dibromoethane	0.0250	0.0277	0.0270	111	108	78.0-122			2.76	20
Dibromomethane	0.0250	0.0232	0.0232	92.7	92.9	79.0-120			0.220	20
1,2-Dichlorobenzene	0.0250	0.0270	0.0260	108	104	80.0-120			3.44	20
1,3-Dichlorobenzene	0.0250	0.0272	0.0268	109	107	72.0-123			1.61	20
1,4-Dichlorobenzene	0.0250	0.0258	0.0253	103	101	77.0-120			1.79	20
Dichlorodifluoromethane	0.0250	0.0199	0.0199	79.7	79.6	49.0-155			0.137	20
1,1-Dichloroethane	0.0250	0.0243	0.0249	97.2	99.7	70.0-128			2.46	20
1,2-Dichloroethane	0.0250	0.0238	0.0243	95.4	97.3	69.0-128			1.95	20
1,1-Dichloroethene	0.0250	0.0238	0.0235	95.1	93.9	63.0-131			1.30	20
cis-1,2-Dichloroethene	0.0250	0.0239	0.0240	95.4	96.1	74.0-123			0.698	20
trans-1,2-Dichloroethene	0.0250	0.0236	0.0238	94.5	95.2	72.0-122			0.686	20
1,2-Dichloropropane	0.0250	0.0243	0.0245	97.4	98.1	75.0-126			0.726	20
1,1-Dichloropropene	0.0250	0.0261	0.0264	105	106	72.0-130			1.01	20
1,3-Dichloropropane	0.0250	0.0279	0.0268	111	107	80.0-121			3.95	20
cis-1,3-Dichloropropene	0.0250	0.0267	0.0264	107	106	80.0-125			1.15	20
trans-1,3-Dichloropropene	0.0250	0.0266	0.0258	106	103	75.0-129			3.20	20
2,2-Dichloropropane	0.0250	0.0220	0.0235	88.1	94.2	60.0-129			6.60	20
Di-isopropyl ether	0.0250	0.0195	0.0200	78.0	80.1	62.0-133			2.72	20
Ethylbenzene	0.0250	0.0272	0.0264	109	106	77.0-120			3.06	20
Hexachloro-1,3-butadiene	0.0250	0.0283	0.0273	113	109	68.0-128			3.51	20
Isopropylbenzene	0.0250	0.0233	0.0231	93.2	92.3	75.0-120			0.996	20
p-Isopropyltoluene	0.0250	0.0272	0.0261	109	104	74.0-125			4.31	20
2-Butanone (MEK)	0.125	0.0739	0.0735	59.1	58.8	37.0-159			0.594	20
Methylene Chloride	0.0250	0.0236	0.0242	94.4	96.9	67.0-123			2.61	20
4-Methyl-2-pentanone (MIBK)	0.125	0.112	0.106	89.4	85.1	60.0-144			4.89	20
Methyl tert-butyl ether	0.0250	0.0234	0.0237	93.5	94.6	66.0-125			1.21	20

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3300455-1 04/09/18 09:45 • (LCSD) R3300455-2 04/09/18 10:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Naphthalene	0.0250	0.0266	0.0251	106	101	64.0-125			5.50	20
n-Propylbenzene	0.0250	0.0245	0.0242	98.0	96.8	78.0-120			1.30	20
Styrene	0.0250	0.0218	0.0218	87.1	87.3	78.0-124			0.226	20
1,1,1,2-Tetrachloroethane	0.0250	0.0262	0.0258	105	103	74.0-124			1.77	20
1,1,2,2-Tetrachloroethane	0.0250	0.0219	0.0212	87.7	85.0	73.0-120			3.20	20
Tetrachloroethene	0.0250	0.0303	0.0293	121	117	70.0-127			3.41	20
Toluene	0.0250	0.0266	0.0261	107	104	77.0-120			2.08	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0239	0.0249	95.4	99.5	64.0-135			4.16	20
1,2,3-Trichlorobenzene	0.0250	0.0309	0.0293	124	117	68.0-126			5.48	20
1,2,4-Trichlorobenzene	0.0250	0.0308	0.0291	123	116	70.0-127			5.63	20
1,1,1-Trichloroethane	0.0250	0.0225	0.0230	89.9	92.1	69.0-125			2.42	20
1,1,2-Trichloroethane	0.0250	0.0267	0.0259	107	104	78.0-120			3.15	20
Trichloroethene	0.0250	0.0282	0.0281	113	113	79.0-120			0.0940	20
Trichlorofluoromethane	0.0250	0.0265	0.0272	106	109	59.0-136			2.62	20
1,2,3-Trichloropropane	0.0250	0.0222	0.0213	88.6	85.4	73.0-124			3.70	20
1,2,3-Trimethylbenzene	0.0250	0.0269	0.0263	108	105	76.0-120			2.23	20
1,2,4-Trimethylbenzene	0.0250	0.0245	0.0242	98.0	96.8	75.0-120			1.19	20
1,3,5-Trimethylbenzene	0.0250	0.0249	0.0246	99.5	98.4	75.0-120			1.11	20
Vinyl chloride	0.0250	0.0222	0.0226	89.0	90.6	63.0-134			1.78	20
Xylenes, Total	0.0750	0.0823	0.0800	110	107	77.0-120			2.83	20
<i>(S) Toluene-d8</i>				110	109	80.0-120				
<i>(S) Dibromofluoromethane</i>				98.5	99.0	74.0-131				
<i>(S) 4-Bromofluorobenzene</i>				90.9	89.1	64.0-132				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J0	J0: Calibration verification outside of acceptance limits. Result is estimated.
J3	The associated batch QC was outside the established quality control range for precision.
V	The sample concentration is too high to evaluate accurate spike recoveries.



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana ¹	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

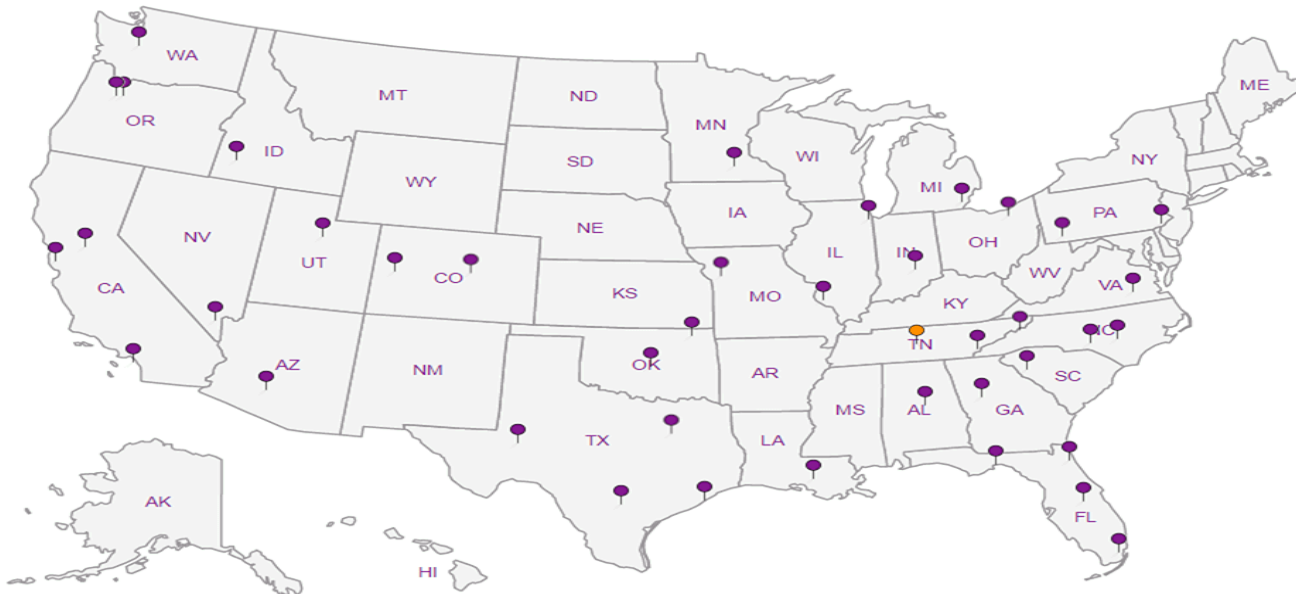
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable


Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



ESC LAB SCIENCES

Cooler Receipt Form

Client: Apex Companies, LLC	SDG# L983210
Cooler Received/Opened On: 04/05/18	Temperature: 6.7
Received By: E Gaddess	
Signature: 	
Receipt Check List	
	NP Yes No
COC Seal Present / Intact?	X
COC Signed / Accurate?	X
Bottles arrive intact?	X
Correct bottles used?	X
Sufficient volume sent?	X
If Applicable	
VOA Zero headspace?	X
Preservation Correct / Checked?	X

3/15/18

35th
LOCST



Document Name:
CA Regulated Soil Notification

Document Revised: 09Aug2017
Page 1 of 1

Document No.:
F-DAV-C-044-Rev.01

Issuing Authority:
Pace Davis, CA Quality Office

USDA / APHIS regulates soil from specific counties that have invasive species, pests, or plant diseases present in the county. In order to process your project, we need to determine if special handling applies to your project. **Any soils received without this completed form cannot be received or processed until the site address is confirmed.**

To be completed prior to sample shipment:

County:

- Alameda Contra Costa Humboldt Lake Los Angeles Marin
- Mendocino Monterey Napa Orange Riverside San Francisco
- San Mateo Santa Clara Santa Cruz Solano Sonoma Trinity
- Other (specify): _____

(If soils are from one of the 18 counties specified above, the site address is required.)

Site Address: _____

(FROM WAS HUNTON)

To be completed by Pace Analytical - Davis:

(Permit # P33D-16-00182 / Compliance Agreement #PS.25-160513-004 CAF)

Work Order # L983210

Are Soils Regulated? No Yes (if yes, complete form)

Regulated for? Phytophthora Ramorum Fire Ants Fruit Flies

Amount of soil received: ~ _____ grams

Received on: _____

Will any analysis be subcontracted? Yes No

If yes, complete the following for each subcontract lab

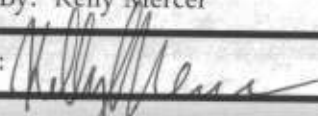
Sub lab notified samples are regulated and shipment sent with receiving lab's Soil Permit / Compliance Agreement?

Subcontract Lab	Amount shipped	Yes	(initial / date)
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	

Initial / date after a copy of form has been sent to Anthony Jackson, USDA APHIS PPQ _____

3.5/16
CASI

ESC LAB SCIENCES Cooler Receipt Form

Client:	PACE ASACREPOR	SDG#	L983210		
Cooler Received/Opened On:	4/6/18	Temperature:	35		
Received By:	Kelly Mercer				
Signature:					
Receipt Check List			NP	Yes	No
COC Seal Present / Intact?				✓	
COC Signed / Accurate?				✓	
Bottles arrive intact?				✓	
Correct bottles used?				✓	
Sufficient volume sent?				✓	
If Applicable					
VOA Zero headspace?					
Preservation Correct / Checked?					

MW-13 POST DEVELOPMENT GROUNDWATER ANALYTICAL

APEX Companies - Portland, OR

Sample Delivery Group: L990704
Samples Received: 05/03/2018
Project Number: 1126-21.002
Description: NuStar Vancouver Groundwater Monitoring
Site: VANCOUVER, WA
Report To: Stephanie Salisbury
3015 SW First Avenue
Portland, OR 97201-4707

Entire Report Reviewed By:



Brian Ford
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



Cp: Cover Page	1	¹Cp
Tc: Table of Contents	2	²Tc
Ss: Sample Summary	3	³Ss
Cn: Case Narrative	4	⁴Cn
Sr: Sample Results	5	⁵Sr
MW-13 L990704-01	5	⁴Cn
Qc: Quality Control Summary	6	⁵Sr
Metals (ICP) by Method 6010C	6	⁶Qc
Gl: Glossary of Terms	7	⁷Gl
Al: Accreditations & Locations	8	⁸Al
Sc: Sample Chain of Custody	9	⁹Sc

SAMPLE SUMMARY



MW-13 L990704-01 GW

Collected by: Kyle Kline
Collected date/time: 04/10/18 10:45
Received date/time: 05/03/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG1108011	1	05/08/18 10:57	05/08/18 12:29	TRB

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford
Technical Service Representative

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Metals (ICP) by Method 6010C

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Copper	13400	<u>J3 V</u>	5.30	10.0	1	05/08/2018 12:29	WG1108011

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



[L990704-01](#)

Method Blank (MB)

(MB) R3307867-1 05/08/18 12:21

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Copper	U		5.30	10.0

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3307867-2 05/08/18 12:24 • (LCSD) R3307867-3 05/08/18 12:26

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Copper	1000	973	980	97.3	98.0	80.0-120			0.652	20

L990704-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L990704-01 05/08/18 12:29 • (MS) R3307867-5 05/08/18 12:34 • (MSD) R3307867-6 05/08/18 12:37

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Copper	1000	13400	15000	24300	162	1090	1	75.0-125	<u>V</u>	<u>J3 V</u>	47.2	20

⁷ Gl

⁸ Al

⁹ Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
V	The sample concentration is too high to evaluate accurate spike recoveries.



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
 * Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana ¹	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

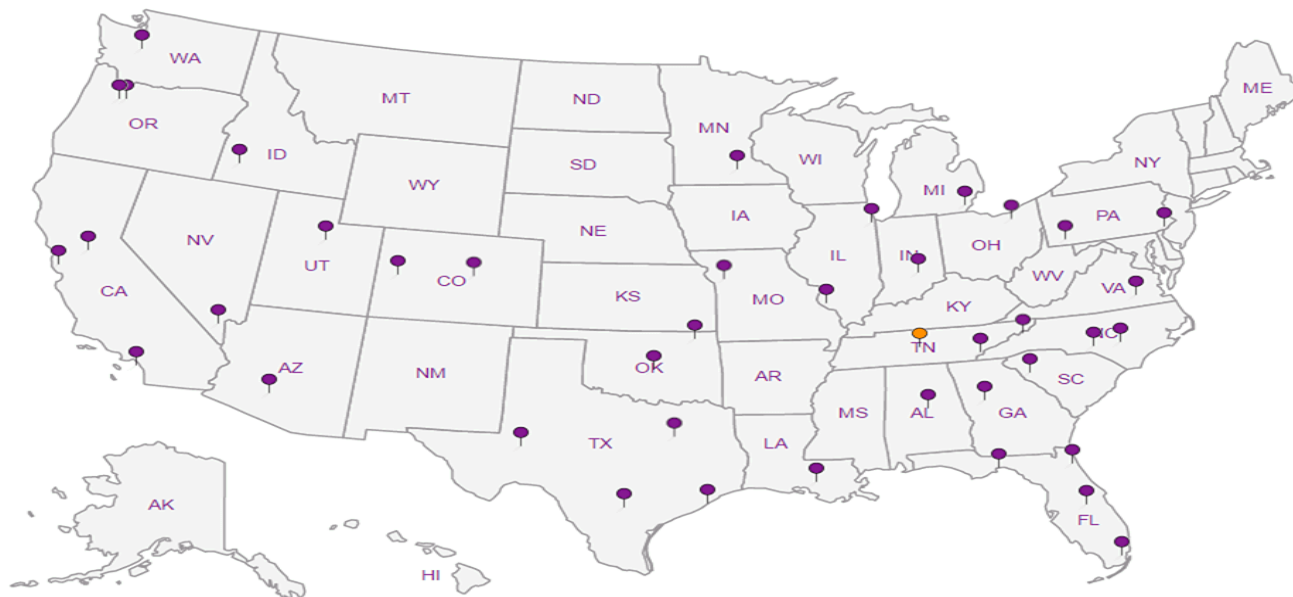
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		


¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



ESC LAB SCIENCES Cooler Receipt Form

Client: <u>ASHCREPOR</u>	SDG#	<u>L990704</u>		
Cooler Received/Opened On: <u>5/3/18</u>	Temperature:	<u>5.3</u>		
Received By: <u>Kelly Mercer</u>				
Signature: 				
Receipt Check List		NP	Yes	No
COC Seal Present / Intact?		<input checked="" type="checkbox"/>		
COC Signed / Accurate?			<input checked="" type="checkbox"/>	
Bottles arrive intact?			<input checked="" type="checkbox"/>	
Correct bottles used?			<input checked="" type="checkbox"/>	
Sufficient volume sent?			<input checked="" type="checkbox"/>	
If Applicable				
VOA Zero headspace?				
Preservation Correct / Checked?		<input checked="" type="checkbox"/>		

GUTTER SAMPLES



Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Friday, July 27, 2018

Stephanie Salisbury
Cascadia Associates
6915 SW Macadam, Suite 250
Portland, OR 97219

RE: A8G0177 - Nustar Vancouver - [none]

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A8G0177, which was received by the laboratory on 7/10/2018 at 8:56:00AM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: ldomenighini@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of final reporting, unless prior arrangements have been made.

