August 14, 2018

Mr. Craig Rankine, Site Manager
Department of Ecology
12121 NE 99th Street, Suite 2100
Vancouver, Washington 98677

Subject: **Semi-Annual Groundwater Monitoring Report**
January through June 2018
NuStar Vancouver Facility
Vancouver, Washington
0060-001-002

Dear Mr. Rankine:

Enclosed, please find the *Semi-Annual Groundwater Monitoring Report: January through June 2018.* The report was prepared on behalf of NuStar Terminals Services, Inc. (NuStar) by Cascadia Associates, LLC. (Cascadia) and presents data collected from January through June 2018. as well as a summary of the ongoing interim action at the Facility. Also included in this report are the groundwater monitoring results for the second and third comprehensive sampling events for nitrate, nitrite and ammonia. The information will be used to inform a draft work plan for nitrate, nitrite and ammonia investigation that will be submitted to Ecology in support of a Revised Remedial Investigation.

If you have any questions or would like to discuss this further, please contact me at (503) 906-6577 (ext. 110).

Sincerely,

Stephanie Bosze Salisbury

Stephanie Bosze Salisbury, L.G.
Senior Associate Geologist

Enclosure
Semi-Annual Groundwater Monitoring Report January through June 2018 (2 hard copies)

cc: Mr. Joe Aldridge, NuStar Energy, L.P. (electronic deliverable)
Ms. Patty Boyden, Port of Vancouver (1 digital [CD] copy)
Mr. Richard Roché, Parametrix (1 digital [CD] copy)

Semi-Annual Groundwater Monitoring Report – January through June 2018

NuStar Vancouver Facility

2565 NW Harborside Drive, Port of Vancouver

Vancouver, Washington

Prepared for:

NuStar Terminals Services, Inc.

Prepared by:

Cascadia Associates, LLC
6915 SW Macadam Avenue, Suite 250
Portland, Oregon 97219

Project No. 0060-001-002
August 2018

Cascadia
Associates, LLC

Semi-Annual Groundwater Monitoring Report – January through June 2018

NuStar Vancouver Facility

2565 NW Harborside Drive, Port of Vancouver

Vancouver, Washington

Prepared for:

NuStar Terminals Services, Inc.

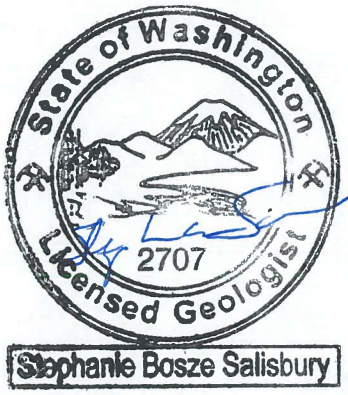
Project No. 0060-001-002

August 2018

Prepared by:

Chris Breemer

Principal Geologist, Cascadia Associates



Stephanie Bosze Salisbury, L.G.

Senior Associate Geologist, Cascadia Associates

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1.0 INTRODUCTION

This semi-annual groundwater monitoring report was prepared by Cascadia Associates, LLC (Cascadia) on behalf of NuStar Terminals Services, Inc. (NuStar) for the NuStar Vancouver Facility (Facility) in Vancouver, Washington (Figure 1). This report presents the results of the groundwater monitoring activities completed at the Facility during the first and second quarters of 2018. Additionally, the report includes a summary and evaluation of interim action monitoring data for the reporting period.

The Facility is located at the Port of Vancouver (POV) Terminal No. 2 in Vancouver, Washington (Figure 1). The Facility Site Plan is shown on Figure 2. The property address is 2565 NW Harborside Drive, Port of Vancouver, Vancouver, Washington 98660 (Latitude: N45° 38.26', Longitude: W122° 42.20'). The property is owned by the POV and leased by NuStar; the current extent of the leasehold is shown on Figure 2. The NuStar facility is on the north shore of the Columbia River. Land on all other sides is industrial property also owned by the POV. The NuStar facility is approximately 19 acres in size located on Clark County Tax Lot Nos.: 151979-000, 502010-002, 502010-000, and a portion of 502020-000, as well as a portion of the Washington Department of Natural Resources tideland area managed by the POV.

2.0 GROUNDWATER MONITORING FIELD ACTIVITIES

The groundwater monitoring was performed in general accordance with the *Groundwater Monitoring Plan* (GWMP; Ash Creek, 2008), which was approved by the Washington State Department of Ecology (Ecology) in a letter to NuStar dated July 30, 2009. The monitoring program for the first and second quarters of 2018 is summarized in Table 1.

Two monitoring events were conducted during this period: the first quarter 2018 groundwater monitoring event was conducted from March 19 to March 22, 2018, and the second quarter 2018 event was conducted from June 27 to July 2, 2018.

2.1 WATER LEVEL MEASUREMENTS

First quarter 2018 groundwater levels were measured on March 19, 2018, and second quarter 2018 groundwater levels were measured on June 27, 2018. Monitoring well locations are shown on Figure 2. Depth to groundwater and groundwater elevation data are summarized in Table 2. The wells are screened in three different groundwater zones: Shallow, Intermediate, and Deep. The depth to groundwater was measured at Facility monitoring wells, multi-level groundwater monitoring (MGMS) wells, and selected off-site wells (MW-14, MW-17, MW-23i, MW-25i, MW-26, MW-30i, MW-31i, MW-E, MW-F, MW-G, S-1, and S-2). Well MW-32i was inaccessible during the June 27, 2018 gauging event and was gauged the following day on June 28, 2018.

2.2 MONITORING WELL SAMPLING AND ANALYSIS

The sampling and analysis program for first and second quarter 2018 is summarized in Table 1. Groundwater monitoring data sheets for the sampling events are included in Appendix A. For quality assurance/quality control (QA/QC), field blanks and equipment blanks were prepared, and sample duplicates were collected from wells MW-7, MW-12, and MW-19 during first quarter 2018 and wells MW-7, MW-12, MW-19 and MGMS3-40 during the second quarter 2018.

For both sampling events, the samples were uniquely labeled, stored in insulated coolers with ice, and transported under chain-of-custody protocol to Pace Analytical Laboratory (Pace) for laboratory analysis. Samples were analyzed for halogenated volatile organic compounds (HVOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B.

Pace acquired ESC Lab Sciences early in 2018. Due to the ownership transition, the first quarter 2018 monitoring event samples were analyzed and reported by ESC (Mt Juliet, Tennessee) and the second quarter 2018 VOC results were analyzed at the same laboratory, but were reported by Pace of Mt Juliet, Tennessee. Groundwater analytical results for both events are shown in Table 3. Historical data are tabulated in Appendix B.

The terminal currently handles and distributes bulk fertilizer products, primarily urea but also mono-ammonium phosphate. Urea cannot be directly measured in water but can be estimated in groundwater by analysis of the primary urea constituents: ammonia, nitrate, and nitrite. To evaluate for urea in groundwater, during the first and second quarter 2018 monitoring events, Facility monitoring wells were sampled for nitrate as nitrogen and nitrite as nitrogen by EPA Method 300.0 and ammonia as nitrogen by EPA Method 350.1. Samples for the analyses listed above were submitted to ALS Group USA, Corp. of Kelso, Washington, using chain-of-custody protocols, for laboratory analysis.

3.0 GROUNDWATER ELEVATIONS

Groundwater elevations and estimated elevation contours for the Shallow and Intermediate Zone wells for the first quarter 2018 are shown on Figures 3 and 4, respectively. Groundwater elevations and estimated elevation contours for the Shallow and Intermediate Zone wells for the second quarter 2018 are shown on Figures 5 and 6, respectively.

3.1 FIRST QUARTER 2018

Shallow Zone. On March 19, 2018, depth-to-groundwater measurements were made at Shallow Zone monitoring wells in accordance with the groundwater monitoring plan provided in Table 1. The observed depths to groundwater in these wells ranged from 23.93 to 30.95 feet below the top of casing (BTOC), and the corresponding groundwater elevations in these wells ranged from 6.92 to 8.69 feet above mean sea level (MSL; Figure 3).

During the first quarter 2018 monitoring event, gauging of the Shallow Zone wells was completed between 10:47 am and 1:52 p.m. (except for the Shallow Zone ports of multi-port well MGMS1). During the time interval in which Shallow Zone monitoring wells were gauged, the water level in the adjacent Columbia River decreased by 0.76 foot. River stage data were obtained from the nearest National Oceanographic and Atmospheric Administration (NOAA) tide station (Columbia River – Vancouver), which is located approximately 0.5 mile upstream of the Facility.

As shown in Table 2, groundwater elevations on average were 2.5 feet higher in March 2018 than during the previous monitoring event in November 2017. During the first quarter 2018 gauging event, groundwater elevations in the Shallow Zone were variable, with groundwater highs in the northwest and southeastern corners of the terminal, near wells MW-10 and MW-6, respectively. Between wells MW-10 and MW-6 there is a groundwater divide; to the south/southwest of the divide groundwater flow is to the river; and to the north/northeast of the divide, groundwater flow is away from the river to the east/northeast. From the groundwater high at well MW-10, groundwater flow was to the southwest and east at gradients of 0.003 ft/ft. There is also an isolated groundwater low around well MW-2 that is inconsistent with the divide that trends from the northwest to the southeast across the Facility.

Intermediate Zone. On March 19, 2018, depth-to-groundwater measurements were made at Intermediate Zone monitoring wells in accordance with the groundwater monitoring plan provided in Table 1. Groundwater levels in Intermediate Zone wells were measured during a predicted tidal inflection to minimize the magnitude of tidal influence on water levels during the gauging event. Water levels were measured from Intermediate Zone wells within a 56 minute-period on March 19, 2018 (between 8:14 am and 9:10 am), except for the Intermediate Zone ports of the multi-port wells. During the time interval in which Intermediate Zone wells were gauged, water levels in the adjacent Columbia River decreased by 0.11 foot.

During the March 19, 2018 water level measurements, the observed depths to groundwater in the Intermediate Zone wells ranged from 23.44 to 26.25 feet BTOC, and groundwater elevations in these wells ranged from 7.66 to 8.38 feet above MSL (Figure 4). As shown in Table 2, groundwater elevations in the Intermediate Zone were about 3 feet higher in March 2018 than during the previous monitoring event in November 2017. During the March 19, 2018 gauging event, groundwater flow was towards the south with a gradient of approximately 0.001 ft/ft.

Deep Zone. Depth to groundwater was measured in well MW-24d, which is screened from 210 to 230 feet below ground surface (bgs), within the Troutdale Formation. Depth to water in well MW-24d was 26.19 feet BTOC, corresponding to an elevation of 7.72 feet above MSL. A groundwater potentiometric map was not prepared for Deep Zone groundwater.

3.2 SECOND QUARTER 2018

Shallow Zone. On June 27, 2018, depth-to-groundwater measurements were made at Shallow Zone monitoring wells in accordance with the groundwater monitoring plan provided in Table 1. The

observed depths to groundwater in these wells ranged from 23.04 to 29.75 feet BTOC, with groundwater elevations ranging from 2.85 to 10.21 feet above MSL (Figure 5).

During the second quarter 2018 monitoring event gauging of the Shallow Zone wells was completed between 11:04 am and 1:00 pm with the exception of the Shallow Zone ports of the multi-port wells. During the gauging activities, the water level in the adjacent Columbia River decreased by 0.11 feet. As shown in Table 2, groundwater elevations on average were between 1 and 1.5 feet higher in June 2018 than the previous monitoring event in March 2018.

A northwest to southeast trending groundwater divide was observed across the property, with groundwater highs in the vicinity of wells MW-8 and MW-15, as shown on Figure 5. At the northwestern corner of the Facility, groundwater flow was to the southwest and northeast at gradients of 0.005 ft/ft and 0.02 ft/ft, respectively. At the southeast part of the facility, near MW-15, the shallow groundwater flow directions were to the north and south at gradients of 0.03 ft/ft and 0.002 ft/ft, respectively.

Intermediate Zone. During the June 27, 2018 gauging event, depth-to-groundwater was measured in Intermediate Zone wells between 2:48 p.m. and 4:08 p.m. Well MW-32i was sampled on June 28, 2018, as the well monument was covered and not accessible on June 27, 2018. During the June 27, 2018 gauging event, water levels in the adjacent Columbia River increased by 0.07 foot. The observed depths to groundwater in Intermediate Zone wells ranged from 24.17 to 28.13 feet BTOC, and groundwater elevations in these wells ranged from 7.35 to 8.01 feet above MSL (Figure 6). Intermediate Zone groundwater was generally flat during the June gauging event with a slight gradient to the southwest of 0.001 ft/ft.

Deep Zone. Depth to water in Deep Zone well MW-24d was 25.80 feet BTOC, corresponding to an elevation of 8.11 feet above MSL.

4.0 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Complete copies of the laboratory reports for the first and second quarter 2018 groundwater monitoring events, including the quality assurance evaluation report and chain-of-custody documentation, are included in Appendix C.

4.1 FIRST QUARTER 2018

The March 2018 monitoring program included the collection of groundwater samples from the wells as shown in Table 1. Groundwater samples from these wells were analyzed for nitrate as nitrogen, nitrite as nitrogen, and ammonia as nitrogen, in addition to HVOCs. The sample results for first quarter 2018 are summarized in Tables 3 and 11; select VOC data are shown on Figure 7, and nitrate and ammonia results are shown on Figure 9.

4.2 SECOND QUARTER 2018

The June 2018 monitoring program included the collection of groundwater samples from the wells listed in the second column of Table 1. These wells were analyzed for nitrate as nitrogen, nitrite as nitrogen, and ammonia as nitrogen, in addition to HVOCs. The sample results for second quarter 2018 are summarized in Tables 3 and 11; select VOC data are shown on Figure 8, and nitrate and ammonia results are shown on Figure 10.

4.3 EVALUATION OF RESULTS

VOC concentration trend plots for each monitoring well are provided in Appendix D. Monitoring results demonstrate decreasing VOC concentration trends in Shallow and Intermediate Zone groundwater in 30 of 33 monitoring wells. VOC concentration trends were slightly increasing for trichloroethene (TCE) in wells MW-17, MW-19, and MGMS3-132 and tetrachloroethene (PCE) in well MGMS3-132. The concentrations of PCE and TCE in wells MW-17 and MGMS3-132 have always been variable and relatively low (i.e., PCE ranging from less than 1 microgram per liter [µg/L] to 16.3 µg/L for MGMS3-132 and TCE ranging from less than 0.5 µg/L to 28.2 µg/L for MW-17) and therefore it is difficult to identify a discernable concentration trend for the wells. While concentrations of PCE have declined in well MW-19, concentration trends for TCE have been predominately stable to slightly increasing. The increase in TCE may be the result of the conversion of chlorinated hydrocarbon mass from PCE to TCE during reductive dechlorination. A discussion of reductive dechlorination and total molar ethene mass is discussed in Section 5.3. Monitoring wells in the source area exhibit concentration decreases of over 95% for PCE and TCE since initiating interim actions in 2008. VOCs in monitoring wells on the periphery or outside of the source area also reflect historical decreasing trends.

Ammonia, nitrate and nitrite results are provided in Table 11 and on Figures 9 and 10. The highest concentration of ammonia and nitrate were found in the north/northwestern area of the property both in Shallow and Intermediate Zone groundwater. Fertilizer products have historically been stored at the terminal, although the specific products and storage areas have changed over time. Historical fertilizer handling operations ceased in late August 2008. The Facility obtained a new contract in 2014, and at that time, resumed fertilizer handling and distribution processes. Historical nitrate results are provided in Table 11. For wells in which historical data are available, the concentrations of nitrate and ammonia in March and June/July 2018 are generally similar to (within an order of magnitude) or less than historical results.

5.0 INTERIM ACTION MEASURE ACTIVITIES

Several interim actions have been implemented at the Facility, including:

- Between 2000 and 2005, a remediation system operated at the Facility that included (1) a re-circulating system to treat groundwater and (2) vapor extraction to treat soil. The interim action system pumped groundwater from extraction wells installed near the river), treated

the pumped water with potassium permanganate, and then filtered and pumped the water into a series of injection wells along the railroad tracks For soil, a soil vapor extraction (SVE) system withdrew soil vapors from wells IW-1, IN-2, IN-3, IN-4, EX-1, EX-3, EX-4, and EX-5.

- Bioremediation injections for remediation of Facility groundwater and the installation of a soil vapor extraction (SVE) system for the remediation of VOCs in vadose-zone soils in the spring/summer of 2008. These activities are herein referred to as the 2008 interim action.
- Expanding the SVE system and performing additional bioremediation injections during the summer of 2011, which is referred to herein as the 2011 interim action. The 2011 interim action included 17 additional SVE well locations (involving shallow and deeper SVE well pairs at each location) for a total of 34 wells, and additional bioremediation injections in and around the 2008 interim action area (shown on Figure 11). Details of the 2008 and 2011 interim actions are provided in the Interim Action Installation Report (Ash Creek, 2009b) and the 2011 Interim Action Evaluation Report (Ash Creek, 2012), respectively.
- Additional bioremediation injections adjacent to the seawall at the Facility in accordance with the 2015 Interim Action Work Plan (Apex, 2016). This work is referred to as the 2016 interim action. The Interim Action Summary Report (Apex, 2017) describes the scope and preliminary results of the interim action.

These interim actions and results to date are described in the following subsections.

5.1 SUMMARY OF 2008 AND 2011 INTERIM ACTIONS

The 2008 interim action consisted of SVE in the vadose zone and enhanced anaerobic bioremediation of the Shallow Zone groundwater. The 2008 enhanced bioremediation locations and the SVE system layout are shown in Appendix E. The 2008 SVE system removed approximately 3,150 pounds of VOCs between startup in September 2008 and the expansion in 2011. The mass removal rate at startup in 2008 was 58.8 pounds per day (lbs/day). The removal rate decreased to an average of 1.7 lbs/day by the third quarter of 2011. Historical monitoring tables and a mass removal chart are provided in Appendix E.

A soil and groundwater investigation in 2010 indicated that the 2008 interim action had reduced VOCs in vadose-zone soils by 90 percent for PCE and 98 percent for TCE and had reduced total molar ethene concentrations in source area groundwater by 77 percent (Ash Creek, 2011). The investigation results were summarized in an appendix to the *2011 Interim Action Work Plan* (Work Plan; Ash Creek, 2011) that was submitted to Ecology on March 25, 2011. The Work Plan included a proposal for the expansion of the SVE system to include 17 additional SVE well locations, additional bioremediation injections in the 2008 interim action area, and bioremediation injections in an expanded interim action area. On May 23, 2011, Ecology approved the Work Plan. The bioinjection activities were conducted from July 21 through August 31, 2011, and the SVE installation activities were conducted from August 2 through 5, 2011, and August 29 through October 3, 2011. The 2008 and 2011 bioremediation injection locations are shown on Figure 11.

The initial Facility SVE system installed in 2008, herein referred to as the 2008 SVE system, was comprised of 17 wells, divided among five branches, which were connected by a network of underground piping as shown on drawings provided in Appendix E. As part of the 2011 SVE system expansion, Branches 4 and 5 were disconnected from the other System branches and were connected to a new blower unit located approximately 150 feet to the northeast of the railroad tracks (Figure 13). The wells and piping associated with Branches 4 and 5 and the associated blower unit are herein referred to as the "North System".

From August 2 through 5, 2011, 17 additional SVE well pairs (for a total of 34 additional SVE wells) were installed within and to the south of Warehouse No. 13 (a.k.a. the Butler building), in general accordance with the *2011 Interim Action Work Plan* (Ash Creek, 2011; Figure 13). For each well pair, one well is screened in vadose-zone soils from 10 to 15 feet bgs and the second well is screened in vadose-zone soils from 15 to 25 feet bgs. These 17 well pairs, along with the Branch 1 through 3 wells from the 2008 SVE system, are piped underground to a blower unit located outside of the southeast corner of Warehouse No. 13. These SVE wells, associated underground piping, and the blower unit are herein referred to as the "South System".

5.2 SUMMARY OF 2016 INTERIM ACTION

NuStar and the Port of Vancouver submitted a joint Feasibility Study (FS) to Ecology in March 2014 (Apex and Parametrix, 2014). To avoid potential delays in groundwater treatment while working through the FS and the associated regulatory approval process, NuStar proposed to implement a portion of the recommended remedial action for the NuStar source area as an interim action. The details of the proposed interim action were submitted to Ecology in an *Interim Action Work Plan* on September 15, 2015. After a 30-day public comment period from May 12 to June 10, 2016, the work plan was approved on June 14, 2016. The interim action consisted of bioremediation injections along the southern portion of the NuStar terminal near the seawall. Per Ecology's request, the interim action also included baseline sediment and surface water sampling in the Columbia River. Additionally, enhanced bioremediation injections were implemented in an isolated area to the northwest of the NuStar terminal (the "Northwest (NW) Area") which has been less responsive to monitored natural attenuation than at the NuStar terminal. The NW Area bioremediation injections were completed as a joint project between NuStar and the Port of Vancouver.

The NW Area injections were competed in July 2016 and included the injection of 52,000 gallons of bioremediation oil substrate (EosPro; diluted with water) into the shallow zone groundwater through 30 boreholes in the vicinity of and between (NuStar) monitoring wells MW-14 and MW-26. Figure 12 illustrates the approximate boring locations in the NW Area. The same substrate material was injected at the NuStar terminal in August and September 2016 and included the injection of 100,000 gallons of EosPro (diluted with water) into 72 borings along the southern portion of the NuStar facility, adjacent to the seawall. Figure 12 identifies the approximate locations of the injection borings near the NuStar seawall. In accordance with the approved *Interim Action Work Plan*, a summary of the groundwater injection and surface/water sampling activities was provided to Ecology in an *Interim Action Summary Report* on June 29, 2017 (Apex, 2017). The report included

the results of the baseline surface water and sediment sampling as well as the results of two quarters of post interim action groundwater monitoring. A brief evaluation of the groundwater monitoring results from the interim action area is summarized in Section 5.3 below.

5.3 INTERIM ACTION MONITORING AND EVALUATION

This section summarizes the scope and results of groundwater monitoring that has been performed to evaluate the effectiveness s of interim actions. Effectiveness is evaluated by reviewing HVOC and ethene concentration trends as well as TOC concentrations in groundwater. Effectiveness of the SVE system is evaluated based on the mass removal rate.

5.3.1 Enhanced Bioremediation Injections

Groundwater samples collected from wells MW-7, MP-1, EX, MW-12, MW-24i, MGMS2-40, MW-13, MW-14, MW-19, MW-26, MGMS1-43 and MGMS3-40 during the first and second quarter 2018 event were analyzed for total organic carbon (TOC) by EPA Method 5310 D and ethene by EPA Method RSK-175M, to evaluate the performance of the bioremediation injections. TOC and ethene analyses were performed by Pace Analytical of Minneapolis, Minnesota.

In addition to the laboratory analysis of groundwater samples, field measurements of oxidation-reduction potential (ORP) and dissolved oxygen (DO) were collected from the monitoring wells during the first and second quarter 2018 monitoring events. Table 4 shows the results of interim action groundwater monitoring from the February 2007 baseline event through the second quarter 2018 monitoring event. Wells MW-24i and MGMS2-40 are not located within the 2008 interim action injection area but are located within the footprint of the 2011 and 2016 interim action areas; therefore, interim action monitoring data for these wells are only presented from the second quarter 2011 baseline event through second quarter 2018. Wells MW-13, MW-14, MW-19, MW-26, MGMS-1, and MGMS-3 are not located within the 2008 or 2011 interim action areas but are within the 2016 interim action area; therefore, monitoring data for those wells are only presented from September 2016 through July 2018.

A discussion of reductive dechlorination of VOCs in groundwater from prior to the 2008 interim action through second quarter 2018 is provided below.

5.3.1.1 VOC Concentrations Evaluation

Bioremediation injections in the primary source area at the Facility were initiated in 2008 and expanded in 2011; bioremediation injections along the riverbank and in the NW Area were completed in 2016. Additionally, seven injection boreholes were advanced in 2016 in the area of wells MP-1 and EX, located on the western side of the (former) primary source area. The following paragraphs evaluate the results to date in each of these areas.

Primary Source Area. Concentration trend plots for PCE, TCE, total dichloroethene (DCE), and vinyl chloride (VC) in 2008/2011 interim action area wells MW-7, EX, MP-1, and MGMS2-40 are provided in Appendix F. VOC data are included from the baseline monitoring event that was

completed prior to the 2008 interim action (first quarter 2007; second quarter 2007 for well MGMS2-40) through June/July 2018. The concentration of PCE and TCE has decreased in each well. The concentrations of PCE and TCE in wells MW-7, EX, and MGMS2-40 have been reduced by more than 96% since the interim measures were initiated. The concentrations of PCE and TCE in well MP-1 have decreased by about 54% and 67%, respectively, between the February 2007 baseline event and the June/July 2018 monitoring event. Well MW-7 is located in the previously identified primary source area, and groundwater concentrations in well MW-7 have decreased dramatically since the 2008 interim action. Groundwater monitoring data for well MW-7, from the completion of the 2008 interim action through June 2018, confirm that VOC concentrations are not rebounding in that area.

Another indicator of effective treatment of chlorinated ethenes is a decrease in the total molar chloroethene concentration (the molar concentration of PCE, TCE, DCE, and VC combined). The use of total molar concentrations allows an assessment of changes in the total number of related contaminant molecules as the reductive dechlorination process transitions from the relatively heavy PCE to the progressively lighter TCE, DCE, and VC. Molar concentration trend plots for wells MW-7, EX, MP-1, and MGMS2-40 are provided in Appendix F. Between the February 2007 baseline event and the June/July 2018 monitoring event, total molar concentrations in wells MP-1, MW-7, EX and MGMS2-40 decreased between 35 percent (well EX) to over 90 percent (wells MW-7 and MGMG2-40).

Riverbank Area. Wells MW-12, MW-13, MW-19, MGMS1-43, and MGMS3-40 are located within the 2016 riverbank interim action area and, therefore, are useful for evaluating the effectiveness of the interim action. Concentration trend plots for PCE, TCE, DCE, and VC in these wells are provided in Appendix F. As shown on the trend plots, monitoring results from the 2016 interim action area indicate reductions in concentrations of PCE and TCE of over 99 percent in groundwater from wells MW-12, MW-13, and MGMS3-40 after the 2016 enhanced bioremediation injections. For example, concentrations of PCE and TCE in well MW-13 in June 2016, prior to the injection event, were 2,470 and 1,820 µg/L, respectively. By July 2018, PCE concentrations in well MW-13 had been reduced to below reporting limits (<0.500 µg/L) and TCE had been reduced to 0.781 µg/L. DCE concentrations have also decreased. The DCE concentrations in wells MW-12, MGMS1-43, and MGMS3-40 have been reduced by over 99 percent, 85 percent, and 99 percent, respectively. DCE concentrations have increased in wells MW-13 and MW-19. The increased DCE concentrations are likely the consequence of the ongoing reductive dechlorination of PCE and TCE. The June 2018 VC concentrations in wells MW-13 and MW-19 were the highest measured since monitoring of the wells was initiated in 1996 and 2002, respectively. Ethene concentrations have also increased in wells MW-13 and MW-19, indicating that reductive dechlorination is occurring through the vinyl chloride stage to the final end stage of ethene generation and that the chlorinated hydrocarbons are successfully being destroyed. Additional discussion of ethene production is provided in the sections below. Future quarterly monitoring will be utilized to further evaluate these concentration trends, both in the Shallow Zone source area as well as outside of the source area treatment zone and in Intermediate Zone groundwater.

Northwest Area. Wells MW-14 and MW-26 are located within the 2016 NW Area interim action area and, therefore, are useful for evaluating the effectiveness of the interim action. Concentration trend plots for PCE, TCE, DCE, and VC in these wells are provided in Appendix F. Response to the 2016 interim action injections has been delayed in these wells, likely due to the typically flat or north/northwest groundwater gradient slowing the spread of the oil substrate. Initial signs of reductive dechlorination are now present in wells MW-14 and MW-26, with DCE trends now increasing since the 2016 enhanced bioremediation injections. In MW-14, PCE concentrations have decreased 65 percent since the 2016 enhanced bioremediation injections; in that same timeframe, concentrations of TCE have increased slightly (13 percent). In MW-26, concentrations of PCE and TCE have both decreased by 28 percent and 36 percent, respectively. Continued quarterly groundwater monitoring will be conducted to further evaluate concentration trends.

5.3.1.2 Ethene Evaluation

Ethene is an end product of the reductive dechlorination process. The detection of ethene confirms the completion of the reductive dechlorination pathway and the destruction of the target VOCs at the Facility. Ethene degrades quickly in most natural environments, therefore, observing increases in ethene concentration can be difficult. During the first semi-annual 2018 monitoring period, ethene was detected in five of the ten 2016 interim action area monitoring wells (MW-13, MW-19, EX-1, MGMS2-40, and MGMS3-40). Further discussion of ethene results is provided below.

Primary Source Area. While the focus of the 2016 interim actions was not located in the area historically identified as the "primary source area", there was some overlap between the 2008/2011 interim action injection areas and the 2016 interim action injection area, namely in the vicinity of wells MP-1 and EX. Concentrations of ethene in well MP-1 reached a maximum of 328 µg/L in March 2017, decreased to 83.2 µg/L in June 2017, and then decreased further to below reporting limits (10 µg/L) in samples collected between September 2017 and June 2018. These data suggest that the 2016 bioremediation substrate injected near well MP-1 was effective for stimulating reductive dechlorination; however, the mass of substrate may be diminished. Ethene samples were not collected from well EX during the September and December 2016 monitoring events; however, ethene has been detected in well EX since the analysis was resumed in March 2017, with the highest concentration measured in June 2018 (99.2 µg/L). Monitoring well MGMS2-40 is located near, but outside of, the 2016 interim action injection area, and within the footprint of the 2011 interim action injection area. Ethene concentrations in well MGMS2-40 increased in response to the 2011 injections and have remained elevated and relatively stable through March 2018. Ethene was not detected in well MGMS2-40 in the recent sample collected in July 2018. The presence of ethene in several interim action area wells, along with decreasing PCE and TCE concentrations, indicate that reductive dechlorination has been ongoing near this well since the 2011 injections.

Since approximately three years after the 2011 injections, ethene has not been detected in groundwater in well MW-7. The lack of ethene in well MW-7, coupled with VOC data at or near

reporting limits, suggest that there is little residual chlorinated hydrocarbon mass in what was historically the most impacted portion of the primary source area.

Riverbank Area. Prior to the 2016 interim action injections, ethene was not present in groundwater in wells located in the interim action area, including wells MW-12, MW-13, MW-19, and MGMS3-40. Since the completion of the 2016 interim action injections, ethene has been detected in all four interim action area wells. The presence of ethene suggests that the 2016 injections have successfully resulted in the complete degradation of chlorinated hydrocarbon mass. A summary of the presence and persistence of ethene in each riverbank area interim action well is provided below:

- Ethene concentrations in well MW-12 increased from non-detect prior to the 2016 interim action, to 75.2 µg/L in March 2017, and remained elevated between March 2017 and September 2017. Concentrations of ethene in well MW-12 tapered off to below the reporting limit (10.0-13.0 µg/L) during the November 2017, March 2018 and July 2018 sampling events.

- PCE and TCE concentrations in MW-13 have decreased significantly between September 2016 and July 2018 (from 5,090 µg/L and 951 µg/L, respectively, to below the reporting limit of 0.511 µg/L and 0.781 µg/L, respectively), but it was not until November 2017 that ethene was detected in the well. Since then, concentrations of ethene have continued to rise, with the highest measurement (500 µg/L) detected in July 2018.

- Ethene was first detected in well MW-19 during the September 2017 monitoring event and has been detected in every sampling event since, with the highest concentration (271 µg/L) detected during the June 2018 sampling event. As previously stated, vinyl chloride concentrations in well MW-19 during the June 2018 monitoring event were the highest since the well was first sampled in 2002. Collectively, these data confirm that reductive dechlorination around well MW-10 and that chlorinated VOC mass is being completely degraded in the process.

- Ethene was detected in well MGMS3-40 during the first monitoring event after the 2016 injections (December 2016) and has been detected during each subsequent monitoring event through June 2018, at concentrations ranging from 23 µg/L to 242 µg/L.

Northwest (NW) Area. Ethene concentrations in wells MW-14 and MW-26 have not been detected above the 10 µg/L reporting limit since ethene monitoring was initiated in September 2016. End stages of the reductive dechlorination process are difficult to identify in this area and may be due to limited mass in the preceding VC reduction stage. Reductions in concentrations of PCE and TCE in well MW-26 were not observed until the September and November 2017 monitoring events. These recent data suggest that reductive dechlorination of chlorinated hydrocarbons is occurring in the NW Area.

5.3.1.3 Total Organic Carbon Evaluation

The presence of elevated TOC indicates that the bioremediation injections have increased the electron donor carbon source needed to reductively dechlorinate the VOCs present in groundwater at the Facility. While a baseline monitoring event was not conducted prior to the 2016 injection event, TOC data are available for wells MP-1 and MW-12 (riverbank area) for the event prior to the injections (June 2016) and the two events concurrent with and following the injections (September and December 2016). TOC was further analyzed between March 2017 and July 2018 at select wells. A discussion of the TOC results is provided below.

Primary Source Area. Seven bioremediation injection points were located near well MP-1 during the 2016 interim action. In well MP-1, TOC values increased by over three orders of magnitude between June and September 2016, with concentrations remaining elevated during the December 2016 event. During the March 2017 event, the TOC value remained stable; however, TOC values decreased in June 2017 by an order of magnitude and further decreased in September 2017 by another order of magnitude before remaining stable through 2018. At well EX, the TOC concentration increased by two orders of magnitude following the 2016 interim action injections and then decreased an order of magnitude during the June 2017 event with a slight increase in June 2018. These results indicate utilization of the oil substrate in the dechlorination of VOCs, supporting the significant decreases in VOC concentrations observed following the 2016 bioremediation injections in this area.

Riverbank Area. The following describes TOC results in the riverbank portion of the 2016 interim action area (wells MW-12, MW-13, MW-19, MGMS3-40, and MGMS1-43).

- In groundwater collected from well MW-12, TOC concentrations increased by over three orders of magnitude between June and September 2016, with concentrations remaining elevated during the December 2016 monitoring event. Between December 2016 and March 2017, the TOC concentration in well MW-12 decreased by an order of magnitude and then gradually decreased another order of magnitude between June 2017 and June 2018.
- At well MW-13, TOC concentrations were elevated during the September 2016 sampling event, and then decreased by three orders of magnitude by the November 2017 event. TOC concentrations have remained relatively stable in well MW-13 through the July 2018 sampling event.
- At well MW-19, TOC values were low (one to two orders of magnitude below concentrations observed in wells MP-1 and MW-12) and stable from September 2016 through November 2017, then increased an order of magnitude through June 2018.
- At well MGMS3-40, TOC concentrations increased during the September and December 2016 groundwater monitoring events, and then decreased by an order of magnitude during the March 2017 event and has remained stable through July 2018.

- At well MGMS1-43 The TOC concentration in groundwater collected from has remained relatively stable from September 2016 through July 2018 even though concentration of PCE and TCE have slightly decreased since the 2016 enhanced bioremediation injections.

In general, TOC concentrations in riverbank area wells indicate utilization of the oil substrate in the dechlorination of VOCs, which is supported by decreasing VOC concentrations in most riverbank area wells.

NW Area. In wells MW-14 and MW-26, TOC concentrations did not increase after the September 2016 injections. TOC levels in these wells remain low and stable.

Summary of Enhanced Bioremediation Results Following the 2016 Interim Action. The 2016 groundwater interim action was implemented in July through September 2016 and included over 72 bioremediation injections at the NuStar Facility and 30 bioremediation injections at the off-facility Northwest Area. Since implementation, groundwater in the 2016 interim action area has been monitored for seven quarters for indicators of reductive dechlorination. The results from the first and second quarter 2018 sampling events are consistent with previous event and indicate that reductive dechlorination is occurring. Specifically:

- Up to three orders of magnitude reduction of PCE and TCE concentrations in the 2016 interim action area have been observed between the September 2016 and June/July 2018 monitoring events.
- Observed trends in breakdown product concentrations are consistent with reductive dechlorination of chlorinated ethene compounds.
- The decreasing of PCE and TCE concentrations in Northwest Area well MW-26 has continued, with concentration reductions of 28 percent and 36 percent, respectively. The concentration of PCE and near Northwest Area well MW-14 has decreased by 65% since the 2016 injections.
- DCE and VC concentrations generally increased or stayed approximately the same in the interim action evaluation wells. These data indicate that dechlorination of PCE and TCE is occurring within the treatment zone.
- After the 2016 injections, ethene was first detected in four interim action monitoring wells in March 2017. Detections of ethene in Facility wells have continued through June/July 2018, where ethene was detected in five interim action monitoring wells. During the June/July 2018 monitoring event, ethene was detected in wells MW-13 and MW-19 at the highest concentrations since the 2016 injections. The presence of ethene indicates that the chlorinated hydrocarbon mass is successfully being reduced to the final stage in the dechlorination process.
- Total molar ethene concentrations from wells located within the 2016 treatment area have decreased, indicating that VOC mass is being significantly reduced.

5.3.2 SVE Systems – Monitoring and Mass Removal Evaluation

The following paragraphs summarize the monitoring and analytical results as well as the total VOC mass removal for the North and South SVE Systems at the Facility. Field vapor measurements were collected with a photoionization detector (PID). Effluent vapor samples from the SVE systems were collected into Summa™ canisters and submitted to TestAmerica Laboratories (Test America) in West Sacramento, California, for analysis of VOCs by method TO-15.

The North SVE System has been non-operational since May 2017 due to the blower motor failing. The rotor is locked and blown fuses were noted on two of the three legs. A replacement blower is required to return the North SVE system to operation. The terminal is planning modifications to the rail alignment at the Facility to accommodate modifications to one of its storage areas; part of the planned work will require the abandonment and potential relocation of several of the SVE wells in the North system. As of July 2018, the modifications to the terminal infrastructure have not been initiated and the North SVE system remains non-operational.

During a non-routine site visit in May 2018, abnormal noise could be heard in the vicinity the South SVE well vault VE-1-2. Apex field staff opened the vault and noted the horizontal piping in the vault had separated drawing ambient air into the SVE system. The valve for that well was turned off and field staff attempted to repair the well. The piping repair was unsuccessful; the SVE installation contractor has been contacted to repair the piping during third quarter 2018. SVE well VE-1-2 will remain closed until the repair is made. The bolts on several of the SVE well vaults are corroded making the well vaults inaccessible.

Monthly SVE monitoring events (limited to the South SVE system) occurred on January 22, February 28, March 29, April 24, and May 16, 2018 during this reporting period. North SVE System operating and analytical data are provided in Tables 5 and 6, respectively. As discussed above, the North SVE system was not operational during this reporting period; therefore, data are limited to the period before May 2017. South SVE System operating and analytical data are provided in Tables 7 and 8, respectively.

SVE System Mass Removal. The approximate VOC mass removed by the North and South SVE Systems through May 2018 is presented in Tables 9 and 10 and on Figures 14 and 15, respectively. The North and South Systems have removed approximately 232 and 3,656 pounds of VOCs, respectively, since startup in October 2011. Including the mass removed from the 2008 SVE System, the total mass removal by SVE at the Facility to date is approximately 7,038 pounds. As of May 2018, the South SVE system will be monitored on a bi-monthly rather than monthly basis. Given the current monitoring information, this monitoring frequency is considered sufficient for maintaining the system and quantifying mass removal. An SVE monitoring event was conducted in July 2018; the next SVE monitoring event is scheduled for September 2018.

6.0 INFRASTRUCTURE MAINTENANCE

During first quarter 2018, several Facility well monuments were replaced, repaired, or upgraded as part of periodic infrastructure maintenance. A summary of these well repairs/upgrades will be provided to Ecology in a separate deliverable during third quarter 2018. In addition, maintenance and repairs to the South SVE system will be conducted during third quarter 2018; a summary of SVE maintenance activities will be provide in the second semi-annual 2018 groundwater monitoring report.

7.0 FUTURE ACTIVITIES

NuStar has been sampling groundwater at the Vancouver Facility for VOCs on a quarterly basis and reporting on a semi-annual basis, since the existing Groundwater Monitoring Plan was approved by Ecology in 2008 (Ash Creek, 2008). Since that time, over 1,600 samples have been collected from 44 wells, over a total of 40 monitoring events. There is a robust set of historical VOC monitoring data to understand concentration trends and to indicate that a less frequent sampling frequency would be appropriate for meeting remedial goals; therefore, we propose modifying the monitoring program to reduce the sampling frequency to semi-annually and to reduce the reporting frequency to annually. This will serve to align the NuStar monitoring program with the Ports sampling program for the Swan Manufacturing and Cadet sites. In addition to revising the monitoring scope for HVOCs, NuStar also proposes to abandon some of the wells associated with the former remediation system installed by SECOR in 199x. These wells are not being used for remediation or monitoring purposes and are located in areas with sufficient monitoring well network coverage. NuStar will send Ecology a proposed monitoring program and abandonment plan for review.

SVE operations and maintenance will occur bi-monthly in accordance with the schedule proposed in the *2011 Interim Action Evaluation Report (*Ash Creek, 2012) at the South SVE system only until the North SVE system is repaired.

As discussed in the February 2018 joint NuStar, Port of Vancouver and Ecology meeting, the sampling of Facility wells for nitrate, nitrite, and ammonia will continue on a quarterly basis for four quarters; the results from the November 2017 event are considered recent “baseline” results. The September 2018 monitoring event will be the fourth of four quarters of monitoring for nitrate, nitrite and ammonia. The nitrate and ammonia results, a description of current and historical products handled at the facility, as well as the timing and implementation of any “best management” practices for handling such products, will ultimately be summarized in a revision to the *Final 2013 Remedial Investigation Report* (Apex, 2013). Prior to the preparation of the addendum to the RI, a work plan will be prepared and submitted to Ecology summarizing plans for any data collection that will be incorporated into the addendum/Revised RI.

8.0 REFERENCES

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TABLES

Table 1
Groundwater Monitoring Plan: First and Second Quarters 2018
NuStar Vancouver Facility
Vancouver, Washington

Monitoring Program	Well ID	Groundwater Zone	Included Monitoring Wells	
			First Quarter	Second Quarter
Groundwater monitoring includes depth-to-water measurement.	MW-1	Shallow	☑	☑
	MW-2	Shallow	☐	☑
	MW-3	Shallow	☑	☑
	MW-5	Shallow	☑	☑
	MW-6	Shallow	☑	☑
	MW-7	Shallow	☑	☑
	MW-8	Shallow	☑	☑
	MW-9	Shallow	☑	☑
	MW-10	Shallow	☐	☑
	MW-12	Shallow	☑	☑
	MW-13	Shallow	☑	☑
	MW-14	Shallow	☑	☑
	MW-15	Shallow	☐	☑
	MW-16	Shallow	☑	☑
	MW-17	Shallow	☐	☑
	MW-18i	Intermediate	☑	☑
	MW-19	Shallow	☑	☑
	MW-19i	Intermediate	☑	☑
	MW-20i	Intermediate	☑	☑
	MW-21i-40	Intermediate	☑	☑
	MW-21i-105	Intermediate	☑	☑
	MW-22i	Intermediate	☑	☑
	MW-23i	Intermediate	☑	☑
	MW-24i	Intermediate	☑	☑
	MW-24d	Deep	☑	☑
	MW-25i	Intermediate	☑	☑
	MW-26	Shallow	☑	☑
	MW-30i	Intermediate	☐	☐
	MW-31i	Intermediate	☐	☐
	MW-32s	Shallow	☑	☐
	MW-32i	Intermediate	☐	☐
	MGMS1-3(43)	Shallow	☑	☑
	MGMS1-2 (60)	Intermediate	☑	☑
	MGMS1-1(110)	Lower Intermediate	☐	☑
	MGMS2-4(40)	Shallow	☑	☑
	MGMS2-3 (60)	Intermediate	☑	☑
	MGMS2-2(110)	Lower Intermediate	☐	☑
	MGMS2-1(132)	Lower Intermediate	☐	☑
	MGMS3-4(40)	Shallow	☑	☑

Please refer to notes at end of table.

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Table 1
Groundwater Monitoring Plan: First and Second Quarters 2018
NuStar Vancouver Facility
Vancouver, Washington

Monitoring Program	Well ID	Groundwater Zone	Included Monitoring Wells	
			First Quarter	Second Quarter
Groundwater monitoring includes depth-to-water measurement.	MGMS3-3(60)	Intermediate	☑	☑
	MGMS3-2(101)	Lower Intermediate	☑	☑
	MGMS3-1(132)	Lower Intermediate	☐	☑
	MW-E	Shallow	☐	☐
	MW-F	Shallow	☐	☐
	MW-G	Shallow	☐	☐
	EW-1	Shallow	☐	☑
	EX-1	Shallow	☑	☑
	MP-1	Shallow	☑	☑
	MP-2	Shallow	☐	☐
	MP-3	Shallow	☐	☑
	MP-4	Shallow	☐	☐
	S-1	Intermediate	☑	☑
	S-2	Shallow	☑	☑

Notes:
1. ☑ = Included in sampling program represented in this report.
2. ☐ = Not included in sampling program represented in this report: water level measurement only.
3. Wells MW-E, MW-G, MW-30i, MW-31i, and MW-32i are sampled by the Port of Vancouver.

Table 2
Groundwater Elevation Data: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
Groundwater Monitoring Wells			
MW-1 (32.60)	09/25/17	28.36	4.24
	11/06/17	27.14	5.46
	03/19/18	24.65	7.95
	6/27/2018	24.31	8.29
MW-2 (34.04)	09/25/17	29.89	4.15
	11/06/17	28.80	5.24
	03/19/18	26.06	7.98
	6/27/2018	25.76	8.28
MW-3 (34.41)	09/25/17	29.48	4.93
	11/06/17	29.04	5.37
	03/19/18	26.28	8.13
	6/27/2018	25.93	8.48
MW-5 (33.86)	09/25/17	28.83	5.03
	11/06/17	28.62	5.24
	03/19/18	25.72	8.14
	6/27/2018	24.46	9.40
MW-6 (32.83)	09/25/17	27.66	5.17
	11/06/17	27.08	5.75
	03/19/18	24.58	8.25
	6/27/2018	23.59	9.24
MW-7 (33.74)	09/25/17	28.60	5.14
	11/06/17	28.61	5.13
	03/19/18	25.53	8.21
	6/27/2018	24.20	9.54
MW-8 (33.97)	09/25/17	28.01	5.96
	11/06/17	28.01	5.96
	03/19/18	25.36	8.61
	6/27/2018	23.76	10.21
MW-9 (33.86)	09/25/17	28.68	5.18
	11/06/17	28.75	5.11
	03/19/18	25.69	8.17
	6/27/2018	24.12	9.74
MW-10 (34.83)	09/25/17	27.92	6.91
	11/06/17	28.49	6.34
	03/19/18	26.14	8.69
	6/27/2018	24.19	***

Please refer to notes at end of table.

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Table 2
Groundwater Elevation Data: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-12 (31.43)	09/25/17	26.98	4.45
	11/06/17	25.76	5.67
	03/19/18	23.48	7.95
	6/27/2018	23.04	8.39
MW-13 (33.15)	09/25/17	26.52	6.63
	11/06/17	27.92	5.23
	03/19/18	25.17	7.98
	6/27/2018	24.30	8.85
MW-14 (33.81)	09/25/17	28.65	5.16
	11/06/17	28.77	5.04
	03/19/18	25.74	8.07
	6/27/2018	24.24	9.57
MW-15 (39.13)	09/25/17	33.42	5.71
	11/06/17	33.34	5.79
	03/19/18	30.95	8.18
	6/27/2018	29.75	9.38
MW-16 (33.05)	09/25/17	28.67	4.38
	11/06/17	27.76	5.29
	03/19/18	24.97	8.08
	6/27/2018	25.86	7.19
MW-17 (32.65)	09/25/17	27.91	4.74
	11/06/17	27.38	5.27
	03/19/18	24.64	8.01
	6/27/2018	23.82	8.83
MW-18i (33.40)	09/25/17	29.84	3.56
	11/06/17	28.24	5.16
	03/19/18	25.22	8.18
	6/27/2018	25.78	7.62
MW-19 (33.59)	09/25/17	28.63	4.96
	11/06/17	28.37	5.22
	03/19/18	25.54	8.05
	6/27/2018	24.56	9.03
MW-19i (33.62)	09/25/17	30.39	3.23
	11/06/17	28.54	5.08
	03/19/18	25.45	8.17
	6/27/2018	26.05	7.57

Please refer to notes at end of table.

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Table 2
Groundwater Elevation Data: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-20i (33.14)	09/25/17	30.05	3.09
	11/06/17	28.04	5.10
	03/19/18	25.01	8.13
	6/27/2018	25.57	7.57
MW21i-40 (34.10)	09/25/17	30.74	3.36
	11/06/17	28.93	5.17
	03/19/18	25.98	8.12
	6/27/2018	26.49	7.61
MW-21i-105 (33.99)	09/25/17	30.57	3.42
	11/06/17	28.81	5.18
	03/19/18	25.87	8.12
	6/27/2018	26.39	7.60
MW-22i (34.39)	09/25/17	31.00	3.39
	11/06/17	29.21	5.18
	03/19/18	26.25	8.14
	6/27/2018	26.79	7.60
MW-23i (33.80)	09/25/17	30.56	3.24
	11/06/17	28.44	5.36
	03/19/18	25.59	8.21
	6/27/2018	26.23	7.57
MW-24i (33.47)	09/25/17	30.23	3.24
	11/06/17	28.28	5.19
	03/19/18	25.21	8.26
	6/27/2018	25.91	7.56
MW-25i (33.58)	09/25/17	30.30	3.28
	11/06/17	28.28	5.30
	03/19/18	25.45	8.13
	6/27/2018	26.03	7.55
MW-26 (33.73)	09/25/17	28.53	5.20
	11/06/17	28.72	5.01
	03/19/18	25.61	8.12
	6/27/2018	23.81	9.92
MW-24d (33.91)	09/25/17	29.80	4.11
	11/06/17	28.80	5.11
	03/19/18	26.19	7.72
	6/27/2018	25.80	8.11

Please refer to notes at end of table.

Table 2
Groundwater Elevation Data: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
EW-1 (31.40)	09/25/17	27.05	4.35
	11/06/17	25.70	5.70
	03/19/18	23.39	8.01
	6/27/2018	23.18	8.22
Secor Interim Action Pilot Study Wells			
S-1 (33.24)	09/25/17	29.95	3.29
	11/06/17	27.83	5.41
	03/19/18	25.08	8.16
	6/27/2018	25.23	8.01
S-2 (33.15)	09/25/17	29.06	4.09
	11/06/17	27.83	5.32
	03/19/18	25.21	7.94
	6/27/2018	25.05	8.10
Multi-Level Monitoring Wells			
MGMS1-3 (43)* (32.86)	09/25/17	28.53	4.33
	11/06/17	27.56	5.30
	03/19/18	24.86	8.00
	6/27/2018	24.33	8.53
MGMS1-2(60)* (32.86)	09/25/17	30.17	2.69
	11/06/17	27.80	5.06
	03/19/18	23.44	9.42
	6/27/2018	25.51	7.35
MGMS1-1(110)* (32.86)	09/25/17	30.11	2.75
	11/06/17	27.82	5.04
	03/19/18	23.43	9.43
	6/27/2018	25.53	7.33
MGMS2-4(40)* (32.59)	09/25/17	27.77	4.82
	11/06/17	27.32	5.27
	03/19/18	24.48	8.11
	6/27/2018	23.52	9.07
MGMS2-3(60)* (32.59)	09/25/17	29.53	3.06
	11/06/17	27.48	5.11
	03/19/18	24.79	7.80
	6/27/2018	25.01	7.58
MGMS2-2(110)* (32.59)	09/25/17	29.64	2.95
	11/06/17	27.57	5.02
	03/19/18	24.82	7.77
	6/27/2018	24.95	7.64

Please refer to notes at end of table.

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Table 2
Groundwater Elevation Data: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MGMS2-1(132)* (32.59)	09/25/17	29.60	2.99
	11/06/17	27.46	5.13
	03/19/18	24.82	7.77
	6/27/2018	24.99	7.60
MGMS3-4(40)* (31.65)	09/25/17	28.30	3.35
	11/06/17	26.47	5.18
	03/19/18	23.93	7.72
	6/27/2018	23.86	7.79
MGMS3-3(60)* (31.65)	09/25/17	28.95	2.70
	11/06/17	26.74	4.91
	03/19/18	23.99	7.66
	6/27/2018	24.17	7.48
MGMS3-2(101)* (31.65)	09/25/17	28.98	2.67
	11/06/17	26.72	4.93
	03/19/18	24.00	7.65
	6/27/2018	24.15	7.50
MGMS3-1(132)* (31.65)	09/25/17	28.98	2.67
	11/06/17	26.74	4.91
	03/19/18	24.02	7.63
	6/27/2018	24.19	7.46
Port of Vancouver Wells			
MW-30i (29.77)	03/27/17	11.42	18.35
	06/12/17	15.55	14.22
	09/25/17	26.36	3.41
	11/06/17	Well Abandoned	
MW-31i** (31.33)	09/26/17	31.18	0.15
	11/06/17	29.34	1.99
	03/19/18	26.46	4.87
	6/28/2018	28.13	3.20
MW-32s (34.34)	09/25/17	29.45	4.89
	11/06/17	28.68	5.66
	03/19/18	26.38	7.96
	6/27/2018	26.33	8.01
MW-32i (34.41)	09/25/17	31.03	3.38
	11/06/17	29.28	5.13
	03/19/18	36.65	-2.24
	6/27/2018	26.67	7.74

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 2
Groundwater Elevation Data: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number/ (TOC Elevation)	Date of Measurement	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-E ** (30.64)	09/25/17	28.72	1.92
	11/06/17	26.83	3.81
	03/19/18	24.85	5.79
	6/27/2018	24.83	5.81
MW-F (33.48)	09/25/17	29.90	3.58
	11/06/17	28.93	4.55
	03/19/18	26.24	7.24
	6/27/2018	26.18	7.30
MW-G (31.50)	09/25/17	29.10	2.40
	11/06/17	27.34	4.16
	03/19/18	24.58	6.92
	6/27/2018	24.58	6.92

Notes:

1. TOC = Top of casing; BTOC = Below top of casing.
2. Utilizes new survey information from June 2010. NGVD29 datum (ft MSL).
3. * Water levels measurement points are located at the top of the plastic fittings mounted on the well covers.
4. NM = Not measured.
5. ** The casing has been modified at Port of Vancouver wells MW-E and MW-31i. The TOC elevation has not yet been re-surveyed, so groundwater elevation data for these wells is likely inaccurate.
6. *** The casing for well MW-10 was lowered during a recent monument replacement event. Top of casing information will be updated once the well is resurveyed.

Cascadia Associates, LLC

Table 3
Groundwater Analytical Results: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
		Concentrations in µg/L (ppb)														
MW-1	9/26/2017	<2.0	<2.0	<0.50	<0.50	**6.8**	<1.0	<0.50	**6.7**	<0.50	<0.50	**1.5**	<0.50	<0.50	**1.6**	**22.6**
	11/9/2017	<2.0	<2.0	<0.50	<0.50	**5.0**	<0.50	<0.50	**22.8**	<0.50	<0.50	**9.5**	<0.50	<0.50	**6.5**	**1.1**
	3/20/2018	<0.500	<2.50	<0.500	<0.500	**4.84**	<0.500	<0.500	**6.13**	<0.500	**0.322 J**	**2.49**	<0.500	<0.500	**2.06**	<0.500
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**6.70**	<0.500	**0.204 J**	**16.1**	**0.303 J**	**0.427 J**	**0.530**	<0.500	<0.500	**1.63**	**10.5**
MW-2	3/28/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	7/2/2018	<0.500	**3.01**	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
MW-3	9/25/2017	<2.0	<2.0	<0.50	<0.50	**5.6**	<1.0	<0.50	**73.3**	**1.3**	<0.50	**127**	**1.5**	<0.50	**29.5**	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	**5.0**	<0.50	<0.50	**59.5**	**0.60**	<0.50	**67.1**	**0.57**	<0.50	**16.1**	**0.68**
	3/20/2018	<0.500	<2.50	**0.380 J**	<0.500	**2.03**	**0.144 J**	<0.500	**77.8**	**2.22**	**1.99**	**194**	**3.40**	<0.500	**48.6**	<0.500
	7/2/2018	<0.500	<2.50	**0.439 J**	<0.500	<0.500	**3.22**	<0.500	**64.5**	**1.62**	**1.07**	**180**	**2.58**	<0.500	**43.1**	<0.500
MW-5	9/27/2017	<2.0	<2.0	<0.50	<0.50	**1.6**	<1.0	<0.50	**15.6**	<0.50	<0.50	**26.7**	<0.50	<0.50	**15.6**	**0.64**
	11/7/2017	<2.0	<2.0	<0.50	<0.50	**0.99**	<0.50	<0.50	**35.6**	<0.50	<0.50	**3.5**	<0.50	<0.50	**9.7**	**5.3**
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**1.86**	<0.500	<0.500	**10.6**	**0.199 J**	<0.500	**2.36**	**0.260 J**
	6/29/2018	<0.500	<2.50	<0.500	<0.500	**0.561**	<0.500	<0.500	**45.5**	**0.174 J**	<0.500	**21.3**	<0.500	<0.500	**11.8**	**1.17**
MW-6	3/30/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	7/1/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
MW-7	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**1.7**	<0.50	<0.50	**2.6**	<0.50	<0.50	**1.6**	**1.6**
	9/27/2017 DUP	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**1.7**	<0.50	<0.50	**2.6**	<0.50	<0.50	**1.6**	**1.7**
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**2.6**	<0.50	<0.50	**6.3 D**	<0.50	<0.50	**7.8**	**1.4**
	11/7/2017 DUP	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**2.5**	<0.50	<0.50	**3.8 D**	<0.50	<0.50	**6.4**	**1.5**
	3/21/2018	<0.500	<2.50	<0.500	<0.500	**0.495 J**	<0.500	<0.500	**17.6**	<0.500	<0.500	**0.228 J**	<0.500	<0.500	**2.86**	**4.93**
	3/21/2018 DUP	<0.500	<2.50	<0.500	<0.500	**0.551**	<0.500	<0.500	**17.2**	<0.500	<0.500	**0.284 J**	<0.500	<0.500	**2.99**	**4.87**
	6/29/2018	<0.500	<2.50	<0.500	<0.500	**0.461 J**	<0.500	<0.500	**5.50**	<0.500	<0.500	**9.89**	<0.500	<0.500	**3.53**	**1.47**
	6/29/2018 DUP	<0.500	<2.50	<0.500	<0.500	**0.437 J**	<0.500	<0.500	**5.41**	<0.500	<0.500	**8.94**	<0.500	<0.500	**3.48**	**1.55**
MW-8	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	**4.3**	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**1.2**	<0.50	<0.50	**4.4**	<0.50	<0.50	<0.50	<0.50
	3/19/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.562**	<0.500	<0.500	**4.22**	<0.500	<0.500	<0.500	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	**0.139 J**	<0.500	<0.500	**2.57**	<0.500	<0.500	**5.36**	<0.500	<0.500	**0.368 J**	<0.500

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 3
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NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
		Concentrations in µg/L (ppb)														
MW-9	9/27/2017	<2.0	<2.0	<0.50	<0.50	**2.8**	<1.0	<0.50	**83.1**	**2.5**	<0.50	**102**	**2.4**	<0.50	**66.7**	**0.99**
	11/7/2017	<2.0	<2.0	<0.50	<0.50	**20.3**	<0.50	**3.3**	**569**	**15.2**	<0.50	**205**	**4.5**	<0.50	**167**	**7.8**
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**1.20**	<0.500	<0.500	**39.0**	**1.14**	<0.500	**14.9**	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	**6.86**	<0.500	**1.63**	**169**	**8.28**	<0.500	**332**	**3.46**	<0.500	**182**	**2.42 J**
MW-10	3/30/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**1.4**	<0.50	<0.50	**1.5**	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	**3.7**	<0.50	<0.50	**2.4**	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**2.5**	<0.50	<0.50	**1.1**	<0.50
	6/29/2018	<0.500	<2.50	<0.500	<0.500	**0.161 J**	<0.500	<0.500	**0.782**	<0.500	<0.500	**5.69**	**0.145 J**	<0.500	**5.82**	<0.500
MW-12	9/28/2017	<3.1	**17.4**	<3.1	<3.1	**19.5**	<3.1	<3.1	**457**	**5.4**	<3.1	<3.1	<3.1	<3.1	<3.1	**47.7**
	9/28/2017 DUP	<1.7	**16.3**	<1.7	<1.7	**17.3**	<1.7	<1.7	**428**	**5.2**	<1.7	<1.7	<1.7	<1.7	<1.7	**45.1**
	11/9/2017	<2.0	**15.4**	<0.50	<0.50	**4.5**	<0.50	<0.50	**22.2**	**1.4**	<0.50	<0.50	<0.50	<0.50	<0.50	**49.1**
	11/9/2017 DUP	<2.0	**12.6**	<0.50	<0.50	**4.5**	<0.50	<0.50	**21.0**	**1.6**	<0.50	<0.50	<0.50	<0.50	<0.50	**36.4**
	3/20/2018	<0.500	**7.50**	<0.500	<0.500	**0.522**	<0.500	<0.500	**5.64**	**1.33**	<0.500	<0.500	<0.500	<0.500	**0.271 J**	**2.77**
	3/20/2018 DUP	<0.500	**8.18**	<0.500	<0.500	**0.550 J**	<0.500 J	<0.500	**5.58**	**1.29 J**	<0.500 J	**0.203 J**	<0.500 J	<0.500 J	**0.261 J**	**2.60**
	7/1/2018	<0.500	**9.73**	<0.500	<0.500	**0.913**	<0.500	<0.500	**4.02**	**1.57**	<0.500	**0.304 J**	<0.500	<0.500	**0.996**	**1.45**
	7/1/2018 DUP	<0.500	**8.34**	<0.500	<0.500	**0.829**	<0.500	<0.500	**3.86**	**1.56**	<0.500	**0.289 J**	<0.500	<0.500	**0.977**	**1.30**
MW-13	9/27/2017	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	**5.0**	**3,220**	**7.3**	<1.0	**3.3**	<1.0	<1.0	**1.3**	**25.0**
	11/7/2017	<16.7	<16.7	<4.2	<4.2	<4.2	<4.2	<4.2	**1,360**	**5.4**	<4.2	<4.2	<4.2	<4.2	<4.2	**25.0**
	3/20/2018	<0.500	**3.29**	<0.500	<0.500	**0.879**	<0.500	**2.55**	**1,730**	**5.20**	<0.500	**0.396 J**	<0.500	<0.500	**2.19**	**211**
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**18.3**	**0.148 J**	**5.98**	**1,680**	**26.9**	<0.500	<0.500	<0.500	<0.500	**0.781**	**2,030**
MW-14	9/26/2017	<0.84	<3.3	<0.84	<0.84	**6.2**	<0.84	**2.6**	**279**	**2.8**	<0.84	**62.4**	<0.84	<0.84	**265**	<0.84
	11/8/2017	<3.3	<3.3	<0.84	<0.84	**4.5**	<0.84	**2.1**	**306**	**2.2**	<0.84	**39.3**	<0.84	<0.84	**160**	**0.91**
	3/20/2018	<0.500	**1.67 J**	<0.500	<0.500	**5.42**	<0.500	**3.64**	**500**	**2.56**	<0.500	**36.0**	**0.579**	<0.500	**150**	**1.35 J**
	6/28/2018	<0.500	<2.50	<0.500	<0.500	**10.5**	<0.500	**2.54**	**255**	**2.52**	<0.500	**34.9**	**1.57**	<0.500	**247**	**0.687**
MW-15	3/28/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.64**	<0.50	<0.50	<0.50	<0.50
	7/2/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	**0.596**	<0.500	<0.500	<0.500	<0.500
MW-16	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**1.3**	<0.50	<0.50	**148**	**1.0**	<0.50	**11.1**	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**3.8**	<0.50	<0.50	**150**	**0.96**	<0.50	**17.4**	<0.50
	3/19/2018	<0.500	<2.50	<0.500	<0.500	**0.232 J**	<0.500	**0.190 J**	**3.82**	<0.500	<0.500	**99.7**	**0.819**	<0.500	**12.6**	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	**0.500 J**	<0.500	**0.209 J**	**9.61**	<0.500	<0.500	**72.5**	**0.855**	<0.500	**7.36**	<0.500

Please refer to notes at end of table.

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Well Number	Sample Date	Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
		Concentrations in µg/L (ppb)														
MW-17	3/29/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/29/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**2.7**	<0.50	<0.50	**4.6**	<0.50	<0.50	**11.4**	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**9.3**	<0.50	<0.50	**9.9**	<0.50	<0.50	**21.9**	<0.50
	6/28/2018	<0.500	<2.50	<0.500	<0.500	**0.516**	<0.500	<0.500	**2.66**	<0.500	<0.500	**3.73**	<0.500	<0.500	**9.00**	<0.500
MW-18i	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**6.4**	<0.50	<0.50	**1.9**	<0.50	<0.50	**1.3**	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.90**	<0.50	<0.50	**0.50**	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**1.43**	<0.500	<0.500	**1.47**	<0.500	<0.500	**0.818**	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.626**	<0.500	<0.500	**0.557**	**0.320 J**	<0.500	<0.500	<0.500
MW-19	9/26/2017	<2.5	<10	<2.5	<2.5	<2.5	<2.5	**26.5**	**1,160**	**5.4**	<2.5	**3,620**	**38.9**	<2.5	**1,450**	**111**
	9/26/2017 DUP	<2.5	<10	<2.5	<2.5	**11.1**	<2.5	**28.9**	**1,150**	**5.4**	<2.5	**3,710**	**40.4**	<2.5	**1,480**	**111**
	11/9/2017	<20	<20	<5.0	<5.0	**104 D**	<5.0	**24.9 D**	**1,660 D**	**24.0 D**	<5.0	**1,530 D**	**20.2 D**	<5.0	**1,020**	**109**
	11/9/2017 DUP	<2.0 J	<2.0 J	<0.50	<0.50	**56.5 D**	<0.50	**14.7 D**	**1,040 D**	**14.7 D**	<0.50	**970 D**	**13.0 D**	**0.75**	**790**	**115**
	3/21/2018	<0.500	**3.90**	<0.500	<0.500	**59.0**	**0.225 J**	**31.4**	**2,430**	**11.2**	<0.500	**1,250**	**17.0**	**0.339 J**	**1,340**	**413**
	3/21/2018 DUP	<0.500	**4.26**	<0.500	<0.500	**58.2**	**0.242 J**	**30.7**	**2,470**	**10.8**	<0.500	**996**	**17.0**	**0.277 J**	**1,180**	**412**
	6/28/2018	<0.500	<2.50	<0.500	<0.500	**81.6**	<0.500	**35.6**	**3890**	**16.4**	<0.500	**163**	**10.9**	**0.210 J**	**148**	**773**
	6/28/2018 DUP	<0.500	<2.50	<0.500	<0.500	**80.2**	<0.500	**36.3**	**4190**	**18.4**	<0.500	**177**	**11.7**	**0.244 J**	**191**	**799**
MW-19i	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**0.83**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**0.57**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.228 J**	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.212 J**	<0.500	<0.500	**0.223 J**	<0.500	<0.500	<0.500	<0.500
MW-20i	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	**0.67**	<0.50	<0.50	<0.50	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**7.7**	<0.50	<0.50	**2.8**	<0.50	<0.50	**1.5**	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	**0.303 J**	<0.500	<0.500	**5.65**	<0.500	<0.500	**1.38**	<0.500	<0.500	**0.903**	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	**0.436 J**	<0.500	<0.500	**9.72**	<0.500	<0.500	**2.27**	<0.500	<0.500	**1.60**	<0.500
MW-21i-105	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**4.3**	<0.50	<0.50	**5.7**	<0.50	<0.50	**3.9**	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**13.0**	<0.50	<0.50	**7.4**	<0.50	<0.50	**6.4**	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.661**	<0.500	<0.500	**0.504**	<0.500	<0.500	**0.477 J**	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**1.92**	<0.500	<0.500	**1.76**	<0.500	<0.500	**1.28**	<0.500
MW-21i-40	9/27/2017	<2.0	<2.0	<0.50	<0.50	**2.3**	<1.0	**0.70**	**60.0**	<0.50	<0.50	**18.1**	<0.50	<0.50	**15.0**	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	**2.6**	<0.50	**0.84**	**65.4**	**0.63**	<0.50	**17.4**	<0.50	<0.50	**14.6**	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	**2.07**	<0.500	**0.643**	**55.1**	**0.391 J**	<0.500	**22.5**	<0.500	<0.500	**16.5**	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	**2.55**	<0.500	**0.747**	**63.2**	**0.526**	<0.500	**26.0**	**0.145 J**	<0.500	**17.0**	<0.500

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 3
Groundwater Analytical Results: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
		Concentrations in µg/L (ppb)														
MW-22i	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**8.8**	<0.50	<0.50	**0.88**	<0.50	<0.50	**6.3**	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**9.7**	<0.50	<0.50	**1.2**	<0.50	<0.50	**6.4**	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	**0.330 J**	<0.500	<0.500	**9.59**	<0.500	<0.500	**1.76**	<0.500	<0.500	**7.79**	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	**0.516**	<0.500	<0.500	**12.4**	<0.500	<0.500	**2.77**	<0.500	<0.500	**8.11**	<0.500
MW-23i	9/26/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.207 J**	<0.500	<0.500	**0.402 J**	<0.500	<0.500	**0.215 J**	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.202 J**	<0.500	<0.500	**0.247 J**	<0.500	<0.500	**0.212 J**	<0.500
MW-24i	9/26/2017	<2.0	<2.0	<0.50	<0.50	**2.1**	<1.0	<0.50	**24.5**	<0.50	<0.50	**30.1**	<0.50	<0.50	**16.6**	<0.50
	11/9/2017	<2.0	<2.0	<0.50	<0.50	**1.1**	<0.50	<0.50	**9.6**	<0.50	<0.50	**12.7**	<0.50	<0.50	**5.9**	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	**1.42**	<0.500	<0.500	**13.5**	<0.500	<0.500	**19.1**	<0.500	<0.500	**10.2**	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	**1.44**	<0.500	<0.500	**13.6**	**1.09**	<0.500	**10.3**	<0.500	<0.500	**5.93**	<0.500
MW-24d	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.259 J**	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	**0.199 J**
	6/27/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	**0.275 J**
MW-25i	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.245 J**	<0.500	<0.500	**0.248 J**	<0.500	<0.500	<0.500	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**0.274 B J**	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
MW-26	9/26/2017	<2.0	<2.0	<0.50	<0.50	**5.1**	<1.0	**1.0**	**192**	**2.1**	<0.50	**68.4**	**0.83**	<0.50	**192**	**0.98**
	11/8/2017	<2.0	**2.4**	<0.50	<0.50	**4.8**	<0.50	**1.5**	**204**	**2.3**	<0.50	**88.1**	**1.0**	<0.50	**170**	**1.8**
	3/20/2018	<0.500	**0.633 J**	**0.149 J**	<0.500	**4.85**	<0.500	**1.35**	**157**	**1.85**	<0.500	**108**	**1.20**	<0.500	**190**	**1.75**
	6/29/2018	<0.500	<2.50	<0.500	<0.500	**5.05**	<0.500	**1.46**	**114**	**1.88**	<0.500	**138**	**1.94**	<0.500	**221**	**1.02**
MW-32s	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
EW-1	3/30/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**10.7**	<0.50	<0.50	**2.4**	<0.50
	9/28/2017	<2.0	<2.0	**2.4**	<0.50	<0.50	<1.0	<0.50	**1.8**	<0.50	<0.50	**32.4**	<0.50	<0.50	**7.2**	<0.50
	11/9/2017	<2.0	<2.0	**0.91**	<0.50	<0.50	<0.50	<0.50	**3.3**	<0.50	<0.50	**33.0**	**0.66**	<0.50	**7.3**	<0.50
	7/1/2018	<0.500	<2.50	**1.94**	<0.500	**0.134 J**	<0.500	<0.500	**1.15 B**	<0.500	<0.500	**30.7**	**0.559**	<0.500	**7.59**	<0.500

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 3
Groundwater Analytical Results: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
		Concentrations in µg/L (ppb)														
S-1	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	**1.01**	<0.500	**0.336 J**	**3.62**	<0.500	<0.500	**3.16**	**0.901**	<0.500	**24.2**	<0.500
S-2	9/28/2017	<2.0	<2.0	<0.50	<0.50	**8.0**	<1.0	<0.50	**13.2**	<0.50	<0.50	<0.50	**0.86**	<0.50	**0.51**	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	**7.1**	<0.50	<0.50	**12.1**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	**3.70**	<0.500	<0.500	**5.88**	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	**4.13**	<0.500	<0.500	**23.2**	**0.562**	<0.500	<0.500	**1.00**	<0.500	**2.34**	<0.500
MGMS1-3(43)	9/29/2017	<2.5	<10.0	<2.5	<2.5	**60.1**	<2.5	**6.9**	**901**	**12.9**	<2.5	**70.7**	<2.5	<2.5	**126**	**117**
	11/7/2017	<10.0	<10.0	<2.5	<2.5	**153**	<2.5	**13.7**	**2,350**	**26.6**	<2.5	**108**	<2.5	<2.5	**211**	**181**
	3/22/2018	<0.500	<2.50	<0.500	<0.500	**192**	<0.500	**18.0**	**2,450**	**34.9**	<0.500	**80.1**	**0.780**	**0.200 J**	**278**	**236**
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**116**	<0.500	**13.8**	**1,880**	**32.8**	<0.500	**107**	**0.588**	<0.500	**246**	**118**
MGMS1-2(60)	9/29/2017	<2.0	<2.0	<0.50	<0.50	**2.0**	<1.0	<0.50	**18.3**	<0.50	<0.50	**18.3**	<0.50	<0.50	**13.4**	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	**1.6**	<0.50	<0.50	**24.9**	<0.50	<0.50	**14.0**	<0.50	<0.50	**14.7**	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	**1.30**	<0.500	<0.500	**13.4**	<0.500	<0.500	**23.3**	<0.500	<0.500	**13.9**	<0.500
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**0.894**	<0.500	<0.500	**11.8**	<0.500	<0.500	**18.4**	<0.500	<0.500	**8.45**	<0.500
MGMS1-1(110)	3/31/2017	<0.50	<2.0	<0.50	<0.50	**13.3**	<0.50	**1.1**	**328**	<0.50	<0.50	**20.1**	<0.50	<0.50	**62.0**	**6.5**
	9/29/2017	<2.0	<2.0	<0.50	<0.50	**5.9**	<1.0	**0.54**	**173**	<0.50	<0.50	**9.0**	<0.50	<0.50	**32.8**	**0.56**
	11/7/2017	<2.0	<2.0	<0.50	<0.50	**10.5**	<0.50	**0.91**	**257**	**0.67**	<0.50	**11.5**	<0.50	<0.50	**41.8**	**0.89**
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**3.30**	<0.500	**0.462 J**	**104**	**0.357 J**	<0.500	**18.5**	**0.132 J**	<0.500	**36.6**	**0.556**
MGMS2-4(40)	9/29/2017	<2.0	<2.0	<0.50	<0.50	**21.7**	<1.0	**6.8**	**195**	**0.74**	<0.50	**41.5**	**0.67**	<0.50	**31.3**	**428**
	11/9/2017	<2.0	<2.0	<0.50	<0.50	**21.3**	<0.50	**0.86**	**61.6**	**0.52**	<0.50	**13.2**	<0.50	<0.50	**9.2**	**170**
	3/22/2018	<0.500	<2.50	<0.500	<0.500	**25.9**	<0.500	**4.22**	**109**	**0.571**	<0.500	**46.0**	**0.259 J**	<0.500	**27.3**	**122**
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**12.7**	<0.500	**5.93**	**151**	**0.971**	<0.500	**62.1**	**1.04**	<0.500	**48.9**	**38.2**
MGMS2-3(60)	9/29/2017	<2.0	<2.0	<0.50	<0.50	**2.3**	<1.0	<0.50	**30.4**	<0.50	<0.50	**17.5**	<0.50	<0.50	**12.0**	**6.7**
	11/9/2017	<2.0	<2.0	<0.50	<0.50	**1.8**	<0.50	<0.50	**30.2**	<0.50	<0.50	**34.2**	<0.50	<0.50	**20.1**	**1.1**
	3/22/2018	<0.500	<2.50	<0.500	<0.500	**0.818**	<0.500	**0.244 J**	**17.3**	**0.164 J**	<0.500	**20.6**	**0.205 J**	<0.500	**11.6**	**1.21**
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**0.726**	<0.500	<0.500	**14.1**	<0.500	<0.500	**19.6**	**0.200**	<0.500	**10.1**	**1.58**
MGMS2-2(110)	3/31/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**19.5**	<0.50	<0.50	**6.4**	<0.50	<0.50	**6.6**	**6.4**
	9/29/2017	<2.0	<2.0	<0.50	<0.50	**2.80**	<1.0	<0.50	**63.5**	<0.50	<0.50	**2.2**	<0.50	<0.50	**5.3**	**25.0**
	11/9/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**6.3**	<0.50	<0.50	**3.9**	<0.50	<0.50	**3.1**	**1.9**
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**0.446 J**	<0.500	<0.500	<0.500	**6.74**	<0.500	**4.40**	**0.175 J**	<0.500	**3.42**	**3.87**
MGMS2-1(132)	3/31/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**15.6**	<0.50	<0.50	**5.2**	<0.50	<0.50	**4.7**	**4.8**
	9/29/2017	<2.0	<2.0	<0.50	<0.50	**2.2**	<1.0	<0.50	**64.9**	<0.50	<0.50	**2.4**	**0.59**	<0.50	**6.3**	**19.4**
	11/9/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**14.3**	<0.50	<0.50	**3.6**	<0.50	<0.50	**4.5**	**5.0**
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**0.531**	<0.500	<0.500	**13.8**	<0.500	<0.500	**4.47**	**0.191 J**	<0.500	**4.85**	**4.6**

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 3
Groundwater Analytical Results: 2017/2018
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
		Concentrations in µg/L (ppb)														
MGMS3-4(40)	9/26/2017	<2.0	<2.0	<0.50	<0.50	**1.1**	<1.0	<0.50	**0.69**	<0.50	<0.50	**0.79**	<0.50	<0.50	<0.50	<0.50
	9/26/2017 DUP	<2.0	<2.0	<0.50	<0.50	**1.1**	<1.0	<0.50	**0.82**	<0.50	<0.50	**0.86**	<0.50	<0.50	<0.50	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	**4.2**	<0.50	<0.50	**7.6**	<0.50	<0.50	**0.85**	<0.50	<0.50	<0.50	**12.8**
	11/10/2017 DUP	<2.0	<2.0	<0.50	<0.50	**4.3**	<0.50	<0.50	**8.0**	<0.50	<0.50	**0.71**	<0.50	<0.50	<0.50	**15.8**
	3/22/2018	<0.500	<2.50	<0.500	<0.500	**8.57**	<0.500	<0.500	**9.81**	**0.179 J**	**0.632**	**1.45**	<0.500	<0.500	**0.528**	**39.8**
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**1.39**	<0.500	<0.500	**7.58**	<0.500	**0.279 J**	**0.498 J**	<0.500	<0.500	**0.169 J**	**8.98 D**
	7/1/2018 DUP	<0.500	<2.50	<0.500	<0.500	**1.96**	<0.500	<0.500	**9.43**	<0.500	**0.318 J**	**0.630**	<0.500	<0.500	**0.163 J**	**17.3 D**
MGMS3-3(60)	9/26/2017	<2.0	<2.0	<0.50	<0.50	**1.2**	<1.0	<0.50	**34.2**	<0.50	<0.50	**8.6**	<0.50	<0.50	**7.8**	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	**1.7**	<0.50	<0.50	**37.6**	<0.50	<0.50	**0.78**	<0.50	<0.50	**1.5**	**13.9**
	3/22/2018	<0.500	<2.50	<0.500	<0.500	**0.757**	<0.500	<0.500	**15.6**	<0.500	<0.500	**2.16**	<0.500	<0.500	**1.76**	**5.89**
	7/2/2018	<0.500	<2.50	<0.500	<0.500	**0.671**	<0.500	<0.500	**12.7**	<0.500	<0.500	**2.70**	<0.500	<0.500	**1.92**	**3.36**
MGMS3-2(110)	3/28/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**7.0**	<0.50	<0.50	**7.0**	<0.50	<0.50	**6.0**	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**4.8**	<0.50	<0.50	**0.96**	<0.50	<0.50	**0.80**	**0.92**
	11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**1.6**	<0.50	<0.50	**2.5**	<0.50	<0.50	**1.5**	<0.50
	7/1/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	**1.71**	<0.500	<0.500	**1.82**	<0.500	<0.500	**1.04**	**0.359 J**
MGMS3-1(132)	3/28/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**7.9**	<0.50	<0.50	**13.8**	<0.50	<0.50	**9.6**	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	**3.4**	<0.50	<0.50	**3.0**	<0.50	<0.50	**2.8**	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	**3.3**	<0.50	<0.50	**5.1**	<0.50	<0.50	**3.8**	<0.50
	7/1/2018	<0.500	<2.50	<0.500	<0.500	**0.247 J**	<0.500	<0.500	**3.98**	<0.500	<0.500	**5.63**	<0.500	<0.500	**4.06**	**0.359 J**
EX-1	6/14/2017	<2.0	**10.2**	<0.50	<0.50	**10.7**	<1.0	<0.50	**11.7**	**0.56**	<0.50	**9.5**	<0.50	<0.50	**3.0**	**1.3**
	9/26/2017	<2.0	**3.4**	<0.50	<0.50	**8.8**	<1.0	<0.50	**6.9**	<0.50	<0.50	**0.82**	<0.50	<0.50	**0.63**	**10.1**
	3/21/2018	<0.500	**1.45 J**	<0.500	<0.500	**1.34**	<0.500	<0.500	**22.6**	<0.500	<0.500	**1.48**	<0.500	<0.500	**2.72**	**10.8**
	6/28/2018	<0.500	**42.9**	<0.500	<0.500	**4.55**	<0.500	**1.11**	**722**	**8.72**	<0.500	**1.91**	<0.500	<0.500	**0.758**	**424**
MP-1	9/26/2017	<2.0	<2.0	<0.50	<0.50	**3.4**	<1.0	**4.5**	**83.0**	**0.83**	<0.50	**307**	<0.50	<0.50	**65.9**	**2.3**
	11/9/2017	<2.0	<2.0	<0.50	<0.50	**3.3**	<0.50	**4.3**	**105**	**0.91**	<0.50	**198**	<0.50	<0.50	**74.0**	**2.6**
	3/21/2018	<0.500	<2.50	<0.500	<0.500	**3.17**	<0.500	**4.04**	**151**	**1.02**	<0.500	**245**	<0.500	<0.500	**64.5**	**1.63**
	6/28/2018	<0.500	<2.50	<0.500	<0.500	**10.2**	<0.500	**9.34**	**353**	**1.74**	<0.500	**747**	**0.555**	<0.500	**140**	**5.26**
MP-3	6/28/2018	<0.500	<2.50	<0.500	<0.500	**5.24**	<0.500	**1.78**	**203**	**1.31**	<0.500	**398**	**1.82**	<0.500	**65.1**	**8.96**

Notes:

1. µg/L (ppb) = Micrograms per liter (parts per billion).
2. **Bold** values represents detected concentration of listed analyte.
3. < = Not detected at or above the specified laboratory method reporting limit (MRL).
4. D = Relative percent difference (RPD) between sample and duplicate is outside of the acceptable range of +/- 30%.
5. J = Estimated concentration above the method detection limit and below the reporting limit.
6. B= Analyte was detected in the associated method blank.
7. Halogenated volatile organic compounds (HVOCs)analysis by U.S. Environmental Protection Agency (EPA) Method 8260B.

Cascadia Associates, LLC

Table 4
Interim Action: Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	MW-7																																										
Sample Date:	2/6/2007	12/16/2008	3/23/2009	6/18/2009	9/18/2009	12/18/2009	3/16/2010	6/17/2010	9/23/2010	12/10/2010	3/11/2011	6/7/2011	9/19/2011	12/9/2011	3/12/2012	06/22/2012	9/14/2012	12/14/2012	3/15/2013	6/14/2013	9/20/2013	12/16/2013	3/24/2014	6/25/2014	9/30/2014	12/15/2014	3/20/2015	6/17/2015	9/23/2015	12/8/2015	6/17/2016	9/29/2016	12/14/2016	3/28/2017	6/14/2017	9/27/2017	11/7/2017	3/21/2018	6/29/2018
Analyte	Concentrations in µg/L (ppb)																																										
Volatile Organic Compounds																																										
Tetrachloroethene	**31,500**	**15,000**	**3,300**	**890**	**2,600**	**1,600**	**550**	**200**	**750**	**220**	**420**	**430**	**410**	**200**	**41**	**25**	**28**	**11**	**1.6**	**1.6**	<0.50	**0.51**	**9.8**	<0.50	<0.50	**0.61**	<0.50	**1.2**	**4.5**	**0.94**	**0.69**	<0.50	**0.78**	**1.2**	<0.50	**2.6**	**6.3**	**0.228 J**	**9.89**
Trichloroethene	**352**	**450**	**270**	**350**	**250**	**160**	**56**	**72**	**110**	**36**	**82**	**110**	**84**	**32**	**8.6**	**5.2**	**5.2**	**6.8**	**0.78**	<0.50	<0.50	<0.50	**2.6**	<0.50	<0.50	**1.5**	**1.1**	**1.0**	**4.2**	**1.7**	**2.1**	**6.0**	<0.50	**0.73**	**0.55**	**1.60**	**7.8**	**2.86**	**3.53**
cis-1,2-Dichloroethene	<100	**130**	**420**	**520**	**930**	**330**	**180**	**360**	**690**	**94**	**150**	**1,400**	**1,300**	**3,400**	**1,600**	**500**	**180**	**130**	**110**	**58**	**56**	**6.9**	**13**	**0.62**	**4.5**	**16**	**8.4**	**12**	**12.7**	**4.1**	**10.9**	**10.9**	**9.4**	<0.50	**2.5**	**1.7**	**2.6**	**17.6**	**5.50**
trans-1,2-Dichloroethene	<100	<50	<15.0	<3.0	<3.0	<5.0	<2.0	<1.5	<3.0	<0.90	**0.91**	**3.3**	<5.0	**6.8**	<5.0	<2.0	**0.70**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500
Vinyl chloride	<100	<50	<15.0	<3.0	<3.0	<5.0	<2.0	<1.5	**4.8**	**1.7**	**9.3**	**7.9**	**78**	**110**	**600**	**290**	**80**	**18**	**11**	**16**	**10**	**9.1**	**7.6**	**1.4**	**9.8**	**21**	**1.0**	**12.6**	**4.8**	**1.9**	**5.4**	**5.5**	**1.0**	<0.50	**2.5**	**1.7**	**1.5**	**4.93**	**1.47**
Ethene	N/A	N/A	N/A	N/A	<1.0	<1.0	<1.0	<1.0	<1.0	**1.19**	**7.76**	<1.0	N/A	**38.7**	**71**	**130**	**47**	**19.5**	**13.3**	**5.86**	**18.6**	**5.0**	**220**	**21.9**	<1.0	<1.0	<6.2	<10.0	<10.0	<10.0	<10.0	N/A	N/A	N/A	<10.0	<10.0	<10.0	<13.0	<10.0
1,1-Dichloroethene	<100	<50	<15.0	<3.0	**5.5**	<5.0	<2.0	<1.5	<3.0	<0.90	**1.6**	**3.4**	<5.0	**6.9**	<5.0	<2.0	**0.54**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500
1,1-Dichloroethane	<100	<50	<15.0	**3.7**	**9.8**	**6.7**	<2.0	<1.5	**3.3**	**1.8**	**6.6**	**4.8**	<5.0	**8.0**	**9.2**	**9.0**	**3.8**	**1.9**	**0.69**	**0.51**	**1.5**	**2.9**	**1.6**	**0.19**	**2.7**	**4.5**	**1.0**	**2.6**	**1.8**	<0.50	**0.60**	**1.1**	<0.50	<0.50	<0.50	<0.50	<0.50	**0.495 J**	**0.461 J**
1,2-Dichloroethane	<100	<50	<0.50	<3.0	<3.0	<5.0	<2.0	<1.5	<3.0	<0.90	<0.90	<2.5	<5.0	<5.0	<5.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<0.500	<0.500
1,1,1-Trichloroethane	<100	<50	<15.0	**5.2**	**10**	**6.7**	**2.0**	**2.7**	**3.5**	**1.6**	**5.1**	**4.0**	<5.0	<5.0	<5.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500
Attenuation Chemistry																																										
Total Organic Carbon (mg/L)	<1.0	**2.4**	**6.7**	N/A	**4.1**	**2.5**	**2.6**	**2.8**	**8.2**	**0.84**	**1.10**	**4.7**	**3,400**	**1,600**	**1,000**	**790**	**790**	**550**	**250**	**220**	**270**	**250**	**77**	**120**	**160**	**28.5**	**23.5**	**46**	**40.6**	**9.8**	**18.9**	N/A	N/A	N/A	**9.1**	**7.8**	**3.1**	**9.96**	**5.0**
Field Parameters																																										
Dissolved Oxygen (mg/L)	1.20	0.72	0.69	6.97	0.59	1.23	1.37	1.86	0.64	6.29	6.65	0.45	4.53	1.19	2.97	6.28	2.29	0.34	1.02	0.29	0.45	0.44	0.43	0.6	1.93	1.61	1.19	0.81	0.87	1.98	1.67	0.96	1.13	0.89	1.08	1.75	2.65	6.03	0.56
Oxidation Reduction Potential (mV)	245.7	-103.2	-614.5	-16.4	121.7	162.1	147.7	240.0	-483.4	111.6	132.3	108.6	695.8	-117.5	96.8	-137.9	93.3	24.1	53.3	47.9	-189.3	-66.1	76.9	-90.5	-112.0	-34.0	-76.8	-4.9	-30.5	84.1	-120.1	164.1	5.6	-25.4	-60.5	110.2	68.6	10.5	187.5

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 4
Interim Action: Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number: MP-1 — Concentrations in µg/L (ppb)

Analyte / Sample Date	2/6/2007	12/16/2008	3/23/2009	6/18/2009	9/18/2009	12/18/2009	3/16/2010	6/17/2010	9/23/2010	12/10/2010	3/14/2011	6/7/2011	9/19/2011	12/9/2011
Volatile Organic Compounds														
Tetrachloroethene	1,610	1,600	1,200	1,500	1,100	1,000	1,500	800	730	1,000	1,200	640	30	640
Trichloroethene	421	230	180	180	310	180	400	140	120	150	180	130	72	120
cis-1,2-Dichloroethene	347	70	89	43	240	58	410	120	41	27	150	75	4.1	49
trans-1,2-Dichloroethene	8.5	<5.0	<4.0	<4.0	8.9	<4.0	13	<3.0	<3.0	<3.0	<3.0	<2.5	<1.5	3.1
Vinyl chloride	23.6	<5.0	<4.0	<4.0	7.3	<4.0	10	<3.0	<3.0	<3.0	5.9	<2.5	1.6	<2.5
Ethene	N/A	N/A	N/A	N/A	<1.0	<1.0	2.47	<1.0	<1.0	<1.0	<0.0010	<1.0	NA	3.28
1,1-Dichloroethene	<5.0	<5.0	<4.0	<4.0	<0.40	<4.0	4.7	<3.0	<3.0	<3.0	<3.0	<2.5	<1.5	<2.5
1,1-Dichloroethane	18.4	<5.0	6.0	4.3	14	<4.0	22	3.2	<3.0	<3.0	7.1	4.9	2.4	2.6
1,2-Dichloroethane	<5.0	<5.0	<4.0	<4.0	<4.0	<4.0	<3.0	<3.0	<3.0	<3.0	<3.0	<2.5	<1.5	<2.5
1,1,1-Trichloroethane	11.2	10	10	12	8.2	7.1	8.6	5.4	4.0	4.5	6.4	3.3	1.9	3.1
Attenuation Chemistry														
Total Organic Carbon (mg/L)	< 1.00	1.80	2.0	N/A	1.50	1.60	2.4	2.4	2.0	1.0	0.96	1.6	3.7	8.3
Field Parameters														
Dissolved Oxygen (mg/L)	0.39	1.37	1.05	3.65	0.48	0.78	0.89	3.22	0.53	0.52	1.35	0.52	0.69	0.83
Oxidation Reduction Potential (mV)	208.9	-78.5	127.3	-43.7	99.7	155.3	83.2	228.3	-464.0	-4.6	159.6	48.9	913.5	-51.7

Analyte / Sample Date	3/9/2012	6/22/2012	9/14/2012	12/14/2012	3/15/2013	6/14/2013	9/20/2013	12/16/2013	3/24/2014	6/23/2014	9/30/2014	12/15/2014	3/20/2015	6/18/2015	9/22/2015	12/8/2015	3/8/2016	6/17/2016
Volatile Organic Compounds																		
Tetrachloroethene	490	690	340	230	230	330	260	290	360	1,200	360	320	570	376	343	308	433	206
Trichloroethene	140	120	83	48	69	70	66	70	54	130	63	59	96	80.8	68.3	62.6	100	67.3
cis-1,2-Dichloroethene	440	530	170	170	140	190	77	67	240	290	110	58	190	91	38.3	50.9	148	125
trans-1,2-Dichloroethene	6.3	2.9	2.2	1.7	2.5	1.6	1.5	0.92	<1.5	1.7	<2.0	<1.5	1.5	0.87	<1.2	<1.2	1.2	0.97
Vinyl chloride	21	48	4.5	1.8	1.8	1.8	<0.90	<0.90	<1.5	5.0	16	<1.5	25	<0.84	<1.2	<1.2	<0.84	<0.50
Ethene	15.9	66.6	16	21.1	5.86	2.96	3.17	<1.0	33	19.6	<1.0	<1.0	<6.2	<10.0	<1.0	<1.0	<1.0	<10.0
1,1-Dichloroethene	2.8	2.8	<1.5	<0.90	0.94	1.4	<0.90	1.1	<1.5	2.3	<2.0	<1.5	1.5	1.5	1.4	1.5	2.1	1.5
1,1-Dichloroethane	9.4	5.6	4.0	2.0	5.1	4.5	2.9	1.7	2.2	4.9	2.8	1.7	3.6	2.9	1.8	1.8	7.5	5.0
1,2-Dichloroethane	<1.5	<2.5	<1.5	<0.90	<0.90	<0.90	<0.90	<0.90	<1.5	<1.5	<2.0	<1.5	<1.0	<0.84	<1.2	<1.2	<0.84	<0.50
1,1,1-Trichloroethane	3.5	12	2.0	1.0	1.0	1.4	0.95	1.2	1.8	9.5	<2.0	<1.5	1.0	<0.84	<1.2	<1.2	<0.84	<0.50
Attenuation Chemistry																		
Total Organic Carbon (mg/L)	16	26	23	18	35	28	35	26	38	34	29	2.4	7.8	6.0	2.2	9.9	5.1	<1.0
Field Parameters																		
Dissolved Oxygen (mg/L)	0.23	0.83	0.43	0.28	0.44	0.34	0.44	1.10	0.69	3.00	4.09	0.88	1.04	1.75	1.66	1.20	1.13	3.71
Oxidation Reduction Potential (mV)	77.7	-51.7	98.2	-15.2	60.4	187.2	1.2	10.3	-18.7	-14.0	42.3	-28.6	29.8	-148.5	105.5	82.8	29.5	-8.6

Analyte / Sample Date	9/28/2016	12/13/2016	3/30/2017	6/14/2017	9/26/2017	11/9/2017	3/21/2018	6/28/2018
Volatile Organic Compounds								
Tetrachloroethene	99.4	2.9	<0.50	16.2	307	198	245	747
Trichloroethene	35.5	1.0	0.79	8.5	65.9	74.0	64.5	140
cis-1,2-Dichloroethene	40.5	209	177	143	83.0	105	151	353
trans-1,2-Dichloroethene	<0.50	0.55	6.0	1.9	0.83	0.91	1.02	1.74
Vinyl chloride	3.3	4.3	186	29.4	2.3	2.6	1.63	5.26
Ethene	<10.0	<10.0	328	83.2	<10.0	<10.0	<13.0	<10.0
1,1-Dichloroethene	3.1	0.92	<0.50	<0.50	3.4	4.3	4.04	9.34
1,1-Dichloroethane	1.3	0.64	7.5	2.3	4.5	3.3	3.17	10.2
1,2-Dichloroethane	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<0.500	<0.500
1,1,1-Trichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	0.555
Attenuation Chemistry								
Total Organic Carbon (mg/L)	2620	130	137	38.9	4.3	3.7	8.3	8.2
Field Parameters								
Dissolved Oxygen (mg/L)	1.32	3.57	0.79	0.87	0.93	0.66	0.36	0.45
Oxidation Reduction Potential (mV)	135.2	12.1	-137.7	-53.2	80.5	-104.8	175.8	159.1

Please refer to notes at end of table.

Table 4
Interim Action: Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number: EX-1 — Concentrations in µg/L (ppb)

Analyte \ Sample Date	2/6/2007	12/16/2008	3/23/2009	6/18/2009	9/18/2009	12/18/2009	3/16/2010	6/17/2010	9/23/2010	12/21/2010	3/31/2011	6/7/2011	9/19/2011	12/9/2011
Volatile Organic Compounds														
Tetrachloroethene	**2,810**	**4,500**	**1,400**	**24**	**2,100**	**700**	**150**	**150**	**2,400**	**900**	**6,800**	**1,400**	**4,100**	<50
Trichloroethene	**564**	**830**	**420**	**11**	**380**	**56**	**33**	**39**	**220**	**99**	**910**	**170**	**460**	<50
cis-1,2-Dichloroethene	**68.2**	**490**	**50**	**4.2**	**120**	**5.6**	**20**	**92**	**90**	**30**	**240**	**140**	**290**	**12,000**
trans-1,2-Dichloroethene	<10.0	<15.0	<5.0	<0.50	**0.76**	<2.5	<0.50	<0.50	**0.53**	<0.50	<4.0	<4.0	<5.0	**9.3**
Vinyl chloride	<10.0	<15.0	<5.0	<0.50	**1.1**	<2.5	<0.50	**2.2**	**1.8**	**0.71**	**5.1**	<4.0	**14**	**140**
Ethene	N/A	N/A	N/A	N/A	<1.0	**55.6**	<0.50	<1.0	<1.0	<1.0	**1.91**	<1.0	N/A	**11.4**
1,1-Dichloroethene	<10.0	<15.0	<5.0	<0.50	**3.3**	<2.5	<0.50	<0.50	**1.6**	**0.59**	**8.1**	<4.0	**11**	**19**
1,1-Dichloroethane	<10.0	**54**	<5.0	<0.50	**4.1**	<2.5	<0.50	**0.97**	**1.5**	**0.83**	**8.2**	<4.0	**7.9**	**16**
1,2-Dichloroethane	<10.0	<15.0	<5.0	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<4.0	<4.0	<5.0	<5.0
1,1,1-Trichloroethane	**40**	**71**	**43**	**1.1**	**38**	**3.7**	**3.2**	**2.3**	**20**	**6.7**	**110**	**15**	**73**	**17**
Attenuation Chemistry														
Total Organic Carbon (mg/L)	**1.45**	**3.30**	**3.0**	N/A	**4.9**	**1.8**	**2.4**	**3.3**	**3.6**	<0.50	**1.9**	**3.5**	**560**	**320**
Field Parameters														
Dissolved Oxygen (mg/L)	0.24	0.74	0.47	0.37	0.60	2.13	0.88	0.84	0.93	0.91	--	0.70	0.63	1.23
Oxidation Reduction Potential (mV)	164.8	-174.5	68.8	-9.3	109.0	170.1	102.6	239.5	-521.6	131.7	--	115.2	907.9	-68.3

Analyte \ Sample Date	3/9/2012	6/22/2012	9/14/2012	12/14/2012	3/15/2013	6/14/2013	9/20/2013	12/16/2013	3/24/2014	6/23/2014	9/30/2014	12/15/2014	3/19/2015
Volatile Organic Compounds													
Tetrachloroethene	**33**	**3.0**	**3.0**	**0.87**	**1.2**	**0.79**	**4.1**	**2.0**	**20**	**29**	**NS**	**22**	**170**
Trichloroethene	**10**	**1.1**	<1.5	<0.50	<0.50	<0.50	**2.6**	**1.4**	**7.5**	**15**	**NS**	**2.7**	**56**
cis-1,2-Dichloroethene	**1,400**	**170**	**320**	**26**	<0.50	**1.6**	**71**	**34**	**30**	**160**	**NS**	**10**	**690**
trans-1,2-Dichloroethene	**8.6**	**1.3**	<1.5	<0.50	<0.50	<0.50	**0.68**	<0.50	<0.50	**0.97**	**NS**	<0.50	**1.9**
Vinyl chloride	**290**	**120**	**42**	**12**	**4.4**	<0.50	**30**	**28**	**11**	**38**	**NS**	<0.50	**2.8**
Ethene	**24.2**	**150**	**47.2**	**5.92**	<1.0	<1.0	**35.4**	**45.3**	**91.1**	**81.5**	**NS**	<1.0	<6.2
1,1-Dichloroethene	<4.0	**0.68**	<1.5	<0.50	<0.50	<0.50	**0.54**	<0.50	<0.50	**1.1**	**NS**	<0.50	**2.1**
1,1-Dichloroethane	**5.0**	**3.4**	**1.5**	<0.50	<0.50	<0.50	**1.9**	**3.8**	**0.80**	**2.9**	**NS**	<0.50	**3.5**
1,2-Dichloroethane	<4.0	<0.50	<1.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**NS**	<0.50	<0.50
1,1,1-Trichloroethane	<4.0	**0.59**	<1.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**NS**	<0.50	**2.5**
Attenuation Chemistry													
Total Organic Carbon (mg/L)	**89**	**110**	**77**	**59**	**64**	**12**	**42**	**46**	**35**	**34**	**NS**	**158**	**<5.0**
Field Parameters													
Dissolved Oxygen (mg/L)	0.14	1.23	0.15	0.25	0.37	0.54	0.43	1.66	0.51	0.41	**NS**	2.41	1.05
Oxidation Reduction Potential (mV)	-33.6	-68.3	-29.5	3.3	67.0	158.8	-175.4	11.9	158.7	-50	**NS**	-52.2	18.2

Analyte \ Sample Date	6/18/2015	9/22/2015	12/8/2015	3/8/2016	6/17/2016	9/28/2016	12/12/2016	3/28/2017	6/14/2017	9/26/2017	3/21/2018	6/28/2018
Volatile Organic Compounds												
Tetrachloroethene	**186**	**302**	**94.4**	**274**	**592**	**39.4**	**4.3**	**6.1**	**9.5**	**0.82**	**1.48**	**1.91**
Trichloroethene	**42**	**61.9**	**21.3**	**71.1**	**90.8**	**549**	**0.96**	**1.9**	**3.0**	**0.63**	**2.72**	**0.758**
cis-1,2-Dichloroethene	**420**	**543**	**427**	**1,160**	**1,040**	**2,230**	**8.1**	**5.2**	**11.7**	**6.9**	**22.6**	**722**
trans-1,2-Dichloroethene	**1.6**	**2.6**	<0.50	**3.6**	<5.0	**3.8**	<0.50	<0.50	**0.56**	<0.50	<0.500	**8.72**
Vinyl chloride	**3.2**	**24.4**	**2.1**	**13.3**	<5.0	**128**	**51.9**	<0.50	**1.3**	**10.1**	**10.8**	**424**
Ethene	<10.0	<1.0	<1.0	<1.0	<10.0	N/A	N/A	**23.5**	**11.2**	**17.5**	**28.3**	**99.2**
1,1-Dichloroethene	**2.6**	**3.7**	<0.50	**2.9**	<5.0	**3.5**	<0.50	<0.50	<0.50	<0.50	<0.500	**1.11**
1,1-Dichloroethane	**2.6**	**2.9**	<0.50	**4.0**	<5.0	**4.6**	<0.50	<0.50	**10.7**	**8.8**	**1.34**	**4.55**
1,2-Dichloroethane	<0.50	<0.50	<0.50	<1.2	<5.0	<1.7	<0.50	<0.50	<1.0	<1.0	<0.500	<0.500
1,1,1-Trichloroethane	**0.88**	**0.65**	<0.50	**5.0**	<5.0	**2.5**	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500
Attenuation Chemistry												
Total Organic Carbon (mg/L)	**7.5**	**22.6**	**7.5**	**22**	**1.2**	N/A	N/A	**347**	**14.0**	**25.5**	**15.4**	**43.6**
Field Parameters												
Dissolved Oxygen (mg/L)	2.29	0.90	--	0.36	2.72	1.61	2.00	1.50	3.48	1.18	0.19	0.39
Oxidation Reduction Potential (mV)	-35.2	23.7	--	113.3	4.8	138.1	-24	89.9	-12.4	-140.5	74.4	-62.6

Please refer to notes at end of table.

Table 4
Interim Action: Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	MW-12																														
Sample Date:	6/7/2011	9/19/2011	12/7/2011	3/12/2012	6/22/2012	9/14/2012	12/13/2012	3/15/2013	6/13/2013	9/20/2013	12/16/2014	3/24/2014	6/24/2014	9/30/2014	12/11/2014	3/20/2015	6/19/2015	9/22/2015	12/8/2015	3/8/2016	6/16/2016	9/27/2016	12/14/2016	3/30/2017	6/12/2017	9/28/2017	11/9/2017	3/20/2018	7/1/2018
Analyte	Concentrations in µg/L (ppb)																														
Volatile Organic Compounds																															
Tetrachloroethene	**53**	**860**	**520**	**770**	**270**	**1,100**	**38**	**760**	**610**	**510**	**150**	**180**	**42**	**680**	**25**	**580**	**514**	**343**	**44.9**	**325**	**314**	**387**	**62.3**	**55.9**	**42.4**	<1.7	<0.50	<0.500	**0.304 J**
Trichloroethene	**25**	**690**	**380**	**540**	**200**	**730**	**23**	**540**	**500**	**400**	**110**	**170**	**34**	**480**	**15**	**340**	**356**	**239**	**22**	**209**	**288**	**163**	**42.2**	**29.6**	**18.1**	<1.7	<0.50	**0.271 J**	**0.996**
cis-1,2-Dichloroethene	**59**	**4,700**	**2,900**	**3,800**	**1,700**	**5,400**	**62**	**4,300**	**4,800**	**3,400**	**800**	**1,900**	**310**	**3,500**	**34**	**2,110**	**2,570**	**2,250**	**40.1**	**1,380**	**3,310**	**867**	**744**	**1,120**	**893 J**	**457**	**22.2**	**5.64**	**4.02**
trans-1,2-Dichloroethene	**1.0**	**55**	**33**	**45**	**39**	**73**	**0.97**	**56**	**53**	**49**	**10**	**25**	**2.3**	**45**	**0.64**	**29**	**25**	**23.4**	**0.72**	**16.2**	**31.6**	**11.4**	**2.3**	**6.1**	**7.6**	**5.4**	**1.6**	**1.33**	**1.57**
Vinyl chloride	<0.50	**63**	**40**	**46**	**22**	**84**	<0.50	**54**	**59**	**50**	**9.8**	**47**	<1.5	**42**	<0.50	**37**	**31.1**	**22.5**	<0.50	**21.3**	**52.3**	**14.8**	**20.5**	**28.3**	**48.4**	**47.7**	**49.1**	**2.77**	**1.45**
Ethene	<1.0	NA	**6.15**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<6.2	<10.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	**75.2**	**120**	**16.0**	<10.0	<13.0	<10.0
1,1-Dichloroethene	<0.50	**45**	**28**	**44**	**16**	**58**	<0.50	**40**	**39**	**37**	**7.6**	**18**	**1.9**	**39**	<0.50	**25**	**28.2**	**16.9**	<0.50	**15.4**	**29.9**	**11.5**	**4.7**	**3.8**	**4.7**	<1.7	<0.50	<0.500	<0.500
1,1-Dichloroethane	**1.8**	**240**	**130**	**210**	**100**	**270**	**1.0**	**200**	**240**	**170**	**36**	**110**	**14**	**190**	**0.73**	**102**	**151**	**120**	**0.84**	**79.9**	**174**	**44**	**16.5**	**11.4**	**14.0**	**19.5**	**4.5**	**0.522**	**0.913**
1,2-Dichloroethane	<0.50	**2.5**	**1.3**	<15.0	<5.0	<15.0	<0.50	**1.8**	<15.0	**1.6**	<2.5	**0.77**	<1.5	<15.0	<0.50	<5.0	<10.0	<8.3	<0.50	<3.6	<8.4	<10.0	<10.0	<2.5	<3.1	<1.7	<0.50	<0.500	<0.500
1,1,1-Trichloroethane	**0.70**	**65**	**34**	**48**	**13**	**76**	**0.53**	**53**	**46**	**37**	**5.8**	**8.6**	**1.6**	**36**	<0.50	**18**	**23.6**	**15.7**	**0.52**	**7.7**	**12.8**	**3.9**	<10.0	<2.5	<3.1	<1.7	<0.50	<0.500	<0.500
Attenuation Chemistry																															
Total Organic Carbon (mg/L)	**0.94**	**8.3**	**59**	**65**	**56**	**100**	**4.9**	**95**	**62**	**110**	**23**	**41**	**13**	**93**	**1.9**	**4**	**4.8**	**4.4**	**16.5**	**5.5**	**3.7**	**5240**	**1930**	**490**	**530**	**243**	**326 J**	**89.1**	**66.0**
Field Parameters																															
Dissolved Oxygen (mg/L)	3.16	0.84	1.00	1	0.66	0.43	1.07	0.62	0.39	0.59	1.22	1.94	3.68	6.09	0.65	0.89	0.71	1.06	0.99	0.71	2.68	0.98	0.46	2.92	0.91	1.19	1.61	8.95	1.77
Oxidation Reduction Potential (mV)	110.4	906.3	109.0	45.3	117.1	140.7	128.6	117.3	205.2	-10.7	40.4	29.1	1.5	47.1	-110.0	75.7	10.2	65.3	28.1	62.2	59.7	252.5	-91.3	-17.9	-34.2	-87.4	-119.0	-136.3	114.3

Please refer to notes at end of table.