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

A handwritten signature in black ink that reads "Lisa A. Domenighini".

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa Domenighini, Client Services Manager



Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

<u>Cascadia Associates</u> 6915 SW Macadam, Suite 250 Portland, OR 97219	Project: <u>Nustar Vancouver</u> Project Number: [none] Project Manager: Stephanie Salisbury	Report ID: A8G0177 - 07 27 18 1405
--	--	--

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
A-01	A8G0177-01	Soil	07/10/18 07:40	07/10/18 08:56
A-02	A8G0177-02	Soil	07/10/18 07:45	07/10/18 08:56

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Lisa Domenighini, Client Services Manager



Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Cascadia Associates

6915 SW Macadam, Suite 250
Portland, OR 97219

Project: Nustar Vancouver

Project Number: [none]

Project Manager: Stephanie Salisbury

Report ID:

A8G0177 - 07 27 18 1405

ANALYTICAL CASE NARRATIVE

Work Order: A8G0177

Amended Report Revision 1:

This report supersedes all previous reports.

At the request of the client several metals were added to the samples included under work order number, A8G0177.

Lisa Domenighini
Client Services Manager
7/27/18

Apex Laboratories

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Lisa Domenighini, Client Services Manager



Cascadia Associates 6915 SW Macadam, Suite 250 Portland, OR 97219	Project: Nustar Vancouver Project Number: [none] Project Manager: Stephanie Salisbury	Report ID: A8G0177 - 07 27 18 1405
--	--	--

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
A-01 (A8G0177-01) Matrix: Soil								
Batch: 8070504								
Arsenic	623	---	58.4	mg/kg dry	400	07/11/18	EPA 6020A	
Barium	ND	---	58.4	mg/kg dry	400	07/11/18	EPA 6020A	
Cadmium	39.1	---	11.7	mg/kg dry	400	07/11/18	EPA 6020A	
Chromium	ND	---	58.4	mg/kg dry	400	07/11/18	EPA 6020A	
Lead	1740	---	11.7	mg/kg dry	400	07/11/18	EPA 6020A	
Mercury	ND	---	4.67	mg/kg dry	400	07/11/18	EPA 6020A	
Molybdenum	3540	---	58.4	mg/kg dry	400	07/11/18	EPA 6020A	
Selenium	70.7	---	58.4	mg/kg dry	400	07/11/18	EPA 6020A	
Silver	80.6	---	11.7	mg/kg dry	400	07/11/18	EPA 6020A	
Zinc	9630	---	234	mg/kg dry	400	07/11/18	EPA 6020A	
Batch: 8071005								
Aluminum	2240	---	1750	mg/kg dry	250	07/26/18	EPA 6020A	
Iron	302000	---	1750	mg/kg dry	250	07/26/18	EPA 6020A	
A-01 (A8G0177-01RE1) Matrix: Soil								
Batch: 8070504								
Copper	174000	---	730	mg/kg dry	5000	07/11/18	EPA 6020A	B-02
A-02 (A8G0177-02) Matrix: Soil								
Batch: 8070504								
Arsenic	281	---	61.4	mg/kg dry	400	07/11/18	EPA 6020A	
Barium	62.8	---	61.4	mg/kg dry	400	07/11/18	EPA 6020A	
Cadmium	27.6	---	12.3	mg/kg dry	400	07/11/18	EPA 6020A	
Chromium	ND	---	61.4	mg/kg dry	400	07/11/18	EPA 6020A	
Lead	882	---	12.3	mg/kg dry	400	07/11/18	EPA 6020A	Q-42
Mercury	ND	---	4.91	mg/kg dry	400	07/11/18	EPA 6020A	
Molybdenum	1310	---	61.4	mg/kg dry	400	07/11/18	EPA 6020A	
Selenium	ND	---	61.4	mg/kg dry	400	07/11/18	EPA 6020A	
Silver	41.9	---	12.3	mg/kg dry	400	07/11/18	EPA 6020A	
Zinc	7720	---	246	mg/kg dry	400	07/11/18	EPA 6020A	Q-42
Batch: 8071005								
Aluminum	6550	---	1790	mg/kg dry	250	07/26/18	EPA 6020A	
Iron	182000	---	1790	mg/kg dry	250	07/26/18	EPA 6020A	
A-02 (A8G0177-02RE1) Matrix: Soil								
Batch: 8070504								

Apex Laboratories

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Lisa Domenighini, Client Services Manager



Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Cascadia Associates 6915 SW Macadam, Suite 250 Portland, OR 97219	Project: Nustar Vancouver Project Number: [none] Project Manager: Stephanie Salisbury	Report ID: A8G0177 - 07 27 18 1405
--	--	--

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
A-02 (A8G0177-02RE1)				Matrix: Soil				
Copper	88200	---	767	mg/kg dry	5000	07/11/18	EPA 6020A	B-02, Q-42

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Lisa Domenighini, Client Services Manager



Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Cascadia Associates 6915 SW Macadam, Suite 250 Portland, OR 97219	Project: Nustar Vancouver Project Number: [none] Project Manager: Stephanie Salisbury	Report ID: A8G0177 - 07 27 18 1405
--	--	--

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
A-01 (A8G0177-01)				Matrix: Soil			Batch: 8070501	
% Solids	73.0	---	1.00	% by Weight	1	07/11/18	EPA 8000C	
A-02 (A8G0177-02)				Matrix: Soil			Batch: 8070501	
% Solids	68.6	---	1.00	% by Weight	1	07/11/18	EPA 8000C	

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Lisa Domenighini, Client Services Manager



Cascadia Associates 6915 SW Macadam, Suite 250 Portland, OR 97219	Project: Nustar Vancouver Project Number: [none] Project Manager: Stephanie Salisbury	Report ID: A8G0177 - 07 27 18 1405
--	---	--

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8070504 - EPA 3051A												
Soil												
Blank (8070504-BLK1)												
Prepared: 07/10/18 09:47 Analyzed: 07/10/18 23:56												
EPA 6020A												
Arsenic	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
Barium	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
Cadmium	ND	---	0.192	mg/kg wet	10	---	---	---	---	---	---	
Chromium	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
Copper	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	B-02
Lead	ND	---	0.192	mg/kg wet	10	---	---	---	---	---	---	
Mercury	ND	---	0.0769	mg/kg wet	10	---	---	---	---	---	---	
Molybdenum	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
Selenium	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
Silver	ND	---	0.192	mg/kg wet	10	---	---	---	---	---	---	
Zinc	ND	---	3.85	mg/kg wet	10	---	---	---	---	---	---	

LCS (8070504-BS1)												
Prepared: 07/10/18 09:47 Analyzed: 07/11/18 00:00												
EPA 6020A												
Arsenic	54.0	---	1.00	mg/kg wet	10	50.0	---	108	80-120%	---	---	
Barium	54.0	---	1.00	mg/kg wet	10	50.0	---	108	80-120%	---	---	
Cadmium	48.5	---	0.200	mg/kg wet	10	50.0	---	97	80-120%	---	---	
Chromium	52.9	---	1.00	mg/kg wet	10	50.0	---	106	80-120%	---	---	
Copper	55.3	---	1.00	mg/kg wet	10	50.0	---	111	80-120%	---	---	B-02
Lead	51.9	---	0.200	mg/kg wet	10	50.0	---	104	80-120%	---	---	
Mercury	0.981	---	0.0800	mg/kg wet	10	1.00	---	98	80-120%	---	---	
Molybdenum	24.7	---	1.00	mg/kg wet	10	25.0	---	99	80-120%	---	---	
Selenium	23.9	---	1.00	mg/kg wet	10	25.0	---	96	80-120%	---	---	
Silver	25.5	---	0.200	mg/kg wet	10	25.0	---	102	80-120%	---	---	
Zinc	53.3	---	4.00	mg/kg wet	10	50.0	---	106	80-120%	---	---	

Duplicate (8070504-DUP1)												
Prepared: 07/10/18 09:47 Analyzed: 07/11/18 00:22												
QC Source Sample: A-02 (A8G0177-02)												
EPA 6020A												
Arsenic	284	---	59.1	mg/kg dry	400	---	281	---	---	1	40%	
Barium	69.2	---	59.1	mg/kg dry	400	---	62.8	---	---	10	40%	
Cadmium	28.2	---	11.8	mg/kg dry	400	---	27.6	---	---	2	40%	
Chromium	ND	---	59.1	mg/kg dry	400	---	34.8	---	---	***	40%	

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa Domenighini, Client Services Manager



Cascadia Associates
6915 SW Macadam, Suite 250
Portland, OR 97219

Project: **Nustar Vancouver**
Project Number: [none]
Project Manager: **Stephanie Salisbury**

Report ID:
A8G0177 - 07 27 18 1405

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8070504 - EPA 3051A												
Soil												
Duplicate (8070504-DUP1)			Prepared: 07/10/18 09:47 Analyzed: 07/11/18 00:22									
QC Source Sample: A-02 (A8G0177-02)												
Lead	905	---	11.8	mg/kg dry	400	---	882	---	---	3	40%	
Mercury	ND	---	4.73	mg/kg dry	400	---	ND	---	---	---	40%	Q-42
Molybdenum	1400	---	59.1	mg/kg dry	400	---	1310	---	---	7	40%	Q-42
Selenium	ND	---	59.1	mg/kg dry	400	---	ND	---	---	---	40%	Q-42
Silver	42.0	---	11.8	mg/kg dry	400	---	41.9	---	---	0.1	40%	
Zinc	7950	---	237	mg/kg dry	400	---	7720	---	---	3	40%	
Duplicate (8070504-DUP2)			Prepared: 07/10/18 09:47 Analyzed: 07/11/18 14:54									
QC Source Sample: A-02 (A8G0177-02RE1)												
EPA 6020A												
Copper	86700	---	739	mg/kg dry	5000	---	88200	---	---	2	40%	B-02, Q-16
Matrix Spike (8070504-MS1)			Prepared: 07/10/18 09:47 Analyzed: 07/11/18 00:27									
QC Source Sample: A-02 (A8G0177-02)												
EPA 6020A												
Arsenic	354	---	60.6	mg/kg dry	400	75.8	281	95	75-125%	---	---	
Barium	127	---	60.6	mg/kg dry	400	75.8	62.8	85	75-125%	---	---	
Cadmium	91.4	---	12.1	mg/kg dry	400	75.8	27.6	84	75-125%	---	---	Q-46
Chromium	106	---	60.6	mg/kg dry	400	75.8	34.8	94	75-125%	---	---	
Lead	931	---	12.1	mg/kg dry	400	75.8	882	65	75-125%	---	---	Q-03
Mercury	ND	---	4.85	mg/kg dry	400	1.52	ND	---	75-125%	---	---	Q-11
Molybdenum	1380	---	60.6	mg/kg dry	400	37.8	1310	186	75-125%	---	---	Q-03
Selenium	66.7	---	60.6	mg/kg dry	400	37.8	ND	176	75-125%	---	---	Q-11
Silver	73.3	---	12.1	mg/kg dry	400	37.8	41.9	83	75-125%	---	---	
Zinc	7930	---	242	mg/kg dry	400	75.8	7720	275	75-125%	---	---	Q-03
Matrix Spike (8070504-MS2)			Prepared: 07/10/18 09:47 Analyzed: 07/11/18 14:58									
QC Source Sample: A-02 (A8G0177-02RE1)												
EPA 6020A												
Copper	84900	---	758	mg/kg dry	5000	75.8	88200	-4400	75-125%	---	---	B-02, Q-03, Q-

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Lisa Domenighini, Client Services Manager

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QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071005 - EPA 3051A						Soil						
Blank (8071005-BLK1)		Prepared: 07/25/18 10:17 Analyzed: 07/26/18 16:02										
<u>EPA 6020A</u>												
Aluminum	ND	---	48.1	mg/kg wet	10	---	---	---	---	---	---	---
Iron	ND	---	48.1	mg/kg wet	10	---	---	---	---	---	---	---
LCS (8071005-BS1)		Prepared: 07/25/18 10:17 Analyzed: 07/26/18 15:39										
<u>EPA 6020A</u>												
Aluminum	4860	---	50.0	mg/kg wet	10	5000	---	97	80-120%	---	---	---
Iron	4990	---	50.0	mg/kg wet	10	5000	---	100	80-120%	---	---	---



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EPA ID: OR01039

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QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8070501 - Total Solids (Dry Weight)						Soil						

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020 (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 8070504</u>							
A8G0177-01	Soil	EPA 6020A	07/10/18 07:40	07/10/18 09:47	0.469g/50mL	0.5g/50mL	1.07
A8G0177-01RE1	Soil	EPA 6020A	07/10/18 07:40	07/10/18 09:47	0.469g/50mL	0.5g/50mL	1.07
A8G0177-02	Soil	EPA 6020A	07/10/18 07:45	07/10/18 09:47	0.475g/50mL	0.5g/50mL	1.05
A8G0177-02RE1	Soil	EPA 6020A	07/10/18 07:45	07/10/18 09:47	0.475g/50mL	0.5g/50mL	1.05
<u>Batch: 8071005</u>							
A8G0177-01	Soil	EPA 6020A	07/10/18 07:40	07/25/18 10:17	0.49g/50mL	0.5g/50mL	1.02
A8G0177-02	Soil	EPA 6020A	07/10/18 07:45	07/25/18 10:17	0.509g/50mL	0.5g/50mL	0.98

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 8070501</u>							
A8G0177-01	Soil	EPA 8000C	07/10/18 07:40	07/10/18 09:28			NA
A8G0177-02	Soil	EPA 8000C	07/10/18 07:45	07/10/18 09:28			NA



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QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

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- B-02** Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
- Q-03** Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- Q-11** Spike recovery cannot be accurately quantified due to sample dilution required for high analyte concentration and/or matrix interference.
- Q-16** Reanalysis of an original Batch QC sample.
- Q-42** Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- Q-46** Results for the Matrix Spike for this sample/analyte are not reported due to high dilution necessary for analysis.

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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

- DET Analyte DETECTED at or above the detection or reporting limit.
- ND Analyte NOT DETECTED at or above the detection or reporting limit.
- NR Result Not Reported
- RPD Relative Percent Difference

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

- Basis: Results for soil samples are generally reported on a 100% dry weight basis. The Result Basis is listed following the units as "dry", "wet", or "" (blank) designation.
 - "dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.
 - "wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.
 - "" Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

- " --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- " *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to 1/2 the Reporting Limit (RL).
-For Blank hits falling between 1/2 the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.



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REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the blank results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.



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LABORATORY ACCREDITATION INFORMATION

TNI Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
<u>All reported analytes are included in Apex Laboratories' current ORELAP scope.</u>					

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation. Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.