Table 4
Interim Action: Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	MW-24i																														
Sample Date:	6/7/2011	9/16/2011	12/7/2011	3/12/2012	6/22/2012	9/14/2012	12/14/2012	3/15/2013	6/14/2013	9/20/2013	12/16/2013	3/24/2014	6/23/2014	9/30/2014	12/15/2014	3/20/2015	6/18/2015	9/22/2015	12/8/2015	3/8/2016	6/17/2016	9/28/2016	12/12/2016	3/30/2017	6/15/2017	9/26/2017	11/9/2017	3/21/2018	6/28/2018
Analyte	Concentrations in µg/L (ppb)																														
Volatile Organic Compounds																															
Tetrachloroethene	**6.6**	**27**	**19**	**30**	**0.85**	**31**	**2.1**	**23**	**6.2**	**15**	**6.7**	**10**	**1.3**	**20**	**2.4**	**6.1**	<0.50	**2.2**	**189**	**4.1**	**11.5**	**5.8**	**1.1**	**1.0**	**6.6**	**30.1**	**12.7**	**19.1**	**10.3**
Trichloroethene	**1.4**	**24**	**14**	**11**	<0.50	**20**	**0.65**	**15**	**3.6**	**5.9**	**3.4**	**5.5**	**5.2**	**10**	**1.1**	**3.1**	<0.50	**0.8**	**36.4**	**1.6**	**6.3**	**3.1**	<0.50	<0.50	**2.8**	**16.6**	**5.9**	**10.2**	**5.93**
cis-1,2-Dichloroethene	**2.0**	**270**	**100**	**79**	**14**	**58**	**51**	**48**	**28**	**15**	**8.4**	**16**	**13**	**21**	**12**	**5.9**	**3.4**	**4.7**	**18**	**3.5**	**7.8**	**5.4**	<0.50	**0.70**	**3.2**	**24.5**	**9.6**	**13.5**	**13.6**
trans-1,2-Dichloroethene	<0.50	**1.7**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	**1.09**
Vinyl chloride	<0.50	**19**	**7.5**	**4.5**	**2.6**	<0.50	<0.50	<0.50	<0.80	<0.80	<0.50	<0.80	**2.1**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500
Ethene	<1.0	NA	**2.29**	**2.03**	**1.52**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**29.1**	<1.0	<1.0	<6.2	<10.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<13.0	<10.0
1,1-Dichloroethene	<0.50	**2.5**	**0.84**	<0.50	<0.50	**0.87**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500
1,1-Dichloroethane	<0.50	**13**	**5.0**	**5.9**	**1.8**	**4.4**	<0.50	**2.8**	**2.7**	**1.0**	**1.3**	**1.3**	**1.2**	**1.8**	**0.60**	**0.58**	<0.50	**1.9**	**0.74**	<0.50	0.99	**0.53**	<0.50	<0.50	<0.50	**2.1**	**1.1**	**1.42**	**1.44**
1,2-Dichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<0.500	<0.500
1,1,1-Trichloroethane	<0.50	**5.6**	**2.9**	**2.3**	<0.50	**0.79**	<0.50	**0.57**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500
Attenuation Chemistry																															
Total Organic Carbon (mg/L)	**1.2**	**7.0**	**290**	**33**	**44**	**15**	**16**	**9.5**	**11**	**11**	**7.9**	**9.4**	**8.4**	**12.0**	<1.0	<1.0	**1.6**	**2.3**	**3.5**	**1.0**	<1.0	**5.3**	**1.5**	**3.4**	**1.2**	**1.2**	**1.3**	**0.734 B J**	<1.0
Field Parameters																															
Dissolved Oxygen (mg/L)	6.40	0.61	3.50	2.11	3.50	0.40	2.11	0.79	0.39	1.92	3.08	3.16	4.70	2.01	6.27	10.28	1.08	1.85	1.36	1.75	3.12	2.58	5.64	5.24	3.72	1.21	3.11	0.95	2.69
Oxidation Reduction Potential (mV)	59.0	646.9	-147.5	-1.2	-147.5	-54.0	6.3	13.1	130.2	-31.2	16.9	-55.4	-49.7	129.7	-13.9	38.6	-158.7	99.4	99.2	47.8	14.0	123.9	2.6	14.3	-13.4	-10.7	-100.1	129.6	129.9

Please refer to notes at end of table.

Table 4
Interim Action: Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	MGMS2-40																													
Sample Date:	6/7/2011	9/12/2011	12/7/2011	3/8/2012	6/19/2012	9/12/2012	12/11/2012	3/15/2013	6/11/2013	9/17/2013	12/16/2013	3/24/2014	6/26/2014	9/23/2014	12/12/2014	3/20/2015	6/19/2015	9/25/2015	12/8/2015	3/8/2016	6/17/2016	9/29/2016	12/16/2016	3/31/2017	6/15/2017	9/29/2017	11/9/2017	3/22/2018	7/1/2018
Analyte	Concentrations in µg/L (ppb)																													
Volatile Organic Compounds																														
Tetrachloroethene	**4,400**	**790**	**61**	**9.9**	**7.2**	**89**	**10**	**5.6**	**0.94**	**16**	**2.4**	**2.6**	**21**	**170**	**3.4**	**31**	**18.4**	**67.4**	**4.0**	**6.5**	**223**	**33.3**	**2.6**	**4.3**	**5.1**	**41.5**	**13.2**	**46.0**	**62.1**
Trichloroethene	**1,400**	**380**	**39**	**5.4**	**2.5**	**80**	**3.4**	**2.2**	<0.50	**17**	**1.4**	**1.8**	**22**	**110**	**2.3**	**22**	**12.8**	**45.9**	**2.8**	**6.2**	**146**	**24.8**	**1.9**	**14.4**	**4.9**	**31.3**	**9.2**	**27.3**	**48.9**
cis-1,2-Dichloroethene	**1,600**	**7,400**	**5,300**	**470**	**20**	**310**	**33**	**300**	**7.9**	**290**	**8.4**	**84**	**88**	**590**	**10**	**47**	**53.8**	**105**	**7.2**	**36.0**	**744**	**115**	**5.2**	**236**	**46.2**	**195**	**61.6**	**109**	**151**
trans-1,2-Dichloroethene	**17**	**20**	<15.0	**2.8**	**1.3**	**3.2**	**1.3**	**2.0**	<0.50	**1.4**	<0.50	<0.50	**0.84**	**2.4**	<0.50	<0.50	<0.50	**0.61**	<0.50	<0.50	**2.8**	<0.50	<0.50	**0.60**	<0.50	**0.74**	**0.52**	**0.571**	**0.971**
Vinyl chloride	**48**	**58**	**460**	**260**	**63**	**440**	**4.0**	**270**	**4.8**	**330**	**3.4**	**270**	**90**	**800**	**18**	**17**	**48.3**	**57.8**	**3.3**	**36**	**227**	**142**	**2.0**	**235**	**98.9**	**428**	**170**	**122**	**38.2**
Ethene	<1.0	NA	**14.5**	**368**	**566**	**264**	**110**	**121**	**55.6**	**143**	**33.3**	**930**	**207**	**12.1**	**34**	**8.1**	**33.7**	<10.0	**22.8**	**63.7**	**31**	N/A	N/A	N/A	**128**	**47.4**	**95.7**	**32.7**	<10.0
1,1-Dichloroethene	**30**	**28**	<15.0	**2.3**	<0.50	**2.8**	<0.50	**1.9**	<0.50	**4.8**	<0.50	**2.9**	**10**	**30**	<0.50	**3.9**	**1.3**	**4.2**	<0.50	**1.6**	**26.4**	<0.50	<0.50	**14.3**	**3.5**	**6.8**	**0.86**	**4.22**	**5.93**
1,1-Dichloroethane	**65**	**44**	**35**	**38**	**53**	**39**	**4.8**	**28**	**8.3**	**28**	**9.7**	**45**	**31**	**30**	**35**	**4.3**	**13.8**	**12.3**	**13.5**	**20.6**	**24.9**	**12.1**	**10.3**	**57.6**	**38.6**	**21.7**	**21.3**	**25.9**	**12.7**
1,2-Dichloroethane	<15.0	<15.0	<15.0	<2.0	<0.50	<1.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	<0.500	<0.500
1,1,1-Trichloroethane	**57**	**48**	<15.0	**5.2**	<0.50	**5.0**	<0.50	**2.5**	<0.50	**1.6**	<0.50	<0.50	<0.50	**3.2**	<0.50	<0.50	<0.50	**0.92**	<0.50	<0.50	**3.1**	<0.50	<0.50	<0.50	<0.50	**0.67**	<0.50	**0.259 J**	**1.04**
Attenuation Chemistry																														
Total Organic Carbon (mg/L)	**2.2**	**110**	**300**	**290**	**500**	**140**	**280**	**81**	**110**	**98**	**110**	**120**	**120**	**94**	**7.9**	**8**	**11**	**10.9**	**7.9**	**7.4**	**3.8**	N/A	N/A	N/A	**7.0**	**6.4**	**6.2**	**9.58**	**5.2**
Field Parameters																														
Dissolved Oxygen (mg/L)	0.86	2.63	6.28	1.22	6.28	1.16	0.55	0.33	0.42	0.27	1.19	1.06	2.22	1.31	1.41	20.02	13.5	9.67	6.14	5.52	1.60	5.16	0.80	0.68	1.29	1.03	1.24	6.89	3.15
Oxidation Reduction Potential (mV)	49.5	338.9	-137.9	-73.6	-137.9	-40.1	-82.3	-24.3	-116.7	-209.9	-41.9	-126.1	-23.7	-119.0	-162.1	-83.7	-117.5	-145.1	-96.9	-161.7	-72.2	194.5	-28.1	-92.2	-109.6	-43.7	-113.3	-112.9	-50.8

Please refer to notes at end of table.

Table 4
Interim Action: Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	MW-13								MW-14							
Sample Date:	9/28/2016	12/16/2016	3/30/2017	6/15/2017	9/27/2017	11/7/2017	3/20/2018	7/1/2018	9/27/2016	12/13/2016	3/27/2017	6/13/2017	9/26/2017	11/8/2017	3/20/2018	6/28/2018
Analyte	Concentrations in µg/L (ppb)															
Volatile Organic Compounds																
Tetrachloroethene	**5,090**	**1,020**	**176**	**97.7**	**3.3**	<4.2	**0.396 J**	<0.500	**100**	**0.56**	**14.7**	**58.3**	**62.4**	**39.3**	**36.0**	**34.9**
Trichloroethene	**951**	**394**	**57.6**	**56.3**	**1.3**	<4.2	**2.19**	**0.781**	**218**	**0.97**	**33.4**	**204**	**265**	**160**	**150**	**247**
cis-1,2-Dichloroethene	**148**	**509**	**101**	**272**	**3220**	**1,360**	**1,730**	**1680**	**61.8**	**1.3**	**69.2**	**432**	**279**	**306**	**500**	**255**
trans-1,2-Dichloroethene	<2.5	<5.0	<5.0	**1.6**	**7.3**	**5.4**	**5.20**	**26.9**	**0.94**	<0.50	<0.50	**2.7**	**2.8**	**2.2**	**2.56**	**2.52**
Vinyl chloride	<2.5	<5.0	<5.0	**4.1**	**25.0**	**25.0**	**211**	**2030**	<0.50	<0.50	**0.62**	**2.5**	<0.84	**0.91**	**1.35**	**0.687**
Ethene	<10.0	<10.0	<10.0	NA	<10.0	**11.6**	**191**	**500**	<10.0	<10.0	<10.0	NA	<10.0	<10.0	<13.0	<10.0
1,1-Dichloroethene	<2.5	<5.0	<5.0	**1.2**	**5.0**	<4.2	**2.55**	**5.98**	**2.1**	<0.50	**0.57**	**5.3**	**2.6**	**2.1**	**3.64**	**2.54**
1,1-Dichloroethane	<2.5	<5.0	<5.0	<1.0	<1.0	<4.2	**0.879**	**18.3**	**7.2**	<0.50	<0.50	**10**	**6.2**	**4.5**	**5.42**	**10.5**
1,2-Dichloroethane	<2.5	<5.0	<5.0	<1.0	<1.0	<4.2	<0.500	**0.148 J**	<0.50	<0.50	<0.50	<1.0	<0.84	<0.84	<0.500	<0.500
1,1,1-Trichloroethane	<2.5	<5.0	<5.0	<1.0	<1.0	<4.2	<0.500	<0.500	**1.7**	<0.50	<0.50	**2.1**	**1.1**	<0.84	**0.579**	**1.57**
Attenuation Chemistry																
Total Organic Carbon (mg/L)	**33,600**	**2220**	**341**	N/A	**55.8**	**85.5**	**73.7**	**52.9**	**8.8**	**5.1**	**5.1**	N/A	**3.8**	**8.5**	**8.76**	**6.6**
Field Parameters																
Dissolved Oxygen (mg/L)	2.71	0.66	4.36	1.41	2.16	2.19	5.79	1.13	8.1	3.1	3.1	0.94	1.89	1.85	0.58	6.59
Oxidation Reduction Potential (mV)	158.7	-111.4	-61.8	-105.7	-103.9	-89.2	-114.8	-31.0	221.2	55.0	55.0	61.3	80.6	106.9	21.7	203.6

Well Number:	MW-19								MW-26							
Sample Date:	9/26/2016	12/12/2016	3/28/2017	6/14/2017	9/26/2017	11/9/2017	3/21/2018	6/28/2018	9/26/2016	12/13/2016	3/29/2017	6/13/2017	9/26/2017	11/8/2017	3/20/2018	6/29/2018
Analyte	Concentrations in µg/L (ppb)															
Volatile Organic Compounds																
Tetrachloroethene	**1,520**	**1,730**	**755**	**566**	**3,710**	**1,530**	**1,250**	**177**	**160**	**167**	**214**	**160**	**68.4**	**88.1**	**108**	**138**
Trichloroethene	**592**	**975**	**896**	**506**	**1,480**	**1,020**	**1,340**	**191**	**288**	**410**	**452**	**311 E, J**	**192**	**170**	**190**	**221**
cis-1,2-Dichloroethene	**235**	**1,030**	**1,990**	**486**	**1160**	**1,660**	**2,430**	**4190**	**61.1**	**85.9**	**170**	**113**	**192**	**204**	**157**	**114**
trans-1,2-Dichloroethene	<5.0	**11.6**	**21.5**	**6.2**	**5.4**	**24.0**	**11.2**	**18.4**	**1.6**	**2.0**	<0.50	**2.0**	**2.1**	**2.3**	**1.85**	**1.88**
Vinyl chloride	**10.1**	**31.9**	**63.2**	**17.2**	**111**	**115**	**413**	**799**	<0.50	<0.50	<0.50	**0.65**	**0.98**	**1.8**	**1.75**	**1.02**
Ethene	<10.0	<10.0	<10.0	NA	**44.3**	**11.8**	**32.3**	**271**	N/A	<10.0	<10.0	NA	<10.0	<10.0	<13.0	<10.0
1,1-Dichloroethene	**11.0**	**14.2**	**26.7**	**15.8**	**28.9**	**24.9**	**31.4**	**36.3**	**1.1**	**2.4**	<0.50	**1.9**	**1.0**	**1.5**	**1.35**	**1.46**
1,1-Dichloroethane	**10.4**	**78.7**	**214**	**41.8**	**111**	**104**	**59.0**	**81.6**	**3.9**	**8.9**	<0.50	**6.7**	**5.1**	**4.8**	**4.85**	**5.05**
1,2-Dichloroethane	<5.0	<5.0	<5.0	<2.5	<2.5	**0.75 J**	**0.225 J**	<0.500	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<0.500	<0.500
1,1,1-Trichloroethane	**14.5**	**15.5**	**19.9**	**8.2**	**40.4**	**20.2**	**17.0**	**11.7**	**2.4**	**3.3**	<0.50	**2.1**	**0.83**	**1.0**	**1.20**	**1.94**
Attenuation Chemistry																
Total Organic Carbon (mg/L)	**1.9**	**8.1**	**4.8**	N/A	**8.1**	**6.9**	**29.9**	**58.2**	N/A	**2.4**	**1.3**	N/A	**7.1**	**5.9**	**5.84**	**3.9**
Field Parameters																
Dissolved Oxygen (mg/L)	3.27	9.22	2.5	1.54	1.92	2.26	1.43	2.18	1.64	0.88	1.34	3.80	5.56	1.75	7.28	0.88
Oxidation Reduction Potential (mV)	174.4	175.2	35.8	-22.7	185.2	-75.2	135.6	-30.8	236.7	102.4	165.2	74.6	77.3	99.8	156.4	224.6

Well Number:	MGMS1-43								MGMS3-40							
Sample Date:	9/26/2016	12/16/2016	3/31/2017	6/12/2017	9/29/2017	11/7/2017	3/22/2018	7/1/2018	9/26/2016	12/16/2016	3/28/2017	6/12/2017	9/26/2017	11/10/2017	3/22/2018	7/1/2018
Analyte	Concentrations in µg/L (ppb)															
Volatile Organic Compounds																
Tetrachloroethene	**230**	**64.1**	**45.8**	**24.4**	**70.7**	**108**	**80.1**	**107**	**1.7**	**0.63**	**1.4**	**0.97**	**0.79**	**0.85**	**1.45**	**0.498 J**
Trichloroethene	**366**	**171**	**119**	**116**	**126**	**211**	**278**	**246**	**1.4**	<0.50	**0.60**	<0.50	<0.50	<0.50	**0.528**	**0.169 J**
cis-1,2-Dichloroethene	**1,980**	**1,810**	**1,430**	**2,620**	**901**	**2,350 J**	**2,450**	**1880**	**226**	**1.3**	**1,050**	**1.7**	**0.69**	**8.0**	**9.81**	**7.58**
trans-1,2-Dichloroethene	**24.2**	**20.1**	**15.2**	**18.7**	**12.9**	**26.6**	**34.9**	**32.8**	**2.0**	**0.97**	**6.0**	<0.50	<0.50	<0.50	**0.179 J**	<0.500
Vinyl chloride	**52**	**239**	**348**	**681**	**117**	**181**	**236**	**118**	**52.1**	**0.88**	**323**	<0.50	<0.50	**15.8**	**39.8**	**8.98**
Ethene	<10.0	<10.0	**14.8**	NA	<10.0	<10.0	<13.0	<10.0	<10.0	**55.2**	**68.1**	NA	**22.8**	**54.8**	**242**	**27.4**
1,1-Dichloroethene	**13.5**	**9.5**	**12.5**	**16.7**	**6.9**	**13.7**	**18.0**	**13.8**	**0.60**	<0.50	**3.3**	<0.50	<0.50	<0.50	<0.500	<0.500
1,1-Dichloroethane	**81.9**	**92.6**	**90.8**	**173**	**60.1**	**153**	**192**	**116**	**4.5**	**1.0**	**22.5**	**3.3**	**1.1**	**4.3**	**8.57**	**1.39**
1,2-Dichloroethane	<8.3	<8.4	<8.4	<8.3	<2.5	<2.5	<0.500	<0.500	<0.50	<0.50	**0.68**	<0.50	<1.0	<0.50	<0.500	<0.500
1,1,1-Trichloroethane	<8.3	<8.4	<8.4	<8.3	<2.5	<2.5	**0.780**	**0.588**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.500	<0.500
Attenuation Chemistry																
Total Organic Carbon (mg/L)	**9.0**	**6.2**	**7.0**	N/A	**6.1**	**5.6**	**13.8**	**7.5**	**36.2**	**86.9**	**5.0**	N/A	**3.8**	**6.5**	**8.74**	**4.6**
Field Parameters																
Dissolved Oxygen (mg/L)	5.09	6.06	3.02	1.17	8.73	2.04	10.71	3.48	2.7	5.95	1.57	5.22	10.02	0.93	6.95	3.18
Oxidation Reduction Potential (mV)	184.2	-17.5	-40.7	-109.8	90.7	74.5	-11.7	-1.6	165.3	-9.20	-125.8	-94.1	-82.8	-111.6	-130.8	-28.6

Notes:

1. µg/L (ppb) = Micrograms per liter (parts per billion).
2. N/A = Not analyzed.
3. B = The anlayte was found in the associated method blank.
4. J = Value is estimated.
5. Ethene is analyzed by EPA Method RSK-175M. All other VOCs were analyzed by EPA Method 8260.
6. **Bold value** represents detected concentration of listed analyte.
7. < = Not detected at or above the specified laboratory method reporting limit (MRL).
8. E = Analyte concentration exceeded the calibration range. Reported result is estimated.

Cascadia Associates, LLC

Table 5
North SVE System – Operation Monitoring
NuStar Vancouver Facility
Vancouver, Washington

Date	Branch 4		Branch 5		Post Blower		Notes
	PID	Pressure	PID	Pressure	PID	Pressure	
10/12/2011	0.0	-13.0	0.0	-12.0	7.2	0.1	--
11/2/2011	--*	-25.0	6.7	-25.0	--	--	--
11/17/2011	0.8	-16.0	6.9	-16.0	7.0	0.1	PID complications; Routinely reported error code. Potential moisture issues.
12/5/2011	--	--	--	--	--	--	System off on arrival and would not restart. Contractor identified electrical issues. Blower removed for replacement.
12/14/2011	--	--	--	--	--	--	System not operating, pending blower replacement. Blower reinstalled January 10, 2012.
1/23/2012	--	-15.0	6.5	-15.0	3.9	0.1	Water in sample port of Branch 4, could not get PID reading.
2/17/2012	0.1	-11.0	0.9	-11.0	2.9	1.0	--
3/22/2012	6.8	-12.0	5.4	-12.0	1.3	0.05	--
4/26/2012	1.3	-4.2	6.4	-4.0	1.0	0.05	--
5/23/2012	0.1	-3.4	3.2	-3.4	0.4	--	--
6/20/2012	0.0	-2.8	0.0	-2.7	0.1	0.2	--
7/24/2012	3.2	-3.2	9.2	-3.2	0.2	0.4	Used Rental PID.
8/22/2012	0.4	-2.4	1.0	-2.4	0.0	0.2	--
9/25/2012	0.1	-1.7	0.5	-1.7	0.0	0.2	Used ACA PID #3.
10/29/2012	--	--	--	--	--	--	System not operating.
11/26/2012	8.4	-4.0	9.2	-4.0	3.0	0.05	Used ACA PID #3.
12/21/2012	0.1	-0.63	0.0	-0.62	0.0	0.1	Used ACA PID #3.
1/24/2013	10.4	-0.45	0.0	-0.15	0.5	0.1	Used ACA PID #3.
2/28/2013	37.1	-0.22	2.1	-0.15	1.3	0.1	Used ACA PID #3.
3/25/2013	--	--	--	--	--	--	System not operating.
4/29/2013	--	--	--	--	--	--	System not operating.
5/24/2013	0.4	-23.0	0.1	-23.0	7.9	0.1	Used APEX PID #3.
6/25/2013	--	-20.0	--	-20.0	--	0.1	--
7/25/2013	6.6	-20.0	13.3	-20.0	6.1	0.1	Used APEX PID #3.
8/27/2013	1.9	-18.0	16.9	-18.0	6.8	0.1	Used APEX PID #3.
9/30/2013	0.0	-20.0	0.0	-20.0	2.1	0.1	Used APEX PID #3.
10/24/2013	1.3	-20.0	1.2	-20.0	2.3	0.1	Used APEX PID #3.
11/25/2013	0.3	-23.0	0.2	-23.0	1.1	0.1	Used APEX PID #3.
12/27/2013	1.0	-21.0	0.6	-21.0	2.6	0.1	Used APEX PID #1

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 5
North SVE System – Operation Monitoring
NuStar Vancouver Facility
Vancouver, Washington

Date	Branch 4		Branch 5		Post Blower		Notes
	PID	Pressure	PID	Pressure	PID	Pressure	
1/29/2014	0.2	-20.0	0.1	-20.0	0.0	3.0	--
2/24/2014	2.4	-20.0	2.6	-20.0	2.6	9.0	Used APEX PID #3.
3/31/2014	0.3	-20.0	1.0	-20.0	0.2	1.0	Used APEX PID #4
4/29/2014	2.0	-20.0	1.4	-20.0	0.0	2.0	--
5/27/2014	2.0	-20.0	1.3	-20.0	0.9	2.0	--
7/3/2014	0.5	-20.0	0.3	-18.0	0.4	4.0	--
7/28/2014	4.0	-20.0	2.6	-19.0	0.1	3.0	Used APEX PID #3.
8/25/2014	--	-20.0	--	-19.0	3.7	3.5	Used APEX PID #3.
9/30/2014	2.1	-17.0	0.6	-17.0	1.7	--	--
10/27/2014	0.4	-26.0	1.4	-26.0	2.3	2.0	Used APEX PID #3.
11/25/2014	0.3	-21.0	1.5	-20.0	0.5	--	Used APEX PID #3.
12/29/2014	20.2	-25.0	32.1	-25.0	--	2.0	Used APEX PID #3.
1/26/2015	2.0	-25.0	3.2	-25.0	0.7	3.0	Used APEX PID #3. Knockout drum emptied.
2/26/2015	0.0	-22.0	0.0	-25.0	0.0	0.1	--
3/30/2015	0.0	-23.0	0.2	-27.0	0.0	0.4	Used APEX PID #3.
4/24/2015	0.0	-23.0	0.2	-27.0	0.0	0.4	--
5/28/2015	5.5	-26.0	4.8	-26.0	5.5	0.05	--
7/29/2015	7.5	-17.0	0.3	-17.0	0.5	0.10	Used APEX PID #3.
8/31/2015	0.0	-11.0	0.0	-10.0	0.9	0.05	Used APEX PID #3.
9/28/2015	0.6	-12.0	2.4	-12.0	1.8	0.00	Used APEX PID #3.
10/29/2015	0.5	-12.0	0.3	-13.0	2.9	1.00	Used APEX PID #3.
11/30/2015	0.0	-13.0	0.2	-13.0	0.0	2.00	Used APEX PID #3.
12/28/2015	0.0	-17.0	9.0	-18.0	0.0	0.10	Used APEX PID #3.
2/1/2016	30.4	-28.0	0.0	-25.0	2.6	3.00	Used APEX PID #3.
2/29/2016	0.0	-13.0	0.0.	-13.0	0.0	0.10	Used APEX PID #3.
3/29/2016	0.0	-12.0	0.0	-12.0	0.0	0.20	Used APEX PID #3.
4/27/2016	0.2	-11.0	0.0	-5.0	0.0	1.00	Used APEX PID #3. North SVE system turned off.
5/25/2016	--	--	--	--	--	--	North SVE system interntionally turned off for approx . 60 days to evaluate system efficiency.
6/28/2016	20.4	-23.0	14.3	-23.0	0.9	0.10	Used APEX PID #3.

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 5
North SVE System – Operation Monitoring
NuStar Vancouver Facility
Vancouver, Washington

Date	Branch 4		Branch 5		Post Blower		Notes
	PID	Pressure	PID	Pressure	PID	Pressure	
7/26/2016	0.0	-20.0	0.4	-20.0	0.6	1.20	Used APEX PID #3.
9/29/2016	1.0	-16.0	0.0	-15.0	0.0	0.10	Used APEX PID #3.
10/25/2016	0.4	-14.0	0.0	-14.0	0.0	0.10	Used APEX PID #3.
11/28/2016	0.0	-12.0	0.0	-12.0	0.0	0.10	Used APEX PID #3.
12/28/2016	0.0	-12.0	0.0	-12.0	0.0	0.10	Used APEX PID #3.
1/30/2017	0.0	-5.0	0.0	-5.0	0.0	0.10	Used APEX PID #3.
2/28/2017	12.5	-15.0	8.7	-14.0	1.0	0.10	--
3/28/2017	0.0	-20.0	0.0	-20.0	0.1	0.00	Used Mini Rae 3000.
4/24/2017	0.8	-20.0	0.0	-20.0	2.0	0.10	Used APEX PID #3.

Notes:

1. PID readings in parts per million (ppm), calibrated to 100 ppm isobutylene.
2. Pressure readings in inches of water, measured with magnahelic gauge.
3. -- = Not available; branch not in use or no measurement collected during the site visit.
4. * = During the 11/2/2011 monitoring event, PID malfunctioned while monitoring Branch 4. Instrument readings would not stabilize.

Cascadia Associates, LLC

Table 6
North SVE System – Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Sampling Location	Sample ID	Date	1,1,1-Trichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	Methylene Chloride	Tetrachloro-ethene	Toluene	Trichloro-ethene	Vinyl Chloride
			Concentrations in µg/m3								
System Effluent	North_EFF-20111012	10/12/2011	**69**	<16	**160**	<16	<14	**9,500**	**16**	**700**	<10
System Effluent	Post Blower_North_012312	1/23/2012	<170	<120	<120	<120	<110	**16,000**	<120	**530**	<79
System Effluent	North_Effluent_0121712	2/17/2012	<140	<100	<100	<100	<91	**11,000**	<99	**300**	<67
System Effluent	North Effluent-032212	3/22/2012	<28	<54	<27	<27	<23	**6,600**	<25	**140**	<8.6
System Effluent	North_Effluent_062012	6/20/2012	<1.6	<3.2	<1.6	<1.6	**5.3**	**250**	<1.5	**15**	<0.51
System Effluent	North_Effluent_082212	8/22/2012	<1.6	<3.2	<1.6	<1.6	<1.4	**140**	<1.5	**11**	<0.51
System Effluent	North_Effluent_112612	11/26/2012	**39**	<14	**52**	<7.1	<6.2	**22,000**	<6.8	**510**	<4.6
System Effluent	North_Effluent_122112	12/21/2012	<31	<59	<30	<30	<26	**3,500**	<28	**61**	<19
System Effluent	North_Effluent_022813	2/28/2013	<36	<70	<35	<35	<31	**4,400**	<33	**160**	<22
System Effluent	SVE North	5/24/2013	<240	<170	**280**	<170	<380	**23,000**	<160	**1,100**	<110
System Effluent	SVE North	6/25/2013	**76**	<51	**88**	<51	<110	**13,000**	<49	**730**	<33
System Effluent	SVE North	8/27/2013	<150	<110	<110	<110	<230	**17,000**	<100	**800**	<69
System Effluent	SVE North Effluent	10/24/2013	<82	<60	<60	<60	<130	**10,000**	<57	**570**	<39
System Effluent	SVE North Effluent	12/27/2013	<44	<32	<32	<32	<69	**7,000**	<30	**470**	<20
System Effluent	SVE North Effluent	1/29/2014	<10	<40	**22**	<40	<87	**1,300**	<38	**110**	<26
System Effluent	SVE_North_Post Carbon	2/24/2014	**55**	<83	**68**	<41	<36	**8,700**	<39	**760**	<27
System Effluent	SVE North Post Carbon	3/5/2014	**25**	<39	**29**	<20	<17	**4,600**	<19	**300**	<13
System Effluent	VCP_North_Effluent	3/31/2014	**19**	<13	**18**	<13	<28	**3,500**	<12	**200**	<8.2
System Effluent	North_SVE_Effluent_042914	4/29/2014	**22**	<15	**17**	<15	<33	**3,500**	<14	**220**	<9.8
System Effluent	North_SVE_Effluent_052714	5/27/2014	<31	<23	<23	<23	<50	**4,100**	<22	**280**	<15
System Effluent	North_VCP_Effluent	7/3/2014	<23	<17	**20**	<17	<37	**4,500**	<16	**290**	<11
System Effluent	SVE North	7/28/2014	<120	<88	**<88**	<88	<190	**7,200**	<84	**460**	<22
System Effluent	North SVE	9/30/2014	<48	<35	**48**	<35	<76	**7,300**	<33	**480**	<22
System Effluent	SVE North Effluent	10/27/2014	<110	<80	<80	<80	<180	**15,000**	<76	**410**	<52
System Effluent	SVE North 11.25.14	11/25/2014	<39	<28	<28	<28	<62	**7,100**	<27	**390**	<18
System Effluent	SVENorth122914	12/29/2014	<140	<99	<99	<99	<220	**15,000**	<94	**290**	<64
System Effluent	SVE North	1/26/2015	**16**	<31	<16	<16	<14	**1,500**	<15	**130**	<10
System Effluent	SVE North	2/26/2015	<1.6	<3.2	<1.6	<1.6	<1.5	**32**	<1.5	<2.1	<1.0
System Effluent	SVE North	3/30/2015	**15**	<9.6	**9.5**	<4.8	<4.2	**1,700**	<4.6	**130**	<3.1
System Effluent	SVE N	4/24/2015	<8.5	<16	<8.2	<8.2	<7.2	**550**	<7.8	**50**	<5.3

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 6
North SVE System – Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Sampling Location	Sample ID	Date	1,1,1-Trichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	Methylene Chloride	Tetrachloro-ethene	Toluene	Trichloro-ethene	Vinyl Chloride
			Concentrations in µg/m3								
System Effluent	SVE North	5/14/2015	<1.6	<3.2	<1.6	<1.6	<1.4	<2.7	<1.5	<2.1	<1.0
System Effluent	SVE North	5/28/2015	<3.8	<7.3	<3.6	<3.6	<3.2	**360**	**3.6**	**8.0**	<2.4
System Effluent	SVE North	7/29/2015	**19**	<33	**21**	<16	<14	**2,000**	<16	**210**	<11
System Effluent	SVE North	8/31/2015	**65**	<65	**62**	<33	<28	**7,100**	<31	**600**	<21
System Effluent	SVE North	9/28/2015	**21**	<22	<11	<11	<9.7	**1,400**	<11	**190**	<7.1
System Effluent	SVE North	10/29/2015	<56	<110	**59**	<55	<48	**6,300**	<52	**550**	<35
System Effluent	SVE_North_Effluent_113015	11/30/2015	<54	<140	<72	<72	<72	**2,300**	<72	**86**	<72
System Effluent	SVE_North_Effluent_122815	12/28/2015	<32	<62	<31	<31	<27	**5,600**	<30	**110**	<20
System Effluent	North_Effluent_020116	2/1/2016	<53	<100	<51	<51	<45	**11,000**	<48	**150**	<33
System Effluent	SVE_North_Effluent_022916	2/29/2016	**30**	<33	**29**	<16	<14	**7,800**	<16	**160**	<11
System Effluent	SVE_North_Effluent_032916	3/29/2016	**19**	<14	<7.2	<7.2	<6.3	**920**	<6.9	**19**	<4.7
System Effluent	North_Effluent	4/27/2016	<15	<29	<14	<14	<13	**1,500**	<14	**75**	<9.2
System Effluent	North_Effluent_62816	6/28/2016	<11	<22	<11	<13	<9.6	**1,800**	<10	**83**	<7.1
System Effluent	SVE-North-Effluent 72616	7/26/2016	<1.6	<3.2	<1.6	<1.6	<1.4	**84**	**2.0**	**6**	<1.0
System Effluent	SVE-North-Effluent 83016	8/30/2016	<0.30	<0.80	<0.40	<0.40	<0.40	**54**	<0.40	**2**	<0.40
System Effluent	SVE_North_Effluent_092916	9/29/2016	<1.6	<3.2	<1.6	<1.6	<1.4	**15**	<1.5	<2.1	<1.0
System Effluent	SVE_North_Effluent_102516	10/25/2016	<1.6	<3.2	<1.6	<1.6	<1.4	**7.9**	**3.0**	<2.1	<1.0
System Effluent	SVE_North_Effluent_112816	11/28/2016	<1.6	<3.2	<1.6	<1.6	<1.4	**2.8**	**3.9**	<2.1	<1.0
System Effluent	SVE_North_Effluent_122816	12/28/2016	<1.6	<3.2	<1.6	<1.6	<1.4	<2.7	**1.7**	<2.1	<1.0
System Effluent	SVE_North_Effluent_013017	1/30/2017	<1.6	<3.2	<1.6	<1.6	<1.4	<2.7	**4.6**	<2.1	<1.0
System Effluent	SVE_North_Effluent_022817	2/28/2017	<1.6	<3.2	<1.6	<1.6	<1.4	**5.9**	<1.5	<2.1	<1.0
System Effluent	SVE_North_Effluent_032817	3/28/2017	<1.6	<3.2	<1.6	<1.6	<1.4	**3.2**	**2.9**	<2.1	<1.0
System Effluent	SVE_North_Effluent	4/24/2017	<1.6	<3.2	<1.6	<1.6	<1.4	**3.9**	**3.7**	<2.1	<1.0

Notes:

1. µg/m^3 = Micrograms per cubic meter.
2. Samples analyzed by Modified EPA Method TO-15.
3. Only analytes detected in at least one sample are presented in this table.
4. **Bold** value represents detected concentration of listed analyte.
5. < = Not detected at or above the specified laboratory method reporting limit (MRL).

Cascadia Associates, LLC

Table 7
South SVE System – Operation Monitoring
NuStar Vancouver Facility
Vancouver, Washington

Date	Pre-Blower		Post Blower (Pre-Carbon)		Post Carbon 1		Post Carbon 2		Notes
	PID	Pressure	PID	Pressure	PID	Pressure	PID	Pressure	
10/12/2011	--	-14.0	17.1	24.0	0	12.0	0.2	4.0	--
10/18/2011	--	-14.0	15.5	--	15.5	14.0	0.5	3.0	Pre-carbon, post blower tap is now covered by noise suppression panels.
11/2/2011	--	-15.0	18.2	26.0	0.0	26.0	2.0	7.0	--
11/17/2011	--	-18.0	8.9	27.0	--*	15.0	--*	6.8	--
12/5/2011	8.3	-18.0	10.7	39.0	0.0	19.0	2.2	6.1	System switch off upon arrival. System restarted. Monitoring event conducted approximately 3 hours after restart.
12/14/2011	11.8	-19.0	21.0	28.0	0.0	18.0	0.7	6.2	--
1/9/2012	7.3	-17.0	8.3	29.0	0.0	18.0	0.0	6.2	--
1/23/2012	7.0	-17.0	8.9	29.0	0.0	17.0	0.0	6.9	--
2/17/2012	6.0	-18.0	11.2	29.0	0.0	18.0	0.0	6.0	--
3/22/2012	13.3	-16.0	10.7	27.0	0.0	15.0	0.0	6.5	--
4/26/2012	10.3	-17.0	11.6	27.0	0.0	16.0	0.0	6.4	--
5/23/2012	10.4	-20.0	10.6	31.0	0.0	19.0	0.0	6.6	--
6/20/2012	7.3	-21.0	7.5	33.0	0.5	20.0	0.0	6.3	--
7/24/2012	19.8	-20.0	41.5	32.0	226.3	20.0	98.8	6.2	Used rental PID.
8/22/2012	8.0	-48.0	10.1	29.0	5.5	18.0	1.1	4.6	--
9/25/2012	10.0	-46.0	13.7	29.0	9.5	15.0	12.8	4.3	Used ACA PID #3.
10/29/2012	8.4	-34.0	18.6	47.0	0.3	28.0	12.9	4.3	Used ACA PID #3; Carbon change-out on 10/29/2012
11/26/2012	13.7	<-100	1.6	18.0	0.1	6.6	3.1	0.66	Used ACA PID #3.
12/21/2012	0.5	-107	0.5	17.0	0.0	6.1	0.0	0.49	Used ACA PID #3.
1/24/2013	5.1	-105	0.5	10.0	0.0	6.5	0.0	0.61	Used ACA PID #3.
2/28/2013	2.8	-105	0.1	18.0	0.0	7.0	0.0	0.60	Used ACA PID #3.
3/25/2013	8.4	-102	0.9	16.0	0.1	7.0	0.0	0.58	Used Apex PID #3
4/29/2013	0.2	-98	0.4	15.0	0.0	6.3	0.1	0.49	Used Apex PID #3
5/24/2013	41.0	-18	49.7	47.0	0.2	26	0.7	5.0	Used Apex PID #3
6/25/2013	--	-15	--	51.0	--	31	--	5.1	--
7/25/2013	12.3	-16	13.9	50.0	0.7	32	0.5	6.0	Used Apex PID #3
8/27/2013	13.2	-16	12.1	52.0	3.8	31	1.2	5.2	Used Apex PID #3
9/30/2013	5.2	-15	15.4	45.0	27.4	30	0.4	5.2	Used Apex PID #3
10/24/2013	3.1	-14	13.2	50.0	6.8	32	1.5	5.2	Used Apex PID #3
11/25/2013	1.4	-19	19.3	51.0	12.4	35	2.8	5.3	Used Apex PID #3
12/27/2013	0.3	-19	7.7	55.0	3.1	32	0.0	5.4	Used Apex PID #1
1/29/2014	2.4	-19	6.7	50.0	5.7	30	0.2	10.0	--
2/24/2014	7.7	-19	19.7	50.0	2.4	30	1.4	10.0	Used Apex PID #3
3/31/2014	2.6	-15	4.6	46.0	5.4	30	0.0	8.0	Used APEX PID #4
4/29/2014	2.0	-14	3.4	48.8	9.7	30	0.0	8.0	--
5/27/2014	3.5	-14	5.0	49.0	10.2	28	0.1	7.0	--
7/3/2014	1.6	-18	2.4	50.0	1.4	30	0.1	10.0	--
7/28/2014	8.5	-19	9.0	50.0	11.0	30	8.7	8.0	Used Apex PID #3
8/25/2014	4.6	-17	7.5	49.0	15.8	26	11.0	7.0	Used Apex PID #3

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 7
South SVE System – Operation Monitoring
NuStar Vancouver Facility
Vancouver, Washington

Date	Pre-Blower		Post Blower (Pre-Carbon)		Post Carbon 1		Post Carbon 2		Notes
	PID	Pressure	PID	Pressure	PID	Pressure	PID	Pressure	
9/30/2014	0.5	-14	5.2	40.0	4.0	28	2.7	5.0	--
10/27/2014	--	--	--	--	--	--	--	--	System off upon arrival. Unable to turn back on.
11/3/2014	5.0	-20	23.0	50.0	13.1	20	14.6	8.0	Used Apex PID #3
11/25/2014	--	--	--	--	--	--	--	--	System off for drum replacement.
12/29/2014	--	--	--	--	--	--	--	--	System off.
1/26/2015	27.1	-25	34.6	20.0	1.0	17	0.0	10.0	Used Apex PID #3
2/26/2015	0.8	-20	12.9	30.0	0.2	19	0.1	8.0	--
3/30/2015	0.4	-20	14.2	29.0	0.1	20	0.1	8.0	Used Apex PID #3
4/24/2015	0.4	-20	14.2	29.0	0.1	20	0.1	8.0	
5/28/2015	1.0	-20	57.5	28.0	63.6	17	33.0	7.0	--
7/29/2015	0.0	-16	14.1	25.0	9.6	14	1.2	5.0	Used Apex PID #3
8/31/2015	0.0	-20	1.2	26.0	6.9	14	1.8	6.0	Used Apex PID #3
9/28/2015	3.0	-20	7.4	26.0	3.8	16	1.1	6.0	Used Apex PID #3
10/29/2015	9.0	-22	11.2	27.0	7.6	16	0.2	8.0	Used Apex PID #3
11/30/2015	--	-18	7.0	30.0	33.6	18	0.4	6.0	Used Apex PID #3
12/28/2015	--	-18	12.5	29.0	1.3	18	0.4	8.0	Used Apex PID #3
2/1/2016	0.1	-24	0.3	19.0	9.2	16	0.0	7.0	Used Apex PID #3
2/29/2016	0.2	-18	25.2	30.0	8.5	17	2.3	6.0	Used Apex PID #3
3/29/2016	0.0	-19	54.0	28.0	13.2	16	3.4	7.0	Used Apex PID #3
4/27/2016	5.0	-28	32.0	50.0	21.3	0.2	22.3	1.0	Used Apex PID #3
5/25/2016	0.2	-100	0.3	3.0	23.2	2	9.7	0.6	Used Apex PID #3
6/28/2016	--	--	--	--	--	--	--	--	System shut down
7/26/2016	8.1	-20	30.4	30.0	26.2	20	18.1	10.0	Used Apex PID #3
9/29/2016	26.3	-18	27.4	28.0	36.7	16	35.7	6.0	Used Apex PID #3
10/25/2016	0.8	-18	13.3	30.0	58.0	18	7.7	8.0	Used Apex PID #3
11/28/2016	0.0	-22	70.1	30.0	78.0	18	54.2	8.0	Used Apex PID #3
12/28/2016	0.0	-100	0.0	2.0	0.4	1.0	1.0	1.0	departure.
1/30/2017	0.0	-22	52.3	33.0	0.0	20.0	0.0	10.0	Used Apex PID #3
2/28/2017	--	--	--	--	--	--	--	--	No sample collected.
3/28/2017	--	--	--	--	--	--	--	--	System not working properly. Knock out drum valve was pulled down and sucking in ambient air. No sample collected.
4/24/2017	--	--	--	--	--	--	--	--	Could not get valved to operate properly. System pulling in ambient air.
7/31/2017	0.0	-18	31.8	31.0	31.2	18.0	27.2	8.0	Used Apex PID #3
8/28/2017	0.0	-18	75.0	32.0	60.0	18.0	50.1	9.0	
9/25/2017	39.2	-18	32.7	30.0	19.7	18.0	20.6	7.5	Used Apex PID #3
10/26/2017	2.8	-22	27.7	30.0	19.0	18.0	17.4	7.0	Used Apex PID #3
11/29/2017	5.2	-20	68.0	30.0	54.0	18.0	56.0	7.0	
12/21/2017	0.3	-20	12.4	30.0	6.7	18.0	5.6	8.0	Pre-Carbon was not sampled due to sampling canister malfunction.
1/22/2018	0.0	-20	13.6	30.0	10.2	18.0	7.2	7.0	Used Apex PID #3
2/28/2018	--	-20	--	30.0	--	18.0	--	7.0	PID was not within calibration and readings were not recorded.
3/29/2018	--	-20	19.0	31.0	28.0	19.0	19.0	8.0	Used Apex PID #3
4/24/2018	2.2	-20	26.8	31.0	29.2	19.0	18.8	8.0	Used Apex PID #3
5/16/2018	13.8	-20	26.6	30.0	40.2	18.0	26.8	8.0	Used Apex PID #3

Notes:

1. PID readings in parts per million (ppm), calibrated to 100 ppm isobutylene.
2. Pressure readings in inches of water, measured with magnahelic gauge.
3. -- = Not available or not applicable.

Cascadia Associates, LLC

Table 8
South SVE System – Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m³										
Pre Carbon	INF 1006	10/6/2011	<330	<320	**470**	<320	<280	**40,000**	<300	**520**	**5,100**	<210	<350
Post Carbon	EFF 1006	10/6/2011	<16	<16	**390**	<16	<14	<27	<15	**140**	**50**	<10	<17
Pre Carbon	Post Blower 110211	11/2/2011	<290	<280	**430**	<280	<250	**26,000**	<270	<390	**2,100**	<180	<310
Pre Carbon	SOUTHSVE_PRECARBON_121411	12/14/2011	<580	<570	**620**	<570	<500	**54,000**	<540	<780	**2,800**	<360	<620
Post Carbon	SOUTHSVE_POSTCARBON_121411	12/14/2011	<16	**35**	**23**	<16	**17**	**1,600**	<15	**78**	**1,300**	**12**	<17
Post Carbon	POST CARBON_SOUTH_012312	1/23/2012	<16	<16	<16	<16	<14	<27	<15	<22	<21	<10	<17
Pre Carbon	South_PreCarbon_021712	2/17/2012	<300	<300	**460**	<300	<260	**28,000**	<280	<410	**1,200**	<190	<330
Post Carbon	South_PostCarbon_021712	2/17/2102	<16	<16	<16	<16	<14	<27	<15	<22	<21	<17	<10
Pre Carbon	South Influent - 032212	3/22/2012	<190	<190	**310**	<95	<84	**30,000**	<91	**99**	**960**	<31	<100
Post Carbon	South Effluent - 032212	3/22/2012	<1.2	<3.2	<1.6	<1.6	**4**	<2.7	<1.5	<1.6	<2.1	**6.4**	<3.5
Pre Carbon	South_SVE_PRECARBON	4/26/2012	<210	<560	<280	<280	<240	**32,000 S**	<270	<290	**640 S**	<90	<610
Post Carbon	South-SVE_POSTCARBON	4/26/2012	<1.2	<3.2	<1.6	<1.6	**4**	<2.7	<1.5	<1.6	<2.1	**2.4**	<3.5
Pre Carbon	SOUTH_SVE_PRECARBON	5/23/2012	<100	<260	**200**	<130	<120	**19,000**	<130	<140	**780**	<43	<290
Post Carbon	South_SVE_PRECARBON	5/23/2012	<1.2	<3.2	<1.6	<1.6	**3**	<2.7	<1.5	<1.6	<2.1	**3.7**	<3.5
Pre Carbon	South_PreCarbon_062012	6/20/2012	<240	<630	**360**	<320	<280	**35,000**	<300	<330	**1,400**	<100	<1040
Post Carbon	South_PostCarbon_062012	6/20/2012	<0.30	<0.80	<0.40	<0.40	**1.0**	<0.40	<0.40	<0.30	<0.40	**1.2**	<1.2
Pre Carbon	South_PreCarbon_072412	7/24/2012	<150	<390	**240**	<200	<170	**33,000**	<190	<200	**1,100**	<63	<640
Post Carbon	South_PostCarbon_072412	7/24/2012	<1.2	**11**	<1.6	<1.6	**3.0**	<2.7	**2.2**	<1.6	<2.1	**3.9**	<5.2
Pre Carbon	South_PreCarbon_082212	8/22/2012	<250	<660	**760**	<330	<290	**47,000**	<310	<340	**2,000**	<110	**1,080**
Post Carbon	South_PostCarbon_082212	8/22/2012	<21	<55	<27	<27	<24	<47	<26	<28	<37	<8.8	<90
Pre Carbon	South_PreCarbon_092512	9/25/2012	<270	<700	**500**	<400	<310	**50,000**	<330	<360	**1,900**	<230	<770
Post Carbon	South_PostCarbon_092512	9/25/2012	**13**	**18**	**1,200**	**11**	**5.7**	<2.7	<1.5	<1.6	<2.1	**6.2**	<3.5
Pre Carbon	South_PreCarbon_102912	10/29/2012	<320	<850	**440**	<480	<370	**60,000**	<400	<440	**2,200**	<270	<930
Post Carbon	South_PostCarbon_102912	10/29/2012	<5.3	<14	<7	<7	<7	<7	<7	<7	<7	<7	<14
Pre Carbon	South_PreCarbon_112612	11/26/2012	<95	<250	<120	<120	<110	**10,000**	<120	<130	**530**	<80	<410
Post Carbon	South_PostCarbon_112612	11/26/2012	<2.7	<7.2	<3.6	<3.6	<3.6	<3.6	<3.6	<2.7	<3.6	<3.6	<10.8
Pre Carbon	South_PreCarbon_122112	12/21/2012	<71	<190	**110**	<93	<82	**14,000**	<89	<96	**600**	<60	<300
Post Carbon	South_PostCarbon_122112	12/21/2012	<1.2	<3.2	<1.6	<1.6	**1.6**	<2.7	<1.5	<1.6	<2.1	**3.0**	<5.2
Pre Carbon	South_PreCarbon_012413	1/24/2013	<9.2	<24	**14**	<12	<11	**1,700**	<11	<12	**100**	<7.8	<39
Post Carbon	South_PostCarbon_012413	1/24/2013	<1.2	<3.2	<1.6	<1.6	**3.3**	<2.7	<1.5	<1.6	<2.1	**3.7**	<5.2
Pre Carbon	South_PreCarbon_022813	2/28/2013	<5.9	<15	**8.5**	<7.7	<6.7	**940**	<7.3	<7.9	**84**	<5.0	<25.4
Post Carbon	South_PostCarbon_022813	2/28/2013	<1.2	<3.2	<1.6	<1.6	**8.1**	<2.7	<1.5	<1.6	<2.1	<1.0	<5.2
Pre Carbon	South_PreCarbon_032513	3/25/2013	<29	<75	<38	<38	<33	**3,700**	<36	<39	**160**	<24	<123
Post Carbon	South_PostCarbon_032513	3/25/2013	<1.2	<3.2	<1.6	<1.6	**2.0**	<2.7	<1.5	<1.6	<2.1	**2.0**	<5.2
Pre Carbon	SVE South Pre Carbon	4/29/2013	<6.3	<16	**10**	<8.2	<7.2	**950**	<7.8	<8.4	**48**	<5.3	<26.9
Post Carbon	SVE South Post Carbon	4/29/2013	<0.30	<0.80	<0.40	<0.40	<0.40	<0.40	<0.40	<0.30	<0.40	**0.93**	<1.2
Pre Carbon	SVE South Pre Carbon	5/24/2013	<1,100	<1,100	**2,400**	<1,100	<2,400	**240,000**	<1,100	<1,500	**8,400**	<720	<4,300
Post Carbon	SVE South Post Carbon	5/24/2013	<0.81	<0.79	<0.79	<0.79	<1.7	<1.4	<0.75	<1.1	<1.1	<0.51	<3.1

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 8
South SVE System – Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m³										
Pre Carbon	SVE South Pre Carbon	6/25/2013	<150	<150	**630**	<150	<330	**39,000**	<140	<210	**1,800**	<97	<570
Post Carbon	SVE South Post Carbon	6/25/2013	<0.81	**8.1**	**3.8**	<0.79	**5.6**	<1.4	<0.75	<1.1	<1.1	**3.1**	<3.1
Pre Carbon	SVE South Pre Carbon	7/25/2013	<120	<120	**380**	<120	<260	**22,000**	<110	<160	**1,200**	<77	<460
Post Carbon	SVE South Post Carbon	7/25/2013	<0.81	**17**	**65**	**2.1**	**3.4**	<1.4	**1.2**	<1.1	<1.1	**2.6**	**1.4**
Pre Carbon	SVE South Pre Carbon	8/27/2013	<150	<150	**520**	<150	<330	**28,000**	<140	<210	**1,500**	<97	<580
Post Carbon	SVE South Post Carbon	8/27/2013	**3.3**	**13**	**270**	**7.0**	**4.7**	<2.7	<1.5	<2.2	<2.1	**3.7**	<6.0
Pre Carbon	SVE South Precarbon	9/30/2013	<110	<110	**450**	<110	<240	**26,000**	<110	<150	**1,400**	<72	<420
Pre Carbon	SVE South Pre Carbon	10/24/2013	<140	<140	**430**	<140	<310	**27,000**	<130	<190	**1,100**	<90	<530
Post Carbon	SVE South Post Carbon	10/24/2013	**3.8**	**4.9**	**390**	**3.3**	<5.2	**4.3**	<2.3	**5.4**	<3.2	**2.6**	<5.1
Pre Carbon	SVE South Pre Carbon	11/25/2013	<100	<98	**250**	<98	<220	**21,000**	<93	<140	**840**	<63	<380
Post Carbon	SVE South Post Carbon	11/25/2013	<2.8	**4.1**	**250**	<2.8	**7.3**	<4.8	<2.6	**17**	**56**	<1.8	<10.6
Pre Carbon	SVE South Pre Carbon	12/27/2013	<110	<110	**270**	<110	<240	**20,000**	<100	<150	**900**	<70	<420
Post Carbon	SVE South Post Carbon	12/27/2013	**2.5**	**4.5**	**220**	**2.4**	**3.8**	**3.5**	<1.1	**6.8**	**62**	<0.77	<4.6
Pre Carbon	SVE South Pre-Carbon	1/29/2014	<80	<79	**260**	<79	<170	**20,000**	<75	<110	**800**	<51	<306
Post Carbon	SVE South Post-Carbon	1/29/2014	**4.5**	**7.2**	**330**	**4.8**	<8.7	**7.9**	<3.8	**13**	**98**	**3.1**	<15.3
Pre Carbon	SVE_South_Pre_Carbon	2/24/2014	<190	<490	**430**	<240	**240.0**	**34,000**	**600**	<250	**1,500**	<160	<800
Post Carbon	SVE_South_Effluent	2/24/2014	<1.2	<3.2	**41**	<1.6	<1.4	<2.7	<1.5	<1.6	<2.1	<1.0	<5.2
Pre Carbon	SVE South Pre Carbon	3/5/2014	<110	<280	**270**	<140	<120	**16,000**	**660**	<140	**660**	<90	**1,090**
Post Carbon	SVE South Effluent	3/5/2014	**3.7**	<8.3	**310**	**4.2**	**4.4**	<7.1	<4.0	<4.3	**21**	<2.7	<13.7
Pre Carbon	VCP_South_Post_Blower	3/31/2014	<83	<82	**260**	<82	<180	**20,000**	<78	<110	**630**	<53	<309
Post Carbon	VCP_South_Effluent	3/31/2014	**3.3**	**4.9**	**290**	**4.2**	<4.3	<3.4	<1.9	**3.3**	**21**	**1.4**	<7.6
Pre Carbon	South_SVE_Postblower_042914	4/29/2014	<47	<46	**180**	<46	<100	**13,000**	<44	<63	**550**	<30	<180
Post Carbon	South_SVE_Effluent_042914	4/29/2014	**5.1**	**5.0**	**540**	<4.8	<11	<8.2	<4.6	<6.6	**37**	<3.1	<18.3
Pre Carbon	South_SVE_Postblower_052714	5/27/2014	<57	<55	**160**	<55	<120	**12,000**	<53	<76	**490**	<36	<201
Post Carbon	South_SVE_PostCarbon_052714	5/27/2014	**5.0**	<4.8	**530**	<4.8	<11	<8.2	<4.6	**14**	**8.1**	<3.1	<18.3
Pre Carbon	South_VCP_Post Blower	7/3/2014	<18	<18	**56**	<18	<45	**2,800**	<18	<18	**150**	<18	<63
Post Carbon	South_VCP_Post Carbon	7/3/2014	<16	<16	**760**	<16	<35	**55**	<15	**430**	**3,200**	<10	<60
Pre Carbon	SVE Pre Carbon	7/28/2014	<69	<67	**200**	<67	<150	**15,000**	<64	<93	**750**	<43	<254
Post Carbon	SVE Post Carbon	7/28/2014	<68	<67	**270**	<67	<150	**13,000**	<63	**530**	**12,000**	<43	<253
Pre Carbon	South SVE Pre Carbon	8/25/2014	<140	<130	**340**	<130	<290	**20,000**	<130	<180	**1,100**	<86	<520
Post Carbon	South SVE Post Carbon	8/25/2014	<140	<130	**270**	<130	<290	**9,600**	<130	<180	**2,700**	<86	<520
Pre Carbon	South SVE_Pre Carbon	9/30/2014	<110	<110	**250**	<110	<230	**17,000**	<100	<150	**930**	<69	<410
Post Carbon	South SVE_Post Carbon	9/30/2014	<130	<120	**280**	<120	<270	**23,000**	<120	<170	**620**	<80	<480
Pre Carbon	SVE South Post Blower	11/3/2014	<130	<130	**320**	<130	<280	**24,000**	<120	<170	**1,100**	<81	<490
Post Carbon	SVE South Post Carbon	11/3/2014	<81	<81	**130**	<81	<180	**12,000**	<77	<110	**290**	<52	<309
Pre Carbon	SVE South Pre Carbon	1/26/2015	<190	<500	**420**	<250	<220	**21,000**	**240**	<260	**860**	<160	<820
Post Carbon	SVE South Post Carbon	1/26/2015	<78	<200	<100	<100	<90	<170	**190**	<110	<140	<66	<330

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 8
South SVE System – Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m^3										
Pre Carbon	SVE South Pre Carbon	2/26/2015	<150	<390	**260**	<200	<170	**18,000**	**280**	<200	**660**	<130	<650
Post Carbon	SVE South Post Carbon	2/26/2015	<1.2	<3.2	<1.6	<1.6	**3.2**	<2.7	<1.5	<1.6	<2.1	**2.5**	<5.2
Pre Carbon	SVE South Pre Carbon	3/30/2015	<61	<160	**200**	<79	**160**	**17,000**	**180**	<82	**570**	<51	<257
Post Carbon	SVE South Post Carbon	3/30/2015	<1.2	<3.2	<1.6	<1.6	**2.8**	<2.7	**2.7**	<1.6	**51**	**2.5**	<5.2
Pre Carbon	SVE S Pre Carbon	4/24/2015	<37	<97	**170**	<49	<43	**5,400**	<46	<50	**410**	<31	<163
Post Carbon	SVE S Post Carbon	4/24/2015	<6.2	<16	<8.1	<8.1	<7.1	**660**	<7.7	<8.3	**19**	<5.2	**18**
Pre Carbon	SVE South Pre Carbon	5/28/2015	<60	<160	**140**	<79	**92**	**8,000**	**240**	<81	**460**	<51	<256
Post Carbon	SVE South Post Carbon	5/28/2015	<4.9	<13	<6.3	<6.3	<5.6	**650**	<6.0	<6.5	**16**	<4.1	**22.1**
Pre Carbon	SVE South Pre Carbon	7/29/2015	<65	<170	**190**	<85	<75	**12,000**	<81	<88	**790**	<55	<183
Post Carbon	SVE South Post Carbon	7/29/2015	**10**	<27	**960**	**16**	<12	**440**	<13	<14	<18	<8.7	<45
Pre Carbon	SVE South Pre Carbon	8/31/2015	<64	<170	**160**	<83	<73	**12,000**	<79	<86	**780**	<54	<171
Post Carbon	SVE South Post Carbon	8/31/2015	<21	<55	**530**	<27	<24	**3,400**	<26	<28	**94**	<18	<90
Pre Carbon	SVE South Pre Carbon	9/28/2015	<83	<220	**170**	<110	<94	**9,900**	<100	<110	**660**	<70	<360
Post Carbon	SVE South Post Carbon	9/28/2015	**3.4**	<6.0	**340**	**3.6**	<2.6	**300**	<2.8	**39**	**59**	<1.9	<9.8
Pre Carbon	SVE South Pre Carbon	10/29/2015	<130	<350	**230**	<170	<150	**18,000**	<170	<180	**790**	<110	<570
Post Carbon	SVE South Post Carbon	10/29/2015	**4.2**	**5.2**	**340**	**4.5**	**2.6**	**26**	<1.5	**67**	**310**	**1.7**	<5.2
Pre Carbon	SVE_South_Precarbon_113015	11/30/2015	<29	<77	**54**	<38	<38	**3,000**	<38	<29	**300**	<38	<77
Post Carbon	SVE_South_Postcarbon_113015	11/30/2015	<0.80	<0.80	**27**	**0.60**	<0.40	<0.40	<0.40	**6**	**11**	<0.40	<0.80
Pre Carbon	SVE_SOUTH_PRE CARBON_12/28/15	12/28/2015	<120	<320	**180**	<160	<140	**35,000**	<150	<170	**1,200**	<100	<530
Post Carbon	SVE_SOUTH_POST CARBON_12/28/15	12/28/2015	<1.2	<3.2	**28**	<1.6	<1.4	<2.7	**1.5**	**2**	**6.5**	<1.0	<4.2
Pre Carbon	SVE_SOUTH_PRE CARBON	2/1/2016	<8.6	<22	**20**	<11	<9.8	**2,900**	<11	**14**	**120**	<7.2	<37
Post Carbon	SVE_SOUTH_POST CARBON	2/1/2016	**2.2**	<3.2	**160**	**2.90**	<1.4	<2.7	<1.5	**92**	**260**	<1.0	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON	3/29/2016	<230	<610	**710**	<300	<270	**71,000**	<290	**520**	**2,800**	<200	<670
Post Carbon	SVE_SOUTH_POST CARBON	3/29/2016	<69	<180	**490**	<23	<79	**9,300**	<86	**1500**	**9,300**	<58	<200
Pre Carbon	SVE_SOUTH_PRE CARBON	4/27/2016	<6.4	<17	**12**	<8.4	<7.4	**910**	<8.0	<8.7	**23**	<5.4	<18
Post Carbon	SVE_SOUTH_POST CARBON	4/27/2016	<63	<160	**180**	<82	<72	**11,000**	<78	**110**	**2,200**	<53	<180
Pre Carbon	SVE_SOUTH_PRE CARBON	5/25/2016	<1.2	<3.2	**4**	<1.6	<1.4	**550**	**2.9**	**3**	**22**	<1.0	**3.9**
Post Carbon	SVE_SOUTH_POST CARBON	5/25/2016	<16	<41	**2300**	**30.00**	<18	**14,000**	<19	**130**	**3,300**	<13	<45
Pre Carbon	SVE_SOUTH_PRE CARBON	7/26/2016	<98	<260	**340**	<130	<110	**18,000**	<120	<130	**970**	<83	<420
Post Carbon	SVE_SOUTH_POST CARBON	7/26/2016	<78	<200	**760**	<120	<89	**15,000**	<97	**220**	**1,400**	<66	<330
Pre Carbon	SVE_SOUTH_PRE CARBON	8/30/2016	<86	<230	**340**	<110	<99	**28,000**	<110	<120	**1,400**	<73	<370
Post Carbon	SVE_SOUTH_POST CARBON	8/30/2016	<81	<210	**370**	<110	<93	**19,000**	<100	**210**	**910**	<68	<350
Pre Carbon	SVE_SOUTH_PRE CARBON	9/29/2016	<73	<190	**340**	<95	<83	**25,000**	<90	**110**	**1,300**	<61	<310
Post Carbon	SVE_SOUTH_POST CARBON	9/29/2016	<46	<120	**410**	<60	<53	**14,000**	<57	**140**	**1,900**	<39	<196

Please refer to notes at end of table.

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Table 8
South SVE System – Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Sampling Location	Sample ID	Date	1,1-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene Chloride	Tetrachloroethene	Toluene	1,1,1-Trichloroethane	Trichloroethene	Vinyl chloride	Total Xylenes
			Concentrations in µg/m^3										
Pre Carbon	SVE-SOUTH_PRE CARBON_102516	10/25/2016	<150	<390	**380**	<190	<170	**32,000**	<180	<200	**1,500**	<120	<630
Post Carbon	SVE-SOUTH_POST CARBON_102516	10/25/2016	<100	<260	**530**	<130	<120	**19,000**	<130	**180**	**2,700**	<85	<430
Pre Carbon	SVE_SOUTH_PRE CARBON_112816	11/28/2016	<260	<670	**420**	<340	<290	**52,000**	<320	<350	**2,100**	<220	<1110
Post Carbon	SVE_SOUTH_POST CARBON_112816	11/28/2016	<79	<210	<100	<100	<90	**18,000**	<98	**360**	**3,200**	<66	<340
Pre Carbon	SVE_SOUTH_PRE CARBON_013017	1/30/2017	<260	<690	**660**	<340	<300	**61,000**	<330	**400**	**2,400**	<220	<1130
Post Carbon	SVE_SOUTH_POST CARBON_013017	1/30/2017	<1.2	<3.2	<1.6	<1.6	<1.4	**24**	**1.8**	<1.6	<2.1	<1.0	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_073117	7/31/2017	<100	<260	**400**	<130	<110	**17,000**	**340**	<130	**1,000**	<84	<430
Post Carbon	SVE_SOUTH_POST CARBON_073117	7/31/2017	<1.2	<3.2	<1.6	<1.6	**2.4**	**6.5**	**8.2**	<1.6	**3.9**	**2.4**	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_082817	8/28/2017	<60	<160	**320**	<79	<69	**32,000**	<75	**90**	**1,100**	<51	<256
Post Carbon	SVE_SOUTH_POST CARBON_082817	8/28/2017	<1.2	**5.8**	**2**	<1.6	**2.4**	**160**	**2.3**	<1.6	**3.9**	**2.2**	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_092517	9/25/2017	<21	<55	**200**	<27	<24	**23,000**	<26	**45**	**460**	<18	<90
Post Carbon	SVE_SOUTH_POST CARBON_092517	9/25/2017	<1.2	**8.0**	**16**	<1.6	**5.3**	**6.8**	<1.5	<1.6	<2.1	**2.2**	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_102617	10/26/2017	<40	<100	**230**	<52	<45	**13,000**	<49	**64**	**700**	<33	<167
Post Carbon	SVE_SOUTH_POST CARBON_102617	10/26/2017	**2.0**	**15**	**98**	**2.1**	**1.6**	**9.7**	<1.5	**3.9**	<2.1	**1.5**	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_112917	11/29/2017	<140	<370	**280**	<180	<160	**22,000**	<170	<190	**820**	<120	<600
Post Carbon	SVE_SOUTH_POST CARBON_112917	11/29/2017	**3.8**	**8.5**	**220**	**4.0**	<2.0	<4.0	<2.2	**12**	<3.2	**2.5**	<5.7
Pre Carbon	SVE_SOUTH_PRE CARBON_122117	12/21/2017	--	--	--	--	--	--	--	--	--	--	--
Post Carbon	SVE_SOUTH_POST CARBON_122117	12/21/2017	**4.6**	**4.9**	**300**	**5.2**	**1.7**	<2.7	<1.5	**20**	**7.2**	**1.8**	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_012218	1/22/2018	<110	<290	**150**	<150	<130	**13,000**	<140	<150	**390**	<95	<480
Post Carbon	SVE_SOUTH_POST CARBON_012218	1/22/2018	**4.3**	<6.5	**380**	<3.2	<2.8	**8.1**	<3.1	**11**	**16**	**2.1**	<10.6
Pre Carbon	SVE_SOUTH_PRE CARBON_022818	2/28/2018	<19	<49	**200**	<25	<22	**13,000**	<23	**52**	**440**	<16	<81
Post Carbon	SVE_SOUTH_POST CARBON_022818	2/28/2018	**2.8**	<3.2	**300**	**4.0**	<1.4	<2.7	<1.5	**14**	**51**	**5.1**	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_032918	3/29/2018	<23	<60	**180**	<30	<26	**13,000**	<28	**46**	**470**	<19	<98
Post Carbon	SVE_SOUTH_POST CARBON_032918	3/29/2018	**4.2**	**5.2**	**500**	**7.4**	**1.5**	**7.8**	<1.5	**15**	**110**	**1.7**	<5.2
Pre Carbon	SVE_SOUTH_PRE CARBON_042418	4/24/2018	<69	<180	**140**	<90	<79	**12,000**	<86	<58	**350**	<58	<299
Post Carbon	SVE_SOUTH_POST CARBON_042418	4/24/2018	**3.4**	**4.2**	**470**	**7.6**	**1.5**	**6.6**	**3.1**	**8.4**	**76**	**1.4**	**17.9**
Pre Carbon	SVE_SOUTH_PRE CARBON_051618	5/16/2018	<50	<130	**160**	<65	<57	**7,800**	<62	<68	**370**	<42	<212
Post Carbon	SVE_SOUTH_POST CARBON_051618	5/16/2018	<4.7	<12	**480**	**6.6**	<0.97	<1.3	<0.75	**7.1**	**33**	<4	<19.7

Notes:

1. µg/m^3 = Micrograms per cubic meter.
2. Samples analyzed by Modified EPA Method TO-15.
3. Only analytes detected in at least one sample are presented in this table.
4. S= Surrogate recoveries were above acceptable recovery limits. Results may be biased high.
5. **Bold** values represents detected concentration of listed analyte.
6. -- = Not sampled.

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Table 9
North SVE System – VOC Mass Removal
NuStar Vancouver Facility
Vancouver, Washington

Sample Date	Post-Blower Pressure (in H_20)	Air Flow Rate [(1)] (cfm)	Total VOCs (mg/m^3)	VOC Removal (lb/day)
10/12/2011	0.1	250	10.5	0.2
1/23/2012	0.1	361	16.5	0.5
2/17/2012	0.05	215	11.3	0.2
3/22/2012	--	210	6.7	0.1
6/20/2012	0.2	217.8	0.3	0.005
8/22/2012	0.2	216	0.2	0.003
11/26/2012	0.05	215	22.6	0.436
12/21/2012	0.1	215	3.6	0.069
2/28/2013	0.1	215	4.6	0.088
5/24/2013	0.1	215	24.4	0.471
6/25/2013	0.1	215	13.8	0.267
8/27/2013	0.1	215	17.8	0.344
10/24/2013	0.1	215	10.6	0.204
12/27/2013	0.1	215	7.5	0.144
1/29/2014	3.0	215	1.4	0.028
2/24/2014	9.0	215	9.5	0.184
3/31/2014	1.0	215	3.7	0.072
4/29/2014	2.0	215	3.7	0.072
5/27/2014	2.0	215	4.4	0.085
7/3/2014	4.0	215	4.8	0.093
7/28/2014	3.0	215	7.7	0.148
9/30/2014	--	215	7.8	0.151
10/27/2014	2.0	215	15.4	0.298
11/25/2014	--	215	7.5	0.145
12/29/2014	2.0	215	15.3	0.296
1/26/2015	3.0	215	1.6	0.032
2/26/2015	0.1	215	0.0	0.001
3/30/2015	0.4	215	1.8	0.036
4/24/2015	0.4	215	0.6	0.012
5/14/2015	--	215	0.0	0.000
5/28/2015	0.05	215	0.4	0.007
7/29/2015	0.10	215	2.2	0.043
8/31/2015	0.05	215	7.8	0.150
9/28/2015	0.00	215	1.6	0.031
10/29/2015	1.00	215	6.9	0.134
11/30/2015	2.00	215	2.4	0.046
12/28/2015	0.10	215	5.7	0.110
2/1/2016	3.00	215	11.2	0.215
2/29/2016	0.10	215	8.0	0.154
3/29/2016	0.20	215	0.9	0.018
4/27/2016	1.00	215	1.6	0.030
5/25/2016	--*	--*	--*	--*
6/28/2016	0.10	215	1.8830	0.036
7/26/2016	1.20	215	0.0916	0.00177
9/29/2016	0.10	215	0.0150	0.00029
10/25/2016	0.10	215	0.0109	0.000211
11/28/2016	0.10	215	0.0067	0.000129
12/28/2016	0.10	215	0.0017	0.0000329
1/30/2017	0.10	215	0.0046	0.0000889
2/28/2017	0.10	215	0.0059	0.000114
3/28/2017	0.10	215	0.0061	0.000118
4/24/2017	0.10	215	0.0076	0.000147

Please refer to notes at end of table.

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Table 9
North SVE System – VOC Mass Removal
NuStar Vancouver Facility
Vancouver, Washington

Date	Activity	VOC Removal Rate (lb/day)	Days of Operation	Approximate VOCs Removed (lbs)	Approximate Cumulative VOCs Removed (lbs)
10/10/2011	Startup	--	--	--	--
10/12/2011	Sample	0.2	37	9	9
1/23/2012	Sample	0.5	31	17	26
2/17/2012	Sample	0.2	25	6	32
3/22/2012	Sample	0.1	34	5	37
6/20/2012	Sample	0.005	90	1	38
8/22/2012	Sample	0.003	63	1	39
11/26/2012	Sample	0.436	66	29	68
12/21/2012	Sample	0.069	25	2	70
2/28/2013	Sample	0.088	69	7	77
5/24/2013	Sample	0.471	--	--	77
6/25/2013	Sample	0.267	32	9	86
8/27/2013	Sample	0.344	63	22	108
10/24/2013	Sample	0.204	58	12	120
12/27/2013	Sample	0.144	64	10	130
1/29/2014	Sample	0.028	33	1	131
2/24/2014	Sample	0.184	--	--	131
3/31/2014	Sample	0.072	35	3	134
4/29/2014	Sample	0.072	29	3	137
5/27/2014	Sample	0.085	28	3	140
7/3/2014	Sample	0.093	37	4	144
7/28/2014	Sample	0.148	25	4	148
9/30/2014	Sample	0.151	64	10	158
10/27/2014	Sample	0.298	27	9	167
11/25/2014	Sample	0.145	29	5	172
12/29/2014	Sample	0.296	34	11	183
1/26/2015	Sample	0.032	28	1	184
2/26/2015	Sample	0.001	31	1	185
3/30/2015	Sample	0.036	32	2	187
4/24/2015	Sample	0.012	25	1	188
5/14/2015	Sample	0.000	20	0	188
5/28/2015	Sample	0.007	14	1	189
6/30/2015	Estimate	0.007	33	1	190
6/30/2015	Estimate	0.000	0	0	190
7/29/2015	Sample	0.043	29	2	192
8/31/2015	Sample	0.150	33	5	197
9/28/2015	Sample	0.031	28	1	198
10/29/2015	Sample	0.134	31	5	203
11/30/2015	Sample	0.046	32	2	205
12/28/2015	Sample	0.110	28	4	209
2/1/2016	Sample	0.215	35	8	217
2/29/2016	Sample	0.154	28	5	222
3/29/2016	Sample	0.018	29	1	223
4/27/2016	Sample	0.030	29	1	224
5/25/2016	Sample	--*	28	--*	221
6/28/2016	Sample	0.0364	34	2	223
7/26/2016	Sample	0.00177	28	1	224
9/29/2016	Sample	0.00029	65	1	225
10/25/2016	Sample	0.000211	26	1	226
11/28/2016	Sample	0.000129	34	1	227
12/28/2016	Sample	0.0000329	30	1	228
1/30/2017	Sample	0.0000889	33	1	229
2/28/2017	Sample	0.000114	29	1	230
3/28/2017	Sample	0.000118	28	1	231
4/24/2017	Sample	0.000147	27	1	232

Notes:

1. Air flow rate read from system gauge.
2. cfm = Cubic feet per minute.
3. mg/m3 = Milligrams per cubic meter.
4. lb/day = Pounds per day.
5. lbs = Pounds.
6. * = Not measured/sampled; system intentionally shut down to evaluate system efficiency.
7. -- = not measured/sampled.

Cascadia Associates, LLC

Table 10
South SVE System – VOC Mass Removal
NuStar Vancouver Facility
Vancouver, Washington

Sample Date	Post-Blower Pressure (in H_20)	Air Flow Rate [1] (cfm)	Total VOCs (mg/m^3)	VOC Removal (lb/day)
10/6/2011	33.0	590	46	2.4
11/2/2011	27.0	590	29	1.5
12/14/2011	27.0	590	57	3.0
2/17/2012	29.0	--[6]	30	1.6
3/22/2012	27.0	658	31	1.9
4/26/2012	27.0	--	0	0.0
5/23/2012	31.0	--	20	1.2
6/20/2012	33.0	--	37	2.2
7/24/2012	32.0	--	34	2.0
8/22/2012	29.0	--	51	3.0
9/25/2012	29.0	--	52	3.1
10/29/2012	47.0	--	63	3.7
11/26/2012	18.0	--	11	0.6
12/21/2012	17.0	--	15	0.9
1/24/2013	10.0	--	2	0.1
2/28/2013	18.0	--	1	0.1
3/25/2013	16.0	--	4	0.2
4/29/2013	15.0	--	1	0.1
5/24/2013	47.0	--	251	14.8
6/25/2013	51.0	--	41	2.5
7/25/2013	50.0	--	24	1.4
8/27/2013	52.0	--	30	1.8
9/30/2013	45.0	--	28	1.6
10/24/2013	50.0	--	29	1.7
11/25/2013	51.0	--	22	1.3
12/27/2013	55.0	--	21	1.3
1/29/2014	50.0	--	21	1.2
2/24/2014	50.0	--	37	2.2
3/31/2014	46.0	--	21	1.2
4/29/2014	48.8	--	14	0.8
5/27/2014	49.0	--	13	0.7
7/3/2014	50.0	--	3	0.2
7/28/2014	50.0	--	16	0.9
8/25/2014	49.0	--	21	1.2
9/30/2014	40.0	--	18	1.1
11/3/2014	50.0	--	25	1.5
1/26/2015	20.0	--	23	1.3
2/26/2015	30.0	--	19	1.1
3/30/2015	29.0	--	18	1.1
4/24/2015	29.0	--	6	0.4
5/28/2015	28.0	--	9	0.5
7/29/2015	25.0	--	13	0.8
8/31/2015	26.0	--	13	0.8
9/28/2015	26.0	--	11	0.6
10/29/2015	27.0	--	19	1.1
11/30/2015	30.0	--	3	0.2
12/28/2015	29.0	--	36	2.2
2/1/2016	19.0	--	3	0.2
2/29/2016	30.0	--	3	0.2
3/29/2016	28.0	--	75	4.4
4/27/2016	5.0	--	1	0.1
5/25/2016	3.0	--	1	0.03
6/28/2016	-- *	-- *	-- *	-- *
7/26/2016	30.0	--	19	1.1
9/29/2016	28.0	--	27	1.6
10/25/2016	30.0	--	34	2.0
11/28/2016	30.0	--	55	3.3
1/30/2017	33.0	--	64	3.8
7/31/2017	31.0	--	19	1.1
8/28/2017	32.0	--	34	2.0
9/25/2017	30.0	--	24	1.4
10/26/2017	30.0	--	14	0.8
11/29/2017	30.0	--	23	1.4
12/21/2017	30.0	--	23	1.4
1/22/2018	30.0	--	14	0.8
2/28/2018	30.0	--	14	0.8
3/29/2018	31.0	--	14	0.8
4/24/2018	31.0	--	12	0.7
5/16/2018	30.0	--	8	0.5

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 10
South SVE System – VOC Mass Removal
NuStar Vancouver Facility
Vancouver, Washington

Date	Activity	VOC Removal Rate (lb/day)	Days of Operation	Approximate VOCs Removed (lbs)	Approximate Cumulative VOCs Removed (lbs)
10/6/2011	Startup	2.4	0.5	2	2
11/2/2011	Sample	1.5	27	41	43
12/14/2011	Sample	3.0	42	96	139
2/17/2012	Sample	1.6	65	151	290
3/22/2012	Sample	1.9	34	59	349
4/26/2012	Sample	0.0	35	33	382
5/23/2012	Sample	1.2	29	18	400
6/20/2012	Sample	2.2	28	47	447
7/24/2012	Sample	2.0	34	72	519
8/22/2012	Sample	3.0	29	74	593
9/25/2012	Sample	3.1	34	104	697
10/29/2012	Sample	3.7	34	116	813
11/26/2012	Sample	0.6	28	61	874
12/21/2012	Sample	0.9	25	19	893
1/24/2013	Sample	0.1	34	17	910
2/28/2013	Sample	0.1	35	3	913
3/25/2013	Sample	0.2	25	4	917
4/29/2013	Sample	0.1	35	6	923
5/24/2013	Sample	14.8	--	--	996
6/25/2013	Sample	2.5	32	277	1273
7/25/2013	Sample	1.4	30	58	1331
8/27/2013	Sample	1.8	33	53	1384
9/30/2013	Sample	1.6	34	59	1443
10/24/2013	Sample	1.7	24	41	1484
11/25/2013	Sample	1.3	32	48	1532
12/27/2013	Sample	1.2	32	41	1573
1/29/2014	Sample	1.2	33	41	1614
2/24/2014	Sample	2.2	--	--	1614
3/31/2014	Sample	1.2	35	60	1674
4/29/2014	Sample	0.8	29	30	1704
5/27/2014	Sample	0.7	28	22	1726
7/3/2014	Sample	0.2	37	18	1744
7/28/2014	Sample	0.9	25	15	1759
8/25/2014	Sample	1.2	28	31	1790
9/30/2014	Sample	1.1	36	42	1832
11/3/2014	Sample	1.5	30	39	1871
12/31/2014	Estimated	1.5	22	33	1904
1/26/2015	Sample	1.3	26	37	1941
2/26/2015	Sample	1.1	31	39	1980
3/30/2015	Sample	1.1	32	36	2016
4/24/2015	Sample	0.4	25	18	2034
5/28/2015	Sample	0.5	34	15	2049
7/29/2015	Sample	0.8	62	41	2090
8/31/2015	Sample	0.8	33	26	2116
9/28/2015	Sample	0.6	28	20	2136
10/29/2015	Sample	1.1	31	28	2164
11/30/2015	Sample	0.2	32	22	2186
12/28/2015	Sample	2.2	28	33	2219
2/1/2016	Sample	0.2	35	41	2260
2/29/2016	Sample	0.2	28	6	2266
3/29/2016	Sample	4.4	29	67	2333
4/27/2016	Sample	0.1	29	66	2399
5/25/2016	Sample	0.03	28	2	2401

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 10
South SVE System – VOC Mass Removal
NuStar Vancouver Facility
Vancouver, Washington

Date	Activity	VOC Removal Rate (lb/day)	Days of Operation	Approximate VOCs Removed (lbs)	Approximate Cumulative VOCs Removed (lbs)
7/26/2016	Sample	1.1	62	36	2437
9/29/2016	Sample	1.6	65	89	2526
10/25/2016	Sample	2.0	26	47	2573
11/28/2016	Sample	3.3	34	90	2663
1/30/2017	Sample	3.8	63	223	2886
7/31/2017	Sample	1.1	182	449	3335
8/28/2017	Sample	2.0	28	44	3379
9/25/2017	Sample	1.4	28	48	3427
10/26/2017	Sample	0.8	31	35	3462
11/29/2017	Sample	1.4	34	38	3500
12/21/2017	estimated (using November effluent data)	1.4	22	30	3530
1/22/2018	Sample	0.8	32	36	3566
2/28/2018	Sample	0.8	37	31	3597
3/29/2018	Sample	0.8	29	24	3621
4/24/2018	Sample	0.7	26	21	3642
5/16/2018	Sample	0.5	22	14	3656

Notes:

1. Air flow rate read from system gauge.
2. cfm = cubic feet per minute.
3. mg/m^3 = Milligrams per cubic meter.
4. lb/day = Pounds per day.
5. lbs = Pounds.
6. Flow rate was not measured on dates with dashes (--). For calcuations, rate is assumed to be the same as measured the date before.
7. System was down during the October 27, 2014 monitoring event and was restarted on October 29, 2014. It is assumed that the system was down for a total of four days, although the exact duration of shutdown is unknown.
8. * = system was off for part replacement.

Table 11
Groundwater Analytical Results - Ammonia, Nitrate, and Nitrite
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	**EX-1**							**MW-1**			**MW-2**		**MW-3**			**MW-5**			**MW-6**	
Sample Date:	2/6/2007	3/23/2009	3/16/2010	6/7/2011	12/9/2011	3/21/2018	6/28/2018	11/9/2017	3/20/2018	7/1/2018	11/6/2017	7/2/2018	11/8/2017	3/20/2018	7/2/2018	11/7/2017	3/21/2018	6/29/2018	11/7/2017	7/1/2018
Analyte	Concentrations in mg/L (ppm)																			
Attenuation Chemistry																				
Ammonia (as Nitrogen)	**26.7**	**14**	**3.4**	--	--	**302**	**119**	**3.96**	**6.2**	**1.47**	**6.34**	**9.85**	**1.68**	<0.40	**0.569**	**2.86**	<0.05	**0.819**	**0.608**	**4.17**
Nitrate-Nitrogen	**108**	**43**	**89**	**150**	<0.50	**1.22**	<0.10	**46.4**	**1.84**	<0.10	**0.26**	<0.10	**2.7**	**19.7**	**15.4**	<0.10	**2.63**	<0.10	**0.35**	<0.10
Nitrite-Nitrogen	**0.49**	**0.54**	**0.71**	<0.10	<0.10	**0.47**	<0.050	<1.0	<0.10	<0.10	<0.10	<0.10	<1.0	<0.10	**1.49**	<0.10	<0.10	<0.10	<0.10	<0.10

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 11
Groundwater Analytical Results - Ammonia, Nitrate, and Nitrite
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	**MW-7**										**MW-8**				**MW-9**				**MW-10**	
Sample Date:	2/6/2007	6/10/2008	3/23/2009	3/16/2010	6/7/2011	12/9/2011	11/7/2017	3/21/2018	3/21/2018 DUP	6/29/2018	6/10/2008	11/6/2017	3/19/2018	6/29/2018	9/21/2010	11/9/2017	3/21/2018	6/29/2018	11/6/2017	6/29/2018
Analyte	Concentrations in mg/L (ppm)																			
Attenuation Chemistry																				
Ammonia (as Nitrogen)	**3.00**	**4.89**	**11**	**2.4**	--	--	**9.09**	**13.4**	**16.9**	**7.9**	<0.0500	<0.050	<0.40	<0.050	**1.4**	**17.4**	<0.050	**14.2**	**35.6**	**29.0**
Nitrate-Nitrogen	**60.7**	**67.5**	**56**	**99**	**140**	<0.50	<0.10	<0.10	<0.10	**10.8**	**167**	**207**	**284**	**333**	**89**	**559**	**230**	**382**	**333**	**486**
Nitrite-Nitrogen	< 0.100	**0.1**	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.61**	**0.270**	<0.10

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 11
Groundwater Analytical Results - Ammonia, Nitrate, and Nitrite
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	MW-12							MW-13			MW-14			MW-15		MW-16			MW-17	
Sample Date:	10/19/2010	6/7/2011	12/7/2011	11/9/2017	3/20/2018	3/20/2018 DUP	7/1/2018	11/7/2017	3/20/2018	7/1/2018	11/8/2017	3/20/2018	6/28/2018	11/6/2017	7/2/2018	11/6/2017	3/19/2018	7/2/2018	11/8/2017	6/28/2018
Analyte	Concentrations in mg/L (ppm)																			
Attenuation Chemistry																				
Ammonia (as Nitrogen)	--	--	--	**55.4**	**39.4**	**39.9**	**33.0**	**35.0**	**191**	**23.5**	**34.7**	**50.7**	**31.6**	<0.050	<0.050	<0.050	<0.40	<0.050	**0.634**	<0.050
Nitrate-Nitrogen	**59**	**1.1**	**67**	**0.57**	<0.10	<0.10	<0.10	**0.52**	<0.10	<0.10	**50.3**	**17.1**	**104**	**9.78**	**6.06**	**9.95**	**15.7**	**19.4**	**43.4**	**7.84**
Nitrite-Nitrogen	--	<0.10	<0.10	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0	<0.10	<2.5	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0	<0.10

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 11
Groundwater Analytical Results - Ammonia, Nitrate, and Nitrite
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	MW-18i				MW-19					MW-19i			MW-20i			MW-21i-40				MW-21i-105			
Sample Date:	6/10/2008	11/7/2017	3/21/2018	7/2/2018	10/19/2010	11/9/2017	3/21/2018	3/21/2018 DUP	6/28/2018	11/8/2017	3/20/2018	7/2/2018	11/7/2017	3/21/2018	7/2/2018	6/10/2008	11/8/2017	3/22/2018	6/29/2018	6/10/2008	11/8/2017	3/22/2018	6/29/2018
Analyte	Concentrations in mg/L (ppm)																						
Attenuation Chemistry																							
Ammonia (as Nitrogen)	<0.0500	<0.050	<0.050	<0.050	--	**80**	**150**	**152**	**194**	**0.236**	<0.40	**0.158**	**0.125**	**1.01**	**0.115**	**0.0594**	<0.050	**1.7**	<0.050	**0.0645**	<0.050	**13.0**	**12.3**
Nitrate-Nitrogen	**0.35**	**1.07**	**0.75**	**1.13**	**19**	**41**	**47.8**	**46.5**	<0.10	<0.10	<0.10	<0.10	**0.28**	**1.06**	**0.37**	<0.100	**1.9**	**0.071**	**5.12**	<0.100	**1.6**	**15.8**	**13.1**
Nitrite-Nitrogen	<0.1	<0.10	<0.10	<0.10	--	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.100	<1.0	<0.10	<1.0	<0.100	<1.0	**0.10**	<0.10

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 11
Groundwater Analytical Results - Ammonia, Nitrate, and Nitrite
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	MW-22i			MW-23i				MW-24i					MW-24d			MW-25i			MW-26			MW-32i	MW-32s	
Sample Date:	11/7/2017	3/22/2018	6/29/2018	6/10/2008	11/8/2017	3/21/2018	6/28/2018	6/7/2011	12/7/2011	11/9/2017	3/21/2018	6/28/2018	11/6/2017	3/20/2018	6/27/2018	11/8/2017	3/21/2018	6/29/2018	11/8/2017	3/20/2018	6/29/2018	11/10/2017	11/10/2017	3/22/2018
Analyte	Concentrations in mg/L (ppm)																							
Attenuation Chemistry																								
Ammonia (as Nitrogen)	**0.354**	**1.25**	**0.469**	<0.0500	<0.050	<0.050	<0.050	--	--	<0.050	**0.687**	<0.050	**0.153**	<0.40	**0.160**	**0.138**	<0.050	<0.050	**34.1**	**30.0**	**22.4**	<0.050	**0.235**	<0.050
Nitrate-Nitrogen	<1.0	**0.63**	<1.0	**0.440**	**0.78**	**0.72**	**0.53**	**0.50**	**1.6**	**3.09**	**7.36**	**2.37**	<0.10	<0.10	<0.10	**0.53**	**0.40**	**0.27**	**101**	**271**	**213**	**1.33**	**0.58**	**0.16**
Nitrite-Nitrogen	<1.0	<0.10	<1.0	<0.100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.050	<0.25	<0.10	<0.10	<2.5	<0.25	<0.10	<0.10	<0.10	<0.10

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 11
Groundwater Analytical Results - Ammonia, Nitrate, and Nitrite
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	**EW-1**		**S-1**			**S-2**			**MGMS1-3(43)**				**MGMS1-2(60)**			**MGMS1-1(110)**		**MGMS2-4(40)**					
Sample Date:	11/9/2017	7/1/2018	11/8/2017	3/20/2018	6/28/2018	11/8/2017	3/20/2018	6/28/2018	10/19/2010	11/7/2017	3/22/2018	7/1/2018	11/7/2017	3/22/2018	7/1/2018	11/7/2017	7/1/2018	9/21/2010	6/7/2011	12/7/2011	11/9/2017	3/22/2018	7/1/2018
Analyte	Concentrations in mg/L (ppm)																						
Attenuation Chemistry																							
Ammonia (as Nitrogen)	<0.050	<0.050	**7.13**	**35.5**	<1.3	**5.64**	**6.1**	**8.05**	--	**217**	**214**	**198**	<0.050	**0.054**	<0.050	**0.822**	**0.134**	**130**	--	--	**87.1**	**84.2**	**83.6**
Nitrate-Nitrogen	**0.50**	**2.91**	**4.14**	**11.4**	**3.02**	**1.05**	**1.25**	**3.28**	**390**	**120**	<0.10	<0.10	**1.91**	**3.18**	**1.83**	**0.73**	**0.11**	**560**	**200**	**8.0**	<0.10	<0.10	**0.76**
Nitrite-Nitrogen	<0.10	<0.10	<0.10	**0.24**	<0.10	<0.10	<0.10	**0.054**	--	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 11
Groundwater Analytical Results - Ammonia, Nitrate, and Nitrite
NuStar Vancouver Facility
Vancouver, Washington

Well Number:	**MGMS2-3(60)**			**MGMS2-2(110)**		**MGMS2-1(132)**		**MGMS3-4(40)**			**MGMS3-3(60)**			**MGMS3-2(110)**		**MGMS3-1(132)**	
Sample Date:	11/9/2017	3/22/2018	7/1/2018	11/9/2017	7/1/2018	11/9/2017	7/1/2018	11/10/2017	3/22/2018	7/1/2018	11/10/2017	3/22/2018	7/1/2018	11/10/2017	7/1/2018	11/10/2017	7/1/2018
Analyte	Concentrations in mg/L (ppm)																
Attenuation Chemistry																	
Ammonia (as Nitrogen)	**1.03**	**0.153**	<0.050	<0.050	**0.050**	<0.050	<0.050	**1.71**	**1.55**	**0.971**	<0.050	**0.272**	**0.100**	<0.050	<0.050	<0.050	<0.050
Nitrate-Nitrogen	**0.12**	**0.68**	**0.77**	**0.37**	**0.28**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.39**	**0.29**	**0.48**	**0.43**	**0.52**	**0.46**
Nitrite-Nitrogen	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Please refer to notes at end of table.

Cascadia Associates, LLC

Table 11
Groundwater Analytical Results - Ammonia, Nitrate, and Nitrite
NuStar Vancouver Facility
Vancouver, Washington

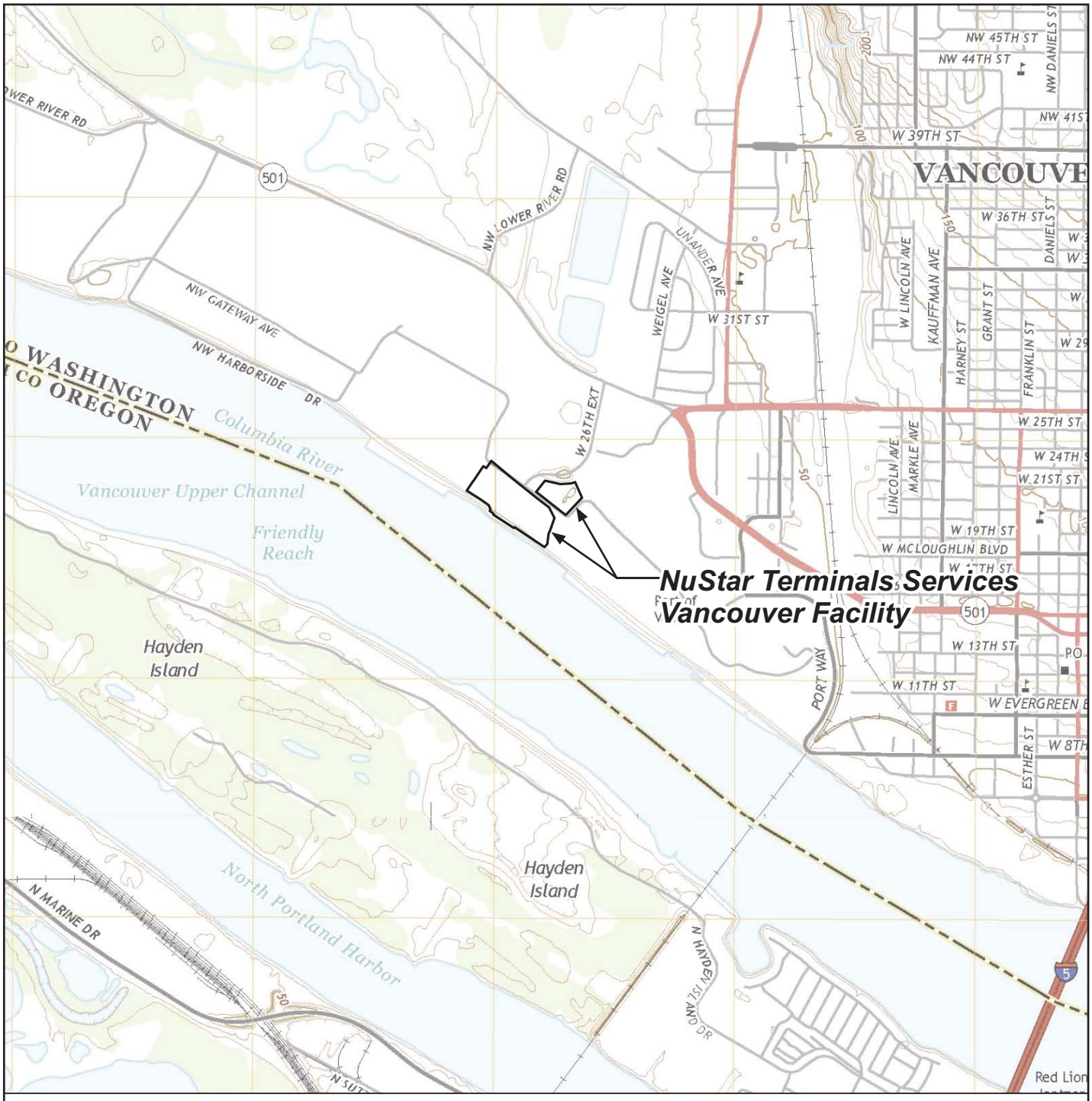
Well Number:	MP-1								MP-3
Sample Date:	2/6/2007	3/23/2009	3/16/2010	6/7/2011	12/9/2011	11/9/2017	3/21/2018	6/28/2018	6/28/2018
Attenuation Chemistry									
Ammonia (as Nitrogen)	**42.4**	**35**	**37**	--	--	**12.2**	**7.13**	**8.71**	**18.8**
Nitrate-Nitrogen	**247**	**210**	**990**	**160**	**120**	**23.0**	**37.8**	**38.2**	**138**
Nitrite-Nitrogen	**0.18**	**1.2**	**0.76**	<0.10	**0.91**	<0.50	<0.10	<0.10	**0.42**

Notes:

1. Milligrams per liter (mg/L) = parts per million (ppm).
2. **Bold** value represents detected concentration of listed analyte.
3. -- = Not sampled or not analyzed.
4. < = Not detected at or above the specified laboratory method reporting limit (MRL).
5. Ammonia as nitrogen by Method 350.1
6. Nitrate as nitrogen and nitrite as nitrogen by Method 300.0

Cascadia Associates, LLC

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.

0 2,000 4,000

Approximate Scale in Feet

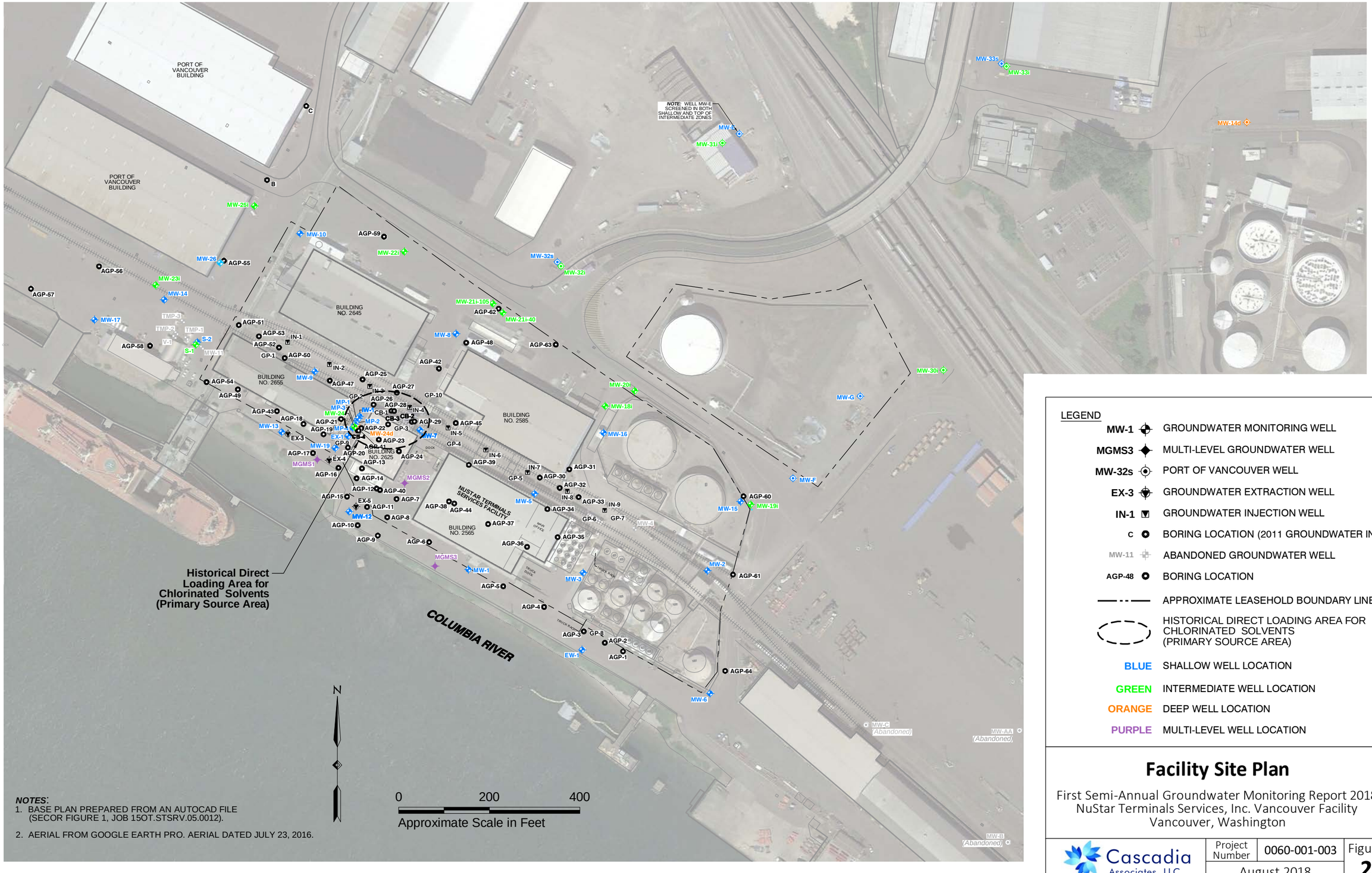
N

Facility Location Map

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure
August 2018		1



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. AERIAL FROM GOOGLE EARTH PRO. AERIAL DATED JULY 23, 2016.

LEGEND

MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL
EX-3	GROUNDWATER EXTRACTION WELL
IN-1	GROUNDWATER INJECTION WELL
C	BORING LOCATION (2011 GROUNDWATER INV.)
MW-11	ABANDONED GROUNDWATER WELL
AGP-48	BORING LOCATION
	APPROXIMATE LEASEHOLD BOUNDARY LINE
	HISTORICAL DIRECT LOADING AREA FOR CHLORINATED SOLVENTS (PRIMARY SOURCE AREA)
BLUE	SHALLOW WELL LOCATION
GREEN	INTERMEDIATE WELL LOCATION
ORANGE	DEEP WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Facility Site Plan

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure
August 2018		2

PORT OF VANCOUVER BUILDING

PORT OF VANCOUVER BUILDING

BUILDING NO. 2645

BUILDING NO. 2655

BUILDING NO. 2585

BUILDING NO. 2625

BUILDING NO. 2565

NUSTAR TERMINALS SERVICES FACILITY

COLUMBIA RIVER

MW-33s NA

MW-E

MW-10 8.69

MW-26 8.12

MW-14 8.07

MW-17 8.01

TMP-3

TMP-2

TMP-1

V-1

S-2 7.94

MW-11

MW-8 8.61

MW-9 8.17

MP-1

MP-3

MW-4

MP-2

MP-4

EX-1

MW-7 8.21

MW-13 7.98

MW-19 8.05

MGMS1 8.00

MGMS2 8.11

MW-5 5.03

MW-12 7.95

MGMS3 7.72

MW-1 7.95

MW-3 8.13

MW-2 7.98

EW-1 8.01

MW-6 8.25

MW-32s 7.96

MW-16 8.08

MW-G 6.92

MW-F 7.24

MW-15 8.18

MW-C (Abandoned)

MW-AA (Abandoned)

MW-B (Abandoned)

8.5

8.0

7.5

7.0

RIVER STAGE
(Max. 4.74) (Min. 3.98) (Avg. 4.36)

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. WELL ELEVATIONS BASED ON JUNE 2010 SURVEY DATA. ELEVATIONS ARE BASED ON WSDOT BENCHMARK - DESIGNATED "PEPSI". THE BENCHMARK ELEVATION IS PRESUMED TO APPROXIMATE THE NGVD29(47) DATUM USED BY CLARK COUNTY.
4. RIVER STAGE MEASUREMENTS FROM NOAA STATION ID 9440083 VANCOUVER, WASHINGTON FROM 10:47 AM TO 1:52 PM ON MARCH 19, 2018.
5. RIVER STAGE CONVERTED FROM CRD TO NGVD29(47) ASSUMING CRD IS 1.82 FEET HIGHER THAN NGVD29(47).

N

0 200 400

Approximate Scale in Feet

LEGEND

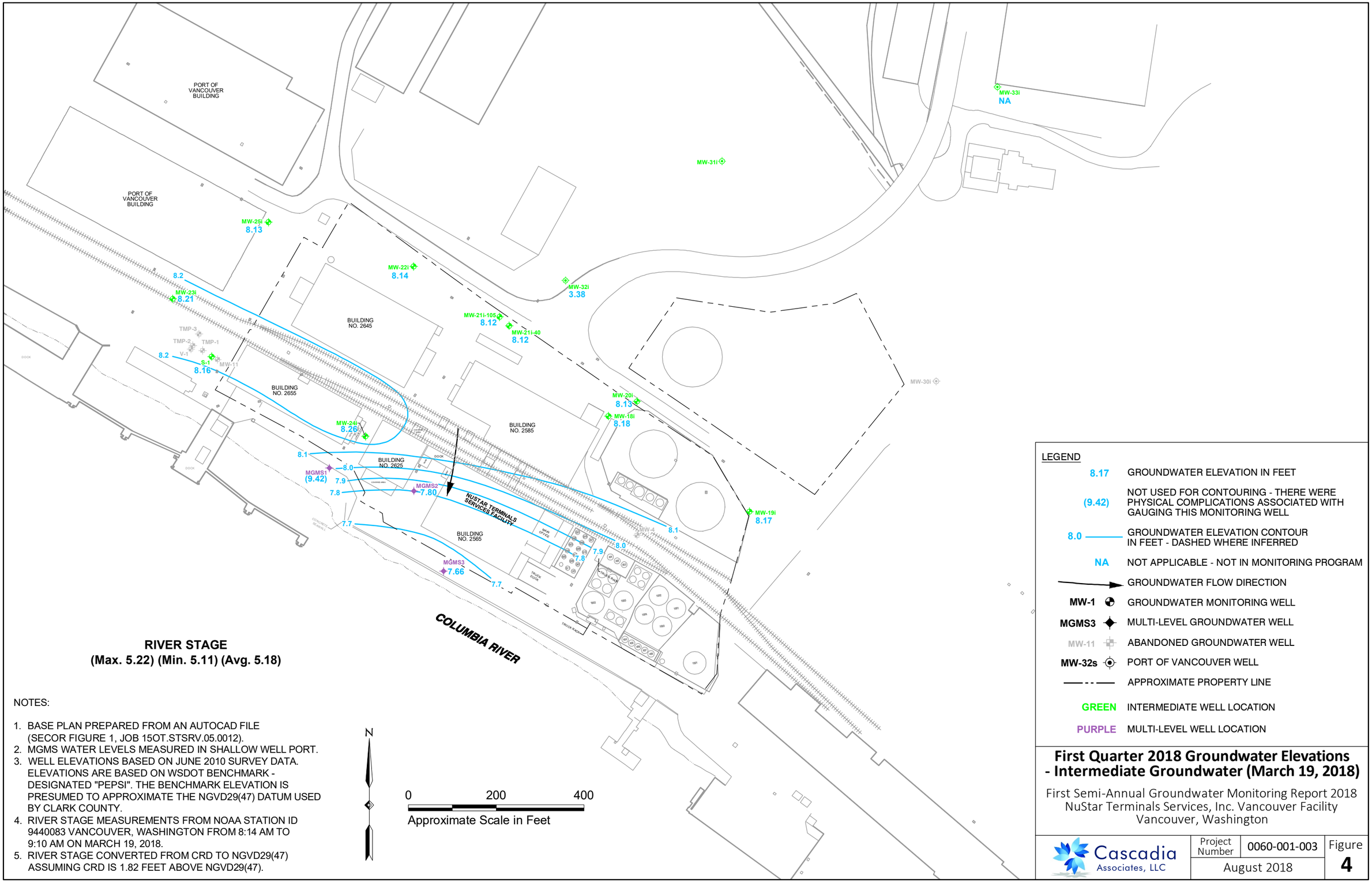
7.24	GROUNDWATER ELEVATION IN FEET
7.0	GROUNDWATER ELEVATION CONTOUR IN FEET
NA	NOT APPLICABLE - NOT IN MONITORING PROGRAM
	GROUNDWATER FLOW DIRECTION
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-11	ABANDONED GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL
	APPROXIMATE PROPERTY LINE
BLUE	SHALLOW WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

First Quarter 2018 Groundwater Elevations - Shallow Groundwater (March 19, 2018)

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure
August 2018		3



RIVER STAGE
(Max. 5.22) (Min. 5.11) (Avg. 5.18)

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. WELL ELEVATIONS BASED ON JUNE 2010 SURVEY DATA. ELEVATIONS ARE BASED ON WSDOT BENCHMARK - DESIGNATED "PEPSI". THE BENCHMARK ELEVATION IS PRESUMED TO APPROXIMATE THE NGVD29(47) DATUM USED BY CLARK COUNTY.
4. RIVER STAGE MEASUREMENTS FROM NOAA STATION ID 9440083 VANCOUVER, WASHINGTON FROM 8:14 AM TO 9:10 AM ON MARCH 19, 2018.
5. RIVER STAGE CONVERTED FROM CRD TO NGVD29(47) ASSUMING CRD IS 1.82 FEET ABOVE NGVD29(47).

N

0 200 400

Approximate Scale in Feet

LEGEND

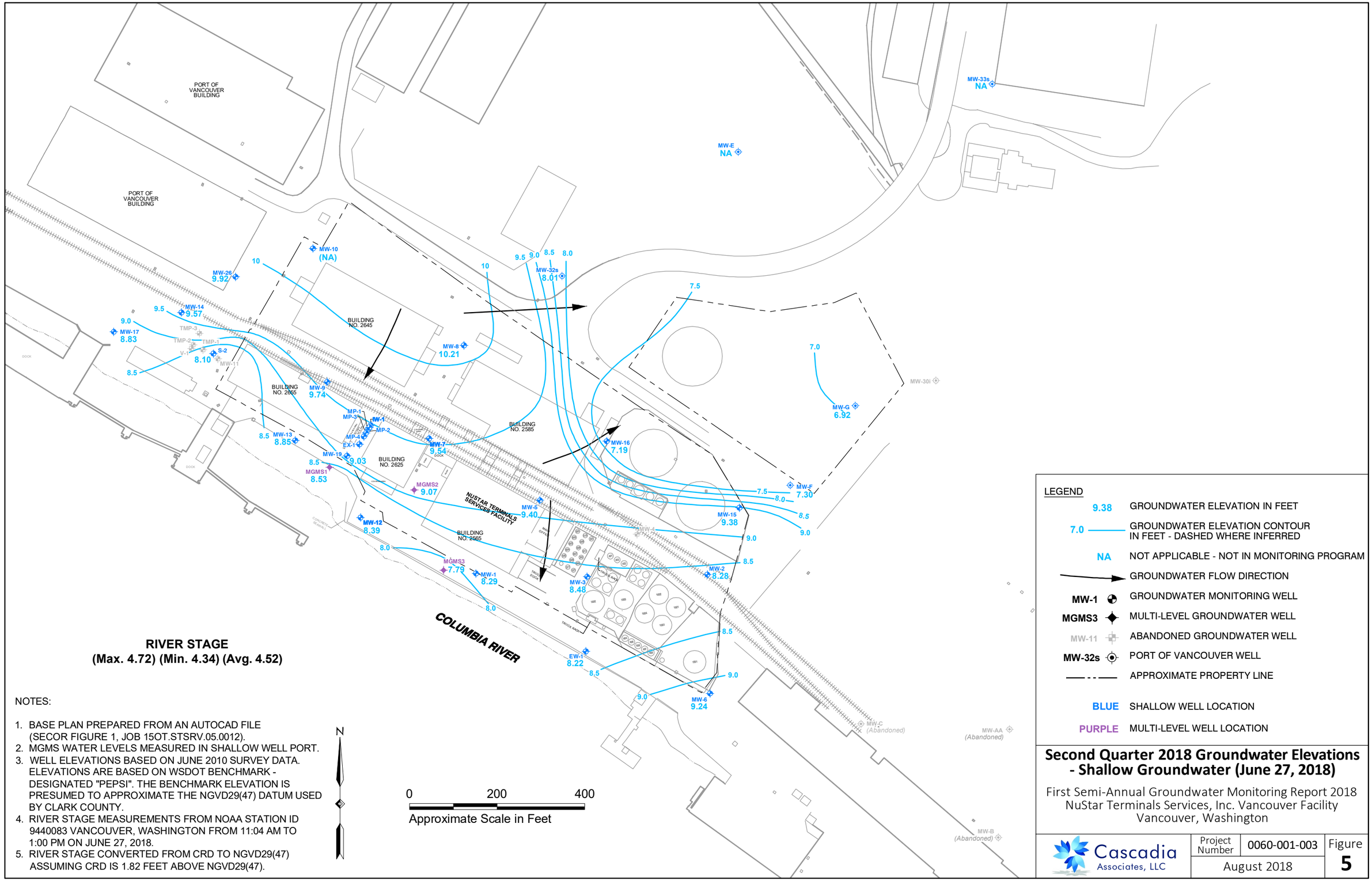
8.17	GROUNDWATER ELEVATION IN FEET
(9.42)	NOT USED FOR CONTOURING - THERE WERE PHYSICAL COMPLICATIONS ASSOCIATED WITH GAUGING THIS MONITORING WELL
8.0	GROUNDWATER ELEVATION CONTOUR IN FEET - DASHED WHERE INFERRED
NA	NOT APPLICABLE - NOT IN MONITORING PROGRAM
	GROUNDWATER FLOW DIRECTION
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-11	ABANDONED GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL
	APPROXIMATE PROPERTY LINE
GREEN	INTERMEDIATE WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

First Quarter 2018 Groundwater Elevations - Intermediate Groundwater (March 19, 2018)

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure 4
August 2018		



RIVER STAGE
(Max. 4.72) (Min. 4.34) (Avg. 4.52)

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. WELL ELEVATIONS BASED ON JUNE 2010 SURVEY DATA. ELEVATIONS ARE BASED ON WSDOT BENCHMARK - DESIGNATED "PEPSI". THE BENCHMARK ELEVATION IS PRESUMED TO APPROXIMATE THE NGVD29(47) DATUM USED BY CLARK COUNTY.
4. RIVER STAGE MEASUREMENTS FROM NOAA STATION ID 9440083 VANCOUVER, WASHINGTON FROM 11:04 AM TO 1:00 PM ON JUNE 27, 2018.
5. RIVER STAGE CONVERTED FROM CRD TO NGVD29(47) ASSUMING CRD IS 1.82 FEET ABOVE NGVD29(47).

LEGEND

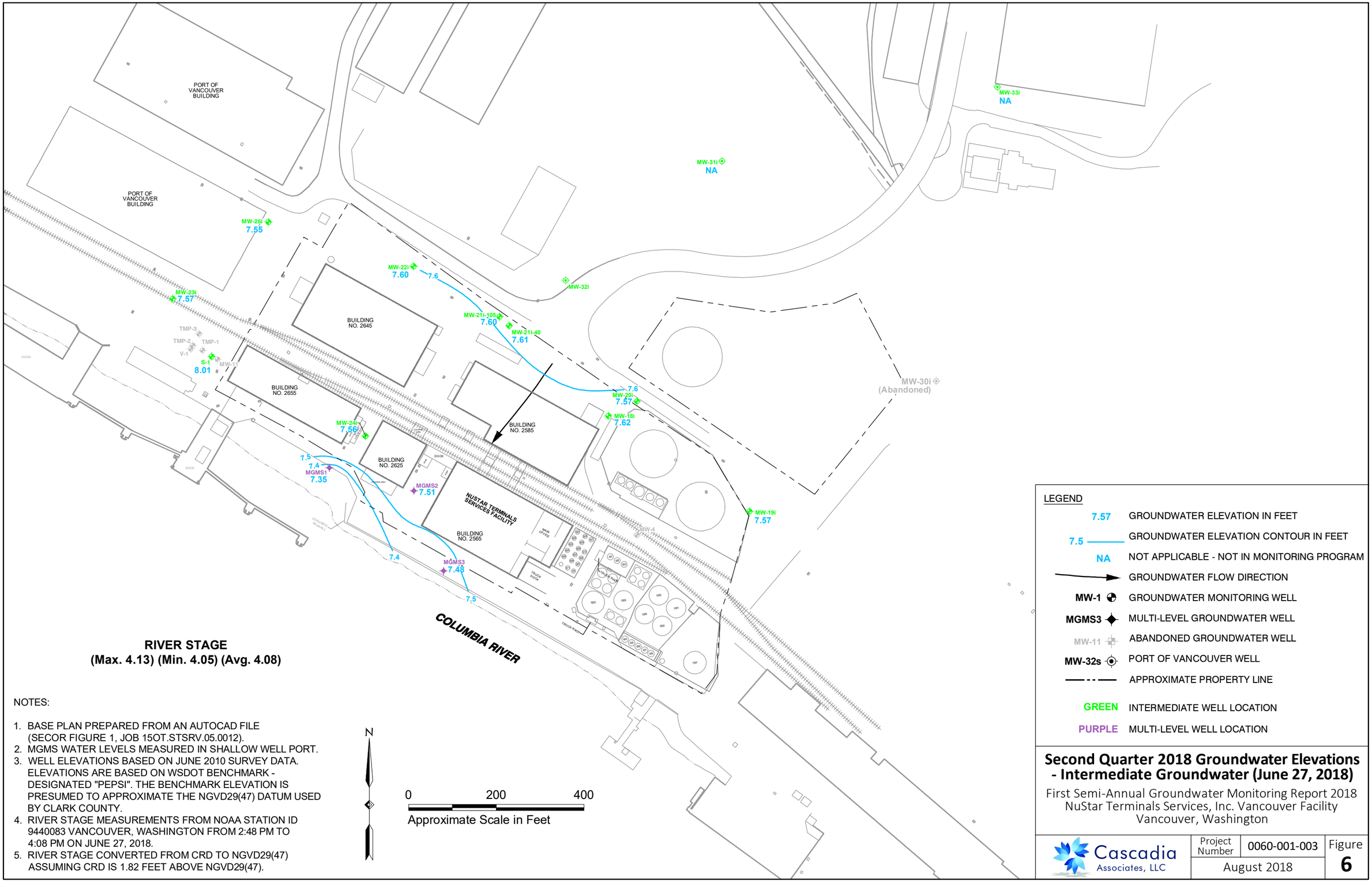
9.38	GROUNDWATER ELEVATION IN FEET
7.0	GROUNDWATER ELEVATION CONTOUR IN FEET - DASHED WHERE INFERRED
NA	NOT APPLICABLE - NOT IN MONITORING PROGRAM
	GROUNDWATER FLOW DIRECTION
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-11	ABANDONED GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL
	APPROXIMATE PROPERTY LINE
BLUE	SHALLOW WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Second Quarter 2018 Groundwater Elevations - Shallow Groundwater (June 27, 2018)

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure
	August 2018	5



RIVER STAGE
(Max. 4.13) (Min. 4.05) (Avg. 4.08)

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. WELL ELEVATIONS BASED ON JUNE 2010 SURVEY DATA. ELEVATIONS ARE BASED ON WSDOT BENCHMARK - DESIGNATED "PEPSI". THE BENCHMARK ELEVATION IS PRESUMED TO APPROXIMATE THE NGVD29(47) DATUM USED BY CLARK COUNTY.
4. RIVER STAGE MEASUREMENTS FROM NOAA STATION ID 9440083 VANCOUVER, WASHINGTON FROM 2:48 PM TO 4:08 PM ON JUNE 27, 2018.
5. RIVER STAGE CONVERTED FROM CRD TO NGVD29(47) ASSUMING CRD IS 1.82 FEET ABOVE NGVD29(47).

N

0 200 400

Approximate Scale in Feet

LEGEND

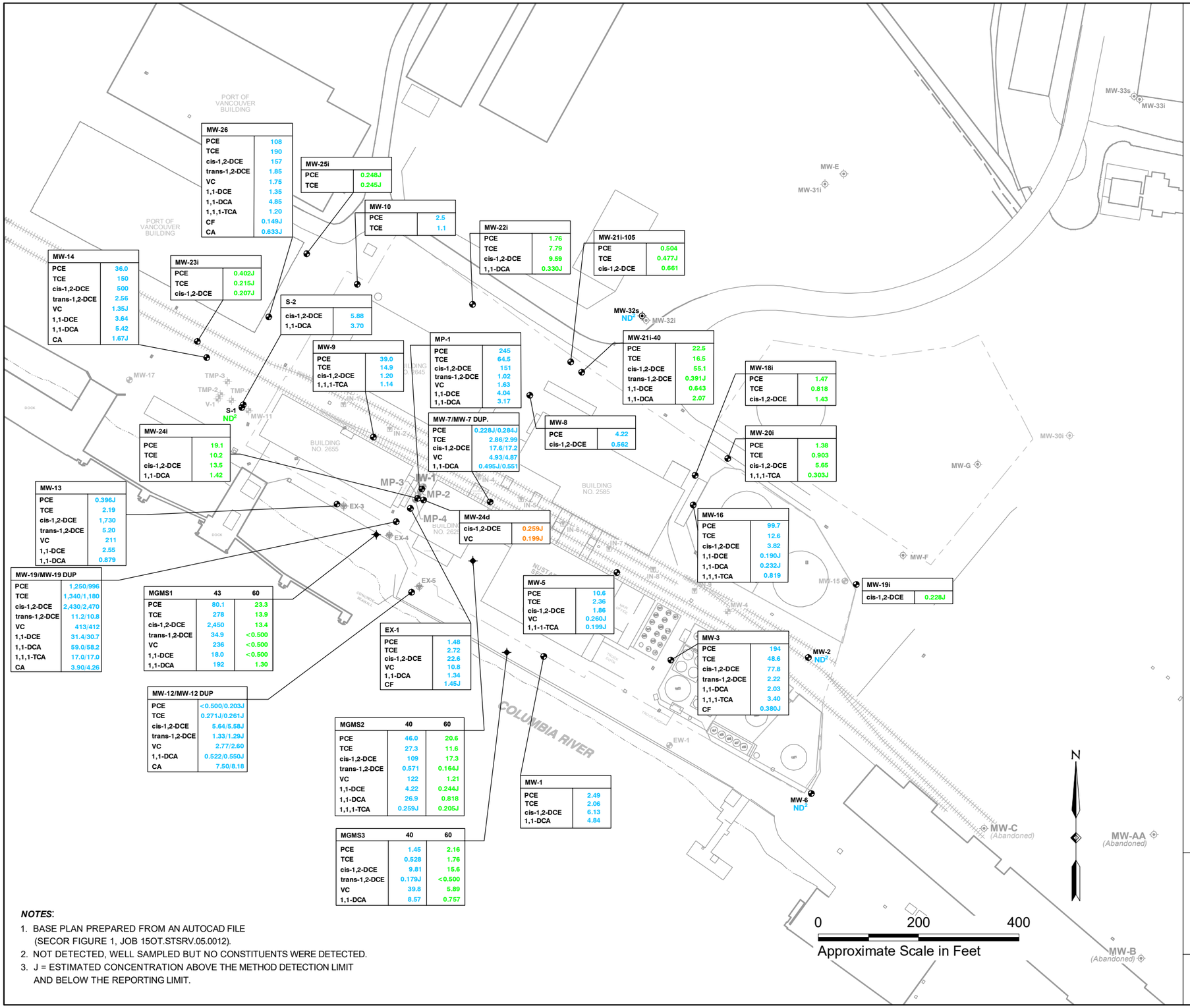
7.57	GROUNDWATER ELEVATION IN FEET
7.5	GROUNDWATER ELEVATION CONTOUR IN FEET
NA	NOT APPLICABLE - NOT IN MONITORING PROGRAM
	GROUNDWATER FLOW DIRECTION
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-11	ABANDONED GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL
	APPROXIMATE PROPERTY LINE
GREEN	INTERMEDIATE WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Second Quarter 2018 Groundwater Elevations - Intermediate Groundwater (June 27, 2018)

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

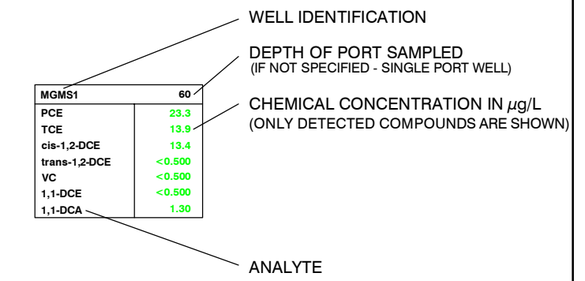
Project Number	0060-001-003	Figure
August 2018		6



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. NOT DETECTED, WELL SAMPLED BUT NO CONSTITUENTS WERE DETECTED.
3. J = ESTIMATED CONCENTRATION ABOVE THE METHOD DETECTION LIMIT AND BELOW THE REPORTING LIMIT.

LEGEND



EX-3	GROUNDWATER EXTRACTION WELL
IN-1	GROUNDWATER INJECTION WELL
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-11	ABANDONED GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL

BLUE	SHALLOW ZONE CONCENTRATION DATA (DEPTHS OF 0 TO 45 FEET)
GREEN	INTERMEDIATE ZONE CONCENTRATION DATA (DEPTHS OF 45 TO 100 FEET)
ORANGE	DEEP ZONE CONCENTRATION DATA (DEPTHS OVER 100 FEET)

ABBREVIATIONS

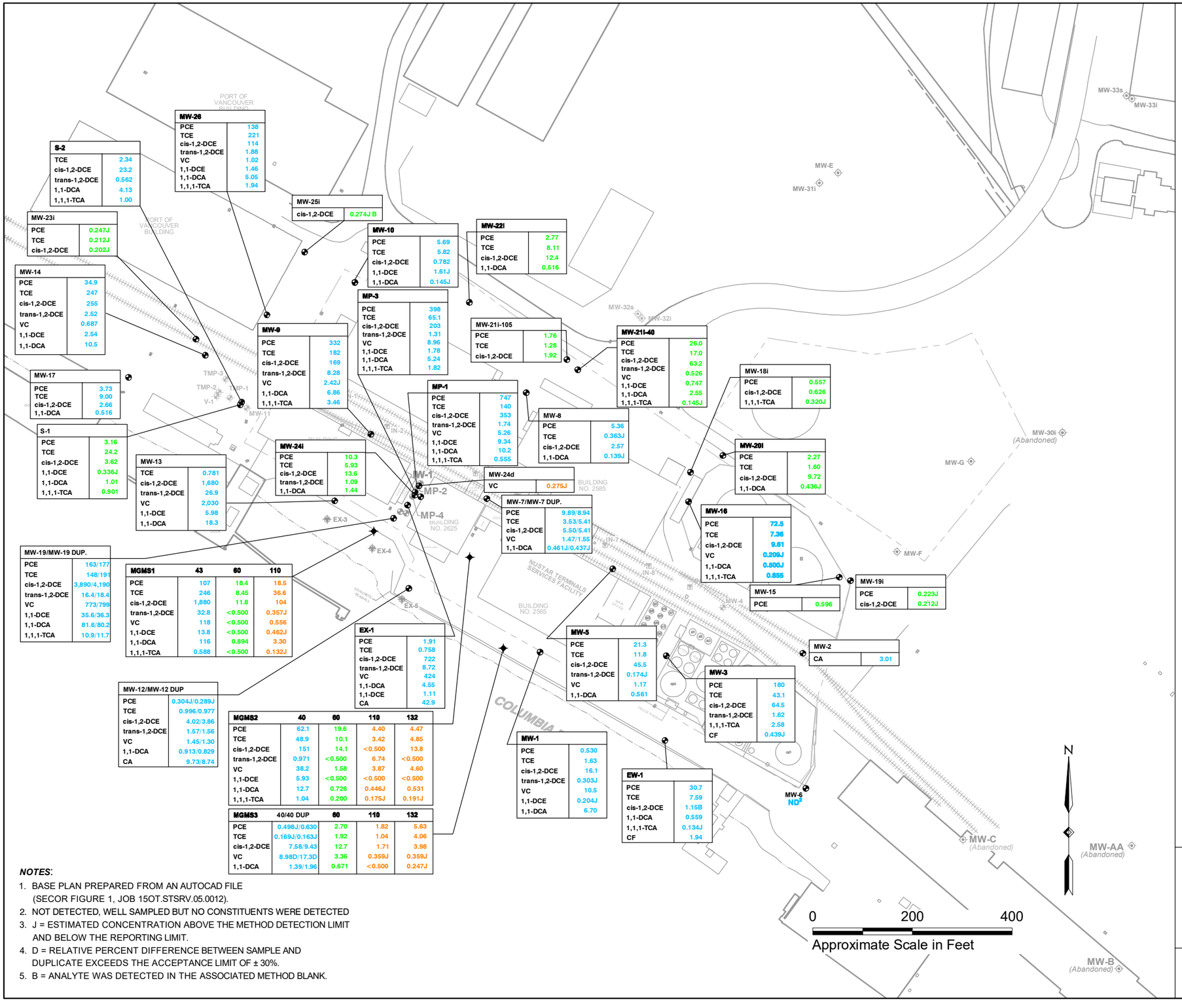
PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE
cis-1,2-DCE	CIS-1,2-DICHLOROETHENE
trans-1,2-DCE	TRANS-1,2-DICHLOROETHENE
VC	VINYL CHLORIDE
1,1-DCE	1,1-DICHLOROETHENE
1,1-DCA	1,1-DICHLOROETHANE
1,1,1-TCA	1,1,1-TRICHLOROETHANE
CF	CHLOROFORM
CA	CHLOROETHANE

First Quarter 2018 Groundwater Concentrations (March 2018)

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure
August 2018		7



S-2	
TCE	2.34
cis-1,2-DCE	23.2
trans-1,2-DCE	0.562
1,1-DCA	4.13
1,1,1-TCA	1.00

MW-26	
PCE	138
TCE	221
cis-1,2-DCE	114
trans-1,2-DCE	1.88
VC	1.02
1,1-DCE	1.46
1,1-DCA	5.05
1,1,1-TCA	1.94

MW-25i	
cis-1,2-DCE	0.274J B

MW-23i	
PCE	0.247J
TCE	0.212J
cis-1,2-DCE	0.202J

MW-10	
PCE	5.69
TCE	5.82
cis-1,2-DCE	0.782
1,1-DCE	1.61J
1,1-DCA	0.145J

MW-22i	
PCE	2.77
TCE	8.11
cis-1,2-DCE	12.4
1,1-DCA	0.516

MW-14	
PCE	34.9
TCE	247
cis-1,2-DCE	255
trans-1,2-DCE	2.52
VC	0.687
1,1-DCE	2.54
1,1-DCA	10.5

MP-3	
PCE	398
TCE	65.1
cis-1,2-DCE	203
trans-1,2-DCE	1.31
VC	8.96
1,1-DCE	1.78
1,1-DCA	5.24
1,1,1-TCA	1.82

MW-9	
PCE	332
TCE	182
cis-1,2-DCE	169
trans-1,2-DCE	8.28
VC	2.42J
1,1-DCA	6.86
1,1,1-TCA	3.46

MW-21i-105	
PCE	1.76
TCE	1.28
cis-1,2-DCE	1.92

MW-21i-40	
PCE	26.0
TCE	17.0
cis-1,2-DCE	63.2
trans-1,2-DCE	0.526
VC	0.747
1,1-DCE	2.55
1,1,1-TCA	0.145J

MW-17	
PCE	3.73
TCE	9.00
cis-1,2-DCE	2.66
1,1-DCA	0.516

MP-1	
PCE	747
TCE	140
cis-1,2-DCE	353
trans-1,2-DCE	1.74
VC	5.26
1,1-DCE	9.34
1,1-DCA	10.2
1,1,1-TCA	0.555

MW-8	
PCE	5.36
TCE	0.363J
cis-1,2-DCE	2.57
1,1-DCA	0.139J

MW-18i	
PCE	0.557
cis-1,2-DCE	0.626
1,1,1-TCA	0.320J

S-1	
PCE	3.16
TCE	24.2
cis-1,2-DCE	3.62
1,1-DCE	0.336J
1,1-DCA	1.01
1,1,1-TCA	0.901

MW-13	
TCE	0.781
cis-1,2-DCE	1,680
trans-1,2-DCE	26.9
VC	2,030
1,1-DCE	5.98
1,1-DCA	18.3

MW-24i	
PCE	10.3
TCE	5.93
cis-1,2-DCE	13.6
trans-1,2-DCE	1.09
1,1-DCA	1.44

MW-24d	
VC	0.275J

MW-20i	
PCE	2.27
TCE	1.60
cis-1,2-DCE	9.72
1,1-DCA	0.436J

MW-7/MW-7 DUP.	
PCE	9.89/8.94
TCE	3.53/5.41
cis-1,2-DCE	5.50/5.41
VC	1.47/1.55
1,1-DCA	0.461J/0.437J

MW-16	
PCE	72.5
TCE	7.36
cis-1,2-DCE	9.61
VC	0.209J
1,1-DCA	0.500J
1,1,1-TCA	0.855

MW-15	
PCE	0.596

MW-19i	
PCE	0.223J
cis-1,2-DCE	0.212J

MW-19/MW-19 DUP.	
PCE	163/177
TCE	148/191
cis-1,2-DCE	3,890/4,190
trans-1,2-DCE	16.4/18.4
VC	773/799
1,1-DCE	35.6/36.3
1,1-DCA	81.6/80.2
1,1,1-TCA	10.9/11.7

MGMS1	43	60	110
PCE	107	18.4	18.5
TCE	246	8.45	36.6
cis-1,2-DCE	1,880	11.8	104
trans-1,2-DCE	32.8	<0.500	0.357J
VC	118	<0.500	0.556
1,1-DCE	13.8	<0.500	0.462J
1,1-DCA	116	0.894	3.30
1,1,1-TCA	0.588	<0.500	0.132J

EX-1	
PCE	1.91
TCE	0.758
cis-1,2-DCE	722
trans-1,2-DCE	8.72
VC	424
1,1-DCA	4.55
1,1-DCE	1.11
CA	42.9

MW-5	
PCE	21.3
TCE	11.8
cis-1,2-DCE	45.5
trans-1,2-DCE	0.174J
VC	1.17
1,1-DCA	0.561

MW-2	
CA	3.01

MW-3	
PCE	180
TCE	43.1
cis-1,2-DCE	64.5
trans-1,2-DCE	1.62
1,1,1-TCA	2.58
CF	0.439J

MW-12/MW-12 DUP	
PCE	0.304J/0.289J
TCE	0.996/0.977
cis-1,2-DCE	4.02/3.86
trans-1,2-DCE	1.57/1.56
VC	1.45/1.30
1,1-DCA	0.913/0.829
CA	9.73/8.74

MGMS2	40	60	110	132
PCE	62.1	19.6	4.40	4.47
TCE	48.9	10.1	3.42	4.85
cis-1,2-DCE	151	14.1	<0.500	13.8
trans-1,2-DCE	0.971	<0.500	6.74	<0.500
VC	38.2	1.58	3.87	4.60
1,1-DCE	5.93	<0.500	<0.500	<0.500
1,1-DCA	12.7	0.726	0.446J	0.531
1,1,1-TCA	1.04	0.200	0.175J	0.191J

MW-1	
PCE	0.530
TCE	1.63
cis-1,2-DCE	16.1
trans-1,2-DCE	0.303J
VC	10.5
1,1-DCE	0.204J
1,1-DCA	6.70

EW-1	
PCE	30.7
TCE	7.59
cis-1,2-DCE	1.15B
1,1-DCA	0.559
1,1,1-TCA	0.134J
CF	1.94

MGMS3	40/40 DUP	60	110	132
PCE	0.498J/0.630	2.70	1.82	5.63
TCE	0.169J/0.163J	1.92	1.04	4.06
cis-1,2-DCE	7.58/9.43	12.7	1.71	3.98
VC	8.98D/17.3D	3.36	0.359J	0.359J
1,1-DCA	1.39/1.96	0.671	<0.500	0.247J

LEGEND

MGMS1	60
PCE	18.4
TCE	8.45
cis-1,2-DCE	11.8
trans-1,2-DCE	<0.500
VC	<0.500JB
1,1-DCE	<0.500
1,1-DCA	0.894
1,1,1-TCA	<0.500

WELL IDENTIFICATION

DEPTH OF PORT SAMPLED
(IF NOT SPECIFIED - SINGLE PORT WELL)

CHEMICAL CONCENTRATION IN µg/L
(ONLY DETECTED COMPOUNDS ARE SHOWN)

ANALYTE

EX-3 GROUNDWATER EXTRACTION WELL

IN-1 GROUNDWATER INJECTION WELL

MW-1 GROUNDWATER MONITORING WELL

MGMS3 MULTI-LEVEL GROUNDWATER WELL

MW-11 ABANDONED GROUNDWATER WELL

MW-32s PORT OF VANCOUVER WELL

BLUE SHALLOW ZONE CONCENTRATION DATA (DEPTHS OF 0 TO 45 FEET)

GREEN INTERMEDIATE ZONE CONCENTRATION DATA (DEPTHS OF 45 TO 100 FEET)

ORANGE DEEP ZONE CONCENTRATION DATA (DEPTHS OVER 100 FEET)

ABBREVIATIONS

PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE
cis-1,2-DCE	CIS-1,2-DICHLOROETHENE
trans-1,2-DCE	TRANS-1,2-DICHLOROETHENE
VC	VINYL CHLORIDE
1,1-DCE	1,1-DICHLOROETHENE
1,1-DCA	1,1-DICHLOROETHANE
1,1,1-TCA	1,1,1-TRICHLOROETHANE
1,1,2-TCA	1,1,2-TRICHLOROETHANE
CF	CHLOROFORM
CA	CHLOROETHANE

NOTES:

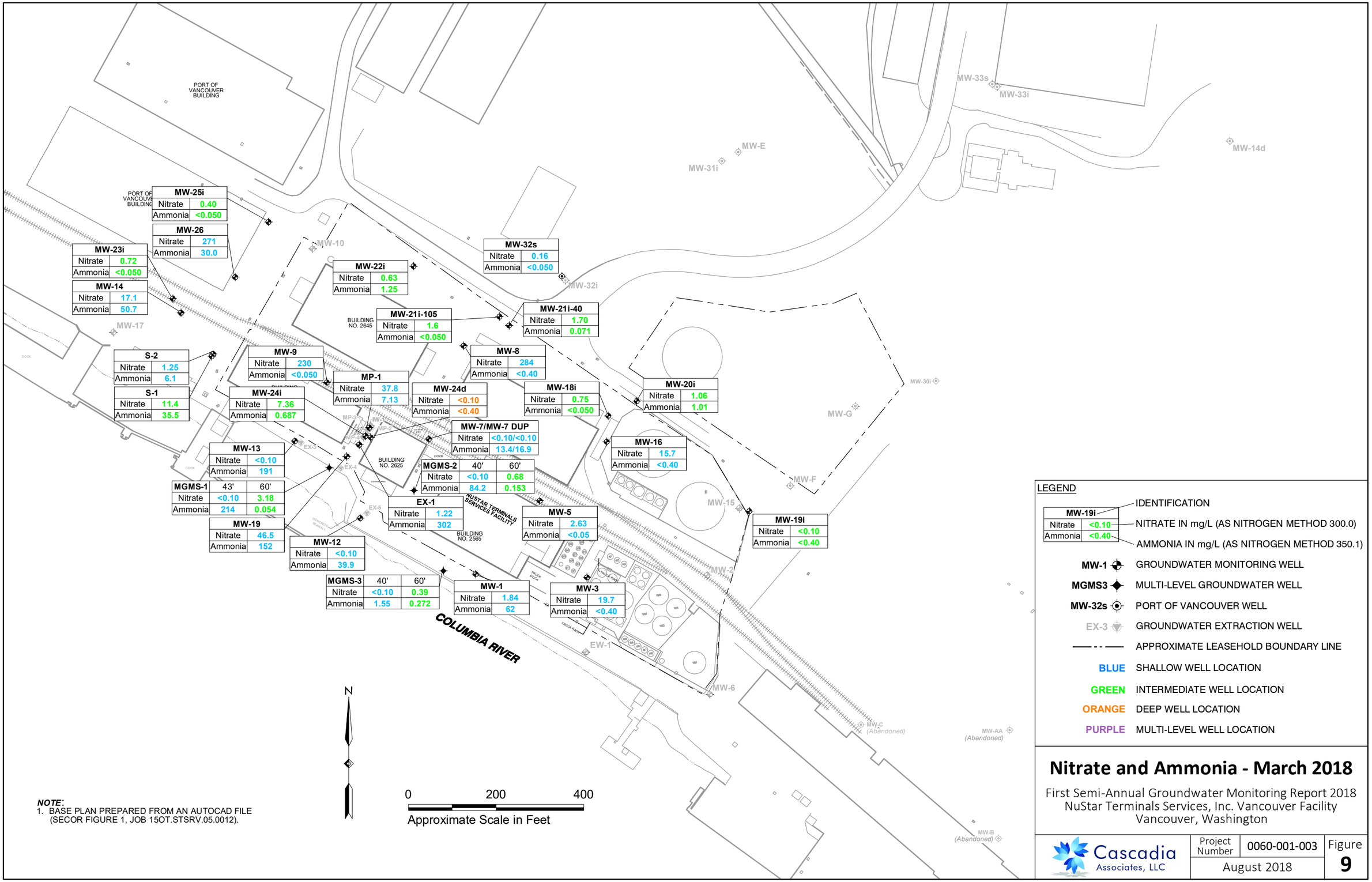
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. NOT DETECTED, WELL SAMPLED BUT NO CONSTITUENTS WERE DETECTED
3. J = ESTIMATED CONCENTRATION ABOVE THE METHOD DETECTION LIMIT AND BELOW THE REPORTING LIMIT.
4. D = RELATIVE PERCENT DIFFERENCE BETWEEN SAMPLE AND DUPLICATE EXCEEDS THE ACCEPTANCE LIMIT OF ± 30%.
5. B = ANALYTE WAS DETECTED IN THE ASSOCIATED METHOD BLANK.

Second Quarter 2018 Groundwater Concentrations (June/July 2018)

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure 8
August 2018		



LEGEND

MW-19i / Nitrate <0.10 / Ammonia <0.40	IDENTIFICATION; NITRATE IN mg/L (AS NITROGEN METHOD 300.0); AMMONIA IN mg/L (AS NITROGEN METHOD 350.1)
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL
EX-3	GROUNDWATER EXTRACTION WELL
	APPROXIMATE LEASEHOLD BOUNDARY LINE
BLUE	SHALLOW WELL LOCATION
GREEN	INTERMEDIATE WELL LOCATION
ORANGE	DEEP WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

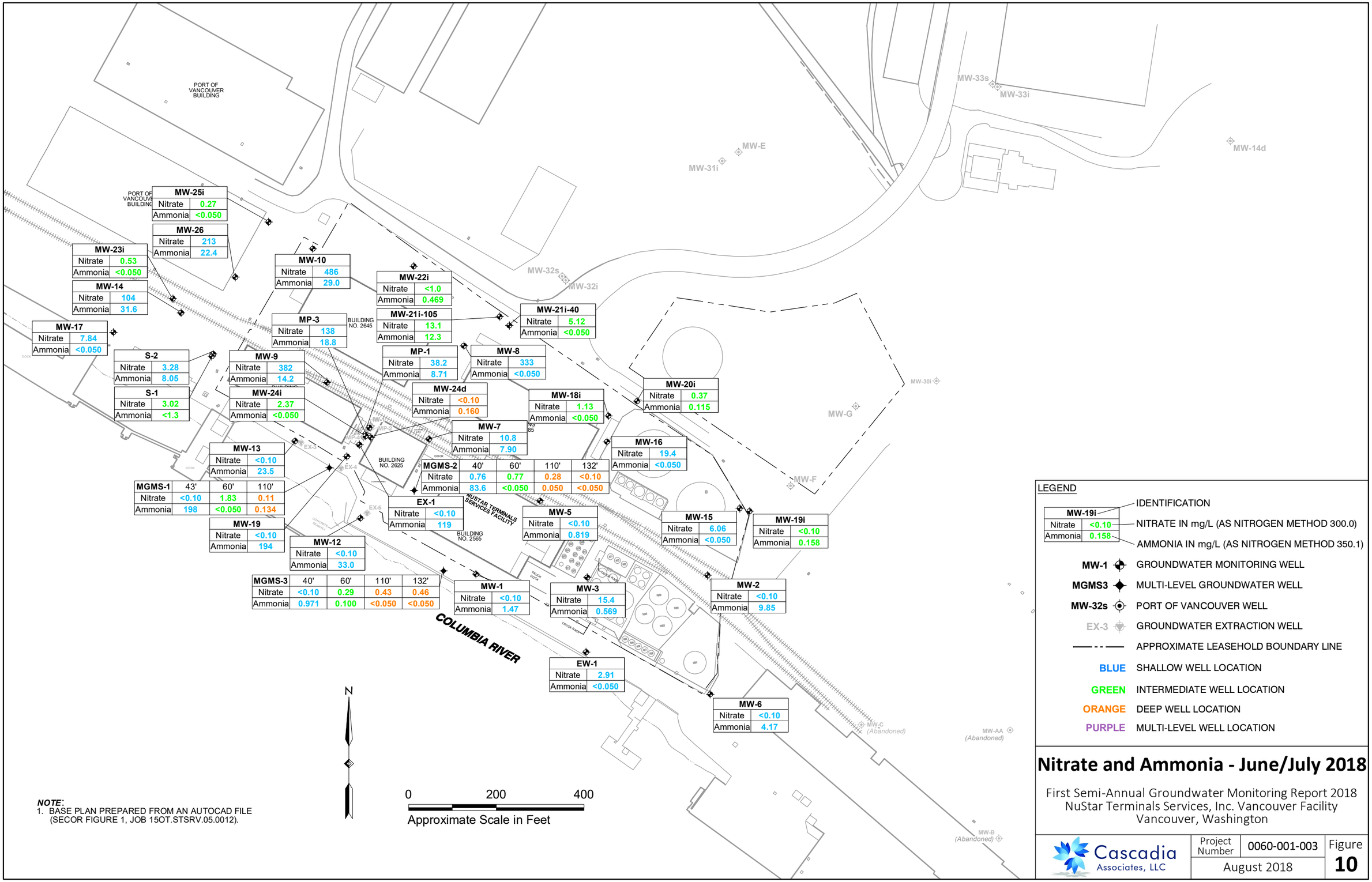
NOTE:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).

Nitrate and Ammonia - March 2018

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure
August 2018		9



NOTE:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).

LEGEND

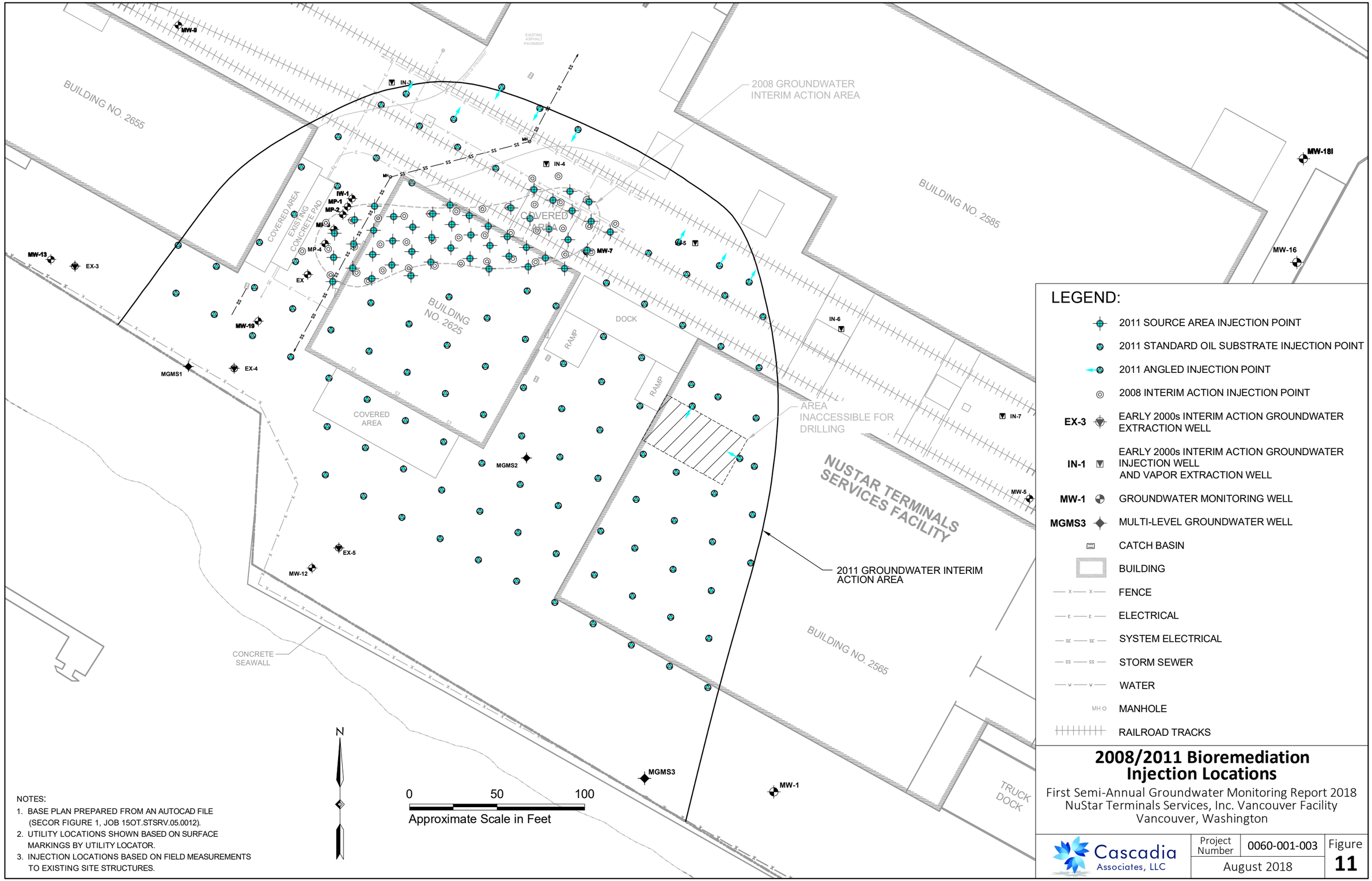
MW-19i	IDENTIFICATION
Nitrate <0.10	NITRATE IN mg/L (AS NITROGEN METHOD 300.0)
Ammonia 0.158	AMMONIA IN mg/L (AS NITROGEN METHOD 350.1)
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL
MW-32s	PORT OF VANCOUVER WELL
EX-3	GROUNDWATER EXTRACTION WELL
	APPROXIMATE LEASEHOLD BOUNDARY LINE
BLUE	SHALLOW WELL LOCATION
GREEN	INTERMEDIATE WELL LOCATION
ORANGE	DEEP WELL LOCATION
PURPLE	MULTI-LEVEL WELL LOCATION

Nitrate and Ammonia - June/July 2018

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure
August 2018		10



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.
3. INJECTION LOCATIONS BASED ON FIELD MEASUREMENTS TO EXISTING SITE STRUCTURES.

LEGEND:

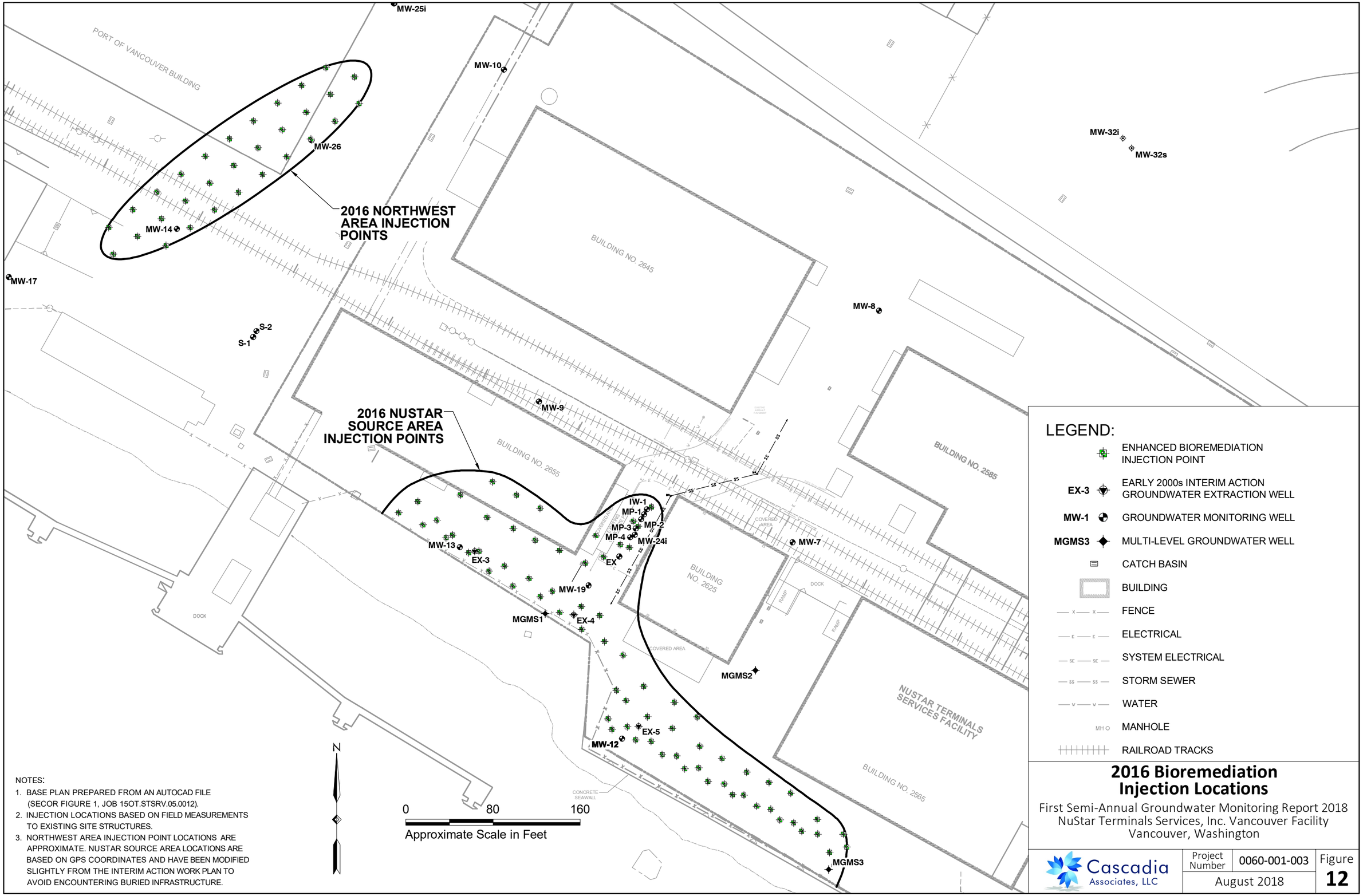
- 2011 SOURCE AREA INJECTION POINT
- 2011 STANDARD OIL SUBSTRATE INJECTION POINT
- 2011 ANGLED INJECTION POINT
- 2008 INTERIM ACTION INJECTION POINT
- **EX-3** EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- **IN-1** EARLY 2000s INTERIM ACTION GROUNDWATER INJECTION WELL AND VAPOR EXTRACTION WELL
- **MW-1** GROUNDWATER MONITORING WELL
- **MGMS3** MULTI-LEVEL GROUNDWATER WELL
- CATCH BASIN
- BUILDING
- FENCE
- ELECTRICAL
- SYSTEM ELECTRICAL
- STORM SEWER
- WATER
- MANHOLE
- RAILROAD TRACKS

2008/2011 Bioremediation Injection Locations

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure 11
August 2018		



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. INJECTION LOCATIONS BASED ON FIELD MEASUREMENTS TO EXISTING SITE STRUCTURES.
3. NORTHWEST AREA INJECTION POINT LOCATIONS ARE APPROXIMATE. NUSTAR SOURCE AREA LOCATIONS ARE BASED ON GPS COORDINATES AND HAVE BEEN MODIFIED SLIGHTLY FROM THE INTERIM ACTION WORK PLAN TO AVOID ENCOUNTERING BURIED INFRASTRUCTURE.

LEGEND:

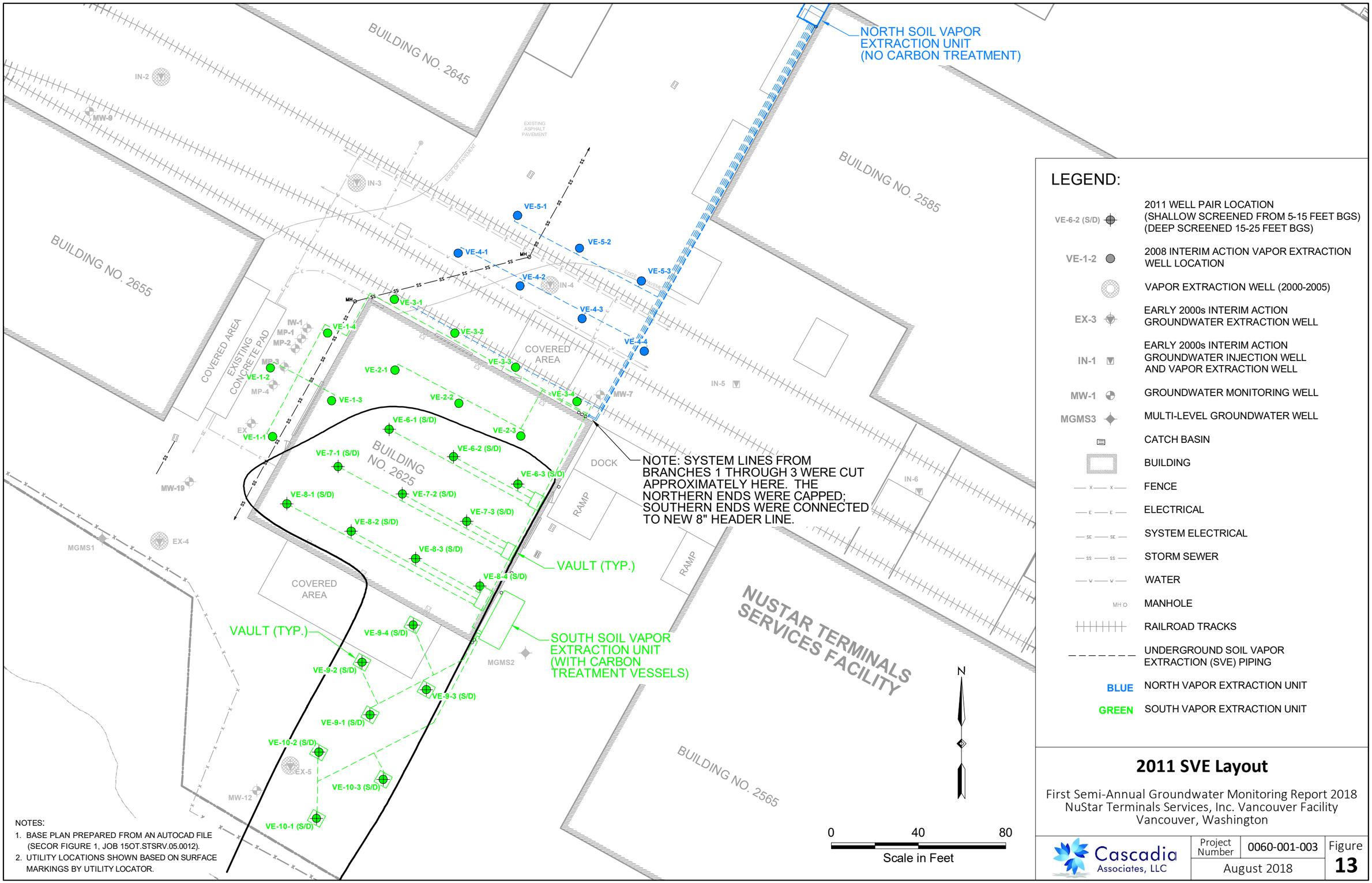
- ENHANCED BIOREMEDIATION INJECTION POINT
- EX-3 — EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- MW-1 — GROUNDWATER MONITORING WELL
- MGMS3 — MULTI-LEVEL GROUNDWATER WELL
- CATCH BASIN
- BUILDING
- FENCE
- ELECTRICAL
- SYSTEM ELECTRICAL
- STORM SEWER
- WATER
- MH — MANHOLE
- RAILROAD TRACKS

2016 Bioremediation Injection Locations

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure
August 2018		12



NOTES:

1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 15OT.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.

LEGEND:

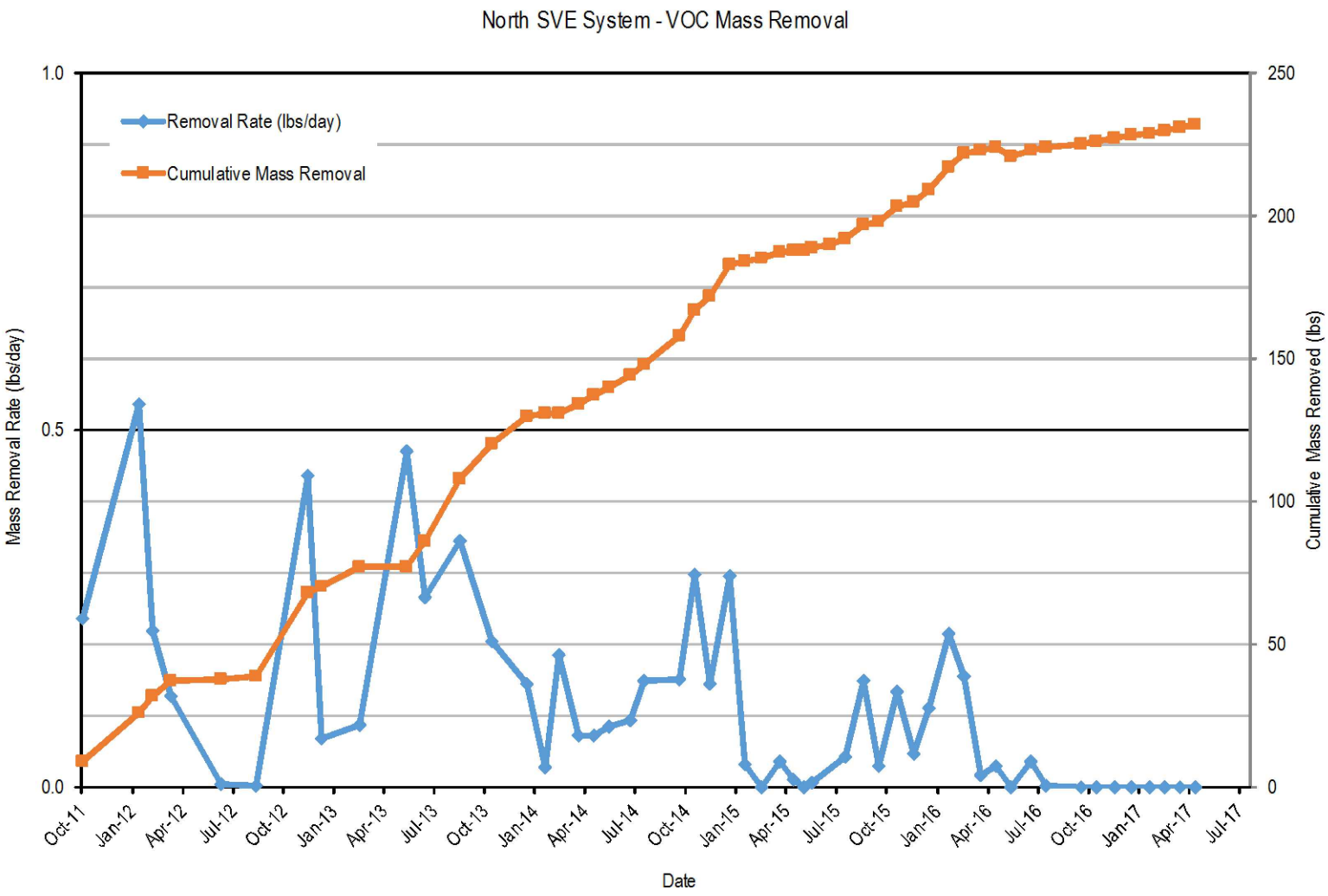
- VE-6-2 (S/D) — 2011 WELL PAIR LOCATION (SHALLOW SCREENED FROM 5-15 FEET BGS) (DEEP SCREENED 15-25 FEET BGS)
- VE-1-2 — 2008 INTERIM ACTION VAPOR EXTRACTION WELL LOCATION
- VAPOR EXTRACTION WELL (2000-2005)
- EX-3 — EARLY 2000s INTERIM ACTION GROUNDWATER EXTRACTION WELL
- IN-1 — EARLY 2000s INTERIM 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

2011 SVE Layout

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project Number	0060-001-003	Figure
August 2018		13



North SVE System - VOC Mass Removal

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project No.	0006-001-003	Figure
August 14, 2018		14

Drwn: JJT

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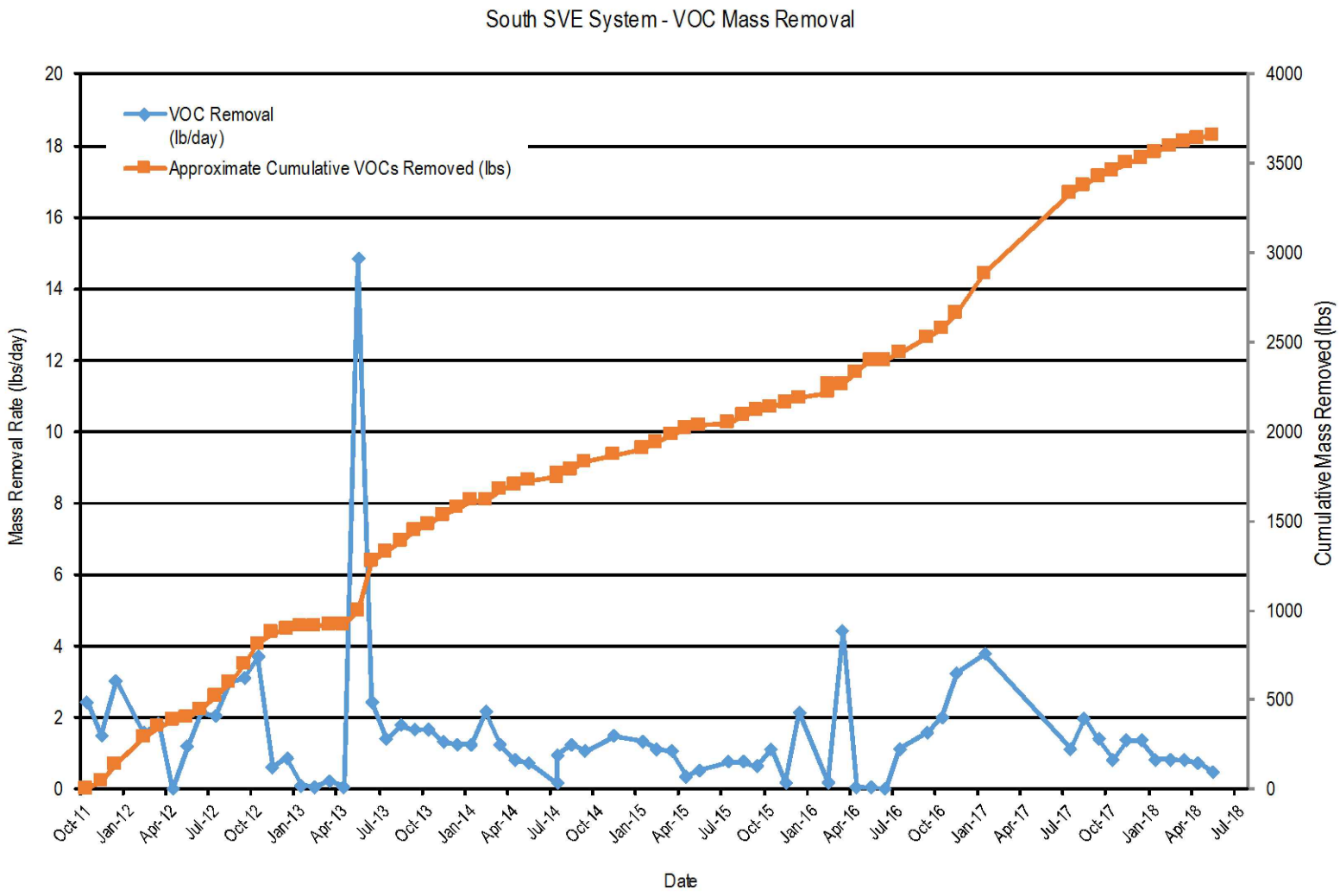

South SVE System - VOC Mass Removal

First Semi-Annual Groundwater Monitoring Report 2018
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Cascadia Associates, LLC

Project No.	0006-001-003	Figure
August 14, 2018		15

Drwn: JJT

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APPENDIX A

FIELD SAMPLING DATA SHEETS

WELL GAGING DATA SHEET

APEX

		Job Number:	1126-21
Client:	Nustar Van	Date:	3/19/18
Project:	GWM	Sampler:	KK/MM
Weather:	overcast	Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-32i	814	—	36.65	61.77	—		
MW-31i	821	—	26.46	76.74	—		
MW-22i	828	—	26.25	64.52	—		
MW-21i-10S	832	—	25.87	—	—		
MW-21i-40	835	—	25.98	50.90	—		
MW-20i	842	—	25.01	55.44	—		
MW-18i	839	—	25.22	70.89	—		
MW-19i	846	—	25.45	60.49	—		
MW-24i	852	—	25.21	64.24	—		
MW-25i	857	—	25.45	60.19	—		
MW-23i	904	—	25.59	65.00	—		
S-1	910	—	25.08	72.00	—		
MW-13	1047	—	25.17	37.15	—		
MW-14	1053	—	25.74	40.50	—		
MW-17	1058	—	24.64	38.16	—		
S-2	1108	—	25.21	49.50	—		
MW-24	1113	—	25.61	41.00	—		
MW-10	1120	—	26.14	37.30	—		
MW-32S	1127	—	26.38	30.35	—		
MW-E	1135	—	24.85	35.38	—		
MW-8	1144	—	25.36	40.41	—		
MW-16	1149	—	24.97	39.26	—		
MW-F	1154	—	26.24	28.20	—		
MW-6	1200	—	24.58	28.47	—		
MW-15	1205	—	30.95	41.79	—		
MW-2	1211	—	26.06	39.12	—		
MW-6	1217	—	24.50	34.80	—		sulfur odor
EW-1	1232	—	23.39	29.07	—		
MW-3	1237	—	26.28	34.59	—		
MW-1	1242	—	24.65	34.83	—		
MGMS-3-130	1247	—	24.02	—	—		
MGMS-3-110	1248	—	24.00	—	—		

WELL GAGING DATA SHEET

APEX

		Job Number:	1126-21
Client:	Nustar Van.	Date:	3/19/18
Project:	GWM	Sampler:	KK/MM
Weather:	Sunny	Time In/Out:	—

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MGMS3-60	1249	—	23.99	—	—		
MGMS3-40	1250	—	23.93	—	—		
MGMS2-132	1254	—	24.82	—	—		
MGMS2-110	1255	—	24.82	—	—		
MGMS2-60	1256	—	24.79	—	—		
MGMS2-40	1258	—	24.48	—	—		
MW-12	1301	—	23.48	40.00	—		
MW-9	1320	—	25.69	40.40	—		
MW-7	1326	—	25.53	39.94	—		
MW-5	1331	—	25.72	36.54	—		
MP-1	1335	—	25.81	33.84	—		
MP-2	1338	—	25.85	34.05	—		
MW-24D	1340	—	26.19	—	—		
MP-3	1342	—	25.67	33.60	—		
MP-4	1344	—	25.70	32.09	—		
EX	1349	—	25.57	31.32	—		
MW-19	1352	—	25.54	43.68	—		
MGMS1-132	1404	—	23.43	—	—		
MGMS1-60	1405	—	23.44	—	—		
MGMS1-40	1407	—	24.86	—	—		

WELL MONITORING DATA SHEET

APEX

Well I.D.	EX	Job Number:	1126-21
Client:	NuStar	Date:	3-21-18
Project:	VAN GWM	Sampler:	MM
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	4"	Water Height	–
Depth to Water:	25.46	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
1130			25.64	0.2	8.39	15.0	1122	4.76	124.2	–	AC
1133			25.70	0.2	8.43	17.1	1628	0.61	61.7	–	AC
1136			25.86	0.2	8.46	17.8	1636	0.22	45	–	AC
1139			25.91	0.2	8.43	17.9	1674	0.19	74.4	–	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	EX	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS
Sample Time:	1145	Final Depth to Water:	25.73	Did Well Dewater?	N

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HVOC	yes (no)			
1 x 125	–	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
2 x 40	HCl	RSK-175	yes (no)			
1 x 250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS1-43	Job Number:	1126-21
Client:	Nustar	Date:	3-22-18
Project:	VAN GORP	Sampler:	MM
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	NA	Water Height	-
Depth to Water:	24.~~MA~~95	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:	BUILT IN PUMP	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	DESIGNATED/ BUILT IN		

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			25.23	0.15	6.77	13.3	2528	0.76	94.1	-	C
1403			25.18	0.15	6.58	13.3	2770	5.95	55.2	-	C
1406			25.23	0.15	6.57	13.4	2820	8.46	25.4	-	C
1409			25.22	0.15	6.57	13.1	2822	9.75	4.1	-	C
1412			25.22	0.15	6.57	13.5	2836	10.35	-5.2	-	C
1415			25.22	0.15	6.56	13.7	2859	10.55	-9.4	-	C
1418			25.25	0.15	6.58	14.0	2874	10.71	-11.7	-	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS1-43	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE IACS
Sample Time:	1421	Final Depth to Water:	25.02	Did Well Dewater?	N

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HVOC	yes (no)			
1 x 125	-	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
2 x 40	HCl	RSK-175	yes (no)			
1 x 250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

MGMS1-60

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS1-60	Job Number:	1126-21
Client:	NuStar	Date:	3-22-18
Project:	VAN OWM	Sampler:	MM
Weather:	OVERCAST / ~~MM~~ RAIN	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	NA	Water Height	-
Depth to Water:	24.83	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:	BUILT IN PUMP	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Type:	DESIGNATED/BUILT IN

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
1337			24.86	0.15	7.85	11.7	519	6.32	13.2	-	C
1335			24.86	0.15	7.22	13.1	251	0.92	4.2	-	C
1338			24.86	0.15	7.24	12.5	227	0.84	-4.8	-	C
1341			24.86	0.15	7.16	12.5	208	0.80	-0.1	-	C
1344			24.86	0.15	7.14	12.6	203	0.87	3.4	-	C
1347			24.88	0.15	7.10	12.5	200	0.84	8.5	-	C

15.00

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS1-60	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE / ALS
Sample Time:	1350	Final Depth to Water:	24.86	Did Well Dewater?	N

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40ml	HCl	HVOC	yes ~~no~~			
1x 125 ml	—	NO_2, NO_3	yes ~~no~~			
1x 125 ml	H_2SO_4	NH_3	yes ~~no~~			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS2-40	Job Number:	1126-21
Client:	NuStar	Date:	3-22-18
Project:	VAN GWM	Sampler:	MM
Weather:	OVERCAST / LT. RAIN	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	NA	Water Height	–
Depth to Water:	24.53	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	

23.01

PURGING DATA

Purge Method:	BUILT IN PUMP	Pump Intake Depth:	MS	Comments				
Sampling Method:	LF	Tubing Type:	DESIGNATED/BUILT IN					

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
1253			25.53	0.15	6.80	13.4	1538	0.62	-12.8	–	C
1256			26.55	0.15	6.83	13.6	1722	2.15	-87.5	–	C
1259			26.57	0.15	6.82	13.8	1764	5.70	-101.6	–	C
1302			26.57	0.15	6.83	14.0	1773	6.43	-106.7	–	C
1305			26.57	0.15	6.82	13.9	1765	6.87	-111.1	–	C
1308			26.59	0.15	6.80	13.9	1773	6.89	-112.9	–	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS2-40	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE/ALS
Sample Time:	1311	Final Depth to Water:	24.54	Did Well Dewater?	N

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOC	yes (no)			
1x125	–	NO_2, NO_3	yes (no)			
1x125	H_2SO_4	NH_3	yes (no)			
2x40	HCl	RSK-175	yes (no)			
1x250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS2-60	Job Number:	1126-21
Client:	NuStar	Date:	3-22-18
Project:	VAN GWM	Sampler:	MM
Weather:	OVERCAST / LT RAIN	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	NA	Water Height	–
Depth to Water:	24.24	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:	BUILT IN PUMP	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	DESIGNATED / BUILTIN	

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
1233			24.24	0.15	6.97	13.0	209.0	0.72	-11.7	–	C
1236			24.25	0.15	6.84	14.0	165.3	0.37	-0.7	–	C
1239			24.26	0.15	6.86	14.0	160.8	0.35	2.2	–	C
1242			24.27	0.15	6.85	13.9	159.5	0.36	9.7	–	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS2-60	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE IALS
Sample Time:	1245	Final Depth to Water:	24.24	Did Well Dewater?	N

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HVOC	yes (no)			
1 x 125	–	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS3-40	Job Number:	1126-21
Client:	Nustar	Date:	3-22-18
Project:	VAN GWM	Sampler:	MM
Weather:	LT. RAIN / OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	NA	Water Height	-
Depth to Water:	23.38	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:	BUILT IN PUMP	Pump Intake Depth:	MS DESIGNATED / BUILT IN	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
1153			23.42	0.15	6.61	12.8	633	0.65	-51.2	-	C
1156			23.42	0.15	6.61	13.3	855	0.36	-104.6	-	C
1159			23.43	0.15	6.62	13.5	925	4.83	-116.7	-	C
1202			23.43	0.15	6.62	13.5	924	6.41	-122.4	-	C
1205			23.43	0.15	6.63	13.6	926	6.80	-126.0	-	C
1208			23.43	0.15	6.63	13.8	925	6.95	-130.8	-	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-40	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE/ALS
Sample Time:	1211	Final Depth to Water:	23.43	Did Well Dewater?	N

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOCs	yes (no)			
1x125	-	NO_2, NO_3	yes (no)			
1x125	H_2SO_4	NH_3	yes (no)			
2x40	HCl	RSK-175	yes (no)			
1x250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS3-60	Job Number:	1126-21
Client:	Nustar	Date:	3-22-18
Project:	VAN Gulm	Sampler:	MM
Weather:	RAIN	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	NA	Water Height	–
Depth to Water:	23.23	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:	BULT IN PUMP	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
1131			23.25	0.15	6.97	11.7	150	1.61	60.3	–	C
1134			23.24	0.15	6.93	12.2	150	2.41	61.7	–	C
1137			23.29	0.15	6.83	12.1	150	2.97	65.9	–	C
1140			23.30	0.15	6.84	12.3	150	2.91	68.0	–	C
1143			23.32	0.15	6.86	12.5	152	3.21	71.4	–	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-60	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE/ALS
Sample Time:	1146	Final Depth to Water:	23.29	Did Well Dewater?	N

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	VOCs	yes (no)			
1 x 125	–	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MP-1	Job Number:	1126-21
Client:	NuStar	Date:	3-21-18
Project:	VAN GWM	Sampler:	MM
Weather:	LT. RAIN	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.77	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
1258			25.85	0.2	7.30	11.1	656	6.91	180.7	-	C
1301			25.89	0.2	7.09	12.7	763	1.89	182.9	-	C
1304			25.89	0.2	7.04	13.4	886	0.71	180.9	-	C
1307			25.89	0.2	7.03	13.5	946	0.47	179.4	-	C
1310			25.90	0.2	7.02	13.5	946	0.41	177.6	-	C
1313			25.96	0.2	7.03	13.8	967	0.36	175.8	-	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MP-1	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS	
Sample Time:	1316	Final Depth to Water:	25.80	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	VOC	yes (no)			
1 x 125	-	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
2 x 40	HCl	RSK-175	yes (no)			
1 x 250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-1	Job Number:	1126-21
Client:	Nustar Van	Date:	3/20/18
Project:	Vancouver GWM	Sampler:	KK
Weather:	Sunny	Time In/Out:	—

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	24.62	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			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
1128	—	—	24.70	0.25	6.51	14.7	351	1.67	36.9	—	C
1131	—	—	24.75	0.25	6.47	15.3	341.2	0.58	33.4	—	C
1134	—	—	24.81	0.25	6.48	15.3	339.6	0.47	28.2	—	C
1137	—	—	24.81	0.25	6.49	15.2	340.0	0.52	21.4	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-1	Sampling Flow Rate	0.25	Analytical Laboratory:	Pace/ALS	
Sample Time:	1140	Final Depth to Water:	24.70	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HVOC	yes (no)	—	—	—
1 x 125	—	NO_2, NO_3	yes (no)	—	—	—
1 x 125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-3	Job Number:	1126-21
Client:	NuStar	Date:	3-20-18
Project:	VAN GWM	Sampler:	MM, KK
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	26.30	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	
1056			26.33	0.2	8.03	10.3	458	8.08	-6.3	-	AC	
1059			26.33	0.2	6.62	12.1	483	2.70	13.8	-	AC	
1102			26.32	0.2	6.53	12.3	462	3.99	21.8	-	AC	
1105			26.34	0.2	6.53	12.2	451	4.37	29.2	-	AC	
1108			26.33	0.2	6.54	12.3	444	4.41	37.6	-	AC	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-3	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS	
Sample Time:	1111	Final Depth to Water:	26.32	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40	HCl	HVOC	yes (no)			
1x 125	-	NO_3, NO_2	yes (no)			
1x 125	~~HCl~~ H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-5	Job Number:	1126-21
Client:	NuStar	Date:	3-21-18
Project:	VAN GWM	Sampler:	MM
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.70	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:	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
0945			25.79	0.2	6.81	12.1	171	6.27	69.2	-	C
0948			25.80	0.2	6.21	14.4	145	2.49	86.5	-	C
0951			25.80	0.2	6.19	14.7	141	3.90	99.9	-	C
0954			25.80	0.2	6.21	14.7	138	4.12	107.2	-	C
0957			25.82	0.2	6.23	14.7	137	4.30	112	-	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-5	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE/ALS
Sample Time:	1000	Final Depth to Water:	25.70	Did Well Dewater?	N

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40	HCl	HVOC	yes (no)			
1x 125	-	NO_2, NO_3	yes (no)			
1x 125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-7	Job Number:	11126-21
Client:	Nustar	Date:	3-21-18
Project:	VAN GUM	Sampler:	MM
Weather:	FAIR/OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	4"	Water Height	–
Depth to Water:	25.48	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

											Comments
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
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0849			25.70	0.2	6.22	9.9	232	5.99	165.8	–	Cl
0852			25.77	0.2	6.14	13.4	295	0.55	61.2	–	Cl
0855			25.85	0.2	6.11	13.8	296	4.57	15.8	–	Cl
0858			25.87	0.2	6.11	14.0	294	5.61	10.2	–	SC
0901			25.89	0.2	6.10	13.9	291	6.01	9.6	–	SC
0904			25.91	0.2	6.10	14.1	291	6.03	10.5	–	SC
											↳ yellowish color

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-7	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE/ALS	
Sample Time:	0908	Final Depth to Water:	25.72	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HVOC	yes (no)			MW-7 DUP
1 x 125	–	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
2 x 40	HCl	RSK-175	yes (no)			
1 x 250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	~~MW-~~ 8	Job Number:	1126-21
Client:	NuStar	Date:	3-19-18
Project:	VAN GWM	Sampler:	MM, KK
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	4"	Water Height	-
Depth to Water:	25.21	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			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
1606			25.46	0.15	6.80	16.6	2226	7.60	200.5	—	AC
1603			25.52	0.15	6.20	15.6	2231	5.04	214.3	—	AC
1606			25.64	0.15	6.18	15.6	2235	4.46	218.2	—	AC
1609			25.73	0.15	6.18	15.7	2236	4.41	221.2	—	AC
1612			25.80	0.15	6.17	15.6	2231	4.36	~~221.2~~ 223.7	—	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-8	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE / ALS	
Sample Time:	1615	Final Depth to Water:		Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	1f VOCs	yes (no)			
1 x 125	—	NO_3, NO_2	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-9	Job Number:	1126-21
Client:	NuStar	Date:	3/21/18
Project:	VAN GWM	Sampler:	MM
Weather:	FAIR/COOL	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	4"	Water Height	–
Depth to Water:	26.66	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
0800			25.69	0.25	8.51	9.6	1498	0.85	146.5	–	C
0803			25.69	0.2	5.06	12.3	1556	0.78	215.0	–	C
0806			25.69	0.2	4.74	12.4	1547	3.46	221.0	–	C
0809			25.70	0.2	4.72	12.5	1542	3.69	224.7	–	C
0812			25.70	0.2	4.68	12.6	1543	3.98	229.2	–	C
0815			25.70	0.2	4.65	12.5	1537	4.09	233.1	–	C
0818			25.70	0.2	4.63	12.6	1541	4.16	238.9	–	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-9	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE/ALS	
Sample Time:	0825	Final Depth to Water:		Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
1x 40 ml	HCl	HVOC	yes (no)			
1x 125 ml	–	NO_2, NO_3	yes (no)			
1x 125 ml	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-12	Job Number:	1126-21
Client:	Nustar	Date:	3-20-18
Project:	VAN GWM	Sampler:	MM KK
Weather:	FAIR/ COOL	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	2"	Water Height	–
Depth to Water:	23.52	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 Skip Designated/ ~~Reamp~~				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	
0747			23.74	0.15	6.69	14.1	1657	2.70	-99.5	–	CL	
0750			24.96	0.15	6.57	15.2	2051	6.98	-127.6	–	CL	
0753			24.09	0.15	6.57	15.5	2058	8.80	-132.8	–	CL	
0756			24.24	0.15	6.58	15.5	2056	8.91	-133.9	–	CL	
0759			24.46	0.15	6.57	15.5	2048	8.95	-136.3	–	CL	

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-12	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE ALS	
Sample Time:	0805	Final Depth to Water:	24.55	Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCl	HVOCs	yes (no)			MW-12 DUP
1 x 125	–	NO_3, NO_2	yes (no)			MW-12 MS
1 x 125	H_2SO_4	NH_3	yes (no)			MW-12 MSD
~~6 x 40~~	~~HCl~~		yes no			
2 x 40	HCl	RSK175	yes (no)			
1 x 250	HCl	TOC	yes (no)			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-13	Job Number:	1126-21
Client:	NuStar	Date:	3-20-18
Project:	VAN Gwm	Sampler:	MM
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	4"	Water Height	-
Depth to Water:	25.21	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	
0913			25.21	0.2	6.84	13.7	1458	4.04	-98.8	-	VC	
0916			25.42	0.2	6.47	14.6	1569	2.44	-118.5	-	VC	
0919			25.~~57~~	0.2	6.52	14.8	1587	5.30	-111.2	-	VC	
0922			25.80	0.2	6.53	15.2	16006	5.74	-118.1	-	VC	
0925			25.89	0.2	6.53	15.1	1607	5.79	-114.8	-	VC	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-13	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS	
Sample Time:	0928	Final Depth to Water:	26.02	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HUOC	yes (no)			
1 x 125	-	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
2 x 40	HCl	RSK-175	yes (no)			
1 x 250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

Fertilizer odor

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-14	Job Number:	1126-21
Client:	Nustar Van	Date:	3/20/18
Project:	Van GWM	Sampler:	KK/MM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	25.72	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	
1338	—	—	25.81	0.25	6.76	16.5	1974	1.36	16.3	—	C	
1341	—	—	25.84	0.25	6.74	16.1	2097	0.47	12.3	—	C	
1344	—	—	25.84	0.25	6.74	16.0	2100	0.45	18.3	—	C	
1347	—	—	25.84	0.25	6.74	16.1	2099	0.58	21.7	—	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-14	Sampling Flow Rate	0.25	Analytical Laboratory:	Pace / AIS	
Sample Time:	1350	Final Depth to Water:	25.70	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HVOC	yes (no)			
1 x 125	—	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
2 x 40	HCl	RSK-175	yes (no)			
1 x 250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-16	Job Number:	1126-21
Client:	NoStar	Date:	3-19-18
Project:	VAN GWM	Sampler:	MM KK
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	4"	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:	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	
1637			25.50	0.15	6.78	14.9	657	7.65	239.4	–	Cl	
1640			25.53	0.15	6.47	14.4	633	2.98	247.2	–	SC	
1643			25.62	0.15	6.43	14.3	630	2.00	247.9	–	AC	
1646			25.69	0.15	6.42	14.2	627	1.93	248.2	–	AC	
1649			25.74	0.15	6.42	14.2	626	2.11	248.3	–	AC	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-16	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE / ALS	
Sample Time:	1652	Final Depth to Water:	25.71	Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ml	HCl	HVOC	yes (no)			
1 x 125 ml	–	NO_3, NO_2	yes (no)			
1 x 125 ml	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-18i	Job Number:	1126-21
Client:	Nustar	Date:	3-21-18
Project:	VAN GWM	Sampler:	MM
Weather:	OVERCAST / RAIN	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.96	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
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1543			25.97	0.2	7.32	14.3	194	7.40	187.0	-	C
1546			25.97	0.2	7.16	14.3	175	6.75	189.6	-	C
1549			25.98	0.2	7.09	14.3	174	4.87	190.7	-	C
1552			25.99	0.2	7.06	14.3	173	4.62	191.0	-	C
1555			25.99	0.2	7.04	14.2	173	4.50	191.2	-	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-18i	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS	
Sample Time:	1558	Final Depth to Water:	~~25.96~~ 25.99	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40	HCl	HVOC	yes (no)			
1x 125	-	NO_2, NO_3	yes (no)			
1x 125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-19	Job Number:	1126-21
Client:	NuStar	Date:	3-21-18
Project:	VAN GWM	Sampler:	MM
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	2"	Water Height	–
Depth to Water:	25.45	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	
1034			25.74	0.2	6.79	12.8	1825	5.57	167.6	–	C	
1037			25.69	0.2	7.10	14.8	2298	1.70	146.1	–	SC	
1040			25.71	0.2	7.09	15.0	2350	1.47	139.4	–	SC	
1043			25.70	0.2	7.13	15.1	2377	1.43	135.6	–	SC	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE/ALS	
Sample Time:	1047	Final Depth to Water:	25.59	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HVOC	yes (no)			MW-19 DUP
1 x 125	–	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
2 x 40	HCl	RSK-175	yes (no)			
1 x 250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-19i	Job Number:	1126-21
Client:	NuStar	Date:	3-20-18
Project:	VAN GWM	Sampler:	MM, KK
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.75	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
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
1209			25.59	0.2	7.40	16.5	216	6.55	31.3	-	AC
1212			25.61	0.2	7.25	16.2	219	8.60	5.1	-	AC
1215			25.57	0.2	7.06	16.0	219	8.00	-23.3	-	AC
1218			25.57	0.2	7.03	15.7	217	7.93	-27.8	-	AC
1221			25.55	0.2	7.02	15.4	216	7.87	-28.3	-	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19i	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS
Sample Time:	1224	Final Depth to Water:	25.80	Did Well Dewater?	N
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD / Duplicate ID
3x40	HCl	HVOC	yes (no)		DUPLICATE
1x125	-	NO_2, NO_3	yes (no)		
1x125	H_2SO_4	NH_3	yes (no)		
			yes no		
			yes no		
			yes no		

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-20i	Job Number:	1126-21
Client:	Nustar	Date:	3-21-18
Project:	VAN GWM	Sampler:	MM
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.80	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	
1618			25.72	0.2	7.32	14.6	212	3.74	199.9	-	C	
1621			25.72	0.2	6.79	14.4	217	0.76	200.8	-	C	
1624			25.72	0.2	6.71	14.4	219	0.43	203.0	-	C	
1627			25.72	0.2	6.73	14.4	222	0.48	199.6	-	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-20i	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS	
Sample Time:	1630	Final Depth to Water:	25.83	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_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-21i-40	Job Number:	11210-21
Client:	NuStar	Date:	3-22-18
Project:	VAN OMAN	Sampler:	MM
Weather:	RAINY	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	2"	Water Height	–
Depth to Water:	25.80	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	
0930			25.85	0.15	6.80	10.3	219	7.48	199.2	–	C	
0933			25.85	0.15	6.66	14.2	266	0.75	200.4	–	C	
0936			25.85	0.15	6.65	14.2	273	0.27	199.3	–	C	
0939			25.85	0.15	6.65	14.2	275	0.28	198.9	–	C	
0942			25.85	0.15	6.65	14.3	276	0.29	197.2	–	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-21i-40	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE/ALS	
Sample Time:	0945	Final Depth to Water:	25.84	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	VOCs	yes (no)			
1 x 125	–	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-21i-105	Job Number:	1126-21
Client:	NuStar	Date:	3-22-18
Project:	VAN GUM	Sampler:	MM
Weather:	RAINY	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	26.05	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:	~~S~~ DESIGNATED /SK						
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	
~~0830~~					6.56	9.8	231	1.56	98.6	-	C	
0843			25.93	0.1	6.10	7.6	222	4.43	211	-	C	
0846			25.90	0.1	6.04	7.3	220	2.39	213	-	C	
849			25.90	0.1	6.00	6.9	215	1.73	213	-	C	
852			25.90	0.1	5.99	6.7	213	1.35	213	-	C	
855			25.90	0.1	6.01	6.7	211	1.25	212	-	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-~~21~~ 21i-105	Sampling Flow Rate	0.1	Analytical Laboratory:	PACE LABS	
Sample Time:	858	Final Depth to Water:	25.93	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	VOCs	yes (no)			
1 x 125	—	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-22i	Job Number:	1126-21
Client:	NuStar	Date:	3-22-18
Project:	VAN GUM	Sampler:	MM
Weather:	RAINY	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	2"	Water Height	–
Depth to Water:	26.09	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

												Comments
Purge Method:	BLADDER				Pump Intake Depth:	NS						
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	
1021			26.09	0.2	7.01	10.6	324	3.99	215.8	–	C	
1024			26.09	0.2	6.54	12.1	390	0.70	36.6	–	C	
1027			26.09	0.2	6.54	12.3	381	0.38	-13.9	–	C	
1030			26.09	0.2	6.55	12.3	374	0.39	-20.2	–	C	
1033			26.09	0.2	6.55	12.3	368	0.40	-26.2	–	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-22i	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE/ALS	
Sample Time:	1036	Final Depth to Water:	26.09	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	–	NO_2, NO_3	yes no			
1 x 125	H_2SO_4	NH_3	yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-23i	Job Number:	1126-21
Client:	NuStar	Date:	3-21-18
Project:	VAN GWM	Sampler:	MM
Weather:	LT. RAIN	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	2"	Water Height	–
Depth to Water:	26.14	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
1359			26.15	0.15	8.20	14.9	191	6.40	48.4	–	C
1402			26.17	0.15	7.62	14.1	170	6.84	154.9	–	C
1405			26.17	0.15	7.37	14.4	184	4.25	161.8	–	C
1408			26.19	0.15	7.17	14.1	184	4.20	164.8	–	C
1411			26.20	0.15	7.17	14.0	184	3.90	168.2	–	C
1414			26.20	0.15	7.15	13.9	183	4.02	169	–	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-23i	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE/ALS
Sample Time:	1417	Final Depth to Water:		Did Well Dewater?	

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	VOC	yes (no)			
1 x 125 ml	–	NO_2, NO_3	yes (no)			
1 x 125 ml	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-24i	Job Number:	1126-21
Client:	NuStar	Date:	3-21-19
Project:	VAN Guam	Sampler:	MM
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.52	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

												Comments
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	
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria	
1204			25.55	0.2	8.17	14.4	319	4.32	96.0	-	C	
1207			25.55	0.2	7.44	14.2	273	6.81	116.4	-	C	
1210			25.55	0.2	7.13	14.0	244	3.61	123.5	-	C	
1213			25.55	0.2	7.03	14.1	241	1.28	126.5	-	C	
1216			25.55	0.2	6.99	14.2	241	1.02	128.4	-	C	
1219			25.55	0.2	6.96	13.9	239	0.95	129.6	-	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-24i	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS	
Sample Time:	1223	Final Depth to Water:	25.55	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	-	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
2 x 40	HCl	RSK-175	yes (no)			
1 x 250	HCl	TOC	yes (no)			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-24d	Job Number:	1126-21
Client:	NuStar	Date:	3-20-18
Project:	VAN GWM	Sampler:	MM, KK
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.91	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:	~~TBD~~ DESIGNATED SKP						
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	
1008			26.02	0.2	7.92	12.1	3268	7.69	-33.7	-	AC	
1011			26.11	0.2	7.73	13.4	331	1.36	-94.3	-	AC	
1014			26.13	0.2	7.74	13.2	330	0.97	-118.0	-	AC	
1017			26.14	0.2	7.88	13.1	331	0.85	-137.2	-	AC	
1020			26.14	0.2	7.89	13.0	333	0.86	-146.5	-	AC	
1023			26.14	0.2	7.94	13.1	335	0.78	-152.9	-	AC	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-24d	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS	
Sample Time:	1026	Final Depth to Water:	25.99	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HVOC	yes (no)			
1 x 125	-	NO_2, NO_3	yes (no)			
1 x 125	~~H~~ H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-25i	Job Number:	1126-21
Client:	Nustar	Date:	3-21-18
Project:	VAN GUM	Sampler:	MM
Weather:	OVERCAST / LT RAIN	Time In/Out:	

WELL DATA

Well Depth:	26.10	Well Diameter:	2"	Water Height	-
Depth to Water:	26.10	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
1502			25.08	0.15	7.59	11.0	171	8.08	176	-	C
1505			25.10	0.15	7.21	12.7	177	3.17	185.0	-	C
1508			25.09	0.15	6.89	12.4	203	~~8.04~~	189.3	-	C
1511			25.02	0.15	6.88	13.0	208	1.30	190.4	-	C
1514			25.09	0.15	6.86	13.0	209	1.15	190	-	C
1517			25.10	0.15	6.85	13.0	208	1.08	189	-	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-25i	Sampling Flow Rate	0.15	Analytical Laboratory:	PACE / AGS	
Sample Time:	1517	Final Depth to Water:	26.12	Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40	HCl	HVOCs	yes (no)			
1x 125	-	NO_2, NO_3	yes (no)			
1x 125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-26	Job Number:	1126-21
Client:	Nustar	Date:	3-20-18
Project:	VAN GWM	Sampler:	MM
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	25.56	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:	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	
1541			25.60	0.2	6.49	17.4	3547	3.62	162.5	-	C	
1544			25.55	0.2	6.41	16.2	3432	3.21	158.7	-	C	
1547			25.58	0.2	6.39	16.2	3099	6.71	156.4	-	C	
1550			25.58	0.2	6.38	16.1	3017	6.60	156.4	-	C	
1553			25.58	0.2	6.39	16.0	2996	7.28	156.4	-	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-26	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS	
Sample Time:	1556	Final Depth to Water:	25.58	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40	HCl	HVOC	yes (no)			
1 x 125	-	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
2 x 40	HCl RSK 175	RSK-175	yes (no)			
1 x 250	HCl TOC	TOC	yes (no)			
			yes no			

COMMENTS

DO NOT STABALIZING

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-32S	Job Number:	1126-21
Client:	NuStar	Date:	3-22-18
Project:	VAN GWM	Sampler:	MM
Weather:	RAINY	Time In/Out:	

WELL DATA

Well Depth:	-	Well Diameter:	2"	Water Height	-
Depth to Water:	26.60	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:	~~PERISTALTIC~~/BUILT IN				Pump Intake Depth:	NS				Comments		
Sampling Method:	LF				Tubing Type:	HDPE/BUILT IN				PUMP		
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	
0742			26.74	0.2	7.85	14.4	466	1.58	132.5	-	C	
0745			26.84	0.2	6.41	13.8	501	3.75	155.0	-	C	
0748			26.93	0.2	6.38	13.5	513	4.20	177.5	-	C	
0751			27.02	0.2	6.38	13.6	510	6.68	180.7	-	C	
0754			27.12	0.2	6.37	13.6	510	7.04	183.4	-	C	
0757			27.20	0.2	6.37	13.7	510	7.13	184.8	-	C	
0800			27.30	0.2	6.37	13.5	508	7.32	187.2	-	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/AGS	
Sample Time:	0803	Final Depth to Water:	27.43	Did Well Dewater?	N	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40	HCl	HVOC	yes (no)			
1x125	-	NO_2, NO_3	yes (no)			
1x125	H_2SO_4	NH_3	yes (no)			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	S-1	Job Number:	1126-21
Client:	NuStar	Date:	03-20-18
Project:	UAN 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

											Comments
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
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1416			25.69	0.2	7.48	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~~ 16.9	487	~~2.43~~ 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:	~~DUP~~ S-1	Sampling Flow Rate	0.2	Analytical Laboratory:	PACE / ALS	
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
3 x 40	HCl	HVOC	yes (no)			
1 x 125	–	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
1 x 250	~~HNO3~~ HNO_3	Cu	yes (no)			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	S-2	Job Number:	1126-21
Client:	NuStar	Date:	3-20-18
Project:	VAN GWM	Sampler:	MM, KK
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	–	Well Diameter:	2"	Water Height	–
Depth to Water:	25.47	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 / SKID						
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	
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	–	CL	
1505	–	–	25.96	0.25	6.55	15.2	1806	7.17	67.4	–	CL	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	S-2	Sampling Flow Rate	0.25	Analytical Laboratory:	PACE / AGS	
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
3 x 40	HCl	HVOC	yes (no)			
1 x 125	–	NO_2, NO_3	yes (no)			
1 x 125	H_2SO_4	NH_3	yes (no)			
1 x 250	HNO_3	Cu	yes (no)			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	FB-031918	Job Number:	1126-21
Client:	NuStar	Date:	3-19-18
Project:	VAN GUM	Sampler:	MM
Weather:	FAIR	Time In/Out:	

WELL DATA

Well Depth:	NA	Well Diameter:		Water Height	
Depth to Water:		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:	
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
NA											

Comments

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	FB-031918	Sampling Flow Rate		Analytical Laboratory:	PACE
Sample Time:	1525	Final Depth to Water:		Did Well Dewater?	

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ml	HCl	HVOC	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Field Blank

WELL MONITORING DATA SHEET

APEX

Well I.D.	FB-032018	Job Number:	1126-21
Client:	NuStar	Date:	3-20-18
Project:	VAN GWM	Sampler:	MM
Weather:	COOL	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	NA	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
	NA										

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	FB-032018	Sampling Flow Rate		Analytical Laboratory:	PACE	
Sample Time:	0735	Final Depth to Water:		Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3+40ml	HCl	HVOCs	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

FIELD BLANK

WELL MONITORING DATA SHEET

APEX

Well I.D.	FB-032118	Job Number:	1126-21
Client:	NuStar	Date:	3-21-18
Project:	VAN GWM	Sampler:	MM
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:	NA	Well Diameter:	NA	Water Height	
Depth to Water:		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
NA	NA										

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	FB-032118	Sampling Flow Rate		Analytical Laboratory:	PACE	
Sample Time:	0730	Final Depth to Water:		Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40mL	HCl	HVOCs	yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

FIELD BLANK

WELL MONITORING DATA SHEET

APEX

Well I.D.	FB-032718	Job Number:	1126-21
Client:	NUSTAR	Date:	3-27-18
Project:	VAN CLUM	Sampler:	MM
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	NA	Screened Interval:	NA	x Multiplier	NA
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:	NA	Pump Intake Depth:	NA
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
NA											

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	1005	Sampling Flow Rate		Analytical Laboratory:	PACE
Sample Time:	FB-032718	Final Depth to Water:		Did Well Dewater?	

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x 40ml	HCl	VOCs	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

FIELD BLANK

WELL MONITORING DATA SHEET

APEX

Well I.D.	~~MW-~~ EQ BLANK	Job Number:	1126-21
Client:	NJ Star	Date:	3-22-18
Project:	VAN DORN	Sampler:	MM
Weather:	OVERCAST	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	NA	Screened Interval:	NA	x Multiplier	NA
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:	NA				Pump Intake Depth:	NA				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
NA	NA										

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	1000	Sampling Flow Rate		Analytical Laboratory:	PACE	
Sample Time:	EQ BLANK	Final Depth to Water:		Did Well Dewater?		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3+40ml	HCl	HVOCs	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

EQUIPMENT BLANK

APEX

3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-21
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 3-19-2018

PROJECT	NuStar Vancouver 1Q18 GWM	ARRIVAL TIME	0656
LOCATION	Vancouver, WA	DEPARTURE TIME	1715
CLIENT	NuStar Energy	WEATHER	OVERCAST / FAIR
PURPOSE OF OBSERVATIONS	Gauge and sample groundwater monitoring wells		
APEX REPRESENTATIVE	M.Masterson, K.Kline	APEX PROJECT MANAGER	S. Salisbury
CONTRACTOR	NA	PERMIT NO.	277110
CONTRACTOR REP.	NA	H&S REVIEW	Yes

0656	Arrive on-site / Signed in / Safety Meeting / Issued permit
0725	Dropped off new tight-head waste drum to waste storage area / labeled drum
0730	Began removing well caps for intermediate-screened (i) wells
0815	Finished removing caps for i wells, began gauging i wells
0915	Finished gauging i wells. Began removing caps for all other wells
1412	Finished gauging the remaining wells / Attempted to grab IDW soil from excavation activity sample from bin but there was standing water on the tarp covering the bin / Notified NuStar and NuStar said they would pump the water out by tomorrow
1500	S. Salisbury (PM) on-site / PM completed a site safety inspection (SSI) / Calibrated YSI / Collected field blank
1530	Mob to MW-8 / Began sampling / PM left site
1715	Finished sample for the day / Transfered purge water to IDW drum / Turned in permit / Signed out / Left site

BY

APEX REPRESENTATIVE

REVIEWED BY

APEX PROJECT MANAGER

APEX

3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-21
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 3-20-2018

PROJECT	NuStar Vancouver 1Q18 GWM	ARRIVAL TIME	0655
LOCATION	Vancouver, WA	DEPARTURE TIME	1625
CLIENT	NuStar Energy	WEATHER	OVERCAST
PURPOSE OF OBSERVATIONS	Sample groundwater monitoring wells / Sample IDW soil		
APEX REPRESENTATIVE	M.Masterson, K.Kline	APEX PROJECT MANAGER	S. Salisbury
CONTRACTOR	NA	PERMIT NO.	277111
CONTRACTOR REP.	NA	H&S REVIEW	Yes

0655	Arrive on-site / Signed in / Safety Meeting / Issued permit
0730	Mob to MW-12 / Calibrate YSI / Collect Field Blank
0745	Began groundwater sampling
0755	K. Kline left to escort One-Call Locates around the site
0830	ALS Courier on-site / Signed over nitrate, nitrite, and ammonia sample containers
0950	K. Kline back from escorting / Continued to help collect groundwater samples
1240	Apex observed NuStar personnel had removed tarp from soil bin / Mob to soil bin to collect IDW soil sample
1315	Finished collecting composite soil sample
1620	Finished sample for the day / Transfered purge water to IDW drum
1625	Turned in permit / Signed out / Left site

BY

APEX REPRESENTATIVE

REVIEWED BY

APEX PROJECT MANAGER

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3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-21
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 3-21-2018

PROJECT	NuStar Vancouver 1Q18 GWM	ARRIVAL TIME	0652
LOCATION	Vancouver, WA	DEPARTURE TIME	1710
CLIENT	NuStar Energy	WEATHER	Overcast
PURPOSE OF OBSERVATIONS	Sample groundwater monitoring wells		
APEX REPRESENTATIVE	M.Masterson	APEX PROJECT MANAGER	S. Salisbury
CONTRACTOR	NA	PERMIT NO.	277168
CONTRACTOR REP.	NA	H&S REVIEW	Yes

0652	Arrive on-site / Signed in / Safety Meeting / Issued permit
0725	Mob to MW-9 / Calibrate YSI / Collect Field Blank
0735	Began groundwater sampling
0830	ALS Courier on-site / Signed over nitrate, nitrite, and ammonia samples
1645	Finished sample for the day / Transfered purge water to IDW drum
1710	Turned in permit / Signed out / Left site

BY

APEX REPRESENTATIVE

REVIEWED BY

APEX PROJECT MANAGER

APEX

3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-21
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 3-22-2018

PROJECT	NuStar Vancouver 1Q18 GWM	ARRIVAL TIME	0656
LOCATION	Vancouver, WA	DEPARTURE TIME	1500
CLIENT	NuStar Energy	WEATHER	Overcast / Rainy
PURPOSE OF OBSERVATIONS	Sample groundwater monitoring wells		
APEX REPRESENTATIVE	M.Masterson, K. Kline	APEX PROJECT MANAGER	S. Salisbury
CONTRACTOR	NA	PERMIT NO.	277141
CONTRACTOR REP.	NA	H&S REVIEW	Yes

0656	Arrive on-site / Signed in / Safety Meeting / Issued permit
0730	Mob to MW-32s / Calibrate YSI
0800	Began groundwater sampling
0920	K. Kline left to escort locate contractor around site
0925	ALS Courier on-site / Signed over nitrate, nitrite, and ammonia samples
1430	Finished sampling / Transfered purge water to IDW drum (approximately 1/2 drum full)
1500	Turned in permit / Signed out / Left site

BY

APEX REPRESENTATIVE

REVIEWED BY

APEX PROJECT MANAGER

WELL GAGING DATA SHEET

APEX

Client:	NuStar	Job Number:	
Project:	Vancouver	Date:	6/27/18
Weather:	Sunny/Hot	Sampler:	JM, ME
		Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-24D	1100		25.80				
MW-19	1104		24.56				
EX	1107		24.25				
MP-4	1109		24.52				
MP-3	1111		24.47				
MP-2	1114		24.48				
MP-1	1116		24.50				
MW-1	1119		24.31				
MW-12	1123		23.04				
MW-13	1125		24.30				
S-2	1133		25.05				
MW-14	1136		24.24				
MW-17	1138		23.82				
MW-26	1140		23.81				
MW-10	1144		24.19				
MW-8	1150		23.76				
MW-32s	1200		26.33				
MW-E	1207		24.83				
MW-F	1210		26.18				
MW-G	1214		24.58				
MW-[redacted]15	1217		29.75				
MW-2	1221		25.76				
MW-6	1229		23.59				
EW-1	1232		23.16				
MW-3	1235		25.93				
MW-16	1250		25.86				
MW-5	1253		24.46				
MW-7	1256		24.20				
MW-9	1300		24.12				
MW-32i	1448		26.67				
MW-22i	1454		26.79				
MW-21i	1504		26.39				

WELL GAGING DATA SHEET

APEX

Client:	Mustar	Job Number:	1126
Project:	Vancouver	Date:	6/27/16
Weather:	Sunny	Sampler:	JCL
		Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW21i-40	1506		26.49				
MW-20i	1509		25.57				
MW-18i	1512		25.78				
MW-19i	1515		26.05				
S-1	1520		25.23				
MW-23i	1523		26.23				
MW-25i	1528		26.03				
MW-24i	1536		25.91				
MGMS1-1	1545		25.53				
MGMS1-2	1547		25.81				
MGMS1-3	1549		24.33				
MGMS2-1	1551		24.99				
MGMS2-2	1554		24.95				
MGMS2-3	1556		25.01				
MGMS2-4	1559		23.52				
MG MS3-1	1604		24.19				
MG MS3-2	1606		24.15				
MG MS3-3	1608		24.17				
MG MS3-4	1610		23.86				
MW31i	1400		28.13				well gauges on 6/28 Because no Longshore Gear locker was locked During inspection
~~MW23i~~							well missing due to recent Railroad development activities
MW30i							

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW 24D	Job Number:	1126
Client:	Nustar	Date:	6/27/18
Project:	Vancouver	Sampler:	JM/ME
Weather:	Sunny / Hot	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:		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:	BP	Pump Intake Depth:	MS
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	—	—	25.80	0.15	7.58	17.2	273.3	1.17	76.4		
1403	0.45			0.15	7.20	16.9	273.7	0.84	64.4		
1406	0.60			0.15	7.69	16.0	264.0		47.9		
1409	0.75			0.15	7.64	15.2	258.4	1.78	44.6		
1412	0.90		26.74	0.15	7.69	14.7	257.2	1.00	38.5		
1415	1.05				7.57	14.7	256.4	0.65	26.0		
1418	1.20				7.83	14.5	255.5	0.57	20.5		

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-24D	Sampling Flow Rate	0.15	Analytical Laboratory:	
Sample Time:	1420	Final Depth to Water:	26.24	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3	HCl	VOC	yes (no)			
1	H_2SO_4	Ammonia Nitrate	yes no			
1		Nitrate	yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS3-132 (1)	Job Number:	1126
Client:	Nustar	Date:	7/1/2016
Project:	Vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	24.19	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:	BP	Pump Intake Depth:	~~New~~ dedicated	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
1523			25.13	0.15	6.99	14.4	195.2	0.14	40.3	-	C
1526			25.13	0.15	6.96	14.5	195.3	0.12	35.2	-	C
1529			25.13	0.15	7.04	14.2	193.3	0.13	26.1	-	C
1532					SAMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-1	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace
Sample Time:	1532	Final Depth to Water:	25.13	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCL	VOC	yes ~~no~~	—	✓	✓
1x125 poly	H_2SO_4	Ammonia	yes ~~no~~	✓	✓	✓
1x125 poly	—	nitrate	yes ~~no~~	✓	✓	✓
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET 101

APEX

Well I.D.	MGMS3-100(2)	Job Number:	1126
Client:	NuStar	Date:	7/1/18
Project:	vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	24.15	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:	BP	Pump Intake Depth:	dedicated	Comments	
Sampling Method:	ZE	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
1707			25.03	0.15	7.00	16.7	174.4	0.98	26.6	—	C
1710			25.03	0.15	7.01	15.6	166.7	3.32	40.7	—	C
1713			25.03	0.15	6.76	14.2	164.0	3.32	40.6	—	C
1716			25.03	0.15	6.77	14.2	163.9	3.33	40.5	—	C
1719			25.03	0.15	6.77	14.2	163.9	3.32	40.7	—	C
					(	SAMPLE			)		

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-2	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace
Sample Time:	1719	Final Depth to Water:	25.03	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCl	VOC	yes no	—	—	—
1x125	H_2SO_4	Ammonia	yes no	—	—	—
1x125	—	nitrate	yes no	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS3-60(3)	Job Number:	1126
Client:	NUSTAR	Date:	7/1/2018
Project:	Vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	24.17	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:	BP				Pump Intake Depth:	Dedicated				Comments		
Sampling Method:	PP				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	
1644			24.17	0.15	6.81	16.0	186.7	3.18	4.4	-	C	
1647			24.51	0.15	6.78	15.6	178.6	3.19	19.6	-	C	
1650			24.93	0.15	6.76	15.5	179.3	3.20	21.2	-	C	
1653			25.01	0.15	6.76	15.6	180.3	3.19	21.3	-	C	
1656			25.12			SAMple						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-3	Sampling Flow Rate	0.15	Analytical Laboratory:	A/S, Pace		
Sample Time:	1656	Final Depth to Water:	25.12	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered		Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCL	VOC	yes no		—	—	—
1x125 Poly	H_2SO_4	Ammonia	yes no		—	—	—
1x125 Poly	—	Nitrate	yes no		—	—	—
			yes no				
			yes no				
			yes no				

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS3-40 (4)	Job Number:	1126
Client:	Nustar	Date:	7/4/2016
Project:	Vancouver	Sampler:	SM
Weather:		Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	23.86	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:	BP				Pump Intake Depth:		dedicated			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
1608			23.46	0.15	6.73	16.5	323.6	3.16	56.6	—	C
1611			23.89	0.15	6.70	15.6	401.1	3.17	-18.9	—	C
1614			24.21	0.15	6.68	15.7	405.3	3.17	-23.4	—	C
1617			24.48	0.15	6.66	15.6	410.1	3.18	-28.6	—	C
1620											
					SAMPLE						

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS3-4	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace
Sample Time:	1620	Final Depth to Water:	24.48	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCL	VOC	yes ~~no~~	/	—	/
1x125 Poly	H_2SO_4	Ammonia	yes ~~no~~	—	—	/
1x125 Poly	—	nitrate	yes ~~no~~	/	/	/
3x20 mL	—	Ethanol Ethanol Methanol	yes ~~no~~	/	/	—
1x250 Amb	H_2SO_4	TOC	yes ~~no~~	/	/	—
3x40 mL	HCL	VOC	yes ~~no~~	/	/	MGMS3-4 DUP

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS2-132(1)	Job Number:	1126
Client:	NuStar	Date:	7/1/2016
Project:	Vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	24.99	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:	BP				Pump Intake Depth:	Dedicated				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	
1530			24.99	0.15	6.94	19.9	237.0	0.32	37.8	—	C	
1533			25.04	0.15	6.83	19.0	240.7	0.21	34.3	—	C	
1536			25.08	0.15	6.81	18.5	236.7	0.17	31.6	—	C	
1539			25.12		SAMPLE							

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS2-1	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace
Sample Time:	1539	Final Depth to Water:	25.12	Did Well Dewater?	NO
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD / Duplicate ID
3X40 mL	HCL	VOC	yes no	—	— / —
1X125 mL	H_2SO_4	Ammonia	yes no	—	— / —
1X125 mL	—	Nitrate	yes no	—	— / —
			yes no		
			yes no		
			yes no		

COMMENTS

* MGMS2 wells not working properly

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS2-110(2)	Job Number:	1126
Client:	Mustar	Date:	7/1/2018
Project:	Vancouver	Sampler:	EM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	24.95	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:	BP	Pump Intake Depth:	dedicated	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
1518			24.95	0.15	6.94	16.3	187.0	1.91	11.2	-	C
1521			25.05	0.15	6.92	16.3	187.0	1.99	12.9	-	C
1524			25.11	0.15	6.92	16.2	186.6	2.06	14.1	-	C
1527			25.16		SAMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS2-2	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace
Sample Time:	1527	Final Depth to Water:	25.16	Did Well Dewater?	no

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40ML	HCL	VOC	yes no	—	—	—
1x125ML	H_2SO_4	Ammonia	yes no	—	—	—
1x125 M	—	nitrate	yes no	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

* MGMS2 wells not working properly

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS2-60(3)	Job Number:	1126
Client:	Nustar	Date:	7/1/2018
Project:	Vancouver	Sampler:	ZM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	25.01	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:	BP	Pump Intake Depth:	Dedicated
Sampling Method:	ZP	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
1501			25.01	0.15	7.70	17.9	341.3	0.64	-11.5	-	C
1503			25.04	0.15	7.44	17.6	304.3	0.70	-5.2	-	C
1506			25.09	0.15	7.50	17.5	291.6	0.72	-4.6	-	C
1509			25.13	0.15	7.51	17.5	295.1	0.74	0.8	-	C
					(Sample)						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS2-3	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Face
Sample Time:	1509	Final Depth to Water:	25.13	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3X40ML	HCl	VOC	yes no	—	—	—
1X125	H_2SO_4	Ammonia	yes no	—	—	—
1X125	—	Nitrate	yes no	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

* MGMS 2 wells not working properly

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS2-40 (4)	Job Number:	1126
Client:	MUSTang	Date:	7/1/2018
Project:	Vancover	Sampler:	ZM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	23.52	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:	BP				Pump Intake Depth:	Dedicated				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	
1435			23.52	0.15	7.36	18.5	1674	3.12	-24.6	—	C	
1438			23.88	0.15	7.37	16.4	1957	3.11	-35.8	—	C	
1441			23.26	0.15	7.37	16.5	1900	3.16	-41.5	—	C	
1444			23.45	0.15	7.37	16.4	1884	3.14	-53.2	—	C	
1447			23.64	0.15	7.37	16.4	1894	3.15	-50.8	—	C	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS2-4	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace	
Sample Time:	1447	Final Depth to Water:	23.64	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCl	VOC	yes no	—	—	—
1x125 mL	H_2SO_4	Ammonia	yes no	—	—	—
1x125 mL	—	Nitrate	yes no	—	—	—
1x250 mL Amb	H_2SO_4	TOC	yes no	—	—	—
3x20 mL	—	Ethene, Ethane, Methane	yes no	—	—	—
			yes no			

COMMENTS

* MGMS2 wells not working properly

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS1-1109	Job Number:	1126
Client:	Nustar	Date:	7/1/2015
Project:	Vancouver	Sampler:	Zq
Weather:	sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	25.53	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:	BP	Pump Intake Depth:	MGS Dedicated	Comments	
Sampling Method:	LF	Tubing Type:	LDPE 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
1400			25.53	0.15	7.40	20.9	231.7	2.35	47.7	—	C
1403			25.64	0.15	7.06	19.0	220.5	0.38	46.9	—	C
1406			25.71	0.15	7.02	18.9	215.8	0.24	43.8	—	C
1409			25.77	0.15	7.01	18.9	213.5	0.23	43.6	—	C
				(				)			
					SAMPLE.						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS1-1	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace
Sample Time:	1409	Final Depth to Water:	25.77	Did Well Dewater?	no

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCL	VOC	yes ~~no~~	—	—	—
1x125 mL	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1x125 mL	—	nitrate	yes ~~no~~	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS1-60 (2)	Job Number:	1126
Client:	Nustar	Date:	7/1/2015
Project:	Vancouver	Sampler:	JM
Weather:		Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	25.51	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:	BP	Pump Intake Depth:	Dedicated	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
1337			25.51	0.15	7.86	14.9	184.6	6.79	20.9	—	C
1340			25.56	0.15	7.78	14.2	182.3	7.01	20.1	—	C
1343			25.61	0.15	7.71	14.2	180.6	7.00	19.5	—	C
1346			25.68		SAMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS1-2	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS/Pace
Sample Time:	1346	Final Depth to Water:	25.64	Did Well Dewater?	no

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40mL	HCl	VOC	yes no	—	—	—
1x125mL	H_2SO_4	Ammonia	yes no	—	—	—
1x125mL	—	Nitrate	yes no	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MGMS1-43 (3)	Job Number:	1126
Client:	NuStar	Date:	7/1/2018
Project:	Vancouver	Sampler:	ZH
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:	—	Well Diameter:	—	Water Height	—
Depth to Water:	24.33	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:	BP	Pump Intake Depth:	Dedicated	Comments
Sampling Method:	ZP	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
1310			24.33	0.15	6.86	16.5	2645	3.41	71.4	—	C
1313			24.38	0.15	6.83	16.0	2687	3.42	14.2	—	C
1316			24.44	0.15	6.85	15.7	2689	3.48	-4.3	—	C
1319			24.46	0.15	6.85	16.0	2693	3.48	-1.6	—	C
			(			SAMPLE			)		

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MGMS1-3	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace
Sample Time:	1319	Final Depth to Water:	24.48	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 ML	HCL	VOC	yes no			
1x125 ML	H_2SO_4	Ammonia	yes no			
1x125 ML	—	Nitrate	yes no			
3x20 ML	—	Ethene, Ethane, Methane	yes no			
1x250 ml	H_2SO_4	TOC	yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-13	Job Number:	1126
Client:	Mustang	Date:	7/11/2018
Project:	Vancouver	Sampler:	EM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	24.30	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:	BP	Pump Intake Depth:	MS
Sampling Method:	LS	Tubing Type:	LDPE

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
1143			24.49	0.15	6.26	19.0	2100	0.91	-6.0	—	C
1146			24.82	0.15	6.46	17.4	2039	0.49	-26.6	—	C
1149			25.14	0.15	6.44	17.4	1946	0.64	-30.5	—	C
1152			25.36	0.15	6.47	17.1	1890	1.01	-31.1	—	C
1155			25.48	0.15	6.48	17.1	1860	1.13	-31.0	—	C
					(	SAMPLE		)			