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APEX LABS COOLER RECEIPT FORM

Client: Cascadia Element WO#: A8 G0177

Project/Project #: Nustar Vancouver

Delivery info:

Date/Time Received: 7/10/18 @ 8:50 By: MS

Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: MS : 8:50 @ 7/10/18

Chain of Custody Included? Yes No Custody Seals? Yes No

Signed/Dated by Client? Yes No

Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>5.0</u>						
Received on Ice? (Y/N)	<input checked="" type="checkbox"/>						
Temp. Blanks? (Y/N)	<input checked="" type="checkbox"/>						
Ice Type: (Gel/Real/Other)	<u>Real</u>						
Condition:	<u>great</u>						

Cooler out of temp? (Y/N) Possible reason why: NA

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA NA

Samples Inspection: Inspected by: MS : 7/10/18 @ 9:00

All Samples Intact? Yes No Comments: _____

Bottle Labels/COCs agree? Yes No Comments: _____

Containers/Volumes Received Appropriate for Analysis? Yes No Comments: _____

Do VOA Vials have Visible Headspace? Yes No NA
Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes No NA
Comments: _____

Additional Information: _____

Labeled by: MS Witness: JS Cooler Inspected by: MS See Project Contact Form: Y

ATTACHMENT B
SVE MONITORING NOTES
NOVEMBER 2017 THROUGH MAY 2018



NuStar Vancouver SVE System Monitoring

32000126-16.003

Date: 11/29/17
Arrival Time: _____
Departure Time: _____

APEX Representative: K. King
Weather: SW
APEX PID: _____

NORTH SVE SYSTEM		Pressure	PID	PID
		(inches H2O) blower on	(blower on)	(blower off)
Branch 4				
Branch 5				
Pre Blower (system effluent)				

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = _____

Knockout drum visually inspected for holes or material deteriorations = _____
Notes: NOT RUNNING
Yes / No _____

SOUTH SVE SYSTEM		Pressure	PID	PID
		(inches H2O) blower on	(blower on)	(blower off)
Pre Blower		<u>-30</u>		
Post Blower - Pre Carbon		<u>30</u>	<u>68</u>	<u>52</u>
Post Carbon 1 (mid carbon)		<u>18</u>	<u>54</u>	
Post Carbon 2		<u>7</u>	<u>56</u>	

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = 16 gallons
Knockout drum visually inspected for holes or material deteriorations = _____
Notes: Blue liquid
 Yes / No

Sampling Information

Sample ID	Sample Location	Canister #	Initial Vacuum	Time		Final Vacuum
				Start	Finish	
<u>SVE South Pre Carbon</u>	<u>112917</u>	<u>34000589</u>	<u>-39</u>	<u>1215</u>	<u>1216</u>	<u>-1</u>
<u>SVE South Post Carbon</u>	<u>112917</u>	<u>34001195</u>	<u>-39</u>	<u>1217</u>	<u>1218</u>	<u>-2</u>

Other Notes / Comments:

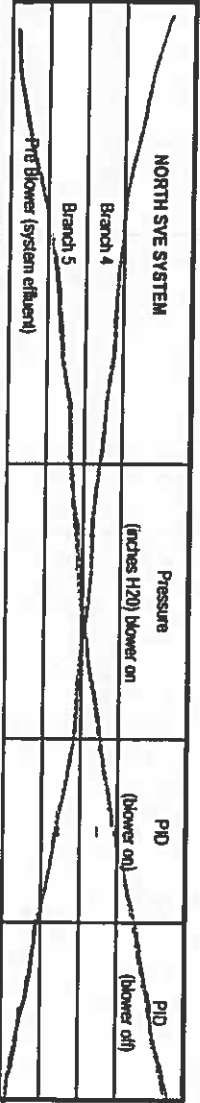


Nustar Vancouver SVE System Monitoring

320001126-16.003

Date: 12/21/17
Arrival Time: 0655
Departure Time:

APEX Representative: KK/ME
Weather: Fog
APEX PID: RADA1



Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = 16 gallons

Knockout drum visually inspected for holes or material deteriorations =
Notes: North system not running

Sample ID	Sample Location	Canister #	Initial Vacuum	Start Time	Finish Time	Final Vacuum
SVE_South - Pre Carbon	18A117	1058	-30	9:22	9:23	-3
SVE_South - Post Carbon	18A117					

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = 16 gallons

Knockout drum visually inspected for holes or material deteriorations =
Notes: Blue liquid

Sample ID	Sample Location	Canister #	Initial Vacuum	Start Time	Finish Time	Final Vacuum
SVE_South - Pre Carbon	18A117	1058	-30	9:22	9:23	-3
SVE_South - Post Carbon	18A117					

Other Notes / Comments:
Did not sample Pre Carbon due to bad canister not hitting full

NuStar Vancouver SVE System Monitoring

320004126-16.003

Date: 1/22/18
 Arrival Time: 7:30
 Departure Time: 8:00

APEX Representative: KK
 Weather: Rain
 APEX PID: 3

NORTH SVE SYSTEM		Pressure (inches H2O) blower on	PID (blower on)	PID (blower off)
Branch 4				
Branch 5				
Pre Blower (system effluent)				

Knockout Drum Emptied = Yes / No
 Volume in Knockout Drum = _____

Knockout drum visually inspected for holes or material deteriorations = _____
 Notes: NOT RUNNING

SOUTH SVE SYSTEM		Pressure (inches H2O) blower on	PID (blower on)	PID (blower off)
Pre Blower		<u>20.0</u>	<u>-</u>	<u>0.0</u>
Post Blower - Pre Carbon		<u>30.0</u>	<u>13.6</u>	<u>-</u>
Post Carbon 1 (end carbon)		<u>18.0</u>	<u>10.2</u>	<u>-</u>
Post Carbon 2		<u>7.0</u>	<u>7.2</u>	<u>-</u>

Knockout Drum Emptied = Yes / No
 Volume in Knockout Drum = 11 gallons

Knockout drum visually inspected for holes or material deteriorations = _____
 Notes: Blue water

Sampling Information

Sample ID	Sample Location	Canister #	Initial Vacuum	Time		Final Vacuum
				Start	Finish	
<u>SVE South - Pre Carbon</u>	<u>012218</u>	<u>7843</u>	<u>-30</u>	<u>7:50</u>	<u>7:51</u>	<u>-3</u>
<u>SVE South - Post Carbon</u>	<u>012218</u>	<u>4182</u>	<u>-21</u>	<u>7:52</u>	<u>7:53</u>	<u>-4</u>

Other Notes / Comments:



Nustar Vancouver SVE System Monitoring

320001126-16.003

Date: 2/28/18
Arrival Time: 0700
Departure Time: _____

APEX Representative: KR
Weather: RAIN
APEX PID: _____

	Pressure (inches H2O) blower on	PID (blower on)	PID (blower off)
NORTH-SVE SYSTEM	_____	_____	_____
Branch 4	_____	_____	_____
Branch 5	_____	_____	_____
Pre Blower (system effluent)	_____	_____	_____

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = _____
Knockout drum visually inspected for holes or material deteriorations = Yes / No
Notes: System Down

	Pressure (inches H2O) blower on	PID (blower on)	PID (blower off)
SOUTH SVE SYSTEM	_____	_____	_____
Pre Blower	_____	_____	_____
Post Blower - Pre Carbon	_____	_____	_____
Post Carbon 1 (mid carbon)	_____	_____	_____
Post Carbon 2	_____	_____	_____

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = 13 gallons
Knockout drum visually inspected for holes or material deteriorations = Yes / No
Notes: Contents are still Blue

Sampling Information

Sample ID	Sample Location	Canister #	Initial Vacuum	Time		Final Vacuum
				Start	Finish	
<u>SVE - South - Pre carbon - 02818</u>		<u>34000299</u>	<u>-30</u>	<u>801</u>	<u>802</u>	<u>-3</u>
<u>SVE - South - Post carbon - 02818</u>		<u>34000564</u>	<u>-30</u>	<u>804</u>	<u>805</u>	<u>-1</u>

Other Notes / Comments: PID was not calibrating correctly so was unable to get readings



NuStar Vancouver SVE System Monitoring

320001126-16.003

Date: 3/29/18
Arrival Time: 1045
Departure Time:

APEX Representative: KK
Weather: sun
APEX PID: 3

NORTH SVE SYSTEM		Pressure	PID	PID
		(inches H2O) blower on	(blower on)	(blower off)
Branch 4				
Branch 5				
Pre Blower (system effluent)				

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum =

Knockout drum visually inspected for holes or material deteriorations =
Notes: north system drum

SOUTH SVE SYSTEM		Pressure	PID	PID
		(inches H2O) blower on	(blower on)	(blower off)
Pre Blower		20	19	-
Post Blower - Pre Carbon		31	28	-
Post Carbon 1 (final carbon)		19	19	-
Post Carbon 2		8	19	-

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = 18 gallons

Knockout drum visually inspected for holes or material deteriorations =
Notes: blue water

Sampling Information

Sample ID	Sample Location	Canister #	Initial Vacuum	Time		Final Vacuum
				Start	Finish	
SVE South - Pre Carbon	032918	34000037	-27	1103	1104	-1
SVE South - Post Carbon	032918	34000049	-28	1105	1106	-1

Other Notes / Comments:

Blank lines for additional notes or comments.



Nustlar Vancouver SVE System Monitoring

320001126-16.003

Date: 4/24/18
Arrival Time: 0655
Departure Time: _____

APEX Representative: KL
Weather: Sunny
APEX PID: 3

NORTH SVE SYSTEM		Pressure (Inches H2O) Blower on	PID (blower on)	PID (blower off)
Branch 4				
Branch 5				
Pre Blower (System effluent)				

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = _____

Knockout drum visually inspected for holes or material deteriorations = _____
Notes: Not running, system down

SOUTH SVE SYSTEM		Pressure (Inches H2O) blower on	PID (blower on)	PID (blower off)
Pre Blower		<u>-20</u>	<u>-</u>	<u>2.2</u>
Post Blower - Pre Carbon		<u>31</u>	<u>26.8</u>	<u>-</u>
Post Carbon 1 (mid carbon)		<u>19</u>	<u>29.2</u>	<u>-</u>
Post Carbon 2		<u>8</u>	<u>18.8</u>	<u>-</u>

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = 8 gallons

Knockout drum visually inspected for holes or material deteriorations = _____
Notes: Blue water

Sampling Information

Sample ID	Sample Location	Canister #	Initial Vacuum	Time		Final Vacuum
				Start	Finish	
<u>SVE - South - Pre Carbon - 041818</u>		<u>34001193</u>	<u>-30</u>	<u>0748</u>	<u>0749</u>	<u>-3</u>
<u>SVE - South - Post Carbon - 041818</u>		<u>34000249</u>	<u>-30</u>	<u>0750</u>	<u>0751</u>	<u>-3</u>

Other Notes / Comments:



NuStar Vancouver SVE System Monitoring

320001126-16.003

Date: 5/16/18
Arrival Time: 0730
Departure Time: 0805

APEX Representative: KK
Weather: overcast
APEX PID: 3

NORTH SVE SYSTEM		Pressure	PID	PID
		(Inches H2O) blower on	(blower on)	(blower on)
Branch 4				
Branch 5				
Pre Blower (system effluent)				

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = _____

Knockout drum visually inspected for holes or material deteriorations = _____ Yes / No
Notes: system is down, not running

SOUTH SVE SYSTEM		Pressure	PID	PID
		(Inches H2O) blower on	(blower on)	(blower on)
Pre Blower		<u>-20</u>		<u>13.8</u>
Post Blower - Pre Carbon		<u>30</u>	<u>36.6</u>	<u>-</u>
Post Carbon 1 (mid carbon)		<u>18</u>	<u>40.2</u>	<u>-</u>
Post Carbon 2		<u>8</u>	<u>26.8</u>	<u>-</u>

Knockout Drum Emptied = Yes / No
Volume in Knockout Drum = _____

Knockout drum visually inspected for holes or material deteriorations = _____ Yes / No
Notes: NO water in Knock out Drum

Sampling Information

Sample ID	Sample Location	Canister #	Initial Vacuum	Time		Final Vacuum
				Start	Finish	
SVE-South. Pre Carbon	051618	34000267	<u>-30</u>	<u>0758</u>	<u>0759</u>	<u>-1</u>
SVE-South. Post Carbon	051618	34001529	<u>-30</u>	<u>0800</u>	<u>0801</u>	<u>-3</u>

Other Notes / Comments:

ATTACHMENT C

SVE VAULT AND PIPING PHOTOS





ATTACHMENT D

WELLHEAD ASSESSMENT - ECOLOGY FIELD NOTES AND PHOTOS

Note: This attachment was provided directly from the Department of Ecology and has not been organized or modified in any way.

March 27 2018 Field visit
 Wade Hemphill Antea CR
 503 F02 8019
 On Nustan facility @ 912
 safety train & get on work.
 permit & full gate safety mty
 w/ APEX, Antea Nitel w/ Antea
 start on Golder Morgan well locations
 S-1/S-2 w/ Stephanie B Salsbery, Apr
 Ride-Malin, Parametric, Megan Masterson, Apr
 MW-17 no rehab this 2018
 3/29/19 w/d bottom Toc - .29'
 1" sample top sed
 MW-23: BOH 65.02 Toc if spursy
 2" not being replaced
 MW-19 being replaced W/d BOH
 4" sample top sed 40.19'
 MW-26 no replace 41.06' Toc
 2" W/d BOH
 NO top sed, not enough to sample
~~W/d~~

March 27, 2018 @ Nustan pg 2

MW-25	no replace								
	water in manua								
	hard surface inside manua								
	no sed for sample								
	BOH 60.23' Toc								
	W/d BOH								
	S-1/S-2	get top sediment bank							
	marky water / sample	From							
	BOH both								
	MW-10	replacing	37.35 Toc						
	lots of manua sed		W/d BOH						
	4in lots of manua maint								
	get top sed sample								
	MW-13	37.39' Toc	casing dirt coated						
	4in	very soft bottom							
	replacing								
	get top BOH sed	samples							
	MW-12	replace	39.98 Toc						
	4in		W/d BOH						
	sample top sed								

March 27, 2018	@ Minster pg 3
MW-19	43.69 Toc
2" no replace	hard bottom
not enough to sample to sed	
EX	36.38 Toc
4" replace	soft B&H but
sample top sed	no much sed @ B&H
MW-01	34.83
2" replace	hard B&H
Mon Full of water	over ween top
sample top sed	
EW-11	29.10
2" replace	hard B&H
Mon partially full	water below csq top
sample top sed	
MW-03	34.59 Toc
2" no replace	hard B&H
Mon partially full	below csq top
no sample top sed	no enough sed

March 27, 2018	@ Minster pg 4
MW-06	34.81 Toc
2" no replace top	hard B&H
Mon water to just below csq top	
MW-07	39.99
2" no replace	hard B&H
Mon water below top of csq	
MW-09	40.47 Toc
4" no tap	hard B&H
Mon water below Toc	
no sed top sed - no sed sample	
MW-02	39.13 Toc
no cond. ent for air	fall
no Monu sed.	little soft B&H
no sed sample	
MW-15	raise Monu inside tank
containment no picture on need to visit	
MW-16	standing water

Soil Field Sampling Data

LOCATION/ADDRESS Nustar / Well Assess
 BORING LOCATION Nustar at Port of Vancouver
 PROJECT NAME _____ # _____
 CLIENT/CONTACT _____

BORING NUMBER _____
 SAMPLER Craig Rankine
 DATE, TIME 3/27/2018
 WEATHER lt. rain

SAMPLE NUMBER	DEPTH INTERVAL TOP/BOTTOM (ft)	SAMPLE TYPE	SAMPLING METHOD	COMMENTS BOTTLE SIZE & NUMBER
MW-17TS	Top well manometer		grab, sed	402 11:10
	Note got flap			
MW-23IT	Top sed		grab, sed	" 11:47
	Note ditto			
MW-14TS	Top sed		grab, sed	402 11:42
	Note ditto			
MW-10	TS Top sed		grab, sed	402 12:22
	on Nlu prop			
MW-13	BS peripump / decant			poly 1305
	Bolt sed	HDPE tubing		nitric acid
MW-13	TS		grab, sed	402 13:10
	Top sed			
MW-12	TS		grab, sed	402 13:43
	Top sed			
EX ~	TS		grab, sed	402 14:09
	Top sed			
MW-01	TS		" , "	402 14:27
	Top sed			



2018/03/21 14:55

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/03/21 15:03~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 15:05

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 15:08

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



MW-23,



~~2018/03/21 15:34~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



RE02294

2018/03/21 15:35

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



REO 2297

2018/03/21 15:43

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 15:45

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



RW-14

2018/03/21 15:48

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 16:05

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



MW-26

2018/03/21 16:06

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/03/21 16:07~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/03/21 16:07~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



25i

2018/03/21 16:13

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



250

2018/03/21 16:13

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/03/21 16:14~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