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-13	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace
Sample Time:	1155	Final Depth to Water:	25.48	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 ML	HCL	VOC	yes ~~no~~	—	—	—
1x125 ML	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1x125 ML	—	Nitrate	yes ~~no~~	—	—	—
3x20 ML	—	Ethene, Ethane, Methane	yes ~~no~~	—	—	—
1x250 ML AMB	H_2SO_4	TOC	yes ~~no~~	—	—	—
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-12	Job Number:	1126
Client:	NuStar	Date:	7/11/2018
Project:	Vancouver	Sampler:	ZH
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	23.04	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:	BP	Pump Intake Depth:	MS	Comments	
Sampling Method:	FF	Tubing Type:	LDPE		

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
1046			23.28	0.15	6.33	17.9	2176	0.42	3.9	—	C
1049			23.46	0.15	6.53	17.0	2129	0.67	71.5	—	C
1062			23.62	0.15	6.52	16.9	2204	1.28	94.6	—	C
1055			23.75	0.15	6.51	16.9	2251	1.57	96.9	—	C
1058			23.82	0.15	6.50	16.8	2265	1.61	106.6	—	C
1101			24.87	0.15	6.49	16.8	2288	1.77	114.3	—	C

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-12	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace		
Sample Time:	1101	Final Depth to Water:	24.87	Did Well Dewater?	no		
# Containers/Type	Preservative	Analysis/Method	Field Filtered		Filter Size	MS/MSD	Duplicate ID
3x40ml	HCL	VOC	yes	no	—	—	—
1x125 poly	H_2SO_4	Ammonia	yes	no	—	—	—
1x125 poly	—	Nitrate	yes	no	—	—	—
3x20 mL	—	Ethene, Ethane, Methane	yes	no	—	—	—
1x250 Amb	H_2SO_4	TOC	yes	no	—	—	—
3x40 mL	HCL	VOC	yes	no	—	—	MW-12 DUP

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	EW-1	Job Number:	1126
Client:	Nustar	Date:	7/11/2018
Project:	Vancouver	Sampler:	ZM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	23.18	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
0959			23.41	0.15	6.61	19.0	239.1	3.86	30.8	-	C
1002			23.41	0.15	6.41	15.8	220.6	3.46	38.2	-	C
1005			23.41	0.15	6.37	15.6	219.1	3.46	38.4	-	C
1006			23.41	0.15	6.35	15.4	216.0	3.28	39.2	-	C
1011			23.41		SAMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	EW-1	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS/Pace
Sample Time:	1011	Final Depth to Water:	23.41	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCL	VOC	yes ~~no~~	—	—	—
1x125 poly	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1x125 poly	—	Nitrate	yes ~~no~~	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-6	Job Number:	1126
Client:	NuStar	Date:	7/1/2016
Project:	Vancouver	Sampler:	ZM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	23.59	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:	BP			Pump Intake Depth:	MS					Comments	
Sampling Method:	LF			Tubing Type:	LDPE						
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
0920			23.90	0.15	6.19	15.8	475.1	0.49	41.5	-	C
0923			23.90	0.15	6.08	15.2	466.2	0.54	25.0	-	C
0926			23.90	0.15	6.02	15.0	422.7	0.59	-0.3	-	C
0929			23.90	0.15	6.06	15.0	413.9	0.64	-3.2	-	C
0932			23.90	0.15	6.06	15.0	409.3	0.62	-4.6	-	C
					(			)			
						SAMPLE					

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-6	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace
Sample Time:	0932	Final Depth to Water:	23.90	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCl	VOC	yes no	—	—	—
1 x 125 poly	H_2SO_4	Ammonia	yes no	—	—	—
1 x 125 poly	—	Nitrate	yes no	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-1	Job Number:	1126
Client:	NuStar	Date:	7-1-2015
Project:	Vancouver	Sampler:	LM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	24.60	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:	BP			Pump Intake Depth:	MS					Comments	
Sampling Method:	LF			Tubing Type:	LDPE						
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
0832			24.63	0.15	6.47	17.0	458.1	0.76	161.5	-	C
0835			24.64	0.15	6.29	16.1	430.1	0.36	165.9	-	C
0838			24.65	0.15	6.13	16.0	435.7	0.26	159.8	-	C
0841			24.65	0.15	6.02	15.6	429.5	0.22	131.7	-	C
0844			24.65	0.15	6.02	15.8	428.4	0.23	130.0	-	C
0847			24.65	0.15	6.02	15.8	426.1	0.24	120.9	-	C
					(				)		
						SAMPLE					

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-1	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace
Sample Time:	0847	Final Depth to Water:	24.65	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 ML	HCL	VOC	yes no	—	—	—
1 x 125 ML	H_2SO_4	Ammonia	yes no	—	—	—
1 x 125 ML	—	nitrate	yes no	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-5	Job Number:	1126
Client:	MuSTar	Date:	6/29/16
Project:	Vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	24.46.	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:	BP	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	LDPE		

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
1625			24.58	0.15	6.40	20.0	153.1	2.04	120.8	—	C
1628			24.58	0.15	6.09	18.1	143.0	0.34	143.0	—	C
1631			24.58	0.15	6.00	18.1	142.2	0.44	111.0	—	C
1634			24.58	0.15	6.00	18.0	142.0	0.44	109.6	—	C
1637			24.58	0.15	6.00	18.1	142.0	0.45	103.4	—	C
					(SAMPLED)						

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-5	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS/Pace
Sample Time:	1637	Final Depth to Water:	24.58	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 ML	HCL	VOC	yes ~~no~~	—	—	—
1x125 Poly	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1x125 Poly	—	Nitrate	yes ~~no~~	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-2	Job Number:	1126
Client:	Mustang	Date:	6/29/18
Project:	Vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	24.20	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:	BP	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	LDPE		

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
1516			24.23	0.15	6.19	17.3	270.4	0.29	200.7	—	C
1519			24.25	0.15	5.92	17.0	266.9	0.23	194.5	—	C
1522			24.27	0.15	5.93	16.9	264.1	0.36	190.3	—	C
1525			24.30	0.15	5.94	16.9	262.7	0.55	187.6	—	C
1528			24.33	0.15	5.94	16.8	262.5	0.56	187.5	—	C
1531			24.37	SAMPLE							

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-7	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Paco
Sample Time:	1531	Final Depth to Water:	24.37	Did Well Dewater?	no

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCL	VOC	yes no	—	—	—
1x125 poly	—	Nitrate	yes no	—	—	—
1x125 poly	H_2SO_4	Ammonia	yes no	—	—	—
1x250 AMB	H_2SO_4	TOC	yes no	—	—	—
3x20mL	—	Ethene, Ethane, Methane	yes no	—	—	—
3x40 mL	HCL	VOC	yes no	—		MW-7 Dup

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-9	Job Number:	11 26
Client:	NuCtal	Date:	6/29/18
Project:	vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	24.12	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:	BP				Pump Intake Depth:	MS					Comments	
Sampling Method:	PE				Tubing Type:	LDPE						
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	
1436			24.28	0.15	5.60	19.6	2081	4.07	219.4	—	C	
1439			24.28	0.15	5.89	16.3	2339	0.64	214.5	—	C	
1442			24.28	0.15	6.05	15.0	2205	0.33	198.4	—	C	
1445			24.28	0.15	6.06	15.1	2207	0.32	198.2	—	C	
1448			24.28	0.15	6.05	15.1	2204	0.33	198.1	—	C	
				(	sample		)					

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-9	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace		
Sample Time:	1448	Final Depth to Water:	24.28	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered		Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCl	VOC	yes ~~no~~		—	—	—
1 x 125 mL	H_2SO_4	Ammonia	yes ~~no~~		—	—	—
1 x 125 mL	—	Nitrate	yes ~~no~~		—	—	—
			yes no				
			yes no				
			yes no				

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-6	Job Number:	1126
Client:	Mustang	Date:	6/29/18
Project:	Vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	~~2~~ 4"	Water Height	
Depth to Water:	23.76	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:	RP				Pump Intake Depth:	MS					Comments	
Sampling Method:	LF				Tubing Type:	LDPE						
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	
1358			23.90	0.15	6.14	17.7	2069	1.35	231.9	-	C	
1401			24.15	0.15	5.94	17.3	2049	1.29	233.6	-	C	
1404			24.26	0.15	5.92	16.8	2029	1.19	222.9	-	C	
1407			24.31	0.15	5.92	16.8	2030	1.20	222.0	-	C	
1410			24.37			SAMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-8	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace	
Sample Time:	1410	Final Depth to Water:	24.37	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered		Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	~~VOA~~ HCl	VOC	yes	no			
1 x 125 mL	H_2SO_4	Ammonia	yes	no			
1 x 125 mL	—	Nitrate	yes	no			
			yes	no			
			yes	no			
			yes	no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-25i	Job Number:	1126
Client:	Mustar	Date:	6/29/18
Project:	Vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	26.03	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:	BP				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	
1308			25.85	0.15	6.75	23.5	168.1	6.67	239.7	-	C	
1311			25.86	0.15	6.76	21.0	174.7	2.16	234.2	-	C	
1314			25.87	0.15	6.48	17.5	163.4	2.00	221.0	-	C	
1317			25.88	0.15	6.44	17.2	161.0	0.80	179.6	-	C	
1320			25.89	0.15	6.45	17.1	161.2	0.80	179.6	-	C	
1323			25.90	0.15	6.45	17.0	160.9	0.77	175.6	-	C	
1326			25.90									

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-25i	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Tacoma		
Sample Time:	1326	Final Depth to Water:	25.90	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered		Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCL	VOC	yes ~~no~~		-	-	-
1 x 125 mL	H_2SO_4	Ammonia	yes ~~no~~		-	-	-
1 x 125 mL	-	Nitrate	yes ~~no~~		-	-	-
			yes no				
			yes no				
			yes no				

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-21i-40	Job Number:	1126
Client:	NuStar	Date:	6/28/18
Project:	Vancouver	Sampler:	EM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	26.49	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:	BP	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	LDPE		

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
1207			26.21	0.15	6.42	18.7	205.5	4.93	214.9	-	C
1210				0.15	6.33	18.0	203.7	4.36	221.1	-	C
1213				0.15	6.31	17.5	210.1	3.15	223.8	-	C
1216				0.15	6.31	17.3	219.2	0.60	217.5	-	C
1219				0.15	6.32	17.3	220.1	0.47	214.9	-	C
1222				0.15	6.33	17.2	220.3	0.45	214.7		
1225			26.25		Sample						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-21i-40	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS Kelso
Sample Time:	1225	Final Depth to Water:	26.25	Did Well Dewater?	no

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40ml	HCl	VOC	yes no	—	—	—
1 X 125 ml	H_2SO_4	Ammonia	yes no	—	—	—
1 X 125 ml	—	Nitrate	yes no	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-21I-10S	Job Number:	1126
Client:	MuSTat	Date:	6/29/18
Project:	Vancouver	Sampler:	Zm
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	26.39	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:	BP	Pump Intake Depth:	MS
Sampling Method:	FE	Tubing Type:	LDPE

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
1116			25.98	0.15	6.06	23.3	238.6	2.27	217.2	-	C
1119			25.99	0.15	6.00	22.0	224.0	2.98	217.9	-	C
1122			26.01	0.15	5.84	20.1	220.8	3.46	218.4	-	C
1125			26.03	0.15	5.82	19.9	218.8	0.87	218.7	-	C
1128			26.04	0.15	5.85	20.2	219.4	0.81	214.1	-	C
1131			26.05	0.15	5.91	20.2	217.8	0.49	200.5	-	C
1134				SAMPLE							

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-21I-10S	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace
Sample Time:	1134	Final Depth to Water:	26.05	Did Well Dewater?	no

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40ML	HCL	VOC	yes no	-	-	-
1 x 125 poly	H_2SO_4	Ammonia	yes no	-	-	-
1 x 125 poly	-	Nitrate	yes no	-	-	-
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-22I	Job Number:	1126
Client:	NuStar	Date:	6/29/16
Project:	Vancouver	Sampler:	AS
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	26.79	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:	BP	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
1025			26.30	0.15	6.47	17.4	268.5	0.49	242.6	-	C
1028			26.31	0.15	6.39	16.8	264.5	0.30	236.9	-	C
1031			26.32	0.15	6.39	16.7	260.0	0.27	229.4	-	C
1034			26.33	0.15	6.40	16.7	254.5	0.27	229.0	-	C
1037			26.34	S	AMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-22I	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS/Pace
Sample Time:	1037	Final Depth to Water:	26.34	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 mL	HCL	VOCs	yes ~~no~~	—	—	—
1 X 125 mL Poly	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1 X 125 mL Poly	—	nitrate	yes ~~no~~	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-10	Job Number:	1126
Client:	Mustar	Date:	6/29/18
Project:	Vancouver	Sampler:	LM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	24.19	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:	BP	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	LDPE		

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
0943			24.23	0.15	4.82	15.8	2784	0.42	286.6	-	C
0946			24.38	0.15	4.59	15.7	2738	0.57	288.6	-	C
0949			24.49	0.15	4.53	15.7	2711	0.61	287.8	-	C
0952			24.61	0.15	4.52	15.7	2705	0.62	287.5	-	C
0955			24.73		SAmple						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-10	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace
Sample Time:	0955	Final Depth to Water:	24.73	Did Well Dewater?	no

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCL	VOC	yes no	-	-	-
1 x 125 mL	H_2SO_4	Ammonia	yes no	-	-	-
1 x 125 mL		Nitrate	yes no	-	-	-
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-26	Job Number:	1126
Client:	NuStar	Date:	6/29/16
Project:	Vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	23.81	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:	BP				Pump Intake Depth:	MS					Comments	
Sampling Method:	LF				Tubing Type:	LDPE						
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	
0849			24.00	0.15	6.83	16.9	2773	0.75	217.8	-	C	
0852			24.00	0.15	6.52	16.1	2588	0.81	223.7	-	C	
0855			24.00	0.15	6.40	16.1	1798	0.84	223.9	-	C	
0858			24.00	0.15	6.38	16.1	1774	0.86	224.3	-	C	
0901			24.00	0.15	6.33	16.2	1748	0.88	224.6	-	C	
			(			SAMPLE					)	

Clarity: VC = very cloudy, CI = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-26	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace	
Sample Time:	0901	Final Depth to Water:	24.00	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCL	VOC	yes ~~no~~	—	—	—
1 x 125 mL Poly	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1 x 125 mL Poly	—	Nitrate	yes ~~no~~	—	—	—
3 x 20 mL G	—	Ethane, Ethene Methane	yes ~~no~~	—	—	—
1 x 250 mL Amber	H_2SO_4	TOC	yes ~~no~~	—	—	—
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-14	Job Number:	1126
Client:	NuStar	Date:	6/28/18
Project:	Vancouver	Sampler:	ZM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	24.24	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:	BP			Pump Intake Depth:	MS					Comments	
Sampling Method:	LF			Tubing Type:	LDPE						
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
1621			24.31	0.15	6.57	22.1	2214	1.23	209.4	—	C
1624			24.31	0.15	6.61	21.2	2148	3.95	207.1	—	C
1627			24.31	0.15	6.64	20.6	2046	5.68	204.3	—	C
1630			24.31	0.15	6.71	20.3	2004	6.74	202.9	—	C
1633			24.31	0.15	6.76	20.2	1965	6.59	204.1	—	C
1636			24.31	0.15	6.80	20.0	1971	6.59	203.6	—	C
1639			24.31	SAMPLE							

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:	AIS, Pace
Sample Time:	1639	Final Depth to Water:	24.31	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 mL	HCl	VOC	yes no	—	—	—
1x100 mL	H_2SO_4	Ammonia	yes no	—	—	—
1x100 mL	—	Nitrate	yes no	—	—	—
3x20 mL	—	Ethene/Ethane/Methane	yes no	—	—	—
1x250 Amb	H_2SO_4	TOC	yes no	—	—	—
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-23I	Job Number:	1126
Client:	MUSTAT	Date:	6/28/18
Project:	Vancouver	Sampler:	JM
Weather:	60 cloudy	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	26.23	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:	BP	Pump Intake Depth:	MS
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
1535			26.20	0.15	7.26	19.2	120.2	5.50	179.4	—	C
1538				0.15	6.97	17.4	130.3	4.51	188.5	—	C
1541				0.15	6.90	17.2	137.2	4.40	172.3	—	C
1544				0.15	6.92	16.7	141.3	4.00	168.5	—	C
1547				0.15	6.93	16.8	141.6	4.04	168.4	—	C
1550			26.25	0.15	6.93	16.8	141.9	4.05	168.6	—	C
						SAMPLE				)	

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-23I	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace
Sample Time:	1550	Final Depth to Water:	26.25	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40mL	HCL	VOC	yes ~~no~~	—	—	—
1x100mL	H_2SO_4	Ammonia	yes no			
1x100mL	—	Nitrate	yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-17	Job Number:	1126
Client:	NuStar	Date:	6/28/18
Project:	Vancouver	Sampler:	JM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2 4"	Water Height	
Depth to Water:	24.20	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

												Comments
Purge Method:					Pump Intake Depth:							
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	
1447			23.83	0.15	7.05	17.9	594	3.41	138.2	—	C	
1450			23.85	0.15	6.72	15.8	576	2.60	144.1	—	C	
1453			23.87	0.15	6.67	15.7	575	2.89	145.9	—	C	
1456			23.89	0.15	6.60	15.6	574	2.68	150.3	—	C	
1459			23.92	0.15	6.57	15.6	573	2.50	151.3	—	C	
1502			23.93	SAMPLE								

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-17	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace	
Sample Time:	1502	Final Depth to Water:	23.93	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCL	VOC	yes no	—		
1 x 100 mL Poly	H_2SO_4	Ammonia	yes no	—		
1 x 100 mL Poly	—	Nitrate	yes no	—		
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-241	Job Number:	1126
Client:	Nustar	Date:	6/28/18
Project:	Vancover	Sampler:	EJ
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	25.95	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

				Comments
Purge Method:	BP	Pump Intake Depth:	MS	
Sampling Method:	FS	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
1045			25.24	0.15	7.70	17.9	645	4.81	111.3	-	C
1048			25.26	0.15	7.54	17.2	162.1	5.17	120.4	-	C
1051			25.28	0.15	7.34	16.9	166.3	4.46	116.5	-	C
1054			25.28	0.15	7.21	16.5	162.8	2.06	120.9	-	C
1057			25.29	0.15	7.11	16.6	156.4	2.66	128.8	-	C
1100			25.30	0.15	7.11	16.6	156.4	2.70	129.1	-	C
1103			25.31	0.15	7.11	16.6	156.2	2.69	129.9	-	C
1106				S	ample						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW241D	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS / Pace
Sample Time:	1106	Final Depth to Water:	25.31	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 mL	HCL	VOC	yes no	—		
100 mL poly	H_2SO_4	Amonia	yes no	—		
100 mL poly	H—	Nitrate	yes no	—		
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	EX-1	Job Number:	1126
Client:	Mustang	Date:	6/28/18
Project:	Vancouver	Sampler:	ZM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	24.30	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:	BP	Pump Intake Depth:	~5	Comments	
Sampling Method:	ZF	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
0936			24.51	0.15	8.01	17.9	1033	0.84	61.9	—	gray
0941			24.51	0.15	7.70	17.4	960	0.30	-10.1	—	"
0944			24.51	0.15	7.73	17.6	982	0.27	-45.8	—	"
0947			24.51	0.15	7.66	17.6	987	0.38	-60.1	—	"
0950			24.51	0.15	7.64	17.6	987	0.39	-62.6	—	"
0953			24.51		SAMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	EX-1	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace
Sample Time:	0953	Final Depth to Water:	24.51	Did Well Dewater?	no

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	6 HCL	VOC	yes no			
1 x 100 mL	8 H_2SO_4	Ammonia	yes no			
1 x 100 mL	9 —	Nitrate	yes no			
250 mL	6 H_2SO_4	TOC	yes no			
3 x 20 mL	6 —	Ethene, Ethane	yes no			
		Methane	yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW 19	Job Number:	1126
Client:	NuStar	Date:	6/28/15
Project:	Vancouver	Sampler:	ZG
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	24.56	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:	BP	Pump Intake Depth:	MS
Sampling Method:	PP	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
0840			24.56	0.15	7.23	17.2	1919	0.80	30.7	-	C
0843			24.58	0.15	7.06	16.8	1925	0.70	20.1	-	C
0846			24.60	0.15	7.05	17.0	1880	2.13	-28.1	-	C
0849			24.62	0.15	7.05	17.0	1881	2.18	-29.6	-	C
0852			24.65	0.15	7.05	17.0	1885	2.18	-30.8	-	C

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:	AIS/Pace
Sample Time:	0852	Final Depth to Water:	24.55	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
Ammonia	H_2SO_4	H_2SO_4	yes ~~no~~	—		
Nitrate	—	—	yes ~~no~~	—		
VOC	~~3 40mL HCl~~	3x40mL	yes ~~no~~	—		
VOC	3 HCl	3x40mL	yes ~~no~~	—		DUP
TOC	H_2SO_4	250mL Amber	yes ~~no~~	—		
Ethene/Ethane Methane	3x20mL	RSK	yes no	—		

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	S-1	Job Number:	1126
Client:	Mustar	Date:	6/28/18
Project:	Vancouver	Sampler:	EM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	25.23	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:	BP	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
1315			24.92	0.15	7.46	24.0	181.6	1.75	182.5	-	C
1316			24.93	0.15	7.10	18.6	166.4	1.63	200.8	-	C
1321			24.94	0.15	6.89	18.0	166.9	1.60	206.3	-	C
1324			24.94	0.15	6.89	18.0	171.5	1.61	206.0	-	C
1327			24.95		SAMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	S-1	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS / Para
Sample Time:	1327	Final Depth to Water:	24.95	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCL	VOC	yes no			
1 x 100 mL	H_2SO_4	Ammonia	yes no			
1 x 100 mL	H_2SO_4	Nitrate	yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	S-2	Job Number:	1126
Client:	Mustang	Date:	6/28/18
Project:	Vancouver	Sampler:	LM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	25.15	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:	BP				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	
1356			24.80	0.15	6.46	19.5	1568	2.04	227.3	—	C	
1359			25.13	0.15	6.46	17.8	1512	2.96	232.8	—	C	
1402			25.36	0.15	6.46	18.0	1516	2.84	229.5	—	C	
1403			25.48	0.15	6.46	18.0	1523	2.97	223.8	—	C	
1405			SAMPLE									

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	S-2	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace		
Sample Time:	1405	Final Depth to Water:	25.48	Did Well Dewater?	no		
# Containers/Type	Preservative	Analysis/Method	Field Filtered		Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCL	VOC	yes	no	—		
1 x 100 mL	H_2SO_4	Ammonia	yes	no	—		
1 x 100 mL	—	Nitrate	yes	no	—		
			yes	no			
			yes	no			
			yes	no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MP-1	Job Number:	1126
Client:	Mostar	Date:	6/28/18
Project:	Vancouver	Sampler:	JM
Weather:	Sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	24.50	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

												Comments
Purge Method:					Pump Intake Depth:							
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	
1200			24.52	0.15	6.87	17.8	892	2.38	178.6	—	C	
1203			24.57	0.15	6.86	16.4	765	0.31	177.1	—	C	
1206			24.63	0.15	6.77	16.3	829	0.34	172.9	—	C	
1209			24.66	0.15	6.75	16.2	835	0.45	159.3	—	C	
1212			24.71	0.15	6.75	16.2	840	0.45	159.1	—	C	
1215				SAMPLE								

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MP-1	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS/Pace	
Sample Time:	1215	Final Depth to Water:	24.71	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40mL	HCL	VOC	yes ~~no~~	—	—	—
1 x 100 Poly	—	Nitrate	yes ~~no~~	—	—	—
1 x 100 Poly	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1 x 250 Amb	H_2SO_4	TOC	yes ~~no~~	—	—	—
3 x 20mL	—	Ethane/Ethene	yes ~~no~~	—	—	—
		Methane	yes ~~no~~			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MP-3	Job Number:	1126
Client:	NuStar	Date:	6/28/18
Project:	Vancouver	Sampler:	LM
Weather:	sunny	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	24.40	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:	BP				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	
1138			24.40	0.15	6.39	17.2	1483	1.04	155.4	—	C	
1141			24.43	0.15	6.38	17.0	1502	1.09	155.5	C	C	
1144			24.46	0.15	6.39	16.9	1498	1.15	153.1	—	C	
1147			24.50		SAMPLE							

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MP-3	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS/Pace	
Sample Time:	1147	Final Depth to Water:	24.50	Did Well Dewater?	no	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
100ML poly	H_2SO_4	Amonia	yes ~~no~~	—	—	—
100 ML poly	—	Nitrate	yes ~~no~~	—	—	—
3X40ML	HCL	VOC	yes ~~no~~	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-2	Job Number:	1126
Client:	NuStar	Date:	7/2/2018
Project:	Vancouver	Sampler:	ZM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	27.05	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:	BP	Pump Intake Depth:	25	Comments	
Sampling Method:	LF	Tubing Type:	LDPE		

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
1309			27.05	0.15	6.37	17.4	724	0.93	175.6	—	C
1312			27.35	0.15	6.35	16.5	727	0.54	81.1	—	C
1315			27.61	0.15	6.38	16.5	772	0.61	-11.5	—	C
1316			27.73	0.15	6.42	16.5	771	0.61	-12.6	—	C
1321			27.80	0.15	6.43	16.5	773	0.61	-13.7	—	C
1324					SAMPLE			0.62	~~-14.8~~	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-2	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS, Pace
Sample Time:	1324	Final Depth to Water:	27.60	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3X40 mL	HCl	VOC	yes ~~no~~	—	—	—
1X125 mL	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1X125 mL	—	nitrate	yes ~~no~~	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-3	Job Number:	1126
Client:	NuStar	Date:	7/2/18
Project:	Vancouver	Sampler:	JM
Weather:	Overast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	26.08	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:	BP	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	LDPE		

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
1231			26.08	0.15	6.62	18.1	932	2.71	200.3	—	Gray
1234			26.10	0.15	6.43	14.9	600	1.08	192.6	—	C
1237			26.11	0.15	6.35	14.9	584	2.01	186.0	—	C
1240			26.12	0.15	6.35	14.7	585	2.09	185.9	—	C
1243			26.13	0.15	6.34	14.7	585	2.32	184.8	—	C
1247					SAMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-3	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS/Pace
Sample Time:	1247	Final Depth to Water:	26.13	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40 ML	HCL	VOC	yes ~~no~~	—	—	—
1x125 ML	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1x125 ML	—	Nitrate	yes ~~no~~	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-19i	Job Number:	1126
Client:	NuStar	Date:	7/2/16
Project:	Vancouver	Sampler:	ZM
Weather:	overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	26.97	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:	BP	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	LDPE		

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
1113			26.97	0.15	6.97	18.6	212.9	4.66	189.1	—	C
1116			26.96	0.15	6.92	16.3	187.5	0.38	189.5	—	C
1119			26.99	0.15	6.84	16.1	166.8	0.26	188.3	—	C
1122			26.99	0.15	6.82	15.9	198.1	0.23	188.8	—	C
1125			26.99	0.15		SAMPLE				—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19i	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS/Pace
Sample Time:	1125	Final Depth to Water:	26.99	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCL	VOC	yes ~~no~~	—	—	—
1 x 125 mL	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1 x 125 mL	—	Nitrate	yes ~~no~~	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-15	Job Number:	1126
Client:	NuStar	Date:	7/2/16
Project:	Vancouver	Sampler:	JM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	29.83	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:	BP			Pump Intake Depth:	25					Comments	
Sampling Method:	LP			Tubing Type:	LDPE						
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
1035			29.83	0.15	6.69	16.5	665	3.38	180.5	-	C
1038			30.01	0.15	6.44	16.2	645	1.11	182.6	-	C
1041			30.26	0.15	6.31	16.0	643	1.05	181.6	-	C
1044			30.58	0.15	6.30	16.2	647	1.21	176.4	-	C
1047			30.68	0.15	6.30	16.2	647	1.26	175.6	-	C
1050						SAMPLE					

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-15	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS/Pace
Sample Time:	1050	Final Depth to Water:	30.68	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 ML	HCL	VOC	yes no	-	-	-
1 X 125 ML	H_2SO_4	Ammonia	yes no	-	-	-
1 X 125 ML	-	NITRATE	yes no	-	-	-
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-20i	Job Number:	1126
Client:	NuStar	Date:	7/2/18
Project:	Vancouver	Sampler:	JM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	26.24	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:	BP				Pump Intake Depth:	MS				Comments	
Sampling Method:	LF				Tubing Type:	LDPE					
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
0939			26.24	0.15	6.93	17.1	208.2	5.18	180.6	—	C
0942			26.26	0.15	6.58	15.5	208.4	0.44	192.1	—	C
0945			26.27	0.15	3.30	15.4	217.1	0.31	181.2	—	C
0948			26.28	0.15	6.29	15.4	214.8	0.29	180.3	—	C
0951			26.28	0.15	6.33	15.0	218.6	0.27	179.5	—	C
0954					(				)		
					(	SAMPLE			)		

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-20i	Sampling Flow Rate	0.15	Analytical Laboratory:	AIS/Pace
Sample Time:	0954	Final Depth to Water:	26.28	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 X 40 mL	HCL	VOC	yes no	—	—	—
1 X 125 mL	H_2SO_4	Ammonia	yes no	—	—	—
1 X 125 mL	—	Nitrate	yes no	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-18i	Job Number:	1126
Client:	NuStar	Date:	7/2/16
Project:	vancouver	Sampler:	JM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	26.45	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:	BP				Pump Intake Depth:		MS				Comments	
Sampling Method:	LF				Tubing Type:		LDPE					
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	
0856			26.45	0.15	6.92	16.6	193.5	5.65	166.4	-	C	
0901			26.46	0.15	6.89	14.9	181.6	4.47	167.8	-	C	
0904			26.47	0.15	6.86	14.8	181.3	4.58	169.2	-	C	
0907			26.47	0.15	6.87	15.0	181.2	4.47	169.1	-	C	
0910						SAMPLE						

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-18i	Sampling Flow Rate	0.15	Analytical Laboratory:	Pace, AIS
Sample Time:	0910	Final Depth to Water:	26.47	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3 x 40 mL	HCl		yes ~~no~~	—	/	—
1 x 125 mL	H_2SO_4	Ammonia	yes ~~no~~	/	/	—
1 x 125 mL	—	nitrate	yes ~~no~~	/	/	—
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-16	Job Number:	1126-21
Client:	NuStar	Date:	7/2/18
Project:	Vancouver	Sampler:	SM
Weather:	Overcast	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	25.81	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:	BP				Pump Intake Depth:	25				Comments	
Sampling Method:	LF				Tubing Type:	LDPE					
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
0814			25.81	0.15	7.81	16.3	607	3.74	77.4	-	C
0817			25.93	0.15	7.06	15.0	598	2.06	104.7	-	C
0820			25.94	0.15	6.50	14.8	594	1.96	127.1	-	C
0823			25.95	0.15	6.45	14.6	594	1.92	127.5	-	C
0827			25.95	0.15	6.43	14.8	594	1.96	133.7	-	C
					(				)		
						SAMPLE					

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-16	Sampling Flow Rate	0.15	Analytical Laboratory:	ALS, Pace
Sample Time:	0827	Final Depth to Water:	25.95	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
3x40ML	HCL	VOC	yes ~~no~~	—	—	—
1x125 ML	H_2SO_4	Ammonia	yes ~~no~~	—	—	—
1x125 ML	—	Nitrate	yes ~~no~~	—	—	—
			yes no			
			yes no			
			yes no			

COMMENTS

APEX

NuStar Vancouver SVE System Monitoring

320001126-16.003

Date: 1/22/18
Arrival Time: 730
Departure Time: 800

APEX Representative: KK
Weather: Rain
APEX PID: 3

NORTH SVE SYSTEM	Pressure (inches H20) 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 = Yes / No
Notes: Not running

SOUTH SVE SYSTEM	Pressure (inches H20) blower on	PID (blower on)	PID (blower off)
Pre Blower	-20.0	--	0.0
Post Blower - Pre Carbon	30.0	13.6	--
Post Carbon 1 (mid carbon)	18.0	10.2	--
Post Carbon 2	7.0	7.2	--

Knockout Drum Emptied = (Yes) / No
Volume in Knockout Drum = 11 gallons

Knockout drum visually inspected for holes or material deteriorations = (Yes) No
Notes: Blue water

Sampling Information

Sample ID	Sample Location	Canister #	Initial Vacuum	Time		Final Vacuum
				Start	Finish	
SVE_South_Pre carbon_012218		7843	-30	750	751	-3
SVE_South_Post carbon_012218		4182	-29	752	753	-4

Other Notes / Comments:

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	**Project Manager:** Stephanie Salisbury	**Samples Collected By:** Kyle Kline	COC No:
Company Name: Apex Companies	**Phone:** 503 924 4704 X 1925		1 of 1 COCs
Address: 3015 SW 1st Ave	**Email:** SSalisbury@Apexcos.com		
City/State/Zip Portland OR 97201			**For Lab Use Only:**
Phone: 503 924-4704	**Site Contact:**		Walk-in Client:
FAX:	**TA Contact:**		Lab Sampling:
Project Name: Mustar Vancouver REM	**Anaylsis Turnaround Time**		Job / SDG No.:
Site/Location: Vancouver WA	Standard (Specific): X		(See below for Add'l Items)
PO # 1126 - 20	Rush (Specifiy):		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25.3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	*Sample Type*	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SVE_South_Pre carbon_012218	1/22/18	750	751	-30	-3	—	7843	X														
SVE_South_Post Carbon_012218	1/22/18	752	753	-29	-4	—	4182	X														

	Temperature (Fahrenheit)			
	Start	Interior	Ambient	
	Stop			

	Temperature (Fahrenheit)			
	Start	Interior	Ambient	
	Stop			

Special Instructions/QC Requirements & Comments:
Email Results to: SSalisbury@Apexcos.com

Samples Shipped by: Kyle Kline	**Date / Time:** 1/23/18 1115	**Samples Received by:**	
Samples Relinquished by: Kyle K	**Date / Time:**	**Received by:**	
Relinquished by:	**Date / Time:**	**Received by:**	
Lab Use Only: **Shipper Name:**	**Opened by:**	**Condition:**	

APEX
3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-21
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 2/28/18

PROJECT	Monthly O+M REM	ARRIVAL TIME	0700
LOCATION	Vancouver WA	DEPARTURE TIME	0852
CLIENT	Nustar	WEATHER	overcast/light rain
PURPOSE OF OBSERVATIONS	monthly SVE		
APEX REPRESENTATIVE	KK	APEX PROJECT MANAGER	S. Salisbury
CONTRACTOR	—	PERMIT NO.	277107
CONTRACTOR REP.	—	H&S REVIEW	yes

0700 - on site, safety meeting, get permit

0725 - Empty Knockout Drum on SVE (south) system, ~ 13 gallons contents are still Blue.

0734 - Start O+M on South SVE system

0816 - Finish O+M on south system. PID was not calibrating correctly so was unable to get PID Readings.

0822 Dump SVE Knockout Drum water, Placed a new waste Drum on site

0840 - Talk with zach, turn in permit, sign out

0852 OFF site

BY
APEX REPRESENTATIVE

REVIEWED BY
APEX PROJECT MANAGER

APEX

NuStar Vancouver SVE System Monitoring

320001126-16.003

Date: 2/28/18
Arrival Time: 0700
Departure Time:

APEX Representative: KK
Weather: Rain
APEX PID: -

NORTH SVE SYSTEM	Pressure (inches H20) 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 = Yes / No
Notes: System Down

SOUTH SVE SYSTEM	Pressure (inches H20) blower on	PID (blower on)	PID (blower off)
Pre Blower	-20.0	--	—
Post Blower - Pre Carbon	30.0	—	--
Post Carbon 1 (mid carbon)	18.0	—	--
Post Carbon 2	7.0	—	--

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	
SVE_South_Pre carbon_022818		34000299	-30	801	802	-3
SVE_South_Post carbon_022818		34000564	-30	804	805	-1

Other Notes / Comments:
PID was not calibrating correctly so was unable to get Readings

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	Project Manager: Stephanie Salisbury	Samples Collected By: Kyle Kline	COC No: 1 of 1 COCs
Company Name: Apex companies	Phone: 503 924 4704 x 1925		
Address: 3015 SW 1st Ave	Email: SSalisbury@Apexcos.com		For Lab Use Only:
City/State/Zip Portland OR 97201			Walk-in Client:
Phone: 503-924-4704	Site Contact:		Lab Sampling:
FAX:	TA Contact:		
Project Name: Nustar Vancouver REM	Anaylsis Turnaround Time		Job / SDG No.:
Site/Location: Vancouver, WA	Standard (Specific): X		(See below for Add'l Items)
PO # 1126-21	Rush (Specifiy):		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25.3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SVE_South_Pre Carbon_022818	2/28/18	801	802	-30	-3	34000	999	X														
SVE_South_Post Carbon_022818	2/28/18	804	805	-30	-1	34000	564	X														

	Temperature (Fahrenheit)		
Start	Interior	Ambient	
Stop			

	Temperature (Fahrenheit)		
Start	Interior	Ambient	
Stop			

Special Instructions/QC Requirements & Comments: Email Results to: SSalisbury@Apexcos.com

Samples Shipped by: Kyle Kline	Date / Time:	Samples Received by:	
Samples Relinquished by: Kyle	Date / Time:	Received by:	
Relinquished by:	Date / Time:	Received by:	
Lab Use Only: Shipper Name:	Opened by:	Condition:	

Form No. CA-C-WI-003, Rev. 1, dated 05/10/2013

APEX
3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-21
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 3/29/18

PROJECT Nustar Van
LOCATION Nustar Vancouver WA
CLIENT Nustar
PURPOSE OF OBSERVATIONS monthly O+M
APEX REPRESENTATIVE KK
CONTRACTOR —
CONTRACTOR REP. —

ARRIVAL TIME 1030
DEPARTURE TIME 1110
WEATHER Sun
APEX PROJECT MANAGER S. Salisbury
PERMIT NO. —
H&S REVIEW yes

GROUND DISTURBANCE PERMIT COMPLETED ☐ YES ☐ NO ☒ N/A

1030 - Empty SVE Knockout Drum ~ 12 gallons
1050 - Start O+M on South system
1110 - Finish O+M at South system

BY
APEX REPRESENTATIVE

REVIEWED BY
APEX PROJECT MANAGER

APEX

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 (inches H20) 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 = Yes / No
Notes: north system down

SOUTH SVE SYSTEM	Pressure (inches H20) blower on	PID (blower on)	PID (blower off)
Pre Blower	-20	--	
Post Blower - Pre Carbon	31	19	--
Post Carbon 1 (mid carbon)	19	28	--
Post Carbon 2	8	19	--

Knockout Drum Emptied = (Yes) / No
Volume in Knockout Drum = ~12 gallons

Knockout drum visually inspected for holes or material deteriorations = (Yes) / No
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:

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	Project Manager: Stephanie Salisbury	Samples Collected By: Kyle Kline	COC No:
Company Name: Apex companies	Phone: 503 924 4704 x 1925		1 of 1 COCs
Address: 3015 SW 1st Ave	Email: SSalisbury@Apexcos.com		
City/State/Zip Portland OR 97201			For Lab Use Only:
Phone: 503 924 4704	Site Contact:		Walk-in Client:
FAX: —	TA Contact:		Lab Sampling:
Project Name: Nustar Van REM	Anaylsis Turnaround Time		Job / SDG No.:
Site/Location: vancouver WA	Standard (Specific): X		(See below for Add'l Items)
P O # 1126-21	Rush (Specifiy):		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25.3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SUE_South_Pre carbon_032918	3/29/18	1103	1104	-27	-1	3400	0037	X														
SUE_South_Post carbon_032918	3/29/18	1105	1106	-28	-1	3400	0049	X														

	Temperature (Fahrenheit)			
	Start	Interior	Ambient	
	Stop			

	Temperature (Fahrenheit)			
	Start	Interior	Ambient	
	Stop			

Special Instructions/QC Requirements & Comments: Email Results to: SSalisbury@Apexcos.com

Samples Shipped by: Kyle Kline	Date / Time: 4/2/18 1120	Samples Received by:	
Samples Relinquished by:	Date / Time:	Received by:	
Relinquished by:	Date / Time:	Received by:	

Lab Use Only: Shipper Name: Opened by: Condition:

APEX
3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 1126-21
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 4/24/18

PROJECT	Nustar REM O+M	ARRIVAL TIME	0653
LOCATION	Vancouver	DEPARTURE TIME	0830
CLIENT	Nustar Vancouver	WEATHER	Sunny
PURPOSE OF OBSERVATIONS	monthly O+M		
APEX REPRESENTATIVE	Kyle Kline	APEX PROJECT MANAGER	S. Salisbury
CONTRACTOR	—	PERMIT NO.	277204
CONTRACTOR REP.	—	H&S REVIEW	yes

0653 - on Site, Sign in, Safety Meeting, get permit
0720 - Empty Knock out Drum on South System.
~ 8 gallons Blue water
0727 - cal PID, prep for O+M.
0731 - Start O+M
0758 - Finish O+M
0805 - Dump purge water into waste Drum
830 - Turn in permit, sign out, OFF Site
Had to wait for Nustar to sign permit.

BY
Kyle Kline
APEX REPRESENTATIVE

REVIEWED BY
APEX PROJECT MANAGER

APEX

NuStar Vancouver SVE System Monitoring

320001126-16.003

Date: 4/24/18
Arrival Time: 0653
Departure Time:

APEX Representative: KK
Weather: Sunny
APEX PID: 3

NORTH SVE SYSTEM	Pressure (inches H20) 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 = Yes / No

Notes: Not running, system down

SOUTH SVE SYSTEM	Pressure (inches H20) blower on	PID (blower on)	PID (blower off)
Pre Blower	-20	--	2.2
Post Blower - Pre Carbon	31	26.8	--
Post Carbon 1 (mid carbon)	19	29.2	--
Post Carbon 2	8	18.8	--

Knockout Drum Emptied = (Yes) / No
Volume in Knockout Drum = ~8 gallons

Knockout drum visually inspected for holes or material deteriorations = (Yes) No

Notes: Blue water

Sampling Information

Sample ID	Sample Location	Canister #	Initial Vacuum	Time		Final Vacuum
				Start	Finish	
SVE_South_Pre Carbon_042418		34001193	-30	0748	0749	-3
SVE_South_Post carbon_042418		34000249	-30	0750	0751	-3

Other Notes / Comments:

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	Project Manager: Stephanie Salisbury	Samples Collected By: Kyle Kline	COC No:
Company Name: Apex Companies	Phone: 503 924-4704 x1925		1 of 1 COCs
Address: 3015 SW 1st Ave	Email: SSalisbury@Apexcos.com		
City/State/Zip Portland OR 97201			For Lab Use Only:
Phone: 503-924-4704	Site Contact: —		Walk-in Client:
FAX: —	TA Contact: —		Lab Sampling:
Project Name: Nustar Van RFM	Anaylsis Turnaround Time		Job / SDG No.:
Site/Location: Vancouver, WA	Standard (Specific): X		(See below for Add'l Items)
PO # 1126-21	Rush (Specifiy):		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25.3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SVE_South_Pre carbon_042418	4/24/18	0748	0749	-30	-3	34001	1193	X														
SVE_South_Post carbon_042418	4/24/18	0750	0751	-30	-3	34000	249	X														

	Temperature (Fahrenheit)			
	Start	Interior	Ambient	
	Stop			

	Temperature (Fahrenheit)			
	Start	Interior	Ambient	
	Stop			

Special Instructions/QC Requirements & Comments: Email Results to: SSalisbury@Apexcos.com

Samples Shipped by: Kyle Kline	Date / Time: 4/24/18 1010	Samples Received by:	
Samples Relinquished by:	Date / Time:	Received by:	
Relinquished by:	Date / Time:	Received by:	
Lab Use Only: Shipper Name:	Opened by:	Condition:	

APEX

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 (inches H20) 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 = Yes / No

Notes: System is down, not running

SOUTH SVE SYSTEM	Pressure (inches H20) blower on	PID (blower on)	PID (blower off)
Pre Blower	-30	--	13.8
Post Blower - Pre Carbon	30	36.6	-
Post Carbon 1 (mid carbon)	18	40.2	-
Post Carbon 2	8	26.8	--

Knockout Drum Emptied = Yes / (No)
Volume in Knockout Drum = Ø

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	-30	0758	0759	-1
SVE_South_Post Carbon_051618		34001529	-30	0800	0801	-3

Other Notes / Comments:

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	**Project Manager:** Stephanie Salisbury	**Samples Collected By:** Kyle Kline
Company Name: Apex companies	**Phone:** 503-924-4704 x 1925	
Address: 3015 SW First Ave	**Email:** SSalisbury@Apexcos.com	
City/State/Zip Portland OR 97201		
Phone: (503) 924 4704	**Site Contact:**	
FAX:	**TA Contact:**	
Project Name: Nustar Van REM	**Anaylsis Turnaround Time**	
Site/Location: Vancouver, WA	Standard (Specific): X	
P O # 1126-21	Rush (Specifiy):	

COC No: 1 of 1 COCs

For Lab Use Only:
Walk-in Client:
Lab Sampling:

Job / SDG No.:
(See below for Add'l Items)

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25.3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SVE_South_Pre Carbon_051618	5/16/18	0758	0759	-30	-1	34000267		X														
SVE_South_Post Carbon_051618	5/16/18	0800	0801	-30	-3	34001529		X														

Temperature (Fahrenheit)			
Start	Interior	Ambient	
Stop			

Temperature (Fahrenheit)			
Start	Interior	Ambient	
Stop			

Special Instructions/QC Requirements & Comments: Email Results To: SSalisbury@Apexcos.com

Samples Shipped by: Kyle Kline	**Date / Time:** 5/17/18 0900	**Samples Received by:**	
Samples Relinquished by: Kyle	**Date / Time:**	**Received by:**	
Relinquished by:	**Date / Time:**	**Received by:**	
Lab Use Only: **Shipper Name:**	**Opened by:**	**Condition:**	

APPENDIX B

HISTORICAL GROUNDWATER ANALYTICAL DATA

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-1	11/17/93	--	500	--	--	<250	<250	--	14,000	--	--	750	<250	--	1,400	<500
	09/01/95	<250	<500	<250	<250	<250	<250	<250	13,000	<250	<250	620	<250	--	890	610
	09/24/96	<5	<20	<2	<2	54	<2	8.4	11,000	83	17	2,600	68	--	1,800	420
	12/02/96	0.8	<0.50	<0.50	<0.20	6.7	<0.50	0.3	1,500	4.4	<0.20	1,200	7.3	--	310	1.6
	11/12/97	<125	<250	<125	<125	<125	<125	<125	11,600	<125	<125	6,330	<125	--	2,880	<250
	08/11/99	<50	<250	<25	<250	43.1	<25	<25	8,590	86	<25	2,520	52.5	--	1,210	408
	11/16/99	<50	<125	<25	<50	38	<25	<25	6,250	47.5	<25	2,400	28	--	829	148
	02/29/00	<100	<500	<50	<50	<50	<50	<50	6,720	60.9	<50	1,370	<100	--	590	438
	06/27/00	<100	<500	<50	<50	<50	<50	<50	6,480	65.1	<50	1,780	<100	--	795	284
	08/31/00	<100	<500	<50	<50	<50	<50	<50	5,160	<50	<50	1,960	<100	--	720	<50
	11/30/00	<20	<100	<10	<10	15	<10	<10	1,550	12.7	<10	660	<20	--	234	<10
	02/27/01	<100	<100	<50	<50	<50	<50	<50	4,990	<50	<50	1,140	<100	--	440	190
	05/29/01	<50	<250	<25	<25	<25	<25	<25	4,050	<25	<25	1,040	<50	--	407	91
	09/25/01	<50	<50	<50	<50	<50	<50	<50	5,000	<50	<50	890	<50	--	440	240
	12/17/01	<2	<10	<1	<1	<1	<1	<1	109	1.26	<1	164	<2	--	42.9	<1
	03/19/02	<50	<25	<25	<50	35	<25	<25	4,120	35	<25	710	<25	--	349	170
	05/30/02	<10	<5	<5	<10	10.8	<5	<5	1,140	6.6	<5	307	<5	--	101	22.3
	11/08/02	<20	<10	<10	<20	22.8	<10	<10	1,980	20.2	<10	367	<10	--	174	14.4
	05/30/03	<20	<10	<10	<20	21.2	<10	<10	2,180	<10	<10	1,200	14.2	--	340	22.6
	11/02/04	<20	<10	<10	<20	22.4	<10	<10	2,130	23.6	<10	335	<10	--	169	22.8
	11/16/04	<12	<12	<12	<12	15	<12	<12	1,300	<12	<12	310	<12	--	130	<12
	05/18/05	<5	<2.5	<2.5	<5	12	<2.5	<2.5	773	14.1	<2.5	193	<2.5	--	87.6	3.8
	05/23/07	<10	<10	<10	<10	15.5	<10	<10	1,110	<10	<10	58.5	<10	--	45.4	11.7
	09/11/07	<50	<25	<25	<50	<25	<25	<25	916	<25	<25	34	<25	--	34	62.5
	12/13/07	<10	<5	<5	<10	9.7	<5	<5	526	5	<5	81.9	<5	--	45.4	8.8
	03/05/08	<1	<0.500	<0.500	<1	16.1	<0.500	1.66	826	9.18	2.3	49.7	0.88	<0.500	45.6	58.8
	09/19/08	<20	<10	<10	<20	20.4	<10	<10	633	<10	<10	108	<10	<10	74.8	<10
	12/10/08	<2.5	<2.5	<2.5	<2.5	15	<2.5	<2.5	570	6.2	<2.5	28	<2.5	<2.5	25	48
	03/27/09	<2.5	<2.5	<2.5	<2.5	17	<0.50	<2.5	580	5.7	<2.5	39	<2.5	<2.5	42	4.4
	06/17/09	<0.90	<0.90	<0.90	<0.90	6.3	<0.90	<0.90	310	3.6	0.99	21	<0.90	<0.90	14	9.7
	09/18/09	<0.80	<0.80	<0.80	<0.80	19	<0.80	<0.80	590	4.2	1.9	29	<0.80		27	8.1
	12/17/09	<0.50	<0.50	<0.50	<0.50	4.8	<0.50	<0.50	170	0.72	0.67	53	0.53	<0.50	26	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-1 (continued)	03/19/10	<0.50	<0.50	<0.50	<0.50	9.3	<0.50	0.61	300	3.6	1.4	22	<0.50	<0.50	21	26
	06/15/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.6	<0.50	<0.50	22	<0.50	<0.50	6.6	<0.50
	09/23/10	<0.90	<0.90	<0.90	<0.90	12	<0.90	<0.90	380	3.4	1.6	25	<0.90	<0.90	27	7.1
	12/09/10	<1.5	<1.5	<1.5	<1.5	7.1	1.5	<1.5	250	2.2	<1.5	25	<1.5	<1.5	17	8
	03/10/11	<1.5	<1.5	<1.5	<1.5	7.5	<1.5	<1.5	250	3	<1.5	16	<1.5	<1.5	16	18
	06/09/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.4	<0.5	<0.5	11	<0.5	<0.5	3.4	<0.5
	09/19/11	<1.5	<1.5	<1.5	<1.5	12	<1.5	<1.5	300	3.2	<1.5	5.2	<1.5	<1.5	13	30
	12/09/11	<1.5	<1.5	<1.5	<1.5	11	<1.5	<1.5	260	2.9	<1.5	6.2	<1.5	<1.5	8.4	40
	03/09/12	<0.50	<0.50	<0.50	<0.50	7.8	<0.50	<0.50	200	2.4	1	3.1	<0.50	<0.50	9.5	19
	06/22/12	<0.5	<0.5	<0.5	<0.5	4.8	<0.5	<0.5	140	1.7	0.53	17	<0.5	<0.5	13	14
	09/13/12	<1.5	<1.5	<1.5	<1.5	10	<1.5	<1.5	260	2.4	<1.5	<1.5	<1.5	<1.5	7	25
	12/13/12	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	47	0.64	<0.50	26	<0.50	<0.50	14	<0.50
	03/15/13	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	140	1.6	0.8	0.83	<0.50	<0.50	6	0.98
	06/13/13	<0.50	<0.50	<0.50	<0.50	7.2	<0.50	<0.50	130	1.9	0.63	1.1	<0.50	<0.50	2.4	28
	09/19/13	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	180	1.6	1	3.2	<0.50	<0.50	5.6	0.92
	12/16/13	<0.50	<0.50	<0.50	<0.50	7.8	<0.50	<0.50	110	1.8	<0.50	8.5	<0.50	<0.50	5.9	13
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.1	<0.50	<0.50	10	<0.50	<0.50	4.3	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.6	45	1	<0.50	<0.50	<0.50	<0.50	0.65	5.9
	9/30/2014	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	170	1.3	0.83	12	<0.50	<0.50	9.7	3.3
	12/11/2014	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	30	<0.50	<0.50	17	<0.50	<0.50	9.4	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	6.2	<0.50	<0.50	47.4	0.67	<0.50	1.1	<0.50	<0.50	1.9	<5
	6/17/2015	<0.50	<0.50	<0.50	<0.50	9.5	<0.50	<0.50	75	0.8	<0.50	4.3	<0.50	<0.50	4.6	4.9
	9/24/2015	<0.50	<0.50	<0.50	<0.50	8.4	<0.50	<0.50	39.1	0.65	<0.50	2.8	<0.50	<0.50	2.4	32.7
	12/8/2015	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	25.2	<0.50	<0.50	18	<0.50	<0.50	8.9	<0.50
	3/7/2016	<0.50	<2	<5	<0.50	4.4	<0.50	<0.50	51.9	<0.50	<0.50	18	<0.50	<0.50	10.3	0.57
	6/15/2016	<0.50	<2	<0.50	<0.50	3.7	<0.50	<0.50	13.1	<0.50	<0.50	0.67	<0.50	<0.50	1.2	5.3
	9/27/2016	<0.50	<2	<0.50	<0.50	8.6	<0.50	<0.50	25.2	<0.50	<0.50	2.3	<0.50	<0.50	3.1	23.9
	12/16/2016	<0.50	<2	<0.50	<0.50	3.4	<0.50	<0.50	22.5	<0.50	<0.50	8	<0.50	<0.50	5.8	0.86
	3/30/2017	<0.50	<2	<0.50	<0.50	<0.5	<0.5	<0.50	1.6	<0.50	<0.50	4.6	<0.50	<0.50	1.6	<0.50
	6/12/2017	<2.0	<2.0	<0.50	<0.50	2.1	<1.0	<0.50	9.9	<0.50	<0.50	4.4	<0.50	<0.50	3.1	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	6.8	<1.0	<0.50	6.7	<0.50	<0.50	1.5	<0.50	<0.50	1.6	22.6
	11/9/2017	<2.0	<2.0	<0.50	<0.50	5.00	<0.50	<0.50	22.80	<0.50	<0.50	9.50	<0.50	<0.50	6.50	1.1
	3/20/2018	<0.500	<2.50	<0.500	<0.500	4.84	<0.500	<0.500	6.13	<0.500	0.322 J	2.49	<0.500	<0.500	2.06	<0.500
	7/1/2018	<0.500	<2.50	<0.500	<0.500	6.70	<0.500	0.204 J	16.1	0.303 J	0.427 J	0.530	<0.500	<0.500	1.63	10.5

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-2	11/17/93	--	51	--	--	12	<0.50	--	10	--	--	<0.50	<0.50	--	<0.50	<0.10
	09/01/95	<0.50	16	<0.50	<0.20	8.2	<0.50	<0.50	2.5	<0.50	<0.50	<0.50	<0.50	--	<0.50	2.2
	09/24/96	<0.50	19	<0.20	<0.20	9.6	0.5	<0.20	9.4	<0.20	<0.20	<0.20	<0.50	--	0.3	5.1
	12/02/96	<0.50	8.8	<0.50	<0.20	6.9	0.6	<0.20	11	<1	<0.20	<0.50	<1	--	<0.30	7.2
	11/13/97	<0.50	<1	<0.50	<0.50	5.32	0.571	<0.50	7.9	<0.50	<0.50	<0.50	<0.50	--	<0.50	<1
	08/11/99	<1	18.3	<0.50	<0.50	6.38	<0.50	<0.50	20	<0.50	<0.50	<0.50	<1	--	10.4	1.64
	02/29/00	<1	16	<0.50	<0.50	5.68	<0.50	<0.50	23.5	<0.50	<0.50	<0.50	<1	--	4.52	1.21
	06/27/00	<1	18.3	<0.50	<0.50	5.34	<0.50	1.27	23.4	<0.50	<0.50	12.8	<1	--	16.6	<0.50
	05/30/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	--	<0.50	<0.50
	05/30/02	<1	1.68	<0.50	<1	2.65	<0.50	<0.50	0.51	<0.50	<0.50	0.61	<0.50	--	<0.50	<0.50
	11/08/02	<1	10.4	<0.50	<1	3.13	<0.50	<0.50	1.84	<0.50	<0.50	1.05	<0.50	--	0.98	<0.50
	05/30/03	<1	3.64	<0.50	<1	1.95	<0.50	<0.50	0.59	<0.50	<0.50	6.6	<0.50	--	1.13	<0.50
	09/12/07	<1	5.9	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	03/07/08	<1	7.86	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.5	<0.500	<0.500	<0.500	<0.500
	09/18/08	<1	5.93	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	03/24/09	<0.50	4.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/16/09	<0.50	5.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	0.85	<0.50
	03/19/10	<0.50	5.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/23/10	<0.5	3.8	<0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	03/09/11	<0.50	4.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/16/11	<0.50	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/09/12	<0.50	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/13/12	<0.50	3.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/14/13	<0.50	3.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/19/13	<0.50	2.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/30/2014	<0.50	2.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2015	<0.50	0.96	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/23/2015	<0.50	2.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/7/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/29/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/28/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	7/2/2018	<0.500	3.0	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-3	11/17/93	--	210	--	--	27	4	--	240	--	--	190	20	--	97	130
	09/01/95	<50	<100	<50	<50	<50	<50	<50	2,700	<50	<50	1,300	<50	--	140	730
	09/24/96	<5	<20	7.9	<2	12	<2	<2	1,100	9.5	4	1,800	21	--	330	82
	12/02/96	<50	<50	<50	<20	<30	<50	<20	650	<100	<20	2,100	<100	--	470	<50
	11/12/97	<25	<50	<25	<25	<25	<25	<25	464	<25	<25	2,000	<25	--	241	<50
	08/11/99	<20	<100	<10	<10	<10	<10	<10	500	<10	<10	1,760	25.4	--	247	<10
	11/16/99	<20	<50	<10	<20	14	<10	<10	628	15.2	<10	700	<10	--	132	<10
	02/29/00	<20	<100	<10	<10	<10	<10	<10	473	<10	<10	1,890	25.4	--	356	<10
	06/27/00	<20	<100	<10	<10	<10	<10	<10	410	<10	10.2	1,460	<20	--	241	<10
	08/31/00	<20	<100	<10	<10	52.2	<10	<10	2,580	25.5	<10	399	<20	--	100	171
	11/30/00	<5	<25	<2.5	<2.5	13.3	<2.5	<2.5	374	3.73	<2.5	366	<5	--	80.3	3.1
	02/27/01	<5	<25	3.64	<2.5	5.78	<2.5	<2.5	153	<2.5	2.5	358	<5	--	76.1	<2.5
	05/29/01	<5	<25	2.8	<2.5	<2.5	<2.5	<2.5	112	<2.5	<2.5	647	5.12	--	93.3	<2.5
	09/25/01	<1.3	3.1	2.4	<1.3	10	2	<1.3	210	3	1.7	550	7.2	--	90	4.9
	12/17/01	<10	<50	<5	<5	<5	<5	<5	164	<5	<5	826	16.9	--	155	<5
	03/19/02	<5	<2.5	2.75	<5	<2.5	<2.5	<2.5	138	4.1	<2.5	758	9.6	--	107	<2.5
	05/30/02	<10	7.8	<5	<10	27.8	<5	<5	1,380	42.6	6	302	11.5	--	55.1	96.7
	11/08/02	<5	15	<2.5	<5	29.4	3.55	<2.5	399	9.05	5.7	359	5.8	--	67.1	19.4
	05/30/03	<5	<2.5	6.45	<5	<2.5	<2.5	<2.5	50.1	3.65	<2.5	706	4.95	--	72.6	<2.5
	11/16/04	<10	<5	<5	<10	15	<5	<5	440	5.9	<5	270	<5	--	72	<5
	03/23/05	<2	2.26	4.16 B	<2	8.92	<1	<1	246	8.4	2.86	329	5.04	--	71.9	3.84
	05/18/05	<2	<1	3.86	<2	5.74	<1	<1	188	4.72	3.02	304	5.06	--	88.5	<1
	05/23/07	<2	<2	<2	<2	<2	<2	<2	110	6.3	<2	349	4.54	--	70.6	<2
	09/11/07	<5	9.95	14.4	<5	43	6.1	<2.50	950	28.2	12	601	31	--	223	6.1
	12/12/07	<10	<5	<5	<10	<5	<5	<5	95.7	<5	<5	254	<5	--	63.2	<5
	03/06/08	<1	<0.500	2.10 J	<1	1.32	<0.500	<0.500	127	8.49	2.37	144	5.66	<0.500	94.7	<0.500
	09/19/08	<5	3.7	2.65 J	<5	10.6	<2.50	<2.50	187	5.85	2.95	283	6.6	<2.50	75	<2.50
	12/10/08	<0.90	1.5	1.9	<0.90	5.3	1.2	<0.90	120	4.3	1.5	200	3.8	<0.90	54	<0.90
	03/26/09	<0.50	<0.50	1.4	<0.50	1.6	<0.50	<0.50	83	4.3	1.2	180	3.6	<0.50	46	<0.50
	06/17/09	<0.50	<0.50	1.1	<0.50	0.89	<0.50	<0.50	76	4.7	0.71	190	3.4	<0.50	49	<0.50
	09/18/09	<0.50	<0.50	3.3	<0.50	10	<0.50	<0.50	180	6.2	2.2	270	7.3	<0.50	62	1.2
	12/17/09	<0.90	<0.90	0.96	<0.90	<0.90	<0.90	<0.90	50	3.2	<0.90	180	3.2	<0.90	47	<0.90
	03/19/10	<0.90	<0.90	1 BE	<0.90	<0.90	<0.90	<0.90	77	5.4	<0.90	280	4.1	<0.90	49	<0.90
	06/16/10	<0.50	<0.50	2.3	<0.50	1.6	0.9	<0.50	42	1.7	<0.50	180	1.9	<0.50	30	<0.50
	09/23/10	<0.5	<0.5	2.8 BE	<0.5	0.56	<0.5	<0.5	75	4.4	0.51	220	3	<0.5	39	<0.5
	12/09/10	<0.5	<0.5	2.7	<0.5	<0.5	<0.5	<0.5	39	3.4	<0.5	210	3	<0.5	35	<0.5

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-3	03/10/11	<0.50	<0.50	5.4	<0.50	<0.50	<0.50	<0.50	8.9	1.1	<0.50	110	1.6	<0.50	15	<0.50
(continued)	06/10/11	<0.5	<0.5	1.6	<0.5	2.2	0.76	<0.5	36	1.1	0.54	99	1.6	<0.5	30	<0.5
	09/16/11	<0.50	<0.50	2	<0.50	3	0.59	<0.50	70	1.7	0.91	130	2.4	<0.50	31	<0.50
	12/09/11	<0.50	<0.50	2.2	<0.50	2.9	0.54	<0.50	62	1.6	0.83	190	2.6	<0.50	45	<0.50
	03/12/12	<0.50	<0.50	2.4	<0.50	0.83	<0.50	<0.50	52	2.8	1	140	3.1	<0.50	45	<0.50
	06/21/12	<0.5	<0.5	2.3	<0.5	0.9	<0.5	<0.5	45	2.7	0.56	170	2.7	<0.5	37	<0.5
	09/13/12	<0.50	<0.50	1.7	<0.50	4.1	<0.50	<0.50	100	2.1	1.4	140	3.3	<0.50	45	<0.50
	12/13/12	<0.50	<0.50	1.3	<0.50	0.78	<0.50	<0.50	27	1.6	<0.50	170	2	<0.50	36	<0.50
	03/14/13	<0.50	<0.50	1.8	<0.50	1	<0.50	<0.50	64	2.5	1.4	160	3.2	<0.50	53	<0.50
	06/14/13	<0.90	<0.90	1.4	<0.90	1.1	<0.90	<0.90	68	3.1	1.3	210	3.3	<0.90	48	<0.90
	09/19/13	<0.50	<0.50	1.1	<0.50	1.1	<0.50	<0.50	99	1.5	1.4	86	1.7	<0.50	30	<0.50
	12/16/13	<0.50	<0.50	1.4	<0.50	1.3	<0.50	<0.50	47	2.1	0.81	170	2.4	<0.50	38	<0.50
	3/21/2014	<0.50	<0.50	1.3	<0.50	0.64	<0.50	<0.50	27	1.6	<0.50	150	2	<0.50	30	<0.50
	6/24/2014	<0.50	0.86	0.86	<0.50	1.4	<0.50	<0.50	65	3.2	1.3	180	3.2	<0.50	44	<0.50
	9/30/2014	<0.50	<0.50	1	<0.50	6.7	0.7	<0.50	110	2.1	1.3	180	2.8	<0.50	47	<0.50
	12/11/2014	<0.50	<0.50	1.2	<0.50	0.8	<0.50	<0.50	28	1.7	<0.50	150	2.2	<0.50	37	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/15/2015	<0.50	<0.50	0.86	<0.50	1.1	<0.50	<0.50	49	2	0.88	160	2.8	<0.50	44	<0.50
	12/9/2015	<0.50	<0.50	0.66	<0.50	4.9	<0.50	<0.50	72	1.8	1.1	145	1.8	<0.50	33.6	<0.50
	3/7/2016	<0.50	<2	0.76	<0.50	2.2	<0.50	<0.50	61.8	2.5	1.3	199	3.6	<0.50	45.1	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	1.1	<0.50	<0.50	50.2	0.82	<0.50	49.5	0.77	<0.50	17.4	<0.50
	9/30/2016	<0.50	<2	0.67	<0.50	8.2	0.73	<0.50	95.3	1.5	1.6	145	2	<0.50	40.1	<0.50
	12/16/2016	<0.50	<2	0.52	<0.50	1.1	<0.50	<0.50	26.8	0.9	0.57	86.2	1.2	<0.50	23.9	<0.50
	3/29/2017	<0.50	<2	<0.50	<0.50	7.1	1.3	<0.50	77.9	1.2	<0.50	67.6	0.64	<0.50	20.2	2.5
	6/14/2017	<2.0	<2.0	1.0	<0.50	2.1	<1.0	<0.50	39.0	1.5	<0.50	163	1.7	<0.50	30.4	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	5.6	<1.0	<0.50	73.3	1.3	<0.50	127	1.5	<0.50	29.5	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	5.0	<0.50	<0.50	59.5	0.6	<0.50	67	0.6	<0.50	16.1	0.7
	3/20/2018	<0.500	<2.50	0.380 J	<0.500	2.0	0.144 J	<0.500	77.8	2.2	1.99	194	3.4	<0.500	48.6	<0.500
	7/2/2018	<0.500	<2.50	0.439 J	<0.500	<0.500	3.2	<0.500	64.5	1.6	1.07	180	2.6	<0.500	43.1	<0.500
MW-4	11/17/93	--	850	--	--	12	<50	--	20	--	--	40	<50	--	5.4	<10
	09/01/95	<5	340	<5	<5	5.2	<50	<5	14	<5	<5	<50	<50	--	<50	30
	09/24/96	<0.50	300	<0.20	<0.20	7.1	1.4	<0.20	3.2	<0.20	1	0.5	<0.50	--	0.8	4.7
	12/02/96	<0.50	310	<0.50	0.3	3.8	1	<0.20	19	<1	0.3	<0.50	<1	--	<0.30	39
	11/13/97	<0.50	252	<0.50	<0.50	4.22	1.23	<0.50	6.91	<0.50	0.688	<0.50	<0.50	--	<0.50	<1

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-4 (continued)	08/11/99	<2	144	<1	<1	1.21	<1	<1	<1	<1	<1	3.6	<2	--	<1	<1
	11/16/99	<1	26.3	<0.50	<1	2.3	<0.50	<0.50	4.18	<0.50	<0.50	1.2	<0.50	--	0.88	2.07
	02/29/00	<2	119	<1	<1	2.84	<1	<1	4.1	<1	<1	<1	<2	--	<1	5.72
	06/28/00	<5	59.4	<2.5	<2.5	3.89	<2.5	<2.5	2.5	<2.5	<2.5	<2.5	<5	--	<2.5	<2.5
	07/05/00	Well Abandoned														
MW-5	11/17/93	--	1,900	--	--	<25	<25	--	100	--	--	1,200	<25	--	52	<50
	09/01/95	<1	<2	<1	<2	<1	<1	<1	1,300	<1	<1	60,000	<1	--	<1	<2
	09/24/96	<5	140	<2	<2	35	<2	7.5	2,600	80	5.3	16,000	64	--	670	370
	12/02/96	71	<50	<50	27	<30	<50	<20	5,600	<100	<20	27,000	110	--	1,700	340
	11/12/97	<500	<1	<500	<500	<500	<500	<500	<500	<500	<500	28,000	<500	--	1,250	<1
	08/11/99	<200	<1	<100	<100	<100	<100	<100	1,750	<100	<100	25,100	<200	--	862	238
	02/29/00	<100	<500	<50	<50	<50	<50	<50	126	<50	<50	5,250	<100	--	135	<50
	08/31/00	<50	<250	<25	<25	41.4	<25	<25	1,860	<25	<25	5,660	<50	--	347	280
	11/30/00	<50	<250	<25	<25	27.3	<25	<25	3,850	26.8	<25	6,150	<50	--	511	189
	02/27/01	<50	<250	<25	<25	<25	<25	<25	1,370	<25	<25	7,350	<50	--	445	127
	05/30/01	<50	<250	<25	<25	<25	<25	<25	2,410	<25	<25	5,560	<50	--	439	129
	09/25/01	<25	200	<25	<25	34	<25	<25	1,800	<25	<25	2,200	<25	--	180	180
	12/17/01	<100	<500	<50	<50	<50	<50	<50	1,480	<50	<50	10,100	<100	--	646	<50
	03/19/02	<50	<25	<25	<50	<25	<25	<25	360	<25	<25	4,640	<25	--	221	114
	05/29/02	<50	46	<25	<50	<25	<25	<25	916	<25	<25	4,330	<25	--	238	39.5
	08/29/02	<50	<25	<25	<50	<25	<25	<25	1,160	<25	<25	4,090	<25	--	288	310
	11/08/02	<5	178	<2.5	<5	8.3	<2.5	<2.5	385	3.25	<2.5	603	<2.5	--	63.4	66
	01/23/03	<50	<25	<25	<50	<25	<25	<25	582	<25	<25	4,090	<25	--	349	<25
	05/30/03	<10	14.1	<5	<10	<5	<5	<5	382	<5	<5	1,450	7.9	--	140	67
	11/10/03	<1	84.2	<1	<1	1.06	<1	<1	90.7	<1	<1	161	<1	--	30.8	9.42
	01/26/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/04/04	<20	<20	<20	<20	<20	<20	<20	432	<20	<20	2,440	<20	--	178	188
	08/17/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/02/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/16/04	<50	<50	<50	<50	<50	<50	<50	6,300	<50	<50	1,800	<50	--	370	990
	03/23/05	<20	<10	<10	<20	26.2	<10	<10	2,350	27.6	<10	511	<10	--	147	604
	05/18/05	<5	<2.5	<2.5	<5	9.25	<2.5	6.45	817	10.2	<2.5	611	<2.5	--	156	329

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-5 (continued)	08/18/05	<5	5.15	<2.50	<5	14.4	<2.50	<2.50	397	4.7	<2.50	169 B	<2.50	--	81.8	278
	11/15/05	<20	<10	<10	<20	36.2	<10	<10	2,790	14	<10	408	<10	--	177	615
	02/21/06	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	72.7	1.06	<0.500	184	0.78	--	31.5	5.05
	06/05/06	<20	<20	<20	<20	<20	<20	<20	2,800	<20	<20	157	<20	--	75	199
	09/06/06	<2	10.6	<1	<2	8.3	<1	<1	377	3.66	<1	104	<1	--	45	29.9
	12/06/06	<2	<1	<1	<2	1.32	<1	1.34	113	1.28	1.52	240	1.6	--	58	43.3
	02/07/07	<10	<5	<5	<10	<5	<5	<5	1,220	18	<5	124	<5	--	26.9	600
	05/22/07	<5	<5	<5	<5	<5	<5	<5	634	8.45	<5	102	<5	--	40.8	59.4
	09/12/07	<1	67.5	<0.50	<1	<0.50	<0.50	<0.50	16.2	<0.50	<0.50	0.89	<0.50	--	1.38	1.86
	12/13/07	<1	<0.50	<0.50	<1	7.1	<0.50	4.67	2,420	9.22	1.14	180	<0.50	--	179	416
	03/07/08	<1	<0.500	<0.500	<1	2.18	<0.500	1.33	411	3.21	<0.500	86.4	<0.500	<0.500	26.1	105
	09/18/08	<1	101	<0.500	<1	0.79	<0.500	<0.500	11.2	<0.500	<0.500	1.14	<0.500	<0.500	1.27	1.74
	12/10/08	<2	<2	<2	<2	3.7	<2	<2	360	2.3	<2	49	<2	<2	53	150
	03/27/09	<0.50	4.2	<0.50	<0.50	4	<0.50	<0.50	170	1	<0.50	0.59	<0.50	<0.50	<0.50	64
	06/17/09	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	0.6	160	2.5	<0.50	11	<0.50	<0.50	12	11
	09/18/09	<0.50	65 BE	<0.50	<0.50	<0.50	<0.50	<0.50	3.6	<0.50	<0.50	<0.50	<0.50	<0.50	0.5	1.2
	12/17/09	<0.50	<0.80	<0.50	<0.50	2.1	<0.50	1.4	340	2	<0.50	19	<0.50	<0.50	37	93
	03/19/10	<0.50	1.4	<0.50	<0.50	4.4	<0.50	<0.50	72	<0.50	<0.50	24	<0.50	<0.50	14	21
	06/16/10	<0.50	<0.50	<0.50	<0.50	3.6	<0.50	0.83	94	0.65	0.54	4.1	<0.50	<0.50	10	23
	09/23/10	<0.5	59	<0.5	<0.5	0.84	<0.5	<0.5	9.7	<0.5	<0.5	<0.5	<0.5	<0.5	0.97	1.3
	12/09/10	<0.5	<0.5	<0.5	<0.5	0.84	<0.5	<0.5	140	0.73	<0.5	5.6	<0.5	<0.5	8.8	15
	03/11/11	<0.50	<0.50	<0.50	<0.50	0.96	<0.50	<0.50	34	<0.50	<0.50	8.4	<0.50	<0.50	7.6	4.7
	06/10/11	<0.5	<0.5	<0.5	<0.5	5	<0.5	<0.5	40	<0.5	0.63	2.2	<0.5	<0.5	3.8	26
	09/19/11	<0.50	2.3	<0.50	<0.50	2.8	<0.50	<0.50	97	<0.50	<0.50	1.3	<0.50	<0.50	11	6.3
	12/09/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	47	<0.50	<0.50	2.7	<0.50	<0.50	7.7	2.8
	03/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.4
	06/22/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	<0.5	<0.5	0.54	<0.5	<0.5	2.9	3
	09/14/12	<0.50	20	<0.50	<0.50	0.75	<0.50	<0.50	26	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.4
	12/13/12	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50	67	0.65	<0.50	<0.50	<0.50	<0.50	1.7	6.6
	03/15/13	<0.50	7.4	<0.50	<0.50	1.5	<0.50	<0.50	48	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	6.6

Please refer to notes at end of table.

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-5 (continued)	06/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.5	<0.50	<0.50	7.2	<0.50	<0.50	7.2	1.7
	09/19/13	<0.50	23	<0.50	<0.50	<0.50	<0.50	<0.50	4.6	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	0.61
	12/16/13	<0.50	<0.50	<0.50	<0.50	0.88	<0.50	<0.50	180	<0.50	<0.50	<0.50	<0.50	<0.50	0.8	71
	3/21/2014	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	39	<0.50	<0.50	<0.50	<0.50	<0.50	3.4	10
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<5	<0.50	<0.50	14	<0.50	<0.50	1.3	<0.50	<0.50	8	2.3
	9/30/2014	<0.50	28	<0.50	<0.50	<5	<0.50	<0.50	20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.6
	12/16/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	33	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	1.9
	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	26.5	<0.50	<0.50	8.4	<0.50	<0.50	5.8	5.6
	6/17/2015	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	3.2	<0.50	<0.50	0.63	<0.50	<0.50	0.64	<0.50
	9/24/2015	<0.50	24.6	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	199	<0.50	<0.50	29.5	<0.50	<0.50	43.2	32.3
	12/8/2015 DUP	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.68	175	<0.50	<0.50	27.1	<0.50	<0.50	38.5	28.4
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	9.9	<0.50	<0.50	3.1	<0.50
	6/17/2016	<0.50	7.5	<0.50	<0.50	<0.50	<0.50	<0.50	23.3	<0.50	<0.50	7.3	<0.50	<0.50	3.2	<0.50
	9/29/2016	<5	<20	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	4.3	<0.50	<0.50	11.5	<0.50	<0.50	2.5	1.1
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	8.4	<0.5	<0.5	6.5	<0.5	<0.5	5.8	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	4.2	<0.50	<0.50	16.3	<0.50	<0.50	6.8	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	1.60	<1.0	<0.50	15.6	<0.50	<0.50	26.7	<0.50	<0.50	15.6	0.64
	11/7/2017	<2.0	<2.0	<0.50	<0.50	0.99	<0.50	<0.50	35.6	<0.50	<0.50	3.5	<0.50	<0.50	9.7	5.30
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	1.9	<0.500	<0.500	10.6	0.199 J	<0.500	2.4	0.260 J
	6/29/2018	<0.500	<2.50	<0.500	<0.500	0.56	<0.500	<0.500	45.5	0.174 J	<0.500	21.3	<0.500	<0.500	11.8	1.17
MW-6	11/17/93	--	<1	--	--	<0.50	<0.50	--	1.2	--	--	2.1	<0.50	--	0.54	<1
	09/01/95	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<1
	09/24/96	<0.50	<2	<0.20	<0.20	<0.20	<0.20	<0.20	0.3	<0.20	<0.20	<0.20	<0.50	--	<0.20	<1
	12/02/96	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.20	<0.20	<1	<0.20	<0.50	<1	--	<0.20	<0.20
	11/12/97	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.03	<0.50	--	<0.50	<1
	08/11/99	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	--	1.37	<0.50
	11/16/99	<1	<2.5	<0.50	<1	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	02/29/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.654	<1	--	<0.50	<0.50
	06/27/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	--	<0.50	<0.50
	05/29/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	--	<0.50	<0.50
	05/30/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	1.51	<0.50	<0.50	1.31	<0.50	--	<0.50	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-6 (continued)	08/28/02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/08/02	<1	<0.50	<0.50	<1	0.51	<0.50	<0.50	2.55	<0.50	<0.50	0.97	<0.50	--	0.55	0.52
	01/23/03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/30/03	<0.50	<0.50	<0.50	<1	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	3.73	<0.50	--	0.99	<0.50
	11/17/04	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.88	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	05/17/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	09/12/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	03/06/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	1.16	<0.500	<0.500	<0.500	<0.500
	09/19/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	03/24/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/19/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/23/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	03/09/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/15/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/05/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/13/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/14/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/19/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	10/2/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/7/2016	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2016	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	7/1/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
MW-7	12/02/96	81	<50	<50	39	<30	<50	110	110	<100	<20	73,000	1,900	--	7,600	<50
	11/12/97	<500	<1	<500	<500	<500	<500	<500	<500	<500	<500	36,400	<500	--	7,670	<1
	08/11/99	<1	<5	<500	<500	<500	<500	<500	<500	<500	<500	49,000	1,210	--	4,650	<500
	11/16/99	<100	<250	<50	<100	<50	<50	92	353	<50	<50	54,800	914	--	5,320	<50
	02/28/00	<1	<5	<500	<500	<500	<500	<500	<500	<500	<500	52,400	<1	--	4,060	<500
	06/28/00	<1	<5	<500	<500	<500	<500	<500	<500	<500	<500	54,300	<1	--	3,390	<500

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-7 (continued)	08/31/00	<500	<2	<250	<250	<250	<250	<250	<250	<250	<250	50,900	824	--	3,960	<250
	11/30/00	<500	<2	<250	<250	<250	<250	<250	<250	<250	<250	33,500	520	--	3,560	<250
	02/27/01	<500	<2	<250	<250	<250	<250	<250	386	<250	<250	26,700	<500	--	3,290	<250
	05/30/01	<200	<1,000	<100	<100	<100	<100	<100	374	<100	<100	20,400	214	--	2,820	<100
	09/25/01	<25	<25	<25	<25	28	<25	35	350	<25	<25	19,000	260	--	2,500	<25
	12/17/01	<100	<50	<50	<50	84.6	<50	<50	506	<50	<50	10,100	200	--	1,960	<50
	03/18/02	<50	<25	<25	<50	<25	<25	<25	206	<25	<25	7,250	71	--	1,020	<25
	05/31/02	<50	<25	<25	<50	<25	<25	<25	42.5	<25	<25	5,500	<25	--	311	<25
	08/29/02	<50	<25	<25	<50	<25	<25	50.5	93	<25	<25	4,940	44.5	--	634	<25
	11/07/02	<50	<25	<25	<50	<25	<25	<25	123	<25	<25	5,810	43	--	758	<25
	01/23/03	<20	<10	<10	<20	<10	<10	<10	59.8	<10	<10	2,010	14	--	282	<10
	05/28/03	<10	<5	<5	<5	6.3	<5	<5	<5	<5	<5	1,080	10.9	--	67.9	<5
	11/11/03	<20	<20	<20	<20	40.2	<20	<20	246	<20	<20	2,460	62	--	599	<20
	01/27/04	<20	<10	<10	<20	17	<10	<10	105	<10	<10	3,510	33	--	380	<10
	05/04/04	<20	<20	<20	<20	<20	<20	<20	72.4	<20	<20	3,940	22	--	323	<20
	11/16/04	<50	<50	<50	<50	<50	<50	<50	99	<50	<50	8,000	<50	--	520	<50
	03/24/05	<50	<25	<25	<50	<25	<25	<25	98.5	<25	<25	3,930	26	--	404	<25
	05/18/05	<10	<5	<5	<10	<5	<5	<5	72.7	<5	<5	1,310	12.4	--	180	<5
	05/18/05 DUP	<10	<5	<5	<10	<5	<5	<5	69.4	<5	<5	1,250	12.4	--	179	<5
	08/18/05	<20	<10	<10	<20	<10	<10	<10	54.8	<10	<10	1,800	<10	--	237	<10
	11/15/05	<20	<10	<10	<20	15.2	<10	<10	107	<10	<10	1,960	29.6	--	333	<10
	02/21/06	<20	<10	<10	<20	<10	<10	<10	<10	<10	<10	2,640	<10	--	139	<10
	06/05/06	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	26,100	<200	--	568	<200
	09/06/06	<100	<50	<50	<100	<50	<50	<50	56	<50	<50	12,800	<50	--	422	<50
	12/06/06	<200	<100	<100	<200	<100	<100	<100	<100	<100	<100	24,600	<100	--	408	<100
	02/07/07	<200	<100	<100	<200	<100	<100	<100	<100	<100	<100	31,500	<100	--	352	<100
	05/22/07	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	29,100	<200	--	450	<200
	09/12/07	<200	<100	<100	<200	<100	<100	<100	<100	<100	<100	21,300	<100	--	366	<100
	12/13/07	<500	<250	<250	<500	<250	<250	<250	345	<250	<250	18,700	<250	--	1,040	280
	03/06/08[7]	<1	<0.500	<0.500	<1	5.06	2.57	3.99	42.3	2.9	<0.500	26,300	38.7	<0.500	430	<0.500
	06/10/08	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	27,000	<500	<500	575	<500
	09/18/08	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	23,200	<500	<500	530	<500
	12/11/08	<50	<50	<50	<50	<50	<50	<50	130	<50	<50	15,000	<50	<50	450	<50
	12/11/08 DUP	<50	<50	<50	<50	<50	<50	<50	120	<50	<50	14,000	<50	<50	430	<50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-7 (continued)	03/23/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	420	<0.50	<0.50	3,330	<0.50	<0.50	270	<0.50
	06/18/09	<3	<3	<3	<3	3.7	<3	<3	520	<3	<3	890	5.2	<3	350	<3
	06/18/09 DUP	<2.5	<2.5	<2.5	<2.5	3.8	<2.5	<2.5	520	<2.5	<2.5	910	5.6	<2.5	360	<2.5
	09/18/09	<3	<3	<3	<3	9.8	<3	5.5	930	<3	<3	2,600	10	<3	250	<3
	09/18/09 DUP	<3	<3	<3	<3	8.7	<3	4.8	850	<3	<3	2,600	9.3	<3	240	<3
	12/18/09	<5	<5	<5	<5	6.7	<5	<5	330	<5	<5	1,600	6.7	<5	160	<5
	12/18/09 DUP	<5	<5	<5	<5	6.6	<5	<5	320	<5	<5	1,500	6.6	<5	160	<5
	03/16/10	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	180	<2.5	<2.5	510	<2.5	<2.5	52	<2.5
	03/16/10 DUP	<2	<2	<2	<2	<2	<2	<2	180	<2	<2	560	<2	<2	55	<2
	06/17/10	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	360	<1.5	<1.5	200	2.7	<1.5	72	<1.5
	06/17/10 DUP	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	360	<1.5	<1.5	200	2.8	<1.5	72	<1.5
	09/23/10	<3	<3	<3	<3	3.3	<3	<3	690	<3	<3	750	3.5	<3	110	4.8
	09/23/10 DUP	<3	<3	<3	<3	3.1	<3	<3	700	<3	<3	740	3.8	<3	100	4.1
	12/10/10	<0.9	<0.9	<0.9	<0.9	1.8	<0.9	<0.9	94	<0.9	<0.9	220	1.6	<0.9	36	1.7
	12/10/10 DUP	<0.9	<0.9	<0.9	<0.9	1.7	<0.9	<0.9	98	<0.9	<0.9	230	1.7	<0.9	36	1.8
	03/11/11	<0.90	<0.90	<0.90	<0.90	6.6	<0.90	1.6	150	0.91	<0.90	420	5.1	<0.90	82	9.3
	03/11/11 DUP	<0.90	<0.90	<0.90	<0.90	6.5	<0.90	1.9	150	1.1	<0.90	400	5.2	<0.90	80	9.7
	06/07/11	<2.5	<2.5	<2.5	<2.5	4.8	<2.5	3.4	1,400	3.3	<2.5	430	4	<2.5	110	7.9
	06/07/11 DUP	<6	<6	<6	<6	<6	<6	<6	1,400	<6	<6	400	<6	<6	110	7.8
	09/19/11	<5	<5	<5	<5	<5	<5	<5	1,300	<5	<5	410	<5	<5	84	78
	09/19/11 DUP	<7	<7	<7	<7	<7	<7	<7	1,300	<7	<7	420	<7	<7	87	81
	12/07/11	<5	<5	<5	<5	8	<5	6.9	3,400	6.8	<5	200	<5	<5	32	110
	12/07/11 DUP	<6	<6	<6	<6	7.6	<6	7.8	3,400	6.8	<6	210	<6	<6	32	110
	03/12/12	<5	<5	<5	<5	9.2	<5	<5	1,600	<5	<5	41	<5	<5	8.6	600
	03/12/12 DUP	<7	<7	<7	<7	9.5	<7	<7	1,600	<7	<7	42	<7	<7	8.9	660
	06/22/2012	<2	9.2	<2	<2	9.8	<2	<2	540	<2	<2	24	<2	<2	5.1	300
	06/22/12 DUP	<2	8.1	<2	<2	9	<2	<2	500	<2	<2	25	<2	<2	5.2	290
	09/14/12	<0.50	6.3	<0.50	<0.50	3.8	<0.50	0.54	180	0.7	<0.50	28	<0.50	0.52	5.2	80
	09/14/12 DUP	<0.50	5.7	<0.50	<0.50	3.8	<0.50	<0.50	180	0.78	<0.50	28	<0.50	<0.50	5.3	79
	12/14/12	<0.50	6.3	<0.50	<0.50	1.9	<0.50	<0.50	130	<0.50	<0.50	8.2	<0.50	<0.50	5.3	16
	12/14/12 DUP	<0.50	5.6	<0.50	<0.50	1.8	<0.50	<0.50	130	<0.50	<0.50	11	<0.50	<0.50	6.8	18
	03/15/13	<0.50	5.2	<0.50	<0.50	0.68	<0.50	<0.50	110	<0.50	<0.50	1.5	<0.50	<0.50	0.75	11
	03/15/13 DUP	<0.50	5.4	<0.50	<0.50	0.69	<0.50	<0.50	110	<0.50	<0.50	1.6	<0.50	<0.50	0.78	11

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-7 (continued)	06/14/13	<0.50	2	<0.50	<0.50	<0.50	<0.50	<0.50	57	<0.50	<0.50	1.6	<0.50	<0.50	<0.50	15
	06/14/13 DUP	<0.50	2	<0.50	<0.50	0.51	<0.50	<0.50	58	<0.50	<0.50	1.5	<0.50	<0.50	<0.50	16
	09/20/13	<0.50	3	<0.50	<0.50	1.5	<0.50	<0.50	56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10
	09/20/13 DUP	<0.50	3	<0.50	<0.50	1.5	<0.50	<0.50	56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10
	12/16/13	<0.50	2.4	<0.50	<0.50	2.9	<0.50	<0.50	6.9	<0.50	<0.50	0.51	<0.50	<0.50	<0.50	9.1
	12/16/13 DUP	<0.50	2.4	<0.50	<0.50	2.4	<0.50	<0.50	6.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.9
	3/24/2014	<0.50	0.97	<0.50	<0.50	1.6	<0.50	<0.50	13	<0.50	<0.50	9.8	<0.50	<0.50	2.6	7.6
	3/24/2014 DUP	<0.50	1	<0.50	<0.50	1.6	<0.50	<0.50	13	<0.50	<0.50	9.4	<0.50	<0.50	2.5	7.7
	6/25/2014	<0.50	1.3	<0.50	<0.50	0.17	<0.50	<0.50	0.59	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3
	6/25/14 DUP	<0.50	0.15	<0.50	<0.50	0.19	<0.50	<0.50	0.62	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4
	9/30/2014	<0.50	1.9	<0.50	<0.50	2.7	<0.50	<0.50	4.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.8
	9/30/2014 DUP	<0.50	1.7	<0.50	<0.50	2.6	<0.50	<0.50	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.8
	12/15/2014	<0.50	1.2	<0.50	<0.50	3.4	<0.50	<0.50	12	<0.50	<0.50	<0.50	<0.50	<0.50	1	15
	12/15/2014 DUP	<0.50	1.6	<0.50	<0.50	4.5	<0.50	<0.50	16	<0.50	<0.50	0.61	<0.50	<0.50	1.5	21
	3/20/2015	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	8.4	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	1
	3/20/15 DUP	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	7.7	<0.50	<0.50	0.53	<0.50	<0.50	1	10.4
	6/17/2015	<0.50	0.72	<0.50	<0.50	2.6	<0.50	<0.50	12	<0.50	<0.50	1.2	<0.50	<0.50	1	12.6
	6/17/2015 DUP	<0.50	0.71	<0.50	<0.50	2.6	<0.50	<0.50	12.2	<0.50	<0.50	0.96	<0.50	<0.50	1	12.3
	9/24/2015	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	<0.50	12.4	<0.50	<0.50	4.5	<0.50	<0.50	4.2	4.6
	9/24/2015 DUP	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	12.7	<0.50	<0.50	4.5	<0.50	<0.50	4.2	4.8
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	9.4	<0.50	<0.50	1.7	1.9
	6/17/2016	<0.50	<2	<0.50	<0.50	0.6	<0.50	<0.50	10.9	<0.50	<0.50	0.69	<0.50	<0.50	2.1	5.4
	6/17/16 DUP	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	0.62	<0.50	<0.50	2	5.4
	9/29/2016	<0.50	<2	<0.50	<0.50	1.1	<0.50	<0.50	10.9	<0.50	<0.50	<0.50	<0.50	<0.50	5.5	5.5
	9/29/2016 DUP	<0.50	<2	<0.50	<0.50	1.1	<0.50	<0.50	10.9	<0.50	<0.50	<0.50	<0.50	<0.50	6	5.5
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	9.2	<0.50	<0.50	0.65	<0.50	<0.50	<0.50	0.98
	12/14/2016 DUP	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	9.4	<0.50	<0.50	0.78	<0.50	<0.50	<0.50	1
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	0.73	<0.5
	3/28/2017 DUP	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	0.69	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.55	2.5
	6/14/2017 DUP	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	2.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.5
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	1.7	<0.50	<0.50	2.60	<0.50	<0.50	1.60	1.6
	9/27/2017 DUP	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	1.7	<0.50	<0.50	2.60	<0.50	<0.50	1.60	1.7
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	<0.50	6.30	<0.50	<0.50	7.80	1.4
	11/7/2017 DUP	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	3.80	<0.50	<0.50	6.40	1.5
	3/21/2018	<0.500	<2.50	<0.500	<0.500	0.495 J	<0.500	<0.500	17.6	<0.500	<0.500	0.228 J	<0.500	<0.500	2.86	4.9
	3/21/2018 DUP	<0.500	<2.50	<0.500	<0.500	0.55	<0.500	<0.500	17.2	<0.500	<0.500	0.284 J	<0.500	<0.500	2.99	4.9
	6/29/2018	<0.500	<2.50	<0.500	<0.500	0.461 J	<0.500	<0.500	5.5	<0.500	<0.500	9.89	<0.500	<0.500	3.53	1.5
	6/29/2018 DUP	<0.500	<2.50	<0.500	<0.500	0.437 J	<0.500	<0.500	5.4	<0.500	<0.500	8.94	<0.500	<0.500	3.48	1.6

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-8	12/02/96	<0.50	<0.50	<0.50	<0.20	1	<0.50	0.2	6.5	<1	<0.20	2.3	<1	--	12	<0.50
	11/13/97	<1	<2	<1	<1	1.72	<1	2.44	9.32	<1	<1	52.4	4	--	38.6	<2
	08/11/99	<1	<5	<0.50	<0.50	0.75	<0.50	<0.50	1.82	<0.50	<0.50	46.2	4.79	--	24.3	<0.50
	11/16/99	<1	<2.5	<0.50	<1	1.22	<0.50	<0.50	2.11	<0.50	<0.50	39.8	1.55	--	15.5	<0.50
	02/28/00	<1	<5	<0.50	<0.50	0.929	<0.50	0.721	2.38	<0.50	<0.50	41.8	3.7	--	20.5	<0.50
	06/27/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	1.46	<0.50	<0.50	33.7	2.88	--	17.5	<0.50
	05/30/01	<100	<5	<0.50	<0.50	0.611	<0.50	<0.50	0.601	<0.50	<0.50	11.8	<1	--	5.46	<0.50
	05/30/02	<1	<0.50	<0.50	<1	1.09	<0.50	<0.50	2.02	<0.50	<0.50	12.1	<0.50	--	4.47	<0.50
	05/28/03	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.84	<0.50	<0.50	40.4	1.55	--	11.2	<0.50
	11/02/04	<1	<0.50	<0.50	<1	1.02	<0.50	<0.50	1.99	<0.50	<0.50	8.88	<0.50	--	2.4	<0.50
	11/16/04	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	1.6	<0.50	<0.50	0.6	<0.50	--	3.1	<0.50
	03/23/05	<1	<0.50	<0.50	<1	0.78	<0.50	<0.50	1.82	<0.50	<0.50	13.5	0.53	--	2.41	<0.50
	05/17/05	<1	<0.50	<0.50	<1	1.1	<0.50	<0.50	6.45	<0.50	<0.50	13.2	<0.50	--	6.92	<0.50
	05/17/05 DUP	<1	<0.50	<0.50	<1	1.19	<0.50	<0.50	6.97	<0.50	<0.50	11.4	<0.50	--	6.39	<0.50
	11/16/05	<1	<0.500	<0.500	<1	0.78	<0.500	<0.500	4.19	<0.500	<0.500	14.8	0.65	--	2.99	<0.500
	06/05/06	<1	<1	<1	<1	1.26	<1	<1	19.8	<1	<1	20.7	<1	--	11.4	<1
	12/06/06	<1	<0.50	<0.50	<1	1.11	<0.50	<0.50	14.2	<0.50	<0.50	18.3	<0.50	--	5.08	<0.50
	05/23/07	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	22.8	<1	--	2.32	<1
	09/12/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	12.4	0.6	--	0.65	<0.50
	12/12/07	<1	<0.50	<0.50	<1	1.03	<0.50	<0.50	13.7	<0.50	<0.50	8.27	<0.50	--	2.71	<0.50
	03/06/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	1.64	<0.500	<0.500	19.1 J	<0.500	<0.500	1.4	<0.500
	6/10/08[7.]	<1	<1	<1	<1	1.07	<1	<1	10.5	<1	<1	10.8	<1	<1	3.87	<1
	09/18/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	1.58	<0.500	<0.500	13.2	0.5	<0.500	1.21	<0.500
	12/09/08	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	9.1	<0.50	<0.50	0.57	<0.50
	12/09/08 DUP	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	9.7	<0.50	<0.50	0.59	<0.50
	03/26/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	8	<0.50	<0.50	0.56	<0.50
	06/17/09	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	<0.50	12	<0.50	<0.50	4.8	<0.50	<0.50	1.4	<0.50
	09/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	11	<0.50	<0.50	<0.50	<0.50
	12/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.2	<0.50	<0.50	8.4	<0.50	<0.50	0.51	<0.50
	03/18/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	11	<0.50	<0.50	<0.50	<0.50
	06/14/10	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	20	0.52	<0.50	4.2	<0.50	<0.50	1.1	<0.50
	09/22/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	<0.5	8.1	<0.5	<0.5	<0.5	<0.5
	12/08/10	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	20	1.1	<0.5	2.5	<0.5	<0.5	0.6	<0.5
	03/11/11	<0.50	<0.50	<0.50	<0.50	0.93	<0.50	<0.50	20	0.58	<0.50	7.9	<0.50	<0.50	0.95	<0.50
	06/08/11	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	40	0.82	<0.5	4	<0.5	<0.5	1.1	<0.5
	09/15/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	10	<0.50	<0.50	0.54	<0.50
	12/08/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	10	<0.50	<0.50	<0.50	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-8	03/06/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.5	<0.50	<0.50	6.8	<0.50	<0.50	0.56	<0.50
(continued)	06/20/12	<0.5	<0.5	<0.5	<0.5	0.89	<0.5	<0.5	22	<0.5	<0.5	6.1	<0.5	<0.5	1.4	<0.5
	09/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	7	<0.50	<0.50	<0.50	<0.50
	12/12/12	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	36	1	<0.50	4.8	<0.50	<0.50	1	<0.80
	03/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.94	<0.50	<0.50	7.2	<0.50	<0.50	<0.50	<0.50
	06/13/13	<0.50	<0.50	<0.50	<0.50	0.84	<0.50	<0.50	18	0.64	<0.50	6.2	<0.50	<0.50	0.76	<0.50
	09/19/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.6	<0.50	<0.50	4.8	<0.50	<0.50	<0.50	<0.50
	12/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.5	0.54	<0.50	4	<0.50	<0.50	<0.50	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	21	1.1	<0.50	2.3	<0.50	<0.50	0.85	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	5.6	<0.50	<0.50	<0.50	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	6.1	<0.50	<0.50	<0.50	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	13	0.86	<0.50	2.3	<0.50	<0.50	0.62	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	7.6	<0.50	<0.50	<0.50	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	<0.50	<0.50	<0.50
	9/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	6.3	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	1.1	<0.50	<0.50	<0.50	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	6.4	<0.50	<0.50	<0.50	<0.50
	6/15/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	<0.50	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	<0.50	<0.50	<0.50
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	3.8	<0.50	<0.50	<0.50	<0.50
	3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	35.7	0.96	<0.5	2.3	<0.5	<0.5	0.57	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	14.3	<0.50	<0.50	4.3	<0.50	<0.50	0.56	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	4.3	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	4.4	<0.50	<0.50	<0.50	<0.50
	3/19/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.6	<0.500	<0.500	4.2	<0.500	<0.500	<0.500	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	0.139 J	<0.500	<0.500	2.6	<0.500	<0.500	5.4	<0.500	<0.500	0.368 J	<0.500
MW-9	12/02/96	<50	<50	<50	<20	<30	<50	<20	<20	<100	<20	5,000	200	--	1,600	<50
	11/13/97	<50	<100	<50	<50	<50	<50	<50	487	<50	<50	2,890	<50	--	1,840	<100
	08/11/99	<20	<100	<10	<10	<10	<10	<10	54	<10	<10	1,490	43.2	--	517	<10
	11/16/99	<20	<50	<10	<20	<10	<10	<10	103	<10	<10	1,730	32	--	305	<10
	02/28/00	<20	<100	<10	<10	<10	<10	<10	<10	<10	<10	2,040	36.4	--	315	<10
	06/27/00	<50	<250	<25	<25	<25	<25	<25	<25	<25	<25	1,300	<50	--	298	<25
	08/31/00	<10	<50	<5	<5	<5	<5	<5	<5	<5	<5	1,560	31.3	--	229	<5
	11/30/00	<10	<50	<5	<5	21.7	<5	10.5	1,330	11.7	<5	823	26.6	--	528	8.15
	09/25/01	<2.5	<2.5	<2.5	<2.5	3.8	<2.5	<2.5	9.1	<2.5	<2.5	680	16	--	140	<2.5
	12/17/01	<5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	306	<5	--	74.2	<2.5

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-9 (continued)	03/18/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	113	<0.50	--	19.1	<0.50
	05/31/02	<2	<1	<1	<2	<1	<1	<1	1.22	<1	<1	296	1.44	--	44	<1
	08/29/02	<2	<1	<1	<2	<1	<1	<1	1.88	<1	<1	294	2.12	--	67.4	<1
	11/07/02	<5	<2.5	<2.5	<5	<2.5	<2.5	<2.5	17.2	<2.5	<2.5	453	4	--	145	<2.5
	01/23/03	<2	<1	<1	<2	<1	<1	<1	1.66	<1	<1	205	2.74	--	59.5	<1
	05/28/03	<1	<0.50	<0.50	<1	1.81	<0.50	<0.50	0.97	<0.50	<0.50	141	2.85	--	27.4	<0.50
	11/11/03	<5	<5	<5	<5	<5	<5	<5	23.7	<5	<5	401	6.25	--	91.4	<5
	01/27/04	<2	<1	<1	<2	<1	<1	<1	2.58	<1	<1	179	2.54	--	58.1	<1
	05/04/04	<1	<1	<1	<1	<1	<1	<1	1.09	<1	<1	178	2.56	--	51.9	<1
	11/15/04	<25	<25	<25	<25	28	<25	<25	1,200	27	<25	1,800	<25	--	1,000	<25
	03/24/05	<5	<2.5	<2.5	<5	3.3	<2.5	<2.5	54.2	<2.5	<2.5	675	8	--	239	<2.5
	05/18/05	<2	<1	<1	<2	<1	<1	<1	2.68	<1	<1	2.41	2.08	--	62.4	<1
	08/18/05	<5	<2.50	<2.50	<5	<2.50	<2.50	<2.50	20.5 B	<2.50	<2.50	551	7.6	--	209	<2.50
	11/15/05	<10	<5	<5	<10	27.1	<5	6.8	1,020	18.6	<5	1,040	14.1	--	633	21.2
	02/21/06	<10	<5	<5	<10	<5	<5	<5	16.7	<5	<5	534	<5	--	165	<5
	06/05/06	<1	<1	<1	<1	<1	<1	<1	1.47	<1	<1	151	2.6	--	57.3	<1
	09/05/06	<5	<2.50	<2.50	<5	5.5	<2.50	<2.50	117	3.15	<2.50	698	6.8	--	314	<2.50
	12/06/06	<5	<2.50	<2.50	<5	2.95	<2.50	<2.50	59	<2.50	<2.50	578	5.55	--	237	<2.50
	02/07/07	<5	<2.50	<2.50	<5	3.15	<2.50	<2.50	72.6	<2.50	<2.50	591	6.1	--	239	2.65
	05/23/07	<2	<2	<2	<2	<2	<2	<2	6.32	<2	<2	210	3	--	90.4	<2
	09/12/07	<2	<1	<1	<2	2.34	<1	<1	47.1	1.44	<1	282	5.12	--	184	<1
	12/13/07	<5	<2.50	<2.50	<5	<2.50	<2.50	<2.50	<2.50	<2.50	<2.50	253	4.45	--	78.4	<2.50
	03/06/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	1.92	<0.500	<0.500	138	3.77	<0.500	61.5	<0.500
	06/10/08	<1	<1	<1	<1	<1	<1	<1	2.73	<1	<1	297	5.16	<1	87.7	<1
	09/18/08	<5	<2.50	<2.50	<5	7.05	<2.50	<2.50	172	3.8	<0.5000	524	5.35	<0.500	315	4.15
	12/09/08	<0.90	<0.90	<0.90	<0.90	3.8	<0.90	1.3	130	2.5	<0.90	270	5.1	<0.90	140	2.3
	03/26/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.4	<0.50	<0.50	170	4	<0.50	56	<0.50
	06/17/09	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	1.1	72	2.8	<0.50	420	4.9	<0.50	180	1.8
	09/17/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	170	4.4	<0.50	60	<0.50
	12/17/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	120	2.5	<0.50	43	<0.50
	03/19/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	<0.50	160	3	<0.50	48	<0.50
	06/16/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	100	1.4	<0.50	36	<0.50
	09/21/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	<0.5	140	2.9	<0.5	50	<0.5
	12/10/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	100	1.3	<0.5	330	<0.5
	03/11/11	<0.50	<0.50	<0.50	<0.50	0.66	<0.50	<0.50	17	0.82	<0.50	190	2.7	<0.50	81	0.52
	03/11/11 DUP	<0.50	<0.50	<0.50	<0.50	0.67	<0.50	<0.50	17	0.85	<0.50	200	2.8	<0.50	84	0.51

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-9	06/10/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	53	1.9	<0.5	31	<0.5
(continued)	09/19/11	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	72	2.3	<0.50	230	3.1	<0.50	120	0.78
	12/09/11	<0.90	<0.90	<0.90	<0.90	53	<0.90	11	1,800	40	<0.90	600	10	<0.90	590	26
	03/12/12	<0.50	<0.50	<0.50	<0.50	0.66	<0.50	<0.50	20	0.57	<0.50	140	2	<0.50	56	<0.50
	06/22/12	<0.5	<0.5	<0.5	<0.5	3.3	<0.5	1.1	140	4.3	<0.5	220	3.3	<0.5	180	2.3
	09/14/12	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	17	<0.90	<0.90	210	2.4	<0.90	78	<0.90
	12/13/12	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	29	0.96	<0.50	110	1.1	<0.50	49	<0.50
	03/15/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5	<0.50	<0.50	86	1.8	<0.50	34	<0.50
	06/13/13	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	1	100	3.7	<0.50	240	3.1	<0.50	150	2.2
	09/20/13	<0.50	<0.50	<0.50	<0.50	2	<0.50	0.51	74	2.2	<0.50	160	2	<0.50	87	0.82
	12/16/13	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	1.4	230	6.4	<0.50	210	3.5	<0.50	180	2.8
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	39	0.57	<0.50	19	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.68	41	1.6	<0.50	190	2.3	<0.50	91	1.1
	9/30/2014	<0.90	<0.90	<0.90	<0.90	2.3	<0.90	<0.90	77	2.3	<0.90	230	2.9	<0.90	110	1.3
	12/15/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	35	0.64	<0.50	18	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	<0.50	18.9	0.6	<0.50	155	2	<0.50	59.5	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	0.93	<0.50	0.54	12.5	0.78	<0.50	160	1.9	<0.50	61.8	1.6
	9/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	74.3	2.2	<0.50	31.6	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	3.5	<0.50	0.85	145	4.2	<0.50	199	2.4	<0.50	113	2
	12/8/2015 DUP	<0.50	<0.50	<0.50	<0.50	3.7	<0.50	0.93	153	4.4	<0.50	198	2.5	<0.50	118	2.1
	3/8/2016	<1	<4	<1	<1	4.1	<1	<1	117	3.8	<1	164	2.3	<1	94.6	3.4
	6/17/2016	<0.50	<2	<0.50	<0.50	1.8	<0.50	0.58	60.7	2.4	<0.50	116	1.7	<0.50	68.3	0.89
	9/29/2016	<0.50	<2	<0.50	<0.50	1.2	<0.50	<0.50	39.3	1.8	<0.50	192	2.5	<0.50	91.9	0.76
	12/14/2016	<0.50	<2	<0.50	<0.50	1.3	<0.50	<0.50	59.7	1.6	<0.50	75.8	1.1	<0.50	44.9	0.52
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	0.77	<0.5	<0.5	27.9	0.89	<0.5	12.5	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	17.5	0.60	<0.50	104	1.3	<0.50	47.2	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	2.80	<1.0	<0.50	83.1	2.50	<0.50	102	2.4	<0.50	66.7	0.99
	11/7/2017	<2.0	<2.0	<0.50	<0.50	20.30	<0.50	3.30	569.0	15.20	<0.50	205	4.5	<0.50	167.0	7.80
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	1.2	<0.500	<0.500	39	1.1	<0.500	14.9	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	6.86	<0.500	1.63	169.0	8.28	<0.500	332	3.5	<0.500	182.0	2.42 J
MW-10	12/02/96	<0.50	<0.50	<0.50	<0.20	<0.30	<0.50	<0.20	<0.20	<1	<0.20	2.7	<1	--	0.4	<0.50
	11/13/97	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.53	<0.50	--	3.65	<1
	08/11/99	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.02	<1	--	1.24	<0.50
	11/16/99	<1	<2.5	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	69.6	1.89	--	10.3	<0.50
	02/28/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.63	<1	--	1.16	<0.50
	06/27/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.72	<1	--	3.74	<0.50
	05/30/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.25	<1	--	2.52	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-10	05/30/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.05	<0.50	--	1.43	<0.50
	05/28/03	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.86	<0.50	<0.50	2.21	<0.50	--	1.28	<0.50
	11/02/04	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.93	<0.50	--	0.98	<0.50
	11/16/04	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	--	3.4	<0.50
	03/23/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.02	<0.50	--	1.21	<0.50
	05/17/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.26	<0.50	--	1.19	<0.50
	09/12/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59 J	<0.50	--	0.83	<0.50
	03/05/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	1.66	<0.500	<0.500	1.67	<0.500
	09/18/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	1.13	<0.500	<0.500	1.4	<0.500
	03/25/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	1.6	<0.50
	09/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	2	<0.50
	03/18/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	1.6	<0.50
	09/22/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	1.4	<0.5
	03/09/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	0.8	<0.50
	09/14/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	2.1	<0.50
	03/06/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	2	<0.50
	09/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.98	<0.50	<0.50	1.4	<0.50
	03/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	<0.50	3.1	<0.50
	09/18/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	1.4	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	8.8	<0.50	<0.50	16	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	2	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	<0.50	1.8	<0.50
	9/21/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	1.6	<0.50
	3/7/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.98	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	1.4	<0.50
	3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	1.5	<0.5
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	3.7	<0.50	<0.50	2.4	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	1.1	<0.50
	6/29/2018	<0.500	<2.50	<0.500	<0.500	0.161 J	<0.500	<0.500	0.8	<0.500	<0.500	5.7	0.145 J	<0.500	5.8	<0.500
MW-11	12/02/96	<50	<50	<50	<20	<30	<50	52	140	<100	<20	2,200	550	--	5,900	<50
	11/13/97	<50	<100	<50	<50	<50	<50	<50	<50	<50	<50	686	90.3	--	2,720	<100
	08/10/99	<5	<25	<2.5	<2.5	13.7	<2.5	22.8	14.4	<2.5	<2.5	259	112	--	1,300	<2.5
	11/16/99	<20	<50	<10	<20	12	<10	16.8	18.8	<10	<10	478	94.8	--	1,500	<10
	02/28/00	<5	<25	<2.5	<2.5	2.71	<2.5	7.9	5.05	<2.5	<2.5	247	30.2	--	473	<2.5
	06/27/00	<10	<50	<5	<5	12.1	<5	28.9	14.8	<5	<5	337	108	--	1,390	<5
	08/31/00	<20	<100	<10	<10	15.4	<10	28	24.8	<10	<10	646	159	--	1,690	<10
	11/30/00	<20	<100	<10	<10	12.2	<10	26.4	19.3	<10	<10	342	125	--	1,550	<10
	02/27/01	<5	<25	<2.5	<2.5	3.65	<2.5	7.82	7.1	<2.5	<2.5	198	35.1	--	468	<2.5
	05/30/01	<10	<50	<5	<5	5.2	<5	13.6	9.09	<5	<5	256	48.8	--	858	<5
	09/25/01	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	260	57	--	820	<13
	12/17/01	<10	<50	<5	<5	<5	<5	15.4	25.9	<5	<5	983	40.9	--	1,390	<5