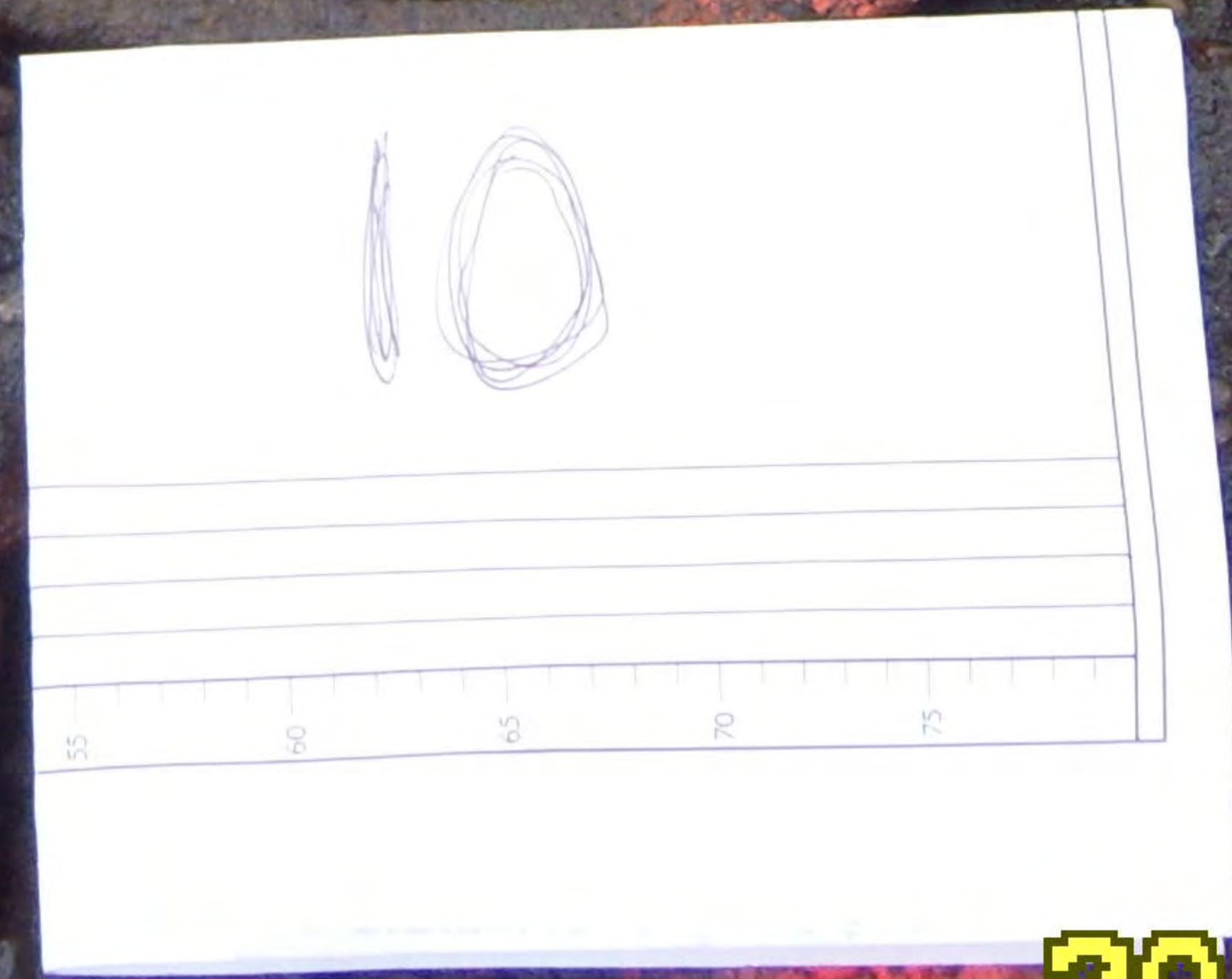
~~2018/03/21 16:24~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 16:27

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 16:27

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



13
55 60 65 70 75

2018/03/21 16:48

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



13

2018/03/21 16:48

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



MALTO HOPE

2018/03/21 16:59

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 17:08

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 17:21

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 17:29

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



12

2018/03/21 17:50

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



12

2018/03/21 17:52

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 18:05

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



19

2018/03/21 18:06

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



SHERWOOD MONITORING WELL COVER
PAT. NO. 5195590
5010-957

19

2018/03/21 18:07

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



EX

~~2018/03/21 18:15~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



EX

~~2018/03/21 18:16~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



01

2018/03/21 18:32

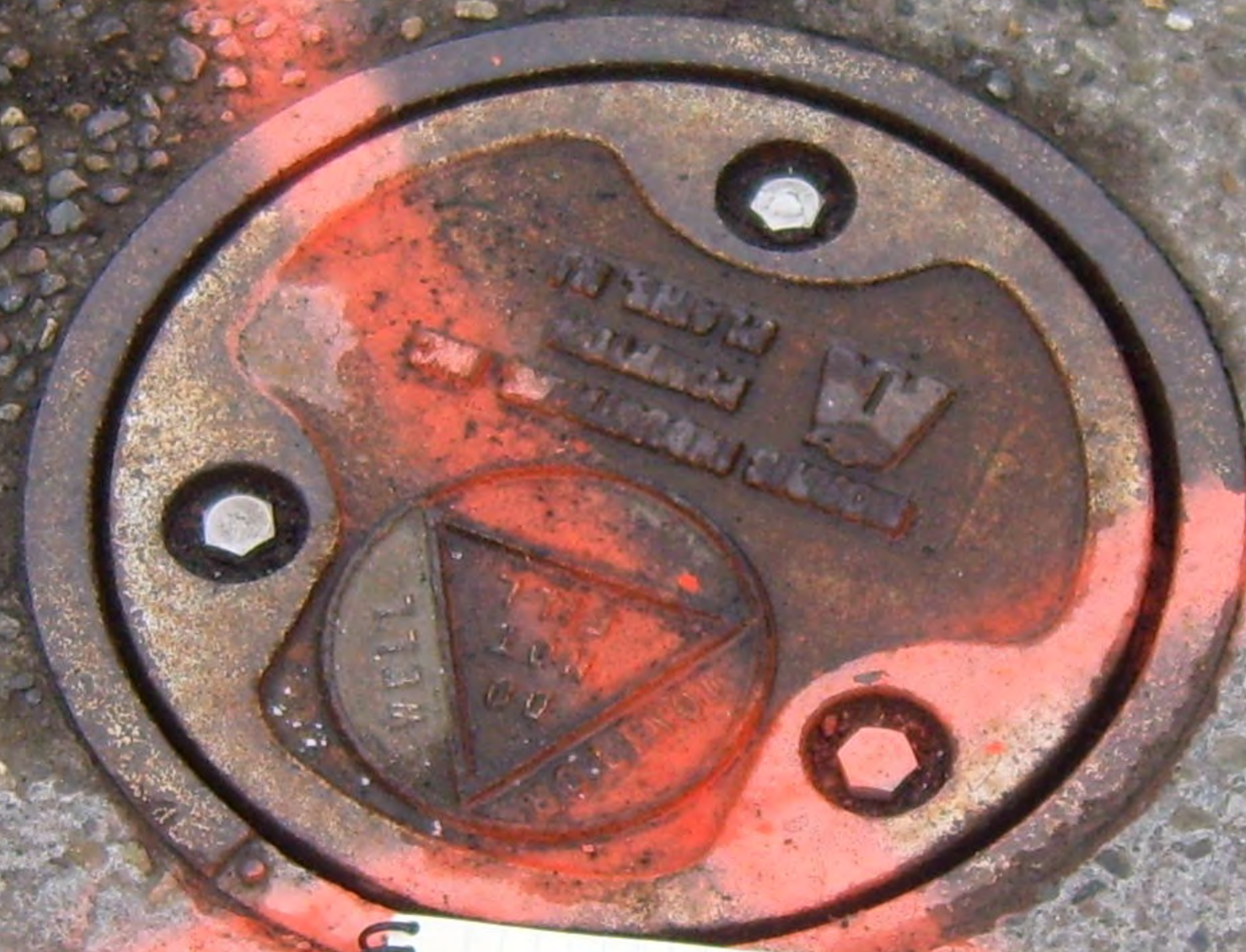
Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



01

2018/03/21 18:33

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



EWV-01

~~2018/03/21 18:45~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



EW-01

2018/03/21 18:46

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



EN-01

~~2018/03/21 18:48~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 18:58

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



03

~~2018/03/21 19:00~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



03

~~2018/03/21 19:01~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



WELL
MONITOR

06

~~2018/03/21 19:08~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



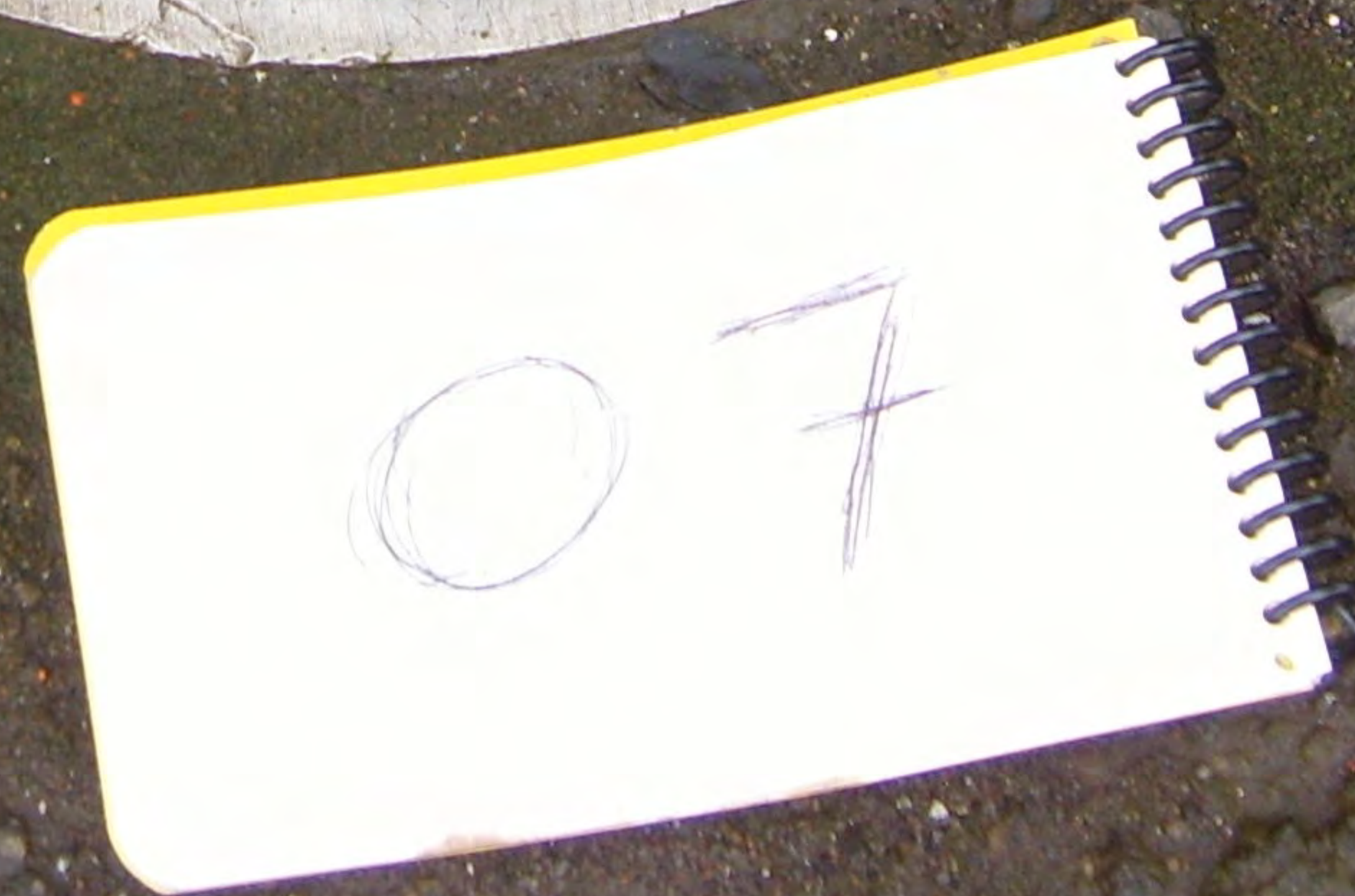
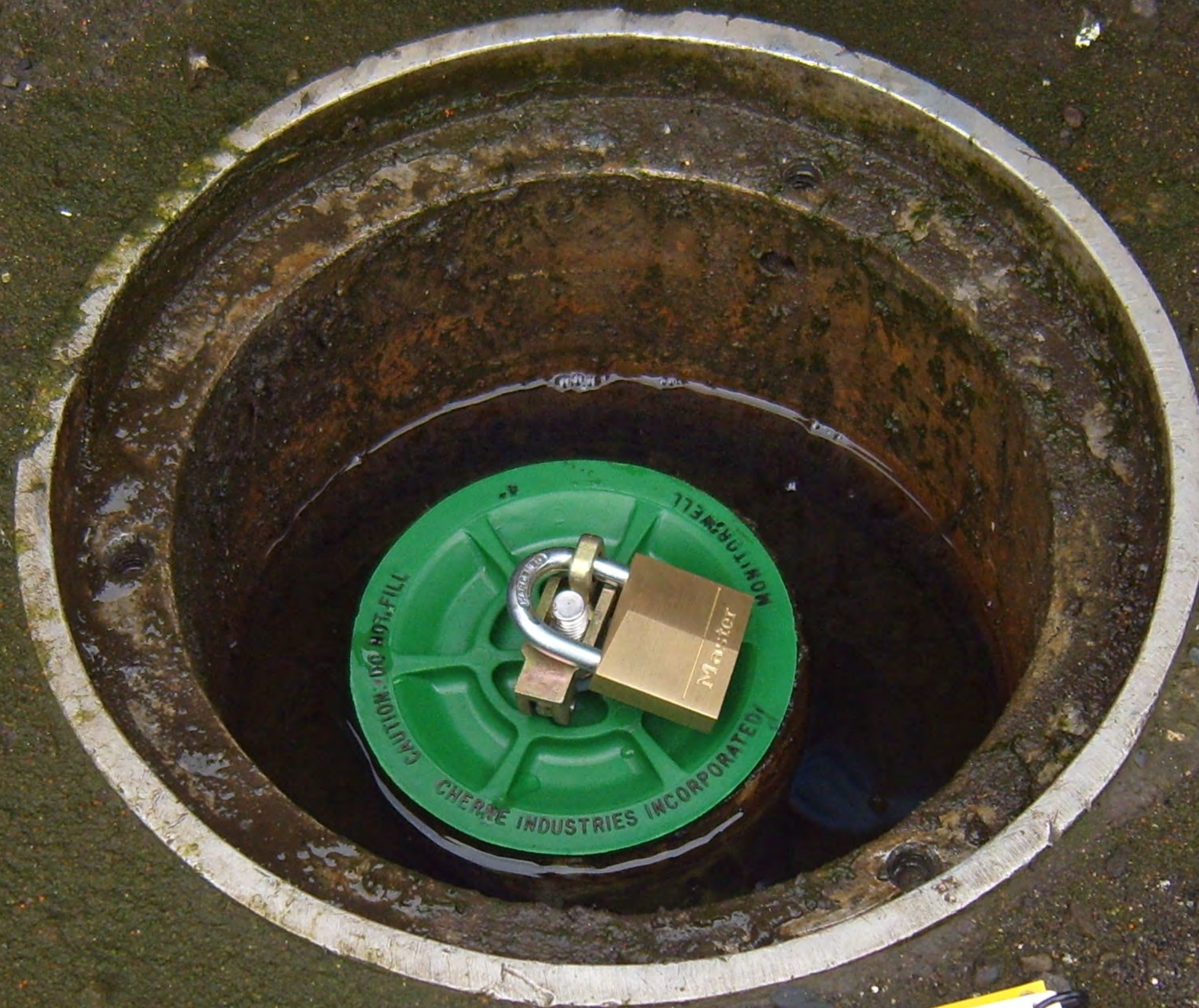
2018/03/21 19:08

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/03/21 19:13~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 19:28

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



07

~~2018/03/21 19:32~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 19:43

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/03/21 19:46~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.

THIS CONNECTION IS
FOR 120/240 VOLT AC
W/ 40 AMPERE FEEDER
ASSEMBLY.

~~2018/03/21 19:59~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 19:59

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/08/21 20:02~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/03/21 20:13~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 20:14

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/03/21 20:18~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



~~2018/03/21 20:21~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.



2018/03/21 20:33

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.




~~2018/03/21 20:34~~

Note: Per Ecology, date/time stamp on photo is inaccurate. Photo was taken on 3/27/18. Time is unspecified.

ATTACHMENT E
WELL DEVELOPMENT FIELD NOTES

ATTACHMENT F
GROUNDWATER PURGING AND SAMPLING SHEETS

WELL MONITORING DATA SHEET

	Well I.D.: EW-1	Job Number: 1176-20
	Client: NuStar	Date: 11-7-17
	Project: VAN AQ17 GUM	Sampler: MM
	Weather: RAINY	Time In/Out:

WELL DATA

Well Depth: -	Well Diameter: 2"	Water Height: -
Depth to Water: 26.74	Screened Interval: -	x Multiplier: -
Water Column Length: -	Depth to Free Product: -	x Casing Volumes: -
Purge Volume: -	Free Product Thickness: -	= Purge Volume: -
Water Height Multipliers (gal)		1-inch = 0.041
		2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: BLADDER				Pump Intake Depth: MS				Comments			
Sampling Method: LF				Tubing Type: DESIGNATED / SWD							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
0900	-	-	-	0.25	8.60	16.86	421	7.02	-79.7	-	AC
0903	0.75	0.75	-	0.25	7.41	12.54	393	1.910	-64.1	-	AC
0906	0.75	1.5	-	0.25	7.00	12.64	393	1.67	-65.7	-	AC
0909	0.75	2.25	-	0.25	6.92	12.25	392	1.44	-63.8	-	AC
0912	0.75	3.0	-	0.25	6.91	12.41	394	1.31	-62.4	-	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID: EW-1	Sampling Flow Rate: 0.25	Analytical Laboratory: PACE / ACS				
Sample Time: 0915	Final Depth to Water: 15.79	Did Well Dewater?				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HUCC	yes <input checked="" type="checkbox"/> no			
1x 175 ml	-	NO ₂ , NO ₃	yes <input checked="" type="checkbox"/> no			
1x 125 ml	H ₂ SO ₄	NH ₃	yes <input checked="" type="checkbox"/> no			
			yes no			
			yes no			

COMMENTS

COULD NOT TAKE DTW MEASUREMENTS. WATER LEVEL TOO LOW - PROBE STOPPED BY PUMP

WELL MONITORING DATA SHEET

	Well I.D.: MGMS1-43	Job Number: 1126-20
	Client: Nustar	Date: 11-7-17
	Project: VAN 4917 GUM	Sampler: MMZ
	Weather: OVERCAST	Time In/Out:

WELL DATA

Well Depth: -	Well Diameter: -	Water Height: -
Depth to Water: 27.56	Screened Interval: -	x Multiplier: -
Water Column Length: -	Depth to Free Product: -	x Casing Volumes: -
Purge Volume: ✓	Free Product Thickness: -	= Purge Volume: -
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: IN SET BLADDER				Pump Intake Depth: MS				Comments			
Sampling Method: LF				Tubing Type:							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1557	-	-	27.70	0.1	8.63	14.22	4219	8.10	79.4	-	AC
1600 1600	0.3	0.3	27.78	0.1	8.88	13.62	4425	7.20	76.8	-	AC
1603 1603	0.3	0.6	27.70	0.1	8.67	13.67	4501	4.33	77.2	-	AC
1606 1606	0.3	0.9	27.70	0.1	8.65	13.68	4669	2.96	77.8	-	AC
1609 1609	0.3	1.2	27.71	0.1	8.61	13.76	4699	2.21	76.4	-	AC
1612	0.3	1.5	27.70	0.1	8.58	13.97	4702	2.09	74.9	-	AC
1615	0.3	1.8	27.71	0.1	8.57	13.99	4695	2.04	74.5	-	AC


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID: MGMS1-43	Sampling Flow Rate: 0.1	Analytical Laboratory: PACE/ALS				
Sample Time: 1620	Final Depth to Water: 27.60	Did Well Dewater? N				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes (no)			
1 x 125 ml	-	NO ₂ , NO ₃	yes (no)			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes (no)			
3 x 40 ml	HCl	RSK-175	yes (no)			
2 x 40 ml	H ₂ SO ₄	TOC	yes (no)			
			yes (no)			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MOMSI-110	Job Number:	1126-20
	Client:	Nustar	Date:	11-7-17
	Project:	VAN AQ17 BWM	Sampler:	MM
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	27.85	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:				Pump Intake Depth:				Comments			
Sampling Method:				Tubing Type:							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1637	—	—	27.80	0.1	9.17	12.10	439	10.70	33.9	—	AC
1640	0.3	0.3	27.80	0.1	9.04	12.85	450	4.65	15.5	—	AC
1643	0.3	0.6	27.80	0.1	9.05	12.91	340	3.01	5.5	✓	AC
1646	0.3	0.9	27.80	0.1	9.03	12.81	323	2.11	0.4	—	AC
1649	0.3	1.2	27.80	0.1	8.98	12.74	299	1.53	0.2	—	AC
1652	0.3	1.5	27.80	0.1	8.95	12.66	291	1.34	0.1	—	AC
1655	0.3	1.8	27.80	0.1	8.94	12.76	287	1.25	2.1	—	AC


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MOMSI-110	Sampling Flow Rate	0.1	Analytical Laboratory:	PACE ALS	
Sample Time:	1650	Final Depth to Water:	27.57	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HUC	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125 ml	—	NO ₂ , NO ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MGM52-60	Job Number:	1126-20
	Client:	Nustar	Date:	11-9-17
	Project:	VAN QUIT GWM	Sampler:	mm
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	NA	Water Height	—
Depth to Water:	27.29	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	✓	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	PERRI				Pump Intake Depth:	MC				Comments	
Sampling Method:	LF				Tubing Type:	HDPE					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1521	—	—	27.33	0.25	8.19	15.88	220	2.01	-43.4	—	VC
1524	0.75	0.75	27.33	0.25	8.22	15.68	260	0.77	-59.3	—	C
1527	0.75	1.5	27.33	0.25	8.21	15.52	266	0.63	-64.7	—	C
1530	0.75	2.25	27.35	0.25	8.10	15.50	265	0.52	-71.1	—	C
1533	0.75	3.00	27.36	0.25	8.13	15.40	265	0.50	-76.2	—	C
1536	0.75	3.75	27.37	0.25	8.10	15.42	265	0.49	-77.1	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MGM52-60	Sampling Flow Rate	0.25	27.35	Analytical Laboratory:	PACEALS
Sample Time:	1539	Final Depth to Water:	27.35		Did Well Dewater?	N
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVOCs	yes	no		
1x 125 ml	—	NO ₂ , NO ₃	yes	no		
1x 125 ml	H ₂ SO ₄	NH ₃	yes	no		
			yes	no		
			yes	no		
			yes	no		

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.	MGMS2-110	Job Number:	1126-20
	Client:	NuStar	Date:	11-9-17
	Project:	VAN AQ17 GUM	Sampler:	MMW
	Weather:	Overcast / LT RAIN	Time In/Out:	-

WELL DATA

Well Depth:	-	Well Diameter:	NA	Water Height	-
Depth to Water:	27.19	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	PFPR				Pump Intake Depth:	MS				Comments	
Sampling Method:	LE				Tubing Type:	HDPE					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1449	-	-	27.25	0.2	7.80	15.01	253	1.97	-60.7	-	AC
1452	0.6	0.6	27.26	0.2	7.76	15.60	250	1.99	-62.4	-	AC
1455	0.6	1.2	27.27	0.2	8.27	15.50	243	2.58	-82.9	-	AC
1458	0.6	1.8	27.29	0.2	8.33	15.52	243	2.59	-85.5	-	AC
1501	0.6	2.4	27.30	0.2	8.36	15.56	243	2.61	-87.1	-	AC


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS2-110	Sampling Flow Rate	0.2	Analytical Laboratory:	PAGE / ACS	
Sample Time:	1504	Final Depth to Water:	27.27	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HUC	yes <input checked="" type="checkbox"/>			
1 x 125 ml	-	NO ₂ , NO ₃	yes <input checked="" type="checkbox"/>			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input checked="" type="checkbox"/>			
			yes	no		
			yes	no		
			yes	no		

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MGMS2-132	Job Number:	1176-20
	Client:	Nustar	Date:	11-9-17
	Project:	VAN ARD 6WM	Sampler:	mmw
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	NA	Water Height	—
Depth to Water:	27.09	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	PERRI	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	HDPE	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1400	—	—	27.18	0.1	10.25	14.30	402	8.37	21.2	—	AC
1401	0.30	0.30	27.15	0.1	9.07	14.89	353	2.34	-15.5	—	AC
1414	0.30	0.60	27.15	0.1	8.80	15.28	332	1.53	-42.9	—	AC
1417	0.30	0.90	27.16	0.1	8.76	15.11	323	1.13	-73.1	—	AC
1420	0.30	1.20	27.17	0.1	8.79	14.75	318	0.90	-87.8	—	AC
1423	0.30	1.50	27.18	0.1	8.78	14.67	314	0.84	-74.3	—	AC


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS2-132	Sampling Flow Rate	0.1	Analytical Laboratory:	PACE/ALS	
Sample Time:	1426	Final Depth to Water:	27.16	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVOC	yes (no)			
1x 125 ml	—	NO ₂ , NO ₃	yes (no)			
1x 125 ml	H ₂ SO ₄	NH ₃	yes (no)			
			yes	no		
			yes	no		
			yes	no		

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.: M6MS3-60	Job Number: 1126-2E
	Client: NusStar	Date: 11-10-17
	Project: VAN 4Q17 GWH	Sampler: MM
	Weather: OVERCAST/RAIN	Time In/Out:

WELL DATA

Well Depth: -	Well Diameter: NA	Water Height: -
Depth to Water: 25.28	Screened Interval: -	x Multiplier: -
Water Column Length: -	Depth to Free Product: -	x Casing Volumes: -
Purge Volume: -	Free Product Thickness: -	= Purge Volume: -
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method:				Pump Intake Depth:				Comments			
Sampling Method:				Tubing Type:							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1137	-	-	25.35	0.25	7.28	13.63	272	6.07	-14.9	-	C
1140	0.75	0.75	25.31	0.25	7.17	13.73	227	0.64	-24.9	-	C
1143	0.75	1.5	25.33	0.25	7.11	13.97	220	0.51	-24.0	-	C
1146	0.75	2.25	25.36	0.25	7.10	14.03	218	0.44	-34.0	-	C
1149	0.75	3.0	25.37	0.25	7.02	14.08	217	0.46	-28.3	-	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID: M6MS3-60	Sampling Flow Rate: 0.25	Analytical Laboratory: PACE/ACS				
Sample Time: 1157	Final Depth to Water: 25.35	Did Well Dewater? N				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVOC	yes <input checked="" type="checkbox"/>			
1x 125 ml	-	NO ₂ , NO ₃	yes <input checked="" type="checkbox"/>			
1x 125 ml	H ₂ SO ₄	NH ₃	yes <input checked="" type="checkbox"/>			
			yes <input type="checkbox"/>			
			yes <input type="checkbox"/>			
			yes <input type="checkbox"/>			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.:	MGMS3-110	Job Number:	1126-20
	Client:	N. Star	Date:	11-10-17
	Project:	UAN 4Q17 OWN	Sampler:	MM
	Weather:	OVERCAST/RAINY	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	NA
Depth to Water:	25.37	Screened Interval:	-
Water Column Length:	-	Depth to Free Product:	-
Purge Volume:	-	Free Product Thickness:	-
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				Pump Intake Depth:				Comments			
PERRI				MS							
Sampling Method:				Tubing Type:							
LF				HDPE							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1108	✓	-	25.30	0.20	5.42	14.37	570	4.00	48.9	-	C
1111	0.6	0.6	25.28	0.2	7.04	14.61	397	2.37	-6.9	-	C
1114	0.6	1.2	25.32	0.2	7.10	14.60	336	2.82	-4.7	-	C
1117	0.6	1.8	25.33	0.2	7.18	14.60	271	2.92	-8.7	-	C
1120	0.6	2.4	25.33	0.2	7.55	14.50	263	3.02	-15.4	-	C
1123	0.6	3.0	25.33	0.2	7.57	14.38	2102	3.06	-20.1	-	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MGMS3-110	Sampling Flow Rate	0.20	Analytical Laboratory:	PACE/ALS	
Sample Time:	1126	Final Depth to Water:	25.29	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HNO3	yes (no)			
1x 125 ml	-	NO2, NO3	yes (no)			
1x 125 ml	H2SO4	NH3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.	M6MS3-132	Job Number:	1126-20
	Client:	Nustar	Date:	11-10-17
	Project:	VAN 4Q17 GUM	Sampler:	MM
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	NA	Water Height	—
Depth to Water:	25.83	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:				PERRI / 粵	Pump Intake Depth:				MS	Comments		
Sampling Method:				LF	Tubing Type:				HDPPE			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria	
1016	—	—	25.62	0.20	3.14	15.34	252	3.25	174.6	—	C	
1013	0.6	0.6	—	0.20	3.82	15.30	266	1.62	120.7	—	C	
* STOPPED TO RE-CAL YSI PH												
1021	0.6	1.2	25.53	0.20	8.55	15.30	309	1.01	95.6	—	C	
1024	0.6	1.8	25.53	0.2	8.65	15.27	287	0.82	76.1	—	C	
1027	0.6	2.4	25.53	0.2	8.99	15.20	271	0.68	68.2	—	C	
1030	0.6	3.0	25.53	0.2	8.97	15.13	272	0.57	59.2	—	C	
1033	0.6	3.6	25.51	0.2	9.07	15.04	271	0.54	51.4	—	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	M6MS3-132	Sampling Flow Rate:	0.2	Analytical Laboratory:	PACE / ALS	
Sample Time:	1036	Final Depth to Water:	25.40	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVOC	yes no			
1x 125 ml	—	NO ₂ , NO ₃	yes no			
1x 125 ml	H ₂ SO ₄	NH ₃	yes no			
			yes no			
			yes no			

COMMENTS

PH WAS ACTING ODD. AT FIRST DISPLAYING VALUES < 4 (EVEN IN CAL SOLUTION + DI H₂O). RECAL PROBE + NOW ALL VALUES ARE ~9 AFTER SAMPLING. PUT PROBE BACK IN 7.0 BUFFER SOLUTION + YSI READ 8.96 RE-CAL ONCE AGAIN.

WELL MONITORING DATA SHEET

	Well I.D.: <u>MP-1</u>	Job Number: <u>1126-20</u>
	Client: <u>No Star</u>	Date: <u>11-9-17</u>
	Project: <u>VAN 4Q17 GWM</u>	Sampler: <u>MMW</u>
	Weather: <u>OVERCAST</u>	Time In/Out:

WELL DATA

Well Depth: <u>-</u>	Well Diameter: <u>2"</u>	Water Height: <u>-</u>
Depth to Water: <u>28.65</u>	Screened Interval: <u>-</u>	x Multiplier: <u>-</u>
Water Column Length: <u>-</u>	Depth to Free Product: <u>-</u>	x Casing Volumes: <u>-</u>
Purge Volume: <u>-</u>	Free Product Thickness: <u>-</u>	= Purge Volume: <u>-</u>
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: <u>BLADDER</u>				Pump Intake Depth: <u>MS</u>				Comments			
Sampling Method: <u>LF</u>				Tubing Type: <u>DESIGNATED / SKID</u>							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1031	-	-	28.74	0.175 MMW	7.33	14.31	1036	4.04	-54.3	-	C
1034	0.525	0.525	28.73	0.175	7.60	14.28	1031	0.93	-87.3	-	C
1037	0.525		28.73	0.175	7.61	14.54	1042	0.76	-97.1	-	C
1040	0.525		28.73	0.175	7.66	14.51	1050	0.66	-104.8	-	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID: <u>MP-1</u>	Sampling Flow Rate: <u>0.175</u>	Analytical Laboratory: <u>PACE/ALS</u>				
Sample Time: <u>1043</u>	Final Depth to Water: <u>28.66</u>	Did Well Dewater? <u>N</u>				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HUOC	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>			
1 x 125	-	NO ₂ , NO ₃	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>			
1 x 125	H ₂ SO ₄	NH ₃	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>			
3 x 40	HCl	PSK-175	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>			
2 x 40	H ₂ SO ₄	TCC	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.: <u>MW-1</u>	Job Number: <u>1126-20</u>
	Client: <u>Mustar</u>	Date: <u>11-9-17</u>
	Project: <u>VAN 4Q17 GUM</u>	Sampler: <u>MMW</u>
	Weather: <u>LT. RAIN</u>	Time In/Out: <u>...</u>