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-11 (continued)	03/18/02	<10	<5	<5	<10	11.9	<5	19.4	17.1	<5	<5	433	79.8	--	1,370	<5
	05/30/02	<10	<5	<5	<10	5.9	<5	10.9	15.6	<5	<5	571	45.6	--	965	<5
	11/07/02	<10	<5	<5	<10	15	<5	19.3	18.9	<5	<5	347	112	--	1,640	<5
	01/23/03	<5	<2.5	<2.5	<5	3.35	<2.5	4.3	5.35	<2.5	<2.5	265	24.1	--	534	<2.5
	05/28/03	<10	<5	<5	<10	13.3	<5	17.9	17.6	<5	<5	305	105	--	1,580	<5
	11/11/03	<5	<5	<5	<5	5	<5	5.15	9.15	<5	<5	191	38.8	--	504	<5
	01/26/04	<10	<5	<5	<10	9.6	<5	11.5	13.5	<5	<5	369	73.3	--	1,070	<5
	03/22/04	Well Abandoned														
MW-12	12/02/96	<50	<50	<50	<20	<30	<50	<20	29	<100	<20	2,500	<100	--	950	<50
	11/12/97	<250	<500	<250	<250	<250	<250	<250	2,710	<250	<250	12,900	645	--	5,400	<500
	08/11/99	<200	<1	<100	<100	120	<100	<100	2,680	<100	<100	11,300	758	--	3,520	<100
	11/16/99	<200	<500	<100	<200	<100	<100	<100	160	<100	<100	18,200	922	--	4,630	<100
	02/28/00	<200	<1	<100	<100	<100	<100	<100	908	<100	<100	3,780	<200	--	1,210	<100
	06/27/00	<100	<500	<50	<50	161	<50	<50	2,880	<50	<50	12,000	712	--	3,180	<50
	05/30/01	<50	<250	<25	<25	64.8	<25	54	1,650	<25	<25	4,990	298	--	1,810	<25
	05/30/02	<5	<2.5	<2.5	<5	4.25	<2.5	<2.5	101	<2.5	<2.5	344	6.6	--	81.6	<2.5
	05/29/03	<5	<2.5	<2.5	<5	28.4	<2.5	8	601	5.7	<2.5	362	18.2	--	199	<2.5
	11/16/04	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	59	<2.5	<2.5	410	3.5	--	96	<2.5
	03/23/05	<20	<10	<10	<20	247	<10	53	3,640	40.2	<10	1,080	49.8	--	639	14.2
	05/18/05	<1	<0.50	<0.50	<1	0.96	<0.50	0.98	30.1	0.57	<0.50	51.1	0.92	--	21.4	<0.50
	05/22/07	<5	<5	<5	<5	35.6	<5	7.45	785	11.1	<5	233	7.8	--	139	<5
	09/11/07	<100	<50	<50	<100	316	<50	57	6,700	53	<50	431	<50	--	516	<50
	12/12/07	<2	<1	<1	<2	1.1	<1	<1	43.8	<1	<1	106	3.16	--	39.6	<1
	03/05/08	<1	4.97	<0.500	<1	156	2.01	46.2	3,170	41.8	<0.500	440	21.2	<0.500	329	18.5
	09/19/08	<50	<25	<25	<50	394	<25	66	7,650	69	<25	968	45	<25	924	58
	12/10/08	<4	<4	<4	<4	33	<4	6.6	670	8.7	<4	99	5	<4	80	<4
	03/27/09	<4	4.8	<4	<4	230	<4	39	4,800	46	<4	540	28	<4	440	31
	03/27/09 DUP	<4	5	<4	<4	250	<4	44	4,700	51	<4	600	32	<4	490	35
	06/18/09	<15	<15	<15	<15	170	<15	32	3,500	36	<15	270	<15	<15	230	26
	06/18/09 DUP	<15	<15	<15	<15	170	<15	32	3,600	37	<15	310	<15	<15	250	25
	09/18/09	<15	<15	<15	<15	240	<15	46	4,200	50	<15	540	26	<15	440	51
	09/18/09 DUP	<15	<15	<15	<15	260	<15	49	4,600	52	<15	590	28	<15	470	56
	12/18/09	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	100	1.1	1.3	170	2.2	<0.50	65	<0.50
	12/18/09 DUP	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	96	1.1	1.3	160	2.1	<0.50	62	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-12 (continued)	03/19/10	<0.50	4.1	<0.50	<0.50	220	2.6	48	4,400	53	<0.50	480	28	0.7	380	37
	03/19/10 DUP	<15	<15	<15	<15	270	<15	44	4,900	54	<15	600	29	<15	460	39
	06/16/10	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	19	<0.50	<0.50	38	<0.50	<0.50	17	<0.50
	06/16/10 DUP	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18	0.54	<0.50	37	<0.50	<0.50	16	<0.50
	09/23/10	<15	<15	<15	<15	260	<15	47	4,800	56	<15	780	38	<15	560	68
	9/23/10 DUP	<15	<15	<15	<15	260	<15	49	4,800	57	<15	800	41	<15	580	65
	12/09/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.5	<0.5	<0.5	5.1	<0.5	<0.5	2.1	<0.5
	12/09/10 DUP	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.4	<0.5	<0.5	5.8	<0.5	<0.5	2	<0.5
	03/10/11	<0.50	0.67	<0.50	<0.50	94	0.96	17	1,900	19	0.55	340	12	<0.50	220	11
	03/10/11 DUP	<0.50	0.87	<0.50	<0.50	93	1	17	1,600	19	0.55	260	13	<0.50	180	11
	06/07/11	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	59	1	<0.5	53	0.7	<0.5	25	<0.5
	06/07/11 DUP	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	60	1	<0.5	58	0.69	<0.5	27	<0.5
	09/19/11	<0.50	3	<0.50	<0.50	240	2.5	45	4,700	55	<0.50	860	65	0.94	690	63
	09/19/11 DUP	<20	<20	<20	<20	240	<20	53	4,700	60	<20	860	60	<20	680	68
	12/07/11	<0.50	<0.50	<0.50	<0.50	130	1.3	28	2,900	33	<0.50	520	34	0.54	380	40
	12/07/11 DUP	<0.50	<15	<0.50	<0.50	140	1.3	29	2,900	33	<0.50	580	34	0.55	400	41
	03/12/12	<15	<15	<15	<15	210	<15	44	3,800	45	<15	770	48	<15	540	46
	03/12/12 DUP	<20	<20	<20	<20	220	<20	44	4,000	47	<20	740	50	<20	540	45
	06/22/2012	<5	<5	<5	<5	100	<5	16	1,700	39	<5	270	13	<5	200	22
	06/22/12 DUP	<5	<5	<5	<5	100	<5	16	1,700	39	<5	270	13	<5	190	22
	09/14/12	<5	<5	<5	<5	220	<5	45	4,700	56	<5	890	61	<5	590	58
	09/14/12 DUP	<15	<15	<15	<15	270	<15	58	5,400	73	<15	1,100	76	<15	730	84
	12/13/12	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	62	0.97	<0.50	38	0.52	<0.50	22	<0.50
	12/13/12 DUP	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	62	0.92	<0.50	38	0.53	<0.50	23	<0.50
	03/15/13	<0.50	1	<0.50	<0.50	200	1.7	40	4,300	55	<0.50	760	53	0.71	540	53
	03/15/13 DUP	<0.50	1	<0.50	<0.50	200	1.8	40	4,200	56	<0.50	750	52	0.66	520	54
	06/13/13	<15	<15	<15	<15	230	<15	38	4,700	53	<15	590	44	<15	480	55
	06/13/13 DUP	<15	<15	<15	<15	240	<15	39	4,800	53	<15	610	46	<15	500	59
	09/20/13	<0.50	<0.50	<0.50	<0.50	170	1.6	37	3,400	49	<0.50	510	37	0.66	400	50
	09/20/13 DUP	<0.50	<0.50	<0.50	<0.50	180	1.7	36	3,400	48	<0.50	520	37	0.63	400	49
	12/16/13	<2.5	<2.5	<2.5	<2.5	36	<2.5	7.5	800	10	<2.5	150	5.7	<2.5	110	9.6
	12/16/13 DUP	<2.5	<2.5	<2.5	<2.5	35	<2.5	7.6	770	9.6	<2.5	140	5.8	<2.5	110	9.8
	3/24/2014	<0.50	<0.50	<0.50	<0.50	110	0.77	18	1,900	25	<0.50	180	8.6	<0.50	170	47
	3/24/2014 DUP	<7	<7	<7	<7	97	<7	16	1,900	22	<7	170	7.5	<7	140	35

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-12 (continued)	6/24/2014	<1.5	<1.5	<1.5	<1.5	14	<1.5	1.7	300	2.1	<1.5	42	<1.5	<1.5	32	<1.5
	6/24/2014 DUP	<1.5	<1.5	<1.5	<1.5	14	<1.5	1.9	310	2.3	<1.5	42	1.6	<1.5	34	<1.5
	9/30/2014	<15	<15	<15	<15	190	<15	39	3,500	45	<15	670	36	<15	480	42
	9/30/2014 DUP	<15	<15	<15	<15	180	<15	39	3,500	45	<15	680	35	<15	460	42
	12/11/2014	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50	34	0.64	<0.50	25	<0.50	<0.50	15	<0.50
	12/11/2014 DUP	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	32	0.6	<0.50	24	<0.50	<0.50	14	<0.50
	3/20/2015	<5	<5	<5	<5	102	<5	25.4	2,110	29.4	<5	584	17.8	<5	344	36.8
	3/20/15 DUP	<12.5	<12.5	<12.5	<12.5	143	<12.5	25.8	2,490	28.8	<12.5	495	21.7	<12.5	340	29
	6/19/2015	<10	<10	<10	<10	151	<10	28.2	2,570	25	<10	514	23.6	<10	356	31.1
	6/19/2015 DUP	<10	<10	<10	<10	157	<10	31	2,680	30	<10	516	23.4	<10	362	33.2
	9/22/2015	<8.3	<8.3	<8.3	<8.3	120	<8.3	16.9	2,250	23.4	<8.3	343	15.7	<8.3	239	22.5
	9/22/2015 DUP	<8.3	<8.3	<8.3	<8.3	134	<8.3	21.4	2,490	25.7	<8.3	425	20.1	<8.3	282	26.5
	12/8/2015	<5	<5	<5	<5	8	<5	<5	40	0.7	<5	45	0.5	<5	22	<5
	3/8/2016	<3.6	<14.3	<3.6	<3.6	79.9	<3.6	15.4	1,380	16.2	<3.6	325	7.7	<3.6	209	21.3
	3/8/16 DUP	<3.6	<14.3	<3.6	<3.6	82	<3.6	16.6	1,390	15.6	<3.6	336	7.7	<3.6	210	21.2
	6/16/2016	<8.4	<33.4	<8.4	<8.4	174	<8.4	29.9	3,310	31.6	<8.4	314	12.8	<8.4	288	52.3
	6/16/16 DUP	<8.4	<33.4	<8.4	<8.4	192	<8.4	31.9	3,420	37.4	<8.4	367	15.4	<8.4	311	67
	9/27/2016	<10	<40	<10	<10	26	<10	<10	525	<10	<10	67.6	<10	<10	45.4	14.8
	9/27/2016 DUP	<2.5	<10	<2.5	<2.5	44.4	<2.5	11.5	867	11.4	<2.5	387	3.9	<2.5	163	22.6
	12/14/2016	<1	<4	<1	<1	<1	<1	<1	6.9	2.3	<1	<1	<1	<1	<1	20.5
	12/14/2016 DUP	<2.5	29.1	<2.5	<2.5	16.5	<2.5	4.7	744	<2.5	<2.5	62.3	<2.5	<2.5	42.2	21.2
	3/30/2017	<10	<40	<10	<10	<10	<10	<10	1,120	<10	<10	55.9	<10	<10	29.6	37.8
	3/30/2017 DUP	<2.5	<10	<2.5	<2.5	11.4	<2.5	3.8	853	6.1	<2.5	49	<2.5	<2.5	26	28.3
	6/12/2017	<125	<12.5	<3.1	<3.1	14.0	<3.1	4.7	893	7.6	<3.1	42.4	<3.1	<3.1	18.1	48.4
	6/12/2017 DUP	<3.1	<12.5	<3.1	<3.1	12.8	<3.1	<3.1	860	7.1	<3.1	40.0	<3.1	<3.1	16.5	47.4
	9/28/2017	<3.1	17.4	<3.1	<3.1	19.5	<3.1	<3.1	457	5.4	<3.1	<3.1	<3.1	<3.1	<3.1	47.7
	9/28/2017 DUP	<1.7	16.3	<1.7	<1.7	17.3	<1.7	<1.7	428	5.2	<1.7	<1.7	<1.7	<1.7	<1.7	45.1
	11/9/2017	<2.0	15.4	<0.50	<0.50	4.5	<0.50	<0.50	22	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	49.1
	11/9/2017 DUP	<2.0	12.6	<0.50	<0.50	4.5	<0.50	<0.50	21	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	36.4
	3/20/2018	<0.500	7.50	<0.500	<0.500	0.5	<0.500	<0.500	6	1.3	<0.500	<0.500	<0.500	<0.500	0.271 J	2.8
	3/20/2018 DUP	<0.500	8.18	<0.500	<0.500	0.550 J	<0.500	<0.500	6	1.29 J	<0.500	0.203 J	<0.500	<0.500	0.261 J	2.6
	7/1/2018	<0.500	9.73	<0.500	<0.500	0.9	<0.500	<0.500	4	1.6	<0.500	0.304 J	<0.500	<0.500	1.0	1.5
	7/1/2018 DUP	<0.500	8.34	<0.500	<0.500	0.8	<0.500	<0.500	4	1.6	<0.500	0.289 J	<0.500	<0.500	1.0	1.3
MW-13	12/02/96	0.7	<0.50	<0.50	<0.20	<0.30	<0.50	0.3	9.1	<1	<0.20	750	6.6	--	82	<0.50
	11/12/97	<250	<500	<250	<250	291	<250	<250	5,050	<250	<250	18,100	<250	--	9,050	<500
	08/11/99	<200	<1	<100	<100	<100	<100	<100	2,280	<100	<100	9,590	<200	--	3,920	<100
	11/16/99	<50	<125	<25	<50	108	<25	51	2,620	<25	<25	7,210	67.5	--	3,050	--
	02/28/00	<200	<1	<100	<100	<100	<100	<100	562	<100	<100	1,340	<200	--	602	<100
	06/28/00	<100	<500	<50	<50	132	<50	142	4,210	<50	<50	14,700	155	--	6,360	<50
	05/30/01	<200	<1,000	<100	<100	<100	<100	<100	2,460	<100	<100	10,300	<200	--	4,620	<100
	05/30/02	<2	<1	<1	<2	1.44	<1	1.28	60.4	<1	<1	241	1.68	--	86.4	<1
	05/28/03	<1	<0.50	<0.50	<1	1.71	<0.50	1.75	79.6	1.26	<0.50	121	1.58	--	130	<0.50
	11/16/04	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	1,200	<12	--	230	<12
	05/18/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	3.14	<0.50	<0.50	71.2	<0.50	--	10.3	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-13 (continued)	09/12/07	<50	<25	<25	<50	55	<25	28	1,290	<25	<25	2,730	29.5	--	2,020	<25
	12/12/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	3.36	<0.50	<0.50	51.3	0.64	--	19.5	<0.50
	03/05/08	<1	<0.500	<0.500	<1	8.32	<0.500	4.46	174	4.52	<0.500	383	4.21	<0.500	337	0.96
	06/25/08	<5	<5	<5	<5	15.2	<5	<5	320	10.4	<5	132	<5	--	160	<5
	09/19/08	<5	<2.50	<2.50	<5	5.6	<2.50	<2.50	116	2.65	<2.50	266	<2.50	<2.50	187	<2.50
	12/10/08	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	0.62	32	0.69	<0.50	25	0.6	<0.50	39	<0.50
	03/27/09	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	15	<0.50	<0.50	25	<0.50	<0.50	17	<0.50
	03/27/09 DUP	<0.50	<0.50	<0.50	<0.50	0.79	<0.50	<0.50	15	<0.50	<0.50	25	<0.50	<0.50	17	<0.50
	06/18/09	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	0.8	58	1.8	<0.50	16	<0.50	<0.50	42	<0.50
	09/17/09	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	3.3	130	2.9	<0.50	430	4	<0.50	270	1
	12/18/09	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	16	<0.50	<0.50	66	0.61	<0.50	45	<0.50
	03/19/10	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	1.4	64	1.2	<0.50	130	1.3	<0.50	110	<0.50
	06/16/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	14	<0.50	<0.50	7.6	<0.50
	09/23/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	<0.5	<0.5	45	<0.5	<0.5	12	<0.5
	12/21/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	03/11/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	0.65	<0.50
	06/09/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	6.1	<0.5	<0.5	4.2	<0.5
	09/19/11	<0.50	0.54	<0.50	<0.50	35	<0.50	17	700	20	<0.50	2,200	17	0.63	1,300	3.6
	12/09/11	<9	<9	<9	<9	23	<9	11	530	18	<9	2,800	12	<9	1,400	<9
	03/12/12	<9	<9	<9	<9	24	<9	14	600	14	<9	1,800	11	<9	1,200	<9
	06/22/12	<4	<4	<4	<4	40	<4	13	940	30	<4	1,300	8.6	<4	1,000	4.5
	09/14/12	<4	<4	<4	<4	38	<4	21	900	22	<4	3,100	16	<4	1,800	<4
	12/13/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	13	0.62	<0.50	88	<0.50	<0.50	51	<0.50
	03/15/13	<0.50	<0.50	<0.50	<0.50	34	<0.50	21	890	20	<0.50	2,400	14	0.68	1,700	3.2
	06/14/13	<4	<4	<4	<4	19	<4	9.4	520	15	<4	1,100	6	<4	920	<4
	09/20/13	<0.50	<0.50	<0.50	<0.50	40	<0.50	20	770	19	<0.50	2,600	13	0.74	1,700	3.4
	12/13/13	<4	<4	<4	<4	11	<4	6.6	280	5.8	<4	1,300	4.9	<4	720	<4
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	14	<0.50	<0.50	100	<0.50	<0.50	54	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	12	<0.50	<0.50	880	33	<0.50	1,500	12	0.67	1,300	3.2
	09/30/14	<4	<4	<4	<4	38	<4	20	890	19	<4	3,100	13	<4	2,000	<4
	12/11/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18	0.66	<0.50	91	<0.50	<0.50	65	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-13 (continued)	3/18/2015	<1.6	<1.6	<1.6	<1.6	19	<1.6	3.1	515	7.4	<1.6	551	2.4	<1.6	609	<1.6
	6/18/2015	<0.50	<0.50	<0.50	<0.50	33.9	<0.50	15.9	615	15.3	<0.50	1,960	10.4	<0.50	1,390	2
	9/22/2015	<0.50	<0.50	<0.50	<0.50	33.9	<0.50	21	754	15.6	<0.50	2,370	10.4	<0.50	1,740	2.4
	12/8/2015	<0.50	<0.50	<0.50	<0.50	0.89	<0.50	0.64	30.5	0.88	<0.50	185	0.7	<0.50	121	<0.50
	3/8/2016	<2.5	<10	<2.5	<2.5	14.3	<2.5	6.4	336	4.6	<2.5	839	3.7	<2.5	736	<2.5
	6/16/2016	<8.4	<33.4	<8.4	<8.4	41.3	<8.4	17.8	841	19.2	<8.4	2,470	10.1	<8.4	1,820	<8.4
	9/28/2016	<2.5	<10	<2.5	<2.5	<2.5	<2.5	<2.5	148	<2.5	<2.5	4,840	<2.5	<2.5	895	<2.5
	9/28/16 DUP	<2.5	<10	<2.5	<2.5	<2.5	<2.5	<2.5	145	<2.5	<2.5	5,090	<2.5	<2.5	951	<2.5
	12/16/2016	<5	<20	<5	<5	<5	<5	<5	509	<5	<5	1,020	<5	<5	394	<5
	3/30/2017	<5	<20	<5	<5	<5	<5	<5	101	<5	<5	176	<5	<5	57.6	<5
	6/15/2017	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	1.2	272	1.6	<1.0	97.7	<1.0	<1.0	56.3	4.1
	9/27/2017	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	5.0	3,220	7.3	<1.0	3.3	<1.0	<1.0	1.3	25.0
	11/7/2017	<16.7	<16.7	<4.2	<4.2	<4.2	<4.2	<4.2	1,360	5.4	<4.2	<4.2	<4.2	<4.2	<4.2	25.0
	3/20/2018	<0.500	3.29	<0.500	<0.500	0.879	<0.500	2.55	1,730	5.20	<0.500	0.396 J	<0.500	<0.500	2.19	211
	7/1/2018	<0.500	<2.50	<0.500	<0.500	18.3	0.148 J	5.98	1680	26.9	<0.500	<0.500	<0.500	<0.500	0.781	2030
MW-14	11/12/97	<5	<10	<5	<5	5.01	<5	<5	<5	<5	<5	42.6	<5	--	394	<10
	08/10/99	<20	<100	<10	<10	<10	<10	<10	15.1	<10	<10	121	35.6	--	853	<10
	11/16/99	<2	<5	<1	<2	2.48	<1	2.48	4.2	<1	<1	186	10.8	--	313	<1
	02/28/00	<100	<500	<50	<50	<50	<50	83.2	85.1	<50	<50	711	190	--	5,300	<50
	06/27/00	<10	<50	<5	<5	10.1	<5	18.9	219	<5	<5	207	46.2	--	1,150	<5
	11/30/00	<2	<10	<1	<1	1.08	<1	1.88	2.27	<1	<1	21.3	5.54	--	157	<1
	05/30/01	<1	<50	<5	<5	6.16	<5	13.8	30.4	<5	<5	268	28.2	--	1,280	<5
	05/30/02	<10	<5	<5	<10	<5	<5	<5	8.4	<5	<5	78.3	11.9	--	303	<5
	05/28/03	<1	<0.50	<0.50	<1	0.9	<0.50	1.47	4.15	<0.50	<0.50	80.6	4.99	--	188	<0.50
	11/15/04	<25	<25	<25	<25	<25	<25	<25	96	<25	<25	480	<25	--	1,200	<25
	05/17/05	<2	<1	<1	<2	4.64	<1	2.3	41.1	<1	<1	127	9.28	--	367	<1
	09/12/07	<20	<10	<10	<20	21.6	<10	<10	162	<10	<10	180	22.2	--	963	<10
	03/05/08	<1	<0.500	0.850 J	<1	24.3	<0.500	13.9	217	3.86	<0.500	549	27.2	<0.500	1,770	<0.500
	06/25/08	<5	<5	<5	<5	15.2	<5	10.2	113	<5	<5	360	18.2	--	1,290	<5
	09/19/08	<5	<2.50	<2.50	<5	19.1	<2.50	8.6	173	<2.50	<2.50	425	16.6	<2.50	1,320	<2.50
	12/10/08	<5	<5	<5	<5	17	<5	9.6	160	<5	<5	330	17	<5	1,200	<5
	03/27/09	<2.5	<2.5	<2.5	<2.5	16	<2.5	6.7	160	2.5	<2.5	320	14	<2.5	980	<2.5
	06/17/09	<2.5	<2.5	<2.5	<2.5	21	<2.5	12	150	<2.5	<2.5	400	21	<2.5	1,400	<2.5
	09/18/09	<0.50	<0.50	0.74	<0.50	19	<0.50	8.8	150	2	<0.50	440	17	<0.50	1,300	<0.50
	12/15/09	<2.5	<2.5	<2.5	<2.5	11	<2.5	4.7	120	<2.5	<2.5	410	7.6	<2.5	820	<2.5
	03/17/10	<2.5	<2.5	<2.5	<2.5	22	<2.5	9.5	140	<2.5	<2.5	320	15	<2.5	1,300	<2.5
	07/02/10	<2.5	<2.5	<2.5	<2.5	7	<2.5	4.8	52	<2.5	<2.5	220	5.9	<2.5	610	<2.5
	09/22/10	<3	<3	<3	<3	16	<3	6.5	140	<3	<3	230	10	<3	800	<3
	12/08/10	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	0.7	11	<0.5	<0.5	82	1.5	<0.5	150	<0.5

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-14	03/09/11	<3	<3	<3	<3	6.8	<3	3.8	55	<3	<3	200	5	<3	540	<3
(continued)	06/08/11	<0.5	<0.5	<0.5	<0.5	0.64	<0.5	<0.5	1.8	<0.5	<0.5	27	1.1	<0.5	66	<0.5
	09/14/11	<2.5	<2.5	<2.5	<2.5	12	<2.5	5.7	120	<2.5	<2.5	300	8	<2.5	850	<2.5
	12/06/11	<2.5	<2.5	<2.5	<2.5	8.4	<2.5	3.9	88	<2.5	<2.5	320	5.7	<2.5	740	<2.5
	03/07/12	<2.5	<2.5	<2.5	<2.5	9.3	<2.5	4.6	87	<2.5	<2.5	270	6.1	<2.5	760	<2.5
	06/19/12	<2.5	<2.5	<2.5	<2.5	11	<2.5	5.6	70	<2.5	<2.5	200	7.4	<2.5	730	<2.5
	09/11/12	<2.5	<2.5	<2.5	<2.5	11	<2.5	5.1	110	<2.5	<2.5	280	6.6	<2.5	730	<2.5
	12/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	16	<0.50	<0.50	27	<0.50
	03/12/13	<0.50	<0.50	0.56	<0.50	12	<0.50	4.4	100	1.7	<0.50	230	7.2	<0.50	670	<0.50
	06/12/13	<3	<3	<3	<3	11	<3	5	84	<3	<3	260	6.6	<3	770	<3
	09/18/13	<0.50	<0.50	<0.50	<0.50	13	<0.50	4.6	130	2	<0.50	240	5.9	<0.50	640	<0.50
	12/11/13	<1.5	<1.5	<1.5	<1.5	8.4	<1.5	2.8	83	<1.5	<1.5	180	3.7	<1.5	460	<1.5
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	20	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	17	<0.50	7	120	1.8	<0.50	210	0.87	<0.50	670	<0.50
	9/24/2014	<2.5	<2.5	<2.5	<2.5	10	<2.5	4	120	<2.5	<2.5	240	4	<2.5	640	<2.5
	12/9/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.7	<0.50	<0.50	29	0.61	<0.50	63	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	15.4	<0.50	5.9	128	2.2	<0.50	312	5.9	<0.50	912	<0.50
	6/16/2015	<3.1	<3.1	<3.1	<3.1	14.7	<3.1	4.9	117	<3.1	<3.1	248	4.4	<3.1	792	<3.1
	9/21/2015	<0.50	<0.50	<0.50	<0.50	15.2	<0.50	5.6	116	2.1	<0.50	201	4.7	<0.50	654	<0.50
	12/8/2015	Not sampled; well monument under water.														
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	<0.50	12.5	<0.50	<0.50	29.2	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	7.2	<0.50	2.1	61.8	0.94	<0.50	100	1.7	<0.50	218	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	0.56	<0.50	<0.50	0.97	<0.50
	3/27/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	0.57	69.2	<0.5	<0.5	14.7	<0.5	<0.5	33.4	0.62
	6/13/2017	<2.0	<2.0	<0.50	<0.50	10	<1.0	5.3	432	2.7	<0.50	58.3	2.1	<0.50	204	2.5
	9/26/2017	<0.84	<3.3	<0.84	<0.84	6	<0.84	2.6	279	2.8	<0.84	62.4	<0.84	<0.84	265	<0.84
	11/8/2017	<3.3	<3.3	<0.84	<0.84	5	<0.84	2.1	306	2.2	<0.84	39.3	<0.84	<0.84	160	0.9
	3/20/2018	<0.500	1.67 J	<0.500	<0.500	5	<0.500	3.6	500	2.6	<0.500	36.0	0.6	<0.500	150	1.35 J
	6/28/2018	<0.500	<2.50	<0.500	<0.500	11	<0.500	2.5	255	2.5	<0.500	34.9	1.6	<0.500	247	0.7
MW-15	11/13/97	<0.50	<1	<0.50	<0.50	<0.50	1.1	<0.50	6.78	<0.50	<0.50	2.38	1.68	--	1.81	<1
	11/16/99	<1	<2.5	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	967	13.7	--	63.4	<0.50
	02/28/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	17.9	1.55	--	1.01	<0.50
	06/27/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.44	1.03	--	0.565	<0.50
	05/30/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.32	<1	--	<0.50	<0.50
	05/31/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.59	0.63	--	<0.50	<0.50
	05/29/03	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	4.42	<0.50	--	1.3	<0.50
	11/02/04	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	--	<0.50	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-15 (continued)	11/16/04	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	12	<0.50	--	3.1	<0.50
	03/24/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	--	1.49	<0.50
	05/17/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.54	<0.50	--	0.58	<0.50
	09/13/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.54 J	<0.50	--	<0.50	<0.50
	03/07/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	2.63 J	<0.500	<0.500	<0.500	<0.500
	09/18/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.86	<0.500	<0.500	<0.500	<0.500
	03/25/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	<0.50	<0.50
	09/17/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.81	<0.50	<0.50	<0.50	<0.50
	03/18/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	<0.50	<0.50
	09/23/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.76	<0.5	<0.5	<0.5	<0.5
	03/09/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/16/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.64	<0.50	<0.50	<0.50	<0.50
	03/09/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	<0.50	<0.50
	09/10/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	<0.50	<0.50
	03/14/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	<0.50	<0.50
	09/19/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	<0.50	<0.50
	3/21/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/30/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	<0.50	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	<0.50	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59	<0.50	<0.50	<0.50	<0.50
	9/30/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	<0.50	<0.50
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	<0.50	<0.50	<0.50
	7/2/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.6	<0.500	<0.500	<0.500	<0.500
MW-16	11/12/97	<5	<10	<5	<5	19.8	<5	27.8	23.6	<5	<5	328	57.5	--	142	<10
	08/11/99	<5	<25	<2.5	<2.5	15.2	<2.5	<2.5	7.2	<2.5	<2.5	205	55.6	--	85.6	<2.5
	02/28/00	<2	<10	<1	<1	10.4	<1	12	7.4	<1	<1	523	54.5	--	112	<1
	06/27/00	<10	<50	<5	<5	12.4	<5	13.9	8.39	<5	<5	236	45	--	93.8	<5
	05/30/01	<10	<50	<5	<5	9.28	<5	12	8.95	<5	<5	302	30.1	--	110	<5
	05/30/02	<5	<2.5	<2.5	<5	13.5	<2.5	10.6	8.65	<2.5	<2.5	467	24	--	119	<2.5
	05/29/03	<5	<2.5	<2.5	<5	3.6	<2.5	3.35	2.85	<2.5	<2.5	412	13.4	--	76	<2.5
	11/02/04	<2	<10	<1	<1	<1	<1	<1	1.66	<1	<1	260	6.9	--	25.4	<1
	11/16/04	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	300	7.8	--	26	<2.5
	03/24/05	<2	<1	<1	<2	1.8	<1	1.34	1.96	<1	<1	373	11.8	--	49.4	<1
	05/17/05	<1	<0.50	<0.50	<1	4.39	<0.50	3.14	9.25	<0.50	<0.50	120	9.09	--	41.5	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-16 (continued)	11/15/05	<1	<0.500	<0.500	<1	2.75	<0.500	1.86	2.5	<0.500	<0.500	152	8.94	--	33.4	<0.500
	02/21/06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/06/06	<2	<2	<2	<2	12.2	<2	3.38	210	<2	<2	84.6	2.56	--	25.2	5.64
	12/06/06	<2	<1	<1	<2	4.2	<1	2.12	16.7	<1	<1	176	5.88	--	45.6	<1
	05/23/07	<1	<1	<1	<1	2.57	<1	<1	14	<1	<1	98.8	3.35	--	23.8	<1
	09/13/07	<1	<0.50	<0.50	<1	3.15	<0.50	1.08	6.6	<0.50	<0.50	163	5.87	--	49.2	<0.50
	12/12/07	<2	<1	<1	<1	2.32	<1	1.44	5.9	<1	<1	110	5.92	--	28.2	<1
	03/07/08	<1	<0.500	<0.500	<1	3	<0.500	1.86	5.93	<0.500	<0.500	280	6.12	<0.500	73.3	<0.500
	09/18/08	<5	<2.50	<2.50	<5	2.7	<2.50	<2.50	5.15	<2.50	<2.50	300	6.2	<2.50	65.2	<2.50
	12/09/08	<1	<1	<1	<1	2.6	<1	1.8	5.5	<1	<1	300	5.7	<1	67	<1
	03/26/09	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	0.82	3.2	<0.50	<0.50	150	5.2	<0.50	28	<0.50
	06/17/09	<0.50	<0.50	<0.50	<0.50	5	<0.50	0.95	29	<0.50	<0.50	54	1.8	<0.50	16	0.68
	09/17/09	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	1.1	2	<0.50	<0.50	220	4.8	<0.50	33	<0.50
	12/17/09	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	0.6	1.4	<0.50	<0.50	100	3.2	<0.50	19	<0.50
	03/19/10	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	1	2	<0.50	<0.50	110	4.5	<0.50	36	<0.50
	06/16/10	<0.50	<0.50	<0.50	<0.50	4.9	<0.50	0.91	37	<0.50	<0.50	39	0.94	<0.50	9.9	1.6
	09/23/10	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	0.94	2.8	<0.5	<0.5	240	4.2	<0.5	43	<0.5
	12/10/10	<0.5	<0.5	<0.5	<0.5	0.85	<0.5	0.54	1.6	<0.5	<0.5	94	2.4	<0.5	18	<0.5
	03/10/11	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	0.5	6.2	<0.50	<0.50	110	1.9	<0.50	21	<0.50
	06/09/11	<0.5	<0.5	<0.5	<0.5	4.9	<0.5	1.2	63	<0.5	<0.5	28	<0.5	<0.5	7.1	2.2
	09/19/11	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	5.1	<0.50	<0.50	160	2.7	<0.50	13	<0.50
	12/08/11	<0.50	<0.50	<0.50	<0.50	0.92	<0.50	0.61	2.2	<0.50	<0.50	210	2.9	<0.50	38	<0.50
	06/20/12	<0.5	<0.5	<0.5	<0.5	3.6	<0.5	0.56	24	<0.5	<0.5	60	0.98	<0.5	14	0.62
	09/13/12	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	0.61	6.5	<0.50	<0.50	190	2.4	<0.50	35	<0.50
	12/13/12	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	0.68	5.7	<0.50	<0.50	110	1.1	<0.50	24	<0.50
	03/14/13	<0.50	<0.50	<0.50	<0.50	0.98	<0.50	0.7	4.7	<0.50	<0.50	200	2	<0.50	50	<0.50
	06/14/13	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	6	<0.50	<0.50	84	0.96	<0.50	18	<0.50
	09/19/13	<0.50	<0.50	<0.50	<0.50	0.92	<0.50	0.75	7.1	<0.50	<0.50	180	1.4	<0.50	57	<0.50
	12/13/13	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	0.68	5.9	<0.50	<0.50	160	1.4	<0.50	52	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	0.89	19	<0.50	<0.50	52	<0.50	<0.50	13	0.55
	6/24/2014	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	10	<0.50	<0.50	70	0.7	<0.50	12	<0.50
	9/27/2014	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	0.66	8.8	<0.50	<0.50	200	1.4	<0.50	47	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-16 (continued)	12/11/2014	<0.50	<0.50	<0.50	<0.50	0.64	<0.50	<0.50	4	<0.50	<0.50	76	0.96	<0.50	17	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	6	<0.50	<0.50	157	0.94	<0.50	31	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	0.61	<0.50	<0.50	10.5	<0.50	<0.50	179	1	<0.50	41.6	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	0.65	10.4	<0.50	<0.50	173	1.2	<0.50	43.5	<0.50
	12/7/2015	Not sampled; well monument under water.														
	9/28/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	9.5	<0.50	<0.50	144	0.66	<0.50	35.6	<0.50
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	51.5	<0.50	<0.50	11.6	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	1.6	<0.5	<0.5	19	<0.5	<0.5	27	<0.5	<0.5	6.4	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	6.4	<0.50	<0.50	53.7	0.66	<0.50	5.4	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	1.3	<0.50	<0.50	148.0	1.00	<0.50	11.1	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	150.0	0.96	<0.50	17.4	<0.50
	3/19/2018	<0.500	<2.50	<0.500	<0.500	0.232 J	<0.500	0.190 J	3.8	<0.500	<0.500	99.7	0.82	<0.500	12.6	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	0.500 J	<0.500	0.209 J	9.6	<0.500	<0.500	72.5	0.86	<0.500	7.4	<0.500
MW-17	11/13/97	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	--	<0.50	<1
	11/16/99	<1	<2.5	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	127	1.5	--	9.54	<0.50
	02/28/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.85	<1	--	2.51	<0.50
	06/27/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.27	<1	--	<0.50	<0.50
	05/30/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1	--	<0.50	<0.50
	05/30/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.82	<0.50	--	<0.50	<0.50
	05/28/03	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.75	<0.50	--	0.92	<0.50
	11/15/04	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	--	<0.50	<0.50
	05/17/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.06	<0.50	--	6.68	<0.50
	05/23/07	<1	<1	<1	<1	<1	<1	<1	8.82	<1	<1	37.8	<1	--	28.2	<1
	09/11/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50 J	<0.50	--	<0.50	<0.50
	03/05/08	<1	<0.500	<0.500	<1	0.9	<0.500	<0.500	0.96	<0.500	<0.500	1.05	<0.500	<0.500	3.62	<0.500
	09/19/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.8	<0.500
	03/25/09	<0.50	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	1	<0.50	<0.50	0.69	<0.50	<0.50	3	<0.50
	09/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	<0.50	0.72	<0.50	<0.50	3.2	<0.50
	03/23/10	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	3.9	<0.50	<0.50	3.2	0.58	<0.50	18	<0.50
	09/20/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.69	<0.5	<0.5	0.71	<0.5	<0.5	3	<0.5
	03/09/11	<0.50	<0.50	<0.50	<0.50	0.65	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	8.2	<0.50
	09/13/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.96	<0.50	<0.50	0.71	<0.50	<0.50	3.1	<0.50
	03/07/12	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	5.4	<0.50	<0.50	6.8	0.56	<0.50	25	<0.50
	09/11/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	0.66	<0.50	<0.50	2.5	<0.50
	03/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	4.1	<0.50	<0.50	11	<0.50
	09/17/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	4.2	<0.50	<0.50	8.9	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-17 (continued)	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	3.2	<0.50	<0.50	6.8	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	0.71	<0.50	<0.50	2.4	<0.50	<0.50	3.9	<0.50	<0.50	12.6	<0.50
	9/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	2.5	<0.50	<0.50	4.2	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	0.83	<0.50	<0.50	3.3	<0.50	<0.50	9.4	<0.50	<0.50	22.7	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	4.2	<0.50	<0.50	10.4	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	9/29/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	2.7	<0.50	<0.50	4.6	<0.50	<0.50	11.4	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	9.3	<0.50	<0.50	9.9	<0.50	<0.50	21.9	<0.50
	6/28/2018	<0.500	<2.50	<0.500	<0.500	0.516	<0.500	<0.500	2.7	<0.500	<0.500	3.7	<0.500	<0.500	9.0	<0.500
MW-18i	09/29/00	ND	ND	0.694	ND	0.843	ND	ND	16.5	ND	ND	11.7	ND	--	8.32	ND
	11/30/00	<1	<5	<0.50	<0.50	0.907	<0.50	<0.50	11.6	<0.50	<0.50	12.4	<1	--	17.6	<0.50
	02/27/01	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	10.2	<2.5	<2.5	15.2	<5	--	10	<2.5
	05/30/01	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	6.47	<2.5	<2.5	29.5	<5	--	8.06	<2.5
	09/25/01	<1	<1	<1	<1	1.8	<1	<1	23	<1	<1	62	2.3	--	39	<1
	03/29/02	<1	<0.50	<0.50	<1	1.2	<0.50	<0.50	17.3	<0.50	<0.50	71.1	1.22	--	31	<0.50
	05/30/02	<1	<0.50	<0.50	<1	1.18	<0.50	<0.50	18.6	<0.50	<0.50	53.2	1.14	--	19.3	<0.50
	08/29/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	6.91	<0.50	<0.50	18.2	<0.50	--	7.34	<0.50
	11/07/02	<1	<0.50	<0.50	<1	0.56	<0.50	<0.50	10.1	<0.50	<0.50	23.3	<0.50	--	9.7	<0.50
	01/23/03	<1	<0.50	<0.50	<1	0.68	<0.50	<0.50	12.3	<0.50	<0.50	27.6	0.5	--	12.5	<0.50
	05/29/03	<1	<0.50	<0.50	<1	0.59	<0.50	<0.50	10.4	<0.50	<0.50	23.9	0.5	--	10.8	<0.50
	11/11/03	<1	<1	<1	<1	<1	<1	<1	16.1	<1	<1	31.5	<1	--	16.3	<1
	01/27/04	<1	<0.50	<0.50	<1	0.67	<0.50	<0.50	14.2	<0.50	<0.50	69.7	0.53	--	12	<0.50
	05/04/04	<1	<1	<1	<1	<1	<1	<1	15.6	<1	<1	112	<1	--	12.1	<1
	08/17/04	<1	<0.50	3.76	<0.50	0.81	1.86	<0.50	22.6	0.78	<0.50	43.8	0.96	--	24	<1
	11/02/04	<0.50	<0.50	<0.50	<0.50	1.09	<0.50	<0.50	21.8	<0.50	<0.50	32.2	0.6	--	17.8	<0.50
	11/16/04	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	24	<0.50	<0.50	42	0.69	--	21	<0.50
	02/01/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	8.92	<0.50	<0.50	13	<0.50	--	6.01	<0.50
	05/18/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	11	<0.50	<0.50	9.69	<0.50	--	7.3	<0.50
	08/18/05	<1	<0.500	<0.500	<1	1.17	<0.500	<0.500	18 B	<0.500	<0.500	21.4 B	0.58	--	16.3 B	<0.500
	08/18/05 DUP	<1	<0.500	<0.500	<1	1.17	<0.500	<0.500	18.5 B	<0.500	<0.500	21.8 B	0.57	--	16.2 B	<0.500
	11/15/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	7.31	<0.500	<0.500	11.4	<0.500	--	6.31	<0.500
	02/21/06	<1	<0.500	<0.500	<1	0.93	<0.500	<0.500	14.8	<0.500	<0.500	24.3	0.52	--	15.2	<0.500
	06/06/06	<1	<1	<1	<1	<1	<1	<1	5.88	<1	<1	8.46	<1	--	4.47	<1

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-18i (continued)	09/06/06	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	5.79	<0.50	<0.50	7.89	<0.50	--	4.23	<0.50
	12/06/06	<1	<0.50	<0.50	<1	0.56	<0.50	<0.50	11.6	<0.50	<0.50	11.2	<0.50	--	6.91	<0.50
	02/07/07	<1	<0.50	<0.50	<1	0.68	<0.50	<0.50	12	<0.50	<0.50	15	<0.50	--	9.32	<0.50
	05/23/07	<1	<1	<1	<1	<1	<1	<1	14.6	<1	<1	17.2	<1	--	11.3	<1
	09/11/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	4.87	<0.50	<0.50	1.13	<0.50	--	1.46	<0.50
	12/13/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	2.99	<0.50	<0.50	5.57	<0.50	--	3.32	<0.50
	03/06/08	<1	<0.500	<0.500	<1	0.82	<0.500	<0.500	13.2	<0.500	<0.500	13.2	<0.500	<0.500	9.78	<0.500
	06/10/08	<1	1	1	<1	<1	<1	<1	4.17	<1	<1	4.31	<1	--	2.18	<1
	09/17/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	3.95	<0.500	<0.500	3.1	<0.500	<0.500	2.55	<0.500
	12/09/08	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	12	<0.50	<0.50	8.5	<0.50	<0.50	7.4	<0.50
	03/26/09	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	8	<0.50	<0.50	4.8	<0.50	<0.50	4.7	<0.50
	06/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	<0.50	2.5	<0.50	<0.50	1.7	<0.50
	09/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.2	<0.50	<0.50	5.9	<0.50	<0.50	4.5	<0.50
	12/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	2.5	<0.50	<0.50	1.6	<0.50
	03/18/10	<0.50	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	11	<0.50	<0.50	9.7	<0.50	<0.50	6	<0.50
	06/15/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	3.6	<0.50	<0.50	1.8	<0.50
	09/22/10	<0.5	<0.5	<0.5	<0.5	0.71	<0.5	0.5	15	<0.5	<0.5	9.8	<0.5	<0.5	7.4	<0.5
	12/09/10	<0.5	<0.5	<0.5	<0.5	0.66	<0.5	0.5	15	<0.5	<0.5	12	<0.5	<0.5	8	<0.5
	03/10/11	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	12	<0.50	<0.50	9.4	<0.50	<0.50	5.2	<0.50
	06/09/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	<0.5	<0.5	2.1	<0.5	<0.5	1	<0.5
	09/15/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	<0.50	2.9	<0.50	<0.50	1.9	<0.50
	12/08/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.8	<0.50	<0.50	8.5	<0.50	<0.50	4.8	<0.50
	03/07/12	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	15	<0.50	<0.50	12	<0.50	<0.50	6.4	<0.50
	06/21/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	<0.5	<0.5	1.5	<0.5	<0.5	0.97	<0.5
	09/13/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	1.7	<0.50	<0.50	1	<0.50
	12/13/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.3	<0.50	<0.50	3.9	<0.50	<0.50	2.1	<0.50
	03/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.2	<0.50	<0.50	3.8	<0.50	<0.50	2.1	<0.50
	06/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	2.4	<0.50	<0.50	1.3	<0.50
	09/19/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	2.2	<0.50	<0.50	1.3	<0.50
	12/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	5.3	<0.50	<0.50	3.6	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	1	<0.50	<0.50	0.7	<0.50
	6/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.63	<0.50	<0.50	0.19	<0.50	<0.50	1	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	1.5	<0.50	<0.50	0.93	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	<0.50	2	<0.50	<0.50	1.3	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-18i (continued)	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	2	<0.50	<0.50	1.1	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	2	<0.50	<0.50	1.1	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.5	<0.50	<0.50	3.4	<0.50	<0.50	1.8	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	<0.50	4	<0.50	<0.50	2.6	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	1	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.98	<0.50	<0.50	0.73	<0.50
	9/28/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	0.85	<0.50
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	2.8	<0.50	<0.50	1.5	<0.50	<0.50	1.2	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	1.4	<0.5	<0.5	1.2	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	0.66	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	6.40	<0.50	<0.50	1.9	<0.50	<0.50	1.30	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	0.50	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	1.43	<0.500	<0.500	1.5	<0.500	<0.500	0.82	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.63	<0.500	<0.500	0.6	0.320 J	<0.500	<0.500	<0.500
MW-19	11/07/02	<20	<10	<10	<20	252	<10	66.2	2,450	23	<10	3,100	139	--	1,810	79.2
	05/30/03	<50	<25	<25	<50	109	<25	36	1,300	<25	<25	7,160	104	--	2,070	35.5
	11/16/04	<50	<50	<50	<50	<50	65	<50	490	<50	<50	7,300	130	--	1,400	<50
	05/18/05	<10	<5	<5	<10	19.3	<5	<5	161	<5	<5	1,500	33.8	--	205	24.6
	11/15/05	<20	<10	<10	<20	27	<10	18.8	230	<10	<10	3,080	67.2	--	785	14.6
	11/15/05 DUP	<20	<10	<10	<20	25	<10	20.2	221	<10	<10	2,860	64.4	--	762	15.2
	06/05/06	<10	<10	<10	<10	<10	<10	<10	80.9	<10	<10	1,280	13.1	--	237	<10
	12/06/06	<20	<10	<10	<20	<10	<10	<10	76.2	<10	<10	2,060	17.2	--	304	<10
	05/22/07	<20	<20	<20	<20	<20	<20	<20	114	<20	<20	2,720	51.4	--	504	<20
	09/11/07	<50	<25	<25	<50	<25	<25	<25	85.5	<25	<25	3,370	62.5	--	608	<25
	12/12/07	<50	<25	<25	<50	<25	<25	<25	80	<25	<25	2,070	38.5	--	326	<25
	03/05/08[7]	<1	<0.500	<0.500	<1	12.5	<0.500	20.5	149	4.53	<0.500	4,060	66	<0.500	1,030	6.41
	06/25/08	<20	<20	<20	<20	45.8	<20	29.6	435	<20	<20	2,790	46.6	--	1,410	<20
	09/19/08	<50	<25	<25	<50	62	<25	37.5	715	<25	<25	4,990	56.5	<25	2,870	39.5
	12/10/08	<25	<25	<25	<25	51	<25	<25	500	<25	<25	6,600	110	<25	1,100	<25
	03/27/09	<15	<15	<15	<15	53	<15	39	650	<15	<15	4,500	120	<15	1,900	25
	03/27/09 DUP	<15	<15	<15	<15	56	<15	39	670	<15	<15	4,800	130	<15	1,900	25
	06/18/09	<2.5	<2.5	<2.5	<2.5	5.4	<2.5	5.3	82	<2.5	<2.5	680	8.6	<2.5	240	<2.5
	06/18/09 DUP	<2.5	<2.5	<2.5	<2.5	5.1	<2.5	5.4	80	<2.5	<2.5	660	8.4	<2.5	240	<2.5
	09/18/09	<2.5	<2.5	<2.5	<2.5	12	<2.5	36	170	4.6	<2.5	9,400	140	<2.5	2,000	11
	09/18/09 DUP	<2.5	<2.5	<2.5	<2.5	12	<2.5	36	170	4.4	<2.5	9,700	140	<2.5	2,000	12
	12/18/09	<10	<10	<10	<10	87	<10	29	780	13	<10	3,200	57	<10	1,200	35
	12/18/09 DUP	<10	<10	<10	<10	84	<10	27	740	12	<10	3,100	53	<10	1,200	32
	03/19/10	<5	<5	<5	<5	<5	<5	8.3	45	<5	<5	1,900	19	<5	380	<5
	03/19/10 DUP	<7	<7	<7	<7	<7	<7	8.3	44	<7	<7	1,800	18	<7	360	<7

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-19 (continued)	06/17/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.7	<0.50	<0.50	67	<0.50	<0.50	25	<0.50
	06/17/10 DUP	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	6.9	<0.50	<0.50	65	0.52	<0.50	24	<0.50
	09/23/10	<2.5	<2.5	<2.5	<2.5	8.7	<2.5	21	110	3.6	<2.5	3,400	50	<2.5	920	12
	09/23/10 DUP	<2.5	<2.5	<2.5	<2.5	8.5	<2.5	21	110	3.4	<2.5	3,700	49	<0.25	890	13
	12/09/10	<15	<15	<15	<15	59	<15	38	590	<15	<15	6,200	68	<15	1,500	48
	12/09/10 DUP	<1.5	<1.5	<1.5	<1.5	58	<1.5	37	590	<1.5	<1.5	6,000	67	<1.5	1,500	48
	03/08/11	<5	<5	<5	<5	23	<5	12	280	<5	<5	1,500	18	<5	590	13
	06/10/11	<0.9	<0.9	<0.9	<0.9	22	<0.9	2.7	160	1.4	<0.9	240	3.6	<0.9	130	5.6
	06/10/11 DUP	<0.9	<0.9	<0.9	<0.9	19	<0.9	2.3	140	1.3	<0.9	220	3.3	<0.9	120	5
	09/19/11	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	53	<1.5	<1.5	400	3	<1.5	78	<1.5
	09/19/11 DUP	<2	<2	<2	<2	<2	<2	<2	53	<2	<2	410	3.2	<2	80	<2
	12/09/11	<1.5	<1.5	<1.5	<1.5	5	<1.5	4.3	110	<1.5	<1.5	730	10	<1.5	220	3.9
	12/09/2011 DUP	<2	<2	<2	<2	5.4	<2	4.7	120	<2	<2	770	10	<2	230	3.9
	03/09/12	<2.5	<2.5	<2.5	<2.5	46	<2.5	26	820	1	<2.5	2,400	50	<2.5	1,200	67
	03/09/12 DUP	<4	<4	<4	<4	43	<4	24	770	8.8	<4	2,400	46	<4	1,200	62
	06/22/2012	<5	<5	<5	<5	74	<5	17	1,000	14	<5	1,300	21	<5	1,000	57
	06/22/12 DUP	<5	<5	<5	<5	74	<5	18	1,000	13	<5	1,300	22	<5	1,000	57
	09/14/12	<5	<5	<5	<5	<5	<5	5.7	300	<5	<5	2,200	31	<5	340	8
	09/14/12 DUP	<5	<5	<5	<5	<5	<5	5.9	300	<5	<5	2,300	31	<5	340	<5
	12/14/12	<1.5	9.8	<1.5	<1.5	21	<1.5	1.8	330	3.6	<1.5	290	3.2	<1.5	140	3.1
	12/14/12 DUP	<1	9.3	<1	<1	21	<1	1.7	340	3.7	<1	300	3.1	<1	140	3
	03/15/13	<1.5	4.7	<1.5	<1.5	29	<1.5	21	870	5.5	<1.5	3,200	67	<1.5	1,600	9
	03/15/13 DUP	<1.5	4.7	<1.5	<1.5	30	<1.5	20	820	6.1	<1.5	3,200	68	<1.5	1,500	9.2
	06/14/13	<9	<9	<9	<9	25	<9	13	730	<9	<9	2,500	29	<9	1,000	<9
	06/14/13 DUP	<9	<9	<9	<9	25	<9	11	720	<9	<9	2,400	26	<9	1,000	<9
	09/20/13	<0.50	1.2	<0.50	<0.50	14	<0.50	25	520	4.5	<0.50	3,000	61	<0.50	1,100	10
	09/20/13 DUP	<1	1.1	<1	<1	12	<1	21	490	3.8	<1	3,200	52	<1	1,200	9
	12/16/13	<15	<15	<15	<15	37	<15	22	680	<15	<15	3,000	36	<15	1,100	<15
	12/16/13 DUP	<15	<15	<15	<15	36	<15	22	660	<15	<15	2,900	37	<15	1,100	<15
	3/21/2014	<0.50	1.4	<0.50	<0.50	4.8	<0.50	2.4	130	1.2	<0.50	180	1.6	<0.50	51	4.3
	3/21/2014 DUP	<0.50	1.4	<0.50	<0.50	4.8	<0.50	2.2	130	1.1	<0.50	180	1.6	<0.50	51	4.3

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-19	6/26/2014	<5	0.89	<0.50	<0.50	0.54	110	38	2,000	21	<0.50	1,900	36	0.8	1,500	6.2
(continued)	6/26/14 DUP	<5	1.1	<0.50	<0.50	110	<0.50	38	1,900	21	<0.50	1,900	36	0.74	1,600	6.1
	9/30/2014	<15	<15	<15	<15	18	<15	38	520	<15	<15	4,400	61	<15	1,700	32
	9/30/2014 DUP	<15	<15	<15	<15	18	<15	37	510	<15	<15	4,400	60	<15	1,700	30
	12/12/2014	<5	<5	<5	<5	96	<5	20	1,500	12	<5	1,400	19	<5	790	60
	12/12/2014 DUP	<5	<5	<5	<5	110	<5	21	1,500	14	<5	1,500	21	<5	890	68
	3/18/2015	<4.2	<4.2	<4.2	<4.2	72.5	<4.2	48	1,460	17.5	<4.2	5,920	56.5	<4.2	3,970	53.7
	3/18/2015 DUP	<4.2	<4.2	<4.2	<4.2	82.9	<4.2	47.9	1,410	17.8	<4.2	4,930	56.2	<4.2	3,500	46.6
	6/18/2015	<0.50	<0.50	<0.50	<0.50	21.5	<0.5	48.5	628	6.6	<0.50	8,080	94.3	<0.50	2,200	28
	6/18/2015 DUP	<0.50	<0.50	<0.50	<0.50	22.7	<0.50	48.8	614	7.5	<0.50	7,990	985	<0.50	2,090	30.7
	9/22/2015	<0.50	<0.50	<0.50	<0.50	4.9	<0.5	31.7	185	2	<0.50	7,200	74.8	<0.50	791	6.8
	12/8/2015	<0.50	<0.50	<0.50	<0.50	150	<0.5	33.5	1,640	16.4	<0.50	2,900	36	<0.50	1,550	87.3
	12/8/15 DUP	<0.50	<0.50	<0.50	<0.50	155	<0.50	35.1	1,680	17.2	<0.50	3,020	37.1	<0.50	1,600	89.8
	3/8/2016	<10	<40	<10	<10	96.6	<10	42	1,520	20.2	<10	4,080	40.8	<10	2,610	64.8
	3/8/16 DUP	<10	<40	<10	<10	93	<10	42.8	1,460	18.2	<10	3,760	40.4	<10	2,560	72.4
	6/16/2016	<10	<40	<10	<10	<10	<10	22.2	507	<10	<10	3,250	29.2	<10	1,030	18.3
	6/16/2016 DUP	<12.5	<50	<12.5	<12.5	19.5	<12.5	23.8	505	<12.5	<12.5	3,460	28.1	<12.5	1,020	17.6
	9/26/2016	<5	<20	<5	<5	10.4	<5	11	235	<5	<5	1,520	14.5	<5	592	10.1
	12/12/2016	<5	<20	<5	<5	72.8	<5	11.2	1,030	10.7	<5	1,730	10.9	<5	812	28.2
	12/12/2016 DUP	<2.5	<10	<2.5	<2.5	78.7	<2.5	14.2	1,010	11.6	<2.5	1,530	15.5	<2.5	975	31.9
	3/28/2017	<5	<20	<5	<5	197	<5	25.5	1,930	19.7	<5	664	17	<5	826	58.5
	3/28/2017 DUP	<5	<20	<5	<5	214	<5	26.7	1,990	21.5	<5	755	19.9	<5	896	63.2
	6/14/2017	<2.5	<10	<2.5	<2.5	40.6	<2.5	15.4	481	6.1	<2.5	531	8.1	<2.5	481	16.5
	6/14/2017 DUP	<2.5	<10	<2.5	<2.5	41.8	<2.5	15.8	486	6.2	<2.5	566	8.2	<2.5	506	17.2
	9/26/2017	<2.5	<10	<2.5	<2.5	<2.5	<2.5	26.5	1,160	5.4	<2.5	3,620	38.9	<2.5	1,450	111.0
	9/26/2017 DUP	<2.5	<10	<2.5	<2.5	11.1	<2.5	28.9	1,150	5.4	<2.5	3,710	40.4	<2.5	1,480	111.0
	11/9/2017	<20	<20	<5.0	<5.0	104.0	<5.0	24.9	1,660	24.0	<5.0	1,530	20.2	<5.0	1,020	109.0
	11/9/2017 DUP	<2.0	<2.0	<0.50	<0.50	56.5	<0.50	14.7	1,040	14.7	<0.50	970	13.0	0.75	790	115.0
	3/21/2018	<0.500	3.90	<0.500	<0.500	59.0	0.225 J	31.4	2,430	11.2	<0.500	1,250	17.0	0.339 J	1,340	413.0
	3/21/2018 DUP	<0.500	4.26	<0.500	<0.500	58.2	0.242 J	30.7	2,470	10.8	<0.500	996	17.0	0.277 J	1,180	412.0
	6/28/2018	<0.500	<2.50	<0.500	<0.500	81.6	<0.500	35.6	3,890	16.4	<0.500	163	10.9	0.210 J	148	773.0
	6/28/2018 DUP	<0.500	<2.50	<0.500	<0.500	80.2	<0.500	36.3	4,190	18.4	<0.500	177	11.7	0.244 J	191	799.0
MW-19i	06/10/08	<1	<1	<1	<1	<1	<1	<1	8.46	<1	<1	<1	<1	<1	1.28	<1
	09/17/08	<1	<0.500	<0.500	<1	1.93	0.53	<0.500	27.1	<0.500	<0.500	1.72	<0.500	<0.500	5.77	<0.500
	12/10/08	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	28	<0.50	<0.50	<0.50	<0.50	<0.50	5.6	<0.50
	03/26/09	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	<0.50	25	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	<0.50
	06/17/09	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	10	<0.50	<0.50	0.67	<0.50	<0.50	1.5	<0.50
	09/16/09	<0.50	<0.50	<0.50	<0.50	1.7	0.64	<0.50	28	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	0.79
	12/15/09	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	<0.50	10	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	<0.50
	03/18/10	<0.50	<0.50	<0.50	<0.50	1.1	0.53	<0.50	15	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50
	06/15/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-19i	09/22/10	<0.5	<0.5	<0.5	<0.5	1.2	0.58	<0.5	20	<0.5	<0.5	<0.5	<0.5	<0.5	2.4	<0.5
(continued)	12/09/10	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	14	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5
	03/09/11	<0.50	<0.50	<0.50	<0.50	0.94	<0.50	<0.50	14	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50
	06/09/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.88	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	09/15/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	<0.50
	12/09/11	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50	8.8	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50
	03/12/12	<0.50	<0.50	<0.50	<0.50	0.86	<0.50	<0.50	13	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50
	06/21/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	09/13/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	<0.50	<0.50	<0.50	<0.50	0.65	<0.50
	12/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/14/13	<0.50	<0.50	<0.50	<0.50	0.65	<0.50	<0.50	9.5	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50
	06/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/19/13	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	6.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/13/13	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	<0.50	6.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	0.83	<0.50	<0.50	1.6	<0.50
	9/27/2014	<0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	6.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	0.75	<0.50	<0.50	11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	5.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	3.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2016	<5	<2	<0.50	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	0.83	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.228 J	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.212 J	<0.500	<0.500	0.223 J	<0.500	<0.500	<0.500	<0.500

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-20i	06/10/08	<1	<1	<1	<1	<1	<1	<1	18	<1	<1	5.77	<1	<1	3.2	<1
	09/17/08	<1	<0.500	<0.500	<1	2.12	<0.500	<0.500	42.3	<0.500	<0.500	12.8	<0.500	<0.500	11	<0.500
	12/11/08	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	47	<0.50	<0.50	11	<0.50	<0.50	9.3	<0.50
	03/25/09	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	36	<0.50	<0.50	8.4	<0.50	<0.50	6.4	<0.50
	06/16/09	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	30	<0.50	<0.50	6.3	<0.50	<0.50	5.1	<0.50
	09/17/09	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	34	<0.50	<0.50	7.4	<0.50	<0.50	5	<0.50
	12/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.3	<0.50	<0.50	1.1	<0.50	<0.50	0.69	<0.50
	03/18/10	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	47	<0.50	<0.50	11	<0.50	<0.50	6.9	<0.50
	06/15/10	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	13	<0.50	<0.50	4.3	<0.50	<0.50	2.3	<0.50
	09/22/10	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	43	<0.5	<0.5	17	<0.5	<0.5	10	<0.5
	12/09/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	<0.5	<0.5	3.7	<0.5	<0.5	2	<0.5
	03/11/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.6	<0.50	<0.50	2.4	<0.50	<0.50	2.3	<0.50
	06/08/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	09/15/11	<0.50	<0.50	<0.50	<0.50	0.96	<0.50	<0.50	21	<0.50	<0.50	7.6	<0.50	<0.50	4.5	<0.50
	12/08/11	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	26	<0.50	<0.50	6.4	<0.50	<0.50	4.2	<0.50
	03/07/12	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	32	<0.50	<0.50	11	<0.50	<0.50	5.9	<0.50
	06/21/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.3	<0.5	<0.5	2.6	<0.5	<0.5	1.5	<0.5
	09/13/12	<0.50	<0.50	<0.50	<0.50	0.83	<0.50	<0.50	18	<0.50	<0.50	6.1	<0.50	<0.50	3.8	<0.50
	12/13/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.9	<0.50	<0.50	1.4	<0.50	<0.50	0.84	<0.50
	03/14/13	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	28	<0.50	<0.50	9.2	<0.50	<0.50	6	<0.50
	06/13/13	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50	14	<0.50	<0.50	7.3	<0.50	<0.50	3.7	<0.50
	09/19/13	<0.50	<0.50	<0.50	<0.50	0.64	<0.50	<0.50	11	<0.50	<0.50	3.9	<0.50	<0.50	2.4	<0.50
	12/13/13	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	16	<0.50	<0.50	2.4	<0.50	<0.50	1.9	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.4	<0.50	<0.50	0.56	<0.50	<0.50	<0.50	<0.50
	6/30/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	1.1	<0.50	<0.50	0.58	<0.50
	9/27/2014	<0.50	<0.50	<0.50	<0.50	0.68	<0.50	<0.50	12	<0.50	<0.50	4.3	<0.50	<0.50	2.6	<0.50
	12/12/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	0.68	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10.3	<0.50	<0.50	3	<0.50	<0.50	1.7	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10.8	<0.50	<0.50	3.7	<0.50	<0.50	2.2	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	0.69	<0.50	<0.50	13.8	<0.50	<0.50	4.1	<0.50	<0.50	2.1	<0.50
	12/7/2015	Not sampled; well monument under water.														

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-20i (continued)	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	6.8	<0.50	<0.50	3.4	<0.50	<5	1.8	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	7.4	<0.50	<0.50	2.1	<0.50	<0.50	1.5	<0.50
	9/28/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	8.7	<0.50	<0.50	4	<0.50	<0.50	2.2	<0.50
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	0.54	<0.50	<0.50	<0.50	<0.50
	3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	5.6	<0.50	<0.50	1.5	<0.50	<0.50	0.84	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	<0.50	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	2.8	<0.50	<0.50	1.50	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	0.303 J	<0.500	<0.500	5.7	<0.500	<0.500	1.4	<0.500	<0.500	0.90	<0.500
	7/2/2018	<0.500	<2.50	<0.500	<0.500	0.436 J	<0.500	<0.500	9.7	<0.500	<0.500	2.3	<0.500	<0.500	1.60	<0.500
MW-21i-105	06/10/08	<2	<2	<2	<2	2	<2	<2	15.8	<2	<2	53.2	<2	<0.50	25.1	<2
	09/18/08	<1	<0.500	<0.500	<1	0.78	<0.500	<0.500	5.42	<0.500	<0.500	2.97	<0.500	<0.50	1.77	<0.500
	12/11/08	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	0.88	61	<0.50	<0.50	33	0.87	<0.50	17	<0.50
	03/26/09	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	61	<0.50	<0.50	0.76	<0.50	<0.50	0.7	<0.50
	06/17/09	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	76	<0.50	<0.50	4.3	0.6	<0.50	3.4	<0.50
	09/17/09	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	73	<0.50	<0.50	11	0.59	<0.50	6.7	<0.50
	12/16/09	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	<0.50	60	<0.50	<0.50	14	0.65	<0.50	9.3	<0.50
	03/18/10	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	<0.50	64	<0.50	<0.50	6.2	0.58	<0.50	7.6	<0.50
	06/15/10	<0.50	<0.50	<0.50	<0.50	1.7	<0.50	0.63	60	<0.50	<0.80	29	0.84	<0.50	22	<0.50
	09/22/10	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	<0.5	75	<0.5	<0.5	5.2	0.55	<0.50	5.1	<0.5
	12/08/10	<0.5	<0.5	<0.5	<0.5	2	<0.5	0.52	72	<0.5	<0.5	27	0.91	<0.50	14	<0.50
	03/09/11	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	0.69	61	<0.50	<0.50	32	1.1	<0.50	17	<0.50
	06/09/11	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	0.61	63	<0.5	<0.5	29	0.7	<0.5	17	<0.5
	09/15/11	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	88	<0.50	<0.50	12	0.59	<0.50	12	<0.50
	12/08/11	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	73	<0.50	<0.50	15	0.58	<0.50	9.3	<0.50
	03/07/12	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	38	<0.50	<0.50	5.6	<0.50	<0.50	5.7	<0.50
	06/20/12	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	52	<0.5	<0.5	1.4	<0.5	<0.5	3	<0.5
	09/12/12	<0.50	<0.50	<0.50	<0.50	0.82	<0.50	<0.50	34	<0.50	<0.50	5	<0.50	<0.50	6.3	<0.50
	12/12/12	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	60	1	<0.50	13	<0.50	<0.50	15	<0.50
	03/13/13	<0.50	<0.50	<0.50	<0.50	0.9	<0.50	<0.50	42	<0.50	<0.50	2.4	<0.50	<0.50	3.7	<0.50
	06/13/13	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	48	<0.50	<0.50	1.2	<0.50	<0.50	9.9	<0.50
	09/18/13	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	51	<0.50	<0.50	2.8	<0.50	<0.50	4.2	<0.50
	12/12/13	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	61	1.6	<0.50	4	<0.50	<0.50	5.4	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	52	<0.50	<0.50	4.4	<0.50	<0.50	6.8	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-21i-105 (continued)	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	5.4	<0.50	<0.50	3.3	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	0.94	<0.50	<0.50	37	<0.50	<0.50	5.4	<0.50	<0.50	9.6	<0.50
	3/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	13.3	<0.50	<0.50	6.6	<0.50	<0.50	5.4	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	20.8	<0.50	<0.50	3.5	<0.50	<0.50	4	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	0.91	<0.50	<0.50	41.4	<0.50	<0.50	3.4	<0.50	<0.50	5.4	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	0.79	<0.50	<0.50	28.5	<0.50	<0.50	4.9	<0.50	<0.50	8.1	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/26/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	11.7	<0.50	<0.50	5.8	<0.50	<0.50	5.1	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	4.8	<0.5	<0.5	5.7	<0.5	<0.5	2.9	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	4.7	<0.50	<0.50	7.6	<0.50	<0.50	4.1	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	4.3	<0.50	<0.50	5.7	<0.50	<0.50	3.9	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	13.0	<0.50	<0.50	7.4	<0.50	<0.50	6.4	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.7	<0.500	<0.500	0.5	<0.500	<0.500	0.477 J	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	1.9	<0.500	<0.500	1.8	<0.500	<0.500	1.3	<0.500
MW-21i-40	09/18/08	<1	<0.500	<0.500	<1	7.48	<0.500	4.38	124	0.77	<0.500	107	2.01	<0.500	133	<0.500
	12/11/08	<0.50	<0.50	<0.50	<0.50	6.6	<0.50	3.6	130	0.84	<0.50	100	1.6	<0.50	110	<0.50
	03/26/09	<0.50	<0.50	<0.50	<0.50	6.2	<0.50	3.6	130	0.63	<0.50	77	1.3	<0.50	88	<0.50
	06/17/09	<0.50	<0.50	<0.50	<0.50	6.6	<0.50	3.1	120	0.79	<0.50	71	1.5	<0.50	88	<0.50
	09/18/09	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	3.2	120	1	<0.50	75	1.3	<0.50	92	0.55
	12/16/09	<0.50	<0.50	<0.50	<0.50	5.7	<0.50	2.6	120	1	<0.50	90	1.2	<0.50	89	<0.50
	03/18/10	<0.50	<0.50	<0.50	<0.50	5.5	<0.50	2.8	120	0.74	<0.50	84	1.1	<0.50	91	<0.50
	06/15/10	<0.50	<0.50	<0.50	<0.50	5.4	<0.50	2.4	120	0.89	<0.50	62	1.2	<0.50	64	<0.50
	09/22/10	<0.5	<0.5	<0.5	<0.5	4.9	<0.5	2.2	110	0.73	<0.5	68	0.93	<0.5	75	<0.5
	12/08/10	<0.5	<0.5	<0.5	<0.5	5.1	<0.5	2.3	110	0.77	<0.5	72	1	<0.5	69	<0.5
	03/10/11	<0.50	<0.50	<0.50	<0.50	4.6	<0.50	1.9	100	0.64	<0.50	53	1	<0.50	57	<0.50
	06/09/11	<0.5	<0.5	<0.5	<0.5	4.7	<0.5	2.1	110	0.7	<0.5	50	0.96	<0.5	55	<0.5
	09/15/11	<0.50	<0.50	<0.50	<0.50	5	<0.50	1.9	110	0.65	<0.50	54	1.1	<0.50	57	<0.50
	12/08/11	<0.50	<0.50	<0.50	<0.50	4.8	<0.50	2.1	110	0.66	<0.50	61	0.96	<0.50	60	<0.50
	03/07/12	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	2.1	110	0.76	<0.50	74	1.5	<0.50	58	<0.50
	06/20/12	<0.5	<0.5	<0.5	<0.5	5	<0.5	2	160	0.84	<0.5	19	0.81	<0.5	23	<0.5
	09/12/12	<0.50	<0.50	<0.50	<0.50	5	<0.50	1.8	110	0.63	<0.50	50	1.1	<0.50	48	<0.50
	12/12/12	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	2	120	0.69	<0.50	74	1.1	<0.50	53	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-21i-40 (continued)	03/13/13	<0.50	<0.50	<0.50	<0.50	4.6	<0.50	1.8	120	0.6	<0.50	43	0.83	<0.50	42	<0.50
	06/13/13	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	48	<0.50	<0.50	12	<0.50	<0.50	9.9	<0.50
	09/18/13	<0.50	<0.50	<0.50	<0.50	4.7	<0.50	1.4	100	0.53	<0.50	38	0.68	<0.50	33	<0.50
	12/12/13	<0.50	<0.50	<0.50	<0.50	4.6	<0.50	1.3	100	1	<0.50	41	0.73	<0.50	37	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	1.5	100	0.61	<0.50	40	0.76	<0.50	34	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	4.3	<0.50	1.3	100	0.51	<0.50	33	0.65	<0.50	29	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	4	<0.50	1.4	100	86	<0.50	31	0.51	<0.50	32	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	1.4	100	0.6	<0.50	30	0.51	<0.50	32	<0.50
	3/17/2015	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	1.5	102	0.51	<0.50	43.6	<0.50	<0.50	37.2	<0.50
	6/19/2015	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	0.76	61.6	<0.50	<0.50	24.7	<0.50	<0.50	21.8	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	0.95	84.2	<0.50	<0.50	26.3	<0.50	<0.50	26.6	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	2.8	<0.50	0.7	63.6	<0.50	<0.50	24.7	<0.50	<0.50	21.1	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	2.1	<0.50	<0.50	58.6	<0.50	<0.50	14.2	<0.50	<0.50	15.1	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	2.3	<0.50	0.8	67.8	<0.50	<0.50	18.1	<0.50	<0.50	17.1	<0.50
	9/26/2016	<0.50	<2	<0.50	<0.50	2.6	<0.50	0.87	77.2	<0.50	<0.50	20.1	<0.50	<0.50	19.8	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	2.4	<0.50	0.83	74.2	<0.50	<0.50	21.4	<0.50	<0.50	19.4	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	2.6	<0.5	0.91	87.6	0.58	<0.5	21.8	<0.5	<0.5	16.2	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	2.3	<1.0	0.63	63.6	0.56	<0.50	24.1	<0.50	<0.50	15.1	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	2.3	<1.0	0.70	60.0	<0.50	<0.50	18.1	<0.50	<0.50	15.0	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	2.6	<0.50	0.84	65.4	0.63	<0.50	17.4	<0.50	<0.50	14.6	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	2.1	<0.500	0.64	55.1	0.391 J	<0.500	22.5	<0.500	<0.500	16.5	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	2.6	<0.500	0.75	63.2	0.53	<0.500	26.0	0.145 J	<0.500	17.0	<0.500
MW-22i	06/10/08	<1	<1	<1	<1	1.02	<1	<1	30	<1	<1	10.3	<1	<1	30	<1
	09/17/08	<1	<0.500	<0.500	<1	7.48	<0.500	4.38	124	0.77	<0.500	107	2.01	<0.500	133	<0.500
	12/11/08	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	0.73	63	<0.50	<0.50	1.1	<0.50	<0.50	6.8	<0.50
	03/25/09	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	0.64	50	<0.50	<0.50	2.5	<0.50	<0.50	14	<0.50
	06/16/09	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	0.52	39	<0.50	<0.50	8.5	<0.50	<0.50	24	<0.50
	09/17/09	<0.50	<0.50	<0.50	<0.50	1	<0.50	0.57	40	<0.50	<0.50	3.3	<0.50	<0.50	21	<0.50
	12/15/09	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	<0.50	28	<0.50	<0.50	3.8	<0.50	<0.50	20	<0.50
	03/18/10	<0.50	<0.50	<0.50	<0.50	0.86	<0.50	<0.50	34	<0.50	<0.50	2.6	<0.50	<0.50	16	<0.50
	06/14/10	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	<0.50	17	<0.50	<0.50	4	<0.50	<0.50	18	<0.50
	09/22/10	<0.5	<0.5	<0.5	<0.5	0.75	<0.5	<0.5	24	<0.5	<0.5	3.6	<0.5	<0.5	18	<0.5
	12/08/10	<0.5	<0.5	<0.5	<0.5	0.73	<0.5	<0.5	21	<0.5	<0.5	3.5	<0.5	<0.5	18	<0.5
	03/11/11	<0.50	<0.50	<0.50	<0.50	0.67	<0.50	<0.50	17	<0.50	<0.50	3.6	<0.50	<0.50	17	<0.50
	06/08/11	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	18	<0.5	<0.5	1.8	<0.5	<0.5	12	<0.5

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-22i (continued)	09/14/11	<0.50	<0.50	<0.50	<0.50	0.55	<0.50	<0.50	18	<0.50	<0.50	1.3	<0.50	<0.50	11	<0.50
	12/08/11	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	17	<0.50	<0.50	2.5	<0.50	<0.50	14	<0.50
	03/06/12	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	13	<0.50	<0.50	2.4	<0.50	<0.50	13	<0.50
	06/20/12	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	12	<0.5	<0.5	1.9	<0.5	<0.5	11	<0.5
	09/12/12	<0.50	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	16	<0.50	<0.50	1.5	<0.50	<0.50	10	<0.50
	12/13/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	13	<0.50	<0.50	1.8	<0.50	<0.50	11	<0.50
	03/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12	<0.50	<0.50	2.2	<0.50	<0.50	11	<0.50
	06/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	14	<0.50	<0.50	1.1	<0.50	<0.50	9.6	<0.50
	09/18/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10	<0.50	<0.50	2.1	<0.50	<0.50	11	<0.50
	12/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.3	<0.50	<0.50	1.4	<0.50	<0.50	8.2	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10	<0.50	<0.50	1.3	<0.50	<0.50	9.6	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9	<0.50	<0.50	1.1	<0.50	<0.50	5.7	<0.50
	9/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.8	<0.50	<0.50	1.7	<0.50	<0.50	9.8	<0.50
	12/10/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.2	<0.50	<0.50	2.1	<0.50	<0.50	11	<0.50
	3/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.2	<0.50	<0.50	1.8	<0.50	<0.50	8.7	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.6	<0.50	<0.50	1.6	<0.50	<0.50	9	<0.50
	9/23/2015	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	10	<0.50	<0.50	2.1	<0.50	<0.50	1.15	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8	<0.50	<0.50	2.1	<0.50	<0.50	11	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	8	<0.50	<0.50	2.2	<0.50	<0.50	12	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	<0.50	1	<0.50	<0.50	7.9	<0.50
	9/28/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	8.1	<0.50	<0.50	1.3	<0.50	<0.50	9	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	8.6	<0.50	<0.50	2	<0.50	<0.50	10.2	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	10	<0.5	<0.5	1.1	<0.5	<0.5	9.7	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	9.6	<0.50	<0.50	0.63	<0.50	<0.50	6.2	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	8.8	<0.50	<0.50	0.88	<0.50	<0.50	6.3	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	9.7	<0.50	<0.50	1.20	<0.50	<0.50	6.4	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	0.330 J	<0.500	<0.500	9.6	<0.500	<0.500	1.76	<0.500	<0.500	7.8	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	0.52	<0.500	<0.500	12.4	<0.500	<0.500	2.77	<0.500	<0.500	8.1	<0.500
MW-23i	06/10/08	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	06/10/08 DUP	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	09/17/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	12/09/08	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/25/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	<0.50	<0.50
	09/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-23i (continued)	03/17/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	07/02/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/22/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	12/08/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	03/09/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/08/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	09/13/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/06/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/07/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/19/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	09/11/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.67	<0.50	<0.50	<0.50	<0.50
	12/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/18/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/9/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.78	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/27/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.207 J	<0.500	<0.500	0.402 J	<0.500	<0.500	0.215 J	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.202 J	<0.500	<0.500	0.247 J	<0.500	<0.500	0.212 J	<0.500

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-24i	10/01/10	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	0.94	52	<0.50	<0.50	52	1.9	<0.50	29	<0.50
	12/10/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.5	<0.5	<0.5	6.3	<0.5	<0.5	2	<0.5
	03/14/11	<0.50	<0.50	<0.50	<0.50	0.88	<0.50	<0.50	15	<0.50	<0.50	23	1	<0.50	7.4	<0.50
	06/07/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	<0.5	<0.5	6.6	<0.5	<0.5	1.4	<0.5
	09/16/11	<0.50	<0.50	<0.50	<0.50	13	<0.50	2.5	270	1.7	<0.50	27	5.6	<0.50	24	19
	12/07/11	<0.50	<0.50	<0.50	<0.50	5	<0.50	0.84	100	<0.50	<0.50	19	2.9	<0.50	14	7.5
	03/12/12	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	<0.50	79	<0.50	<0.50	30	2.3	<0.50	11	4.5
	06/22/12	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	14	<0.5	<0.5	0.85	<0.5	<0.5	<0.5	2.6
	09/14/12	<0.50	<0.50	<0.50	<0.50	4.4	<0.50	0.87	58	<0.50	<0.50	31	0.79	<0.50	20	<0.50
	12/14/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	2.1	<0.50	<0.50	0.65	<0.50
	03/15/13	<0.50	<0.50	<0.50	<0.50	2.8	<0.50	<0.50	48	<0.50	<0.50	23	0.57	<0.50	15	<0.50
	06/14/13	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	<0.50	28	<0.50	<0.50	6.2	<0.50	<0.50	3.6	<0.80
	09/20/13	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	15	<0.50	<0.50	15	<0.50	<0.50	5.9	<0.80
	12/16/13	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	8.4	<0.50	<0.50	6.7	<0.50	<0.50	3.4	<0.50
	3/24/2014	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	16	<0.50	<0.50	10	<0.50	<0.50	5.5	<0.80
	6/23/2014	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	13	<0.50	<0.50	1.3	<0.50	<0.50	5.2	2.1
	9/30/2014	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	21	<0.50	<0.50	20	<0.50	<0.50	10	<0.50
	12/15/2014	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	<0.50	12	<0.50	<0.50	2.4	<0.50	<0.50	1.1	<0.50
	3/20/2015	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	5.9	<0.50	<0.50	6.1	<0.50	<0.50	3.1	<0.50
	6/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/22/2015	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	4.7	<0.50	<0.50	2.2	<0.50	<0.50	0.8	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	18	<0.50	<0.50	189	<0.50	<0.50	36.4	<0.50
	3/8/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	3.5	<0.50	<0.50	4.1	<0.50	<0.50	1.6	<0.50
	6/17/2016	<0.50	<2	<0.50	<0.50	0.99	<0.50	<0.50	7.8	<0.50	<0.50	11.5	<0.50	<0.50	6.3	<0.50
	9/28/2016	<0.50	<2	<0.50	<0.50	0.53	<0.50	<0.50	5.4	<0.50	<0.50	5.8	<0.50	<0.50	3.1	<0.50
	12/12/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	<0.50	<0.50
	3/30/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5
	6/15/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	3.2	<0.50	<0.50	6.6	<0.50	<0.50	2.8	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	2.10	<1.0	<0.50	24.5	<0.50	<0.50	30.1	<0.50	<0.50	16.6	<0.50
	11/9/2017	<2.0	<2.0	<0.50	<0.50	1.10	<0.50	<0.50	9.6	<0.50	<0.50	12.7	<0.50	<0.50	5.9	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	1.42	<0.500	<0.500	13.5	<0.500	<0.500	19.1	<0.500	<0.500	10.2	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	1.44	<0.500	<0.500	13.6	1.09	<0.500	10.3	<0.500	<0.500	5.9	<0.500
MW-24d	09/14/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/09/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/08/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/21/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-24d (continued)	09/14/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/14/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/15/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/14/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/20/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/16/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12	<0.50	<0.50	4	<0.50	<0.50	1.6	<0.50
	6/23/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	10/2/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/15/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	3.8	<0.50	<0.50	1.7	<0.50
	9/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/9/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/17/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/30/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/12/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/15/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/25/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/6/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.259 J	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.199 J
	6/27/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.275 J
MW-25i	09/16/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/08/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/06/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/20/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	09/11/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/18/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/19/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-25i (continued)	9/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/9/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/21/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.75	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/9/2016 DUP	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/15/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/29/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.81	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/29/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/15/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/27/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/21/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.245 J	<0.500	<0.500	0.248 J	<0.500	<0.500	<0.500	<0.500
	6/29/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.274 B J	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
MW-26	09/16/11	<2	<2	<2	<2	7	<2	2.2	120	2.6	<2	250	5.7	<2	490	<2
	12/08/11	<2	<2	<2	<2	7.1	<2	2.5	110	2.2	<2	300	5.8	<2	500	<2
	03/06/12	<2	<2	<2	<2	8.2	<2	2.2	99	<2	<2	210	4.6	<2	450	<2
	06/19/12	<2	<2	<2	<2	14	<2	3	90	<2	<2	160	5.2	<2	460	<2
	09/11/12	<2	<2	<2	<2	6.3	<2	2.3	110	3	<2	280	4.3	<2	460	<2
	12/12/12	<2	<2	<2	<2	5.6	<2	<2	120	3.7	<2	300	3.8	<2	470	<2
	03/13/13	<2	<2	<2	<2	4.9	<2	<2	83	<2	<2	210	2.9	<2	390	<2
	06/12/13	<2	<2	<2	<2	8.2	<2	<2	80	<2	<2	170	4.5	<2	360	<2
	09/18/13	<2	<2	<2	<2	5.7	<2	<2	96	2.4	<2	210	3.2	<2	410	<2
	12/11/13	<2	<2	<2	<2	7.8	<2	<2	75	<2	<2	150	3.9	<2	370	<2
	3/19/2014	<2	<2	<2	<2	4.9	<2	<2	95	2.1	<2	220	2.9	<2	350	<2
	6/24/2014	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	6.4	49	0.86	<0.50	150	2.1	<0.50	200	<0.50
	9/24/2014	<2	<2	<2	<2	3.9	<2	<2	68	<2	<2	220	3.1	<2	340	<2
	12/9/2014	<0.90	<0.90	<0.90	<0.90	3.8	<0.90	0.96	55	1.3	<0.90	160	2.8	<0.90	280	<0.90
	3/17/2015	<1	<1	<1	<1	5.8	<1	1.7	75.7	1.8	<1	265	3.7	<1	458	<1
	6/16/2015	<1.7	<1.7	<1.7	<1.7	5	<1.7	<1.7	77.9	<1.7	<1.7	205	2.8	<1.7	385	<1.7
	9/21/2015	<1.7	<1.7	<1.7	<1.7	4.3	<1.7	<1.7	72.4	1.7	<1.7	176	2.7	<1.7	326	<1.7
	12/7/2015	<1.2	<1.2	<1.2	<1.2	8.5	<1.2	1.7	75	1.6	<1.2	179	3.5	<1.2	393	<1.2
	3/8/2016	<1.2	<5	<1.2	<1.2	8	<1.2	1.5	76.1	1.8	<1.2	171	3.7	<1.2	370	<1.2

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-26 (continued)	6/15/2016	<1	<4	<1	<1	4.6	<1	1.4	83.1	2.2	<1	192	2.2	<1	343	<1
	9/27/2016	<0.50	<2	<0.50	<0.50	3.9	<0.50	1.1	61.1	1.6	<0.50	160	2.4	<0.50	288	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	8.9	<0.50	2.4	85.9	2	<0.50	167	3.3	<0.50	410	<0.50
	3/29/2017	<5	<20	<5	<5	<5	<5	<5	170	<5	<5	214	<5	<5	452	<5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	6.7	<1.0	1.9	113	2.0	<0.50	160	2.1	<0.50	311 E, J	0.65
	9/26/2017	<2.0	<2.0	<0.50	<0.50	5.1	<1.0	1.0	192	2.1	<0.50	68	0.8	<0.50	192	0.98
	11/8/2017	<2.0	2	<0.50	<0.50	4.8	<0.50	1.5	204	2.3	<0.50	88	1.0	<0.50	170	1.80
	3/20/2018	<0.500	0.633 J	0.149 J	<0.500	4.9	<0.500	1.4	157	1.9	<0.500	108	1.2	<0.500	190	1.75
	6/29/2018	<0.500	<2.50	<0.500	<0.500	5.1	<0.500	1.5	114	1.9	<0.500	138	1.9	<0.500	221	1.02
MW-32s	03/24/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.79	<0.50	--	<0.50	<0.50
	08/18/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/14/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/06/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	09/17/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	12/09/08	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	07/02/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/22/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/07/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/09/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	0.94	<0.5	<0.5	1.1	<0.5
	09/15/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/08/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/21/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	09/13/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/14/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/11/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/20/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/16/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/25/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MW-32s (continued)	3/19/2015	<0.50	<0.50	0.77	<0.50	1.5	<0.50	<0.50	73.5	2.5	<0.50	<0.50	3.5	<0.50	52	<0.50
	6/17/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/7/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/14/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/14/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
MW-32i	11/10/17	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	7	<0.50	<0.50	8.2	<0.50	<0.50	3.4	<0.50
MW-F	06/14/95	--	<10	<5	<5	<5	5	<5	15	<5	--	<5	<5	--	<5	<10
	02/27/01	<1	<5	<0.50	<0.50	0.754	<0.50	<0.50	5.99	<0.50	<0.50	0.506	<1	--	1.18	<0.50
	05/29/01	<1	<5	<0.50	<0.50	0.58	<0.50	<0.50	6.47	<0.50	<0.50	<0.50	<1	--	0.585	<0.50
	09/24/01	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	6.5	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	12/18/01	<1	<5	<0.50	<0.50	1.44	<0.50	<0.50	17.9	<0.50	<0.50	<0.50	<1	--	0.709	<0.50
	03/18/02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/31/02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/28/02	<1	<0.50	<0.50	<1	1.12	0.65	<0.50	9.54	<0.50	<0.50	<0.50	<0.50	--	0.69	<0.50
	11/08/02	<1	<0.50	<0.50	<1	1.15	0.81	<0.50	9.86	<0.50	<0.50	<0.50	<0.50	--	0.65	<0.50
	01/23/03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/29/03	<1	<0.50	<0.50	<1	1.11	0.83	<0.50	10.6	<0.50	<0.50	<0.50	<0.50	--	0.62	<0.50
	11/10/03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	01/26/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/04/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/17/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/02/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/15/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/24/05	<1	<0.50	<0.50	<1	0.87	0.64	<0.50	8.31	<0.50	<0.50	0.52	<0.50	--	0.74	<0.50
	05/17/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/18/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/14/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/13/07	<1	<0.50	<0.50	<1	0.5	0.52	<0.50	5.93	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	09/18/08	<1	<0.500	<0.500	<1	0.85	0.72	<0.500	8.57	<0.500	<0.500	<0.500	<0.500	<0.500	0.57	<0.500

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
EW-1	04/25/91	--	<2	--	--	35	20	--	750	--	--	9,100	280	--	440	9.3
	11/17/93	--	<200	---	--	<100	<100	--	1,700	--	--	8,600	<100	--	480	<200
	09/01/95	<25	<50	<25	<25	<25	<25	<25	140	<25	<25	2,400	74	--	340	<50
	09/24/96	<1	<4	3	<0.4	8.5	2.1	<0.40	260	6.2	<0.40	49	34	--	29	89
	12/02/96	0.7	<0.50	1.9	<0.20	5.7	5	1	530	3.3	<0.20	310	86	--	98	10
	11/12/97	<2.5	<5	<2.5	<2.5	5.05	3.38	<2.5	68.5	4.91	<2.5	111	5.1	--	47.4	9.2
	08/11/99	<10	<50	<5	<5	<5	<5	<5	14.5	<5	<5	369	<10	--	39.9	<5
	11/16/99	<5	<12.5	<2.5	<5	<2.5	3.15	<2.5	41.7	3	<2.5	314	6.9	--	35.5	5.1
	02/29/00	<2	<10	<1	<1	<1	6.42	<1	13.7	<1	<1	97.3	3.48	--	20.8	<1
	06/27/00	<2	<10	2.12	<1	<1	6.42	<1	17.5	<1	<1	293	5.37	--	35.1	<1
	08/31/00	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	31.9	<2.5	<2.5	325	<5	--	38.4	<2.5
	01/30/00	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	45.6	<2.5	<2.5	380	5.86	--	53.9	<2.5
	02/27/01	<2	<10	1.42	<1	2.51	2.83	<1	35	<1	<1	240	7.98	--	47.5	2.43
	05/29/01	<10	<50	<5	<5	<5	<5	<5	22.4	<5	<5	338	<10	--	61.1	<5
	09/25/01	<5	<5	<5	<5	<5	<5	<5	14	<5	<5	320	9.5	--	61	<5
	12/17/01	<2	<10	<1	<1	1.19	<1	<1	25.8	<1	<1	217	12.8	--	47.1	<1
	03/19/02	<2	<1	<1	<2	1.04	<1	<1	17.5	<1	<1	323	5.66	--	46.1	<1
	05/30/02	<2	<1	1.38	<2	1	1.68	<1	23.5	<1	<1	319	6.46	--	39.9	<1
	08/29/02	<2	<1	1.36	<2	2.44	1.24	<1	20.4	<1	<1	307	3.38	--	37.8	<1
	11/08/02	<2	<1	1.46	<2	3.02	3.96	<1	28.4	<1	<1	274	5.54	--	50.2	<1
	01/23/03	<2	<1	1.36	<2	2.34	<1	<1	17	<1	<1	252	5.06	--	51.9	<1
	05/30/03	<2	<1	5.22	<2	<1	<1	<1	6.12	<1	<1	255	5.06	--	41.1	<1
	11/10/03	<5	<5	<5	<5	<5	<5	<5	9	<5	<5	85.8	<5	--	16.2	<5
	01/27/04	<1	<0.50	2.07	<1	0.87	0.78	<0.50	5.2	<0.50	<0.50	151	4.26	--	37.6	<0.50
	05/04/04	<1	<1	4.73	<1	<1	1.25	<1	4.36	<1	<1	168	3.09	--	30.8	<1
	08/17/04	<1	<0.50	3.76	<0.50	0.81	1.86	<0.50	6.83	<0.50	<0.50	144	1.73	--	23.2	<0.50
	11/17/04	<2.5	<2.5	4	<2.5	<2.5	<2.5	<2.5	9.6	<2.5	<2.5	180	3.6	--	33	<2.5
	05/18/05	<2	<1	<1	<2	<1	<1	<1	8.28	<1	<1	207	<1	--	23.2	2.3
	11/14/05	<2	<1	1.06	<2	1.36	2.7	<1	11.1	<1	<1	187	<1	--	26.1	<1
	06/05/06	<1	<1	2.4	<1	<1	<1	<1	6.18	<1	<1	102	3.55	--	19.1	<1
	12/06/06	<1	<0.50	2.07	<1	1.13	<0.50	<0.50	8.98	<0.50	<0.50	133	2.1	--	28.3	<0.50

Please refer to notes at end of table.

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
EW-1 (continued)	09/12/07	<1	<0.50	2.66	<1	0.51	1.14	<0.50	6.28	<0.50	<0.50	76.9	1.47	--	18.3	<0.50
	03/06/08	<1	<0.500	1.71 J	<1	0.64	1.04	<0.500	5.75	<0.500	<0.500	80.9	1.45	<0.500	19.9	<0.500
	09/19/08	<5	<2.50	<2.50	<5	<2.50	<2.50	<2.50	14.6	<2.50	<2.50	86.1	<2.50	<2.50	20.8	<2.50
	03/26/09	<0.50	<0.50	3.6	<0.50	<0.50	0.76	<0.50	3.8	<0.50	<0.50	81	1	<0.50	14	<0.50
	09/17/09	<0.50	<0.50	3.4	<0.50	0.63	<0.50	<0.50	8.3	<0.50	<0.50	100	0.74	<0.50	17	<0.50
	03/19/10	<0.50	<0.50	3.5 BE	<0.50	<0.50	<0.50	0.52	4.1	<0.50	<0.50	89	1.5	<0.50	22	<0.50
	09/23/10	<0.50	<0.50	1.7 BE	<0.50	0.86	0.94	<0.50	10	<0.50	<0.50	87	0.64	<0.50	17	<0.50
	03/10/11	<0.50	<0.50	5.2	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	<0.50	67	0.89	<0.50	13	<0.50
	09/16/11	<0.50	<0.50	2.7	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	75	0.69	<0.50	9.9	<0.50
	03/12/12	<0.50	<0.50	4.4	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	52	0.68	<0.50	13	<0.50
	09/13/12	<0.50	<0.50	1.7	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	<0.50	60	0.58	<0.50	8.6	<0.50
	03/15/12	<0.50	<0.50	2.4	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	78	0.63	<0.50	12	<0.50
	09/19/13	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	<0.50	63	0.57	<0.50	14	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	<0.50	<0.50	32	1.6	<0.50	12	<0.50
	9/27/2014	Insufficient water for sampling during monitoring event.														
	9/21/2015	<0.50	<0.50	2	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	45.3	0.56	<0.50	12.5	<0.50
	3/8/2016	<0.50	<2	2	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	<0.50	62.6	0.83	<0.50	14.3	<0.50
	9/29/2016	<0.50	<2	1.1	<0.50	<0.50	1.5	<0.50	5.4	<0.50	<0.50	38.6	<0.50	<0.50	10.5	<0.50
	3/30/2017	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10.7	<0.50	<0.50	2.4	<0.50
	9/28/2017	<2.0	<2.0	2.4	<0.50	<0.50	<1.0	<0.50	1.8	<0.50	<0.50	32.4	<0.50	<0.50	7.2	<0.50
	11/9/2017	<2.0	<2.0	0.91	<0.50	<0.50	<0.50	<0.50	3.30	<0.50	<0.50	33.0	0.66	<0.50	7.3	<0.50
	7/1/2018	<0.500	<2.50	1.94	<0.500	0.134 J	<0.500	<0.500	1.15 B	<0.500	<0.500	30.7	0.56	<0.500	7.6	<0.500
S-1	08/10/99	<1	<5	<0.50	<1	<0.50	<0.50	<0.50	2.63	<0.50	<0.50	7.81	1.3	--	20.6	<0.50
	02/29/00	<1	<5	<0.50	<0.50	0.761	<0.50	<0.50	2.21	<0.50	<0.50	60.6	2.98	--	24.4	<0.50
	06/28/00	<5	<25	<2.5	<2.5	<2.5	<2.5	2.7	58.2	<2.5	<2.5	749	14.5	--	232	<2.5
	08/31/00	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	4.98	<2.5	<2.5	313	5.14	--	60.4	<2.5
	11/30/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	1.61	<0.50	<0.50	9.78	1.95	--	29.8	<0.50
	02/27/01	<1	<5	<0.50	<0.50	<0.50	<0.50	0.551	1.66	<0.50	<0.50	13.5	2.26	--	45.2	<0.50
	05/30/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	0.974	<0.50	<0.50	7.38	<1	--	12.6	<0.50
	09/25/01	<2.5	<2.5	<2.5	<2.5	2.6	<2.5	4	2.7	<2.5	<2.5	39	18	--	210	<2.5
	03/19/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.21	<0.50	--	3.73	<0.50
	05/30/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.45	<0.50	--	10.4	<0.50
	11/07/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	2.34	<0.50	<0.50	8.71	1.02	--	19.7	<0.50
	01/23/03	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.78	<0.50	<0.50	6.15	0.56	--	13	<0.50
	05/28/03	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	<0.500	--	8.67	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
S-1	11/11/03	<1	<1	<1	<1	<1	<1	<1	1.85	<1	<1	4.22	<1	--	13.2	<1
(continued)	01/26/04	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.57	0.67	--	15.5	<0.50
	05/04/04	<1	<1	<1	<1	<1	<1	<1	1.17	<1	<1	4.07	<1	--	10.6	<1
	11/15/04	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	2.8	<0.50	<0.50	8.4	0.82	--	18	<0.50
	02/01/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	0.75	<0.50	<0.50	1.89	<0.50	--	2.87	<0.50
	05/18/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	2.24	<0.50	<0.50	3.73	<0.50	--	8.39	<0.50
	05/23/07	<1	<1	<1	<1	<1	<1	<1	3.63	<1	<1	4.02	<1	--	6.85	<1
	12/13/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	4.61	<0.50	<0.50	4.87	<0.50	--	8.44	<0.50
	03/05/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	5.15	<0.500	<0.500	<0.500	4.14	<0.500	<0.500	<0.500
	06/25/08	<1	<1	<1	<1	<1	<1	<1	1.67	<1	<1	<1	1.37	<1	<1	<1
	09/17/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	5.55	<0.500	<0.500	2.81	<0.500	<0.500	6.07	<0.500
	12/09/08	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	0.62	<0.50	<0.50	1.4	<0.50
	03/25/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	1.4	<0.50	<0.50	2.7	<0.50
	06/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.91	<0.50	<0.50	0.81	<0.50	<0.50	1.8	<0.50
	09/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	1.7	<0.50	<0.50	5	<0.50
	12/16/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	<0.50	1.7	<0.50	<0.50	6.1	<0.50
	03/17/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	1	<0.50
	07/02/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/22/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.66	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5
	12/08/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	0.77	<0.5	<0.5	3	<0.5
	03/09/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50
	06/08/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.66	<0.5
	09/14/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	1.4	<0.50	<0.50	4	<0.50
	12/06/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	1.3	<0.50	<0.50	3.1	<0.50
	03/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.59	<0.50	<0.50	0.74	<0.50	<0.50	1.8	<0.50
	06/21/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.98	<0.5	<0.5	0.94	<0.5	<0.5	3.5	<0.5
	09/14/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.88	<0.50	<0.50	0.88	<0.50	<0.50	2.6	<0.50
	12/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	0.96	<0.50	<0.50	3.8	<0.50
	03/13/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.78	<0.50	<0.50	1.5	<0.50
	06/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	<0.50	2.2	<0.50
	09/20/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	<0.50	1.8	<0.50	<0.50	5.4	<0.50
	12/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	1.2	<0.50	<0.50	5.1	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.82	<0.50	<0.50	2.1	<0.50

Please refer to notes at end of table.