WELL DATA

Well Depth: <u>-</u>	Well Diameter: <u>2"</u>	Water Height: <u>-</u>
Depth to Water: <u>27.09</u>	Screened Interval: <u>-</u>	x Multiplier: <u>-</u>
Water Column Length: <u>-</u>	Depth to Free Product: <u>-</u>	x Casing Volumes: <u>-</u>
Purge Volume: <u>-</u>	Free Product Thickness: <u>-</u>	= Purge Volume: <u>-</u>
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: <u>BLADDER</u>				Pump Intake Depth: <u>MS</u>				Comments			
Sampling Method: <u>LF</u>				Tubing Type: <u>disconnected / skip</u>							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<<- Stabilization Criteria
0952	-	-	27.13	0.2	8.25	10.91	816	10.09	20.9	-	Cl reddish color
0955	0.6	0.6	27.13	0.2	7.30	12.40	931	2.41	7.0	-	Cl ""
0958	0.6	1.2	27.13	0.2	7.07	11.20	942	1.84	-17.7	-	Cl ""
1001	0.6	1.8	27.13	0.2	6.96	11.16	932	1.59	-33.8	-	VC SC ""
1003	0.6	2.4	27.14	0.2	6.94	11.01	931	1.52	-35.0	-	SC ""
1006	0.6	3.0	27.13	0.2	6.93	10.76	931	1.48	-40.2	-	SC ""

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID: <u>MW-1</u>	Sampling Flow Rate: <u>0.20</u>	Analytical Laboratory: <u>PAGE/ALS</u>				
Sample Time: <u>1009</u>	Final Depth to Water: <u>27.11</u>	Did Well Dewater? <u>N</u>				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVCC	yes (no)			
1x 125 ml	-	NO ₂ , NO ₃	yes (no)			
1x 125 ml	H ₂ SO ₄	NH ₃	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.	MW-2	Job Number:	1126-20
	Client:	No Star	Date:	11-6-17
	Project:	4917 Gwm	Sampler:	MM
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height:	-
Depth to Water:	28.49	Screened Interval:	-	x Multiplier:	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes:	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume:	-
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:				LF				Pump Intake Depth:			MS		Comments	
Sampling Method:				BLADDER				Tubing Type:					designated skip zone	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1212	-	-	28.80	0.15	8.42	12.85	648	6.00	30.0	-	SC			
1215	0.45		28.81	0.15	8.51	12.95	665	2.60	-4.4	-	AC			
1218	0.45		28.81	0.15	8.52	12.73	676	2.21	-19.7	✓	AC			
1221	0.45		28.84	0.15	8.51	12.99	692	1.92	-33.8	✓	AC			
1224	0.45		28.87	0.15	8.52	13.17	713	1.75	-47.5	-	AC			
1227	0.45		28.93	0.15	8.54	13.20	722	1.65	-60.8	-	AC			
1230	0.45		28.97	0.15	8.55	13.19	723	1.58	-65.8	-	AC			


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-2	Sampling Flow Rate:	0.15	Analytical Laboratory:	PAC/ALS	
Sample Time:	1238	Final Depth to Water:	29.11	Did Well Dewater?:		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCl	HVOCs	yes <input type="radio"/> no <input checked="" type="radio"/>			
1 x 125 mL poly	-	NO ₂ , NO ₃	yes <input type="radio"/> no <input checked="" type="radio"/>			
1 x 125 mL poly	H ₂ SO ₄	NH ₃	yes <input type="radio"/> no <input checked="" type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.:	MW-3	Job Number:	1126-20
	Client:	Nustar	Date:	11-8-17
	Project:	VAN 4Q17 OUM	Sampler:	MM
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	29.81	Screened Interval:	—	x Multiplier	✓
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	✓	Free Product Thickness:	✓	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BLADDER				Pump Intake Depth:	MS				Comments	
Sampling Method:	LE				Tubing Type:	Designated / Skip					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1624	✓	✓	29.04	0.25	9.30	10.26	763	9.37	52.1	—	SC
1627	0.75	0.75	29.40	0.25	8.75	12.15	778	7.12	26.0	—	SC
1630	0.75	1.50	29.89	0.25	8.91	13.05	840	3.88	28.1	—	SC
1633	0.75	2.25	30.18	0.25	8.76	13.13	884	5.48	28.0	—	SC
1636	0.75	3.00	30.48	0.25	8.82	13.03	854	6.10	28.7	—	SC
1639	0.75	3.75	30.91	0.25	8.87	13.03	843	6.43	30.7	—	SC
1642	0.75	4.50	31.17	0.25	8.88	12.98	844	6.39	31.7	—	SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-3	Sampling Flow Rate:	0.25	Analytical Laboratory:	PACE ALS	
Sample Time:	1645	Final Depth to Water:	31.51	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVOC	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1x 125 ml	—	NO ₂ , NO ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1x 125 ml	H ₂ SO ₄	NH ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			

COMMENTS

* DA KEPT RISING + FALLING, SWINGING BY AT LEAST 2 ppm per 3-MINUTE CYCLE

WELL MONITORING DATA SHEET

	Well I.D.:	MW-5	Job Number:	1126-20
	Client:	Nustar	Date:	11-7-17
	Project:	VAN 4Q17 GMM	Sampler:	MMW
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	28.56	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				BIADDER				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			DESIGNATED / SKIP			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria			
0956	-	-	28.52	0.20	7.32	13.43	521	3.84	57.1		AC			
0959	0.60	0.60	28.52	0.20	7.58	14.55	518	3.24	0.1		AC			
1002	0.60	1.20	28.58	0.20	7.69	12.45	520	3.79	-23.6		AC			
1005	0.60	1.80	28.55	0.20	7.71	13.27	518	4.24	-34.3		AC			
1008	0.60	2.40	28.57	0.20	7.74	13.26	518	4.62	-41.8		AC			
1011	0.60	3.00	28.60	0.20	7.76	13.31	516	4.81	-45.1		AC			


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-5	Sampling Flow Rate	0.20	Analytical Laboratory:	PACE / ALS	
Sample Time:	1015	Final Depth to Water:	28.58	Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HUOC	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125 ml	-	NO ₂ , NO ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-6	Job Number:	1126-20
	Client:	Huster	Date:	11-7-17
	Project:	VAN 4Q17 GUM	Sampler:	MM
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height:	-
Depth to Water:	27.04	Screened Interval:	-	x Multiplier:	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes:	-
Purge Volume:	-	Free Product Thickness:	✓	= Purge Volume:	-
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:		BLADDER			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		DESIGNATED / SKIP				
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1328	-	-	27.13	0.30	8.56	12.75	401	7.81	31.2	-	AC
1331	0.90	0.90	27.30	0.30	8.22	13.40	406	3.00	5.8	-	AC
133A	0.90	1.80	27.31	0.30	8.25	13.60	402	4.66	0.6	-	AC
1337	0.90	2.70	27.36	0.30	8.25	13.54	398	4.68	-2.6	-	AC
1340	0.90	3.60	27.31	0.30	8.22	13.62	398	4.92	-3.3	-	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-6	Sampling Flow Rate:	0.30	Analytical Laboratory:	PACE/ALS	
Sample Time:	1343	Final Depth to Water:	27.12	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 > 40ml	HCl	HUOC	yes <u>no</u>			
1x 125ml	-	NO ₂ , NO ₃	yes <u>no</u>			
1x 125ml	H ₂ SO ₄	NH ₃	yes <u>no</u>			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.:	MW-7	Job Number:	1126-20
Client:	NuStar	Date:	11-7-17
Project:	VAN 4217 GWM	Sampler:	MMW
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	4"	Water Height	-
Depth to Water:	28.54	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	-

PURGING DATA

Purge Method:	BLADDER				Pump Intake Depth:	MS				Comments	
Sampling Method:	LF				Tubing Type:	DESIGNATED/SKIP					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
0848					7.05	7.73	117	12.27	149		
0851	0.90	0.90	28.70	0.30	7.09	13.30	152	2.55	36.6	-	SC
0854	0.90	1.80	28.70	0.30	7.60	13.01	163	2.68	48.5	-	AC
0857	0.90	2.70	28.70	0.30	7.47	12.60	167	2.61	49.9	-	AC
0900	0.90	3.50	28.70	0.30	7.39	12.18	167	2.54	59.3	-	AC
0903	0.90	4.40	28.70	0.30	7.34	11.84	167	2.60	63.2	-	AC
0906	0.90	5.30	28.70	0.30	7.30	11.81	168	2.65	68.6	-	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-7	Sampling Flow Rate	0.30	Analytical Laboratory:	PACE, ALS	
Sample Time:	0710	Final Depth to Water:	28.98	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HUOC	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			MW-7 DUP
1 x 125 ml	-	NO ₂ , NO ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 40 ml			yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
3 x 40 ml	HCl	RSK-175	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
2 x 40 ml	H ₂ SO ₄	TUC	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			

COMMENTS

360 430 2014

WELL MONITORING DATA SHEET

	Well I.D.	MW-8	Job Number:	1126-20
	Client:	Nustar	Date:	11-6-17
	Project:	4Q17 GUM	Sampler:	MW
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	4"	Water Height	-
Depth to Water:	27.98	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		LF			Pump Intake Depth:		MS			Comments	
Sampling Method:		BLADDER			Tubing Type:		DESGINATED / SLIP				
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1057	-	-	28.06	-	8.55	13.72	2394	9.10	30.1		AC
1100	1.5	1.5	28.11	0.18	8.31	14.89	2538	2.81	5.8		AC
1103	0.55		28.24	0.18	8.17	14.35	2549	2.74	10.2		AC
1106	0.55		28.19	0.18	8.09	14.38	2557	2.93	15.3		AC
1109	0.55		28.21	0.18	8.05	14.00	2559	2.69	21.3		AC


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-8	Sampling Flow Rate	0.18	Analytical Laboratory:	PACE / ALS	
Sample Time:	1112	Final Depth to Water:	28.06	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 10ml	HCl	HVOC	yes <input checked="" type="radio"/> no			
1 x 125ml poly	-	NO ₂ , NO ₃	yes <input checked="" type="radio"/> no			
1 x 125ml poly	H ₂ SO ₄	NH ₃	yes <input checked="" type="radio"/> no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-9	Job Number:	1126-20
	Client:	Nustar	Date:	11-7-17
	Project:	VAN 1017 GWM	Sampler:	MMW
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	4"	Water Height	-
Depth to Water:	28.70	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	-

PURGING DATA

Purge Method:				BIADDER				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			DESIGNATED / SKIP			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
0800	-	-	28.67	0.25	8.08	10.52	2760	9.89	138.3		AC			
0803	0.75	0.75	28.67	0.25	7.74	11.93	4657	1.73	143.3		AC			
0806	0.75	1.50	28.67	0.25	7.60	12.01	4900	1.10	141.9		AC			
0809	0.75	2.25	28.67	0.25	7.50	12.10	5145	0.92	140.8		AC			
0812	0.75	3.00	28.67	0.25	7.45	12.15	5206	0.89	141.9		AC			
0815	0.75	3.75	28.67	0.25	7.42	12.32	5300	0.90	142.8		AC			

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-9	Sampling Flow Rate	0.25	Analytical Laboratory:	PACE / ALS	
Sample Time:	0818	Final Depth to Water:	28.70	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOCs	yes (no)			
1 x 125 ml	-	NO ₂ , NO ₃	yes (no)			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

259340

WELL MONITORING DATA SHEET

	Well I.D.: <u>MW-10</u>	Job Number: <u>1126-20</u>
	Client: <u>NuStar</u>	Date: <u>11-6-17</u>
	Project: <u>Van 4Q17 Gum</u>	Sampler: <u>mm</u>
	Weather: <u>OVERCAST</u>	Time In/Out: <u></u>

WELL DATA

Well Depth: <u>-</u>	Well Diameter: <u>4"</u>	Water Height: <u>-</u>
Depth to Water: <u>28.38</u>	Screened Interval: <u>-</u>	x Multiplier: <u>-</u>
Water Column Length: <u>-</u>	Depth to Free Product: <u>-</u>	x Casing Volumes: <u>-</u>
Purge Volume: <u>-</u>	Free Product Thickness: <u>-</u>	= Purge Volume: <u>-</u>
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: <u>BLADDER</u>				Pump Intake Depth: <u>MS</u>				Comments			
Sampling Method: <u>LF</u>				Tubing Type: <u>DESIGNATED / SKIP</u>							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<<- Stabilization Criteria
1312	-	-	28.31	0.25	8.57	12.35	3309	10.88	52.8	-	AC
1315	0.75	0.75	28.38	0.25	8.15	14.33	3467	2.97	56.5	-	AC
1318	0.75	1.5	28.58	0.25	8.08	14.63	3504	2.71	58.6	-	AC
1321	0.75	2.25	28.82	0.25	8.06	14.65	3515	5.99	61.2	-	AC
1324	0.75	3.0	28.93	0.25	8.10	14.72	3527	7.60	62.5	-	AC
1327	0.75	3.75	29.13	0.25	8.12	14.67	3539	8.30*	63.3	-	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID: <u>MW-10</u>	Sampling Flow Rate: <u>0.25</u>	Analytical Laboratory: <u>PAGE / ALS</u>				
Sample Time: <u>1330</u>	Final Depth to Water: <u>29.67</u>	Did Well Dewater? <u></u>				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HUOC	yes <input type="radio"/> no <input checked="" type="radio"/>			
1 x 125 ml	-	NO ₂ , NO ₃	yes <input type="radio"/> no <input checked="" type="radio"/>			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input type="radio"/> no <input checked="" type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			

COMMENTS

* DO DID NOT STABILIZE - DID NOT SHOW SIGNS EITHER - KEPT INCREASING STEADILY

WELL MONITORING DATA SHEET

Well I.D.	MW-12	Job Number:	1126-20
Client:	Nustar VAN	Date:	11-9-17
Project:	4Q17 GUM	Sampler:	MM
Weather:	RAINY / WINDY	Time In/Out:	

WELL DATA			
Well Depth:	25.80	Well Diameter:	4"
Water Column Length:		Screened Interval:	
Purge Volume:		Depth to Free Product:	
Water Height Multipliers (gal)	1-inch = 0.041	Free Product Thickness:	
		2-inch = 0.162	
		4-inch = 0.653	
		= Purge Volume	
		1 gallon = 3.785 liters	

PURGING DATA			
Purge Method:	BLADDER	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Type:	Designated / Skip

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
0745	-	-	26.08	0.15	4.35	14.07	2223	4.61	-44.4	-	VC
0748	0.45	0.45	26.15	0.15	6.23	14.40	2420	2.91	-88.8	-	VC
0751	0.45		26.23	0.15	6.19	13.73	2432	2.54	-105.7	-	VC
0754	0.45		26.29	0.15	6.15	14.18	2422	2.24	-114.6	-	VC
0757	0.45		26.31	0.15	6.14	14.11	2381	1.89	-116.0	-	VC
0800	0.45		26.46	0.15	6.12	14.03	2328	1.72	-118.3	-	VC
0803	0.45		26.54	0.15	6.13	13.87	2303	1.61	-119.0	-	VC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-12	Sampling Flow Rate:	0.15
Sample Time:	0800	Final Depth to Water:	28.33
# Containers/Type	Preservative	Analysis/Method	Field Filtered
	3x 40 ml HCl	HVOC	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
1x 125	H ₂ SO ₄	NO ₂ , NO ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
1x 125	HCl	NH ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
3x 40	H ₂ SO ₄	PSK-175	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
2x 40	H ₂ SO ₄	TU	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>

COMMENTS

Analytical Laboratory: PACIFALS
 Did Well Dewater? N
 Filter Size: MS/MSD
 Duplicate ID: MW-12 DUP, MW-12 MS, MW-12 MSD

WELL MONITORING DATA SHEET

	Well I.D.	MW-13	Job Number:	1126-20
	Client:	KuStar	Date:	11-7-17
	Project:	VAN 4017 GUM	Sampler:	mm
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height:	—
Depth to Water:	27.63	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:		BLADDER			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		DESIGNATED/SKIP				
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1406	—	—	27.76	0.20	8.00	13.25	803	7.00	32.1		CI
1409	0.60	0.60	27.96	0.20	8.07	13.92	912	2.78	-30.9		CI
1412	0.60	1.20	28.14	0.20	8.12	14.15	921	2.38	-57.5		CI
1415	0.60	1.80	28.20	0.20	8.13	14.10	926	2.11	-80.6		CI
1418	0.60	2.40	28.55	0.20	8.12	14.10	926	2.14	-86.2		CI
1421	0.60	3.00	28.61	0.20	8.07	14.01	927	2.19	-89.2		CI


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-13	Sampling Flow Rate	0.20	Analytical Laboratory:	PACE LABS	
Sample Time:	1425	Final Depth to Water:	28.97	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HCC	yes <input checked="" type="radio"/> no			
1 x 125 ml	—	NO ₂ , NO ₃	yes <input checked="" type="radio"/> no			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input checked="" type="radio"/> no			
3 x 40 ml	HCl	BSK-175	yes <input checked="" type="radio"/> no			
2 x 40 ml	H ₂ SO ₄	TOC	yes <input checked="" type="radio"/> no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.: MW-14	Job Number: 1126-20
	Client: Nustar	Date: 11-8-17
	Project: VAN AQ17 GWM	Sampler: mm
	Weather:	Time In/Out:

WELL DATA

Well Depth: -	Well Diameter: 4"	Water Height: -
Depth to Water: 28.60	Screened Interval: -	x Multiplier: -
Water Column Length: -	Depth to Free Product: -	x Casing Volumes: -
Purge Volume: -	Free Product Thickness: ✓	= Purge Volume: -
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: BLADDER				Pump Intake Depth: MS				Comments			
Sampling Method: LF				Tubing Type: DESIGNATED / SKIP							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
0932	-	-	28.65	0.15	8.06	12.14	2325	9.11	96.4	-	CI
0935	0.45	0.45	28.65	0.15	8.15	14.98	2631	2.37	91.0	-	SC
0938	0.45	0.90	28.65	0.15	8.05	14.40	2657	2.08	94.5	-	AC
0941	0.45	1.35	28.65	0.15	8.08	11.67 11.67	2669	2.08	97.5	-	AC
0944	0.45		28.65	0.15	8.07	11.34	2641	1.96	103.6	-	AC
0947	0.45		28.65	0.15	8.09	11.21	2616	1.85	106.9	-	AC


Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID: MW-14	Sampling Flow Rate: 0.15	Analytical Laboratory: PAEE / ALS				
Sample Time: 0950	Final Depth to Water: 28.60	Did Well Dewater? N				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes (no)			
1 x 125 ml	-	NO ₂ , NO ₃	yes (no)			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes (no)			
3 x 40 ml	HCl	PSK-175	yes (no)			
2 x 40 ml	H ₂ SO ₄	TOC	yes (no)			
			yes (no)			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.:	MW-15	Job Number:	1126-20
	Client:	Nuster	Date:	11-6-17
	Project:	VAN 4Q17 GWM	Sampler:	MM, MW
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	4"	Water Height	-
Depth to Water:	33.03	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	✓	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				BIADDER				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			Designated / SKIP			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
11.16	-	-		0.25	9.04	12.14	802	5.77	8.7	-	C			
1619	0.75	0.75		0.25	8.89	12.75	779	4.38	-1.5	-	C			
1622	0.75	1.50		0.25	8.85	12.82	775	3.80	-4.3	-	C			
1625	0.75	2.25		0.25	8.85	12.67	779	3.60	-4.8	-	C			
1628	0.75	3.00		0.25	8.84	12.71	775	3.43	-3.8	-	C			


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-15	Sampling Flow Rate	0.25	Analytical Laboratory:	PACE/ALS	
Sample Time:	1631	Final Depth to Water:		Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 10 ml	HCl	HVOCs	yes <input checked="" type="radio"/> no			
1 x 125 ml	-	NO ₂ , NO ₃	yes <input checked="" type="radio"/> no			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input checked="" type="radio"/> no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.: MW-16	Job Number: 1126-26
	Client: NuStar	Date: 11-06-2017
	Project: 4Q17 GWM	Sampler: mm
	Weather: OVERCAST	Time In/Out:

WELL DATA

Well Depth: -	Well Diameter: 4"	Water Height: -
Depth to Water: 27.31	Screened Interval: -	x Multiplier: -
Water Column Length: -	Depth to Free Product: -	x Casing Volumes: -
Purge Volume: -	Free Product Thickness: -	= Purge Volume: -
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method: LF				Pump Intake Depth: 6MS				Comments			
Sampling Method: BLADDER				Tubing Type: DESIGNATED / SKIPBOND							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1135	-	-	27.34	0.22	8.85	10.33	779	13.00	35.0	-	SC
1138	0.66	0.66	27.52	0.22	8.36	11.97	886	3.19	34.7	-	AC
1141	0.66		27.62	0.22	8.31	12.73	860	2.83	29.3	-	AC
1144	0.66		27.60	0.22	8.32	12.85	832	2.51	29.4	-	AC
1147	0.66		27.70	0.22	8.31	12.91	817	2.23	31.2	-	AC
1150	0.66		27.74	0.22	8.31	13.02	805	2.07	33.0	-	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID: MW-16	Sampling Flow Rate: 0.22	Analytical Laboratory: PAGE, AWS				
Sample Time: 1153	Final Depth to Water: 27.76	Did Well Dewater? N				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ml	HCl	H VOCs	yes (no)			
1 x 125ml poly	-	NO ₂ , NO ₃	yes (no)			
1 x 125ml poly	H ₂ SO ₄	NH ₃	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.: MW-17	Job Number: 1126-26
	Client: Nustar	Date: 11-8-17
	Project: VAN ARDUR GUM	Sampler: mm
	Weather: OVERCAST	Time In/Out:

WELL DATA

Well Depth: —	Well Diameter: 4"	Water Height: —
Depth to Water: 27.20	Screened Interval: —	x Multiplier: —
Water Column Length: —	Depth to Free Product: —	x Casing Volumes: —
Purge Volume: —	Free Product Thickness: —	= Purge Volume: —
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: BLADDER	Pump Intake Depth: MS	Comments:
Sampling Method: LF	Tubing Type: DESIGNATED/SKIP	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
0747	—	—	27.37	0.25	9.76	12.88	1040	8.36	37.8	—	AC
0750	0.75	0.75	27.41	0.25	8.19	14.52	923	1.92	44.6	—	AC
0753	0.75	1.50	27.41	0.25	7.73	14.58	936	1.28	39.1	—	AC
0756	0.75	2.25	27.39	0.25	7.40	14.59	960	1.54	42.1	—	AC
0759	0.75	3.00	27.54	0.25	7.25	14.55	976	1.40	44.2	—	AC
0802	0.75	3.75	27.48	0.25	7.22	14.55	988	1.34	45.3	—	AC
0805	0.75	4.50	27.55	0.25	7.19	14.53	997	1.32	46.0	—	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID: MW-17	Sampling Flow Rate: 0.25	Analytical Laboratory: PAGE / ALS				
Sample Time: 0808	Final Depth to Water: 27.45	Did Well Dewater? N				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ml	HCl	HVOCs	yes <input checked="" type="checkbox"/> no			
1 x 125 ml	—	NO ₂ , NO ₃	yes <input checked="" type="checkbox"/> no			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input checked="" type="checkbox"/> no			
			yes no			
			yes no			
			yes no			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.	MW-19	Job Number:	1126-20
	Client:	NuStar	Date:	11-9-17
	Project:	VAN 1017 GUM	Sampler:	mmw
	Weather:	RAINY / HIGH WIND	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	28.16	Screened Interval:	-	x Multiplier	-
Water Column Length:	<	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	✓	Free Product Thickness:	-	= Purge Volume	✓
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:		BLADDER			Pump Intake Depth:		MS		Comments		
Sampling Method:		LF			Tubing Type:		DESIGNATED				
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1221	-	-	28.46	0.15	8.03	14.20	2731	6.18	-61.7	-	SC
1224	0.45	0.45	28.38	0.15	7.95	14.29	3016	3.00	-58.1	-	SC
1227	0.45		28.36	0.15	7.91	13.55	3035	2.37	-67.0	-	SC
1230	0.45		28.34	0.15	7.90	13.63	3028	2.35	-71.6	-	SC
1233	0.45		28.34	0.15	7.88	13.85	3027	2.26	-75.2	-	SC


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19	Sampling Flow Rate:	0.15	Analytical Laboratory:	PACELABS	
Sample Time:	1236	Final Depth to Water:	28.34	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVOC	yes no			MW-19 DUP
1x 125	-	NO ₂ , NO ₃	yes no			
1x 125	H ₂ SO ₄	NH ₃	yes no			
3x 40	HCl	PSK-175	yes no			
2x 40	H ₂ SO ₄	TOC	yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-20i	Job Number:	1126-20
	Client:	Nustar	Date:	11-7-17
	Project:	UAN AQ17 GUM	Sampler:	MMW
	Weather:	OVERCAST/WINDY	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height:	—
Depth to Water:	28.00	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:		BLADDER			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		DESIGNATED/SLOW				
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1238	—	—	28.11	0.25	8.69	14.17	280	4.37	13.8	—	AC
1241	0.75	0.75	28.18	0.25	8.71	14.35	300	0.74	6.5	—	AC
1245	0.75	1.50	28.45	0.25	8.100	14.32	302	0.58	6.2	—	AC
1248	0.75	2.25	28.70	0.25	8.63	14.24	301	0.53	6.4	—	AC


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-20i	Sampling Flow Rate:	0.25	Analytical Laboratory:	RACE/ALS	
Sample Time:	1251	Final Depth to Water:	28.18	Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40ml	HCl	HVOC	yes <input checked="" type="checkbox"/>			
1x 125 ml	—	NO ₂ , NO ₃	yes <input checked="" type="checkbox"/>			
1x 125 ml	H ₂ SO ₄	NH ₃	yes <input checked="" type="checkbox"/>			
			yes <input type="checkbox"/>			
			yes <input type="checkbox"/>			
			yes <input type="checkbox"/>			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.:	MW-21i-40	Job Number:	1126-20
	Client:	NuStar	Date:	11-8-17
	Project:	VAN 4Q17 Gum	Sampler:	MM
	Weather:	RAINY	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	-
Depth to Water:	28.96	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:	BLADDER	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	DESIGNATED/SKIP	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
1451	-	-	28.98	0.2	9.61	12.11	339	1.91	43.8	-	SC
1454	0.60	0.6	28.98	0.2	9.58	13.52	377	2.20	25.1	-	AC
1457	0.60	1.2	28.98	0.2	9.27	14.10	386	0.85	23.0	-	AC
1500	0.60	1.8	28.98	0.2	9.08	14.11	387	0.71	22.3	-	AC
1503	0.60	2.40	28.98	0.2	9.05	14.08	386	0.72	22.0	-	AC
1506	0.60	3.00	28.98	0.2	8.99	14.25	385	0.78	22.3	-	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-21i-40	Sampling Flow Rate:	0.2	Analytical Laboratory:	PACE/ALS	
Sample Time:	1510	Final Depth to Water:	28.98	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125 ml	-	NO ₂ , NO ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			

COMMENTS

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WELL MONITORING DATA SHEET



Well I.D.	MW-21i-105	Job Number:	1126-20
Client:	MuStar	Date:	11-8-17
Project:	VAN 1017 gum	Sampler:	MM
Weather:	VERY RAINY	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	
Depth to Water:	28.79	Screened Interval:	-	x Multiplier	
Water Column Length:		Depth to Free Product:	-	x Casing Volumes	
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BLADDER	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	DESIGNATED / SKIP		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1411	-	-	28.83	0.25	11.33	11.87	345	8.02	23.6	-	AC
1414	0.75	0.75	28.83	0.25	10.77	10.85	300	4.01	26.7	-	AC
1417	0.75	1.50	28.83	0.25	10.48	11.47	216	2.49	27.3	-	AC
1420	0.75	2.25	28.83	0.25	9.82	12.02	328	1.60	28.7	-	AC
1423	0.75	3.00	28.83	0.25	9.78	11.40	337	1.41	29.0	-	AC
1426	0.75	3.75	28.83	0.25	9.77	11.43	342	1.36	29.6	-	AC


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-21i-105	Sampling Flow Rate	0.25	Analytical Laboratory:	PACE/ACS	
Sample Time:	1430	Final Depth to Water:	28.79	Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HUOC	yes no			
1 x 125 ml	-	NH ₃ , NH ₃	yes no			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.:	MW-23i	Job Number:	1126-20
	Client:	Nustar	Date:	11-8-17
	Project:	VAN 9Q170um	Sampler:	mm
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	27.90	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				BLADDER				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			DESIGNATED / SKIP			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
0852	-	-	27.91	0.20	8.82	14.87	253	8.65	38.7	-	AC			
0855	0.60	0.60	27.91	0.20	8.73	14.73	257	7.66	18.6	-	AC			
0858	0.60		27.91	0.20	8.53	14.96	265	4.23	18.8	-	AC			
0901	0.60		27.91	0.20	8.45	14.69	265	4.11	19.6	-	AC			
0904	0.60		27.91	0.20	8.43	14.68	265	4.06	20.2	-	AC			

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-23i	Sampling Flow Rate	0.20	Analytical Laboratory:	PACE/ALS	
Sample Time:	0907	Final Depth to Water:	27.90	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <input checked="" type="checkbox"/> no			
1 x 125 ml	-	NO ₂ , NO ₃	yes <input checked="" type="checkbox"/> no			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input checked="" type="checkbox"/> no			
			yes no			
			yes no			
			yes no			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.: <u>MW-24i</u>	Job Number: <u>1126-20</u>
	Client: <u>Nustar</u>	Date: <u>11-9-17</u>
	Project: <u>VAN 4017 GWM</u>	Sampler: <u>MM</u>
	Weather: <u>OVERCAST</u>	Time In/Out: <u></u>

WELL DATA

Well Depth: <u>-</u>	Well Diameter: <u>2"</u>	Water Height: <u>-</u>
Depth to Water: <u>27.50</u>	Screened Interval: <u>-</u>	x Multiplier: <u>-</u>
Water Column Length: <u>-</u>	Depth to Free Product: <u>-</u>	x Casing Volumes: <u>-</u>
Purge Volume: <u>-</u>	Free Product Thickness: <u>-</u>	= Purge Volume: <u>-</u>
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162
		4-inch = 0.653
		1 gallon = 3.785 liters

PURGING DATA

Purge Method: <u>BLADDER</u>				Pump Intake Depth: <u>MC</u>				Comments			
Sampling Method: <u>LE</u>				Tubing Type: <u>DESIGNATED</u>							
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1128	-	-	27.14	0.25	9.72	14.88	257	6.00	-65.9	-	AC
1131	0.75	0.75	27.02	0.25	9.05	14.75	278	5.25	-85.3	-	AC
1134	0.75	1.5	26.98	0.25	8.78	14.56	285	3.53	-92.0	-	AC
1137	0.75	2.25	26.98	0.25	8.58	14.25	286	3.27	-95.0	-	AC
1140	0.75	3.0	26.98	0.25	8.42	14.10	286	3.18	-98.5	-	AC
1143	0.75	3.75	27.07	0.25	8.38	14.07	285	3.12	-99.3	-	AC
1146	0.75	4.50 4.50	27.00	0.25	8.34	14.06	285	3.11	-100.1	-	AC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID: <u>MW-24i</u>	Sampling Flow Rate: <u>0.25</u>	Analytical Laboratory: <u>PACE SALS</u>				
Sample Time: <u>1149</u>	Final Depth to Water: <u>27.00</u>	Did Well Dewater? <u>N</u>				
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVOC	yes <u>no</u>			
1x 125	-	NO ₂ , NO ₃	yes <u>no</u>			
1x 125	H ₂ SO ₄	NH ₃	yes <u>no</u>			
3x 40	HCl	BULK IFS	yes <u>no</u>			
2x 40	H ₂ SO ₄	TOL	yes <u>no</u>			
			yes	no		

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.:	MW-24d	Job Number:	1126-20
	Client:	Nustar Van 421700M	Date:	11-6-17
	Project:	Nustar Van 421700M	Sampler:	MMW
	Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	27.87	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				DIAPHRAGM				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			DESIGNATED SKIP POINT			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1007	1.38	1.38	27.85	0.46	8.52	12.55	463	7.38	142.7		AC			
1010	1.38	1.38	27.93	0.46	8.63	13.63	476	2.11	67.1		AC			
1013	1.38	2.76	27.71	0.46	8.67	13.32	472	1.68	44.1		AC			
1016	1.38	4.14	27.79	0.46	8.82	13.21	475	1.50	29.6		AC			
1019	1.38	5.52	27.83	0.46	8.83	13.19	479	1.44	18.7		AC			
1021	1.38	6.9	27.85	0.46	8.90	13.14	481	1.24	6.9		AC			
1024	1.38	8.28	27.96	0.46	8.95	13.11	481	1.16	0.2		AC			