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
S-1 (continued)	9/27/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	1.3	<0.50	<0.50	4.3	<0.50
	12/9/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	1.3	<0.50	<0.50	4.9	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	1.4	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	<0.50
	9/21/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	1.6	<0.50	<0.50	5.1	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.6	<0.50
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/27/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	0.73	<0.50	<0.50	3	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	0.54	<0.50	<0.50	1.6	<0.50
	3/27/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	1.01	<0.500	0.336 J	3.62	<0.500	<0.500	3.16	0.90	<0.500	24.20	<0.500
S-2	08/11/99	<1	<5	<0.50	<0.50	2.37	<0.50	<0.50	<0.50	<0.50	<0.50	1.7	<1	--	0.843	<0.50
	11/15/04	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	4.4	<0.50	--	1.6	<0.50
	12/12/12	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	<0.50	1.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/13/13	<0.50	<0.50	<0.50	<0.50	3.4	<0.50	<0.50	2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	06/12/13	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	09/20/13	<0.50	<0.50	<0.50	<0.50	3.7	<0.50	<0.50	3.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/12/13	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2014	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/24/2014	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	3.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/27/2014	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	<0.50	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/9/2014	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	4.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	<0.50	5.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2015	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	3.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	3	<0.50	<0.50	3.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	6/16/2016	<0.50	<2	<0.50	<0.50	4.3	<0.50	<0.50	6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/26/2016	<0.50	<2	<0.50	<0.50	6.2	<0.50	<0.50	11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/13/2016	<0.50	<2	<0.50	<0.50	3.5	<0.50	<0.50	4.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/27/2017	<0.5	<2	<0.5	<0.5	2.6	<0.5	<0.5	4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	6/13/2017	<2.0	<2.0	<0.50	<0.50	3.3	<1.0	<0.50	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	9/28/2017	<2.0	<2.0	<0.50	<0.50	8.0	<1.0	<0.50	13.2	<0.50	<0.50	<0.50	0.86	<0.50	0.51	<0.50
	11/8/2017	<2.0	<2.0	<0.50	<0.50	7.1	<0.50	<0.50	12.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	3/20/2018	<0.500	<2.50	<0.500	<0.500	3.7	<0.500	<0.500	5.9	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
	6/28/2018	<0.500	<2.50	<0.500	<0.500	4.1	<0.500	<0.500	23.2	0.56	<0.500	<0.500	1.00	<0.500	2.34	<0.500

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-3(43)	06/28/00	<50	<250	<25	<25	278	<25	55.9	4,270	<25	<25	734	<50	--	1,840	<25
	08/30/00	<200	<1	<100	<100	420	<100	116	8,850	<100	<100	5,940	<200	--	3,040	<100
	11/29/00	<100	<500	<50	<50	249	<50	76.2	4,560	<50	<50	1,210	<100	--	1,140	<50
	02/27/01	<100	<500	<50	<50	697	<50	164	14,000	<50	<50	148	<100	--	1,390	133
	05/31/01	<100	<500	<50	<50	<50	<50	<50	5,870	<50	<50	130	<100	--	599	<50
	09/24/01	<13	<13	<13	<13	150	<13	32	4,700	<13	<13	310	<13	--	450	25
	12/18/01	<50	<250	<25	<25	153	<25	33.3	3,600	<25	<25	276	<50	--	568	<25
	03/19/02	<100	<50	<50	<100	310	<50	103	6,700	<50	<50	2,090	<50	--	1,720	86
	05/29/02	<50	<25	<25	<50	188	<25	39	4,700	<25	<25	470	<25	--	624	37.5
	08/29/02	<1	<0.50	<0.50	<1	3.72	<0.50	0.84	94.7	0.54	<0.50	34.9	0.75	--	35.7	1.46
	11/11/02	<100	<50	<50	<100	183	<50	<50	4,810	<50	<50	757	<50	--	831	51
	01/23/03	<100	<50	<50	<100	378	<50	76	10,500	<50	<50	782	<50	--	1,290	109
	05/28/03	<100	<50	<50	<100	402	<50	72	9,510	<50	<50	270	<50	--	841	114
	11/11/03	<50	<50	<50	<50	252	<50	<50	9,710	<50	<50	516	<50	--	1,020	58
	01/27/04	<50	<25	<25	<50	290	<25	54.5	8,160	53.5	<25	393	<25	--	808	95
	05/03/04	<100	<100	<100	<100	370	<100	<100	12,300	<100	<100	830	<100	--	1,520	111
	08/17/04	<100	<50	<50	<100	401	<50	114	12,700	109	<50	1,540	<50	--	2,340	151
	11/15/04	<120	<120	<120	<120	270	<120	<120	9,600	<120	<120	1,400	<120	--	1,600	<120
	03/24/05	<100	<50	<50	<100	481	<50	148	15,600	135	<50	1,390	<50	--	2,090	266
	05/16/05	<50	<25	<25	<50	327	<25	89	9,670	83	<25	802	<25	--	1,410	157
	05/17/05	<100	<50	<50	<100	353	<50	86	10,600	94	<50	920	<50	--	1,660	173
	11/17/05	<100	<50	<50	<100	392	<50	121	13,400	133	<50	1,310	<50	--	2,280	186
	06/06/06	<100	<100	<100	<100	385	<100	<100	11,800	115	<100	628	<100	--	1,370	192
	12/06/06	<100	<50	<50	<100	256	<50	72	9,960	92	<50	843	<50	--	1,260	155
	05/22/07	<100	<100	<100	<100	439	<100	119	14,200	152	<100	910	<100	--	1,920	245
	09/11/07	<100	<50	<50	<100	303	<50	109	11,700	128	<50	1,100	<50	--	2,060	189
	12/12/07	<100	<50	<50	<100	270	<50	75	8,740	93	<50	1,010	<50	--	1,540	167
	03/05/08	<50	<25	<25	<50	370	<25	128	6,740	220	<25	1,480	36	<25	2,350	234
	09/16/08	<100	<50	<50	<100	302	<50	112	10,400	139	<50	2,700	<50	<50	2,500	171
	12/08/08	<4	<4	<4	<4	190	<4	63	6,000	78	<4	1,300	19	<4	1,200	100
	03/25/09	<15	<15	<15	<15	110	<15	66	3,500	34	<15	3,600	49	<15	2,100	49
	09/15/09	<15	<15	<15	<15	140	<15	74	4,200	45	<15	4,300	44	<15	2,300	84
	12/14/09	<15	<15	<15	<15	140	<15	46	4,000	55	<15	1,500	15	<15	1,100	67
	03/17/10	<15	<15	<15	<15	160	<15	63	4,600	44	<15	2,800	32	<15	1,900	78

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-3(43)	06/14/10	<25	<25	<25	<25	220	<25	46	5,400	69	<25	790	<25	<25	900	85
(continued)	09/21/10	<15	<15	<15	<15	130	<15	55	3,800	43	<15	2,900	37	<15	1,900	68
	12/07/10	<15	<15	<15	<15	190	<15	63	5,500	69	<15	2,500	23	<15	1,800	96
	03/08/11	<20	<20	<20	<20	170	<20	52	4,600	56	<20	1,400	<20	<20	1,300	86
	06/06/11	<15	<15	<15	<15	190	<15	36	4,700	71	<15	610	<15	<15	790	97
	09/13/11	<20	<20	<20	<20	290	<20	78	8,000	160	<20	900	<20	<20	1,800	160
	03/08/12	<4	<40	<40	<40	340	<40	62	9,500	150	<40	240	<40	<40	690	890
	06/21/12	<20	<20	<20	<20	220	<20	25	4,400	76	<20	74	<20	<20	260	1,100
	09/12/12	<20	<20	<20	<20	280	<20	72	8,800	180	<20	360	<20	<20	970	890
	12/11/12	<20	<20	<20	<20	220	<20	40	6,100	110	<20	160	<20	<20	430	680
	03/12/13	<20	<20	<20	<20	220	<20	21	4,700	74	<20	110	<20	<20	340	1,600
	06/11/13	<20	<20	<20	<20	190	<20	<20	3,900	56	<20	78	<20	<20	260	1,100
	09/17/13	<15	<15	<15	<15	190	<15	21	4,600	66	<15	100	<15	<15	350	1,100
	12/10/13	<15	<15	<15	<15	210	<15	18	3,600	54	<15	95	<15	<15	270	1,800
	3/18/2014	<20	<20	<20	<20	150	<20	<20	3,600	40	<20	93	<20	<20	260	440
	6/26/2014	<7	<7	<7	<7	120	<7	14	2,000	14	<7	21	<7	<7	57	480
	9/23/2014	<15	<15	<15	<15	190	<15	35	4,700	69	<15	120	<15	<15	420	550
	12/12/2014	<7	<7	<7	<7	200	<7	23	4,000	52	<7	100	<7	<7	350	810
	3/19/2015	<12.5	<12.5	<12.5	<12.5	131	<12.5	<12.5	2,450	16.6	<12.5	31.7	<12.5	<12.5	129	249
	6/18/2015	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	<0.50	59.1	<0.50	<0.50	0.84	<0.50	<0.50	2.8	3.1
	9/21/2015	<10	<10	<10	<10	124	<10	14.1	2,810	24.8	<10	53.5	<10	<10	171	129
	12/8/2015	<0.50	<0.50	<0.50	<0.50	92	<0.50	<0.50	1,580	11.5	<0.50	26.2	<0.50	<0.50	88	230
	3/9/2016	<10	<40	<10	<10	93.9	<10	<10	1,700	12.4	<10	24.1	<10	<10	81.9	209
	6/17/2016	<8.3	<33.3	<8.3	<8.3	163	<8.3	26.6	3,130	36.1	<8.3	64.6	<8.3	<8.3	248	288
	9/30/2016	<8.3	<33.3	<8.3	<8.3	81.9	<8.3	13.5	1,980	24.2	<8.3	230	<8.3	<8.3	366	52
	12/16/2016	<8.4	<33.4	<8.4	<8.4	92.6	<8.4	9.5	1,810	20.1	<8.4	64.1	<8.4	<8.4	171	239
	3/31/2017	<8.4	<33.4	<8.4	<8.4	90.8	<8.4	12.5	1,430	15.2	<8.4	45.8	<8.4	<8.4	119	348
	6/12/2017	<8.3	<33.3	<8.3	<8.3	173	<8.3	16.7	2,620	18.7	<8.3	24.4	<8.3	<8.3	116	681
	9/29/2017	<2.5	<10.0	<2.5	<2.5	60	<2.5	6.9	901	12.9	<2.5	70.7	<2.5	<2.5	126	117
	11/7/2017	<10.0	<10.0	<2.5	<2.5	153	<2.5	13.7	2,350 J-	26.6	<2.5	108	<2.5	<2.5	211	181
	3/22/2018	<0.500	<2.50	<0.500	<0.500	192	<0.500	18.0	2,450	34.9	<0.500	80	0.8	0.200 J	278	236
	7/1/2018	<0.500	<2.50 J3	<0.500	<0.500	116	<0.500	13.8	1,880	32.8	<0.500	107	0.6	<0.500	246	118
MGMS1-2(60)	06/28/00	<10	<50	<5	<5	53.6	<5	<5	369	<5	<5	658	19.7	--	240	<5
	08/30/00	<20	<100	<10	<10	21.7	<10	13.1	267	<10	<10	2,590	108	--	586	<10
	11/29/00	<2	<10	<1	<1	1.58	<1	1.09	57.7	<1	<1	121	4.58	--	40.3	<1

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-2(60) (continued)	02/27/01	<1	<5	<0.5	<0.5	0.838	<0.5	0.686	32.9	<0.5	<0.5	54.6	2.06	--	24.7	<0.5
	05/31/01	<1	<5	<0.50	<0.50	0.662	<0.50	0.581	39	<0.50	<0.50	69.4	<1	--	27.8	0.52
	09/24/01	<13	<13	<13	<13	<13	<13	<13	89	<13	<13	830	14	--	150	<13
	12/18/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	20.4	<0.50	<0.50	12.8	<1	--	15.7	<0.50
	03/19/02	<1	<0.50	<0.50	<1	2.52	<0.50	0.99	68	<0.50	<0.50	62.9	1.2	--	34	3.48
	05/29/02	<1	<0.50	<0.50	<1	0.78	<0.50	<0.50	22.8	<0.50	<0.50	23.4	<0.50	--	14.2	0.6
	08/29/02	<10	<5	<5	<10	30.6	<5	5.1	661	<5	<5	138	<5	--	116	<5
	11/11/02	<1	<0.50	<0.50	<1	2.99	<0.50	0.83	86	<0.50	<0.50	38.2	1.16	--	38.9	<0.50
	01/23/03	<1	<0.50	<0.50	<1	1.53	<0.50	0.74	42.6	<0.50	<0.50	42.8	0.78	--	34.2	1.04
	05/28/03	<1	<0.50	<0.50	<1	2.87	<0.50	1.21	72	<0.50	<0.50	51.1	1.18	--	47.6	0.63
	11/11/03	<1	<1	<1	<1	1.84	<1	<1	48.8	<1	<1	45.9	<1	--	36	<1
	01/27/04	<1	<0.50	<0.50	<1	2.06	<0.50	1.06	72.3	0.69	<0.50	40.9	0.66	--	43.1	0.63
	05/03/04	<1	<1	<1	<1	4.07	<1	1.22	70.7	<1	<1	54.8	1.36	--	43.5	2.53
	08/17/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/02/04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/15/04	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	0.68	39	<0.50	<0.50	31	<0.50	--	28	0.67
	02/01/05	<1	<0.50	<0.50	<1	1.31	<0.50	<0.50	37.5	0.56	<0.50	33.2	<0.50	--	21.7	1.3
	05/16/05	<1	<0.50	<0.50	<1	0.95	<0.50	<0.50	40.6	<0.50	<0.50	21.7	<0.50	--	19.8	<0.50
	05/16/05 DUP	<1	<0.50	<0.50	<1	1.02	<0.50	<0.50	42.1	<0.50	<0.50	21.4	<0.50	--	20.5	<0.50
	08/18/05	<1	<0.500	<0.500	<1	7.28	<0.500	2.41	145	1.2	<0.500	76.5 B	1.46	--	65.6	5.16 B
	11/17/05	<1	<0.500	<0.500	<1	2.53	<0.500	0.99	87	0.59	<0.500	34.8	<0.500	--	26.4	0.93
	02/20/06	<1	<0.500	<0.500	<1	6.17	<0.500	1.93	136	1.1	<0.500	61.9	0.93	--	45.5	4.17
	06/06/06	<1	<1	<1	<1	1.02	<1	<1	33.7	<1	<1	23.4	<1	--	18.7	<1
	09/05/06	<1	<0.50	<0.50	<1	5.37	<0.50	1.75	115	0.84	<0.50	55.9	0.8	--	37.5	4.79
	12/06/06	<1	<0.50	<0.50	<1	3.39	<0.50	1.12	90.9	0.62	<0.50	39.5	<0.50	--	28.3	2.15
	02/07/07	<1	<0.50	<0.50	<1	4.37	<0.50	1.37	116	0.93	<0.50	55.9	0.58	--	40.7	3
	05/22/07	<1	<1	<1	<1	1.18	<1	<1	38.5	<1	<1	31.6	<1	--	25.2	<1
	09/11/07	<5	<2.50	<2.50	<5	26.6	<2.50	8.75	711	7.2	<2.50	81.4	2.95	--	216	11.9
	12/12/07	<1	<0.50	<0.50	<1	1.83	<0.50	0.79	64.9	0.65	<0.50	28.1	<0.50	--	24.9	0.67
	03/04/08	<1	<0.500	<0.500	<1	6.65	<0.500	2.22	166	2.92	<0.500	75.4	0.81	<0.500	60.5	2.79
	09/16/08	<5	<2.50	<2.50	<2.50	5.5	<2.50	<2.50	160	<2.50	<2.50	38.8	<2.50	<2.50	65.5	<2.50
	12/08/08	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	1.2	88	1.1	<0.50	40	0.51	<0.50	38	1.3
	12/08/08 DUP	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	1.2	84	1.1	<0.50	42	0.52	<0.50	38	1.3

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-2(60) (continued)	03/25/09	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	1.3	71	0.75	<0.50	40	0.65	<0.50	37	0.54
	06/15/09	<0.50	<0.50	<0.50	<0.50	1	<0.50	0.8	47	0.9	<0.50	26	<0.50	<0.50	30	0.55
	09/15/09	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	0.82	44	0.58	<0.50	42	<0.50	<0.50	30	0.82
	12/14/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	17	<0.50	<0.50	18	<0.50	<0.50	16	<0.50
	03/17/10	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	0.96	61	0.68	<0.50	40	0.51	<0.50	38	<0.50
	06/14/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	20	<0.50	<0.50	17	<0.50	<0.50	15	<0.50
	09/21/10	<0.5	<0.5	<0.5	<0.5	2.1	<0.5	0.57	46	<0.5	<0.5	42	<0.5	<0.5	32	0.8
	12/07/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	16	<0.5	<0.5	19	<0.5	<0.5	15	<0.5
	03/08/11	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	19	<0.50	<0.50	27	<0.50	<0.50	16	<0.50
	06/06/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.3	<0.5	<0.5	16	<0.5	<0.5	11	<0.5
	09/13/11	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	0.73	42	0.5	<0.50	42	0.89	<0.50	30	0.74
	12/06/11	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	30	<0.50	<0.50	33	<0.50	<0.50	22	0.6
	03/08/12	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	32	<0.50	<0.50	36	<0.50	<0.50	21	<5
	06/19/12	<0.5	<0.5	<0.5	<0.5	0.71	<0.5	<0.5	28	<0.5	<0.5	22	<0.5	<0.5	16	<0.5
	09/12/12	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	0.66	36	<0.50	<0.50	33	<0.50	<0.50	20	1.1
	12/11/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	20	<0.50	<0.50	19	<0.50	<0.50	11	<0.50
	03/12/13	<0.50	<0.50	<0.50	<0.50	1.8	<0.50	0.56	38	<0.50	<0.50	35	<0.50	<0.50	20	0.66
	06/11/13	<0.50	<0.50	<0.50	<0.50	0.66	<0.50	<0.50	29	<0.50	<0.50	27	<0.50	<0.50	18	<0.50
	09/17/13	<0.50	<0.50	<0.50	<0.50	0.89	<0.50	<0.50	20	<0.50	<0.50	32	<0.50	<0.50	16	0.54
	12/10/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	16	<0.50	<0.50	17	<0.50	<0.50	11	<0.50
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.5	<0.50	<0.50	10	<0.50	<0.50	5.8	<0.50
	6/26/2014	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	33	<0.50	<0.50	21	<0.50	<0.50	20	<0.50
	9/23/2014	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	26	<0.50	<0.50	34	<0.50	<0.50	20	12
	12/12/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	22	<0.50	<0.50	20	<0.50	<0.50	14	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	26.1	<0.50	<0.50	22.7	<0.50	<0.50	16.1	<0.50
	6/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.95	<0.50	<0.50	17.7	<0.50	<0.50	9.1	<0.50
	9/21/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	1.6	<0.50
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18.8	<0.50	<0.50	13.8	<0.50	<0.50	12.4	<0.50
	3/9/2016	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	17.5	<0.50	<0.50	16.9	<0.50	<0.50	14	<0.50
	6/17/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	11.8	<0.50	<0.50	18	<0.50	<0.50	11.1	<0.50
	9/30/2016	<0.50	<2	<0.50	<0.50	0.89	<0.50	<0.50	17.7	<0.50	<0.50	22.5	<0.50	<0.50	17.6	<0.50
	12/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	7.6	<0.50	<0.50	4.7	<0.50
	3/31/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	15.6	<0.5	<0.5	13.6	<0.5	<0.5	13.2	<0.5
	6/12/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	6.0	<0.50	<0.50	12.8	<0.50	<0.50	7.1	<0.50
	9/29/2017	<2.0	<2.0	<0.50	<0.50	2.00	<1.0	<0.50	18.3	<0.50	<0.50	18.3	<0.50	<0.50	13.4	<0.50
	11/7/2017	<2.0	<2.0	<0.50	<0.50	1.60	<0.50	<0.50	24.9	<0.50	<0.50	14.0	<0.50	<0.50	14.7	<0.50
	3/22/2018	<0.500	<2.50	<0.500	<0.500	1.30	<0.500	<0.500	13.4	<0.500	<0.500	23.3	<0.500	<0.500	13.9	<0.500
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.89	<0.500	<0.500	11.8	<0.500	<0.500	18.4	<0.500	<0.500	8.5	<0.500

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-1(110)	06/28/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	3.78	<0.50	<0.50	3.9	<1	--	3.35	<0.50
	08/30/00	<5	<25	<2.5	<2.5	3.7	<2.5	3.32	55	<2.5	<2.5	510	24	--	130	<2.5
	11/29/00	<5	<25	<2.5	<2.5	4.21	<2.5	4.59	51	<2.5	<2.5	583	23.2	--	166	<2.5
	02/27/01	<5	<25	<2.5	<2.5	5.21	<2.5	3.39	47.5	<2.5	<2.5	385	16.5	--	105	<2.5
	05/31/01	<10	<50	<5	<5	<5	<5	<5	55.8	<5	<5	639	13.8	--	141	<5
	09/24/01	<1.3	<1.3	<1.3	<1.3	6.1	<1.3	2.9	57	<1.3	<1.3	580	20	--	120	<1.3
	12/18/01	<5	<25	<2.5	<2.5	5.04	<2.5	2.68	54.8	<2.5	<2.5	527	20.2	--	131	<2.5
	03/19/02	<5	<2.5	<2.5	<5	5.25	<2.5	<2.5	54	<2.5	<2.5	454	10.8	--	98	<2.5
	05/29/02	<5	<2.5	<2.5	<5	4.9	<2.5	<2.5	62.3	<2.5	<2.5	299	9.7	--	65.1	<2.5
	08/29/02	<1	<0.50	<0.50	<1	5.43	<0.50	1.32	110	0.8	<0.50	60.2	3.62	--	47.8	<0.50
	11/11/02	<2	<1	<1	<2	4.74	<1	1.2	46.1	<1	<1	208	7.84	--	66.1	<1
	01/23/03	<2	<1	<1	<2	4.44	<1	1.24	65.3	<1	<1	210	6.54	--	74.1	<1
	05/28/03	<2	<1	<1	<2	3.96	<1	<1	69.2	<1	<1	109	2.48	--	57.5	<1
	11/11/03	<2	<2	<2	<2	4.14	<2	<2	44.8	<2	<2	256	3.6	--	60.2	<2
	01/27/04	<2	<1	<1	<2	4.22	<1	1.1	67.1	<1	<1	167	4.16	--	69.7	<1
	05/03/04	<1	<1	<1	<1	3.66	<1	<1	47.2	<1	<1	190	2.18	--	55.9	<1
	11/15/04	<2.5	<2.5	<2.5	<2.5	3.7	<2.5	<2.5	95	<2.5	<2.5	76	<2.5	--	64	<2.5
	06/20/05	<2	<1	<1	<2	9.22	<1	2.58	283	1.8	<1	23.6	1.62	--	70	1.24
	11/17/05	<1	<0.500	<0.500	<1	2.93	<0.500	<0.500	51.3	<0.500	<0.500	102	1.95	--	76.1	<0.500
	06/06/06	<1	<1	<1	<1	2.15	<1	<1	44	<1	<1	94.4	1.36	--	66.8	<1
	12/06/06	<1	<0.50	<0.50	<1	5.81	<0.50	0.6	142	<0.50	<0.50	53.8	0.88	--	74.6	0.57
	09/11/07	<2	<1	<1	<2	3.78	<1	1.2	189	<1	<1	31.6	<1	--	61.1	<1
	03/04/08	<1	<0.500	<0.500	<1	3.73	<0.500	0.91	242	2.37	<0.500	32.7	0.64	<0.500	44.4	<0.500
	03/25/09	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	0.87	160	0.9	<0.50	25	<0.50	<0.50	39	<0.50
	06/15/09	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	0.74	130	1	<0.50	24	<0.50	<0.50	39	<0.50
	09/15/09	<2.5	<2.5	<2.5	<2.5	20	<2.5	2.7	620	3.6	<2.5	24	<2.5	<2.5	75	<2.5
	03/17/10	<2.5	<2.5	<2.5	<2.5	20	<2.5	4.3	720	3.7	<2.5	20	<2.5	<2.5	79	<2.5
	09/21/10	<0.5	<0.5	<0.5	<0.5	2.5	<0.5	1.1	150	1	<0.5	28	<0.5	<0.5	53	<0.5
	03/10/11	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	0.57	83	0.52	<0.50	26	<0.50	<0.50	31	<0.50
	09/13/11	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	1.2	110	0.96	<0.50	30	<0.50	<0.50	59	<0.50
	03/08/12	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	62	<0.50	<0.50	22	<0.50	<0.50	21	<0.50
	09/12/12	<0.50	<0.50	<0.50	<0.50	0.93	<0.50	0.53	60	<0.50	<0.50	22	<0.50	<0.50	25	<0.50
	03/12/13	<0.50	<0.50	<0.50	<0.50	0.95	<0.50	<0.50	65	<0.50	<0.50	23	<0.50	<0.50	24	<0.50
	09/17/13	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	0.56	68	<0.50	<0.50	26	<0.50	<0.50	32	<0.50
	3/18/2014	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	63	<0.50	<0.50	23	<0.50	<0.50	27	0.65

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS1-1(110)	9/24/2014	Not sampled; 60 foot port accidentally sampled twice.														
(continued)	3/19/2015	<0.50	<0.50	<0.50	<0.50	2.7	<0.50	0.69	126	<0.50	<0.50	23.7	<0.50	<0.50	41.5	0.82
	9/21/2015	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	49	<0.50	<0.50	19.4	<0.50	<0.50	20.4	<0.50
	9/30/2016	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	56.7	<0.50	<0.50	18.4	<0.50	<0.50	28.7	<0.50
	3/31/2017	<0.50	<20	<0.50	<0.50	13.3	<0.50	1.1	328	0.7	<0.50	20.1	<0.50	<0.50	62	6.5
	9/29/2017	<2.0	<2.0	<0.50	<0.50	5.9	<1.0	0.5	173	<0.50	<0.50	9.0	<0.50	<0.50	33	0.6
	11/7/2017	<2.0	<2.0	<0.50	<0.50	10.5	<0.50	0.9	257	0.7	<0.50	11.5	<0.50	<0.50	42	0.9
	7/1/2018	<0.500	<2.50	<0.500	<0.500	3.3	<0.500	0.462 J	104	0.357 J	<0.500	18.5	0.132 J	<0.500	37	0.6
MGMS2-4(40)	06/28/00	<50	<250	<25	<25	44.9	<25	<25	1,210	<25	<25	5,030	215	--	3,090	<25
	08/30/00	<10	<50	<5	<5	23.4	<5	31.3	644	7.28	<5	2,980	152	--	1,850	<5
	11/29/00	<100	<500	<50	<50	51.3	<50	94	1,420	<50	<50	8,740	424	--	3,980	<50
	02/27/01	<50	<250	<25	<25	35.6	<25	66.2	753	<25	<25	7,360	280	--	3,360	<25
	05/31/01	<50	<250	<25	<25	<25	<25	<25	604	<25	<25	3,610	94.4	--	2,050	<25
	09/24/01	<5	<5	<5	<5	28	<5	26	780	13	<5	2,600	170	--	1,700	<5
	12/18/01	<50	<250	<25	<25	175	<25	77	1,350	<25	<25	5,590	374	--	3,220	<25
	03/19/02	<50	<25	<25	<50	36	<25	36	868	<25	<25	6,240	180	--	3,040	<25
	05/29/02	<50	<25	<25	<50	76	<25	53	1,330	<25	<25	6,580	230	--	2,530	<25
	11/11/02	<20	<10	<10	<20	19.8	<10	13.6	639	<10	<10	3,080	89.4	--	1,820	<10
	01/23/03	<20	<10	<10	<20	13.4	<10	<10	353	<10	<10	2,290	52.6	--	1,480	<10
	05/28/03	<10	<5	<5	<10	5.4	<5	<5	110	<5	<5	1,190	19.1	--	474	<5
	11/11/03	<10	<10	<10	<10	<10	<10	<10	54.1	<10	<10	1,820	14	--	398	<10
	01/27/04	<20	<10	<10	<20	45.2	<10	10	397	<10	<10	1,740	55.8	--	688	<10
	05/03/04	<10	<10	<10	<10	<10	<10	<10	41.2	<10	<10	599	<10	--	200	<10
	08/17/04	<10	<5	<5	<10	9.7	<5	6.1	158	<5	<5	1,530	30.7	--	705	<5
	11/15/04	<25	<25	<25	<25	<25	<25	<25	310	<25	<25	2,900	<25	--	1,300	<25
	03/24/05	<20	<10	<10	<20	10.8	<10	<10	159	<10	<10	1,900	25.8	--	834	<10
	05/16/05	<20	<10	<10	<20	34.2	<10	28.2	489	<10	<10	2,540	52.2	--	1,150	<10
	11/16/05	<50	<25	<25	<50	43.5	<25	<25	396	<25	<25	4,240	82.5	--	1,750	<25
	06/06/06	<50	<50	<50	<50	62	<50	<50	917	<50	<50	4,820	55	--	1,770	<50
	12/05/06	<50	<25	<25	<50	<25	<25	<25	370	<25	<25	3,090	31.5	--	1,200	<25
	05/21/07	<20	<20	<20	<20	27.4	<20	<20	359	<20	<20	2,880	38.2	--	1,080	<20
	09/10/07	<50	<25	<25	<50	<25	<25	<25	402	<25	<25	2,010	52.5	--	1,600	<25
	12/12/07	<50	<25	<25	<50	26	<25	<25	330	<25	<25	2,080	35.5	--	914	<25
	03/04/08[7.]	<1	<0.500	<0.500	<1	20.4	<0.500	16.1	181	7.71	<0.500	1,810	53.7	0.51	950	4.68
	09/16/08	<50	<25	<25	<25	<25	<25	<25	208	<25	<25	2,330	32	<25	1,130	<25
	12/08/08	Not sampled. Air leak in sampling point prohibited the collection of the sample.														
	03/24/09	<2	<2	<2	<2	8.4	<2	3.6	100	2	<2	990	14	<2	430	<2

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-4(40) (continued)	09/15/09	<1.5	<1.5	<1.5	<1.5	3.1	<1.5	<1.5	52	<1.5	<1.5	440	4.1	<1.5	200	<1.5
	12/14/09	<1.5	<1.5	<1.5	<1.5	54	<1.5	16	360	6.9	<1.5	2,400	62	<1.5	1,000	2.6
	03/16/10	<7	<7	<7	<7	16	<7	<7	140	<7	<7	1,800	19	<7	810	<7
	06/14/10	<25	<25	<25	<25	72	<25	41	1,400	<25	<25	6,400	68	<25	1,500	43
	09/21/10	<2.5	<2.5	<2.5	<2.5	35	<2.5	17	480	9	<2.5	3,500	48	<2.5	1,500	5.4
	12/07/10	<15	<15	<15	<15	69	<15	26	700	<15	<15	4,100	83	<15	1,600	<15
	03/07/11	<15	<15	<15	<15	88	<15	30	930	<15	<15	3,700	91	<15	1,600	<15
	06/07/11	<15	<15	<15	<15	65	<15	30	1,600	17	<15	4,400	57	<15	1,400	48
	09/12/11	<15	<15	<15	<15	44	<15	28	7,400	20	<15	790	48	<15	380	58
	12/07/11	<15	<15	<15	<15	35	<15	<15	5,300	<15	<15	61	<15	<15	39	460
	03/08/12	<2	<2	<2	<2	38	<2	2.3	470	2.8	<2	9.9	5.2	<2	5.4	260
	06/19/12	<0.5	3.9	<0.5	<0.5	53	<0.5	<0.5	20	1.3	<0.5	7.2	<0.5	<0.5	2.5	63
	09/13/12	<1.5	1.8	<1.5	<1.5	39	<1.5	2.8	310	3.2	<1.5	89	5	<1.5	80	440
	12/11/12	<0.50	30	<0.50	<0.50	4.8	<0.50	<0.50	33	1.3	<0.50	10	<0.50	<0.50	3.4	4
	03/12/13	<0.50	8.2	<0.50	<0.50	28	<0.50	1.9	300	2	<0.50	5.6	2.5	<0.50	2.2	270
	06/11/13	<0.50	15	<0.50	<0.50	8.3	<0.50	<0.50	7.9	<0.50	<0.50	0.94	<0.50	<0.50	<0.50	4.8
	09/17/13	<0.50	9.4	<0.50	<0.50	28	<0.50	4.8	290	1.4	<0.50	16	1.6	<0.50	17	330
	12/16/13	<0.50	6.9	<0.50	<0.50	9.7	<0.50	<0.50	8.4	<0.50	<0.50	2.4	<0.50	<0.50	1.4	3.4
	3/24/2014	<0.50	2.4	<0.50	<0.50	45	<0.50	2.9	84	<0.50	<0.50	2.6	<0.50	<0.50	1.8	270
	6/26/2014	<0.50	6.1	<0.50	<0.50	31	<0.50	10	88	0.84	<0.50	21	<0.50	<0.50	22	90
	9/23/2014	<0.50	2.5	<0.50	<0.50	30	<0.50	30	590	2.4	<0.50	170	3.2	<0.50	110	800
	12/12/2014	<0.50	12	<0.50	<0.50	35	<0.50	<0.50	10	<0.50	<0.50	3.4	<0.50	<0.50	2.3	18
	3/20/2015	<0.50	<0.50	<0.50	<0.50	4.3	<0.50	3.9	47	<0.50	<0.50	30.6	<0.50	<0.50	22.1	17.3
	6/19/2015	<0.50	<0.50	<0.50	<0.50	13.8	<0.50	1.3	53.8	<0.50	<0.50	18.4	<0.50	<0.50	12.8	48.3
	9/25/2015	<0.50	<0.50	<0.50	<0.50	12.3	<0.50	4.2	105	0.61	<0.50	67.4	0.92	<0.50	45.9	57.8
	12/8/2015	<0.50	3.8	<0.50	<0.50	13.5	<0.50	<0.50	7	<0.50	<0.50	4	<0.50	<0.50	2.8	3.3
	3/9/2016	<0.50	<2	<0.50	<0.50	20.6	<0.50	1.6	36	<0.50	<0.50	6.5	<0.50	<0.50	6.2	36
	6/17/2016	<0.50	<2	<0.50	<0.50	24.9	<0.50	26.4	744	2.8	<0.50	223	3.1	<0.50	146	227
	9/29/2016	<0.50	<2	<0.50	<0.50	12.1	<0.50	<0.50	115	<0.50	<0.50	33.3	<0.50	<0.50	24.8	142
	12/16/2016	<0.50	<2	<0.50	<0.50	10.3	<0.50	<0.50	5.2	<0.50	<0.50	2.6	<0.50	<0.50	1.9	2
	3/31/2017	<0.5	<2	<0.5	<0.5	57.6	<0.5	14.3	236	0.6	<0.5	4.3	<0.5	<0.5	14.4	235
	6/15/2017	<0.50	<2.0	<0.50	<0.50	38.6	<0.50	3.5	46.2	<0.50	<0.50	5.1	<0.50	<0.50	4.9	98.9
	9/29/2017	<2.0	<2.0	<0.50	<0.50	21.7	<1.0	6.8	195.0	0.74	<0.50	41.5	0.67	<0.50	31.3	428.0
	11/9/2017	<2.0	<2.0	<0.50	<0.50	21.3	<0.50	0.9	61.6	0.52	<0.50	13.2	<0.50	<0.50	9.2	170.0
	3/22/2018	<0.500	<2.50	<0.500	<0.500	25.9	<0.500	4.2	109.0	0.57	<0.500	46.0	0.259 J	<0.500	27.3	122.0
	7/1/2018	<0.500	<2.50	<0.500	<0.500	12.7	<0.500	5.9	151.0	0.97	<0.500	62.1	1.04	<0.500	48.9	38.2

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-3(60)	06/28/00	<5	<25	<2.5	<2.5	35.6	<2.5	8.3	433	<2.5	<2.5	110	22.3	--	198	<2.5
	08/30/00	<10	<50	<5	<5	36	<5	13	1,120	<5	<5	164	32	--	136	<5
	11/29/00	<5	<25	<2.5	<2.5	5.08	<2.5	3.88	279	<2.5	<2.5	26.8	<5	--	38	<2.5
	02/27/01	<2	<10	<1	<1	40.2	<1	2.65	46.6	<1	<1	20.7	12.4	--	27	173
	05/31/01	<1	<5	<0.50	<0.50	2.47	<0.50	2.3	39.1	<0.50	<0.50	113	3.44	--	75.6	5.06
	09/24/01	<2.5	<2.5	<2.5	<2.5	14	<2.5	11	180	3.6	<2.5	340	11	--	220	48
	12/18/01	<1	<5	<0.50	<0.50	0.607	<0.50	1.01	15	<0.50	<0.50	64.4	2.06	--	47.7	<0.50
	03/19/02	<1	<0.50	<0.50	<1	5.4	<0.50	2.96	62.9	0.81	<0.50	91.9	5.78	--	80.1	15.2
	05/29/02	<1	<0.50	<0.50	<1	2.55	<0.50	2.02	59.7	0.82	<0.50	119	4.8	--	67.6	1.06
	01/23/03	<1	<0.50	<0.50	<1	10.1	<0.50	2.7	114	1.12	<0.50	111	6.06	--	96	22.8
	05/28/03	<2	<1	<1	<2	15	<1	3.28	178	1.48	<1	131	9.3	--	126	15.6
	11/11/03	<2	<2	<2	<2	21.3	<2	4.56	208	<2	<2	223	9.06	--	139	20.6
	01/27/04	<1	<0.50	<0.50	<1	17.2	<0.50	2.83	117	1.57	<0.50	96.3	5.38	--	92.2	17.7
	05/03/04	<1	<1	<1	<1	4.79	<1	1.96	86.4	<1	<1	121	3.31	--	84	<1
	11/15/04	<2.5	<2.5	<2.5	<2.5	<2.5	13	4.4	220	2.8	<2.5	170	6.4	--	140	11
	02/01/05	<1	<0.50	<0.50	<1	2.49	<0.50	1.47	92	2.46	<0.50	97.7	2.41	--	73.9	0.6
	05/16/05	<1	<0.50	<0.50	<1	1.49	<0.50	1.51	45.2	0.59	<0.50	74.1	1.61	--	41.5	<0.50
	08/18/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	27.6 B	<0.500	<0.500	23.5 B	<0.500	--	13 B	<0.500
	11/16/05	<1	<0.500	<0.500	<1	7.5	<0.500	2.05	90.9	1.16	<0.500	107	3.1	--	78.3	2.68
	02/20/06	<1	<0.500	<0.500	<1	3.35	<0.500	1.6	65	0.82	<0.500	99.5	1.55	--	62.3	1.27
	06/06/06	<1	<1	<1	<1	<1	<1	<1	55	<1	<1	76.3	1.01	--	36.2	<1
	09/05/06	<1	<0.50	<0.50	<1	2.85	<0.50	1.13	75.1	0.73	<0.50	73	1.11	--	45.6	0.83
	12/05/06	<1	<0.50	<0.50	<1	2.58	<0.50	1.44	77	0.75	<0.50	98.7	1.27	--	61.2	0.79
	02/07/07	<1	<0.50	<0.50	<1	3.36	<0.50	1.3	96.5	0.79	<0.50	76.3	1.64	--	55	1.51
	05/21/07	<1	<1	<1	<1	2.45	<1	1.33	73.7	<1	<1	99.1	1.51	--	54.5	<1
	09/10/07	<10	<5	<5	<10	31.2	<5	8.2	559	<5	<5	221	10.8	--	192	26.7
	12/12/07	<1	<0.50	<0.50	<1	1.49	<0.50	0.88	78.6	0.56	<0.50	66.1	0.98	--	36.8	1.75
	03/04/08	<1	<0.500	<0.500	<1	4.46	<0.500	2.19	164	1.37	<0.500	89.7	2.32	<0.500	72.2	6.88
	09/16/08	<5	<2.50	<2.50	<5	10.4	<2.50	3.65	166	<2.50	<2.50	111	3.85	<2.50	96.4	7.15
	12/08/08	<0.80	<0.80	<0.80	<0.80	11	<0.80	3	160	1.7	<0.80	110	3.2	<0.80	80	10
	03/24/09	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	1.6	110	1	<0.50	84	2.2	<0.50	53	3.7
	09/15/09	<0.50	<0.50	<0.50	<0.50	6.4	<0.50	2.3	91	1.2	<0.50	110	2.4	<0.50	72	4.2
	12/14/09	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	1.1	61	0.75	<0.50	84	1.1	<0.50	54	0.96
	03/16/10	<0.50	<0.50	<0.50	<0.50	15	<0.50	3.6	140	1.6	<0.50	160	8.2	<0.50	110	12
	06/14/10	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	0.75	46	0.55	<0.50	73	0.86	<0.50	38	0.88
	09/21/10	<0.5	<0.5	<0.5	<0.5	11	<0.5	3	130	1.5	<0.5	150	5.8	<0.5	100	6.8

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-3(60)	12/07/10	<0.5	<0.5	<0.5	<0.5	4.1	<0.5	1.8	86	1.2	<0.5	120	1.7	<0.5	77	1.6
(continued)	03/07/11	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	0.86	73	0.62	<0.50	61	1.2	<0.50	34	1.4
	06/06/11	<0.5	<0.5	<0.5	<0.5	0.64	<0.5	<0.5	22	<0.5	<0.5	64	0.54	<0.5	27	<0.5
	09/12/11	<0.50	<0.50	<0.50	<0.50	10	<0.50	3.2	110	1.4	<0.50	170	6	<0.50	100	2
	12/05/11	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	0.95	51	0.54	<0.50	84	1	<0.50	41	<0.50
	03/08/12	<0.50	<0.50	<0.50	<0.50	10	<0.50	2.9	300	1.9	<0.50	71	1.5	<0.50	45	43
	06/19/12	<0.5	<0.5	<0.5	<0.5	2	<0.5	1	79	0.87	<0.5	78	0.78	<0.5	45	5.3
	09/12/12	<0.50	<0.50	<0.50	<0.50	1.5	<0.50	0.56	48	<0.50	<0.50	44	<0.50	<0.50	20	2.7
	12/11/12	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	2.5	59	1.5	<0.50	57	0.62	<0.50	36	16
	03/12/13	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	<0.50	22	<0.50	<0.50	16	<0.50	<0.50	9	<0.50
	06/11/13	<0.50	<0.50	<0.50	<0.50	2.4	<0.50	1.5	53	0.58	<0.50	29	0.55	<0.50	21	12
	09/17/13	<0.50	<0.50	<0.50	<0.50	5.4	<0.50	0.98	73	0.66	<0.50	24	0.6	<0.50	13	29
	12/10/13	<0.50	<0.50	<0.50	<0.50	3	<0.50	1	88	0.88	<0.50	23	0.6	<0.50	18	13
	3/18/2014	<0.50	<0.50	<0.50	<0.50	0.96	<0.50	<0.50	28	<0.50	<0.50	33	<0.50	<0.50	13	1.7
	9/23/2014	Insufficient air pressure to inflate dedicated bladder; no sample collected.														
	12/12/2014	Insufficient air pressure to inflate dedicated bladder; no sample collected.														
	3/20/2015	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	29.4	<0.50	<0.50	41.4	<0.50	<0.50	24.3	5.2
	6/19/2015	<0.50	<0.50	<0.50	<0.50	2	<0.50	0.56	38.1	<0.50	<0.50	35.1	<0.50	<0.50	23.5	7.9
	9/25/2015	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	0.5	51.6	<0.50	<0.50	18.4	<0.50	<0.50	15.8	9.7
	12/8/2015	Well Damaged, Unable to Sample														
	6/17/2016	<0.50	<2	<0.50	<0.50	1.1	<0.50	<0.50	19.4	<0.50	<0.50	17.2	<0.50	<0.50	11.8	3.4
	9/30/2016	<0.50	<2	<0.50	<0.50	2	<0.50	<0.50	40	<0.50	<0.50	9.6	<0.50	<0.50	11.5	9.6
	12/16/2016	<0.50	<2	<0.50	<0.50	1.7	<0.50	<0.50	35.3	<0.50	<0.50	40.7	<0.50	<0.50	24.8	1.4
	3/31/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	18.5	<0.5	<0.5	26	<0.5	<0.5	11.2	0.75
	6/15/2017	<2.0	<2.0	<0.50	<0.50	0.88	<1.0	<0.50	20.7	<0.50	<0.50	40.4	<0.50	<0.50	17.3	1.3
	9/29/2017	<2.0	<2.0	<0.50	<0.50	2.30	<1.0	<0.50	30.4	<0.50	<0.50	17.5	<0.50	<0.50	12.0	6.7
	11/9/2017	<2.0	<2.0	<0.50	<0.50	1.80	<0.50	<0.50	30.2	<0.50	<0.50	34.2	<0.50	<0.50	20.1	1.1
	3/22/2018	<0.500	<2.50	<0.500	<0.500	0.82	<0.500	0.244 J	17.3	0.164 J	<0.500	20.6	0.205 J	<0.500	11.6	1.2
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.73	<0.500	<0.500	14.1	<0.500	<0.500	19.6	0.20	<0.500	10.1	1.6
MGMS2-2(110)	06/28/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	12.2	<0.50	<0.50	6.04	<1	--	17.1	<0.50
	08/30/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	4.41	<0.50	<0.50	16.4	<1	--	14.7	<0.50
	11/29/00	<1	<5	<0.50	<0.50	<0.50	<0.50	0.717	8.23	<0.50	<0.50	13	<1	--	19.3	<0.50
	02/27/01	<1	<5	<0.50	<0.50	<0.50	<0.50	0.756	7.31	<0.50	<0.50	15.2	<1	--	21.6	<0.50
	05/31/01	<1	<5	<0.50	<0.50	<0.50	<0.50	0.938	10.7	<0.50	<0.50	24.4	1.14	--	29.1	<0.50
	09/24/01	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.6	6.8	<0.50	<0.50	37	1.1	--	34	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-2(110) (continued)	12/18/01	<1	<5	<0.50	<0.50	<0.50	<0.50	0.62	4.91	<0.50	<0.50	35.1	<1	--	27.5	<0.50
	03/19/02	<1	<0.50	<0.50	<1	<0.50	<0.50	0.61	9.97	<0.50	<0.50	35.6	1.23	--	24.6	<0.50
	05/29/02	<1	<0.50	<0.50	<1	<0.50	<0.50	1.21	31.9	<0.50	<0.50	114	2.39	--	51	0.61
	01/23/03	<1	<0.50	<0.50	<1	<0.50	<0.50	1.01	57.1	<0.50	<0.50	47.8	2.79	--	44.1	2.98
	05/28/03	<1	<0.50	<0.50	<1	0.61	<0.50	0.73	63.9	<0.50	<0.50	54.6	1.98	--	43.1	1.13
	11/11/03	<1	<1	<1	<1	1.14	<1	<1	76.7	1.07	<1	32.4	2.19	--	30.8	2.03
	01/27/04	<1	<0.50	<0.50	<1	0.63	<0.50	<0.50	49	<0.50	<0.50	67.9	1.17	--	30	1
	05/03/04	<1	<1	<1	<1	<1	<1	<1	14	<1	<1	28	<1	--	13.6	<1
	11/15/04	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	0.62	60	<0.50	<0.50	50	1.6	--	30	<0.50
	05/16/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	27.9	<0.50	<0.50	21.5	0.52	--	10.9	<0.50
	11/16/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	15.1	<0.500	<0.500	18	<0.500	--	8.42	<0.500
	06/06/06	<1	<1	<1	<1	<1	<1	<1	30.9	<1	<1	13.9	<1	--	6.59	<1
	12/05/06	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	36.2	<0.50	<0.50	17.9	<0.50	--	8.27	<0.50
	09/10/07	<5	<2.50	<2.50	<5	<2.50	<2.50	3.2	512	<2.50	<2.50	146	5.65	--	94.4	14.9
	03/04/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	59.5	<0.500	<0.500	33.4	0.75	<0.500	16.7	2.82
	09/16/08	<1	<0.500	<0.500	<1	<0.500	<0.500	0.71	77	<0.500	<0.500	44	1.18	<0.500	23.8	3.45
	03/24/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	40	<0.50	<0.50	27	<0.50	<0.50	11	2.5
	06/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	31	<0.50	<0.50	20	0.57	<0.50	8.9	2.3
	09/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	26	<0.50	<0.50	16	<0.50		6.7	1.8
	03/15/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	28	<0.50	<0.50	21	<0.50	<0.50	8.1	1.6
	09/21/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	33	<0.5	<0.5	34	0.6	<0.5	14	1.3
	03/07/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	24	<0.50	<0.50	26	<0.50	<0.50	8.6	1
	09/12/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	15	<0.50	<0.50	22	<0.50	<0.50	8.3	<0.50
	03/08/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	31	<0.50	<0.50	23	<0.50	<0.50	9.3	2.4
	09/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18	<0.50	<0.50	20	<0.50	<0.50	8.3	1.4
	03/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	34	<0.50	<0.50	23	0.52	<0.50	10	2.7
	09/17/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	30	<0.50	<0.50	18	<0.50	<0.50	8.7	2.2
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	21	<0.50	<0.50	13	<0.50	<0.50	6.2	2.5
	9/23/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	25	<0.50	<0.50	12	<0.50	<0.50	7.3	4.9
	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	18.3	<0.50	<0.50	7.9	<0.50	<0.50	4.8	4.6
	9/25/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	15.3	<0.50	<0.50	9.4	<0.50	<0.50	5.9	4.1
	3/9/2016	<0.50	<2	<0.50	<0.50	0.73	<0.50	<0.50	22.6	<0.50	<0.50	7.1	<0.50	<0.50	8	10
	9/29/2016	<0.50	<2	<0.50	<0.50	0.62	<0.50	<0.50	16.8	<0.50	<0.50	6.5	<0.50	<0.50	6.3	5.8
	3/31/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	19.5	<0.5	<0.5	6.4	<0.5	<0.5	6.6	6.4
	9/29/2017	<2.0	<2.0	<0.50	<0.50	2.8	<1.0	<0.50	63.5	<0.50	<0.50	2.2	<0.50	<0.50	5.3	25.0
	11/9/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	6.3	<0.50	<0.50	3.9	<0.50	<0.50	3.1	1.9
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.446 J	<0.500	<0.500	<0.500	6.7	<0.500	4.4	0.175 J	<0.500	3.4	3.87

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-1(132)	06/28/00	<1	<5	<0.50	<0.50	1.25	<0.50	1.77	27.6	<0.50	<0.50	27.5	2.06	--	54.3	<0.50
	08/30/00	<1	<5	<0.50	<0.50	0.903	<0.50	<0.50	23	<0.50	<0.50	77.8	2.47	--	52.9	<0.50
	11/29/00	<1	<5	<0.50	<0.50	<0.50	<0.50	0.569	12.4	<0.50	<0.50	25.3	<1	--	27.8	<0.50
	02/27/01	<1	<5	<0.50	<0.50	0.537	<0.50	0.605	11.4	<0.50	<0.50	25.2	<1	--	24.4	2.6
	05/31/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	8.86	<0.50	<0.50	25.5	<1	--	24.4	<0.50
	09/24/01	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.76	7.6	<0.50	<0.50	29	1.1	--	30	<0.50
	12/18/01	<1	<5	<0.50	<0.50	<0.50	<0.50	0.773	6.81	<0.50	<0.50	26.8	1.36	--	23.8	<0.50
	03/19/02	<1	<0.50	<0.50	<1	<0.50	<0.50	0.53	8.62	<0.50	<0.50	33.5	0.77	--	24.2	<0.50
	05/29/02	<1	<0.50	<0.50	<1	<0.50	<0.50	1.29	35.4	0.52	<0.50	117	2.5	--	53.6	0.62
	01/23/03	<1	<0.50	<0.50	<1	<0.50	<0.50	0.96	57.4	<0.50	<0.50	49.9	2.35	--	46.2	3.19
	05/28/03	<1	<0.50	<0.50	<1	<0.50	<0.50	0.53	27.2	<0.50	<0.50	29.3	0.98	--	24	1.07
	11/11/03	<1	<1	<1	<1	<1	<1	<1	46.3	<1	<1	28.8	1.56	--	29.7	1.49
	01/27/04	<1	<0.50	<0.50	<1	0.63	<0.50	0.56	37.6	<0.50	<0.50	28	0.96	--	22.2	1.51
	05/04/04	<1	<1	<1	<1	<1	<1	<1	38.2	<1	<1	7.55	<1	--	5.22	<1
	11/15/04	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.58	62	<0.50	<0.50	38	1.1	--	26	0.85
	05/16/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	29.5	<0.50	<0.50	23.7	0.56	--	15.2	0.86
	11/16/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	8.85	<0.500	<0.500	13	<0.500	--	6.06	<0.500
	06/06/06	<1	<1	<1	<1	<1	<1	<1	23.1	<1	<1	14.8	<1	--	6.71	<1
	12/05/06	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	27.6	<0.50	<0.50	14.9	<0.50	--	7.89	<0.50
	09/10/07	<5	<2.50	<2.50	<5	4.55	<2.50	3	615	<2.50	<2.50	93.2	5.5	--	61	21.5
	03/04/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	37.3 J	<0.500	<0.500	22.6 J	0.59	<0.500	12.9 J	2.4
	09/16/08	<1	<0.500	<0.500	<1	0.53	<0.500	1	101	0.56	<0.500	38.3	1.37	<0.500	26.1	6.11
	03/24/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	32	<0.50	<0.50	24	0.57	<0.50	11	1.5
	06/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	32	<0.50	<0.50	24	<0.50	<0.50	12	1.6
	09/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	26	<0.50	<0.50	18	<0.50		8	1.5
	03/15/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	28	<0.50	<0.50	23	<0.50	<0.50	9.9	1.6
	09/21/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	28	<0.5	<0.5	31	<0.5	<0.5	12	1.1
	03/07/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	30	<0.50	<0.50	41	0.56	<0.50	13	0.97
	03/08/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	26	<0.50	<0.50	24	<0.50	<0.50	9.4	1.8
	09/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	22	<0.50	<0.50	22	<0.50	<0.50	9	2
	03/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	24	<0.50	<0.50	19	<0.50	<0.50	8.3	1.9
	09/17/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	35	<0.50	<0.50	15	<0.50	<0.50	8.1	2.7
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	22	<0.50	<0.50	12	<0.50	<0.50	5.4	2.6
	9/23/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	32	<0.50	<0.50	9.8	<0.50	<0.50	6	5.5
	3/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10.5	<0.50	<0.50	9.4	<0.50	<0.50	4.4	0.75

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS2-1(132) (continued)	3/9/2016	<0.50	<0.50	<0.50	<0.50	0.86	<0.50	<0.50	36.8	<0.50	<0.50	7.9	0.69	<0.50	10.7	12.4
	9/29/2016	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	<0.50	31.4	<0.50	<0.50	6.4	<0.50	<0.50	7.9	8.2
	3/31/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	15.6	<0.5	<0.5	5.2	<0.5	<0.5	4.7	4.8
	9/29/2017	<2.0	<2.0	<0.50	<0.50	2.2	<1.0	<0.50	64.9	<0.50	<0.50	2.4	0.6	<0.50	6.3	19.4
	11/9/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	14.3	<0.50	<0.50	3.6	<0.50	<0.50	4.5	5.0
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.5	<0.500	<0.500	13.8	<0.500	<0.500	4.5	0.191 J	<0.500	4.9	4.6
MGMS3-4(40)	08/30/00	<10	<50	<5	<5	13.2	<5	5.01	858	14.1	<5	580	10.8	--	205	6.65
	11/29/00	<20	<100	<10	<10	<10	<10	<10	820	10.6	<10	2,810	<20	--	395	<10
	02/27/01	<50	<250	<25	<25	39.4	<25	29.2	4,570	<25	<25	2,970	<50	--	756	79.3
	05/31/01	<50	<250	<25	<25	<25	<25	<25	2,920	38.5	<25	3,960	<50	--	716	<25
	09/24/01	<2.5	<2.5	<2.5	<2.5	5.8	<2.5	<2.5	730	5.4	<2.5	1,400	9.2	--	230	3.5
	12/18/01	<50	<250	<25	<25	<25	<25	<25	2,550	<25	<25	3,310	<50	--	631	31
	03/19/02	<20	<10	<10	<20	34.6	<10	15.4	3,370	30.2	<10	3,560	23.8	--	707	57
	05/29/02	<50	<25	<25	<50	71.5	<25	26	5,180	38.5	<25	2,470	33.5	--	728	86
	11/11/02	<50	<25	<25	<50	<25	<25	<25	1,520	<25	<25	2,750	<25	--	309	<25
	01/23/03	<20	<10	<10	<20	137	<10	38.4	3,530	32.6	<10	2,380	118	--	1,400	83.6
	05/28/03	<50	<25	<25	<50	56	<25	28.5	1,720	<25	<25	3,560	<25	--	1,470	<25
	11/11/03	<10	<10	<10	<10	<10	<10	<10	672	<10	<10	58.3	<10	--	32.4	<10
	01/27/04	<20	<10	<10	<20	20	<10	<10	1,900	19.4	<10	1,350	10	--	246	20
	05/03/04	<20	<20	<20	<20	50	<20	<20	1,420	<20	<20	2,700	34.2	--	913	24.8
	08/17/04	<20	<10	<10	<20	71.6	<10	17	3,300	31	<10	1,360	29.2	--	569	45.2
	11/15/04	<25	<25	<25	<25	<25	<25	<25	1,400	<25	<25	1,600	<25	--	290	<25
	03/24/05	<20	<10	<10	<20	79.4	<10	30	3,440	34.2	<10	2,330	43.8	--	1,080	60.2
	03/24/05 DUP	<20	<10	<10	<20	83.2	<10	29.2	3,450	34	<10	2,150	44	--	1,040	58.6
	05/16/05	<10	<5	<5	<10	7	<5	<5	657	11.3	<5	1,130	8.1	--	224	<5
	11/16/05	<10	<5	<5	<10	5.8	<5	<5	794	8.4	<5	1,180	7.6	--	210	<5
	03/14/06	<50	<50	<50	<50	51	<50	<50	4,130	<50	<50	1,410	<50	--	484	<50
	06/06/06	<20	<20	<20	<20	20.4	<20	<20	2,290	32.2	<20	1,410	<20	--	401	23.6
	12/05/06	<20	<10	<10	<20	29.8	<10	<10	3,570	29	<10	1,020	<10	--	360	95.4
	05/22/07	<20	<20	<20	<20	20.8	<20	<20	2,640	20.2	<20	952	<20	--	349	22.6
	09/10/07	<50	<25	<25	<50	<25	<25	<25	2,340	<25	<25	499	<25	--	215	25.5
	12/12/07	<50	<25	<25	<50	<25	<25	<25	723	<25	<25	536	<25	--	133	<25
	03/04/08	<1	<0.500	<0.500	<1	32.4	3.08	22	2,280	25.4	3.86	1,580	27.5	<0.500	972	85.1
	09/16/08	<50	<25	<25	<50	64.5	<25	<25	2,700	<25	<25	714	<25	<25	462	47
	12/08/08	<9	<9	<9	<9	24	<9	<9	1,800	20	<9	350	<9	<9	160	90
	03/24/09	<7	<7	<7	<7	36	<7	7.9	1,600	12	<7	600	11	<7	280	33
	09/15/09	<5	<5	<5	<5	15	<5	<5	1,500	13	<5	550	<5	<5	180	8.2
	09/15/09 DUP	<5	<5	<5	<5	15	<5	<5	1,400	13	<5	540	<5	<5	170	9.8

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-4(40) (continued)	12/14/09	<2.5	<2.5	<2.5	<2.5	8.1	<2.5	<2.5	750	5.3	<2.5	180	<2.5	<2.5	74	19
	03/17/10	<2.5	<2.5	<2.5	<2.5	52	<2.5	14	1,800	18	2.9	810	16	<2.5	490	41
	03/17/10 DUP	<5	<5	<5	<5	51	<5	14	1,600	18	<5	780	16	<5	470	39
	06/14/10	<0.90	<0.90	<0.90	<0.90	2.4	<0.90	<0.90	230	2.3	<0.90	300	2.2	<0.90	88	1.5
	09/20/10	<7	<7	<7	<7	32	<7	8.6	1,800	16	<7	530	7.9	<7	230	31
	09/20/10 DUP	<6	<6	<6	<6	31	<6	7.4	1,700	15	<6	510	7.4	<6	220	29
	12/07/10	<2	<2	<2	<2	5.3	<2	<2	460	3.9	<2	330	2.2	<2	95	3.2
	03/07/11	<2	<2	<2	<2	20	<2	4.7	1,300	10	<2	330	4	<2	140	53
	03/07/11 DUP	<4	<4	<4	<4	19	<4	4.9	1,200	10	<4	320	<4	<4	140	46
	06/06/11	<3	<3	<3	<3	6.5	<3	4.1	780	7	<3	370	5.4	<3	150	8.5
	09/13/11	<5	<5	<5	<5	45	<5	13	1,800	19	<5	560	15	<5	380	29
	09/13/11 DUP	<7	<7	<7	<7	40	<7	12	1,700	16	<7	570	12	<7	330	23
	12/06/11	<5	<5	<5	<5	14	<5	<5	1,000	9.3	<5	140	<5	<5	64	44
	03/08/12	<5	<5	<5	<5	33	<5	13	1,400	14	<5	930	17	<5	450	28
	03/08/12 DUP	<6	<6	<6	<6	35	<6	14	1,400	14	<6	990	18	<6	480	30
	06/21/2012	<5	<5	<5	<5	22	<5	5.6	1,300	11	<5	220	<5	<5	140	44
	09/12/12	<5	<5	<5	<5	23	<5	6.2	1,400	13	<5	220	<5	<5	120	85
	09/12/12 DUP	<5	<5	<5	<5	23	<5	5.3	1,400	13	<5	230	<5	<5	120	86
	12/11/12	<2	<2	<2	<2	7.1	<2	<2	510	6.5	<2	180	<2	<2	72	6.5
	03/12/13	<2	<2	<2	<2	30	<2	8.4	1,400	12	<2	510	8.7	<2	260	35
	03/12/13 DUP	<2	<2	<2	<2	29	<2	8.8	1,300	12	<2	470	8.4	<2	250	35
	06/11/13	<2.5	<2.5	<2.5	<2.5	11	<2.5	<2.5	740	7.1	<2.5	110	<2.5	<2.5	58	34
	09/16/13	<2	<2	<2	<2	7.7	<2	<2	360	4.6	<2	100	<2	<2	48	24
	09/16/13 DUP	<2	<2	<2	<2	8.5	<2	<2	380	5.1	<2	100	<2	<2	49	25
	12/10/13	<0.90	<0.90	<0.90	<0.90	4.7	<0.90	<0.90	230	2.8	<0.90	60	<0.90	<0.90	29	2
	12/10/13 DUP	<0.90	<0.90	<0.90	<0.90	4.6	<0.90	<0.90	230	2.7	<0.90	61	<0.90	<0.90	29	1.9
	3/18/2014	<0.90	<0.90	<0.90	<0.90	2.7	<0.90	0.98	280	1.8	0.91	84	<0.90	<0.90	38	<0.90
	3/18/2014 DUP	<0.90	<0.90	<0.90	<0.90	2.6	<0.90	<0.90	280	1.9	0.93	86	<0.90	<0.90	39	<0.90
	6/26/2014	<0.90	<0.90	<0.90	<0.90	12	<0.90	3.5	690	5.7	<0.90	180	1.3	<0.90	100	20
	6/26/14 DUP	<0.90	<0.90	<0.90	<0.90	11	<0.90	2.8	490	5	<0.90	160	1.1	<0.90	930	14
	9/23/2014	<0.90	<0.90	<0.90	<0.90	10	<0.90	1.7	410	5.8	<0.90	72	<0.90	<0.90	55	74
	9/23/2014 DUP	<0.20	<0.20	<0.20	<0.20	11	<0.20	<0.20	430	5.5	<0.20	70	<0.20	<0.20	53	75

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-4(40)	12/12/2014	<2	<2	<2	<2	7.9	<2	<2	490	4.2	<2	36	<2	<2	28	20
(continued)	3/18/2015	<1.6	<1.6	<1.6	<1.6	20	<1.6	3.2	896	7.3	<1.6	249	<1.6	<1.6	159	21.7
	3/18/2015 DUP	<0.50	<0.50	<0.50	<0.50	17	<0.50	2.4	713	5.5	<0.50	194	<0.50	<0.50	124	16.8
	6/19/2015	<0.84	<0.84	<0.84	<0.84	7.2	<0.84	<0.84	339	3.2	<0.84	34.4	<0.84	<0.84	32.8	73.3
	9/22/2015	<0.50	<0.50	<0.50	<0.50	2.8	<0.50	<0.50	164	<0.50	<0.50	2.5	<0.50	<0.50	8.6	61.9
	9/22/2015 DUP	<0.50	<0.50	<0.50	<0.50	2.5	<0.50	<0.50	151	1.2	<0.50	2.3	<0.50	<0.50	7.8	51.9
	12/7/2015	<0.50	<0.50	<0.50	<0.50	9.1	<0.50	2	370	3.1	<0.50	109	<0.50	<0.50	94.8	4
	3/9/2016	<2.5	<10	<2.5	<2.5	11.6	<2.5	<2.5	610	4	<2.5	86.7	<2.5	<2.5	89.7	22.9
	3/8/2016 DUP	<2.5	<10	<2.5	<2.5	12.4	<2.5	<2.5	643	5.4	<2.5	97.4	<2.5	<2.5	102	28
	6/17/2016	<1.2	<5	<1.2	<1.2	24.5	<1.2	6	955	9.1	<1.2	232	<1.2	<1.2	209	85.9
	9/30/2016	<0.50	<2	<0.50	<0.50	4.1	<0.50	0.54	226	1.8	<0.50	1.7	<0.50	<0.50	1.3	45.8
	9/30/2016 DUP	<0.50	<2	<0.50	<0.50	4.5	<0.50	0.6	219	2	<0.50	1.5	<0.50	<0.50	1.4	52.1
	12/16/2016	<0.50	<2	<0.50	<0.50	1	<0.50	<0.50	1.3	0.97	<0.50	0.63	<0.50	<0.50	<0.50	0.88
	3/28/2017	<0.5	<2	<0.5	<0.5	22.5	0.68	2.8	979	5.5	<0.5	1.4	<0.5	<0.5	0.6	257
	3/28/2017 DUP	<2.5	<10	<2.5	<2.5	20.7	<2.5	3.3	1,050	6	<2.5	<2.5	<2.5	<2.5	<2.5	323
	6/12/2017	<0.50	<2.0	<0.50	<0.50	3.3	<0.50	<0.50	1.7	<0.50	<0.50	0.97	<0.50	<0.50	<0.50	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	1.1	<1.0	<0.50	0.7	<0.50	<0.50	0.79	<0.50	<0.50	<0.50	<0.50
	9/26/2017 DUP	<2.0	<2.0	<0.50	<0.50	1.1	<1.0	<0.50	0.8	<0.50	<0.50	0.86	<0.50	<0.50	<0.50	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	4.2	<0.50	<0.50	7.6	<0.50	<0.50	0.85	<0.50	<0.50	<0.50	12.80
	11/10/2017 DUP	<2.0	<2.0	<0.50	<0.50	4.3	<0.50	<0.50	8.0	<0.50	<0.50	0.71	<0.50	<0.50	<0.50	15.80
	3/22/2018	<0.500	<2.50	<0.500	<0.500	8.6	<0.500	<0.500	9.8	0.179 J	0.63	1.45	<0.500	<0.500	0.53	39.80
	7/1/2018	<0.500	<2.50	<0.500	<0.500	1.4	<0.500	<0.500	7.6	<0.500	0.279 J	0.498 J	<0.500	<0.500	0.169 J	8.98
	7/1/2018 DUP	<0.500	<2.50	<0.500	<0.500	2.0	<0.500	<0.500	9.4	<0.500	0.318 J	0.63	<0.500	<0.500	0.163 J	17.30
MGMS3-3(60)	08/30/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	7.03	<1	--	3.31	<0.50
	11/29/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	3.11	<0.50	<0.50	2.8	<1	--	1.28	<0.50
	02/27/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	21.5	<0.50	<0.50	14.9	<1	--	7.32	<0.50
	05/31/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	10.1	<0.50	<0.50	9.84	<1	--	4.76	<0.50
	09/24/01	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.1	<0.50	<0.50	9.7	<0.50	--	3.7	<0.50
	12/18/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	3.26	<0.50	<0.50	17	<1	--	3.84	<0.50
	03/19/02	<1	<0.50	<0.50	<1	0.68	<0.50	<0.50	17.6	<0.50	<0.50	32.3	0.5	--	14	<0.50
	05/29/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	40.5	<0.50	<0.50	20.8	<0.50	--	7.92	<0.50
	01/23/03	<1	<0.50	<0.50	<1	0.5	<0.50	<0.50	33.9	<0.50	<0.50	20.3	<0.50	--	12.7	<0.50
	05/28/03	<1	<0.50	<0.50	<1	0.58	<0.50	<0.50	88.3	0.53	<0.50	16.9	<0.50	--	11.9	0.7
	11/11/03	<2	<2	<2	<2	<2	<2	<2	298	<2	<2	36.1	<2	--	23	<2
	01/27/04	<2	<1	<1	<2	1.2	<1	<1	274	1.24	<1	25.2	<1	--	23.4	1.28
	05/03/04	<2	<2	<2	<2	<2	<2	<2	274	<2	<2	46.6	<2	--	27	<2
	11/15/04	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	43	<0.50	<0.50	8.8	<0.50	--	3.4	<0.50
	02/01/05	<2	<1	<1	<2	<1	<1	<1	179	1.72	<1	15.6	<1	--	7.9	<1
	05/16/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	33.8	<0.50	<0.50	5.7	<0.50	--	2.39	<0.50
	08/18/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	47.9	<0.500	<0.500	4.39	<0.500	--	1.96	0.66

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-3(60) (continued)	11/16/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	8.39	<0.500	<0.500	2.59	<0.500	--	0.83	<0.500
	02/21/06	<5	<2.50	<2.50	<5	2.65	<2.50	<2.50	558	<2.50	<2.50	25	<2.50	--	14.4	21.6
	03/14/06	<1	<1	<1	<1	2.92	<1	1.37	97.1	<1	<1	50.6	<1	--	39.2	<1
	06/06/06	<1	<1	<1	<1	<1	<1	<1	7.97	<1	<1	2.84	<1	--	1.04	<1
	09/05/06	<1	<0.50	<0.50	<1	2.75	<0.50	1.17	108	0.78	<0.50	47.3	0.93	--	34.2	0.65
	12/05/06	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	19.8	<0.50	<0.50	10.5	<0.50	--	5.57	<0.50
	02/07/07	<1	<0.50	<0.50	<1	1.08	<0.50	<0.50	44.3	<0.50	<0.50	21.5	<0.50	--	15.4	<0.50
	05/22/07	<1	<1	<1	<1	<1	<1	<1	32.5	<1	<1	45.2	<1	--	18.2	<1
	09/10/07	<2	<1	<1	<2	2.98	<1	<1	148	<1	<1	28.8	<1	--	31.6	1.67
	12/12/07	<2	<1	<1	<2	<1	<1	<1	11.5	<1	<1	4.22	<1	--	1.9	1.18
	03/04/08	<1	<0.500	<0.500	<1	1.58	<0.500	0.68	72.1	0.6	<0.500	27.2	0.5	<0.500	22.7	2.33
	12/08/08	<0.50	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	44	<0.50	<0.50	12	<0.50	<0.50	9.2	1.3
	03/24/09	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	42	<0.50	<0.50	21	<0.50	<0.50	14	0.91
	09/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	15	<0.50	<0.50	8.5	<0.50	<0.50	4.3	0.84
	12/14/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	2	<0.50	<0.50	0.85	<0.50
	03/17/10	<0.50	<0.50	<0.50	<0.50	0.69	<0.50	<0.50	25	<0.50	<0.50	17	<0.50	<0.50	10	0.57
	06/14/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.8	<0.50	<0.50	2.4	<0.50	<0.50	1.1	0.69
	09/20/10	<0.5	<0.5	<0.5	<0.5	0.81	<0.5	<0.5	28	<0.5	<0.5	18	<0.5	<0.5	11	0.52
	12/07/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	9	<0.5	<0.5	3.4	<0.5	<0.5	1.5	0.94
	03/07/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	17	<0.50	<0.50	10	<0.50	<0.50	4.6	0.67
	06/06/11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.9	<0.5	<0.5	2	<0.5	<0.5	0.73	<0.5
	09/13/11	<0.50	<0.50	<0.50	<0.50	0.94	<0.50	<0.50	34	<0.50	<0.50	17	<0.50	<0.50	12	<0.50
	12/05/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	14	<0.50	<0.50	14	<0.50	<0.50	7.3	<0.50
	03/08/12	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	21	<0.50	<0.50	15	<0.50	<0.50	9	<0.50
	06/21/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.9	<0.5	<0.5	3	<0.5	<0.5	1.2	<0.5
	09/12/12	<0.50	<0.50	<0.50	<0.50	1	<0.50	<0.50	39	<0.50	<0.50	18	<0.50	<0.50	12	<0.50
	12/11/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	<0.50	<0.50	2.3	<0.50	<0.50	0.9	<0.50
	03/12/13	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	<0.50	22	<0.50	<0.50	16	<0.50	<0.50	9	<0.50
	06/11/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	16	<0.50	<0.50	11	<0.50	<0.50	5.4	<0.50
	09/16/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	11	<0.50	<0.50	6.8	<0.50	<0.50	3.3	<0.50
	12/10/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	3.6	<0.50	<0.50	1.5	<0.50
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4	<0.50	<0.50	2.5	<0.50	<0.50	0.89	<0.50
	6/26/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.5	<0.50	<0.50	3.4	<0.50	<0.50	1.4	<0.50

Please refer to notes at end of table.

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-3(60) (continued)	9/23/2014	<0.50	<0.50	<0.50	<0.50	0.71	<0.50	<0.50	2	<0.50	<0.50	8.8	<0.50	<0.50	4.7	<0.50
	12/12/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50	2.2	<0.50	<0.50	0.72	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12.2	<0.50	<0.50	6	<0.50	<0.50	3.7	<0.50
	6/19/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6	<0.50	<0.50	3.5	<0.50	<0.50	1.6	<0.50
	9/22/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	3.9	<0.50	<0.50	2	0.6
	12/7/2015	<0.50	<0.50	<0.50	<0.50	0.75	<0.50	<0.50	13.9	<0.50	<0.50	4.2	<0.50	<0.50	2.5	16.7
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	2.8	<0.50	<0.50	0.78	<0.50
	6/17/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	17.4	<0.50	<0.50	5.8	<0.50	<0.50	5	<0.50
	9/30/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	3.7	<0.50	<0.50	1.9	<0.50
	12/16/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	1.7	<0.50	<0.50	0.68	<0.50
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	0.62	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5
	6/12/2017	<0.50	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50	<0.50	1.3	<0.50	<0.50	0.64	<0.50
	9/26/2017	<2.0	<2.0	<0.50	<0.50	1.20	<1.0	<0.50	34.2	<0.50	<0.50	8.6	<0.50	<0.50	7.80	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	1.70	<0.50	<0.50	37.6	<0.50	<0.50	0.8	<0.50	<0.50	1.50	13.90
	3/22/2018	<0.500	<2.50	<0.500	<0.500	0.76	<0.500	<0.500	15.6	<0.500	<0.500	2.2	<0.500	<0.500	1.76	5.89
	7/2/2018	<0.500	<2.50 J3	<0.500	<0.500	0.67	<0.500	<0.500	12.7	<0.500	<0.500	2.7	<0.500	<0.500	1.92	3.36
MGMS3-2(101)	08/30/00	<10	<50	<5	<5	7.28	<5	<5	120	<5	<5	154	12.1	--	98.2	<5
	11/29/00	<5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	11.4	<2.5	<2.5	11.5	<5	--	13	<2.5
	02/27/01	<2	<10	<1	<1	<1	<1	<1	2.4	<1	<1	3.36	<2	--	1.98	<1
	05/31/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	4.24	<0.50	<0.50	3.07	<1	--	1.85	<0.50
	09/24/01	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.6	<0.50	<0.50	5.3	<0.50	--	2.4	<0.50
	12/18/01	<1	<5	<0.50	<0.50	0.864	<0.50	0.913	10.3	<0.50	<0.50	50.9	2.98	--	23.9	<0.50
	03/19/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	4.02	<0.50	<0.50	6.88	<0.50	--	2.54	<0.50
	05/29/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	8.19	<0.50	<0.50	11.5	<0.50	--	3.9	<0.50
	01/23/03	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	21.2	<0.50	<0.50	17.2	<0.50	--	8.38	<0.50
	05/28/03	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	28.6	<0.50	<0.50	18.4	<0.50	--	8.76	<0.50
	11/11/03	<1	<1	<1	<1	<1	<1	<1	53.7	<1	<1	18.3	<1	--	9.3	<1
	01/27/04	<1	<0.50	<0.50	<1	0.53	<0.50	<0.50	114	0.8	<0.50	24	<0.50	--	15.1	<0.50
	05/03/04	<1	<1	<1	<1	<1	<1	<1	22.1	<1	<1	6.74	<1	--	4.21	<1
	11/15/04	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	47	<0.50	<0.50	6.3	<0.50	--	2.9	<0.50
	05/16/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	66.5	<0.50	<0.50	3.59	<0.50	--	1.48	0.77
	11/16/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	25.3	<0.500	<0.500	4.93	<0.500	--	1.66	0.66
	03/14/06	<1	<1	<1	<1	<1	<1	<1	23.1	<1	<1	2.91	<1	--	1.14	1.06
	06/06/06	<1	<1	<1	<1	<1	<1	<1	15.9	<1	<1	3.56	<1	--	1.88	1.06
	12/05/06	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	32.6	<0.50	<0.50	2.84	<0.50	--	1.17	2.85
	09/10/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	40.4	<0.50	<0.50	6.32	<0.50	--	3.7	13.2

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-2(101) (continued)	03/04/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	18.1	<0.500	<0.500	3.4	<0.500	<0.500	1.47	5.64
	09/16/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	20.4	<0.500	<0.500	6.34	<0.500	<0.500	3.5	4.24
	03/24/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	15	<0.50	<0.50	3	<0.50	<0.50	1.5	2.3
	06/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	2.4	<0.50	<0.50	1.2	2.2
	09/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	14	<0.50	<0.50	3.8	<0.50	<0.50	2.1	3.2
	03/17/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7	<0.50	<0.50	3.1	<0.50	<0.50	1.8	1.2
	09/20/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.5	<0.5	<0.5	3	<0.5	<0.5	1.4	1.2
	03/07/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	3.7	<0.50	<0.50	2.2	0.86
	03/08/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.9	<0.50	<0.50	5.9	<0.50	<0.50	4.5	<0.50
	09/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	<0.50	2.7	<0.50	<0.50	1.3	<0.50
	03/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.9	<0.50	<0.50	5.6	<0.50	<0.50	4.4	0.59
	09/16/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	3.6	<0.50	<0.50	2.1	<0.50
	3/18/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.8	<0.50	<0.50	9.1	<0.50	<0.50	6.5	<0.50
	9/23/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.7	<0.50	<0.50	3	<0.50	<0.50	1.5	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	4.4	<0.50	<0.50	2.8	<0.50
	9/22/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.3	<0.50	<0.50	3.8	<0.50	<0.50	2.6	1.2
	3/9/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	7.3	<0.50	<0.50	7.5	<0.50	<0.50	6.1	<0.50
	9/30/2016	<0.50	<2	<0.50	<0.50	<0.50	<0.50	<0.50	6.5	<0.50	<0.50	4.4	<0.50	<0.50	3	<0.50
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	7	<0.5	<0.5	7	<0.5	<0.5	6	<0.5
	9/26/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	5	<0.50	<0.50	0.96	<0.50	<0.50	1	0.9
	11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	2	<0.50	<0.50	2.50	<0.50	<0.50	2	<0.50
	7/1/2018	<0.500	<2.50	<0.500	<0.500	<0.500	<0.500	<0.500	2	<0.500	<0.500	1.82	<0.500	<0.500	1	0.359 J
MGMS3-1(132)	08/30/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	5.58	<1	--	0.746	<0.50
	11/29/00	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	2.04	<0.50	<0.50	0.754	<1	--	<0.50	<0.50
	02/27/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	1.08	<0.50	<0.50	2.62	<1	--	0.722	<0.50
	05/31/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	6.67	<0.50	<0.50	3.13	<1	--	1.44	<0.50
	09/24/01	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	6.1	<0.50	--	1.9	<0.50
	12/18/01	<1	<5	<0.50	<0.50	<0.50	<0.50	<0.50	4.11	<0.50	<0.50	8.75	<1	--	2.24	<0.50
	03/19/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	4.88	<0.50	<0.50	9.63	<0.50	--	3.02	<0.50
	05/29/02	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	11.8	<0.50	<0.50	14.6	<0.50	--	4.28	<0.50
	01/23/03	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	16.8	<0.50	<0.50	11.4	<0.50	--	6.04	<0.50
	05/28/03	<1	<0.50	<0.50	<1	0.59	<0.50	<0.50	93.3	0.76	<0.50	16.3	<0.50	--	10.1	0.83
	11/11/03	<1	<1	<1	<1	<1	<1	<1	72.4	<1	<1	12.2	<1	--	8	<1
	01/27/04	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	34.9	0.61	<0.50	12.7	<0.50	--	9.47	<0.50
	05/03/04	<1	<1	<1	<1	<1	<1	<1	11.9	<1	<1	<1	<1	--	14.2	<1
	11/15/04	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	200	<2.5	<2.5	6.2	<2.5	--	3.4	<2.5

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MGMS3-1(132) (continued)	05/16/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	42.6	0.79	<0.50	4.42	<0.50	--	2.23	<0.50
	11/16/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	19.9	<0.500	<0.500	2.41	<0.500	--	0.8	<0.500
	03/14/06	<1	<1	<1	<1	<1	<1	<1	20.3	<1	<1	2.13	<1	--	<1	<1
	06/06/06	<1	<1	<1	<1	<1	<1	<1	18.6	<1	<1	1.57	<1	--	<1	1.36
	12/05/06	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	24.1	<0.50	<0.50	3.05	<0.50	--	1.08	4.68
	09/10/07	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	36.5	<0.50	<0.50	4.69	<0.50	--	3.17	16.8
	03/04/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	21.8	<0.500	<0.500	3.37	<0.500	<0.500	1.64	6.83
	09/16/08	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	26	<0.500	<0.500	4.86	<0.500	<0.500	3.52	4.96
	03/24/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6.3	<0.50	<0.50	1.8	<0.50	<0.50	0.79	2.4
	03/24/09 DUP	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.8	<0.50	<0.50	1.6	<0.50	<0.50	0.78	2.3
	06/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	12	<0.50	<0.50	4.3	<0.50	<0.50	1.9	1.6
	09/15/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.7	<0.50	<0.50	2.1	<0.50	<0.50	1.2	2
	03/17/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.2	<0.50	<0.50	2.6	<0.50	<0.50	1.9	0.92
	09/20/10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.5	<0.5	<0.5	2.9	<0.5	<0.5	2.3	1.3
	03/07/11	<0.50	<0.50	<0.50	<0.50	0.64	<0.50	<0.50	18	<0.50	<0.50	4	<0.50	<0.50	3.8	4.3
	09/13/11	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.6	<0.50	<0.50	3.8	<0.50	<0.50	3.4	0.55
	03/08/12	<0.50	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	9.3	<0.50	<0.50	7	<0.50	<0.50	6.9	0.67
	09/12/12	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	6	<0.50	<0.50	4.9	<0.50	<0.50	4	<0.50
	03/12/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	9.4	<0.50	<0.50	8.1	<0.50	<0.50	7.2	0.98
	09/16/13	<0.50	<0.50	<0.50	<0.50	0.58	<0.50	<0.50	9.8	<0.50	<0.50	7.9	<0.50	<0.50	8.1	0.84
	3/18/2014	<0.50	<0.50	<0.50	<0.50	0.62	<0.50	0.51	11	<0.50	<0.50	13	<0.50	<0.50	11	0.76
	9/23/2014	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	8.9	<0.50	<0.50	9	<0.50	<0.50	7.9	<0.50
	3/18/2015	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	<0.50	9.3	<0.50	<0.50	6.3	<0.50	<0.50	6	0.56
	9/22/2015	<0.50	<0.50	<0.50	<0.50	0.74	<0.50	<0.50	13.3	<0.50	<0.50	8.1	<0.50	<0.50	8.2	1.2
	3/9/2016	<0.50	<2	<0.50	<0.50	1	<0.50	0.56	14.4	<0.50	<0.50	13.5	0.56	<0.50	12.7	0.8
	9/30/2016	<0.50	<2	<0.50	<0.50	0.84	<0.50	0.54	12.9	<0.50	<0.50	13.8	<0.50	<0.50	11.9	<0.50
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	7.9	<0.5	<0.5	13.8	<0.5	<0.5	9.6	<0.5
	9/26/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<1.0	<0.50	3.4	<0.50	<0.50	3.0	<0.50	<0.50	2.8	<0.50
	11/10/2017	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	<0.50	<0.50	5.1	<0.50	<0.50	3.8	<0.50
	7/1/2018	<0.500	<2.50	<0.500	<0.500	0.247 J	<0.500	<0.500	4.0	<0.500	<0.500	5.6	<0.500	<0.500	4.1	0.359 J
CMT1-1	11/11/03	<1	<1	2.87	<1	<1	<1	<1	<1	<1	<1	<1	<1	--	<1	<1
	01/26/04	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	05/03/04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	--	<1	<1
	08/19/04	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	11/17/04	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	--	<5	<5

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
CMT1-1 (continued)	03/23/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	05/17/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	11/17/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--	<0.500	<0.500
	05/26/06	Well Abandoned														
CMT1-2	11/11/03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	--	<1	<1
	01/26/04	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.75	<0.50	--	1.03	<0.50
	05/03/04	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	--	<1	<1
	08/19/04	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	11/17/04	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	<0.50	--	0.88	<0.50
	02/01/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.37	<0.50	--	0.99	<0.50
	05/16/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.77	<0.50	--	0.69	<0.50
	11/17/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.6	<0.500	--	<0.500	<0.500
	05/26/06	Well Abandoned														
CMT1-3	11/11/03	<2	<2	3.56	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2
	01/26/04	<1	<0.50	1.1	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	05/03/04	<1	<1	2.97	<1	<1	<1	<1	<1	<1	<1	<1	<1	--	<1	<1
	08/19/04	<1	<0.50	2.16	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
	11/17/04	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	--	<25	<25
	05/16/05	<1	<0.50	<0.50	<1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.6	<0.50	--	<0.50	<0.50
	11/17/05	<1	<0.500	<0.500	<1	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--	<0.500	<0.500
	05/26/06	Well Abandoned														
EX	03/23/09	<5	<5	<5	<5	<5	<5	<5	50	<5	<5	1,400	43	<5	420	<5
	06/18/09	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	4.2	<0.50	<0.50	24	1.1	<0.50	11	<0.50
	09/18/09	<0.50	<0.50	<0.50	<0.50	4.1	<0.50	3.3	120	0.76	<0.50	2,100	38	<0.50	380	1.1
	12/18/09	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	5.6	<2.5	<2.5	700	3.7	<2.5	56	<2.5
	03/16/10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	20	<0.50	<0.50	150	3.2	<0.50	33	<0.50
	06/17/10	<0.50	<0.50	<0.50	<0.50	0.97	<0.50	<0.50	92	<0.50	<0.50	150	2.3	<0.50	39	2.2
	09/23/10	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	1.6	90	0.53	<0.5	2,400	20	<0.5	220	1.8
	12/21/10	<0.5	<0.5	<0.5	<0.5	0.83	<0.5	0.59	30	<0.50	<0.5	900	6.7	<0.5	99	0.71
	03/31/11	<4	<4	<4	<4	8.2	<4	8.1	240	<4	<4	6,800	110	<4	910	5.1
	06/07/11	<4	<4	<4	<4	<4	<4	<4	140	<4	<4	1,400	15	<4	170	<4

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
EX (continued)	09/19/11	<5	<5	<5	<5	7.9	<5	11	290	<5	<5	4,100	73	<5	460	14
	12/07/11	<5	<5	<5	<5	16	<5	19	12,000	9.3	<5	<50	17	<5	<50	140
	03/09/12	<4	<4	<4	<4	5	<4	<4	1,400	8.6	<4	33	<4	<4	10	290
	06/22/12	<0.5	5.5	<0.5	<0.5	3.4	<0.5	0.68	170	1.3	<0.5	3	0.59	<0.5	1.1	120
	09/14/12	<1.5	2.7	<1.5	<1.5	1.5	<1.5	<1.5	320	<1.5	<1.5	3	<1.5	<1.5	<1.5	42
	12/14/12	<0.50	1.4	<0.50	<0.50	<0.50	<0.50	<0.50	26	<0.50	<0.50	0.87	<0.50	<0.50	<0.50	12
	03/15/13	<0.50	2.8	<0.50	<0.50	<0.50	<0.50	<0.50	9.5	<0.50	<0.50	1.2	<0.50	<0.50	<0.50	4.4
	06/14/13	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	<0.50	<0.50	0.79	<0.50	<0.50	<0.50	<0.50
	09/20/13	<0.50	1.9	<0.50	<0.50	1.9	<0.50	0.54	71	0.68	<0.50	4.1	<0.50	<0.50	2.6	30
	12/16/13	<0.50	1.4	<0.50	<0.50	3.8	<0.50	<0.50	34	<0.50	<0.50	2	<0.50	<0.50	1.4	28
	3/24/2014	<0.50	<0.50	<0.50	<0.50	0.8	<0.50	<0.50	30	<0.50	<0.50	20	<0.50	<0.50	7.5	11
	6/23/2014	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	1.1	160	0.97	<0.50	29	<0.50	<0.50	15	38
	9/30/2014	Insufficient water for sampling .														
	12/15/2014	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10	<0.50	<0.50	22	<0.50	<0.50	2.7	<0.50
	3/19/2015	<0.50	<0.50	<0.50	<0.50	3.5	<0.50	2.1	688	1.9	<0.50	168	2.5	<0.50	55.8	2.8
	6/18/2015	<0.50	<0.50	<0.50	<0.50	2.6	<0.50	2.6	420	1.6	<0.50	186	0.88	<0.50	42	3.2
	9/22/2015	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	3.7	543	2.6	<0.50	302	0.65	<0.50	61.9	24.4
	12/8/2015	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	427	<0.50	<0.50	94	<0.50	<0.50	21.3	2.1
	3/8/2016	<1.2	<5	<1.2	<1.2	4	<1.2	2.9	1,160	3.6	<1.2	274	5	<1.2	71.1	13.3
	6/17/2016	<5	<20	<5	<5	<5	<5	<5	1,040	<5	<5	592	<5	<5	90.8	<5
	9/28/2016	<1.7	<6.7	<1.7	<1.7	4.6	<1.7	3.5	2,230	3.8	<1.7	39.4	2.5	<1.7	549	128
	12/12/2016	<0.50	3.7	<0.50	<0.50	<0.50	<0.50	<0.50	8.1	<0.50	<0.50	4.3	<0.50	<0.50	0.96	51.9
	3/28/2017	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	5.2	<0.5	<0.5	6.1	<0.5	<0.5	1.9	<0.5
	6/14/2017	<2.0	10.2	<0.50	<0.50	10.7	<1.0	<0.50	11.7	0.56	<0.50	9.5	<0.50	<0.50	3.0	1.3
	9/26/2017	<2.0	3.4	<0.50	<0.50	8.8	<1.0	<0.50	6.9	<0.50	<0.50	0.8	<0.50	<0.50	0.6	10.1
	3/21/2018	<0.500	1.45 J	<0.500	<0.500	1.3	<0.500	<0.500	22.6	<0.500	<0.500	1.5	<0.500	<0.500	2.7	10.8
	6/28/2018	<0.500	42.9	<0.500	<0.500	4.6	<0.500	1.11	722.0	8.72	<0.500	1.9	<0.500	<0.500	0.8	424.0
MP-1	03/23/09	<4	<4	<4	<4	6	<4	<4	89	<4	<4	1,200	10	<4	180	<4
	06/18/09	<4	<4	<4	<4	4.3	<4	<4	43	<4	<4	1,500	12	<4	180	<4
	09/18/09	<4	<4	<4	<4	14	<4	<4	240	8.9	<4	1,100	8.2	<4	310	7.3
	12/18/09	<4	<4	<4	<4	<4	<4	<4	58	<4	<4	1,000	7.1	<4	180	<4
	03/16/10	<3	<3	<3	<3	22	<3	4.7	410	13	<3	1,500	8.6	<3	400	10
	06/17/10	<3	<3	<3	<3	3.2	<3	<3	120	<3	<3	800	5.4	<3	140	<3
	09/23/10	<3	<3	<3	<3	<3	<3	<3	41	<3	<3	730	4	<3	120	<3

Please refer to notes at end of table.

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Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MP-1	12/10/10	<3	<3	<3	<3	<3	<3	<3	27	<3	<3	1,000	4.5	<3	150	<3
(continued)	03/14/11	<3	<3	<3	<3	7.1	<3	<3	150	<3	<3	1,200	6.4	<3	180	5.9
	06/07/11	<2.5	<2.5	<2.5	<2.5	4.9	<2.5	<2.5	75	<2.5	<2.5	640	3.3	<2.5	130	<2.5
	09/19/11	<1.5	<1.5	<1.5	<1.5	2.4	<1.5	<1.5	41	<1.5	<1.5	300	1.9	<1.5	72	1.6
	12/07/11	<2.5	<2.5	<2.5	<2.5	2.6	<2.5	<2.5	49	3.1	<2.5	640	3.1	<2.5	120	<2.5
	03/09/12	<1.5	<1.5	<1.5	<1.5	9.4	<1.5	2.8	440	6.3	<1.5	490	3.5	<1.5	140	21
	06/22/12	<2.5	<2.5	<2.5	<2.5	5.6	<2.5	2.8	530	2.9	<2.5	690	12	<2.5	120	48
	09/14/12	<1.5	<1.5	<1.5	<1.5	4	<1.5	<1.5	170	2.2	<1.5	340	2	<1.5	83	4.5
	12/14/12	<0.90	<0.90	<0.90	<0.90	2	<0.90	<0.90	170	1.7	<0.90	230	1	<0.90	48	1.8
	03/15/13	<0.90	<0.90	<0.90	<0.90	5.1	<0.90	0.94	140	2.5	<0.90	230	1	<0.90	69	1.8
	06/14/13	<0.90	<0.90	<0.90	<0.90	4.5	<0.90	1.4	190	1.6	<0.90	330	1.4	<0.90	70	1.8
	09/20/13	<0.90	<0.90	<0.90	<0.90	2.9	<0.90	<0.90	77	1.5	<0.90	260	0.95	<0.90	66	<0.90
	12/16/13	<0.90	<0.90	<0.90	<0.90	1.7	<0.90	1.1	67	0.92	<0.90	290	1.2	<0.90	70	<0.90
	3/24/2014	<1.5	<1.5	<1.5	<1.5	2.2	<1.5	<1.5	240	<1.5	<1.5	360	1.8	<1.5	54	<1.5
	6/23/2014	<1.5	<1.5	<1.5	<1.5	4.9	<1.5	2.3	290	1.7	<1.5	1,200	9.5	<1.5	130	5
	9/30/2014	<2	<2	<2	<2	2.8	<2	<2	110	<2	<2	360	<2	<2	63	16
	12/15/2014	<1.5	<1.5	<1.5	<1.5	1.7	<1.5	<1.5	58	<1.5	<1.5	320	<1.5	<1.5	59	<1.5
	3/20/2015	<1	<1	<1	<1	3.6	<1	1.5	188	1.5	<1	565	1	<1	95.6	24.8
	6/18/2015	<0.84	<0.84	<0.84	<0.84	2.9	<0.84	1.5	91	0.87	<0.84	376	<0.84	<0.84	80.8	<0.84
	9/22/2015	<1.2	<1.2	<1.2	<1.2	1.8	<1.2	1.4	38.3	<1.2	<1.2	343	<1.2	<1.2	68.3	<1.2
	12/8/2015	<1.2	<1.2	<1.2	<1.2	1.8	<1.2	1.5	50.9	<1.2	<1.2	308	<1.2	<1.2	62.6	<1.2
	3/8/2016	<0.84	<3.3	<0.84	<0.84	7.5	<0.84	2.1	148	1.2	<0.84	433	<0.84	<0.84	100	<0.84
	6/17/2016	<0.50	<2	<0.50	<0.50	5	<0.50	1.5	125	0.97	<0.50	206	<0.50	<0.50	67.3	<0.50

Please refer to notes at end of table.

Cascadia Associates, LLC

Appendix B
Historical Groundwater Analytical Results
NuStar Vancouver Facility
Vancouver, Washington

Well Number	Sample Date	Concentrations in µg/L (ppb)														
		Bromo-form	Chloro-ethane	Chloro-form	Dibromo-chloro-methane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1,1-Dichloro-ethene	cis-1,2-Dichloro-ethene	trans-1,2-Dichloro-ethene	1,2-Dichloro-propane	Tetra-chloro-ethene	1,1,1-Trichloro-ethane	1,1,2-Trichloro-ethane	Trichloro-ethene	Vinyl Chloride
MP-1	9/28/2016	<0.50	<2	<0.50	<0.50	1.3	<0.50	3.1	40.5	<0.50	<0.50	99.4	<0.50	<0.50	35.5	3.3
(continued)	12/13/2016	<0.50	<2	<0.50	<0.50	0.64	<0.50	0.92	209	0.55	<0.50	2.9	<0.50	<0.50	1	4.3
	3/30/2017	<0.5	71.4	<0.5	<0.5	7.5	<0.5	<0.5	177	6	<0.5	<0.5	<0.5	<0.5	0.79	186
	6/14/2017	<2.0	4.0	<0.50	<0.50	2.3	<1.0	<0.50	143	1.9	<0.50	16.2	<0.50	<0.50	8.5	29.4
	9/26/2017	<2.0	<2.0	<0.50	<0.50	3.4	<1.0	4.50	83	0.8	<0.50	307.0	<0.50	<0.50	65.9	2.3
	11/9/2017	<2.0	<2.0	<0.50	<0.50	3.3	<0.50	4.30	105	0.9	<0.50	198.0	<0.50	<0.50	74.0	2.6
	3/21/2018	<0.500	<2.50	<0.500	<0.500	3.2	<0.500	4.04	151	1.0	<0.500	245.0	<0.500	<0.500	64.5	1.6
	6/28/2018	<0.500	<2.50	<0.500	<0.500	10.2	<0.500	9.34	353	1.7	<0.500	747.0	0.56	<0.500	140.0	5.3

Notes:

1. HVOCs = Halogenated volatile organic compounds analysis by U.S. Environmental Protection Agency (EPA) Method 8260B; results reported in micrograms per liter (µg/L).
2. TPH = Total petroleum hydrocarbons in the diesel and heavy oil range analysis by Washington Department of Ecology (WDOE) Method TPH-418.1 Results reported in milligrams per liter (mg/L).
3. -- = Not sampled or not analyzed.
4. < = Not detected at or above the specified laboratory method reporting limit (MRL).
5. B = Estimated concentration based on data quality review - similar detection in associated field blank/equipment blanks (less than 5x difference).
6. J = Estimated concentration based on data quality review.
7. n-Propylbenzene, 1,1,1,2-Tetrachloro-ethane, and 1,1,2-Trichloroethane were detected during the first semi-annual 2008 monitoring event. Refer to Table 3 of the *First Semi-Annual 2008 Groundwater Monitoring Report* for detection concentrations.
8. ND = Not detected and no reporting limit specified.
10. E = Chloroform was detected in the equipment blank during the March 2010 and September 2010 sampling events. Chloroform was flagged with an "E" in samples where the concentration was five times or less than the maximum detection in the equipment blank.

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APPENDIX C

LABORATORY ANALYTICAL REPORTS AND

DATA QUALITY REVIEW (ON CD)

1.0 INTRODUCTION

This appendix documents the results of a quality assurance/quality control (QA/QC) review of the analytical data for groundwater samples collected during the March and June/July 2018 groundwater sampling events, and air samples collected during the January through May 2018 soil vapor extraction (SVE) effluent sampling events. The samples were collected at the NuStar Terminals Services, Inc. (NuStar) Vancouver Facility (Facility) in Vancouver, Washington. TestAmerica Laboratories in West Sacramento, California, Pace Analytical (Pace) in Mt. Juliet, Tennessee, and ALS Group USA, Corp. of Kelso, Washington performed the analyses. A list of the laboratory reports is presented below. A copy of each analytical laboratory report is included in this appendix.

Report	Report Date	Sampling Event
K1802564	April 3, 2018	First Quarter Groundwater Monitoring
K1802604	April 9, 2018	First Quarter Groundwater Monitoring
K1802664.01	July 19, 2018	First Quarter Groundwater Monitoring
K1802744	April 11, 2018	First Quarter Groundwater Monitoring
L980397	April 3, 2018	First Quarter Groundwater Monitoring
10438422	July 16, 2018	Second Quarter Groundwater Monitoring
K1806113	July 12, 2018	Second Quarter Groundwater Monitoring
K1806163	July 19, 2018	Second Quarter Groundwater Monitoring
K1806179	July 13, 2018	Second Quarter Groundwater Monitoring
K1806193	July 12, 2018	Second Quarter Groundwater Monitoring
K1806242	July 12, 2018	Second Quarter Groundwater Monitoring
L1007508	July 13, 2018	Second Quarter Groundwater Monitoring
J35385-1	February 8, 2018	January SVE Monitoring
J36671-1	March 19, 2018	February SVE Monitoring
J37748-1	April 20, 2018	March SVE Monitoring
J38487-1	May 10, 2018	April SVE Monitoring
J39464-1	May 29, 2018	May SVE Monitoring

2.0 DATA VALIDATION

The QA review outlines the applicable quality control criteria utilized during the data review process, as well as any deviations from those criteria. Examination and validation of the laboratory summary reports include:

- Analytical preparation and quantitation methods
- Analytical method holding times
- Sample handling
- Chain of custody handling
- Detection and reporting limits
- Method blank, field blank, equipment blank and trip blank detections
- Laboratory control samples, matrix spikes and surrogates to assess laboratory accuracy
- Laboratory control sample duplicates, matrix spike duplicates and laboratory duplicates to assess laboratory precision
- Field duplicates to assess sampling and laboratory precision

The QA review did not include a review of raw data.

3.0 ANALYTICAL METHODS

Chemical analyses for water samples consisted of volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B. Select groundwater samples were also analyzed for total organic carbon (TOC) by EPA Method 5310, ethene by EPA Method RSK-175M, ammonia as nitrogen by EPA Method 350.1 and nitrate as nitrogen and nitrite as nitrogen by EPA Method 300.0. SVE effluent vapor samples were analyzed for VOCs using EPA Method TO-15.

4.0 QUALITY ASSURANCE OBJECTIVES AND REVIEW

The general QA objectives for this project were to develop and implement procedures for obtaining, evaluating, and confirming the usability of data of a specified quality for monitoring groundwater quality trends and SVE monitoring data at the Facility. To collect such information, analytical data must have an appropriate degree of accuracy and reproducibility, samples collected must be representative of actual field conditions, and samples must be collected and analyzed using unbroken chain-of-custody procedures.

Reporting limits and analytical results were compared to action levels for each parameter in the media of concern. Precision, accuracy, representativeness, completeness, and comparability parameters used to indicate data quality are defined below.

Sample Receipt. Samples were received by the laboratory in good condition and on ice. VOA containers for VOC analysis arrived without headspace.

Reporting Limits. Detection limits are set by the laboratory and are based on instrumentation abilities, sample matrix, and suggested detection limits by the EPA or the Washington State Department of Ecology (Ecology). In some cases, the detection limits may be raised due to high concentrations of analytes in the samples or matrix interferences. Detection limits were generally consistent with industry standards and below promulgated regulatory standards when possible (if not raised, as previously discussed). Reporting limits were reviewed and are generally acceptable for this project. Reporting limits for individual samples are varied based on the magnitude of the chemical impact. It is not expected that any of the raised detection limits compromise the usability of the data.

Holding Times. Samples EX-1, MP-1, MW-14, MW-19, and MW-24i that were collected during the June 2018 sampling event and analyzed via Method RSK 175 (report 10438422) were analyzed slightly beyond the recommended method holding time. The results may be biased low; however, given the qualitative use of the data for verifying the successful reductive dechlorination of chlorinated VOCs, the data are sufficient for the intended use.

Samples MW-8, MW-9, MW-10, MW-14, MW-17, MW-19, MW-21i-105, MW-24i, MW-26, EX-1, S-1, S-2, MP-1, and MP-3 (report K1806163) and samples MW-10, MW-14, MW-17, MW-19, and MP-3 (K1806179) were initially analyzed for nitrate by method Method 300.0 within the recommended holding time, but were over-diluted by the laboratory (or were over range in the case of MW-10 for nitrate as nitrogen analysis). The affected samples were re-diluted and reanalyzed slightly beyond the recommended holding time of 48 hours. In the presence of oxygen, nitrite will oxidize to nitrate, resulting in low biased results for nitrite and high-biased results for nitrate. Historical analyses of the samples from the same wells (within recommended holding times) indicated proportionately low concentrations of nitrite relative to nitrate. Therefore, we can assume that any nitrite available to oxidize to nitrate (outside of the recommended hold time) was limited. Furthermore, field staff were cognizant of limiting headspace while collecting the nitrite/nitrate samples by filling the container completely and tightly sealing the lid. The absence of headspace in sample containers limits the oxygen present to support oxidation of nitrite to nitrate. For the reasons discussed above, the nitrate data i reports K1806163 and K1806179 are considered sufficient for the intended use.

Calibration and Analysis. Calibration verification was outside of acceptable limits for select VOCs (chloromethane, trans-1-4-Dichloro-2—butene, and vinyl acetate) in sample batch WG1090159

(affecting samples EX, MGMS1-43, MGMS1-60, MGMS2-40, MGMS2-60, MGMS3-40, MGMS3-60, MP-1, MW-1, MW-3, MW-5, MW-7, MW-7 DUP, MW-8, MW-9, MW-12, MW-12 DUP, MW-13, MW-14, MW-16, MW-18i, MW-19, MW-19 DUP, MW-19i, MW-20i, MW-21i-40, MW-21i-105, MW-22i, MW-23i, MW-24i, MW-24D, MW-25i, MW-26, MW-32S, S-1, and S-2; report L980397). As the corresponding sample results are all below method reporting limits, and are not considered COCs for this project, no data were flagged. All other calibrations were within the control limits for analytes presented in Table 3.

Method Blanks. A method, or laboratory, blank is a sample prepared in the laboratory along with the actual samples and analyzed for the same parameters at the same time. It is used to assess if detected contaminants may have been the result of contamination of the samples in the laboratory. In sample batch WG1135547 (report L1007508), cis-1,2-dichloroethene was detected in the method blank at a concentration above the method detection limit (MDL) but below the reported detection limit (RDL). Samples with reported concentrations of cis-1,2-dichloroethene were flagged with a "B" qualifier (affecting samples EW-1 and MW-25i). In sample batch WG1090261 (report L980397; March 2018 event), TOC was detected in the method blank at concentrations higher than the MDL but below the RDL. Primary samples with reported concentrations of TOC were flagged (sample MW-24i) with a "B" qualifier. No other analytes were detected in the laboratory method blanks for the groundwater or air analyses.

Laboratory Control Samples and Laboratory Control Sample Duplicate. Laboratory Control Samples (LCS) were analyzed to assess the accuracy of the analytical equipment and methods. LCS are prepared from an analyte-free matrix that is then spiked with known levels of the constituents of interest (COI; i.e., a standard). The concentrations are measured, and the results compared to the known spiked levels. This comparison is expressed as percent recovery.

In QC sample batch WG1090423 (report L980397), the LCS was above the recovery limits for various VOC analytes. The affected analytes were not detected in the primary samples and are not contaminants of interest; therefore, the LCS recovery exceedances do not affect the primary sample data. The quality control range for precision was exceeded for various VOCs in sample batches WG1135547, WG1135361, and WG1135361 (report L1007508). The associated MS and MSD samples were within acceptable recovery limits; therefore, the precision of the analysis was considered acceptable and no data were flagged. In sample run 221728 (air sample report J38487-1), benzyl chloride had lower recovery than recommended limits and chloroethane had higher recovery than recommended limits; these analytes were not detected in the associated batch samples and have not been flagged.

Matrix Spike Analyses. A matrix spike QC sample is used to assess the performance of the analytical method by determining potential matrix interferences. Matrix spike (MS) and matrix spike duplicate (MSD) analyses are performed on one environmental sample per analytical batch. A

matrix spike sample uses an environmental sample that is spiked with known concentrations of analytes of interest. The matrix spike is then prepared and analyzed with the same analytical procedures as environmental samples in the analytical batch. The resulting concentration of the matrix spike is then compared to the known - or true - values plus the non-spiked environmental sample concentration. This comparison is expressed as a percent recovery. The matrix spike duplicate is then compared to the matrix spike of the same batch and expressed as a relative percent difference (RPD) value. The percent recovery and RPD values are then compared to control limits to assess data quality.

The detected concentration of nitrate in the MSD for sample MW-24i exceeded the upper control limit due to suspected matrix interference (report K1802664.01). The reported concentration of nitrate in sample MW-24i may be biased high. The recovered concentrations of various VOCs in the MS and MSD samples in batch WG1090159 (report L980397) were below acceptable limits due to matrix interference. The corresponding LCS/LCSD sample results were within control limits, indicating the accuracy of the sample process was acceptable.

The RPD for the MS and MSD sample 2984934 (report 10438422) exceeded the acceptable recovery limit for the analysis of ethane, ethene, and methane. The results of the corresponding matrix spike/matrix spike duplicate analyses were within the recommended control limits; therefore, the data are considered acceptable for use. Furthermore, the RPD between the corresponding LCS and LCS samples was within the acceptable recovery limits, indicating that the precision of the analysis process was acceptable.

No MS or MSD samples were analyzed as part of the air sample QC batch.

Surrogate Recovery. Surrogates are organic compounds that are similar in chemical composition to the COI and spiked into environmental and batch quality control samples prior to sample preparation and analysis. Surrogate recoveries for environmental samples are used to evaluate matrix interference on a sample-specific basis. Surrogate recoveries were within acceptable control limits for samples with the exception of 4-Bromofluorobenzene in sample MW-13 (report L1007508) which had a slightly lower recovery (79.7%) than lower control limits (80%). The surrogate recovery was effectively equal to the lower recovery limit; therefore, the associated sample data are considered acceptable.

Laboratory Duplicate. A laboratory duplicate is a second analysis of an environmental sample received by the laboratory, which serves as an internal check on laboratory quality as well as potential variability of the sample matrix. The laboratory duplicate concentration is compared to the primary sample concentration to assess the precision of the analytical method. This comparison can be expressed by the RPD between the original and duplicate samples. Laboratory duplicate sample RPD values were within recommended control limits.

Field Duplicate. A field duplicate is a second field sample collected from a selected monitoring point. Field duplicate samples serve as a check on laboratory quality as well as potential variability of the sample matrix. The field duplicate is analyzed and compared with the primary sample to assess the precision of the analytical method. This comparison can be expressed by the RPD between the primary and duplicate samples. With the exception of vinyl chloride in the duplicate sample for MGMS3-3 (4), which was collected during the June 2018 sampling event, the field duplicate sample RPD values were within recommended limits. The RPD between vinyl chloride concentrations in the associated LCS and LCSD samples was also out of recommended limits, suggesting that the analytical method is the source of imprecision, rather than sample heterogeneity. No data were flagged.

Field Blank. A field blank is a sample of analyte-free water poured into a clean sample container in the field, preserved, and shipped to the laboratory with field samples. Field blanks assess the potential for contamination from field conditions during sampling. FB-032018, FB-032118, and FB-032218 (report L980397; 1Q18) contained concentrations of chloroform above the MDL but below the RDL. Chloroform was detected in samples MW-26, EW-1 and MW-3 during the March 2018 sampling event. Chloroform is not a COI at the Facility; however, it is a common laboratory solvent. The sample data were not flagged. No other analytes were identified in the field blanks collected during the first and second quarter 2018 monitoring events.

Equipment Blank. An equipment blank is a sample of analyte-free water poured over or through decontaminated field sampling equipment during a sampling event. Equipment blanks assess the potential for contamination from the sampling, sample preparation, and measurement processes. With the exception of chloroform identified in the equipment blank (report L980397; March 2018 event), no analytes were identified in the equipment blanks collected during the first and second quarter 2018 monitoring events. Chloroform was also reported in the field blank. As discussed above, chloroform is not a COI, but it is a common laboratory solvent. The detection of chloroform in the equipment blank is not considered significant for data interpretation.

Trip Blank. A trip blank is a sample of analyte-free water that is transported from the laboratory to the sampling site and transported back to the laboratory without having been exposed to sampling procedures. Trip blanks assess contamination introduced during shipping and field-handling activities. Trip blank samples did not contain analytes above the laboratory reporting limit.

Conclusion. In conclusion, the overall QA objectives have been met, and the data are of adequate quality for use in this project.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-35385-1
Client Project/Site: NuStar Vancouver REM

For:
Apex Companies LLC
3015 SW 1st Avenue
Portland, Oregon 97201

Attn: Heather Gosack

Authorized for release by:
2/8/2018 12:18:04 PM
Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

Designee for

Cathy Gamble, Project Manager I
(253)922-2310
cathy.gamble@testamericainc.com

Table of Contents

Glossary

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

Case Narrative

Client: Apex Companies LLC
Project/Site: NuStar Vancouver REM

TestAmerica Job ID: 320-35385-1

Job ID: 320-35385-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-35385-1

Comments
No additional comments.

Receipt
The samples were received on 1/25/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice.

Receipt Exceptions
The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. #2 canister ID is 34000184, while on COC client used not TA-SAC ID#.

Air - GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

Detection Summary

Client: Apex Companies LLC
Project/Site: NuStar Vancouver REM

TestAmerica Job ID: 320-35385-1

Client Sample ID: SVE_South_Precarbon_012218 — Lab Sample ID: 320-35385-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	37		37		ppb v/v	92.8		TO-15	Total/NA
Tetrachloroethene	1800		37		ppb v/v	92.8		TO-15	Total/NA
Trichloroethene	73		37		ppb v/v	92.8		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	150		150		ug/m3 Air	92.8		TO-15	Total/NA
Tetrachloroethene	13000		250		ug/m3 Air	92.8		TO-15	Total/NA
Trichloroethene	390		200		ug/m3 Air	92.8		TO-15	Total/NA

Client Sample ID: SVE_South_Postcarbon_012218 — Lab Sample ID: 320-35385-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	2.0		0.61		ppb v/v	2.04		TO-15	Total/NA
1,1-Dichloroethane	1.1		0.61		ppb v/v	2.04		TO-15	Total/NA
cis-1,2-Dichloroethene	96		0.82		ppb v/v	2.04		TO-15	Total/NA
Tetrachloroethene	1.2		0.82		ppb v/v	2.04		TO-15	Total/NA
Trichloroethene	3.0		0.82		ppb v/v	2.04		TO-15	Total/NA
Vinyl chloride	0.82		0.82		ppb v/v	2.04		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	11		3.3		ug/m3 Air	2.04		TO-15	Total/NA
1,1-Dichloroethane	4.3		2.5		ug/m3 Air	2.04		TO-15	Total/NA
cis-1,2-Dichloroethene	380		3.2		ug/m3 Air	2.04		TO-15	Total/NA
Tetrachloroethene	8.1		5.5		ug/m3 Air	2.04		TO-15	Total/NA
Trichloroethene	16		4.4		ug/m3 Air	2.04		TO-15	Total/NA
Vinyl chloride	2.1		2.1		ug/m3 Air	2.04		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: SVE_South_Precarbon_012218
Lab Sample ID: 320-35385-1
Date Collected: 01/22/18 07:51
Matrix: Air
Date Received: 01/25/18 09:30
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		28		ppb v/v			02/06/18 21:04	92.8
1,1,2,2-Tetrachloroethane	ND		37		ppb v/v			02/06/18 21:04	92.8
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		37		ppb v/v			02/06/18 21:04	92.8
1,1,2-Trichloroethane	ND		37		ppb v/v			02/06/18 21:04	92.8
1,1-Dichloroethane	ND		28		ppb v/v			02/06/18 21:04	92.8
1,1-Dichloroethene	ND		74		ppb v/v			02/06/18 21:04	92.8
1,2,4-Trichlorobenzene	ND		190		ppb v/v			02/06/18 21:04	92.8
1,2,4-Trimethylbenzene	ND		74		ppb v/v			02/06/18 21:04	92.8
1,2-Dibromoethane (EDB)	ND		74		ppb v/v			02/06/18 21:04	92.8
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		37		ppb v/v			02/06/18 21:04	92.8
1,2-Dichlorobenzene	ND		37		ppb v/v			02/06/18 21:04	92.8
1,2-Dichloroethane	ND		74		ppb v/v			02/06/18 21:04	92.8
1,2-Dichloropropane	ND		37		ppb v/v			02/06/18 21:04	92.8
1,3,5-Trimethylbenzene	ND		37		ppb v/v			02/06/18 21:04	92.8
1,3-Dichlorobenzene	ND		37		ppb v/v			02/06/18 21:04	92.8
1,4-Dichlorobenzene	ND		37		ppb v/v			02/06/18 21:04	92.8
2-Butanone (MEK)	ND		74		ppb v/v			02/06/18 21:04	92.8
2-Hexanone	ND		37		ppb v/v			02/06/18 21:04	92.8
4-Ethyltoluene	ND		37		ppb v/v			02/06/18 21:04	92.8
4-Methyl-2-pentanone (MIBK)	ND		37		ppb v/v			02/06/18 21:04	92.8
Acetone	ND		460		ppb v/v			02/06/18 21:04	92.8
Benzene	ND		37		ppb v/v			02/06/18 21:04	92.8
Benzyl chloride	ND		74		ppb v/v			02/06/18 21:04	92.8
Bromodichloromethane	ND		28		ppb v/v			02/06/18 21:04	92.8
Bromoform	ND		37		ppb v/v			02/06/18 21:04	92.8
Bromomethane	ND		74		ppb v/v			02/06/18 21:04	92.8
Carbon disulfide	ND		74		ppb v/v			02/06/18 21:04	92.8
Carbon tetrachloride	ND		74		ppb v/v			02/06/18 21:04	92.8
Chlorobenzene	ND		28		ppb v/v			02/06/18 21:04	92.8
Chloroethane	ND		74		ppb v/v			02/06/18 21:04	92.8
Chloroform	ND		28		ppb v/v			02/06/18 21:04	92.8
Chloromethane	ND		74		ppb v/v			02/06/18 21:04	92.8
cis-1,2-Dichloroethene	**37**		37		ppb v/v			02/06/18 21:04	92.8
cis-1,3-Dichloropropene	ND		37		ppb v/v			02/06/18 21:04	92.8
Dibromochloromethane	ND		37		ppb v/v			02/06/18 21:04	92.8
Dichlorodifluoromethane	ND		37		ppb v/v			02/06/18 21:04	92.8
Ethylbenzene	ND		37		ppb v/v			02/06/18 21:04	92.8
Hexachlorobutadiene	ND		190		ppb v/v			02/06/18 21:04	92.8
m,p-Xylene	ND		74		ppb v/v			02/06/18 21:04	92.8
Methylene Chloride	ND		37		ppb v/v			02/06/18 21:04	92.8
o-Xylene	ND		37		ppb v/v			02/06/18 21:04	92.8
Styrene	ND		37		ppb v/v			02/06/18 21:04	92.8
Tetrachloroethene	**1800**		37		ppb v/v			02/06/18 21:04	92.8
Toluene	ND		37		ppb v/v			02/06/18 21:04	92.8
trans-1,2-Dichloroethene	ND		37		ppb v/v			02/06/18 21:04	92.8
trans-1,3-Dichloropropene	ND		37		ppb v/v			02/06/18 21:04	92.8
Trichloroethene	**73**		37		ppb v/v			02/06/18 21:04	92.8
Trichlorofluoromethane	ND		37		ppb v/v			02/06/18 21:04	92.8

Client Sample ID: SVE_South_Precarbon_012218
Lab Sample ID: 320-35385-1
Date Collected: 01/22/18 07:51
Matrix: Air
Date Received: 01/25/18 09:30
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl acetate	ND		74		ppb v/v			02/06/18 21:04	92.8
Vinyl chloride	ND		37		ppb v/v			02/06/18 21:04	92.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		150		ug/m3 Air			02/06/18 21:04	92.8
1,1,2,2-Tetrachloroethane	ND		250		ug/m3 Air			02/06/18 21:04	92.8
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		280		ug/m3 Air			02/06/18 21:04	92.8
1,1,2-Trichloroethane	ND		200		ug/m3 Air			02/06/18 21:04	92.8
1,1-Dichloroethane	ND		110		ug/m3 Air			02/06/18 21:04	92.8
1,1-Dichloroethene	ND		290		ug/m3 Air			02/06/18 21:04	92.8
1,2,4-Trichlorobenzene	ND		1400		ug/m3 Air			02/06/18 21:04	92.8
1,2,4-Trimethylbenzene	ND		360		ug/m3 Air			02/06/18 21:04	92.8
1,2-Dibromoethane (EDB)	ND		570		ug/m3 Air			02/06/18 21:04	92.8
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		260		ug/m3 Air			02/06/18 21:04	92.8
1,2-Dichlorobenzene	ND		220		ug/m3 Air			02/06/18 21:04	92.8
1,2-Dichloroethane	ND		300		ug/m3 Air			02/06/18 21:04	92.8
1,2-Dichloropropane	ND		170		ug/m3 Air			02/06/18 21:04	92.8
1,3,5-Trimethylbenzene	ND		180		ug/m3 Air			02/06/18 21:04	92.8
1,3-Dichlorobenzene	ND		220		ug/m3 Air			02/06/18 21:04	92.8
1,4-Dichlorobenzene	ND		220		ug/m3 Air			02/06/18 21:04	92.8
2-Butanone (MEK)	ND		220		ug/m3 Air			02/06/18 21:04	92.8
2-Hexanone	ND		150		ug/m3 Air			02/06/18 21:04	92.8
4-Ethyltoluene	ND		180		ug/m3 Air			02/06/18 21:04	92.8
4-Methyl-2-pentanone (MIBK)	ND		150		ug/m3 Air			02/06/18 21:04	92.8
Acetone	ND		1100		ug/m3 Air			02/06/18 21:04	92.8
Benzene	ND		120		ug/m3 Air			02/06/18 21:04	92.8
Benzyl chloride	ND		380		ug/m3 Air			02/06/18 21:04	92.8
Bromodichloromethane	ND		190		ug/m3 Air			02/06/18 21:04	92.8
Bromoform	ND		380		ug/m3 Air			02/06/18 21:04	92.8
Bromomethane	ND		290		ug/m3 Air			02/06/18 21:04	92.8
Carbon disulfide	ND		230		ug/m3 Air			02/06/18 21:04	92.8
Carbon tetrachloride	ND		470		ug/m3 Air			02/06/18 21:04	92.8
Chlorobenzene	ND		130		ug/m3 Air			02/06/18 21:04	92.8
Chloroethane	ND		200		ug/m3 Air			02/06/18 21:04	92.8
Chloroform	ND		140		ug/m3 Air			02/06/18 21:04	92.8
Chloromethane	ND		150		ug/m3 Air			02/06/18 21:04	92.8
cis-1,2-Dichloroethene	**150**		150		ug/m3 Air			02/06/18 21:04	92.8
cis-1,3-Dichloropropene	ND		170		ug/m3 Air			02/06/18 21:04	92.8
Dibromochloromethane	ND		320		ug/m3 Air			02/06/18 21:04	92.8
Dichlorodifluoromethane	ND		180		ug/m3 Air			02/06/18 21:04	92.8
Ethylbenzene	ND		160		ug/m3 Air			02/06/18 21:04	92.8
Hexachlorobutadiene	ND		2000		ug/m3 Air			02/06/18 21:04	92.8
m,p-Xylene	ND		320		ug/m3 Air			02/06/18 21:04	92.8
Methylene Chloride	ND		130		ug/m3 Air			02/06/18 21:04	92.8
o-Xylene	ND		160		ug/m3 Air			02/06/18 21:04	92.8
Styrene	ND		160		ug/m3 Air			02/06/18 21:04	92.8
Tetrachloroethene	**13000**		250		ug/m3 Air			02/06/18 21:04	92.8
Toluene	ND		140		ug/m3 Air			02/06/18 21:04	92.8
trans-1,2-Dichloroethene	ND		150		ug/m3 Air			02/06/18 21:04	92.8

Client Sample ID: SVE_South_Precarbon_012218

Lab Sample ID: 320-35385-1
Matrix: Air
Date Collected: 01/22/18 07:51
Date Received: 01/25/18 09:30
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		170		ug/m3 Air			02/06/18 21:04	92.8
Trichloroethene	**390**		200		ug/m3 Air			02/06/18 21:04	92.8
Trichlorofluoromethane	ND		210		ug/m3 Air			02/06/18 21:04	92.8
Vinyl acetate	ND		260		ug/m3 Air			02/06/18 21:04	92.8
Vinyl chloride	ND		95		ug/m3 Air			02/06/18 21:04	92.8

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 130*		*02/06/18 21:04*	*92.8*
4-Bromofluorobenzene (Surr)	*77*		*70 - 130*		*02/06/18 21:04*	*92.8*
Toluene-d8 (Surr)	*92*		*70 - 130*		*02/06/18 21:04*	*92.8*

Client Sample ID: SVE_South_Postcarbon_012218

Lab Sample ID: 320-35385-2
Matrix: Air
Date Collected: 01/22/18 07:53
Date Received: 01/25/18 09:30
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**2.0**		0.61		ppb v/v			02/05/18 23:47	2.04
1,1,2,2-Tetrachloroethane	ND		0.82		ppb v/v			02/05/18 23:47	2.04
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.82		ppb v/v			02/05/18 23:47	2.04
1,1,2-Trichloroethane	ND		0.82		ppb v/v			02/05/18 23:47	2.04
1,1-Dichloroethane	**1.1**		0.61		ppb v/v			02/05/18 23:47	2.04
1,1-Dichloroethene	ND		1.6		ppb v/v			02/05/18 23:47	2.04
1,2,4-Trichlorobenzene	ND		4.1		ppb v/v			02/05/18 23:47	2.04
1,2,4-Trimethylbenzene	ND		1.6		ppb v/v			02/05/18 23:47	2.04
1,2-Dibromoethane (EDB)	ND		1.6		ppb v/v			02/05/18 23:47	2.04
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.82		ppb v/v			02/05/18 23:47	2.04
1,2-Dichlorobenzene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
1,2-Dichloroethane	ND		1.6		ppb v/v			02/05/18 23:47	2.04
1,2-Dichloropropane	ND		0.82		ppb v/v			02/05/18 23:47	2.04
1,3,5-Trimethylbenzene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
1,3-Dichlorobenzene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
1,4-Dichlorobenzene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
2-Butanone (MEK)	ND		1.6		ppb v/v			02/05/18 23:47	2.04
2-Hexanone	ND		0.82		ppb v/v			02/05/18 23:47	2.04
4-Ethyltoluene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
4-Methyl-2-pentanone (MIBK)	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Acetone	ND		10		ppb v/v			02/05/18 23:47	2.04
Benzene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Benzyl chloride	ND		1.6		ppb v/v			02/05/18 23:47	2.04
Bromodichloromethane	ND		0.61		ppb v/v			02/05/18 23:47	2.04
Bromoform	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Bromomethane	ND		1.6		ppb v/v			02/05/18 23:47	2.04
Carbon disulfide	ND		1.6		ppb v/v			02/05/18 23:47	2.04
Carbon tetrachloride	ND		1.6		ppb v/v			02/05/18 23:47	2.04
Chlorobenzene	ND		0.61		ppb v/v			02/05/18 23:47	2.04
Chloroethane	ND		1.6		ppb v/v			02/05/18 23:47	2.04
Chloroform	ND		0.61		ppb v/v			02/05/18 23:47	2.04

Client Sample ID: SVE_South_Postcarbon_012218
Lab Sample ID: 320-35385-2
Date Collected: 01/22/18 07:53
Matrix: Air
Date Received: 01/25/18 09:30
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		1.6		ppb v/v			02/05/18 23:47	2.04
cis-1,2-Dichloroethene	**96**		0.82		ppb v/v			02/05/18 23:47	2.04
cis-1,3-Dichloropropene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Dibromochloromethane	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Dichlorodifluoromethane	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Ethylbenzene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Hexachlorobutadiene	ND		4.1		ppb v/v			02/05/18 23:47	2.04
m,p-Xylene	ND		1.6		ppb v/v			02/05/18 23:47	2.04
Methylene Chloride	ND		0.82		ppb v/v			02/05/18 23:47	2.04
o-Xylene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Styrene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Tetrachloroethene	**1.2**		0.82		ppb v/v			02/05/18 23:47	2.04
Toluene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
trans-1,2-Dichloroethene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
trans-1,3-Dichloropropene	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Trichloroethene	**3.0**		0.82		ppb v/v			02/05/18 23:47	2.04
Trichlorofluoromethane	ND		0.82		ppb v/v			02/05/18 23:47	2.04
Vinyl acetate	ND		1.6		ppb v/v			02/05/18 23:47	2.04
Vinyl chloride	**0.82**		0.82		ppb v/v			02/05/18 23:47	2.04

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**11**		3.3		ug/m3 Air			02/05/18 23:47	2.04
1,1,2,2-Tetrachloroethane	ND		5.6		ug/m3 Air			02/05/18 23:47	2.04
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		6.3		ug/m3 Air			02/05/18 23:47	2.04
1,1,2-Trichloroethane	ND		4.5		ug/m3 Air			02/05/18 23:47	2.04
1,1-Dichloroethane	**4.3**		2.5		ug/m3 Air			02/05/18 23:47	2.04
1,1-Dichloroethene	ND		6.5		ug/m3 Air			02/05/18 23:47	2.04
1,2,4-Trichlorobenzene	ND		30		ug/m3 Air			02/05/18 23:47	2.04
1,2,4-Trimethylbenzene	ND		8.0		ug/m3 Air			02/05/18 23:47	2.04
1,2-Dibromoethane (EDB)	ND		13		ug/m3 Air			02/05/18 23:47	2.04
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		5.7		ug/m3 Air			02/05/18 23:47	2.04
1,2-Dichlorobenzene	ND		4.9		ug/m3 Air			02/05/18 23:47	2.04
1,2-Dichloroethane	ND		6.6		ug/m3 Air			02/05/18 23:47	2.04
1,2-Dichloropropane	ND		3.8		ug/m3 Air			02/05/18 23:47	2.04
1,3,5-Trimethylbenzene	ND		4.0		ug/m3 Air			02/05/18 23:47	2.04
1,3-Dichlorobenzene	ND		4.9		ug/m3 Air			02/05/18 23:47	2.04
1,4-Dichlorobenzene	ND		4.9		ug/m3 Air			02/05/18 23:47	2.04
2-Butanone (MEK)	ND		4.8		ug/m3 Air			02/05/18 23:47	2.04
2-Hexanone	ND		3.3		ug/m3 Air			02/05/18 23:47	2.04
4-Ethyltoluene	ND		4.0		ug/m3 Air			02/05/18 23:47	2.04
4-Methyl-2-pentanone (MIBK)	ND		3.3		ug/m3 Air			02/05/18 23:47	2.04
Acetone	ND		24		ug/m3 Air			02/05/18 23:47	2.04
Benzene	ND		2.6		ug/m3 Air			02/05/18 23:47	2.04
Benzyl chloride	ND		8.4		ug/m3 Air			02/05/18 23:47	2.04
Bromodichloromethane	ND		4.1		ug/m3 Air			02/05/18 23:47	2.04
Bromoform	ND		8.4		ug/m3 Air			02/05/18 23:47	2.04
Bromomethane	ND		6.3		ug/m3 Air			02/05/18 23:47	2.04
Carbon disulfide	ND		5.1		ug/m3 Air			02/05/18 23:47	2.04
Carbon tetrachloride	ND		10		ug/m3 Air			02/05/18 23:47	2.04

Client: Apex Companies LLC
Project/Site: NuStar Vancouver REM

TestAmerica Job ID: 320-35385-1

Client Sample ID: SVE_South_Postcarbon_012218
Lab Sample ID: 320-35385-2
Date Collected: 01/22/18 07:53
Matrix: Air
Date Received: 01/25/18 09:30
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorobenzene	ND		2.8		ug/m3 Air			02/05/18 23:47	2.04
Chloroethane	ND		4.3		ug/m3 Air			02/05/18 23:47	2.04
Chloroform	ND		3.0		ug/m3 Air			02/05/18 23:47	2.04
Chloromethane	ND		3.4		ug/m3 Air			02/05/18 23:47	2.04
cis-1,2-Dichloroethene	**380**		3.2		ug/m3 Air			02/05/18 23:47	2.04
cis-1,3-Dichloropropene	ND		3.7		ug/m3 Air			02/05/18 23:47	2.04
Dibromochloromethane	ND		7.0		ug/m3 Air			02/05/18 23:47	2.04
Dichlorodifluoromethane	ND		4.0		ug/m3 Air			02/05/18 23:47	2.04
Ethylbenzene	ND		3.5		ug/m3 Air			02/05/18 23:47	2.04
Hexachlorobutadiene	ND		44		ug/m3 Air			02/05/18 23:47	2.04
m,p-Xylene	ND		7.1		ug/m3 Air			02/05/18 23:47	2.04
Methylene Chloride	ND		2.8		ug/m3 Air			02/05/18 23:47	2.04
o-Xylene	ND		3.5		ug/m3 Air			02/05/18 23:47	2.04
Styrene	ND		3.5		ug/m3 Air			02/05/18 23:47	2.04
Tetrachloroethene	**8.1**		5.5		ug/m3 Air			02/05/18 23:47	2.04
Toluene	ND		3.1		ug/m3 Air			02/05/18 23:47	2.04
trans-1,2-Dichloroethene	ND		3.2		ug/m3 Air			02/05/18 23:47	2.04
trans-1,3-Dichloropropene	ND		3.7		ug/m3 Air			02/05/18 23:47	2.04
Trichloroethene	**16**		4.4		ug/m3 Air			02/05/18 23:47	2.04
Trichlorofluoromethane	ND		4.6		ug/m3 Air			02/05/18 23:47	2.04
Vinyl acetate	ND		5.7		ug/m3 Air			02/05/18 23:47	2.04
Vinyl chloride	**2.1**		2.1		ug/m3 Air			02/05/18 23:47	2.04

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 130*		*02/05/18 23:47*	*2.04*
4-Bromofluorobenzene (Surr)	*79*		*70 - 130*		*02/05/18 23:47*	*2.04*
Toluene-d8 (Surr)	*90*		*70 - 130*		*02/05/18 23:47*	*2.04*

Surrogate Summary

Client: Apex Companies LLC
Project/Site: NuStar Vancouver REM

TestAmerica Job ID: 320-35385-1

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		DCA	BFB	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
320-35385-1	SVE_South_Precarbon_012218	106	77	92
320-35385-2	SVE_South_Postcarbon_012218	105	79	90
LCS 320-206850/4	Lab Control Sample	110	107	98
LCS 320-207162/4	Lab Control Sample	108	105	94
LCSD 320-206850/5	Lab Control Sample Dup	109	104	95
LCSD 320-207162/5	Lab Control Sample Dup	106	106	95
MB 320-206850/9	Method Blank	106	74	94
MB 320-207162/9	Method Blank	104	73	94

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 320-206850/9
Matrix: Air
Analysis Batch: 206850

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.30		ppb v/v			02/05/18 16:27	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			02/05/18 16:27	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			02/05/18 16:27	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			02/05/18 16:27	1
1,1-Dichloroethane	ND		0.30		ppb v/v			02/05/18 16:27	1
1,1-Dichloroethene	ND		0.80		ppb v/v			02/05/18 16:27	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			02/05/18 16:27	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			02/05/18 16:27	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			02/05/18 16:27	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			02/05/18 16:27	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			02/05/18 16:27	1
1,2-Dichloroethane	ND		0.80		ppb v/v			02/05/18 16:27	1
1,2-Dichloropropane	ND		0.40		ppb v/v			02/05/18 16:27	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			02/05/18 16:27	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			02/05/18 16:27	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			02/05/18 16:27	1
2-Butanone (MEK)	ND		0.80		ppb v/v			02/05/18 16:27	1
2-Hexanone	ND		0.40		ppb v/v			02/05/18 16:27	1
4-Ethyltoluene	ND		0.40		ppb v/v			02/05/18 16:27	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			02/05/18 16:27	1
Acetone	ND		5.0		ppb v/v			02/05/18 16:27	1
Benzene	ND		0.40		ppb v/v			02/05/18 16:27	1
Benzyl chloride	ND		0.80		ppb v/v			02/05/18 16:27	1
Bromodichloromethane	ND		0.30		ppb v/v			02/05/18 16:27	1
Bromoform	ND		0.40		ppb v/v			02/05/18 16:27	1
Bromomethane	ND		0.80		ppb v/v			02/05/18 16:27	1
Carbon disulfide	ND		0.80		ppb v/v			02/05/18 16:27	1
Carbon tetrachloride	ND		0.80		ppb v/v			02/05/18 16:27	1
Chlorobenzene	ND		0.30		ppb v/v			02/05/18 16:27	1
Chloroethane	ND		0.80		ppb v/v			02/05/18 16:27	1
Chloroform	ND		0.30		ppb v/v			02/05/18 16:27	1
Chloromethane	ND		0.80		ppb v/v			02/05/18 16:27	1
cis-1,2-Dichloroethene	ND		0.40		ppb v/v			02/05/18 16:27	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			02/05/18 16:27	1
Dibromochloromethane	ND		0.40		ppb v/v			02/05/18 16:27	1
Dichlorodifluoromethane	ND		0.40		ppb v/v			02/05/18 16:27	1
Ethylbenzene	ND		0.40		ppb v/v			02/05/18 16:27	1
Hexachlorobutadiene	ND		2.0		ppb v/v			02/05/18 16:27	1
m,p-Xylene	ND		0.80		ppb v/v			02/05/18 16:27	1
Methylene Chloride	ND		0.40		ppb v/v			02/05/18 16:27	1
o-Xylene	ND		0.40		ppb v/v			02/05/18 16:27	1
Styrene	ND		0.40		ppb v/v			02/05/18 16:27	1
Tetrachloroethene	ND		0.40		ppb v/v			02/05/18 16:27	1
Toluene	ND		0.40		ppb v/v			02/05/18 16:27	1
trans-1,2-Dichloroethene	ND		0.40		ppb v/v			02/05/18 16:27	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			02/05/18 16:27	1
Trichloroethene	ND		0.40		ppb v/v			02/05/18 16:27	1
Trichlorofluoromethane	ND		0.40		ppb v/v			02/05/18 16:27	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-206850/9
Matrix: Air
Analysis Batch: 206850

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl acetate	ND		0.80		ppb v/v			02/05/18 16:27	1
Vinyl chloride	ND		0.40		ppb v/v			02/05/18 16:27	1

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.6		ug/m3 Air			02/05/18 16:27	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			02/05/18 16:27	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			02/05/18 16:27	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			02/05/18 16:27	1
1,1-Dichloroethane	ND		1.2		ug/m3 Air			02/05/18 16:27	1
1,1-Dichloroethene	ND		3.2		ug/m3 Air			02/05/18 16:27	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			02/05/18 16:27	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			02/05/18 16:27	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			02/05/18 16:27	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			02/05/18 16:27	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			02/05/18 16:27	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			02/05/18 16:27	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			02/05/18 16:27	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			02/05/18 16:27	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			02/05/18 16:27	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			02/05/18 16:27	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			02/05/18 16:27	1
2-Hexanone	ND		1.6		ug/m3 Air			02/05/18 16:27	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			02/05/18 16:27	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			02/05/18 16:27	1
Acetone	ND		12		ug/m3 Air			02/05/18 16:27	1
Benzene	ND		1.3		ug/m3 Air			02/05/18 16:27	1
Benzyl chloride	ND		4.1		ug/m3 Air			02/05/18 16:27	1
Bromodichloromethane	ND		2.0		ug/m3 Air			02/05/18 16:27	1
Bromoform	ND		4.1		ug/m3 Air			02/05/18 16:27	1
Bromomethane	ND		3.1		ug/m3 Air			02/05/18 16:27	1
Carbon disulfide	ND		2.5		ug/m3 Air			02/05/18 16:27	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			02/05/18 16:27	1
Chlorobenzene	ND		1.4		ug/m3 Air			02/05/18 16:27	1
Chloroethane	ND		2.1		ug/m3 Air			02/05/18 16:27	1
Chloroform	ND		1.5		ug/m3 Air			02/05/18 16:27	1
Chloromethane	ND		1.7		ug/m3 Air			02/05/18 16:27	1
cis-1,2-Dichloroethene	ND		1.6		ug/m3 Air			02/05/18 16:27	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			02/05/18 16:27	1
Dibromochloromethane	ND		3.4		ug/m3 Air			02/05/18 16:27	1
Dichlorodifluoromethane	ND		2.0		ug/m3 Air			02/05/18 16:27	1
Ethylbenzene	ND		1.7		ug/m3 Air			02/05/18 16:27	1
Hexachlorobutadiene	ND		21		ug/m3 Air			02/05/18 16:27	1
m,p-Xylene	ND		3.5		ug/m3 Air			02/05/18 16:27	1
Methylene Chloride	ND		1.4		ug/m3 Air			02/05/18 16:27	1
o-Xylene	ND		1.7		ug/m3 Air			02/05/18 16:27	1
Styrene	ND		1.7		ug/m3 Air			02/05/18 16:27	1
Tetrachloroethene	ND		2.7		ug/m3 Air			02/05/18 16:27	1
Toluene	ND		1.5		ug/m3 Air			02/05/18 16:27	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-206850/9
Matrix: Air
Analysis Batch: 206850

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		1.6		ug/m3 Air			02/05/18 16:27	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			02/05/18 16:27	1
Trichloroethene	ND		2.1		ug/m3 Air			02/05/18 16:27	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			02/05/18 16:27	1
Vinyl acetate	ND		2.8		ug/m3 Air			02/05/18 16:27	1
Vinyl chloride	ND		1.0		ug/m3 Air			02/05/18 16:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 130*		*02/05/18 16:27*	*1*
4-Bromofluorobenzene (Surr)	*74*		*70 - 130*		*02/05/18 16:27*	*1*
Toluene-d8 (Surr)	*94*		*70 - 130*		*02/05/18 16:27*	*1*

Lab Sample ID: LCS 320-206850/4
Matrix: Air
Analysis Batch: 206850

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	20.7		ppb v/v		104	69 - 129
1,1,2,2-Tetrachloroethane	20.0	21.8		ppb v/v		109	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	20.0		ppb v/v		100	70 - 130
1,1,2-Trichloroethane	20.0	20.7		ppb v/v		103	64 - 124
1,1-Dichloroethane	20.0	20.1		ppb v/v		100	71 - 131
1,1-Dichloroethene	20.0	20.9		ppb v/v		105	72 - 132
1,2,4-Trichlorobenzene	20.0	23.0		ppb v/v		115	58 - 138
1,2,4-Trimethylbenzene	20.0	22.5		ppb v/v		113	60 - 132
1,2-Dibromoethane (EDB)	20.0	20.9		ppb v/v		104	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	22.2		ppb v/v		111	74 - 134
1,2-Dichlorobenzene	20.0	22.9		ppb v/v		114	62 - 126
1,2-Dichloroethane	20.0	21.5		ppb v/v		108	71 - 131
1,2-Dichloropropane	20.0	21.7		ppb v/v		108	72 - 132
1,3,5-Trimethylbenzene	20.0	23.8		ppb v/v		119	65 - 125
1,3-Dichlorobenzene	20.0	23.9		ppb v/v		119	59 - 130
1,4-Dichlorobenzene	20.0	24.1		ppb v/v		120	58 - 132
2-Butanone (MEK)	20.0	20.4		ppb v/v		102	73 - 133
2-Hexanone	20.0	22.4		ppb v/v		112	69 - 129
4-Ethyltoluene	20.0	23.6		ppb v/v		118	66 - 129
4-Methyl-2-pentanone (MIBK)	20.0	23.2		ppb v/v		116	74 - 134
Acetone	20.0	20.9		ppb v/v		104	65 - 125
Benzene	20.0	19.3		ppb v/v		97	68 - 128
Benzyl chloride	16.0	18.6		ppb v/v		116	67 - 127
Bromodichloromethane	20.0	21.0		ppb v/v		105	71 - 131
Bromoform	20.0	22.6		ppb v/v		113	66 - 126
Bromomethane	20.0	19.8		ppb v/v		99	73 - 134
Carbon disulfide	20.0	19.7		ppb v/v		99	71 - 131
Carbon tetrachloride	20.0	19.0		ppb v/v		95	63 - 126
Chlorobenzene	20.0	20.7		ppb v/v		103	63 - 123

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-206850/4
Matrix: Air
Analysis Batch: 206850

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloroethane	20.0	19.9		ppb v/v		99	73 - 133
Chloroform	20.0	20.2		ppb v/v		101	70 - 130
Chloromethane	20.0	22.0		ppb v/v		110	61 - 140
cis-1,2-Dichloroethene	20.0	19.5		ppb v/v		98	70 - 130
cis-1,3-Dichloropropene	20.0	20.5		ppb v/v		102	72 - 132
Dibromochloromethane	20.0	21.9		ppb v/v		109	66 - 126
Dichlorodifluoromethane	20.0	20.1		ppb v/v		100	69 - 129
Ethylbenzene	20.0	21.2		ppb v/v		106	64 - 124
Hexachlorobutadiene	20.0	21.9		ppb v/v		110	58 - 131
m,p-Xylene	40.0	43.3		ppb v/v		108	65 - 125
Methylene Chloride	20.0	21.2		ppb v/v		106	67 - 127
o-Xylene	20.0	21.8		ppb v/v		109	65 - 125
Styrene	20.0	23.9		ppb v/v		120	67 - 127
Tetrachloroethene	20.0	20.6		ppb v/v		103	63 - 123
Toluene	20.0	19.7		ppb v/v		98	68 - 128
trans-1,2-Dichloroethene	20.0	20.4		ppb v/v		102	72 - 132
trans-1,3-Dichloropropene	20.0	21.3		ppb v/v		107	66 - 126
Trichloroethene	20.0	20.3		ppb v/v		101	70 - 130
Trichlorofluoromethane	20.0	21.1		ppb v/v		105	71 - 131
Vinyl acetate	20.0	22.2		ppb v/v		111	65 - 134
Vinyl chloride	20.0	20.1		ppb v/v		101	59 - 152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	110	113		ug/m3 Air		104	69 - 129
1,1,2,2-Tetrachloroethane	140	150		ug/m3 Air		109	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	150	153		ug/m3 Air		100	70 - 130
1,1,2-Trichloroethane	110	113		ug/m3 Air		103	64 - 124
1,1-Dichloroethane	81	81.3		ug/m3 Air		100	71 - 131
1,1-Dichloroethene	79	83.0		ug/m3 Air		105	72 - 132
1,2,4-Trichlorobenzene	150	170		ug/m3 Air		115	58 - 138
1,2,4-Trimethylbenzene	98	111		ug/m3 Air		113	60 - 132
1,2-Dibromoethane (EDB)	150	160		ug/m3 Air		104	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	155		ug/m3 Air		111	74 - 134
1,2-Dichlorobenzene	120	138		ug/m3 Air		114	62 - 126
1,2-Dichloroethane	81	87.1		ug/m3 Air		108	71 - 131
1,2-Dichloropropane	92	100		ug/m3 Air		108	72 - 132
1,3,5-Trimethylbenzene	98	117		ug/m3 Air		119	65 - 125
1,3-Dichlorobenzene	120	143		ug/m3 Air		119	59 - 130
1,4-Dichlorobenzene	120	145		ug/m3 Air		120	58 - 132
2-Butanone (MEK)	59	60.2		ug/m3 Air		102	73 - 133
2-Hexanone	82	91.9		ug/m3 Air		112	69 - 129
4-Ethyltoluene	98	116		ug/m3 Air		118	66 - 129
4-Methyl-2-pentanone (MIBK)	82	95.0		ug/m3 Air		116	74 - 134
Acetone	48	49.5		ug/m3 Air		104	65 - 125
Benzene	64	61.7		ug/m3 Air		97	68 - 128
Benzyl chloride	83	96.4		ug/m3 Air		116	67 - 127
Bromodichloromethane	130	141		ug/m3 Air		105	71 - 131

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-206850/4
Matrix: Air
Analysis Batch: 206850

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	210	234		ug/m3 Air		113	66 - 126
Bromomethane	78	76.8		ug/m3 Air		99	73 - 134
Carbon disulfide	62	61.5		ug/m3 Air		99	71 - 131
Carbon tetrachloride	130	119		ug/m3 Air		95	63 - 126
Chlorobenzene	92	95.3		ug/m3 Air		103	63 - 123
Chloroethane	53	52.4		ug/m3 Air		99	73 - 133
Chloroform	98	98.5		ug/m3 Air		101	70 - 130
Chloromethane	41	45.5		ug/m3 Air		110	61 - 140
cis-1,2-Dichloroethene	79	77.5		ug/m3 Air		98	70 - 130
cis-1,3-Dichloropropene	91	93.0		ug/m3 Air		102	72 - 132
Dibromochloromethane	170	186		ug/m3 Air		109	66 - 126
Dichlorodifluoromethane	99	99.4		ug/m3 Air		100	69 - 129
Ethylbenzene	87	92.0		ug/m3 Air		106	64 - 124
Hexachlorobutadiene	210	234		ug/m3 Air		110	58 - 131
m,p-Xylene	170	188		ug/m3 Air		108	65 - 125
Methylene Chloride	69	73.6		ug/m3 Air		106	67 - 127
o-Xylene	87	94.7		ug/m3 Air		109	65 - 125
Styrene	85	102		ug/m3 Air		120	67 - 127
Tetrachloroethene	140	140		ug/m3 Air		103	63 - 123
Toluene	75	74.2		ug/m3 Air		98	68 - 128
trans-1,2-Dichloroethene	79	80.7		ug/m3 Air		102	72 - 132
trans-1,3-Dichloropropene	91	96.8		ug/m3 Air		107	66 - 126
Trichloroethene	110	109		ug/m3 Air		101	70 - 130
Trichlorofluoromethane	110	118		ug/m3 Air		105	71 - 131
Vinyl acetate	70	78.1		ug/m3 Air		111	65 - 134
Vinyl chloride	51	51.4		ug/m3 Air		101	59 - 152

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*70 - 130*
4-Bromofluorobenzene (Surr)	*107*		*70 - 130*
Toluene-d8 (Surr)	*98*		*70 - 130*

Lab Sample ID: LCSD 320-206850/5
Matrix: Air
Analysis Batch: 206850

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	20.0	21.1		ppb v/v		106	69 - 129	2	25
1,1,2,2-Tetrachloroethane	20.0	21.9		ppb v/v		110	64 - 124	0	25
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	20.8		ppb v/v		104	70 - 130	4	25
1,1,2-Trichloroethane	20.0	21.7		ppb v/v		109	64 - 124	5	25
1,1-Dichloroethane	20.0	20.9		ppb v/v		105	71 - 131	4	25
1,1-Dichloroethene	20.0	21.5		ppb v/v		108	72 - 132	3	25
1,2,4-Trichlorobenzene	20.0	23.1		ppb v/v		115	58 - 138	1	25
1,2,4-Trimethylbenzene	20.0	22.4		ppb v/v		112	60 - 132	0	25
1,2-Dibromoethane (EDB)	20.0	21.7		ppb v/v		109	64 - 124	4	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-206850/5
Matrix: Air
Analysis Batch: 206850

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	22.3		ppb v/v		112	74 - 134	1	25
1,2-Dichlorobenzene	20.0	22.8		ppb v/v		114	62 - 126	1	25
1,2-Dichloroethane	20.0	22.0		ppb v/v		110	71 - 131	2	25
1,2-Dichloropropane	20.0	22.2		ppb v/v		111	72 - 132	2	25
1,3,5-Trimethylbenzene	20.0	23.5		ppb v/v		118	65 - 125	1	25
1,3-Dichlorobenzene	20.0	23.7		ppb v/v		118	59 - 130	1	25
1,4-Dichlorobenzene	20.0	24.0		ppb v/v		120	58 - 132	0	25
2-Butanone (MEK)	20.0	21.6		ppb v/v		108	73 - 133	6	25
2-Hexanone	20.0	23.0		ppb v/v		115	69 - 129	3	25
4-Ethyltoluene	20.0	23.5		ppb v/v		117	66 - 129	1	25
4-Methyl-2-pentanone (MIBK)	20.0	23.0		ppb v/v		115	74 - 134	1	25
Acetone	20.0	21.5		ppb v/v		107	65 - 125	3	25
Benzene	20.0	20.0		ppb v/v		100	68 - 128	3	25
Benzyl chloride	16.0	18.5		ppb v/v		116	67 - 127	1	25
Bromodichloromethane	20.0	21.4		ppb v/v		107	71 - 131	2	25
Bromoform	20.0	22.8		ppb v/v		114	66 - 126	1	25
Bromomethane	20.0	20.9		ppb v/v		104	73 - 134	5	25
Carbon disulfide	20.0	20.5		ppb v/v		102	71 - 131	4	25
Carbon tetrachloride	20.0	19.3		ppb v/v		97	63 - 126	2	25
Chlorobenzene	20.0	21.1		ppb v/v		106	63 - 123	2	25
Chloroethane	20.0	21.4		ppb v/v		107	73 - 133	7	25
Chloroform	20.0	20.9		ppb v/v		105	70 - 130	4	25
Chloromethane	20.0	23.5		ppb v/v		118	61 - 140	6	25
cis-1,2-Dichloroethene	20.0	20.5		ppb v/v		102	70 - 130	5	25
cis-1,3-Dichloropropene	20.0	20.7		ppb v/v		103	72 - 132	1	25
Dibromochloromethane	20.0	22.7		ppb v/v		113	66 - 126	4	25
Dichlorodifluoromethane	20.0	18.8		ppb v/v		94	69 - 129	7	25
Ethylbenzene	20.0	21.5		ppb v/v		108	64 - 124	2	25
Hexachlorobutadiene	20.0	21.8		ppb v/v		109	58 - 131	1	25
m,p-Xylene	40.0	44.1		ppb v/v		110	65 - 125	2	25
Methylene Chloride	20.0	21.8		ppb v/v		109	67 - 127	3	25
o-Xylene	20.0	21.9		ppb v/v		109	65 - 125	0	25
Styrene	20.0	24.0		ppb v/v		120	67 - 127	0	25
Tetrachloroethene	20.0	21.3		ppb v/v		107	63 - 123	4	25
Toluene	20.0	19.7		ppb v/v		98	68 - 128	0	25
trans-1,2-Dichloroethene	20.0	21.4		ppb v/v		107	72 - 132	5	25
trans-1,3-Dichloropropene	20.0	22.3		ppb v/v		111	66 - 126	4	25
Trichloroethene	20.0	20.7		ppb v/v		104	70 - 130	2	25
Trichlorofluoromethane	20.0	21.6		ppb v/v		108	71 - 131	3	25
Vinyl acetate	20.0	22.8		ppb v/v		114	65 - 134	3	25
Vinyl chloride	20.0	21.9		ppb v/v		109	59 - 152	8	25

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	110	115		ug/m3 Air		106	69 - 129	2	25
1,1,2,2-Tetrachloroethane	140	150		ug/m3 Air		110	64 - 124	0	25
1,1,2-Trichloro-1,2,2-trifluoroethane	150	159		ug/m3 Air		104	70 - 130	4	25
1,1,2-Trichloroethane	110	118		ug/m3 Air		109	64 - 124	5	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-206850/5
Matrix: Air
Analysis Batch: 206850

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethane	81	84.6		ug/m3 Air		105	71 - 131	4	25
1,1-Dichloroethene	79	85.4		ug/m3 Air		108	72 - 132	3	25
1,2,4-Trichlorobenzene	150	171		ug/m3 Air		115	58 - 138	1	25
1,2,4-Trimethylbenzene	98	110		ug/m3 Air		112	60 - 132	0	25
1,2-Dibromoethane (EDB)	150	167		ug/m3 Air		109	64 - 124	4	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	156		ug/m3 Air		112	74 - 134	1	25
1,2-Dichlorobenzene	120	137		ug/m3 Air		114	62 - 126	1	25
1,2-Dichloroethane	81	89.0		ug/m3 Air		110	71 - 131	2	25
1,2-Dichloropropane	92	102		ug/m3 Air		111	72 - 132	2	25
1,3,5-Trimethylbenzene	98	116		ug/m3 Air		118	65 - 125	1	25
1,3-Dichlorobenzene	120	142		ug/m3 Air		118	59 - 130	1	25
1,4-Dichlorobenzene	120	144		ug/m3 Air		120	58 - 132	0	25
2-Butanone (MEK)	59	63.6		ug/m3 Air		108	73 - 133	6	25
2-Hexanone	82	94.5		ug/m3 Air		115	69 - 129	3	25
4-Ethyltoluene	98	115		ug/m3 Air		117	66 - 129	1	25
4-Methyl-2-pentanone (MIBK)	82	94.1		ug/m3 Air		115	74 - 134	1	25
Acetone	48	51.0		ug/m3 Air		107	65 - 125	3	25
Benzene	64	63.8		ug/m3 Air		100	68 - 128	3	25
Benzyl chloride	83	95.8		ug/m3 Air		116	67 - 127	1	25
Bromodichloromethane	130	143		ug/m3 Air		107	71 - 131	2	25
Bromoform	210	236		ug/m3 Air		114	66 - 126	1	25
Bromomethane	78	81.1		ug/m3 Air		104	73 - 134	5	25
Carbon disulfide	62	63.7		ug/m3 Air		102	71 - 131	4	25
Carbon tetrachloride	130	122		ug/m3 Air		97	63 - 126	2	25
Chlorobenzene	92	97.2		ug/m3 Air		106	63 - 123	2	25
Chloroethane	53	56.4		ug/m3 Air		107	73 - 133	7	25
Chloroform	98	102		ug/m3 Air		105	70 - 130	4	25
Chloromethane	41	48.5		ug/m3 Air		118	61 - 140	6	25
cis-1,2-Dichloroethene	79	81.2		ug/m3 Air		102	70 - 130	5	25
cis-1,3-Dichloropropene	91	93.8		ug/m3 Air		103	72 - 132	1	25
Dibromochloromethane	170	193		ug/m3 Air		113	66 - 126	4	25
Dichlorodifluoromethane	99	93.1		ug/m3 Air		94	69 - 129	7	25
Ethylbenzene	87	93.5		ug/m3 Air		108	64 - 124	2	25
Hexachlorobutadiene	210	232		ug/m3 Air		109	58 - 131	1	25
m,p-Xylene	170	191		ug/m3 Air		110	65 - 125	2	25
Methylene Chloride	69	75.8		ug/m3 Air		109	67 - 127	3	25
o-Xylene	87	95.0		ug/m3 Air		109	65 - 125	0	25
Styrene	85	102		ug/m3 Air		120	67 - 127	0	25
Tetrachloroethene	140	145		ug/m3 Air		107	63 - 123	4	25
Toluene	75	74.2		ug/m3 Air		98	68 - 128	0	25
trans-1,2-Dichloroethene	79	84.8		ug/m3 Air		107	72 - 132	5	25
trans-1,3-Dichloropropene	91	101		ug/m3 Air		111	66 - 126	4	25
Trichloroethene	110	111		ug/m3 Air		104	70 - 130	2	25
Trichlorofluoromethane	110	122		ug/m3 Air		108	71 - 131	3	25
Vinyl acetate	70	80.3		ug/m3 Air		114	65 - 134	3	25
Vinyl chloride	51	55.9		ug/m3 Air		109	59 - 152	8	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-206850/5
Matrix: Air
Analysis Batch: 206850

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

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*109*		*70 - 130*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*
Toluene-d8 (Surr)	*95*		*70 - 130*

Lab Sample ID: MB 320-207162/9
Matrix: Air
Analysis Batch: 207162

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.30		ppb v/v			02/06/18 19:20	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			02/06/18 19:20	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			02/06/18 19:20	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			02/06/18 19:20	1
1,1-Dichloroethane	ND		0.30		ppb v/v			02/06/18 19:20	1
1,1-Dichloroethene	ND		0.80		ppb v/v			02/06/18 19:20	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			02/06/18 19:20	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			02/06/18 19:20	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			02/06/18 19:20	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			02/06/18 19:20	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			02/06/18 19:20	1
1,2-Dichloroethane	ND		0.80		ppb v/v			02/06/18 19:20	1
1,2-Dichloropropane	ND		0.40		ppb v/v			02/06/18 19:20	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			02/06/18 19:20	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			02/06/18 19:20	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			02/06/18 19:20	1
2-Butanone (MEK)	ND		0.80		ppb v/v			02/06/18 19:20	1
2-Hexanone	ND		0.40		ppb v/v			02/06/18 19:20	1
4-Ethyltoluene	ND		0.40		ppb v/v			02/06/18 19:20	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			02/06/18 19:20	1
Acetone	ND		5.0		ppb v/v			02/06/18 19:20	1
Benzene	ND		0.40		ppb v/v			02/06/18 19:20	1
Benzyl chloride	ND		0.80		ppb v/v			02/06/18 19:20	1
Bromodichloromethane	ND		0.30		ppb v/v			02/06/18 19:20	1
Bromoform	ND		0.40		ppb v/v			02/06/18 19:20	1
Bromomethane	ND		0.80		ppb v/v			02/06/18 19:20	1
Carbon disulfide	ND		0.80		ppb v/v			02/06/18 19:20	1
Carbon tetrachloride	ND		0.80		ppb v/v			02/06/18 19:20	1
Chlorobenzene	ND		0.30		ppb v/v			02/06/18 19:20	1
Chloroethane	ND		0.80		ppb v/v			02/06/18 19:20	1
Chloroform	ND		0.30		ppb v/v			02/06/18 19:20	1
Chloromethane	ND		0.80		ppb v/v			02/06/18 19:20	1
cis-1,2-Dichloroethene	ND		0.40		ppb v/v			02/06/18 19:20	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			02/06/18 19:20	1
Dibromochloromethane	ND		0.40		ppb v/v			02/06/18 19:20	1
Dichlorodifluoromethane	ND		0.40		ppb v/v			02/06/18 19:20	1
Ethylbenzene	ND		0.40		ppb v/v			02/06/18 19:20	1
Hexachlorobutadiene	ND		2.0		ppb v/v			02/06/18 19:20	1
m,p-Xylene	ND		0.80		ppb v/v			02/06/18 19:20	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-207162/9
Matrix: Air
Analysis Batch: 207162

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylene Chloride	ND		0.40		ppb v/v			02/06/18 19:20	1
o-Xylene	ND		0.40		ppb v/v			02/06/18 19:20	1
Styrene	ND		0.40		ppb v/v			02/06/18 19:20	1
Tetrachloroethene	ND		0.40		ppb v/v			02/06/18 19:20	1
Toluene	ND		0.40		ppb v/v			02/06/18 19:20	1
trans-1,2-Dichloroethene	ND		0.40		ppb v/v			02/06/18 19:20	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			02/06/18 19:20	1
Trichloroethene	ND		0.40		ppb v/v			02/06/18 19:20	1
Trichlorofluoromethane	ND		0.40		ppb v/v			02/06/18 19:20	1
Vinyl acetate	ND		0.80		ppb v/v			02/06/18 19:20	1
Vinyl chloride	ND		0.40		ppb v/v			02/06/18 19:20	1

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.6		ug/m3 Air			02/06/18 19:20	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			02/06/18 19:20	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			02/06/18 19:20	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			02/06/18 19:20	1
1,1-Dichloroethane	ND		1.2		ug/m3 Air			02/06/18 19:20	1
1,1-Dichloroethene	ND		3.2		ug/m3 Air			02/06/18 19:20	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			02/06/18 19:20	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			02/06/18 19:20	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			02/06/18 19:20	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			02/06/18 19:20	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			02/06/18 19:20	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			02/06/18 19:20	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			02/06/18 19:20	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			02/06/18 19:20	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			02/06/18 19:20	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			02/06/18 19:20	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			02/06/18 19:20	1
2-Hexanone	ND		1.6		ug/m3 Air			02/06/18 19:20	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			02/06/18 19:20	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			02/06/18 19:20	1
Acetone	ND		12		ug/m3 Air			02/06/18 19:20	1
Benzene	ND		1.3		ug/m3 Air			02/06/18 19:20	1
Benzyl chloride	ND		4.1		ug/m3 Air			02/06/18 19:20	1
Bromodichloromethane	ND		2.0		ug/m3 Air			02/06/18 19:20	1
Bromoform	ND		4.1		ug/m3 Air			02/06/18 19:20	1
Bromomethane	ND		3.1		ug/m3 Air			02/06/18 19:20	1
Carbon disulfide	ND		2.5		ug/m3 Air			02/06/18 19:20	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			02/06/18 19:20	1
Chlorobenzene	ND		1.4		ug/m3 Air			02/06/18 19:20	1
Chloroethane	ND		2.1		ug/m3 Air			02/06/18 19:20	1
Chloroform	ND		1.5		ug/m3 Air			02/06/18 19:20	1
Chloromethane	ND		1.7		ug/m3 Air			02/06/18 19:20	1
cis-1,2-Dichloroethene	ND		1.6		ug/m3 Air			02/06/18 19:20	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			02/06/18 19:20	1
Dibromochloromethane	ND		3.4		ug/m3 Air			02/06/18 19:20	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-207162/9
Matrix: Air
Analysis Batch: 207162

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		2.0		ug/m3 Air			02/06/18 19:20	1
Ethylbenzene	ND		1.7		ug/m3 Air			02/06/18 19:20	1
Hexachlorobutadiene	ND		21		ug/m3 Air			02/06/18 19:20	1
m,p-Xylene	ND		3.5		ug/m3 Air			02/06/18 19:20	1
Methylene Chloride	ND		1.4		ug/m3 Air			02/06/18 19:20	1
o-Xylene	ND		1.7		ug/m3 Air			02/06/18 19:20	1
Styrene	ND		1.7		ug/m3 Air			02/06/18 19:20	1
Tetrachloroethene	ND		2.7		ug/m3 Air			02/06/18 19:20	1
Toluene	ND		1.5		ug/m3 Air			02/06/18 19:20	1
trans-1,2-Dichloroethene	ND		1.6		ug/m3 Air			02/06/18 19:20	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			02/06/18 19:20	1
Trichloroethene	ND		2.1		ug/m3 Air			02/06/18 19:20	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			02/06/18 19:20	1
Vinyl acetate	ND		2.8		ug/m3 Air			02/06/18 19:20	1
Vinyl chloride	ND		1.0		ug/m3 Air			02/06/18 19:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 130*		*02/06/18 19:20*	*1*
4-Bromofluorobenzene (Surr)	*73*		*70 - 130*		*02/06/18 19:20*	*1*
Toluene-d8 (Surr)	*94*		*70 - 130*		*02/06/18 19:20*	*1*

Lab Sample ID: LCS 320-207162/4
Matrix: Air
Analysis Batch: 207162

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	21.1		ppb v/v		106	69 - 129
1,1,2,2-Tetrachloroethane	20.0	22.2		ppb v/v		111	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	20.6		ppb v/v		103	70 - 130
1,1,2-Trichloroethane	20.0	22.0		ppb v/v		110	64 - 124
1,1-Dichloroethane	20.0	21.0		ppb v/v		105	71 - 131
1,1-Dichloroethene	20.0	21.6		ppb v/v		108	72 - 132
1,2,4-Trichlorobenzene	20.0	22.1		ppb v/v		111	58 - 138
1,2,4-Trimethylbenzene	20.0	23.0		ppb v/v		115	60 - 132
1,2-Dibromoethane (EDB)	20.0	21.8		ppb v/v		109	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	22.1		ppb v/v		110	74 - 134
1,2-Dichlorobenzene	20.0	22.5		ppb v/v		112	62 - 126
1,2-Dichloroethane	20.0	21.5		ppb v/v		107	71 - 131
1,2-Dichloropropane	20.0	21.7		ppb v/v		109	72 - 132
1,3,5-Trimethylbenzene	20.0	23.5		ppb v/v		118	65 - 125
1,3-Dichlorobenzene	20.0	23.4		ppb v/v		117	59 - 130
1,4-Dichlorobenzene	20.0	23.8		ppb v/v		119	58 - 132
2-Butanone (MEK)	20.0	21.7		ppb v/v		109	73 - 133
2-Hexanone	20.0	23.1		ppb v/v		115	69 - 129
4-Ethyltoluene	20.0	23.4		ppb v/v		117	66 - 129
4-Methyl-2-pentanone (MIBK)	20.0	22.2		ppb v/v		111	74 - 134

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-207162/4
Matrix: Air
Analysis Batch: 207162

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	21.0		ppb v/v		105	65 - 125
Benzene	20.0	19.8		ppb v/v		99	68 - 128
Benzyl chloride	16.0	18.4		ppb v/v		115	67 - 127
Bromodichloromethane	20.0	21.0		ppb v/v		105	71 - 131
Bromoform	20.0	22.5		ppb v/v		113	66 - 126
Bromomethane	20.0	20.9		ppb v/v		104	73 - 134
Carbon disulfide	20.0	20.6		ppb v/v		103	71 - 131
Carbon tetrachloride	20.0	18.4		ppb v/v		92	63 - 126
Chlorobenzene	20.0	21.1		ppb v/v		106	63 - 123
Chloroethane	20.0	21.1		ppb v/v		106	73 - 133
Chloroform	20.0	21.0		ppb v/v		105	70 - 130
Chloromethane	20.0	22.0		ppb v/v		110	61 - 140
cis-1,2-Dichloroethene	20.0	20.7		ppb v/v		103	70 - 130
cis-1,3-Dichloropropene	20.0	20.5		ppb v/v		102	72 - 132
Dibromochloromethane	20.0	22.6		ppb v/v		113	66 - 126
Dichlorodifluoromethane	20.0	18.2		ppb v/v		91	69 - 129
Ethylbenzene	20.0	21.8		ppb v/v		109	64 - 124
Hexachlorobutadiene	20.0	21.4		ppb v/v		107	58 - 131
m,p-Xylene	40.0	44.5		ppb v/v		111	65 - 125
Methylene Chloride	20.0	21.3		ppb v/v		106	67 - 127
o-Xylene	20.0	22.2		ppb v/v		111	65 - 125
Styrene	20.0	24.1		ppb v/v		120	67 - 127
Tetrachloroethene	20.0	21.1		ppb v/v		106	63 - 123
Toluene	20.0	19.5		ppb v/v		97	68 - 128
trans-1,2-Dichloroethene	20.0	21.3		ppb v/v		107	72 - 132
trans-1,3-Dichloropropene	20.0	22.7		ppb v/v		113	66 - 126
Trichloroethene	20.0	20.1		ppb v/v		101	70 - 130
Trichlorofluoromethane	20.0	21.3		ppb v/v		106	71 - 131
Vinyl acetate	20.0	22.5		ppb v/v		113	65 - 134
Vinyl chloride	20.0	21.0		ppb v/v		105	59 - 152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	110	115		ug/m3 Air		106	69 - 129
1,1,2,2-Tetrachloroethane	140	152		ug/m3 Air		111	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	150	158		ug/m3 Air		103	70 - 130
1,1,2-Trichloroethane	110	120		ug/m3 Air		110	64 - 124
1,1-Dichloroethane	81	84.8		ug/m3 Air		105	71 - 131
1,1-Dichloroethene	79	85.7		ug/m3 Air		108	72 - 132
1,2,4-Trichlorobenzene	150	164		ug/m3 Air		111	58 - 138
1,2,4-Trimethylbenzene	98	113		ug/m3 Air		115	60 - 132
1,2-Dibromoethane (EDB)	150	167		ug/m3 Air		109	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	154		ug/m3 Air		110	74 - 134
1,2-Dichlorobenzene	120	135		ug/m3 Air		112	62 - 126
1,2-Dichloroethane	81	86.8		ug/m3 Air		107	71 - 131
1,2-Dichloropropane	92	100		ug/m3 Air		109	72 - 132
1,3,5-Trimethylbenzene	98	116		ug/m3 Air		118	65 - 125
1,3-Dichlorobenzene	120	141		ug/m3 Air		117	59 - 130

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-207162/4
Matrix: Air
Analysis Batch: 207162

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	120	143		ug/m3 Air		119	58 - 132
2-Butanone (MEK)	59	64.0		ug/m3 Air		109	73 - 133
2-Hexanone	82	94.5		ug/m3 Air		115	69 - 129
4-Ethyltoluene	98	115		ug/m3 Air		117	66 - 129
4-Methyl-2-pentanone (MIBK)	82	90.9		ug/m3 Air		111	74 - 134
Acetone	48	50.0		ug/m3 Air		105	65 - 125
Benzene	64	63.3		ug/m3 Air		99	68 - 128
Benzyl chloride	83	95.3		ug/m3 Air		115	67 - 127
Bromodichloromethane	130	140		ug/m3 Air		105	71 - 131
Bromoform	210	233		ug/m3 Air		113	66 - 126
Bromomethane	78	81.0		ug/m3 Air		104	73 - 134
Carbon disulfide	62	64.3		ug/m3 Air		103	71 - 131
Carbon tetrachloride	130	116		ug/m3 Air		92	63 - 126
Chlorobenzene	92	97.2		ug/m3 Air		106	63 - 123
Chloroethane	53	55.7		ug/m3 Air		106	73 - 133
Chloroform	98	102		ug/m3 Air		105	70 - 130
Chloromethane	41	45.5		ug/m3 Air		110	61 - 140
cis-1,2-Dichloroethene	79	82.0		ug/m3 Air		103	70 - 130
cis-1,3-Dichloropropene	91	92.9		ug/m3 Air		102	72 - 132
Dibromochloromethane	170	192		ug/m3 Air		113	66 - 126
Dichlorodifluoromethane	99	90.2		ug/m3 Air		91	69 - 129
Ethylbenzene	87	94.5		ug/m3 Air		109	64 - 124
Hexachlorobutadiene	210	228		ug/m3 Air		107	58 - 131
m,p-Xylene	170	193		ug/m3 Air		111	65 - 125
Methylene Chloride	69	74.0		ug/m3 Air		106	67 - 127
o-Xylene	87	96.5		ug/m3 Air		111	65 - 125
Styrene	85	102		ug/m3 Air		120	67 - 127
Tetrachloroethene	140	143		ug/m3 Air		106	63 - 123
Toluene	75	73.5		ug/m3 Air		97	68 - 128
trans-1,2-Dichloroethene	79	84.6		ug/m3 Air		107	72 - 132
trans-1,3-Dichloropropene	91	103		ug/m3 Air		113	66 - 126
Trichloroethene	110	108		ug/m3 Air		101	70 - 130
Trichlorofluoromethane	110	120		ug/m3 Air		106	71 - 131
Vinyl acetate	70	79.4		ug/m3 Air		113	65 - 134
Vinyl chloride	51	53.7		ug/m3 Air		105	59 - 152

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*70 - 130*
4-Bromofluorobenzene (Surr)	*105*		*70 - 130*
Toluene-d8 (Surr)	*94*		*70 - 130*

Lab Sample ID: LCSD 320-207162/5
Matrix: Air
Analysis Batch: 207162

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	20.0	21.0		ppb v/v		105	69 - 129	1	25
1,1,2,2-Tetrachloroethane	20.0	21.4		ppb v/v		107	64 - 124	3	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-207162/5
Matrix: Air
Analysis Batch: 207162

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	20.6		ppb v/v		103	70 - 130	0	25
1,1,2-Trichloroethane	20.0	21.3		ppb v/v		107	64 - 124	3	25
1,1-Dichloroethane	20.0	20.8		ppb v/v		104	71 - 131	1	25
1,1-Dichloroethene	20.0	21.5		ppb v/v		107	72 - 132	1	25
1,2,4-Trichlorobenzene	20.0	21.6		ppb v/v		108	58 - 138	2	25
1,2,4-Trimethylbenzene	20.0	21.5		ppb v/v		108	60 - 132	7	25
1,2-Dibromoethane (EDB)	20.0	21.1		ppb v/v		106	64 - 124	3	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	22.1		ppb v/v		110	74 - 134	0	25
1,2-Dichlorobenzene	20.0	21.7		ppb v/v		109	62 - 126	3	25
1,2-Dichloroethane	20.0	21.2		ppb v/v		106	71 - 131	1	25
1,2-Dichloropropane	20.0	21.5		ppb v/v		107	72 - 132	1	25
1,3,5-Trimethylbenzene	20.0	22.8		ppb v/v		114	65 - 125	3	25
1,3-Dichlorobenzene	20.0	22.6		ppb v/v		113	59 - 130	4	25
1,4-Dichlorobenzene	20.0	22.8		ppb v/v		114	58 - 132	5	25
2-Butanone (MEK)	20.0	21.7		ppb v/v		108	73 - 133	0	25
2-Hexanone	20.0	22.3		ppb v/v		112	69 - 129	3	25
4-Ethyltoluene	20.0	22.5		ppb v/v		113	66 - 129	4	25
4-Methyl-2-pentanone (MIBK)	20.0	22.3		ppb v/v		112	74 - 134	1	25
Acetone	20.0	21.1		ppb v/v		105	65 - 125	0	25
Benzene	20.0	19.9		ppb v/v		100	68 - 128	1	25
Benzyl chloride	16.0	17.8		ppb v/v		111	67 - 127	3	25
Bromodichloromethane	20.0	20.8		ppb v/v		104	71 - 131	1	25
Bromoform	20.0	21.8		ppb v/v		109	66 - 126	3	25
Bromomethane	20.0	20.8		ppb v/v		104	73 - 134	0	25
Carbon disulfide	20.0	20.6		ppb v/v		103	71 - 131	0	25
Carbon tetrachloride	20.0	18.4		ppb v/v		92	63 - 126	0	25
Chlorobenzene	20.0	20.5		ppb v/v		103	63 - 123	3	25
Chloroethane	20.0	21.4		ppb v/v		107	73 - 133	1	25
Chloroform	20.0	21.0		ppb v/v		105	70 - 130	0	25
Chloromethane	20.0	22.7		ppb v/v		113	61 - 140	3	25
cis-1,2-Dichloroethene	20.0	20.5		ppb v/v		102	70 - 130	1	25
cis-1,3-Dichloropropene	20.0	20.4		ppb v/v		102	72 - 132	0	25
Dibromochloromethane	20.0	21.8		ppb v/v		109	66 - 126	4	25
Dichlorodifluoromethane	20.0	17.8		ppb v/v		89	69 - 129	2	25
Ethylbenzene	20.0	21.1		ppb v/v		106	64 - 124	3	25
Hexachlorobutadiene	20.0	20.8		ppb v/v		104	58 - 131	3	25
m,p-Xylene	40.0	43.1		ppb v/v		108	65 - 125	3	25
Methylene Chloride	20.0	21.3		ppb v/v		107	67 - 127	0	25
o-Xylene	20.0	21.4		ppb v/v		107	65 - 125	4	25
Styrene	20.0	23.3		ppb v/v		117	67 - 127	3	25
Tetrachloroethene	20.0	20.6		ppb v/v		103	63 - 123	2	25
Toluene	20.0	19.4		ppb v/v		97	68 - 128	1	25
trans-1,2-Dichloroethene	20.0	21.2		ppb v/v		106	72 - 132	1	25
trans-1,3-Dichloropropene	20.0	21.9		ppb v/v		110	66 - 126	3	25
Trichloroethene	20.0	20.0		ppb v/v		100	70 - 130	0	25
Trichlorofluoromethane	20.0	21.2		ppb v/v		106	71 - 131	1	25
Vinyl acetate	20.0	22.4		ppb v/v		112	65 - 134	1	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-207162/5
Matrix: Air
Analysis Batch: 207162

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride			20.0	21.9		ppb v/v		109	59 - 152	4	25

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane			110	115		ug/m3 Air		105	69 - 129	1	25
1,1,2,2-Tetrachloroethane			140	147		ug/m3 Air		107	64 - 124	3	25
1,1,2-Trichloro-1,2,2-trifluoroethane			150	158		ug/m3 Air		103	70 - 130	0	25
1,1,2-Trichloroethane			110	116		ug/m3 Air		107	64 - 124	3	25
1,1-Dichloroethane			81	84.2		ug/m3 Air		104	71 - 131	1	25
1,1-Dichloroethene			79	85.2		ug/m3 Air		107	72 - 132	1	25
1,2,4-Trichlorobenzene			150	161		ug/m3 Air		108	58 - 138	2	25
1,2,4-Trimethylbenzene			98	106		ug/m3 Air		108	60 - 132	7	25
1,2-Dibromoethane (EDB)			150	162		ug/m3 Air		106	64 - 124	3	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane			140	154		ug/m3 Air		110	74 - 134	0	25
1,2-Dichlorobenzene			120	131		ug/m3 Air		109	62 - 126	3	25
1,2-Dichloroethane			81	86.0		ug/m3 Air		106	71 - 131	1	25
1,2-Dichloropropane			92	99.2		ug/m3 Air		107	72 - 132	1	25
1,3,5-Trimethylbenzene			98	112		ug/m3 Air		114	65 - 125	3	25
1,3-Dichlorobenzene			120	136		ug/m3 Air		113	59 - 130	4	25
1,4-Dichlorobenzene			120	137		ug/m3 Air		114	58 - 132	5	25
2-Butanone (MEK)			59	63.9		ug/m3 Air		108	73 - 133	0	25
2-Hexanone			82	91.4		ug/m3 Air		112	69 - 129	3	25
4-Ethyltoluene			98	111		ug/m3 Air		113	66 - 129	4	25
4-Methyl-2-pentanone (MIBK)			82	91.5		ug/m3 Air		112	74 - 134	1	25
Acetone			48	50.0		ug/m3 Air		105	65 - 125	0	25
Benzene			64	63.7		ug/m3 Air		100	68 - 128	1	25
Benzyl chloride			83	92.3		ug/m3 Air		111	67 - 127	3	25
Bromodichloromethane			130	139		ug/m3 Air		104	71 - 131	1	25
Bromoform			210	226		ug/m3 Air		109	66 - 126	3	25
Bromomethane			78	80.7		ug/m3 Air		104	73 - 134	0	25
Carbon disulfide			62	64.3		ug/m3 Air		103	71 - 131	0	25
Carbon tetrachloride			130	116		ug/m3 Air		92	63 - 126	0	25
Chlorobenzene			92	94.5		ug/m3 Air		103	63 - 123	3	25
Chloroethane			53	56.4		ug/m3 Air		107	73 - 133	1	25
Chloroform			98	102		ug/m3 Air		105	70 - 130	0	25
Chloromethane			41	46.8		ug/m3 Air		113	61 - 140	3	25
cis-1,2-Dichloroethene			79	81.2		ug/m3 Air		102	70 - 130	1	25
cis-1,3-Dichloropropene			91	92.8		ug/m3 Air		102	72 - 132	0	25
Dibromochloromethane			170	186		ug/m3 Air		109	66 - 126	4	25
Dichlorodifluoromethane			99	88.1		ug/m3 Air		89	69 - 129	2	25
Ethylbenzene			87	91.7		ug/m3 Air		106	64 - 124	3	25
Hexachlorobutadiene			210	221		ug/m3 Air		104	58 - 131	3	25
m,p-Xylene			170	187		ug/m3 Air		108	65 - 125	3	25
Methylene Chloride			69	74.1		ug/m3 Air		107	67 - 127	0	25
o-Xylene			87	92.9		ug/m3 Air		107	65 - 125	4	25
Styrene			85	99.3		ug/m3 Air		117	67 - 127	3	25
Tetrachloroethene			140	140		ug/m3 Air		103	63 - 123	2	25
Toluene			75	73.1		ug/m3 Air		97	68 - 128	1	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-207162/5
Matrix: Air
Analysis Batch: 207162

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
trans-1,2-Dichloroethene			79	84.0		ug/m3 Air		106	72 - 132	1	25
trans-1,3-Dichloropropene			91	99.6		ug/m3 Air		110	66 - 126	3	25
Trichloroethene			110	108		ug/m3 Air		100	70 - 130	0	25
Trichlorofluoromethane			110	119		ug/m3 Air		106	71 - 131	1	25
Vinyl acetate			70	78.8		ug/m3 Air		112	65 - 134	1	25
Vinyl chloride			51	55.9		ug/m3 Air		109	59 - 152	4	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 130*
4-Bromofluorobenzene (Surr)	*106*		*70 - 130*
Toluene-d8 (Surr)	*95*		*70 - 130*

QC Association Summary

Client: Apex Companies LLC
Project/Site: NuStar Vancouver REM

TestAmerica Job ID: 320-35385-1

Air - GC/MS VOA

Analysis Batch: 206850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35385-2	SVE_South_Postcarbon_012218	Total/NA	Air	TO-15	
MB 320-206850/9	Method Blank	Total/NA	Air	TO-15	
LCS 320-206850/4	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-206850/5	Lab Control Sample Dup	Total/NA	Air	TO-15	

Analysis Batch: 207162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35385-1	SVE_South_Precarbon_012218	Total/NA	Air	TO-15	
MB 320-207162/9	Method Blank	Total/NA	Air	TO-15	
LCS 320-207162/4	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-207162/5	Lab Control Sample Dup	Total/NA	Air	TO-15	

Lab Chronicle

Client: Apex Companies LLC
Project/Site: NuStar Vancouver REM

TestAmerica Job ID: 320-35385-1

Client Sample ID: SVE_South_Precarbon_012218

Lab Sample ID: 320-35385-1

Date Collected: 01/22/18 07:51

Matrix: Air

Date Received: 01/25/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		92.8	4 mL	250 mL	207162	02/06/18 21:04	AP1	TAL SAC

Client Sample ID: SVE_South_Postcarbon_012218

Lab Sample ID: 320-35385-2

Date Collected: 01/22/18 07:53

Matrix: Air

Date Received: 01/25/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		2.04	200 mL	250 mL	206850	02/05/18 23:47	SRS	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Apex Companies LLC
Project/Site: NuStar Vancouver REM

TestAmerica Job ID: 320-35385-1

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-18
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-18
Michigan	State Program	5	9947	01-31-18 *
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-29-20
Pennsylvania	NELAP	3	68-01272	03-31-18
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18
Virginia	NELAP	3	460278	03-14-18
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Portland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
N/A	N/A	N/A	None on record.	

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Apex Companies LLC
Project/Site: NuStar Vancouver REM

TestAmerica Job ID: 320-35385-1

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Apex Companies LLC
Project/Site: NuStar Vancouver REM

TestAmerica Job ID: 320-35385-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-35385-1	SVE_South_Precarbon_012218	Air	01/22/18 07:51	01/25/18 09:30
320-35385-2	SVE_South_Postcarbon_012218	Air	01/22/18 07:53	01/25/18 09:30

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	Project Manager: Stephanie Salisbury	Samples Collected By: Kyle Kline	COC No: 1 of 1 COCs
Company Name: Apex Companies	Phone: 503 924 4704 X 1925		
Address: 3015 SW 1st Ave	Email: SSalisbury@Apexcos.com		For Lab Use Only:
City/State/Zip Portland OR 97201			Walk-in Client:
Phone: 503 924-4704	Site Contact:		Lab Sampling:
FAX:	TA Contact:		
Project Name: Mustar Vancouver REM	Anaylsis Turnaround Time		Job / SDG No.:
Site/Location: Vancouver WA	Standard (Specific): X		(See below for Add'l Items)
PO # 1126 - 2021	Rush (Specifiy):		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25:3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SVE_South_Pre carbon_012218	1/22/18	750	751	-30	-3	—	7843	X														
* SVE_South_Post Carbon_012218	1/22/18	752	753	-29	-4	—	4182	X														

Temperature (Fahrenheit)			
Start	Interior	Ambient	
Stop			

Temperature (Fahrenheit)			
Start	Interior	Ambient	
Stop			

320-35385 Chain of Custody

Special Instructions/QC Requirements & Comments: Email Results to: SSalisbury@Apexcos.com

Samples Shipped by: Kyle Kline	Date / Time: 1/23/18 1115	Samples Received by:	1/24/18 1200	
Samples Relinquished by:	Date / Time:	Received by: TAPOR	1/24/18 1255	
Relinquished by:	Date / Time: 1/24/18 1255	Received by: Gabriela Ilier	01/25/18 09:30	TA-SAC
Lab Use Only: Shipper Name:	Opened by: 1/24/18 1700	Condition:	GKI 1/25/18	

Form No. CA-C-WI-003, Rev. 1, dated 05/10/2013

* Used not TA-SAC ID on COC. The canister ID is 34000184. GKI 1/25/18

Login Sample Receipt Checklist

Client: Apex Companies LLC

Job Number: 320-35385-1

Login Number: 35385
List Number: 1
Creator: Iliev, Gabriela K

List Source: TestAmerica Sacramento

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Canister QC Certification
Batch Certification

Date Cleaned/Batch ID: 12-27-17 320-34737

Date of QC: 12/28/2017

Data File Number: C:\MSDOCUM\1\DATA\171228\MS122817-d

320-34737 Chain of Custody

(*File ID for certification analysis of canister designated below*)

CANISTER ID NUMBERS

*	34000927
	7843
	8278
	34000815
	34000457
	34000851

	34001443
	34000184
	34001322
	34000592
	8307
	7955

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED.

1st level Reviewed By: _____ Date: 12/29/17

2nd level Reviewed By: _____ Date: 1/4/18

Q:\DOCUMENT-MANAGEMENT\FORMS\QA-814 BATCH`CAN QC 20171023.DOC
QA-814

RE 10232017

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34737-1

SDG No.:

Client Sample ID: 34000927 Lab Sample ID: 320-34737-1

Matrix: Air Lab File ID: MS6122817.D

Analysis Method: TO-15 Date Collected: 12/27/2017 00:00

Sample wt/vol: 500(mL) Date Analyzed: 12/29/2017 05:29

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 201704 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
67-64-1	Acetone	0.34	J	5.0	0.18
107-02-8	Acrolein	ND		2.0	0.22
107-13-1	Acrylonitrile	ND		2.0	0.19
107-05-1	Allyl chloride	ND		0.80	0.11
71-43-2	Benzene	ND		0.40	0.079
100-44-7	Benzyl chloride	ND		0.80	0.16
75-27-4	Bromodichloromethane	ND		0.30	0.066
75-25-2	Bromoform	ND		0.40	0.070
74-83-9	Bromomethane	ND		0.80	0.34
106-99-0	1,3-Butadiene	ND		0.80	0.15
106-97-8	n-Butane	0.18	J	0.40	0.15
78-93-3	2-Butanone (MEK)	ND		0.80	0.20
75-65-0	tert-Butyl alcohol (TBA)	ND		2.0	0.11
104-51-8	n-Butylbenzene	ND		0.40	0.18
135-98-8	sec-Butylbenzene	ND		0.40	0.070
98-06-6	tert-Butylbenzene	ND		0.80	0.068
75-15-0	Carbon disulfide	ND		0.80	0.078
56-23-5	Carbon tetrachloride	ND		0.80	0.064
108-90-7	Chlorobenzene	ND		0.30	0.064
75-45-6	Chlorodifluoromethane	ND		0.80	0.27
75-00-3	Chloroethane	ND		0.80	0.31
67-66-3	Chloroform	ND		0.30	0.095
74-87-3	Chloromethane	ND		0.80	0.20
95-49-8	2-Chlorotoluene	ND		0.40	0.080
110-82-7	Cyclohexane	ND		0.40	0.084
124-48-1	Dibromochloromethane	ND		0.40	0.079
106-93-4	1,2-Dibromoethane (EDB)	ND		0.80	0.075
74-95-3	Dibromomethane	ND		0.40	0.057
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16
95-50-1	1,2-Dichlorobenzene	ND		0.40	0.13
541-73-1	1,3-Dichlorobenzene	ND		0.40	0.11
106-46-7	1,4-Dichlorobenzene	ND		0.40	0.15
75-71-8	Dichlorodifluoromethane	ND		0.40	0.15
75-34-3	1,1-Dichloroethane	ND		0.30	0.072
107-06-2	1,2-Dichloroethane	ND		0.80	0.088

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34737-1

SDG No.:

Client Sample ID: 34000927 Lab Sample ID: 320-34737-1

Matrix: Air Lab File ID: MS6122817.D

Analysis Method: TO-15 Date Collected: 12/27/2017 00:00

Sample wt/vol: 500(mL) Date Analyzed: 12/29/2017 05:29

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 201704 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-35-4	1,1-Dichloroethene	ND		0.80	0.13
156-59-2	cis-1,2-Dichloroethene	ND		0.40	0.089
156-60-5	trans-1,2-Dichloroethene	ND		0.40	0.10
78-87-5	1,2-Dichloropropane	ND		0.40	0.24
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.10
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.088
123-91-1	1,4-Dioxane	ND		0.80	0.10
141-78-6	Ethyl acetate	ND		0.30	0.18
100-41-4	Ethylbenzene	ND		0.40	0.063
622-96-8	4-Ethyltoluene	ND		0.40	0.19
142-82-5	n-Heptane	ND		0.80	0.063
87-68-3	Hexachlorobutadiene	ND		2.0	0.43
110-54-3	n-Hexane	ND		0.80	0.075
591-78-6	2-Hexanone	ND		0.40	0.087
98-82-8	Isopropylbenzene	ND		0.80	0.10
99-87-6	4-Isopropyltoluene	ND		0.80	0.12
1634-04-4	Methyl-t-Butyl Ether (MTBE)	ND		0.80	0.12
80-62-6	Methyl methacrylate	ND		0.80	0.16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14
75-09-2	Methylene Chloride	0.13	J B	0.40	0.072
98-83-9	alpha-Methylstyrene	ND		0.40	0.065
91-20-3	Naphthalene	ND		0.80	0.56
111-65-9	n-Octane	ND		0.40	0.055
109-66-0	n-Pentane	ND		0.80	0.26
115-07-1	Propylene	0.13	J B	0.40	0.099
103-65-1	N-Propylbenzene	ND		0.40	0.059
100-42-5	Styrene	ND		0.40	0.059
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.40	0.069
127-18-4	Tetrachloroethene	ND		0.40	0.051
109-99-9	Tetrahydrofuran	ND		0.80	0.21
108-88-3	Toluene	0.068	J B	0.40	0.051
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	0.43
71-55-6	1,1,1-Trichloroethane	ND		0.30	0.065
79-00-5	1,1,2-Trichloroethane	ND		0.40	0.067

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-34737-1

SDG No.:

Client Sample ID: 34000927 Lab Sample ID: 320-34737-1

Matrix: Air Lab File ID: MS6122817.D

Analysis Method: TO-15 Date Collected: 12/27/2017 00:00

Sample wt/vol: 500(mL) Date Analyzed: 12/29/2017 05:29

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 201704 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-01-6	Trichloroethene	ND		0.40	0.11
75-69-4	Trichlorofluoromethane	ND		0.40	0.20
96-18-4	1,2,3-Trichloropropane	ND		0.40	0.17
95-63-6	1,2,4-Trimethylbenzene	ND		0.80	0.16
108-67-8	1,3,5-Trimethylbenzene	ND		0.40	0.13
540-84-1	2,2,4-Trimethylpentane	ND		0.40	0.071
108-05-4	Vinyl acetate	ND		0.80	0.15
593-60-2	Vinyl bromide	ND		0.80	0.26
75-01-4	Vinyl chloride	ND		0.40	0.12
179601-23-1	m,p-Xylene	ND		0.80	0.10
95-47-6	o-Xylene	ND		0.40	0.054

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	97		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		70-130
2037-26-5	Toluene-d8 (Surr)	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20171228-52236.b\MS6122817.D
Lims ID: 320-34737-A-1
Client ID: 34000927
Sample Type: Client
Inject. Date: 29-Dec-2017 05:29:30 ALS Bottle#: 11 Worklist Smp#: 17
Purge Vol: 25.000 mL Dil. Factor: 1.0000
Sample Info: 320-34737-A-1
Misc. Info.: 500 mL
Operator ID: LHS Instrument ID: ATMS6

Method: \\ChromNA\Sacramento\ChromData\ATMS6\20171228-52236.b\TO15_ATMS6.m
Limit Group: MSA - TO15 - ICAL
Last Update: 29-Dec-2017 07:45:55 Calib Date: 28-Dec-2017 17:01:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\ATMS6\20171228-52236.b\MS6122804.D

Column 1 : RTX Volatiles (0.32 mm) Det: MS SCAN
Process Host: XAWRK007

First Level Reviewer: leeh Date: 29-Dec-2017 07:40:09

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ppb v/v	Flags
* 1 Chlorobromomethane (IS)	130	13.302	13.295	0.007	97	28668	4.00	
* 2 1,4-Difluorobenzene	114	15.431	15.431	0.000	95	147815	4.00	
* 3 Chlorobenzene-d5 (IS)	117	22.159	22.153	0.006	88	233155	4.00	
$ 4 1,2-Dichloroethane-d4 (Sur	65	14.500	14.500	0.000	35	59918	4.09	
$ 5 Toluene-d8 (Surr)	100	18.886	18.874	0.012	99	145678	4.18	
$ 6 4-Bromofluorobenzene (Surr	95	24.721	24.714	0.007	92	208066	3.86	
11 Propene	41	4.645	4.632	0.013	60	4023	0.1278	
12 Chlorodifluoromethane	51	4.651	4.657	-0.006	90	8494	0.1533	
17 Butane	43	5.460	5.454	0.006	85	14173	0.1755	
26 Trichlorofluoromethane	101	7.370	7.370	0.000	72	1969	0.0291	
27 Pentane	43	7.431	7.425	0.006	91	4883	0.0728	
32 Acetone	43	8.441	8.435	0.007	97	36758	0.3357	
36 2-Methyl-2-propanol	59	9.122	9.134	-0.012	35	2335	0.0342	
39 Methylene Chloride	49	9.706	9.694	0.012	97	5439	0.1300	
58 Isooctane	57	14.415	14.402	0.013	54	3021	0.0224	
63 Benzene	78	14.841	14.828	0.013	92	4236	0.0524	
64 n-Heptane	43	14.938	14.920	0.018	60	1523	0.0324	
75 Toluene	91	19.063	19.056	0.007	93	6565	0.0676	
87 m-Xylene & p-Xylene	91	22.585	22.573	0.012	93	4338	0.0488	

Reagents:

VAMSIS20_00090 Amount Added: 50.00 Units: mL Run Reagent

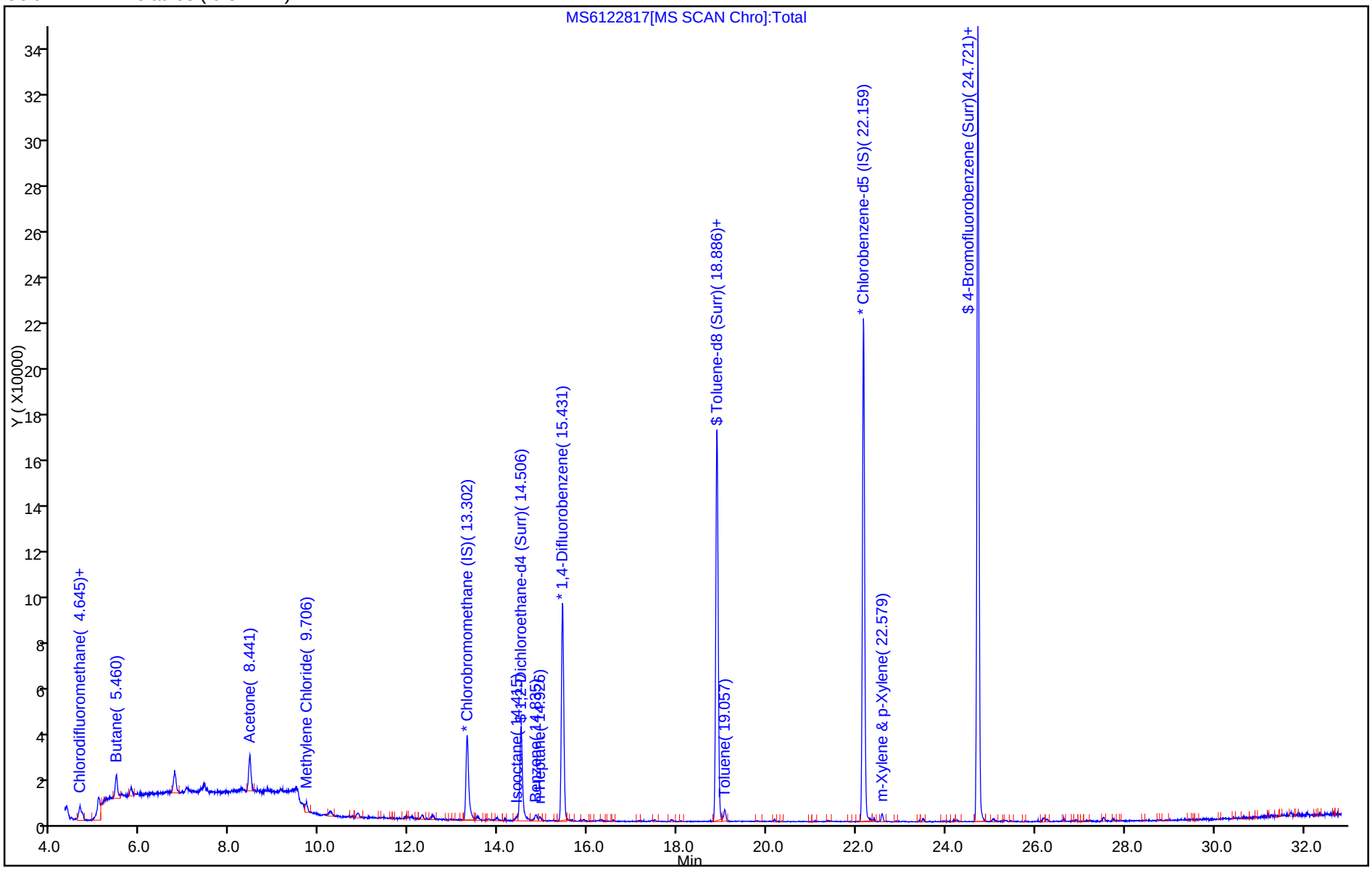
Report Date: 29-Dec-2017 07:48:06 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20171228-52236.b\MS6122817.D

Injection Date:	29-Dec-2017 05:29:30	Instrument ID:	ATMS6	Operator ID:	LHS
Lims ID:	320-34737-A-1	Lab Sample ID:	320-34737-1	Worklist Smp#:	17
Client ID:	34000927				
Purge Vol:	25.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	11
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		

Column: RTX Volatiles (0.32 mm)



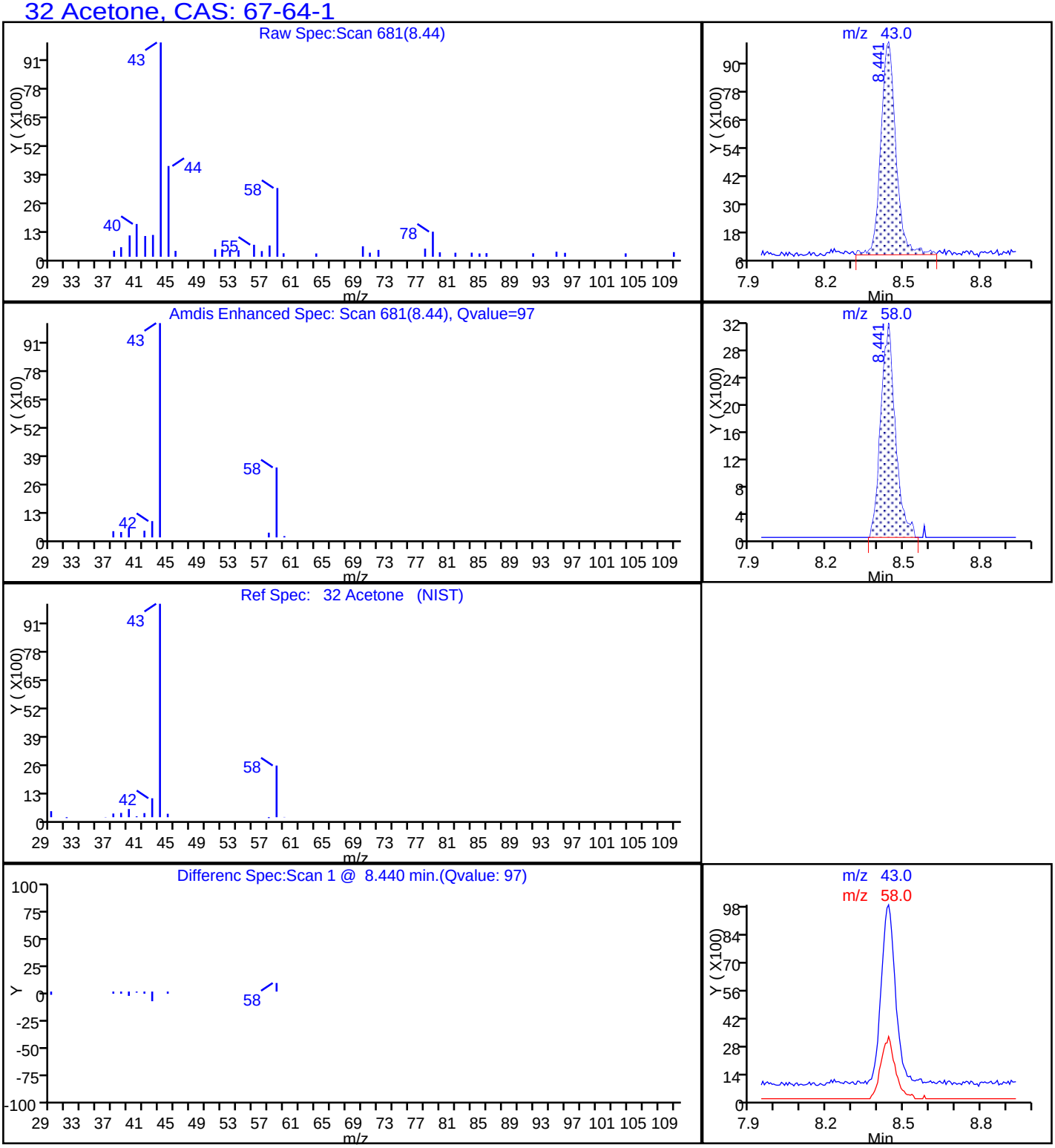
Report Date: 29-Dec-2017 07:48:07 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20171228-52236.b\MS6122817.D

Injection Date:	29-Dec-2017 05:29:30	Instrument ID:	ATMS6		
Lims ID:	320-34737-A-1	Lab Sample ID:	320-34737-1		
Client ID:	34000927				
Operator ID:	LHS	ALS Bottle#:	11	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

32 Acetone, CAS: 67-64-1



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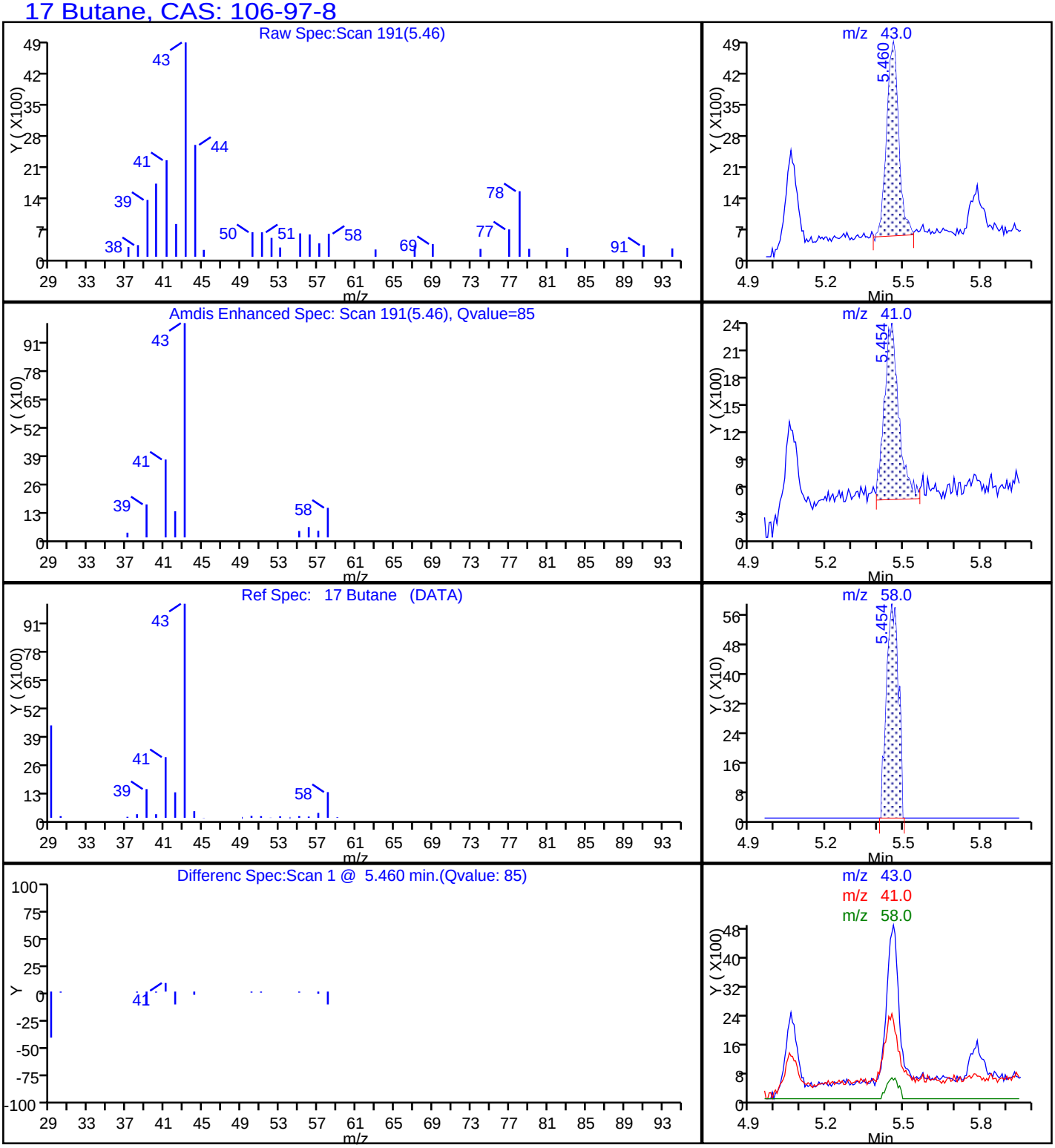
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20171228-52236.b\MS6122817.D

Injection Date:	29-Dec-2017 05:29:30	Instrument ID:	ATMS6		
Lims ID:	320-34737-A-1	Lab Sample ID:	320-34737-1		
Client ID:	34000927				
Operator ID:	LHS	ALS Bottle#:	11	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

17 Butane, CAS: 106-97-8



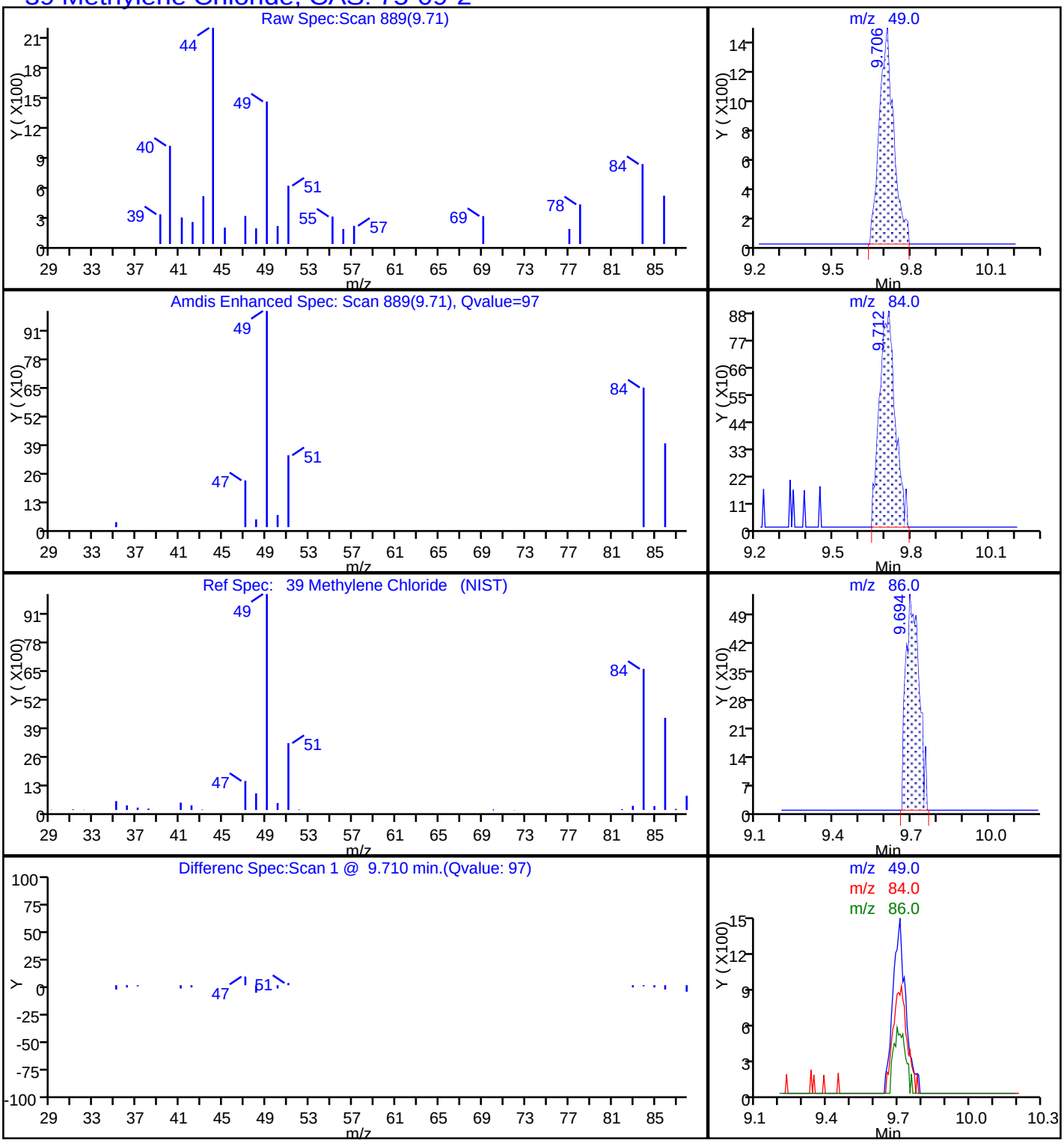
Report Date: 29-Dec-2017 07:48:07 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20171228-52236.b\MS6122817.D

Injection Date:	29-Dec-2017 05:29:30	Instrument ID:	ATMS6		
Lims ID:	320-34737-A-1	Lab Sample ID:	320-34737-1		
Client ID:	34000927				
Operator ID:	LHS	ALS Bottle#:	11	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

39 Methylene Chloride, CAS: 75-09-2



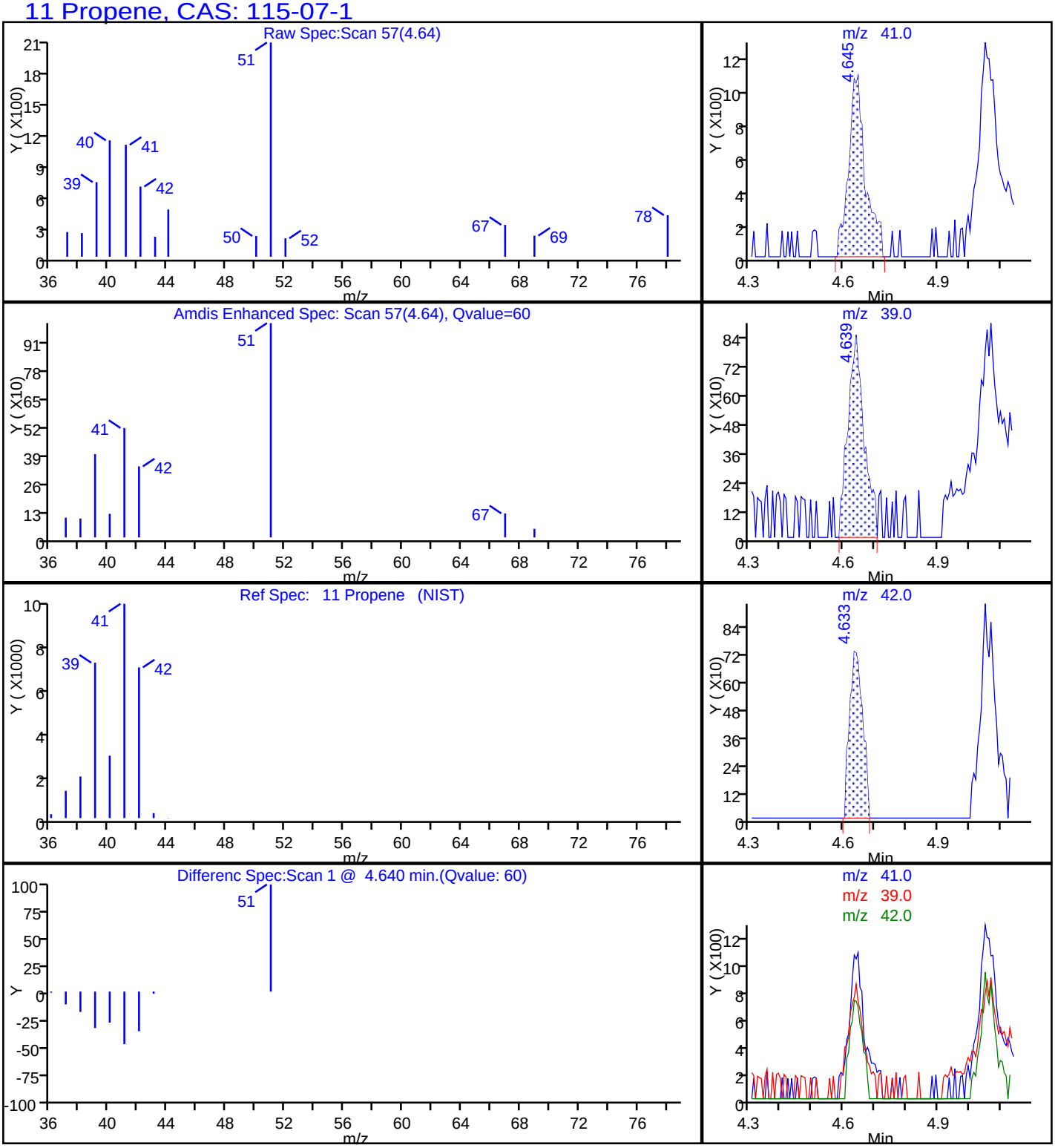
Report Date: 29-Dec-2017 07:48:06 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20171228-52236.b\MS6122817.D

Injection Date:	29-Dec-2017 05:29:30	Instrument ID:	ATMS6		
Lims ID:	320-34737-A-1	Lab Sample ID:	320-34737-1		
Client ID:	34000927				
Operator ID:	LHS	ALS Bottle#:	11	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

11 Propene, CAS: 115-07-1



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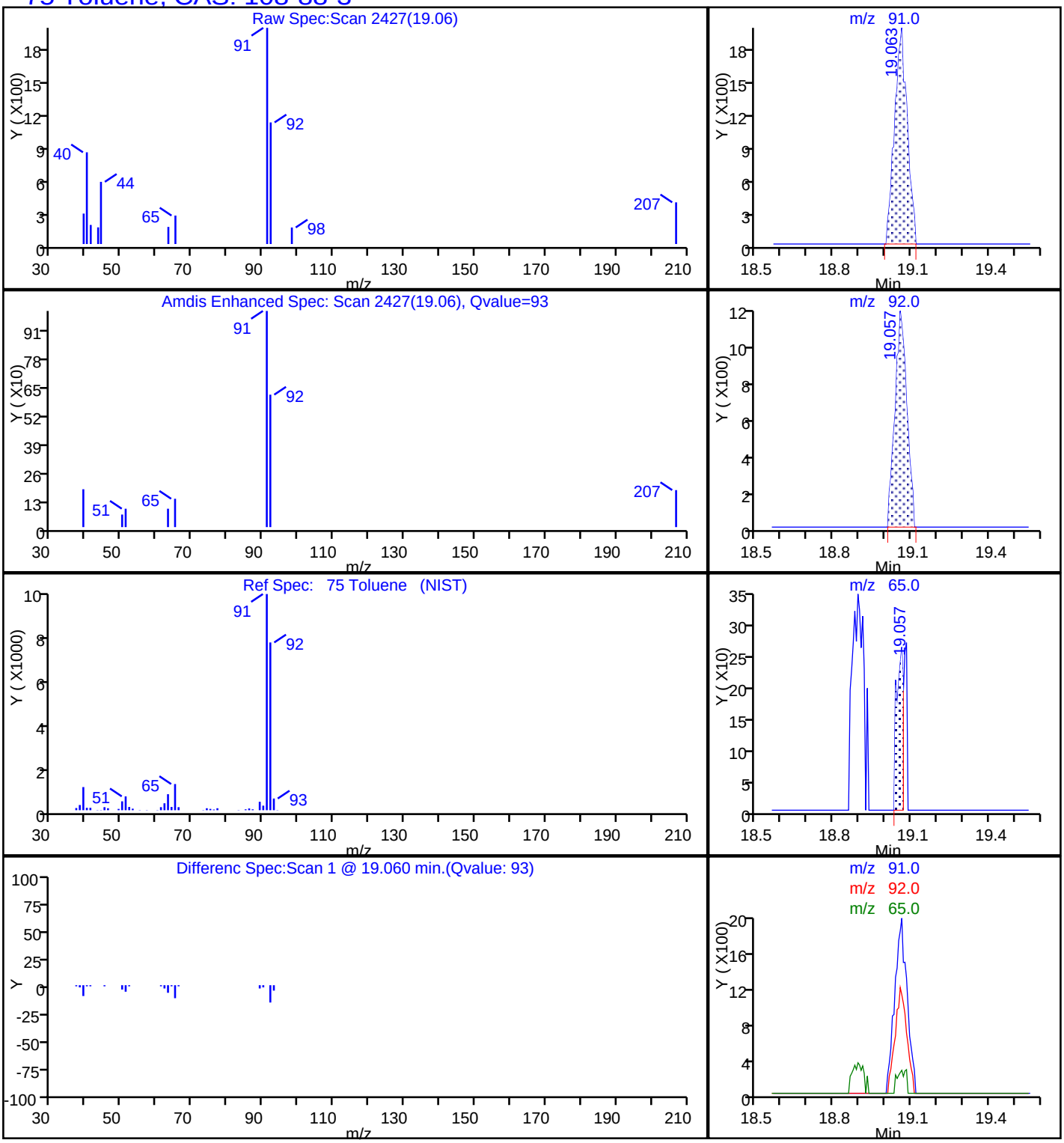
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS6\20171228-52236.b\MS6122817.D

Injection Date:	29-Dec-2017 05:29:30	Instrument ID:	ATMS6		
Lims ID:	320-34737-A-1	Lab Sample ID:	320-34737-1		
Client ID:	34000927				
Operator ID:	LHS	ALS Bottle#:	11	Worklist Smp#:	17
Purge Vol:	25.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS6	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

75 Toluene, CAS: 108-88-3



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-36671-1
Client Project/Site: NuStar Vapor REM

For:
Apex Companies LLC
3015 SW 1st Avenue
Portland, Oregon 97201

Attn: Heather Gosack

Authorized for release by:
3/19/2018 12:30:07 PM

Cathy Gamble, Project Manager I
(253)922-2310
cathy.gamble@testamericainc.com

Table of Contents

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Glossary

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

Job ID: 320-36671-1

Laboratory: TestAmerica Sacramento

Narrative

Receipt
The samples were received on 3/2/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice.