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-24d	Sampling Flow Rate	0.46	Analytical Laboratory:	PACE / ALS	
Sample Time:	1030	Final Depth to Water:	28.06	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HUOCs	yes <input checked="" type="radio"/> no			
1 x 125 ml	-	NO ₂ , NO ₃	yes <input checked="" type="radio"/> no			
1 x 125 ml	H ₂ SO ₄	NO ₃ /NO ₂ NH ₃	yes <input checked="" type="radio"/> no			
			yes	no		
			yes	no		
			yes	no		

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.	MW-251	Job Number:	1126- 17 20
	Client:	M. Star	Date:	11-8-17
	Project:	VAN AQ17 GWM	Sampler:	MMW
	Weather:	RAINY	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	28.08	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BLADDER	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	DESIGNATED / SKIP		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1210	-	-	28.11	0.25	10.45	11.79	294	7.84	46.1	-	SC
1213	0.75	0.75	28.11	0.25	9.89	11.14	313	6.01	35.9	-	SC
1216	0.75	1.50	28.11	0.25	9.65	10.91	314	2.30	36.2	-	SC
1219	0.75	2.25	28.11	0.25	9.97	11.45	313	1.80	36.8	-	SC
1222	0.75	3.00	28.11	0.25	9.78	11.16	312	1.64	35.6	-	SC
1225	0.75	3.75	28.11	0.25	9.24	11.16	312	1.63	35.6	-	SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-251	Sampling Flow Rate	0.25	Analytical Laboratory:	PAE/ALS	
Sample Time:	1228	Final Depth to Water:	28.10	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes (no)			
1 x 125 ml	-	NO2, NO3	yes (no)			
1 x 125 ml	H2SO4	NH3	yes (no)			
			yes (no)			
			yes (no)			
			yes (no)			

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	MW-26	Job Number:	1126-20
Client:	Nuster	Date:	11-8-17
Project:	JAN 4Q17 GWM	Sampler:	MM
Weather:	OVERCAST / RAIN	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	78.50	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				BLADDER				Pump Intake Depth:			MS		Comments
Sampling Method:				LF				Tubing Type:					
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria		
1252	-	-	78.59	0.20	8.70	14.14	3666	3.21	96.5	-	AC		
1255	0.60	0.60	78.61	0.20	8.68	13.28	3747	2.29	96.9	-	AC		
1258	0.60	1.20	78.62	0.20	8.61	14.11	3712	2.05	98.1	-	AC		
1301	0.60	1.80	78.62	0.20	8.55	14.05	3644	1.89	99.8	-	AC		
1304	0.60	2.40	78.62	0.20	8.43	14.04	3555	1.75	99.8	-	AC		

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	MW-26	Sampling Flow Rate	0.20	Analytical Laboratory:	PACE / ALS	
Sample Time:	1307	Final Depth to Water:	78.58	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125 ml	-	NO ₂ , NO ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
3 x 40 ml	HCl	PSK-175	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
2 x 40 ml	H ₂ SO ₄	TOL	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.	MW-32s	Job Number:	1126-20
	Client:	NuStar	Date:	11-10-17
	Project:	VAN ARD 7 GUM	Sampler:	mm
	Weather:	OVERCAST / LIGHT RAIN	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	- NA	Water Height	-
Depth to Water:	28.98	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BLADDER	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	HDPE	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
0847	-	-	29.51	0.20	6.79	14.70	617	4.19	-84.3	-	C
0850	0.6	0.6	29.87	0.20	6.60	14.42	490	3.30	-78.8	-	C
0853	0.6	1.2	29.95	0.2	6.46	14.47	444	3.60	-74.1	-	C
0856	0.6	1.8	29.85	0.2	6.68	14.49	240	4.17	-51.4	-	C
0859	0.6	2.4	29.80	0.2	5.70	14.54	142	4.18	-27.1	-	C
0902	0.6	3.0	29.80	0.2	5.38	14.71	115	4.08	-11.5	-	C
0905	0.6	3.6	29.80	0.2	5.37	14.72	114	4.03	-8.6	-	C
0908	0.6	4.2	29.81	0.2	5.34	14.67	114	4.01	-6.9	-	C


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-32s	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE/ALS	
Sample Time:	0911	Final Depth to Water:	28.83	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40 ml	HCl	HVOC	yes (no)			
1x 125 ml	-	NO ₂ , NO ₃	yes (no)			
1x 125 ml	H ₂ SO ₄	NH ₃	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	MW-32i	Job Number:	1126-20
	Client:	NVStar	Date:	11-10-17
	Project:	VAN 4017 GUM	Sampler:	mm
	Weather:	OVERCAST / L RAIN	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	NA	Water Height	—
Depth to Water:	29.26	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:				BLADDER				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			HOPE?			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks			
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<< Stabilization Criteria			
0811			29.26	0.15	8.92	14.75	415	9.16	-144.2	—	C			
0814	0.45	0.45	29.22	0.15	8.00	14.21	384	7.26	-85.6	—	C			
0817	0.45		29.21	0.15	7.93	14.04	365	5.21	-87.6	—	C			
0820	0.45		29.19	0.15	7.62	13.70	345	4.51	-84.4	—	C			
0823	0.45		29.18	0.15	7.33	13.93	328	4.00	-78.9	—	C			
0826	0.45		29.15	0.15	7.19	13.88	324	3.84	-80.0	—	C			
0829	0.45		29.13	0.15	7.16	13.81	324	3.78	-80.6	—	C			

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-32i	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE / ALS	
Sample Time:	0832	Final Depth to Water:	29.11	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HUOC	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125	—	NO ₂ , NO ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
1 x 125	H ₂ SO ₄	NH ₃	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			
			yes <input type="checkbox"/> no <input type="checkbox"/>			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.:	S-1	Job Number:	1126-20
	Client:	NuStar	Date:	11-8-17
	Project:	VAN 4Q17 GWM	Sampler:	MM
	Weather:	LT RAM	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	27.47	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	-

PURGING DATA

Purge Method:	BLADDER	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	DESIGNATED/SKIP	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
1035	-	-	27.54	0.20	10.09	13.30	239	3.13	37.1	-	AC SC
1038	0.60	1.20	27.54	0.20	9.26	12.92	177	2.12	46.5	-	AC SC
1041	0.60	1.80	27.54	0.20	9.04	13.66	181	1.57	47.9	-	AC SC
1044	0.60	1.80	27.59	0.20	8.83	13.42	184	1.28	52.9	-	AC SC
1047	0.60	2.40	27.60	0.20	8.65	13.59	190	0.91	58.6	-	AC SC
1050	0.60	3.00	27.61	0.20	8.61	13.70	191	0.83	60.4	-	AC SC
1053	0.60	3.60	27.63	0.20	8.59	13.56	194	0.80	61.5	-	AC SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	S-1	Sampling Flow Rate	0.20	Analytical Laboratory:	PACE/ALS	
Sample Time:	1053	Final Depth to Water:	27.60	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes <input type="radio"/> no <input checked="" type="radio"/>			
1 x 125 ml	-	NO ₂ , NO ₃	yes <input type="radio"/> no <input checked="" type="radio"/>			
1 x 125 ml	H ₂ SO ₄	NH ₃	yes <input type="radio"/> no <input checked="" type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			
			yes <input type="radio"/> no <input type="radio"/>			

COMMENTS

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WELL MONITORING DATA SHEET

	Well I.D.	S-2	Job Number:	1126-20
	Client:	Nuster	Date:	11-8-17
	Project:	VAN AQ17 GUM	Sampler:	MM
	Weather:	LT RAIN	Time In/Out:	

WELL DATA

Well Depth:	✓	Well Diameter:	2"	Water Height:	—
Depth to Water:	27.08	Screened Interval:	—	x Multiplier:	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes:	—
Purge Volume:	✓	Free Product Thickness:	✓	= Purge Volume:	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BLADDER	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	DESIGNATED / SKIP	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1110	—	—	27.22	0.25	8.39	11.95	1702	5.03	88.4	—	VC reddish color
1113	0.75	0.75	27.30	0.25	8.32	12.89	2384	2.16	88.0	—	VC
1116	0.75	1.50	27.31	0.25	8.29	12.90	2438	2.15	84.5	—	VC
1119	0.75	2.25	27.31	0.25	8.28	12.75	2556	2.06	83.9	—	VC
1121	0.75	3.00	27.35	0.25	8.26	12.86	2610	1.71	83.1	—	VC
1124	0.75	3.75	27.39	0.25	8.25	12.85	2615	1.65	82.8	—	VC

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear


SAMPLING DATA

Sample ID:	S-2	Sampling Flow Rate:	0.25	Analytical Laboratory:	PACE/ALS
Sample Time:	1127	Final Depth to Water:	27.36	Did Well Dewater?	N
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3x 40	HCl	HNO ₃	yes (no)		
1x 125	—	NO ₂ , NO ₃	yes (no)		
1x 125	H ₂ SO ₄	NH ₃	yes (no)		
			yes no		
			yes no		
			yes no		

COMMENTS

REDDISH-ORANGE COLOR

WELL MONITORING DATA SHEET

	Well I.D.	MW-14	Job Number:	1126-20
	Client:	Nustar Van	Date:	1/22/18
	Project:	GW copper	Sampler:	KK
	Weather:	overcast/Rain	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	25.32	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:		Bladder			Pump Intake Depth:		MS			Comments	
Sampling Method:		LF			Tubing Type:		Dedicated				
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
959	—	—	25.52	0.15	6.29	12.86	429	6.84	105.2	—	SC
1002	—	—	25.54	0.15	6.09	13.59	298	4.57	112.9	—	SC
1005	—	—	25.58	0.15	6.12	13.50	292	4.35	109.3	—	SC
1008	—	—	25.59	0.15	6.08	13.56	288	4.30	107.5	—	SC


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-14	Sampling Flow Rate	0.15	Analytical Laboratory:	Pace
Sample Time:	1010	Final Depth to Water:	25.50	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
2x 250	HNO3	CU	yes <input type="radio"/> no <input checked="" type="radio"/>	—	—
3x 40	HCl		yes <input type="radio"/> no <input checked="" type="radio"/>	—	—
			yes <input type="radio"/> no <input type="radio"/>		
			yes <input type="radio"/> no <input type="radio"/>		
			yes <input type="radio"/> no <input type="radio"/>		
			yes <input type="radio"/> no <input type="radio"/>		

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	S-2	Job Number:	1126-21
	Client:	Nustar Van	Date:	4/2/18
	Project:	Nustar Van GWM	Sampler:	KK
	Weather:	Sun	Time In/Out:	

WELL DATA

Well Depth:	49.64	Well Diameter:	2"	Water Height	—
Depth to Water:	25.22	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	Bladder	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	SKIP	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
901	—	—	25.01	0.20	6.46	10.8	1708	3.90	205.5	—	Cl
904	—	—	25.04	0.20	6.45	11.7	1860	5.23	74.0	—	Cl
907	—	—	24.98	0.20	6.47	12.1	1874	9.12	43.0	—	Cl
910	—	—	25.00	0.20	6.45	12.0	1889	9.28	36.2	—	Cl
913	—	—	25.05	0.20	6.45	11.9	1887	9.44	26.4	—	Cl


Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	S-2	Sampling Flow Rate	0.20	Analytical Laboratory:	AIS	
Sample Time:	915	Final Depth to Water:	25.28	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
2 x 125	HNO3	metals	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

	Well I.D.	S-1	Job Number:	1126-21
	Client:	Mustar	Date:	4/2/18
	Project:	Mustar Van GWM	Sampler:	KK
	Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:	73.65	Well Diameter:	2"	Water Height	
Depth to Water:	24.70	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	Bladder	Pump Intake Depth:	ms	Comments
Sampling Method:	LF	Tubing Type:	SK:P	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
821			24.70	0.20	7.22	8.3	222.0	1.95	172.5		C
824			24.70	0.20	7.09	9.9	219.8	1.55	180.1		SC
827			24.70	0.20	7.13	9.9	217.1	0.81	181.1		SC
830			24.70	0.20	7.10	9.6	215.4	0.76	183.5		AC
833			24.70	0.20	7.09	9.5	211.7	0.70	185.8		AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	S-1	Sampling Flow Rate	0.20	Analytical Laboratory:	AIS
Sample Time:	0835	Final Depth to Water:	24.70	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
2 x 125	HNO3	metals	yes <u>no</u>		
			yes no		
			yes no		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	S-1	Job Number:	1126-21
Client:	Nustar	Date:	03-20-18
Project:	VAN GWM	Sampler:	MM, KK
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.68	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	-

PURGING DATA

Purge Method:	BLADDER	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	DESIGNATED / SKIP	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria
1416			25.69	0.2	7.40	17.3	422	2.65	119.8	-	AC
1419			25.69	0.2	7.13	17.4	457	2.75	131	-	AC
1422			25.69	0.2	7.18	16.9	487	2.43	132	-	AC
1425			25.69	0.2	7.30	16.3	505	1.75	125	-	AC
1428			25.70	0.2	7.37	16.1	510	0.88	118.4	-	AC
1431			25.72	0.2	7.40	16.2	512	0.62	114.2	-	AC
1434			25.73	0.2	7.43	16.1	513	0.58	111.3	-	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	S-1	Sampling Flow Rate:	0.2	Analytical Laboratory:	PAGE / AWS
Sample Time:	1437	Final Depth to Water:	25.71	Did Well Dewater?	N
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD Duplicate ID
3x 40	HCl	HVOC	yes <input type="radio"/> no <input checked="" type="radio"/>		
1x 125	-	NO ₂ , NO ₃	yes <input type="radio"/> no <input checked="" type="radio"/>		
1x 125	H ₂ SO ₄	NH ₃	yes <input type="radio"/> no <input checked="" type="radio"/>		
1x 250	HNO ₃	Cu	yes <input type="radio"/> no <input checked="" type="radio"/>		
			yes <input type="radio"/> no <input type="radio"/>		

COMMENTS

WELL MONITORING DATA SHEET



Well I.D.	S-2	Job Number:	1126-21
Client:	NuStar	Date:	3-20-18
Project:	VAN GUM	Sampler:	MM, KK
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.47	Screened Interval:	-	x Multiplier	-
Water Column Length:	-	Depth to Free Product:	-	x Casing Volumes	-
Purge Volume:	-	Free Product Thickness:	-	= Purge Volume	-
Water Height Multipliers (gal)		1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters

PURGING DATA

Purge Method:				Bladder				Pump Intake Depth:			MS		Comments	
Sampling Method:				LF				Tubing Type:			DESIGNATED / skip			
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (ft)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color	Other Remarks		
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	← Stabilization Criteria			
1450	-	-	25.93	0.25	6.62	16.1	1617	2.67	151.2	-	AC			
1453	-	-	25.95	0.25	6.53	15.0	1866	1.12	110.8	-	AC			
1456	-	-	25.98	0.25	6.53	14.9	1821	4.49	86.0	-	AC			
1459	-	-	25.95	0.25	6.52	15.1	1825	6.82	81.7	-	AC			
1502	-	-	25.97	0.25	6.55	15.2	1817	7.01	73.1	-	CI			
1505	-	-	25.96	0.25	6.55	15.2	1806	7.17	67.4	-	CI			

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	S-2	Sampling Flow Rate:	0.25	Analytical Laboratory:	PACE / AWS	
Sample Time:	1510	Final Depth to Water:	25.97	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40	HCl	HVOC	yes <input checked="" type="checkbox"/>			
1x 125	-	NO ₂ , NO ₃	yes <input checked="" type="checkbox"/>			
1x 125	H ₂ SO ₄	NH ₃	yes <input checked="" type="checkbox"/>			
1x 250	HNO ₃	CU	yes <input checked="" type="checkbox"/>			
			yes no			
			yes no			

COMMENTS

ATTACHMENT G
PHOTOS OF SEDIMENT SAMPLE LOCATIONS



Photo 1 (top)
Roof of NuStar Building #2655. Facing south.

Photo 2 (bottom)
Close up of gutter sample location A-01. North side of Warehouse #2655.

Project Name

Project Site Name

City, State

0025-001-001





Photo 1 (top)

Surface sediment sample (SED-1) location. Facing southwest. Vessel at Berth #7 in background. Sample collected from the ground surface below the opening in the steel berm.

Project Name

Project Site Name

City, State

0025-001-001