Air - GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

Detection Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Client Sample ID: SVE_south_Pre carbon_022818 — Lab Sample ID: 320-36671-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	9.5		4.7		ppb v/v	15.5		TO-15	Total/NA
cis-1,2-Dichloroethene	50		6.2		ppb v/v	15.5		TO-15	Total/NA
Trichloroethene	82		6.2		ppb v/v	15.5		TO-15	Total/NA
Tetrachloroethene - DL	1900		19		ppb v/v	46.6		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	52		25		ug/m3 Air	15.5		TO-15	Total/NA
cis-1,2-Dichloroethene	200		25		ug/m3 Air	15.5		TO-15	Total/NA
Trichloroethene	440		33		ug/m3 Air	15.5		TO-15	Total/NA
Tetrachloroethene - DL	13000		130		ug/m3 Air	46.6		TO-15	Total/NA

Client Sample ID: SVE_south_Post carbon_022818 — Lab Sample ID: 320-36671-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	2.6		0.30		ppb v/v	1		TO-15	Total/NA
1,1-Dichloroethane	0.69		0.30		ppb v/v	1		TO-15	Total/NA
Carbon disulfide	3.8		0.80		ppb v/v	1		TO-15	Total/NA
cis-1,2-Dichloroethene	77		0.40		ppb v/v	1		TO-15	Total/NA
Dichlorodifluoromethane	0.43		0.40		ppb v/v	1		TO-15	Total/NA
trans-1,2-Dichloroethene	1.0		0.40		ppb v/v	1		TO-15	Total/NA
Trichloroethene	9.4		0.40		ppb v/v	1		TO-15	Total/NA
Vinyl chloride	0.50		0.40		ppb v/v	1		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	14		1.6		ug/m3 Air	1		TO-15	Total/NA
1,1-Dichloroethane	2.8		1.2		ug/m3 Air	1		TO-15	Total/NA
Carbon disulfide	12		2.5		ug/m3 Air	1		TO-15	Total/NA
cis-1,2-Dichloroethene	300		1.6		ug/m3 Air	1		TO-15	Total/NA
Dichlorodifluoromethane	2.1		2.0		ug/m3 Air	1		TO-15	Total/NA
trans-1,2-Dichloroethene	4.0		1.6		ug/m3 Air	1		TO-15	Total/NA
Trichloroethene	51		2.1		ug/m3 Air	1		TO-15	Total/NA
Vinyl chloride	1.3		1.0		ug/m3 Air	1		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Client Sample ID: SVE_south_Pre carbon_022818
Lab Sample ID: 320-36671-1
Date Collected: 02/28/18 08:02
Matrix: Air
Date Received: 03/02/18 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**9.5**		4.7		ppb v/v			03/16/18 22:28	15.5
1,1,2,2-Tetrachloroethane	ND		6.2		ppb v/v			03/16/18 22:28	15.5
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		6.2		ppb v/v			03/16/18 22:28	15.5
1,1,2-Trichloroethane	ND		6.2		ppb v/v			03/16/18 22:28	15.5
1,1-Dichloroethane	ND		4.7		ppb v/v			03/16/18 22:28	15.5
1,1-Dichloroethene	ND		12		ppb v/v			03/16/18 22:28	15.5
1,2,4-Trichlorobenzene	ND		31		ppb v/v			03/16/18 22:28	15.5
1,2,4-Trimethylbenzene	ND		12		ppb v/v			03/16/18 22:28	15.5
1,2-Dibromoethane (EDB)	ND		12		ppb v/v			03/16/18 22:28	15.5
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		6.2		ppb v/v			03/16/18 22:28	15.5
1,2-Dichlorobenzene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
1,2-Dichloroethane	ND		12		ppb v/v			03/16/18 22:28	15.5
1,2-Dichloropropane	ND		6.2		ppb v/v			03/16/18 22:28	15.5
1,3,5-Trimethylbenzene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
1,3-Dichlorobenzene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
1,4-Dichlorobenzene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
2-Butanone (MEK)	ND		12		ppb v/v			03/16/18 22:28	15.5
2-Hexanone	ND		6.2		ppb v/v			03/16/18 22:28	15.5
4-Ethyltoluene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
4-Methyl-2-pentanone (MIBK)	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Acetone	ND		78		ppb v/v			03/16/18 22:28	15.5
Benzene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Benzyl chloride	ND		12		ppb v/v			03/16/18 22:28	15.5
Bromodichloromethane	ND		4.7		ppb v/v			03/16/18 22:28	15.5
Bromoform	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Bromomethane	ND		12		ppb v/v			03/16/18 22:28	15.5
Carbon disulfide	ND		12		ppb v/v			03/16/18 22:28	15.5
Carbon tetrachloride	ND		12		ppb v/v			03/16/18 22:28	15.5
Chlorobenzene	ND		4.7		ppb v/v			03/16/18 22:28	15.5
Chloroethane	ND		12		ppb v/v			03/16/18 22:28	15.5
Chloroform	ND		4.7		ppb v/v			03/16/18 22:28	15.5
Chloromethane	ND		12		ppb v/v			03/16/18 22:28	15.5
cis-1,2-Dichloroethene	**50**		6.2		ppb v/v			03/16/18 22:28	15.5
cis-1,3-Dichloropropene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Dibromochloromethane	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Dichlorodifluoromethane	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Ethylbenzene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Hexachlorobutadiene	ND		31		ppb v/v			03/16/18 22:28	15.5
m,p-Xylene	ND		12		ppb v/v			03/16/18 22:28	15.5
Methylene Chloride	ND		6.2		ppb v/v			03/16/18 22:28	15.5
o-Xylene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Styrene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Toluene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
trans-1,2-Dichloroethene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
trans-1,3-Dichloropropene	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Trichloroethene	**82**		6.2		ppb v/v			03/16/18 22:28	15.5
Trichlorofluoromethane	ND		6.2		ppb v/v			03/16/18 22:28	15.5
Vinyl acetate	ND		12		ppb v/v			03/16/18 22:28	15.5

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Client Sample ID: SVE_south_Pre carbon_022818
Date Collected: 02/28/18 08:02
Date Received: 03/02/18 09:15
Sample Container: Summa Canister 6L

Lab Sample ID: 320-36671-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		6.2		ppb v/v			03/16/18 22:28	15.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**52**		25		ug/m3 Air			03/16/18 22:28	15.5
1,1,2,2-Tetrachloroethane	ND		43		ug/m3 Air			03/16/18 22:28	15.5
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		48		ug/m3 Air			03/16/18 22:28	15.5
1,1,2-Trichloroethane	ND		34		ug/m3 Air			03/16/18 22:28	15.5
1,1-Dichloroethane	ND		19		ug/m3 Air			03/16/18 22:28	15.5
1,1-Dichloroethene	ND		49		ug/m3 Air			03/16/18 22:28	15.5
1,2,4-Trichlorobenzene	ND		230		ug/m3 Air			03/16/18 22:28	15.5
1,2,4-Trimethylbenzene	ND		61		ug/m3 Air			03/16/18 22:28	15.5
1,2-Dibromoethane (EDB)	ND		95		ug/m3 Air			03/16/18 22:28	15.5
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		43		ug/m3 Air			03/16/18 22:28	15.5
1,2-Dichlorobenzene	ND		37		ug/m3 Air			03/16/18 22:28	15.5
1,2-Dichloroethane	ND		50		ug/m3 Air			03/16/18 22:28	15.5
1,2-Dichloropropane	ND		29		ug/m3 Air			03/16/18 22:28	15.5
1,3,5-Trimethylbenzene	ND		30		ug/m3 Air			03/16/18 22:28	15.5
1,3-Dichlorobenzene	ND		37		ug/m3 Air			03/16/18 22:28	15.5
1,4-Dichlorobenzene	ND		37		ug/m3 Air			03/16/18 22:28	15.5
2-Butanone (MEK)	ND		37		ug/m3 Air			03/16/18 22:28	15.5
2-Hexanone	ND		25		ug/m3 Air			03/16/18 22:28	15.5
4-Ethyltoluene	ND		30		ug/m3 Air			03/16/18 22:28	15.5
4-Methyl-2-pentanone (MIBK)	ND		25		ug/m3 Air			03/16/18 22:28	15.5
Acetone	ND		180		ug/m3 Air			03/16/18 22:28	15.5
Benzene	ND		20		ug/m3 Air			03/16/18 22:28	15.5
Benzyl chloride	ND		64		ug/m3 Air			03/16/18 22:28	15.5
Bromodichloromethane	ND		31		ug/m3 Air			03/16/18 22:28	15.5
Bromoform	ND		64		ug/m3 Air			03/16/18 22:28	15.5
Bromomethane	ND		48		ug/m3 Air			03/16/18 22:28	15.5
Carbon disulfide	ND		39		ug/m3 Air			03/16/18 22:28	15.5
Carbon tetrachloride	ND		78		ug/m3 Air			03/16/18 22:28	15.5
Chlorobenzene	ND		21		ug/m3 Air			03/16/18 22:28	15.5
Chloroethane	ND		33		ug/m3 Air			03/16/18 22:28	15.5
Chloroform	ND		23		ug/m3 Air			03/16/18 22:28	15.5
Chloromethane	ND		26		ug/m3 Air			03/16/18 22:28	15.5
cis-1,2-Dichloroethene	**200**		25		ug/m3 Air			03/16/18 22:28	15.5
cis-1,3-Dichloropropene	ND		28		ug/m3 Air			03/16/18 22:28	15.5
Dibromochloromethane	ND		53		ug/m3 Air			03/16/18 22:28	15.5
Dichlorodifluoromethane	ND		31		ug/m3 Air			03/16/18 22:28	15.5
Ethylbenzene	ND		27		ug/m3 Air			03/16/18 22:28	15.5
Hexachlorobutadiene	ND		330		ug/m3 Air			03/16/18 22:28	15.5
m,p-Xylene	ND		54		ug/m3 Air			03/16/18 22:28	15.5
Methylene Chloride	ND		22		ug/m3 Air			03/16/18 22:28	15.5
o-Xylene	ND		27		ug/m3 Air			03/16/18 22:28	15.5
Styrene	ND		26		ug/m3 Air			03/16/18 22:28	15.5
Toluene	ND		23		ug/m3 Air			03/16/18 22:28	15.5
trans-1,2-Dichloroethene	ND		25		ug/m3 Air			03/16/18 22:28	15.5
trans-1,3-Dichloropropene	ND		28		ug/m3 Air			03/16/18 22:28	15.5
Trichloroethene	**440**		33		ug/m3 Air			03/16/18 22:28	15.5

Client Sample ID: SVE_south_Pre carbon_022818

Lab Sample ID: 320-36671-1
Matrix: Air
Date Collected: 02/28/18 08:02
Date Received: 03/02/18 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichlorofluoromethane	ND		35		ug/m3 Air			03/16/18 22:28	15.5
Vinyl acetate	ND		44		ug/m3 Air			03/16/18 22:28	15.5
Vinyl chloride	ND		16		ug/m3 Air			03/16/18 22:28	15.5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 130*		*03/16/18 22:28*	*15.5*
4-Bromofluorobenzene (Surr)	*98*		*70 - 130*		*03/16/18 22:28*	*15.5*
Toluene-d8 (Surr)	*101*		*70 - 130*		*03/16/18 22:28*	*15.5*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	**1900**		19		ppb v/v			03/17/18 19:25	46.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	**13000**		130		ug/m3 Air			03/17/18 19:25	46.6

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 130*		*03/17/18 19:25*	*46.6*
4-Bromofluorobenzene (Surr)	*87*		*70 - 130*		*03/17/18 19:25*	*46.6*
Toluene-d8 (Surr)	*100*		*70 - 130*		*03/17/18 19:25*	*46.6*

Client Sample ID: SVE_south_Post carbon_022818

Lab Sample ID: 320-36671-2
Matrix: Air
Date Collected: 02/28/18 08:05
Date Received: 03/02/18 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**2.6**		0.30		ppb v/v			03/16/18 23:17	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			03/16/18 23:17	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			03/16/18 23:17	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			03/16/18 23:17	1
1,1-Dichloroethane	**0.69**		0.30		ppb v/v			03/16/18 23:17	1
1,1-Dichloroethene	ND		0.80		ppb v/v			03/16/18 23:17	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			03/16/18 23:17	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			03/16/18 23:17	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			03/16/18 23:17	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			03/16/18 23:17	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			03/16/18 23:17	1
1,2-Dichloroethane	ND		0.80		ppb v/v			03/16/18 23:17	1
1,2-Dichloropropane	ND		0.40		ppb v/v			03/16/18 23:17	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			03/16/18 23:17	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			03/16/18 23:17	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			03/16/18 23:17	1
2-Butanone (MEK)	ND		0.80		ppb v/v			03/16/18 23:17	1
2-Hexanone	ND		0.40		ppb v/v			03/16/18 23:17	1
4-Ethyltoluene	ND		0.40		ppb v/v			03/16/18 23:17	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			03/16/18 23:17	1
Acetone	ND		5.0		ppb v/v			03/16/18 23:17	1
Benzene	ND		0.40		ppb v/v			03/16/18 23:17	1

Client Sample ID: SVE_south_Post carbon_022818
Lab Sample ID: 320-36671-2
Date Collected: 02/28/18 08:05
Matrix: Air
Date Received: 03/02/18 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzyl chloride	ND		0.80		ppb v/v			03/16/18 23:17	1
Bromodichloromethane	ND		0.30		ppb v/v			03/16/18 23:17	1
Bromoform	ND		0.40		ppb v/v			03/16/18 23:17	1
Bromomethane	ND		0.80		ppb v/v			03/16/18 23:17	1
Carbon disulfide	**3.8**		0.80		ppb v/v			03/16/18 23:17	1
Carbon tetrachloride	ND		0.80		ppb v/v			03/16/18 23:17	1
Chlorobenzene	ND		0.30		ppb v/v			03/16/18 23:17	1
Chloroethane	ND		0.80		ppb v/v			03/16/18 23:17	1
Chloroform	ND		0.30		ppb v/v			03/16/18 23:17	1
Chloromethane	ND		0.80		ppb v/v			03/16/18 23:17	1
cis-1,2-Dichloroethene	**77**		0.40		ppb v/v			03/16/18 23:17	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			03/16/18 23:17	1
Dibromochloromethane	ND		0.40		ppb v/v			03/16/18 23:17	1
Dichlorodifluoromethane	**0.43**		0.40		ppb v/v			03/16/18 23:17	1
Ethylbenzene	ND		0.40		ppb v/v			03/16/18 23:17	1
Hexachlorobutadiene	ND		2.0		ppb v/v			03/16/18 23:17	1
m,p-Xylene	ND		0.80		ppb v/v			03/16/18 23:17	1
Methylene Chloride	ND		0.40		ppb v/v			03/16/18 23:17	1
o-Xylene	ND		0.40		ppb v/v			03/16/18 23:17	1
Styrene	ND		0.40		ppb v/v			03/16/18 23:17	1
Tetrachloroethene	ND		0.40		ppb v/v			03/16/18 23:17	1
Toluene	ND		0.40		ppb v/v			03/16/18 23:17	1
trans-1,2-Dichloroethene	**1.0**		0.40		ppb v/v			03/16/18 23:17	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			03/16/18 23:17	1
Trichloroethene	**9.4**		0.40		ppb v/v			03/16/18 23:17	1
Trichlorofluoromethane	ND		0.40		ppb v/v			03/16/18 23:17	1
Vinyl acetate	ND		0.80		ppb v/v			03/16/18 23:17	1
Vinyl chloride	**0.50**		0.40		ppb v/v			03/16/18 23:17	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**14**		1.6		ug/m3 Air			03/16/18 23:17	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			03/16/18 23:17	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			03/16/18 23:17	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			03/16/18 23:17	1
1,1-Dichloroethane	**2.8**		1.2		ug/m3 Air			03/16/18 23:17	1
1,1-Dichloroethene	ND		3.2		ug/m3 Air			03/16/18 23:17	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			03/16/18 23:17	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			03/16/18 23:17	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			03/16/18 23:17	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			03/16/18 23:17	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			03/16/18 23:17	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			03/16/18 23:17	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			03/16/18 23:17	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			03/16/18 23:17	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			03/16/18 23:17	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			03/16/18 23:17	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			03/16/18 23:17	1
2-Hexanone	ND		1.6		ug/m3 Air			03/16/18 23:17	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			03/16/18 23:17	1

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Client Sample ID: SVE_south_Post carbon_022818
Lab Sample ID: 320-36671-2
Date Collected: 02/28/18 08:05
Matrix: Air
Date Received: 03/02/18 09:15
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			03/16/18 23:17	1
Acetone	ND		12		ug/m3 Air			03/16/18 23:17	1
Benzene	ND		1.3		ug/m3 Air			03/16/18 23:17	1
Benzyl chloride	ND		4.1		ug/m3 Air			03/16/18 23:17	1
Bromodichloromethane	ND		2.0		ug/m3 Air			03/16/18 23:17	1
Bromoform	ND		4.1		ug/m3 Air			03/16/18 23:17	1
Bromomethane	ND		3.1		ug/m3 Air			03/16/18 23:17	1
Carbon disulfide	**12**		2.5		ug/m3 Air			03/16/18 23:17	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			03/16/18 23:17	1
Chlorobenzene	ND		1.4		ug/m3 Air			03/16/18 23:17	1
Chloroethane	ND		2.1		ug/m3 Air			03/16/18 23:17	1
Chloroform	ND		1.5		ug/m3 Air			03/16/18 23:17	1
Chloromethane	ND		1.7		ug/m3 Air			03/16/18 23:17	1
cis-1,2-Dichloroethene	**300**		1.6		ug/m3 Air			03/16/18 23:17	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			03/16/18 23:17	1
Dibromochloromethane	ND		3.4		ug/m3 Air			03/16/18 23:17	1
Dichlorodifluoromethane	**2.1**		2.0		ug/m3 Air			03/16/18 23:17	1
Ethylbenzene	ND		1.7		ug/m3 Air			03/16/18 23:17	1
Hexachlorobutadiene	ND		21		ug/m3 Air			03/16/18 23:17	1
m,p-Xylene	ND		3.5		ug/m3 Air			03/16/18 23:17	1
Methylene Chloride	ND		1.4		ug/m3 Air			03/16/18 23:17	1
o-Xylene	ND		1.7		ug/m3 Air			03/16/18 23:17	1
Styrene	ND		1.7		ug/m3 Air			03/16/18 23:17	1
Tetrachloroethene	ND		2.7		ug/m3 Air			03/16/18 23:17	1
Toluene	ND		1.5		ug/m3 Air			03/16/18 23:17	1
trans-1,2-Dichloroethene	**4.0**		1.6		ug/m3 Air			03/16/18 23:17	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			03/16/18 23:17	1
Trichloroethene	**51**		2.1		ug/m3 Air			03/16/18 23:17	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			03/16/18 23:17	1
Vinyl acetate	ND		2.8		ug/m3 Air			03/16/18 23:17	1
Vinyl chloride	**1.3**		1.0		ug/m3 Air			03/16/18 23:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 130*		*03/16/18 23:17*	*1*
4-Bromofluorobenzene (Surr)	*103*		*70 - 130*		*03/16/18 23:17*	*1*
Toluene-d8 (Surr)	*103*		*70 - 130*		*03/16/18 23:17*	*1*

Surrogate Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		DCA	BFB	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
320-36671-1	SVE_south_Pre carbon_022818	98	98	101
320-36671-1 - DL	SVE_south_Pre carbon_022818	104	87	100
320-36671-2	SVE_south_Post carbon_022818	96	103	103
LCS 320-213423/3	Lab Control Sample	100	108	104
LCS 320-213520/4	Lab Control Sample	105	108	103
LCSD 320-213423/5	Lab Control Sample Dup	99	108	105
LCSD 320-213520/5	Lab Control Sample Dup	104	107	104
MB 320-213423/7	Method Blank	95	100	100
MB 320-213520/9	Method Blank	104	90	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 320-213423/7
Matrix: Air
Analysis Batch: 213423

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.30		ppb v/v			03/16/18 17:51	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			03/16/18 17:51	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			03/16/18 17:51	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			03/16/18 17:51	1
1,1-Dichloroethane	ND		0.30		ppb v/v			03/16/18 17:51	1
1,1-Dichloroethene	ND		0.80		ppb v/v			03/16/18 17:51	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			03/16/18 17:51	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			03/16/18 17:51	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			03/16/18 17:51	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			03/16/18 17:51	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			03/16/18 17:51	1
1,2-Dichloroethane	ND		0.80		ppb v/v			03/16/18 17:51	1
1,2-Dichloropropane	ND		0.40		ppb v/v			03/16/18 17:51	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			03/16/18 17:51	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			03/16/18 17:51	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			03/16/18 17:51	1
2-Butanone (MEK)	ND		0.80		ppb v/v			03/16/18 17:51	1
2-Hexanone	ND		0.40		ppb v/v			03/16/18 17:51	1
4-Ethyltoluene	ND		0.40		ppb v/v			03/16/18 17:51	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			03/16/18 17:51	1
Acetone	ND		5.0		ppb v/v			03/16/18 17:51	1
Benzene	ND		0.40		ppb v/v			03/16/18 17:51	1
Benzyl chloride	ND		0.80		ppb v/v			03/16/18 17:51	1
Bromodichloromethane	ND		0.30		ppb v/v			03/16/18 17:51	1
Bromoform	ND		0.40		ppb v/v			03/16/18 17:51	1
Bromomethane	ND		0.80		ppb v/v			03/16/18 17:51	1
Carbon disulfide	ND		0.80		ppb v/v			03/16/18 17:51	1
Carbon tetrachloride	ND		0.80		ppb v/v			03/16/18 17:51	1
Chlorobenzene	ND		0.30		ppb v/v			03/16/18 17:51	1
Chloroethane	ND		0.80		ppb v/v			03/16/18 17:51	1
Chloroform	ND		0.30		ppb v/v			03/16/18 17:51	1
Chloromethane	ND		0.80		ppb v/v			03/16/18 17:51	1
cis-1,2-Dichloroethene	ND		0.40		ppb v/v			03/16/18 17:51	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			03/16/18 17:51	1
Dibromochloromethane	ND		0.40		ppb v/v			03/16/18 17:51	1
Dichlorodifluoromethane	ND		0.40		ppb v/v			03/16/18 17:51	1
Ethylbenzene	ND		0.40		ppb v/v			03/16/18 17:51	1
Hexachlorobutadiene	ND		2.0		ppb v/v			03/16/18 17:51	1
m,p-Xylene	ND		0.80		ppb v/v			03/16/18 17:51	1
Methylene Chloride	ND		0.40		ppb v/v			03/16/18 17:51	1
o-Xylene	ND		0.40		ppb v/v			03/16/18 17:51	1
Styrene	ND		0.40		ppb v/v			03/16/18 17:51	1
Tetrachloroethene	ND		0.40		ppb v/v			03/16/18 17:51	1
Toluene	ND		0.40		ppb v/v			03/16/18 17:51	1
trans-1,2-Dichloroethene	ND		0.40		ppb v/v			03/16/18 17:51	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			03/16/18 17:51	1
Trichloroethene	ND		0.40		ppb v/v			03/16/18 17:51	1
Trichlorofluoromethane	ND		0.40		ppb v/v			03/16/18 17:51	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-213423/7
Matrix: Air
Analysis Batch: 213423

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl acetate	ND		0.80		ppb v/v			03/16/18 17:51	1
Vinyl chloride	ND		0.40		ppb v/v			03/16/18 17:51	1

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.6		ug/m3 Air			03/16/18 17:51	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			03/16/18 17:51	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			03/16/18 17:51	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			03/16/18 17:51	1
1,1-Dichloroethane	ND		1.2		ug/m3 Air			03/16/18 17:51	1
1,1-Dichloroethene	ND		3.2		ug/m3 Air			03/16/18 17:51	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			03/16/18 17:51	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			03/16/18 17:51	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			03/16/18 17:51	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			03/16/18 17:51	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			03/16/18 17:51	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			03/16/18 17:51	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			03/16/18 17:51	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			03/16/18 17:51	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			03/16/18 17:51	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			03/16/18 17:51	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			03/16/18 17:51	1
2-Hexanone	ND		1.6		ug/m3 Air			03/16/18 17:51	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			03/16/18 17:51	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			03/16/18 17:51	1
Acetone	ND		12		ug/m3 Air			03/16/18 17:51	1
Benzene	ND		1.3		ug/m3 Air			03/16/18 17:51	1
Benzyl chloride	ND		4.1		ug/m3 Air			03/16/18 17:51	1
Bromodichloromethane	ND		2.0		ug/m3 Air			03/16/18 17:51	1
Bromoform	ND		4.1		ug/m3 Air			03/16/18 17:51	1
Bromomethane	ND		3.1		ug/m3 Air			03/16/18 17:51	1
Carbon disulfide	ND		2.5		ug/m3 Air			03/16/18 17:51	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			03/16/18 17:51	1
Chlorobenzene	ND		1.4		ug/m3 Air			03/16/18 17:51	1
Chloroethane	ND		2.1		ug/m3 Air			03/16/18 17:51	1
Chloroform	ND		1.5		ug/m3 Air			03/16/18 17:51	1
Chloromethane	ND		1.7		ug/m3 Air			03/16/18 17:51	1
cis-1,2-Dichloroethene	ND		1.6		ug/m3 Air			03/16/18 17:51	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			03/16/18 17:51	1
Dibromochloromethane	ND		3.4		ug/m3 Air			03/16/18 17:51	1
Dichlorodifluoromethane	ND		2.0		ug/m3 Air			03/16/18 17:51	1
Ethylbenzene	ND		1.7		ug/m3 Air			03/16/18 17:51	1
Hexachlorobutadiene	ND		21		ug/m3 Air			03/16/18 17:51	1
m,p-Xylene	ND		3.5		ug/m3 Air			03/16/18 17:51	1
Methylene Chloride	ND		1.4		ug/m3 Air			03/16/18 17:51	1
o-Xylene	ND		1.7		ug/m3 Air			03/16/18 17:51	1
Styrene	ND		1.7		ug/m3 Air			03/16/18 17:51	1
Tetrachloroethene	ND		2.7		ug/m3 Air			03/16/18 17:51	1
Toluene	ND		1.5		ug/m3 Air			03/16/18 17:51	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-213423/7
Matrix: Air
Analysis Batch: 213423

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		1.6		ug/m3 Air			03/16/18 17:51	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			03/16/18 17:51	1
Trichloroethene	ND		2.1		ug/m3 Air			03/16/18 17:51	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			03/16/18 17:51	1
Vinyl acetate	ND		2.8		ug/m3 Air			03/16/18 17:51	1
Vinyl chloride	ND		1.0		ug/m3 Air			03/16/18 17:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 130*		*03/16/18 17:51*	*1*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*		*03/16/18 17:51*	*1*
Toluene-d8 (Surr)	*100*		*70 - 130*		*03/16/18 17:51*	*1*

Lab Sample ID: LCS 320-213423/3
Matrix: Air
Analysis Batch: 213423

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	20.7		ppb v/v		103	69 - 129
1,1,2,2-Tetrachloroethane	20.0	23.3		ppb v/v		116	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	21.2		ppb v/v		106	70 - 130
1,1,2-Trichloroethane	20.0	22.4		ppb v/v		112	64 - 124
1,1-Dichloroethane	20.0	20.9		ppb v/v		105	71 - 131
1,1-Dichloroethene	20.0	21.6		ppb v/v		108	72 - 132
1,2,4-Trichlorobenzene	20.0	22.9		ppb v/v		115	58 - 138
1,2,4-Trimethylbenzene	20.0	21.3		ppb v/v		106	60 - 132
1,2-Dibromoethane (EDB)	20.0	23.0		ppb v/v		115	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	22.4		ppb v/v		112	74 - 134
1,2-Dichlorobenzene	20.0	22.1		ppb v/v		111	62 - 126
1,2-Dichloroethane	20.0	22.6		ppb v/v		113	71 - 131
1,2-Dichloropropane	20.0	22.1		ppb v/v		110	72 - 132
1,3,5-Trimethylbenzene	20.0	21.8		ppb v/v		109	65 - 125
1,3-Dichlorobenzene	20.0	22.0		ppb v/v		110	59 - 130
1,4-Dichlorobenzene	20.0	22.2		ppb v/v		111	58 - 132
2-Butanone (MEK)	20.0	23.1		ppb v/v		116	73 - 133
2-Hexanone	20.0	24.8		ppb v/v		124	69 - 129
4-Ethyltoluene	20.0	22.2		ppb v/v		111	66 - 129
4-Methyl-2-pentanone (MIBK)	20.0	24.7		ppb v/v		123	74 - 134
Acetone	20.0	20.8		ppb v/v		104	65 - 125
Benzene	20.0	23.1		ppb v/v		116	68 - 128
Benzyl chloride	16.0	17.6		ppb v/v		110	67 - 127
Bromodichloromethane	20.0	22.6		ppb v/v		113	71 - 131
Bromoform	20.0	23.0		ppb v/v		115	66 - 126
Bromomethane	20.0	22.4		ppb v/v		112	73 - 134
Carbon disulfide	20.0	22.2		ppb v/v		111	71 - 131
Carbon tetrachloride	20.0	20.5		ppb v/v		102	63 - 126
Chlorobenzene	20.0	22.4		ppb v/v		112	63 - 123

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-213423/3
Matrix: Air
Analysis Batch: 213423

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloroethane	20.0	22.6		ppb v/v		113	73 - 133
Chloroform	20.0	21.5		ppb v/v		107	70 - 130
Chloromethane	20.0	21.4		ppb v/v		107	61 - 140
cis-1,2-Dichloroethene	20.0	21.2		ppb v/v		106	70 - 130
cis-1,3-Dichloropropene	20.0	24.3		ppb v/v		122	72 - 132
Dibromochloromethane	20.0	22.7		ppb v/v		113	66 - 126
Dichlorodifluoromethane	20.0	23.9		ppb v/v		119	69 - 129
Ethylbenzene	20.0	23.3		ppb v/v		116	64 - 124
Hexachlorobutadiene	20.0	23.0		ppb v/v		115	58 - 131
m,p-Xylene	40.0	48.4		ppb v/v		121	65 - 125
Methylene Chloride	20.0	20.2		ppb v/v		101	67 - 127
o-Xylene	20.0	22.3		ppb v/v		112	65 - 125
Styrene	20.0	23.6		ppb v/v		118	67 - 127
Tetrachloroethene	20.0	20.8		ppb v/v		104	63 - 123
Toluene	20.0	22.6		ppb v/v		113	68 - 128
trans-1,2-Dichloroethene	20.0	21.0		ppb v/v		105	72 - 132
trans-1,3-Dichloropropene	20.0	22.6		ppb v/v		113	66 - 126
Trichloroethene	20.0	20.4		ppb v/v		102	70 - 130
Trichlorofluoromethane	20.0	21.6		ppb v/v		108	71 - 131
Vinyl acetate	20.0	21.1		ppb v/v		105	65 - 134
Vinyl chloride	20.0	21.8		ppb v/v		109	59 - 152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	110	113		ug/m3 Air		103	69 - 129
1,1,2,2-Tetrachloroethane	140	160		ug/m3 Air		116	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	150	162		ug/m3 Air		106	70 - 130
1,1,2-Trichloroethane	110	122		ug/m3 Air		112	64 - 124
1,1-Dichloroethane	81	84.7		ug/m3 Air		105	71 - 131
1,1-Dichloroethene	79	85.6		ug/m3 Air		108	72 - 132
1,2,4-Trichlorobenzene	150	170		ug/m3 Air		115	58 - 138
1,2,4-Trimethylbenzene	98	105		ug/m3 Air		106	60 - 132
1,2-Dibromoethane (EDB)	150	177		ug/m3 Air		115	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	156		ug/m3 Air		112	74 - 134
1,2-Dichlorobenzene	120	133		ug/m3 Air		111	62 - 126
1,2-Dichloroethane	81	91.4		ug/m3 Air		113	71 - 131
1,2-Dichloropropane	92	102		ug/m3 Air		110	72 - 132
1,3,5-Trimethylbenzene	98	107		ug/m3 Air		109	65 - 125
1,3-Dichlorobenzene	120	132		ug/m3 Air		110	59 - 130
1,4-Dichlorobenzene	120	133		ug/m3 Air		111	58 - 132
2-Butanone (MEK)	59	68.1		ug/m3 Air		116	73 - 133
2-Hexanone	82	102		ug/m3 Air		124	69 - 129
4-Ethyltoluene	98	109		ug/m3 Air		111	66 - 129
4-Methyl-2-pentanone (MIBK)	82	101		ug/m3 Air		123	74 - 134
Acetone	48	49.5		ug/m3 Air		104	65 - 125
Benzene	64	73.9		ug/m3 Air		116	68 - 128
Benzyl chloride	83	91.2		ug/m3 Air		110	67 - 127
Bromodichloromethane	130	152		ug/m3 Air		113	71 - 131

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-213423/3
Matrix: Air
Analysis Batch: 213423

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	210	238		ug/m3 Air		115	66 - 126
Bromomethane	78	87.0		ug/m3 Air		112	73 - 134
Carbon disulfide	62	69.2		ug/m3 Air		111	71 - 131
Carbon tetrachloride	130	129		ug/m3 Air		102	63 - 126
Chlorobenzene	92	103		ug/m3 Air		112	63 - 123
Chloroethane	53	59.6		ug/m3 Air		113	73 - 133
Chloroform	98	105		ug/m3 Air		107	70 - 130
Chloromethane	41	44.2		ug/m3 Air		107	61 - 140
cis-1,2-Dichloroethene	79	83.9		ug/m3 Air		106	70 - 130
cis-1,3-Dichloropropene	91	110		ug/m3 Air		122	72 - 132
Dibromochloromethane	170	193		ug/m3 Air		113	66 - 126
Dichlorodifluoromethane	99	118		ug/m3 Air		119	69 - 129
Ethylbenzene	87	101		ug/m3 Air		116	64 - 124
Hexachlorobutadiene	210	245		ug/m3 Air		115	58 - 131
m,p-Xylene	170	210		ug/m3 Air		121	65 - 125
Methylene Chloride	69	70.3		ug/m3 Air		101	67 - 127
o-Xylene	87	96.9		ug/m3 Air		112	65 - 125
Styrene	85	100		ug/m3 Air		118	67 - 127
Tetrachloroethene	140	141		ug/m3 Air		104	63 - 123
Toluene	75	85.2		ug/m3 Air		113	68 - 128
trans-1,2-Dichloroethene	79	83.2		ug/m3 Air		105	72 - 132
trans-1,3-Dichloropropene	91	103		ug/m3 Air		113	66 - 126
Trichloroethene	110	109		ug/m3 Air		102	70 - 130
Trichlorofluoromethane	110	121		ug/m3 Air		108	71 - 131
Vinyl acetate	70	74.1		ug/m3 Air		105	65 - 134
Vinyl chloride	51	55.8		ug/m3 Air		109	59 - 152

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*
4-Bromofluorobenzene (Surr)	*108*		*70 - 130*
Toluene-d8 (Surr)	*104*		*70 - 130*

Lab Sample ID: LCSD 320-213423/5
Matrix: Air
Analysis Batch: 213423

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	20.0	19.1		ppb v/v		95	69 - 129	8	25
1,1,2,2-Tetrachloroethane	20.0	24.7		ppb v/v		123	64 - 124	6	25
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	20.0		ppb v/v		100	70 - 130	6	25
1,1,2-Trichloroethane	20.0	21.8		ppb v/v		109	64 - 124	3	25
1,1-Dichloroethane	20.0	19.3		ppb v/v		97	71 - 131	8	25
1,1-Dichloroethene	20.0	20.1		ppb v/v		101	72 - 132	7	25
1,2,4-Trichlorobenzene	20.0	24.8		ppb v/v		124	58 - 138	8	25
1,2,4-Trimethylbenzene	20.0	23.5		ppb v/v		118	60 - 132	10	25
1,2-Dibromoethane (EDB)	20.0	22.2		ppb v/v		111	64 - 124	3	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-213423/5
Matrix: Air
Analysis Batch: 213423

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	19.4		ppb v/v		97	74 - 134	14	25
1,2-Dichlorobenzene	20.0	23.5		ppb v/v		118	62 - 126	6	25
1,2-Dichloroethane	20.0	20.1		ppb v/v		100	71 - 131	12	25
1,2-Dichloropropane	20.0	21.4		ppb v/v		107	72 - 132	3	25
1,3,5-Trimethylbenzene	20.0	23.5		ppb v/v		118	65 - 125	7	25
1,3-Dichlorobenzene	20.0	23.2		ppb v/v		116	59 - 130	5	25
1,4-Dichlorobenzene	20.0	23.2		ppb v/v		116	58 - 132	4	25
2-Butanone (MEK)	20.0	22.4		ppb v/v		112	73 - 133	3	25
2-Hexanone	20.0	25.8		ppb v/v		129	69 - 129	4	25
4-Ethyltoluene	20.0	23.5		ppb v/v		117	66 - 129	5	25
4-Methyl-2-pentanone (MIBK)	20.0	24.8		ppb v/v		124	74 - 134	0	25
Acetone	20.0	20.3		ppb v/v		102	65 - 125	3	25
Benzene	20.0	21.3		ppb v/v		107	68 - 128	8	25
Benzyl chloride	16.0	18.6		ppb v/v		116	67 - 127	6	25
Bromodichloromethane	20.0	21.5		ppb v/v		108	71 - 131	5	25
Bromoform	20.0	22.9		ppb v/v		114	66 - 126	1	25
Bromomethane	20.0	19.8		ppb v/v		99	73 - 134	12	25
Carbon disulfide	20.0	19.8		ppb v/v		99	71 - 131	12	25
Carbon tetrachloride	20.0	19.4		ppb v/v		97	63 - 126	5	25
Chlorobenzene	20.0	21.7		ppb v/v		108	63 - 123	3	25
Chloroethane	20.0	19.7		ppb v/v		99	73 - 133	13	25
Chloroform	20.0	19.8		ppb v/v		99	70 - 130	8	25
Chloromethane	20.0	20.2		ppb v/v		101	61 - 140	6	25
cis-1,2-Dichloroethene	20.0	19.4		ppb v/v		97	70 - 130	9	25
cis-1,3-Dichloropropene	20.0	21.9		ppb v/v		109	72 - 132	11	25
Dibromochloromethane	20.0	21.5		ppb v/v		108	66 - 126	5	25
Dichlorodifluoromethane	20.0	22.7		ppb v/v		114	69 - 129	5	25
Ethylbenzene	20.0	23.9		ppb v/v		119	64 - 124	3	25
Hexachlorobutadiene	20.0	24.9		ppb v/v		124	58 - 131	8	25
m,p-Xylene	40.0	50.0		ppb v/v		125	65 - 125	3	25
Methylene Chloride	20.0	19.0		ppb v/v		95	67 - 127	6	25
o-Xylene	20.0	23.2		ppb v/v		116	65 - 125	4	25
Styrene	20.0	24.4		ppb v/v		122	67 - 127	3	25
Tetrachloroethene	20.0	20.1		ppb v/v		101	63 - 123	3	25
Toluene	20.0	21.8		ppb v/v		109	68 - 128	4	25
trans-1,2-Dichloroethene	20.0	20.0		ppb v/v		100	72 - 132	5	25
trans-1,3-Dichloropropene	20.0	21.8		ppb v/v		109	66 - 126	4	25
Trichloroethene	20.0	19.1		ppb v/v		95	70 - 130	6	25
Trichlorofluoromethane	20.0	19.1		ppb v/v		95	71 - 131	13	25
Vinyl acetate	20.0	20.8		ppb v/v		104	65 - 134	1	25
Vinyl chloride	20.0	20.2		ppb v/v		101	59 - 152	8	25

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	110	104		ug/m3 Air		95	69 - 129	8	25
1,1,2,2-Tetrachloroethane	140	169		ug/m3 Air		123	64 - 124	6	25
1,1,2-Trichloro-1,2,2-trifluoroethane	150	154		ug/m3 Air		100	70 - 130	6	25
1,1,2-Trichloroethane	110	119		ug/m3 Air		109	64 - 124	3	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-213423/5
Matrix: Air
Analysis Batch: 213423

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethane	81	78.2		ug/m3 Air		97	71 - 131	8	25
1,1-Dichloroethene	79	79.8		ug/m3 Air		101	72 - 132	7	25
1,2,4-Trichlorobenzene	150	184		ug/m3 Air		124	58 - 138	8	25
1,2,4-Trimethylbenzene	98	116		ug/m3 Air		118	60 - 132	10	25
1,2-Dibromoethane (EDB)	150	171		ug/m3 Air		111	64 - 124	3	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	136		ug/m3 Air		97	74 - 134	14	25
1,2-Dichlorobenzene	120	141		ug/m3 Air		118	62 - 126	6	25
1,2-Dichloroethane	81	81.3		ug/m3 Air		100	71 - 131	12	25
1,2-Dichloropropane	92	99.0		ug/m3 Air		107	72 - 132	3	25
1,3,5-Trimethylbenzene	98	116		ug/m3 Air		118	65 - 125	7	25
1,3-Dichlorobenzene	120	139		ug/m3 Air		116	59 - 130	5	25
1,4-Dichlorobenzene	120	139		ug/m3 Air		116	58 - 132	4	25
2-Butanone (MEK)	59	66.0		ug/m3 Air		112	73 - 133	3	25
2-Hexanone	82	106		ug/m3 Air		129	69 - 129	4	25
4-Ethyltoluene	98	115		ug/m3 Air		117	66 - 129	5	25
4-Methyl-2-pentanone (MIBK)	82	102		ug/m3 Air		124	74 - 134	0	25
Acetone	48	48.2		ug/m3 Air		102	65 - 125	3	25
Benzene	64	68.1		ug/m3 Air		107	68 - 128	8	25
Benzyl chloride	83	96.4		ug/m3 Air		116	67 - 127	6	25
Bromodichloromethane	130	144		ug/m3 Air		108	71 - 131	5	25
Bromoform	210	237		ug/m3 Air		114	66 - 126	1	25
Bromomethane	78	76.9		ug/m3 Air		99	73 - 134	12	25
Carbon disulfide	62	61.6		ug/m3 Air		99	71 - 131	12	25
Carbon tetrachloride	130	122		ug/m3 Air		97	63 - 126	5	25
Chlorobenzene	92	99.7		ug/m3 Air		108	63 - 123	3	25
Chloroethane	53	52.1		ug/m3 Air		99	73 - 133	13	25
Chloroform	98	96.5		ug/m3 Air		99	70 - 130	8	25
Chloromethane	41	41.8		ug/m3 Air		101	61 - 140	6	25
cis-1,2-Dichloroethene	79	76.8		ug/m3 Air		97	70 - 130	9	25
cis-1,3-Dichloropropene	91	99.3		ug/m3 Air		109	72 - 132	11	25
Dibromochloromethane	170	183		ug/m3 Air		108	66 - 126	5	25
Dichlorodifluoromethane	99	112		ug/m3 Air		114	69 - 129	5	25
Ethylbenzene	87	104		ug/m3 Air		119	64 - 124	3	25
Hexachlorobutadiene	210	265		ug/m3 Air		124	58 - 131	8	25
m,p-Xylene	170	217		ug/m3 Air		125	65 - 125	3	25
Methylene Chloride	69	66.0		ug/m3 Air		95	67 - 127	6	25
o-Xylene	87	101		ug/m3 Air		116	65 - 125	4	25
Styrene	85	104		ug/m3 Air		122	67 - 127	3	25
Tetrachloroethene	140	137		ug/m3 Air		101	63 - 123	3	25
Toluene	75	82.1		ug/m3 Air		109	68 - 128	4	25
trans-1,2-Dichloroethene	79	79.3		ug/m3 Air		100	72 - 132	5	25
trans-1,3-Dichloropropene	91	99.1		ug/m3 Air		109	66 - 126	4	25
Trichloroethene	110	103		ug/m3 Air		95	70 - 130	6	25
Trichlorofluoromethane	110	107		ug/m3 Air		95	71 - 131	13	25
Vinyl acetate	70	73.3		ug/m3 Air		104	65 - 134	1	25
Vinyl chloride	51	51.7		ug/m3 Air		101	59 - 152	8	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-213423/5
Matrix: Air
Analysis Batch: 213423

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

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*
4-Bromofluorobenzene (Surr)	*108*		*70 - 130*
Toluene-d8 (Surr)	*105*		*70 - 130*

Lab Sample ID: MB 320-213520/9
Matrix: Air
Analysis Batch: 213520

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.30		ppb v/v			03/17/18 18:33	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			03/17/18 18:33	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			03/17/18 18:33	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			03/17/18 18:33	1
1,1-Dichloroethane	ND		0.30		ppb v/v			03/17/18 18:33	1
1,1-Dichloroethene	ND		0.80		ppb v/v			03/17/18 18:33	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			03/17/18 18:33	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			03/17/18 18:33	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			03/17/18 18:33	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			03/17/18 18:33	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			03/17/18 18:33	1
1,2-Dichloroethane	ND		0.80		ppb v/v			03/17/18 18:33	1
1,2-Dichloropropane	ND		0.40		ppb v/v			03/17/18 18:33	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			03/17/18 18:33	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			03/17/18 18:33	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			03/17/18 18:33	1
2-Butanone (MEK)	ND		0.80		ppb v/v			03/17/18 18:33	1
2-Hexanone	ND		0.40		ppb v/v			03/17/18 18:33	1
4-Ethyltoluene	ND		0.40		ppb v/v			03/17/18 18:33	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			03/17/18 18:33	1
Acetone	ND		5.0		ppb v/v			03/17/18 18:33	1
Benzene	ND		0.40		ppb v/v			03/17/18 18:33	1
Benzyl chloride	ND		0.80		ppb v/v			03/17/18 18:33	1
Bromodichloromethane	ND		0.30		ppb v/v			03/17/18 18:33	1
Bromoform	ND		0.40		ppb v/v			03/17/18 18:33	1
Bromomethane	ND		0.80		ppb v/v			03/17/18 18:33	1
Carbon disulfide	ND		0.80		ppb v/v			03/17/18 18:33	1
Carbon tetrachloride	ND		0.80		ppb v/v			03/17/18 18:33	1
Chlorobenzene	ND		0.30		ppb v/v			03/17/18 18:33	1
Chloroethane	ND		0.80		ppb v/v			03/17/18 18:33	1
Chloroform	ND		0.30		ppb v/v			03/17/18 18:33	1
Chloromethane	ND		0.80		ppb v/v			03/17/18 18:33	1
cis-1,2-Dichloroethene	ND		0.40		ppb v/v			03/17/18 18:33	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			03/17/18 18:33	1
Dibromochloromethane	ND		0.40		ppb v/v			03/17/18 18:33	1
Dichlorodifluoromethane	ND		0.40		ppb v/v			03/17/18 18:33	1
Ethylbenzene	ND		0.40		ppb v/v			03/17/18 18:33	1
Hexachlorobutadiene	ND		2.0		ppb v/v			03/17/18 18:33	1
m,p-Xylene	ND		0.80		ppb v/v			03/17/18 18:33	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-213520/9
Matrix: Air
Analysis Batch: 213520

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylene Chloride	ND		0.40		ppb v/v			03/17/18 18:33	1
o-Xylene	ND		0.40		ppb v/v			03/17/18 18:33	1
Styrene	ND		0.40		ppb v/v			03/17/18 18:33	1
Tetrachloroethene	ND		0.40		ppb v/v			03/17/18 18:33	1
Toluene	ND		0.40		ppb v/v			03/17/18 18:33	1
trans-1,2-Dichloroethene	ND		0.40		ppb v/v			03/17/18 18:33	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			03/17/18 18:33	1
Trichloroethene	ND		0.40		ppb v/v			03/17/18 18:33	1
Trichlorofluoromethane	ND		0.40		ppb v/v			03/17/18 18:33	1
Vinyl acetate	ND		0.80		ppb v/v			03/17/18 18:33	1
Vinyl chloride	ND		0.40		ppb v/v			03/17/18 18:33	1

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.6		ug/m3 Air			03/17/18 18:33	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			03/17/18 18:33	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			03/17/18 18:33	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			03/17/18 18:33	1
1,1-Dichloroethane	ND		1.2		ug/m3 Air			03/17/18 18:33	1
1,1-Dichloroethene	ND		3.2		ug/m3 Air			03/17/18 18:33	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			03/17/18 18:33	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			03/17/18 18:33	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			03/17/18 18:33	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			03/17/18 18:33	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			03/17/18 18:33	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			03/17/18 18:33	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			03/17/18 18:33	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			03/17/18 18:33	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			03/17/18 18:33	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			03/17/18 18:33	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			03/17/18 18:33	1
2-Hexanone	ND		1.6		ug/m3 Air			03/17/18 18:33	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			03/17/18 18:33	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			03/17/18 18:33	1
Acetone	ND		12		ug/m3 Air			03/17/18 18:33	1
Benzene	ND		1.3		ug/m3 Air			03/17/18 18:33	1
Benzyl chloride	ND		4.1		ug/m3 Air			03/17/18 18:33	1
Bromodichloromethane	ND		2.0		ug/m3 Air			03/17/18 18:33	1
Bromoform	ND		4.1		ug/m3 Air			03/17/18 18:33	1
Bromomethane	ND		3.1		ug/m3 Air			03/17/18 18:33	1
Carbon disulfide	ND		2.5		ug/m3 Air			03/17/18 18:33	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			03/17/18 18:33	1
Chlorobenzene	ND		1.4		ug/m3 Air			03/17/18 18:33	1
Chloroethane	ND		2.1		ug/m3 Air			03/17/18 18:33	1
Chloroform	ND		1.5		ug/m3 Air			03/17/18 18:33	1
Chloromethane	ND		1.7		ug/m3 Air			03/17/18 18:33	1
cis-1,2-Dichloroethene	ND		1.6		ug/m3 Air			03/17/18 18:33	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			03/17/18 18:33	1
Dibromochloromethane	ND		3.4		ug/m3 Air			03/17/18 18:33	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-213520/9
Matrix: Air
Analysis Batch: 213520

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		2.0		ug/m3 Air			03/17/18 18:33	1
Ethylbenzene	ND		1.7		ug/m3 Air			03/17/18 18:33	1
Hexachlorobutadiene	ND		21		ug/m3 Air			03/17/18 18:33	1
m,p-Xylene	ND		3.5		ug/m3 Air			03/17/18 18:33	1
Methylene Chloride	ND		1.4		ug/m3 Air			03/17/18 18:33	1
o-Xylene	ND		1.7		ug/m3 Air			03/17/18 18:33	1
Styrene	ND		1.7		ug/m3 Air			03/17/18 18:33	1
Tetrachloroethene	ND		2.7		ug/m3 Air			03/17/18 18:33	1
Toluene	ND		1.5		ug/m3 Air			03/17/18 18:33	1
trans-1,2-Dichloroethene	ND		1.6		ug/m3 Air			03/17/18 18:33	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			03/17/18 18:33	1
Trichloroethene	ND		2.1		ug/m3 Air			03/17/18 18:33	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			03/17/18 18:33	1
Vinyl acetate	ND		2.8		ug/m3 Air			03/17/18 18:33	1
Vinyl chloride	ND		1.0		ug/m3 Air			03/17/18 18:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 130*		*03/17/18 18:33*	*1*
4-Bromofluorobenzene (Surr)	*90*		*70 - 130*		*03/17/18 18:33*	*1*
Toluene-d8 (Surr)	*99*		*70 - 130*		*03/17/18 18:33*	*1*

Lab Sample ID: LCS 320-213520/4
Matrix: Air
Analysis Batch: 213520

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	22.3		ppb v/v		112	69 - 129
1,1,2,2-Tetrachloroethane	20.0	20.8		ppb v/v		104	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	22.2		ppb v/v		111	70 - 130
1,1,2-Trichloroethane	20.0	20.8		ppb v/v		104	64 - 124
1,1-Dichloroethane	20.0	22.5		ppb v/v		113	71 - 131
1,1-Dichloroethene	20.0	22.7		ppb v/v		113	72 - 132
1,2,4-Trichlorobenzene	20.0	22.8		ppb v/v		114	58 - 138
1,2,4-Trimethylbenzene	20.0	22.3		ppb v/v		112	60 - 132
1,2-Dibromoethane (EDB)	20.0	21.1		ppb v/v		106	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	22.0		ppb v/v		110	74 - 134
1,2-Dichlorobenzene	20.0	21.9		ppb v/v		109	62 - 126
1,2-Dichloroethane	20.0	22.8		ppb v/v		114	71 - 131
1,2-Dichloropropane	20.0	23.0		ppb v/v		115	72 - 132
1,3,5-Trimethylbenzene	20.0	21.0		ppb v/v		105	65 - 125
1,3-Dichlorobenzene	20.0	22.2		ppb v/v		111	59 - 130
1,4-Dichlorobenzene	20.0	21.6		ppb v/v		108	58 - 132
2-Butanone (MEK)	20.0	21.9		ppb v/v		109	73 - 133
2-Hexanone	20.0	22.8		ppb v/v		114	69 - 129
4-Ethyltoluene	20.0	22.5		ppb v/v		113	66 - 129
4-Methyl-2-pentanone (MIBK)	20.0	22.7		ppb v/v		114	74 - 134

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-213520/4
Matrix: Air
Analysis Batch: 213520

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	21.4		ppb v/v		107	65 - 125
Benzene	20.0	21.6		ppb v/v		108	68 - 128
Benzyl chloride	16.0	18.0		ppb v/v		113	67 - 127
Bromodichloromethane	20.0	22.2		ppb v/v		111	71 - 131
Bromoform	20.0	21.6		ppb v/v		108	66 - 126
Bromomethane	20.0	22.3		ppb v/v		111	73 - 134
Carbon disulfide	20.0	21.7		ppb v/v		109	71 - 131
Carbon tetrachloride	20.0	22.5		ppb v/v		113	63 - 126
Chlorobenzene	20.0	20.4		ppb v/v		102	63 - 123
Chloroethane	20.0	22.2		ppb v/v		111	73 - 133
Chloroform	20.0	22.7		ppb v/v		113	70 - 130
Chloromethane	20.0	21.5		ppb v/v		107	61 - 140
cis-1,2-Dichloroethene	20.0	22.3		ppb v/v		111	70 - 130
cis-1,3-Dichloropropene	20.0	22.1		ppb v/v		111	72 - 132
Dibromochloromethane	20.0	21.3		ppb v/v		106	66 - 126
Dichlorodifluoromethane	20.0	23.7		ppb v/v		119	69 - 129
Ethylbenzene	20.0	21.1		ppb v/v		106	64 - 124
Hexachlorobutadiene	20.0	22.0		ppb v/v		110	58 - 131
m,p-Xylene	40.0	42.6		ppb v/v		106	65 - 125
Methylene Chloride	20.0	21.5		ppb v/v		108	67 - 127
o-Xylene	20.0	21.5		ppb v/v		107	65 - 125
Styrene	20.0	22.7		ppb v/v		113	67 - 127
Tetrachloroethene	20.0	20.6		ppb v/v		103	63 - 123
Toluene	20.0	21.5		ppb v/v		107	68 - 128
trans-1,2-Dichloroethene	20.0	22.5		ppb v/v		113	72 - 132
trans-1,3-Dichloropropene	20.0	21.6		ppb v/v		108	66 - 126
Trichloroethene	20.0	21.8		ppb v/v		109	70 - 130
Trichlorofluoromethane	20.0	22.3		ppb v/v		112	71 - 131
Vinyl acetate	20.0	23.1		ppb v/v		115	65 - 134
Vinyl chloride	20.0	20.6		ppb v/v		103	59 - 152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	110	122		ug/m3 Air		112	69 - 129
1,1,2,2-Tetrachloroethane	140	143		ug/m3 Air		104	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	150	170		ug/m3 Air		111	70 - 130
1,1,2-Trichloroethane	110	114		ug/m3 Air		104	64 - 124
1,1-Dichloroethane	81	91.1		ug/m3 Air		113	71 - 131
1,1-Dichloroethene	79	90.0		ug/m3 Air		113	72 - 132
1,2,4-Trichlorobenzene	150	169		ug/m3 Air		114	58 - 138
1,2,4-Trimethylbenzene	98	110		ug/m3 Air		112	60 - 132
1,2-Dibromoethane (EDB)	150	162		ug/m3 Air		106	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	154		ug/m3 Air		110	74 - 134
1,2-Dichlorobenzene	120	132		ug/m3 Air		109	62 - 126
1,2-Dichloroethane	81	92.3		ug/m3 Air		114	71 - 131
1,2-Dichloropropane	92	106		ug/m3 Air		115	72 - 132
1,3,5-Trimethylbenzene	98	103		ug/m3 Air		105	65 - 125
1,3-Dichlorobenzene	120	133		ug/m3 Air		111	59 - 130

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-213520/4
Matrix: Air
Analysis Batch: 213520

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	120	130		ug/m3 Air		108	58 - 132
2-Butanone (MEK)	59	64.6		ug/m3 Air		109	73 - 133
2-Hexanone	82	93.3		ug/m3 Air		114	69 - 129
4-Ethyltoluene	98	111		ug/m3 Air		113	66 - 129
4-Methyl-2-pentanone (MIBK)	82	93.1		ug/m3 Air		114	74 - 134
Acetone	48	50.8		ug/m3 Air		107	65 - 125
Benzene	64	69.0		ug/m3 Air		108	68 - 128
Benzyl chloride	83	93.4		ug/m3 Air		113	67 - 127
Bromodichloromethane	130	149		ug/m3 Air		111	71 - 131
Bromoform	210	223		ug/m3 Air		108	66 - 126
Bromomethane	78	86.6		ug/m3 Air		111	73 - 134
Carbon disulfide	62	67.6		ug/m3 Air		109	71 - 131
Carbon tetrachloride	130	142		ug/m3 Air		113	63 - 126
Chlorobenzene	92	94.0		ug/m3 Air		102	63 - 123
Chloroethane	53	58.5		ug/m3 Air		111	73 - 133
Chloroform	98	111		ug/m3 Air		113	70 - 130
Chloromethane	41	44.4		ug/m3 Air		107	61 - 140
cis-1,2-Dichloroethene	79	88.3		ug/m3 Air		111	70 - 130
cis-1,3-Dichloropropene	91	100		ug/m3 Air		111	72 - 132
Dibromochloromethane	170	181		ug/m3 Air		106	66 - 126
Dichlorodifluoromethane	99	117		ug/m3 Air		119	69 - 129
Ethylbenzene	87	91.8		ug/m3 Air		106	64 - 124
Hexachlorobutadiene	210	235		ug/m3 Air		110	58 - 131
m,p-Xylene	170	185		ug/m3 Air		106	65 - 125
Methylene Chloride	69	74.8		ug/m3 Air		108	67 - 127
o-Xylene	87	93.2		ug/m3 Air		107	65 - 125
Styrene	85	96.7		ug/m3 Air		113	67 - 127
Tetrachloroethene	140	139		ug/m3 Air		103	63 - 123
Toluene	75	81.0		ug/m3 Air		107	68 - 128
trans-1,2-Dichloroethene	79	89.3		ug/m3 Air		113	72 - 132
trans-1,3-Dichloropropene	91	97.8		ug/m3 Air		108	66 - 126
Trichloroethene	110	117		ug/m3 Air		109	70 - 130
Trichlorofluoromethane	110	125		ug/m3 Air		112	71 - 131
Vinyl acetate	70	81.2		ug/m3 Air		115	65 - 134
Vinyl chloride	51	52.7		ug/m3 Air		103	59 - 152

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 130*
4-Bromofluorobenzene (Surr)	*108*		*70 - 130*
Toluene-d8 (Surr)	*103*		*70 - 130*

Lab Sample ID: LCSD 320-213520/5
Matrix: Air
Analysis Batch: 213520

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	20.0	21.6		ppb v/v		108	69 - 129	3	25
1,1,2,2-Tetrachloroethane	20.0	20.6		ppb v/v		103	64 - 124	1	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-213520/5
Matrix: Air
Analysis Batch: 213520

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	21.4		ppb v/v		107	70 - 130	3	25
1,1,2-Trichloroethane	20.0	20.5		ppb v/v		103	64 - 124	1	25
1,1-Dichloroethane	20.0	22.2		ppb v/v		111	71 - 131	1	25
1,1-Dichloroethene	20.0	22.4		ppb v/v		112	72 - 132	2	25
1,2,4-Trichlorobenzene	20.0	22.2		ppb v/v		111	58 - 138	3	25
1,2,4-Trimethylbenzene	20.0	22.5		ppb v/v		112	60 - 132	0	25
1,2-Dibromoethane (EDB)	20.0	20.7		ppb v/v		103	64 - 124	2	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	20.9		ppb v/v		104	74 - 134	5	25
1,2-Dichlorobenzene	20.0	21.4		ppb v/v		107	62 - 126	2	25
1,2-Dichloroethane	20.0	22.4		ppb v/v		112	71 - 131	2	25
1,2-Dichloropropane	20.0	22.8		ppb v/v		114	72 - 132	1	25
1,3,5-Trimethylbenzene	20.0	20.9		ppb v/v		105	65 - 125	0	25
1,3-Dichlorobenzene	20.0	21.6		ppb v/v		108	59 - 130	2	25
1,4-Dichlorobenzene	20.0	21.2		ppb v/v		106	58 - 132	2	25
2-Butanone (MEK)	20.0	21.9		ppb v/v		109	73 - 133	0	25
2-Hexanone	20.0	22.6		ppb v/v		113	69 - 129	1	25
4-Ethyltoluene	20.0	22.1		ppb v/v		110	66 - 129	2	25
4-Methyl-2-pentanone (MIBK)	20.0	22.8		ppb v/v		114	74 - 134	1	25
Acetone	20.0	20.7		ppb v/v		104	65 - 125	3	25
Benzene	20.0	21.7		ppb v/v		109	68 - 128	1	25
Benzyl chloride	16.0	17.8		ppb v/v		112	67 - 127	1	25
Bromodichloromethane	20.0	21.9		ppb v/v		109	71 - 131	2	25
Bromoform	20.0	20.9		ppb v/v		105	66 - 126	3	25
Bromomethane	20.0	22.8		ppb v/v		114	73 - 134	2	25
Carbon disulfide	20.0	21.5		ppb v/v		108	71 - 131	1	25
Carbon tetrachloride	20.0	21.8		ppb v/v		109	63 - 126	3	25
Chlorobenzene	20.0	20.1		ppb v/v		100	63 - 123	2	25
Chloroethane	20.0	22.0		ppb v/v		110	73 - 133	1	25
Chloroform	20.0	22.1		ppb v/v		110	70 - 130	3	25
Chloromethane	20.0	20.9		ppb v/v		105	61 - 140	3	25
cis-1,2-Dichloroethene	20.0	21.9		ppb v/v		110	70 - 130	2	25
cis-1,3-Dichloropropene	20.0	22.0		ppb v/v		110	72 - 132	0	25
Dibromochloromethane	20.0	20.7		ppb v/v		103	66 - 126	3	25
Dichlorodifluoromethane	20.0	24.1		ppb v/v		120	69 - 129	1	25
Ethylbenzene	20.0	20.8		ppb v/v		104	64 - 124	1	25
Hexachlorobutadiene	20.0	21.2		ppb v/v		106	58 - 131	4	25
m,p-Xylene	40.0	42.2		ppb v/v		105	65 - 125	1	25
Methylene Chloride	20.0	21.0		ppb v/v		105	67 - 127	3	25
o-Xylene	20.0	21.2		ppb v/v		106	65 - 125	1	25
Styrene	20.0	22.5		ppb v/v		112	67 - 127	1	25
Tetrachloroethene	20.0	20.0		ppb v/v		100	63 - 123	3	25
Toluene	20.0	21.5		ppb v/v		107	68 - 128	0	25
trans-1,2-Dichloroethene	20.0	22.1		ppb v/v		110	72 - 132	2	25
trans-1,3-Dichloropropene	20.0	21.3		ppb v/v		107	66 - 126	1	25
Trichloroethene	20.0	21.7		ppb v/v		109	70 - 130	0	25
Trichlorofluoromethane	20.0	21.5		ppb v/v		107	71 - 131	4	25
Vinyl acetate	20.0	22.6		ppb v/v		113	65 - 134	2	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-213520/5
Matrix: Air
Analysis Batch: 213520

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride			20.0	20.5		ppb v/v		102	59 - 152	1	25

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane			110	118		ug/m3 Air		108	69 - 129	3	25
1,1,2,2-Tetrachloroethane			140	141		ug/m3 Air		103	64 - 124	1	25
1,1,2-Trichloro-1,2,2-trifluoroethane			150	164		ug/m3 Air		107	70 - 130	3	25
1,1,2-Trichloroethane			110	112		ug/m3 Air		103	64 - 124	1	25
1,1-Dichloroethane			81	90.0		ug/m3 Air		111	71 - 131	1	25
1,1-Dichloroethene			79	88.6		ug/m3 Air		112	72 - 132	2	25
1,2,4-Trichlorobenzene			150	165		ug/m3 Air		111	58 - 138	3	25
1,2,4-Trimethylbenzene			98	110		ug/m3 Air		112	60 - 132	0	25
1,2-Dibromoethane (EDB)			150	159		ug/m3 Air		103	64 - 124	2	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane			140	146		ug/m3 Air		104	74 - 134	5	25
1,2-Dichlorobenzene			120	129		ug/m3 Air		107	62 - 126	2	25
1,2-Dichloroethane			81	90.5		ug/m3 Air		112	71 - 131	2	25
1,2-Dichloropropane			92	105		ug/m3 Air		114	72 - 132	1	25
1,3,5-Trimethylbenzene			98	103		ug/m3 Air		105	65 - 125	0	25
1,3-Dichlorobenzene			120	130		ug/m3 Air		108	59 - 130	2	25
1,4-Dichlorobenzene			120	128		ug/m3 Air		106	58 - 132	2	25
2-Butanone (MEK)			59	64.5		ug/m3 Air		109	73 - 133	0	25
2-Hexanone			82	92.8		ug/m3 Air		113	69 - 129	1	25
4-Ethyltoluene			98	109		ug/m3 Air		110	66 - 129	2	25
4-Methyl-2-pentanone (MIBK)			82	93.6		ug/m3 Air		114	74 - 134	1	25
Acetone			48	49.3		ug/m3 Air		104	65 - 125	3	25
Benzene			64	69.4		ug/m3 Air		109	68 - 128	1	25
Benzyl chloride			83	92.4		ug/m3 Air		112	67 - 127	1	25
Bromodichloromethane			130	147		ug/m3 Air		109	71 - 131	2	25
Bromoform			210	216		ug/m3 Air		105	66 - 126	3	25
Bromomethane			78	88.7		ug/m3 Air		114	73 - 134	2	25
Carbon disulfide			62	67.0		ug/m3 Air		108	71 - 131	1	25
Carbon tetrachloride			130	137		ug/m3 Air		109	63 - 126	3	25
Chlorobenzene			92	92.4		ug/m3 Air		100	63 - 123	2	25
Chloroethane			53	58.1		ug/m3 Air		110	73 - 133	1	25
Chloroform			98	108		ug/m3 Air		110	70 - 130	3	25
Chloromethane			41	43.2		ug/m3 Air		105	61 - 140	3	25
cis-1,2-Dichloroethene			79	86.9		ug/m3 Air		110	70 - 130	2	25
cis-1,3-Dichloropropene			91	99.9		ug/m3 Air		110	72 - 132	0	25
Dibromochloromethane			170	176		ug/m3 Air		103	66 - 126	3	25
Dichlorodifluoromethane			99	119		ug/m3 Air		120	69 - 129	1	25
Ethylbenzene			87	90.5		ug/m3 Air		104	64 - 124	1	25
Hexachlorobutadiene			210	226		ug/m3 Air		106	58 - 131	4	25
m,p-Xylene			170	183		ug/m3 Air		105	65 - 125	1	25
Methylene Chloride			69	73.0		ug/m3 Air		105	67 - 127	3	25
o-Xylene			87	92.2		ug/m3 Air		106	65 - 125	1	25
Styrene			85	95.8		ug/m3 Air		112	67 - 127	1	25
Tetrachloroethene			140	136		ug/m3 Air		100	63 - 123	3	25
Toluene			75	80.9		ug/m3 Air		107	68 - 128	0	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-213520/5
Matrix: Air
Analysis Batch: 213520

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
trans-1,2-Dichloroethene			79	87.5		ug/m3 Air		110	72 - 132	2	25
trans-1,3-Dichloropropene			91	96.7		ug/m3 Air		107	66 - 126	1	25
Trichloroethene			110	117		ug/m3 Air		109	70 - 130	0	25
Trichlorofluoromethane			110	121		ug/m3 Air		107	71 - 131	4	25
Vinyl acetate			70	79.6		ug/m3 Air		113	65 - 134	2	25
Vinyl chloride			51	52.3		ug/m3 Air		102	59 - 152	1	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 130*
4-Bromofluorobenzene (Surr)	*107*		*70 - 130*
Toluene-d8 (Surr)	*104*		*70 - 130*

QC Association Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Air - GC/MS VOA

Analysis Batch: 213423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-36671-1	SVE_south_Pre carbon_022818	Total/NA	Air	TO-15	
320-36671-2	SVE_south_Post carbon_022818	Total/NA	Air	TO-15	
MB 320-213423/7	Method Blank	Total/NA	Air	TO-15	
LCS 320-213423/3	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-213423/5	Lab Control Sample Dup	Total/NA	Air	TO-15	

Analysis Batch: 213520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-36671-1 - DL	SVE_south_Pre carbon_022818	Total/NA	Air	TO-15	
MB 320-213520/9	Method Blank	Total/NA	Air	TO-15	
LCS 320-213520/4	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-213520/5	Lab Control Sample Dup	Total/NA	Air	TO-15	

Lab Chronicle

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Client Sample ID: SVE_south_Pre carbon_022818

Lab Sample ID: 320-36671-1

Date Collected: 02/28/18 08:02

Matrix: Air

Date Received: 03/02/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		15.5	25 mL	250 mL	213423	03/16/18 22:28	AP1	TAL SAC
Total/NA	Analysis	TO-15	DL	46.6	8.33 mL	250 mL	213520	03/17/18 19:25	AP1	TAL SAC

Client Sample ID: SVE_south_Post carbon_022818

Lab Sample ID: 320-36671-2

Date Collected: 02/28/18 08:05

Matrix: Air

Date Received: 03/02/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		1	345 mL	250 mL	213423	03/16/18 23:17	AP1	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-18 *
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-18
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	04-01-18
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-18 *
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-18 *
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Portland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
N/A	N/A	N/A	None on record.	

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor REM

TestAmerica Job ID: 320-36671-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-36671-1	SVE_south_Pre carbon_022818	Air	02/28/18 08:02	03/02/18 09:15
320-36671-2	SVE_south_Post carbon_022818	Air	02/28/18 08:05	03/02/18 09:15

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	**Project Manager:** Stephanie Salisbury	**Samples Collected By:** Kyle Kline
Company Name: Apex companies	**Phone:** 503 924 4704 x 1925	
Address: 3015 SW 1st Ave	**Email:** SSalisbury@Apexcos.com	
City/State/Zip Portland OR 97201		
Phone: 503-924-4704	**Site Contact:**	
FAX:	**TA Contact:**	
Project Name: Nustar Vancouver REM	**Anaylsis Turnaround Time**	
Site/Location: Vancouver, WA	Standard (Specific): X	
P O # 1126-21	Rush (Specifiy):	

COC No: ___1___ of ___1___ COCs

For Lab Use Only:
Walk-in Client:
Lab Sampling:

Job / SDG No.:
(See below for Add'l Items)

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25.3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SUE_South_Pre Carbon_022818	2/28/18	801	802	-30	-3	34000	599	X														
SUE_South_Post carbon_022818	2/28/18	804	805	-30	-1	34000	564	X														

320-36671 Chain of Custody

	Temperature (Fahrenheit)		
Start	Interior	Ambient	
Stop			

	Temperature (Fahrenheit)		
Start	Interior	Ambient	
Stop			

Special Instructions/QC Requirements & Comments: Email Results to: SSalisbury@Apexcos.com

Samples Shipped by: Kyle Kline	**Date / Time:** 2/28/18 1015	**Samples Received by:**	2/28/18 1330
Samples Relinquished by:	**Date / Time:**	**Received by:**	
Relinquished by:	**Date / Time:** 2/28/18 1500	**Received by:**	2/28/18 1500
Lab Use Only: **Shipper/Nagle:**	**Opened by:** 3/1/18 1630	**Condition:** Cassie Brown 09:15 03-02-18	

TA-SAC

Login Sample Receipt Checklist

Client: Apex Companies LLC

Job Number: 320-36671-1

Login Number: 36671
List Number: 1
Creator: Branscum, Cassie

List Source: TestAmerica Sacramento

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

TestAmerica
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Sacramento
Canister QC Certification
Batch Certification

Date Cleaned/Batch ID: TO-15 SCAN

Date of QC: 11-16-17 320-33396

Data File Number: 1711722

320-33396 Chain of Custody

(*File ID for certification analysis of canister designated below*)

CANISTER ID NUMBERS

*	8021
	34000509
	34001555
	34000286
	8430
	8032

	34000564
	34000364
	34000378
	34000299
	34001565
	34000855

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED.

1st level Reviewed By: _____ Date: 11/20/17

2nd level Reviewed By: _____ Date: 11/20/17

Q:\DOCUMENT-MANAGEMENT\FORMS\QA-814 BATCH CAN QC 20171023.DOC
QA-814

RE 10232017

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33396-1

SDG No.:

Client Sample ID: 8021 Lab Sample ID: 320-33396-1

Matrix: Air Lab File ID: 17111722.D

Analysis Method: TO-15 Date Collected: 11/16/2017 00:00

Sample wt/vol: 500(mL) Date Analyzed: 11/18/2017 01:39

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 195401 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
67-64-1	Acetone	ND		5.0	0.18
107-02-8	Acrolein	ND		2.0	0.22
107-13-1	Acrylonitrile	ND		2.0	0.19
107-05-1	Allyl chloride	ND		0.80	0.11
71-43-2	Benzene	ND		0.40	0.079
100-44-7	Benzyl chloride	ND		0.80	0.16
75-27-4	Bromodichloromethane	ND		0.30	0.066
75-25-2	Bromoform	ND		0.40	0.070
74-83-9	Bromomethane	ND		0.80	0.34
106-99-0	1,3-Butadiene	ND		0.80	0.15
106-97-8	n-Butane	ND		0.40	0.15
78-93-3	2-Butanone (MEK)	ND		0.80	0.20
75-65-0	tert-Butyl alcohol (TBA)	ND		2.0	0.11
104-51-8	n-Butylbenzene	ND		0.40	0.18
135-98-8	sec-Butylbenzene	ND		0.40	0.070
98-06-6	tert-Butylbenzene	ND		0.80	0.068
75-15-0	Carbon disulfide	ND		0.80	0.078
56-23-5	Carbon tetrachloride	ND		0.80	0.064
108-90-7	Chlorobenzene	ND		0.30	0.064
75-45-6	Chlorodifluoromethane	ND		0.80	0.27
75-00-3	Chloroethane	ND		0.80	0.31
67-66-3	Chloroform	ND		0.30	0.095
74-87-3	Chloromethane	ND		0.80	0.20
95-49-8	2-Chlorotoluene	ND		0.40	0.080
110-82-7	Cyclohexane	ND		0.40	0.084
124-48-1	Dibromochloromethane	ND		0.40	0.079
106-93-4	1,2-Dibromoethane (EDB)	ND		0.80	0.075
74-95-3	Dibromomethane	ND		0.40	0.057
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16
95-50-1	1,2-Dichlorobenzene	ND		0.40	0.13
541-73-1	1,3-Dichlorobenzene	ND		0.40	0.11
106-46-7	1,4-Dichlorobenzene	ND		0.40	0.15
75-71-8	Dichlorodifluoromethane	ND		0.40	0.15
75-34-3	1,1-Dichloroethane	ND		0.30	0.072
107-06-2	1,2-Dichloroethane	ND		0.80	0.088

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33396-1

SDG No.:

Client Sample ID: 8021 Lab Sample ID: 320-33396-1

Matrix: Air Lab File ID: 17111722.D

Analysis Method: TO-15 Date Collected: 11/16/2017 00:00

Sample wt/vol: 500(mL) Date Analyzed: 11/18/2017 01:39

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 195401 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-35-4	1,1-Dichloroethene	ND		0.80	0.13
156-59-2	cis-1,2-Dichloroethene	ND		0.40	0.089
156-60-5	trans-1,2-Dichloroethene	ND		0.40	0.10
78-87-5	1,2-Dichloropropane	ND		0.40	0.24
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.10
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.088
123-91-1	1,4-Dioxane	ND		0.80	0.10
141-78-6	Ethyl acetate	ND		0.30	0.18
100-41-4	Ethylbenzene	ND		0.40	0.063
622-96-8	4-Ethyltoluene	ND		0.40	0.19
142-82-5	n-Heptane	ND		0.80	0.063
87-68-3	Hexachlorobutadiene	ND		2.0	0.43
110-54-3	n-Hexane	ND		0.80	0.075
591-78-6	2-Hexanone	ND		0.40	0.087
98-82-8	Isopropylbenzene	ND		0.80	0.10
99-87-6	4-Isopropyltoluene	ND		0.80	0.12
1634-04-4	Methyl-t-Butyl Ether (MTBE)	ND		0.80	0.12
80-62-6	Methyl methacrylate	ND		0.80	0.16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14
75-09-2	Methylene Chloride	0.077	J B	0.40	0.072
98-83-9	alpha-Methylstyrene	ND		0.40	0.065
91-20-3	Naphthalene	ND		0.80	0.56
111-65-9	n-Octane	ND		0.40	0.055
109-66-0	n-Pentane	ND		0.80	0.26
115-07-1	Propylene	ND		0.40	0.099
103-65-1	N-Propylbenzene	ND		0.40	0.059
100-42-5	Styrene	ND		0.40	0.059
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.40	0.069
127-18-4	Tetrachloroethene	ND		0.40	0.051
109-99-9	Tetrahydrofuran	ND		0.80	0.21
108-88-3	Toluene	ND		0.40	0.051
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	0.43
71-55-6	1,1,1-Trichloroethane	ND		0.30	0.065
79-00-5	1,1,2-Trichloroethane	ND		0.40	0.067

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-33396-1

SDG No.:

Client Sample ID: 8021 Lab Sample ID: 320-33396-1

Matrix: Air Lab File ID: 17111722.D

Analysis Method: TO-15 Date Collected: 11/16/2017 00:00

Sample wt/vol: 500(mL) Date Analyzed: 11/18/2017 01:39

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 195401 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-01-6	Trichloroethene	ND		0.40	0.11
75-69-4	Trichlorofluoromethane	ND		0.40	0.20
96-18-4	1,2,3-Trichloropropane	ND		0.40	0.17
95-63-6	1,2,4-Trimethylbenzene	ND		0.80	0.16
108-67-8	1,3,5-Trimethylbenzene	ND		0.40	0.13
540-84-1	2,2,4-Trimethylpentane	ND		0.40	0.071
108-05-4	Vinyl acetate	ND		0.80	0.15
593-60-2	Vinyl bromide	ND		0.80	0.26
75-01-4	Vinyl chloride	ND		0.40	0.12
179601-23-1	m,p-Xylene	ND		0.80	0.10
95-47-6	o-Xylene	ND		0.40	0.054

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	98		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		70-130
2037-26-5	Toluene-d8 (Surr)	101		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\ATMS2\20171117-50600.b\17111722.D
Lims ID: 320-33396-A-1
Client ID: 8021
Sample Type: Client
Inject. Date: 18-Nov-2017 01:39:30 ALS Bottle#: 1 Worklist Smp#: 39
Purge Vol: 250.000 mL Dil. Factor: 1.0000
Sample Info: 320-33396-A-1
Misc. Info.: 500 mL
Operator ID: RG Instrument ID: ATMS2

Method: \\ChromNA\Sacramento\ChromData\ATMS2\20171117-50600.b\TO15_ATMS2N.m
Limit Group: MSA - TO15 - ICAL
Last Update: 20-Nov-2017 08:50:39 Calib Date: 12-Oct-2017 00:48:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\ATMS2\20171011-49044.b\17101112.D

Column 1 : RTX Volatiles (0.32 mm) Det: MS SCAN
Process Host: XAWRK028

First Level Reviewer: girr Date: 20-Nov-2017 08:50:40

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ppb v/v	Flags
* 1 Chlorobromomethane (IS)	130	11.369	11.381	-0.012	97	51803	4.00	
* 2 1,4-Difluorobenzene	114	13.468	13.474	-0.006	95	199531	4.00	
* 3 Chlorobenzene-d5 (IS)	117	19.539	19.539	0.000	86	194345	4.00	
$ 4 1,2-Dichloroethane-d4 (Sur	65	12.531	12.537	-0.006	0	65445	4.10	
$ 5 Toluene-d8 (Surr)	100	16.704	16.704	0.000	98	130454	4.06	
$ 6 4-Bromofluorobenzene (Surr	95	21.559	21.559	0.000	93	121803	3.93	
32 Acetone	43	6.910	6.867	0.043	92	2397	0.1469	
39 Methylene Chloride	49	8.059	8.066	-0.007	89	1509	0.0769	

Reagents:

VAMSIS20_00061 Amount Added: 50.00 Units: mL Run Reagent

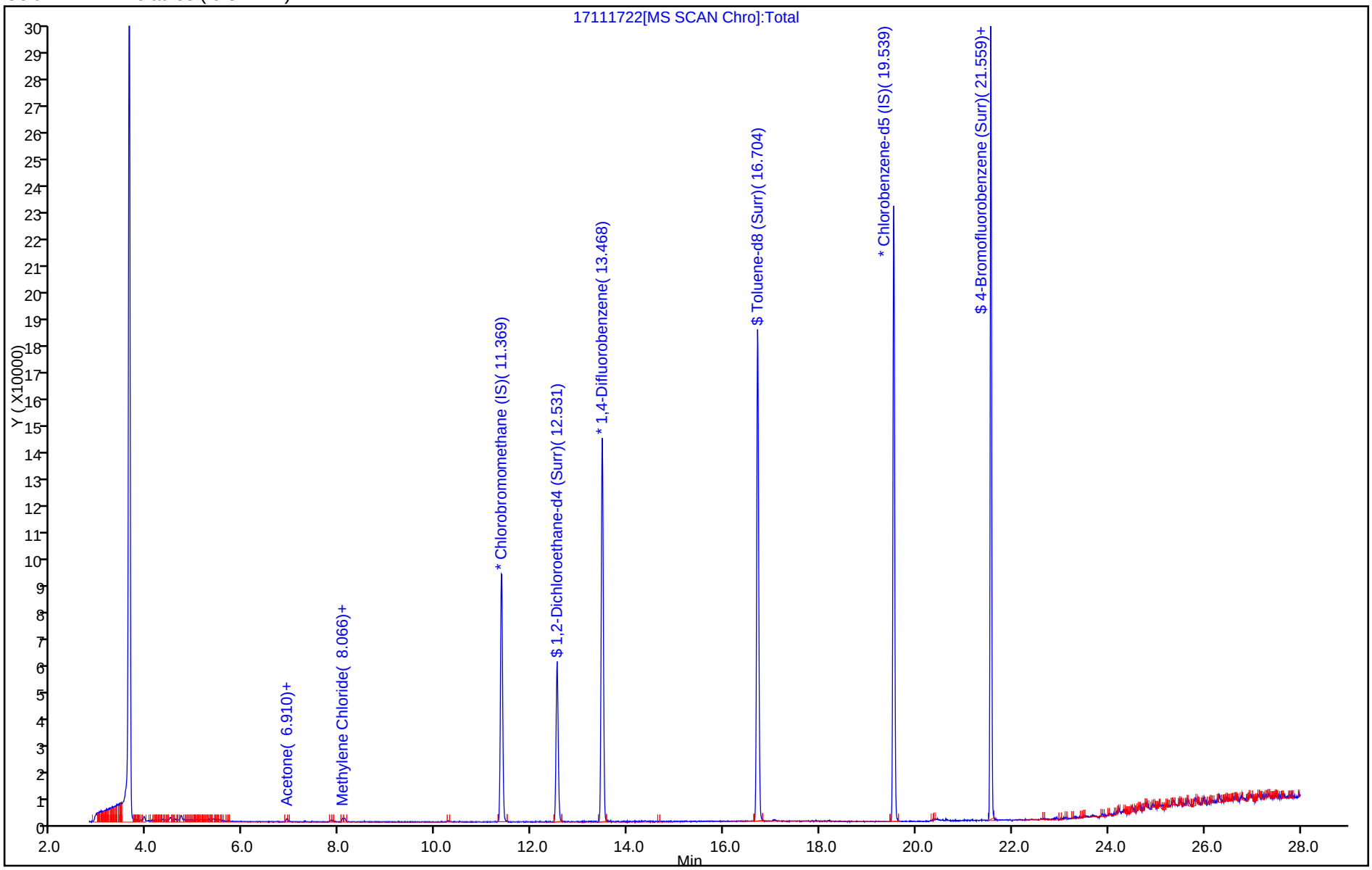
Report Date: 20-Nov-2017 08:50:41 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS2\20171117-50600.b\17111722.D

Injection Date:	18-Nov-2017 01:39:30	Instrument ID:	ATMS2	Operator ID:	RG
Lims ID:	320-33396-A-1	Lab Sample ID:	320-33396-1	Worklist Smp#:	39
Client ID:	8021				
Purge Vol:	250.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	1
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		

Column: RTX Volatiles (0.32 mm)



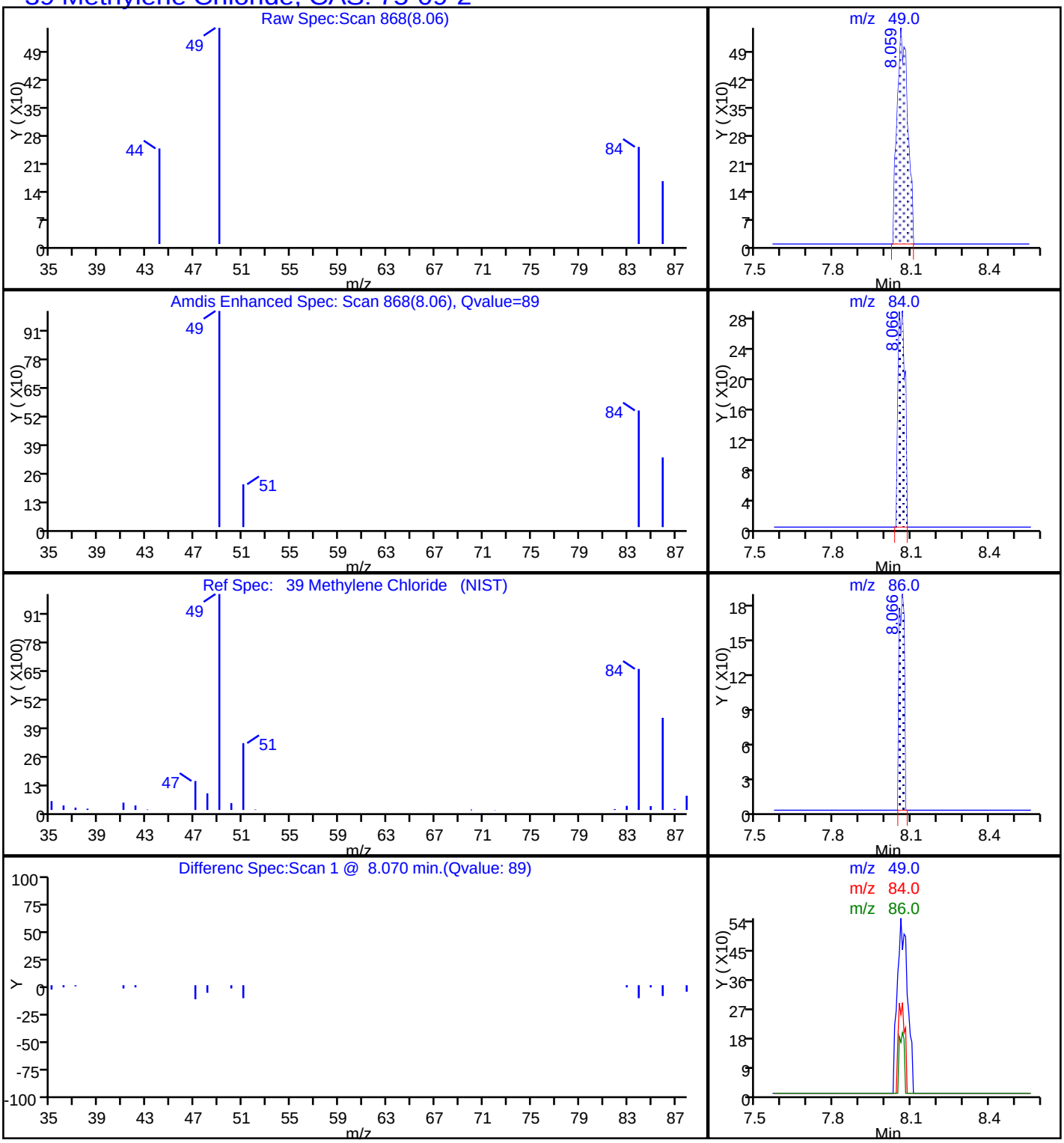
Report Date: 20-Nov-2017 08:50:41 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS2\20171117-50600.b\17111722.D

Injection Date:	18-Nov-2017 01:39:30	Instrument ID:	ATMS2		
Lims ID:	320-33396-A-1	Lab Sample ID:	320-33396-1		
Client ID:	8021				
Operator ID:	RG	ALS Bottle#:	1	Worklist Smp#:	39
Purge Vol:	250.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS2N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

39 Methylene Chloride, CAS: 75-09-2



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-37748-1
Client Project/Site: NuStar Van REM

For:
Apex Companies LLC
3015 SW 1st Avenue
Portland, Oregon 97201

Attn: Heather Gosack

Kristine D. Allen

Authorized for release by:
4/20/2018 11:07:44 AM
Kristine Allen, Manager of Project Management
(253)248-4970
kristine.allen@testamericainc.com

Designee for

Cathy Gamble, Project Manager I
(253)922-2310
cathy.gamble@testamericainc.com

Table of Contents

Glossary

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

Job ID: 320-37748-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-37748-1

Comments
No additional comments.

Receipt
The samples were received on 4/3/2018 8:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice.

Air - GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

Detection Summary

Client: Apex Companies LLC
Project/Site: NuStar Van REM

TestAmerica Job ID: 320-37748-1

Client Sample ID: SVE_South_Pre carbon_032918 — Lab Sample ID: 320-37748-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	8.4		5.6		ppb v/v	18.8		TO-15	Total/NA
cis-1,2-Dichloroethene	46		7.5		ppb v/v	18.8		TO-15	Total/NA
Tetrachloroethene	1800		7.5		ppb v/v	18.8		TO-15	Total/NA
Trichloroethene	88		7.5		ppb v/v	18.8		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	46		31		ug/m3 Air	18.8		TO-15	Total/NA
cis-1,2-Dichloroethene	180		30		ug/m3 Air	18.8		TO-15	Total/NA
Tetrachloroethene	13000		51		ug/m3 Air	18.8		TO-15	Total/NA
Trichloroethene	470		40		ug/m3 Air	18.8		TO-15	Total/NA

Client Sample ID: SVE_South_Post carbon_032918 — Lab Sample ID: 320-37748-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	2.7		0.30		ppb v/v	1		TO-15	Total/NA
1,1-Dichloroethane	1.0		0.30		ppb v/v	1		TO-15	Total/NA
1,1-Dichloroethene	1.3		0.80		ppb v/v	1		TO-15	Total/NA
2-Butanone (MEK)	3.4		0.80		ppb v/v	1		TO-15	Total/NA
Acetone	18		5.0		ppb v/v	1		TO-15	Total/NA
Chloroform	0.33		0.30		ppb v/v	1		TO-15	Total/NA
Methylene Chloride	0.42		0.40		ppb v/v	1		TO-15	Total/NA
Tetrachloroethene	1.2		0.40		ppb v/v	1		TO-15	Total/NA
trans-1,2-Dichloroethene	1.9		0.40		ppb v/v	1		TO-15	Total/NA
Trichloroethene	20		0.40		ppb v/v	1		TO-15	Total/NA
Trichlorofluoromethane	0.40		0.40		ppb v/v	1		TO-15	Total/NA
Vinyl chloride	0.67		0.40		ppb v/v	1		TO-15	Total/NA
cis-1,2-Dichloroethene - DL	130		1.4		ppb v/v	3.56		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	15		1.6		ug/m3 Air	1		TO-15	Total/NA
1,1-Dichloroethane	4.2		1.2		ug/m3 Air	1		TO-15	Total/NA
1,1-Dichloroethene	5.0		3.2		ug/m3 Air	1		TO-15	Total/NA
2-Butanone (MEK)	10		2.4		ug/m3 Air	1		TO-15	Total/NA
Acetone	42		12		ug/m3 Air	1		TO-15	Total/NA
Chloroform	1.6		1.5		ug/m3 Air	1		TO-15	Total/NA
Methylene Chloride	1.5		1.4		ug/m3 Air	1		TO-15	Total/NA
Tetrachloroethene	7.8		2.7		ug/m3 Air	1		TO-15	Total/NA
trans-1,2-Dichloroethene	7.4		1.6		ug/m3 Air	1		TO-15	Total/NA
Trichloroethene	110		2.1		ug/m3 Air	1		TO-15	Total/NA
Trichlorofluoromethane	2.2		2.2		ug/m3 Air	1		TO-15	Total/NA
Vinyl chloride	1.7		1.0		ug/m3 Air	1		TO-15	Total/NA
cis-1,2-Dichloroethene - DL	500		5.6		ug/m3 Air	3.56		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: SVE_South_Pre carbon_032918 — **Lab Sample ID: 320-37748-1**
Date Collected: 03/29/18 11:04 — **Matrix: Air**
Date Received: 04/03/18 08:50
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**8.4**		5.6		ppb v/v			04/18/18 20:56	18.8
1,1,2,2-Tetrachloroethane	ND		7.5		ppb v/v			04/18/18 20:56	18.8
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		7.5		ppb v/v			04/18/18 20:56	18.8
1,1,2-Trichloroethane	ND		7.5		ppb v/v			04/18/18 20:56	18.8
1,1-Dichloroethane	ND		5.6		ppb v/v			04/18/18 20:56	18.8
1,1-Dichloroethene	ND		15		ppb v/v			04/18/18 20:56	18.8
1,2,4-Trichlorobenzene	ND		38		ppb v/v			04/18/18 20:56	18.8
1,2,4-Trimethylbenzene	ND		15		ppb v/v			04/18/18 20:56	18.8
1,2-Dibromoethane (EDB)	ND		15		ppb v/v			04/18/18 20:56	18.8
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		7.5		ppb v/v			04/18/18 20:56	18.8
1,2-Dichlorobenzene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
1,2-Dichloroethane	ND		15		ppb v/v			04/18/18 20:56	18.8
1,2-Dichloropropane	ND		7.5		ppb v/v			04/18/18 20:56	18.8
1,3,5-Trimethylbenzene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
1,3-Dichlorobenzene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
1,4-Dichlorobenzene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
2-Butanone (MEK)	ND		15		ppb v/v			04/18/18 20:56	18.8
2-Hexanone	ND		7.5		ppb v/v			04/18/18 20:56	18.8
4-Ethyltoluene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
4-Methyl-2-pentanone (MIBK)	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Acetone	ND		94		ppb v/v			04/18/18 20:56	18.8
Benzene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Benzyl chloride	ND		15		ppb v/v			04/18/18 20:56	18.8
Bromodichloromethane	ND		5.6		ppb v/v			04/18/18 20:56	18.8
Bromoform	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Bromomethane	ND		15		ppb v/v			04/18/18 20:56	18.8
Carbon disulfide	ND		15		ppb v/v			04/18/18 20:56	18.8
Carbon tetrachloride	ND		15		ppb v/v			04/18/18 20:56	18.8
Chlorobenzene	ND		5.6		ppb v/v			04/18/18 20:56	18.8
Chloroethane	ND		15		ppb v/v			04/18/18 20:56	18.8
Chloroform	ND		5.6		ppb v/v			04/18/18 20:56	18.8
Chloromethane	ND		15		ppb v/v			04/18/18 20:56	18.8
cis-1,2-Dichloroethene	**46**		7.5		ppb v/v			04/18/18 20:56	18.8
cis-1,3-Dichloropropene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Dibromochloromethane	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Dichlorodifluoromethane	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Ethylbenzene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Hexachlorobutadiene	ND		38		ppb v/v			04/18/18 20:56	18.8
m,p-Xylene	ND		15		ppb v/v			04/18/18 20:56	18.8
Methylene Chloride	ND		7.5		ppb v/v			04/18/18 20:56	18.8
o-Xylene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Styrene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Tetrachloroethene	**1800**		7.5		ppb v/v			04/18/18 20:56	18.8
Toluene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
trans-1,2-Dichloroethene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
trans-1,3-Dichloropropene	ND		7.5		ppb v/v			04/18/18 20:56	18.8
Trichloroethene	**88**		7.5		ppb v/v			04/18/18 20:56	18.8
Trichlorofluoromethane	ND		7.5		ppb v/v			04/18/18 20:56	18.8

Client: Apex Companies LLC
Project/Site: NuStar Van REM

TestAmerica Job ID: 320-37748-1

Client Sample ID: SVE_South_Pre carbon_032918
Lab Sample ID: 320-37748-1
Date Collected: 03/29/18 11:04
Matrix: Air
Date Received: 04/03/18 08:50
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl acetate	ND		15		ppb v/v			04/18/18 20:56	18.8
Vinyl chloride	ND		7.5		ppb v/v			04/18/18 20:56	18.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**46**		31		ug/m3 Air			04/18/18 20:56	18.8
1,1,2,2-Tetrachloroethane	ND		52		ug/m3 Air			04/18/18 20:56	18.8
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		58		ug/m3 Air			04/18/18 20:56	18.8
1,1,2-Trichloroethane	ND		41		ug/m3 Air			04/18/18 20:56	18.8
1,1-Dichloroethane	ND		23		ug/m3 Air			04/18/18 20:56	18.8
1,1-Dichloroethene	ND		60		ug/m3 Air			04/18/18 20:56	18.8
1,2,4-Trichlorobenzene	ND		280		ug/m3 Air			04/18/18 20:56	18.8
1,2,4-Trimethylbenzene	ND		74		ug/m3 Air			04/18/18 20:56	18.8
1,2-Dibromoethane (EDB)	ND		120		ug/m3 Air			04/18/18 20:56	18.8
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		53		ug/m3 Air			04/18/18 20:56	18.8
1,2-Dichlorobenzene	ND		45		ug/m3 Air			04/18/18 20:56	18.8
1,2-Dichloroethane	ND		61		ug/m3 Air			04/18/18 20:56	18.8
1,2-Dichloropropane	ND		35		ug/m3 Air			04/18/18 20:56	18.8
1,3,5-Trimethylbenzene	ND		37		ug/m3 Air			04/18/18 20:56	18.8
1,3-Dichlorobenzene	ND		45		ug/m3 Air			04/18/18 20:56	18.8
1,4-Dichlorobenzene	ND		45		ug/m3 Air			04/18/18 20:56	18.8
2-Butanone (MEK)	ND		44		ug/m3 Air			04/18/18 20:56	18.8
2-Hexanone	ND		31		ug/m3 Air			04/18/18 20:56	18.8
4-Ethyltoluene	ND		37		ug/m3 Air			04/18/18 20:56	18.8
4-Methyl-2-pentanone (MIBK)	ND		31		ug/m3 Air			04/18/18 20:56	18.8
Acetone	ND		220		ug/m3 Air			04/18/18 20:56	18.8
Benzene	ND		24		ug/m3 Air			04/18/18 20:56	18.8
Benzyl chloride	ND		78		ug/m3 Air			04/18/18 20:56	18.8
Bromodichloromethane	ND		38		ug/m3 Air			04/18/18 20:56	18.8
Bromoform	ND		78		ug/m3 Air			04/18/18 20:56	18.8
Bromomethane	ND		58		ug/m3 Air			04/18/18 20:56	18.8
Carbon disulfide	ND		47		ug/m3 Air			04/18/18 20:56	18.8
Carbon tetrachloride	ND		95		ug/m3 Air			04/18/18 20:56	18.8
Chlorobenzene	ND		26		ug/m3 Air			04/18/18 20:56	18.8
Chloroethane	ND		40		ug/m3 Air			04/18/18 20:56	18.8
Chloroform	ND		28		ug/m3 Air			04/18/18 20:56	18.8
Chloromethane	ND		31		ug/m3 Air			04/18/18 20:56	18.8
cis-1,2-Dichloroethene	**180**		30		ug/m3 Air			04/18/18 20:56	18.8
cis-1,3-Dichloropropene	ND		34		ug/m3 Air			04/18/18 20:56	18.8
Dibromochloromethane	ND		64		ug/m3 Air			04/18/18 20:56	18.8
Dichlorodifluoromethane	ND		37		ug/m3 Air			04/18/18 20:56	18.8
Ethylbenzene	ND		33		ug/m3 Air			04/18/18 20:56	18.8
Hexachlorobutadiene	ND		400		ug/m3 Air			04/18/18 20:56	18.8
m,p-Xylene	ND		65		ug/m3 Air			04/18/18 20:56	18.8
Methylene Chloride	ND		26		ug/m3 Air			04/18/18 20:56	18.8
o-Xylene	ND		33		ug/m3 Air			04/18/18 20:56	18.8
Styrene	ND		32		ug/m3 Air			04/18/18 20:56	18.8
Tetrachloroethene	**13000**		51		ug/m3 Air			04/18/18 20:56	18.8
Toluene	ND		28		ug/m3 Air			04/18/18 20:56	18.8
trans-1,2-Dichloroethene	ND		30		ug/m3 Air			04/18/18 20:56	18.8

Client Sample ID: SVE_South_Pre carbon_032918

Lab Sample ID: 320-37748-1
Matrix: Air
Date Collected: 03/29/18 11:04
Date Received: 04/03/18 08:50
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		34		ug/m3 Air			04/18/18 20:56	18.8
Trichloroethene	**470**		40		ug/m3 Air			04/18/18 20:56	18.8
Trichlorofluoromethane	ND		42		ug/m3 Air			04/18/18 20:56	18.8
Vinyl acetate	ND		53		ug/m3 Air			04/18/18 20:56	18.8
Vinyl chloride	ND		19		ug/m3 Air			04/18/18 20:56	18.8

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*		*04/18/18 20:56*	*18.8*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*		*04/18/18 20:56*	*18.8*
Toluene-d8 (Surr)	*107*		*70 - 130*		*04/18/18 20:56*	*18.8*

Client Sample ID: SVE_South_Post carbon_032918

Lab Sample ID: 320-37748-2
Matrix: Air
Date Collected: 03/29/18 11:06
Date Received: 04/03/18 08:50
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**2.7**		0.30		ppb v/v			04/18/18 21:49	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			04/18/18 21:49	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			04/18/18 21:49	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			04/18/18 21:49	1
1,1-Dichloroethane	**1.0**		0.30		ppb v/v			04/18/18 21:49	1
1,1-Dichloroethene	**1.3**		0.80		ppb v/v			04/18/18 21:49	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			04/18/18 21:49	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			04/18/18 21:49	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			04/18/18 21:49	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			04/18/18 21:49	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			04/18/18 21:49	1
1,2-Dichloroethane	ND		0.80		ppb v/v			04/18/18 21:49	1
1,2-Dichloropropane	ND		0.40		ppb v/v			04/18/18 21:49	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			04/18/18 21:49	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			04/18/18 21:49	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			04/18/18 21:49	1
2-Butanone (MEK)	**3.4**		0.80		ppb v/v			04/18/18 21:49	1
2-Hexanone	ND		0.40		ppb v/v			04/18/18 21:49	1
4-Ethyltoluene	ND		0.40		ppb v/v			04/18/18 21:49	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			04/18/18 21:49	1
Acetone	**18**		5.0		ppb v/v			04/18/18 21:49	1
Benzene	ND		0.40		ppb v/v			04/18/18 21:49	1
Benzyl chloride	ND		0.80		ppb v/v			04/18/18 21:49	1
Bromodichloromethane	ND		0.30		ppb v/v			04/18/18 21:49	1
Bromoform	ND		0.40		ppb v/v			04/18/18 21:49	1
Bromomethane	ND		0.80		ppb v/v			04/18/18 21:49	1
Carbon disulfide	ND		0.80		ppb v/v			04/18/18 21:49	1
Carbon tetrachloride	ND		0.80		ppb v/v			04/18/18 21:49	1
Chlorobenzene	ND		0.30		ppb v/v			04/18/18 21:49	1
Chloroethane	ND		0.80		ppb v/v			04/18/18 21:49	1
Chloroform	**0.33**		0.30		ppb v/v			04/18/18 21:49	1

Client Sample ID: SVE_South_Post carbon_032918
Lab Sample ID: 320-37748-2
Date Collected: 03/29/18 11:06
Matrix: Air
Date Received: 04/03/18 08:50
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		0.80		ppb v/v			04/18/18 21:49	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			04/18/18 21:49	1
Dibromochloromethane	ND		0.40		ppb v/v			04/18/18 21:49	1
Dichlorodifluoromethane	ND		0.40		ppb v/v			04/18/18 21:49	1
Ethylbenzene	ND		0.40		ppb v/v			04/18/18 21:49	1
Hexachlorobutadiene	ND		2.0		ppb v/v			04/18/18 21:49	1
m,p-Xylene	ND		0.80		ppb v/v			04/18/18 21:49	1
Methylene Chloride	**0.42**		0.40		ppb v/v			04/18/18 21:49	1
o-Xylene	ND		0.40		ppb v/v			04/18/18 21:49	1
Styrene	ND		0.40		ppb v/v			04/18/18 21:49	1
Tetrachloroethene	**1.2**		0.40		ppb v/v			04/18/18 21:49	1
Toluene	ND		0.40		ppb v/v			04/18/18 21:49	1
trans-1,2-Dichloroethene	**1.9**		0.40		ppb v/v			04/18/18 21:49	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			04/18/18 21:49	1
Trichloroethene	**20**		0.40		ppb v/v			04/18/18 21:49	1
Trichlorofluoromethane	**0.40**		0.40		ppb v/v			04/18/18 21:49	1
Vinyl acetate	ND		0.80		ppb v/v			04/18/18 21:49	1
Vinyl chloride	**0.67**		0.40		ppb v/v			04/18/18 21:49	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**15**		1.6		ug/m3 Air			04/18/18 21:49	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			04/18/18 21:49	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			04/18/18 21:49	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			04/18/18 21:49	1
1,1-Dichloroethane	**4.2**		1.2		ug/m3 Air			04/18/18 21:49	1
1,1-Dichloroethene	**5.0**		3.2		ug/m3 Air			04/18/18 21:49	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			04/18/18 21:49	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			04/18/18 21:49	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			04/18/18 21:49	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			04/18/18 21:49	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			04/18/18 21:49	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			04/18/18 21:49	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			04/18/18 21:49	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			04/18/18 21:49	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			04/18/18 21:49	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			04/18/18 21:49	1
2-Butanone (MEK)	**10**		2.4		ug/m3 Air			04/18/18 21:49	1
2-Hexanone	ND		1.6		ug/m3 Air			04/18/18 21:49	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			04/18/18 21:49	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			04/18/18 21:49	1
Acetone	**42**		12		ug/m3 Air			04/18/18 21:49	1
Benzene	ND		1.3		ug/m3 Air			04/18/18 21:49	1
Benzyl chloride	ND		4.1		ug/m3 Air			04/18/18 21:49	1
Bromodichloromethane	ND		2.0		ug/m3 Air			04/18/18 21:49	1
Bromoform	ND		4.1		ug/m3 Air			04/18/18 21:49	1
Bromomethane	ND		3.1		ug/m3 Air			04/18/18 21:49	1
Carbon disulfide	ND		2.5		ug/m3 Air			04/18/18 21:49	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			04/18/18 21:49	1
Chlorobenzene	ND		1.4		ug/m3 Air			04/18/18 21:49	1

Client Sample ID: SVE_South_Post carbon_032918 — **Lab Sample ID: 320-37748-2**
Date Collected: 03/29/18 11:06 — **Matrix: Air**
Date Received: 04/03/18 08:50
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		2.1		ug/m3 Air			04/18/18 21:49	1
Chloroform	**1.6**		1.5		ug/m3 Air			04/18/18 21:49	1
Chloromethane	ND		1.7		ug/m3 Air			04/18/18 21:49	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			04/18/18 21:49	1
Dibromochloromethane	ND		3.4		ug/m3 Air			04/18/18 21:49	1
Dichlorodifluoromethane	ND		2.0		ug/m3 Air			04/18/18 21:49	1
Ethylbenzene	ND		1.7		ug/m3 Air			04/18/18 21:49	1
Hexachlorobutadiene	ND		21		ug/m3 Air			04/18/18 21:49	1
m,p-Xylene	ND		3.5		ug/m3 Air			04/18/18 21:49	1
Methylene Chloride	**1.5**		1.4		ug/m3 Air			04/18/18 21:49	1
o-Xylene	ND		1.7		ug/m3 Air			04/18/18 21:49	1
Styrene	ND		1.7		ug/m3 Air			04/18/18 21:49	1
Tetrachloroethene	**7.8**		2.7		ug/m3 Air			04/18/18 21:49	1
Toluene	ND		1.5		ug/m3 Air			04/18/18 21:49	1
trans-1,2-Dichloroethene	**7.4**		1.6		ug/m3 Air			04/18/18 21:49	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			04/18/18 21:49	1
Trichloroethene	**110**		2.1		ug/m3 Air			04/18/18 21:49	1
Trichlorofluoromethane	**2.2**		2.2		ug/m3 Air			04/18/18 21:49	1
Vinyl acetate	ND		2.8		ug/m3 Air			04/18/18 21:49	1
Vinyl chloride	**1.7**		1.0		ug/m3 Air			04/18/18 21:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*		*04/18/18 21:49*	*1*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*04/18/18 21:49*	*1*
Toluene-d8 (Surr)	*104*		*70 - 130*		*04/18/18 21:49*	*1*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**130**		1.4		ppb v/v			04/19/18 06:59	3.56

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**500**		5.6		ug/m3 Air			04/19/18 06:59	3.56

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 130*		*04/19/18 06:59*	*3.56*
4-Bromofluorobenzene (Surr)	*84*		*70 - 130*		*04/19/18 06:59*	*3.56*
Toluene-d8 (Surr)	*101*		*70 - 130*		*04/19/18 06:59*	*3.56*

Surrogate Summary

Client: Apex Companies LLC
Project/Site: NuStar Van REM

TestAmerica Job ID: 320-37748-1

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		DCA	BFB	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
320-37748-1	SVE_South_Pre carbon_032918	100	94	107
320-37748-2	SVE_South_Post carbon_032918	99	95	104
320-37748-2 - DL	SVE_South_Post carbon_032918	98	84	101
LCS 320-218593/3	Lab Control Sample	105	107	108
LCSD 320-218593/4	Lab Control Sample Dup	105	105	108
MB 320-218593/7	Method Blank	99	93	105

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 320-218593/7
Matrix: Air
Analysis Batch: 218593

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.30		ppb v/v			04/18/18 16:40	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			04/18/18 16:40	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			04/18/18 16:40	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			04/18/18 16:40	1
1,1-Dichloroethane	ND		0.30		ppb v/v			04/18/18 16:40	1
1,1-Dichloroethene	ND		0.80		ppb v/v			04/18/18 16:40	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			04/18/18 16:40	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			04/18/18 16:40	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			04/18/18 16:40	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			04/18/18 16:40	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			04/18/18 16:40	1
1,2-Dichloroethane	ND		0.80		ppb v/v			04/18/18 16:40	1
1,2-Dichloropropane	ND		0.40		ppb v/v			04/18/18 16:40	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			04/18/18 16:40	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			04/18/18 16:40	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			04/18/18 16:40	1
2-Butanone (MEK)	ND		0.80		ppb v/v			04/18/18 16:40	1
2-Hexanone	ND		0.40		ppb v/v			04/18/18 16:40	1
4-Ethyltoluene	ND		0.40		ppb v/v			04/18/18 16:40	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			04/18/18 16:40	1
Acetone	ND		5.0		ppb v/v			04/18/18 16:40	1
Benzene	ND		0.40		ppb v/v			04/18/18 16:40	1
Benzyl chloride	ND		0.80		ppb v/v			04/18/18 16:40	1
Bromodichloromethane	ND		0.30		ppb v/v			04/18/18 16:40	1
Bromoform	ND		0.40		ppb v/v			04/18/18 16:40	1
Bromomethane	ND		0.80		ppb v/v			04/18/18 16:40	1
Carbon disulfide	ND		0.80		ppb v/v			04/18/18 16:40	1
Carbon tetrachloride	ND		0.80		ppb v/v			04/18/18 16:40	1
Chlorobenzene	ND		0.30		ppb v/v			04/18/18 16:40	1
Chloroethane	ND		0.80		ppb v/v			04/18/18 16:40	1
Chloroform	ND		0.30		ppb v/v			04/18/18 16:40	1
Chloromethane	ND		0.80		ppb v/v			04/18/18 16:40	1
cis-1,2-Dichloroethene	ND		0.40		ppb v/v			04/18/18 16:40	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			04/18/18 16:40	1
Dibromochloromethane	ND		0.40		ppb v/v			04/18/18 16:40	1
Dichlorodifluoromethane	ND		0.40		ppb v/v			04/18/18 16:40	1
Ethylbenzene	ND		0.40		ppb v/v			04/18/18 16:40	1
Hexachlorobutadiene	ND		2.0		ppb v/v			04/18/18 16:40	1
m,p-Xylene	ND		0.80		ppb v/v			04/18/18 16:40	1
Methylene Chloride	ND		0.40		ppb v/v			04/18/18 16:40	1
o-Xylene	ND		0.40		ppb v/v			04/18/18 16:40	1
Styrene	ND		0.40		ppb v/v			04/18/18 16:40	1
Tetrachloroethene	ND		0.40		ppb v/v			04/18/18 16:40	1
Toluene	ND		0.40		ppb v/v			04/18/18 16:40	1
trans-1,2-Dichloroethene	ND		0.40		ppb v/v			04/18/18 16:40	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			04/18/18 16:40	1
Trichloroethene	ND		0.40		ppb v/v			04/18/18 16:40	1
Trichlorofluoromethane	ND		0.40		ppb v/v			04/18/18 16:40	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-218593/7
Matrix: Air
Analysis Batch: 218593

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl acetate	ND		0.80		ppb v/v			04/18/18 16:40	1
Vinyl chloride	ND		0.40		ppb v/v			04/18/18 16:40	1

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.6		ug/m3 Air			04/18/18 16:40	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			04/18/18 16:40	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			04/18/18 16:40	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			04/18/18 16:40	1
1,1-Dichloroethane	ND		1.2		ug/m3 Air			04/18/18 16:40	1
1,1-Dichloroethene	ND		3.2		ug/m3 Air			04/18/18 16:40	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			04/18/18 16:40	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			04/18/18 16:40	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			04/18/18 16:40	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			04/18/18 16:40	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			04/18/18 16:40	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			04/18/18 16:40	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			04/18/18 16:40	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			04/18/18 16:40	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			04/18/18 16:40	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			04/18/18 16:40	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			04/18/18 16:40	1
2-Hexanone	ND		1.6		ug/m3 Air			04/18/18 16:40	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			04/18/18 16:40	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			04/18/18 16:40	1
Acetone	ND		12		ug/m3 Air			04/18/18 16:40	1
Benzene	ND		1.3		ug/m3 Air			04/18/18 16:40	1
Benzyl chloride	ND		4.1		ug/m3 Air			04/18/18 16:40	1
Bromodichloromethane	ND		2.0		ug/m3 Air			04/18/18 16:40	1
Bromoform	ND		4.1		ug/m3 Air			04/18/18 16:40	1
Bromomethane	ND		3.1		ug/m3 Air			04/18/18 16:40	1
Carbon disulfide	ND		2.5		ug/m3 Air			04/18/18 16:40	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			04/18/18 16:40	1
Chlorobenzene	ND		1.4		ug/m3 Air			04/18/18 16:40	1
Chloroethane	ND		2.1		ug/m3 Air			04/18/18 16:40	1
Chloroform	ND		1.5		ug/m3 Air			04/18/18 16:40	1
Chloromethane	ND		1.7		ug/m3 Air			04/18/18 16:40	1
cis-1,2-Dichloroethene	ND		1.6		ug/m3 Air			04/18/18 16:40	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			04/18/18 16:40	1
Dibromochloromethane	ND		3.4		ug/m3 Air			04/18/18 16:40	1
Dichlorodifluoromethane	ND		2.0		ug/m3 Air			04/18/18 16:40	1
Ethylbenzene	ND		1.7		ug/m3 Air			04/18/18 16:40	1
Hexachlorobutadiene	ND		21		ug/m3 Air			04/18/18 16:40	1
m,p-Xylene	ND		3.5		ug/m3 Air			04/18/18 16:40	1
Methylene Chloride	ND		1.4		ug/m3 Air			04/18/18 16:40	1
o-Xylene	ND		1.7		ug/m3 Air			04/18/18 16:40	1
Styrene	ND		1.7		ug/m3 Air			04/18/18 16:40	1
Tetrachloroethene	ND		2.7		ug/m3 Air			04/18/18 16:40	1
Toluene	ND		1.5		ug/m3 Air			04/18/18 16:40	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-218593/7
Matrix: Air
Analysis Batch: 218593

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		1.6		ug/m3 Air			04/18/18 16:40	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			04/18/18 16:40	1
Trichloroethene	ND		2.1		ug/m3 Air			04/18/18 16:40	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			04/18/18 16:40	1
Vinyl acetate	ND		2.8		ug/m3 Air			04/18/18 16:40	1
Vinyl chloride	ND		1.0		ug/m3 Air			04/18/18 16:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*		*04/18/18 16:40*	*1*
4-Bromofluorobenzene (Surr)	*93*		*70 - 130*		*04/18/18 16:40*	*1*
Toluene-d8 (Surr)	*105*		*70 - 130*		*04/18/18 16:40*	*1*

Lab Sample ID: LCS 320-218593/3
Matrix: Air
Analysis Batch: 218593

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	21.9		ppb v/v		110	69 - 129
1,1,2,2-Tetrachloroethane	20.0	20.9		ppb v/v		104	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	22.0		ppb v/v		110	70 - 130
1,1,2-Trichloroethane	20.0	20.2		ppb v/v		101	64 - 124
1,1-Dichloroethane	20.0	22.1		ppb v/v		111	71 - 131
1,1-Dichloroethene	20.0	22.3		ppb v/v		112	72 - 132
1,2,4-Trichlorobenzene	20.0	17.8		ppb v/v		89	58 - 138
1,2,4-Trimethylbenzene	20.0	20.7		ppb v/v		104	60 - 132
1,2-Dibromoethane (EDB)	20.0	20.4		ppb v/v		102	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	22.1		ppb v/v		111	74 - 134
1,2-Dichlorobenzene	20.0	20.9		ppb v/v		104	62 - 126
1,2-Dichloroethane	20.0	21.8		ppb v/v		109	71 - 131
1,2-Dichloropropane	20.0	22.2		ppb v/v		111	72 - 132
1,3,5-Trimethylbenzene	20.0	20.6		ppb v/v		103	65 - 125
1,3-Dichlorobenzene	20.0	21.4		ppb v/v		107	59 - 130
1,4-Dichlorobenzene	20.0	21.7		ppb v/v		108	58 - 132
2-Butanone (MEK)	20.0	22.9		ppb v/v		115	73 - 133
2-Hexanone	20.0	21.1		ppb v/v		105	69 - 129
4-Ethyltoluene	20.0	21.1		ppb v/v		105	66 - 129
4-Methyl-2-pentanone (MIBK)	20.0	23.2		ppb v/v		116	74 - 134
Acetone	20.0	23.0		ppb v/v		115	65 - 125
Benzene	20.0	21.7		ppb v/v		108	68 - 128
Benzyl chloride	16.0	14.6		ppb v/v		91	67 - 127
Bromodichloromethane	20.0	22.2		ppb v/v		111	71 - 131
Bromoform	20.0	21.4		ppb v/v		107	66 - 126
Bromomethane	20.0	22.1		ppb v/v		111	73 - 134
Carbon disulfide	20.0	21.5		ppb v/v		107	71 - 131
Carbon tetrachloride	20.0	21.6		ppb v/v		108	63 - 126
Chlorobenzene	20.0	20.5		ppb v/v		102	63 - 123

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-218593/3
Matrix: Air
Analysis Batch: 218593

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloroethane	20.0	22.8		ppb v/v		114	73 - 133
Chloroform	20.0	22.0		ppb v/v		110	70 - 130
Chloromethane	20.0	21.9		ppb v/v		110	61 - 140
cis-1,2-Dichloroethene	20.0	22.2		ppb v/v		111	70 - 130
cis-1,3-Dichloropropene	20.0	22.6		ppb v/v		113	72 - 132
Dibromochloromethane	20.0	20.6		ppb v/v		103	66 - 126
Dichlorodifluoromethane	20.0	23.4		ppb v/v		117	69 - 129
Ethylbenzene	20.0	20.6		ppb v/v		103	64 - 124
Hexachlorobutadiene	20.0	21.0		ppb v/v		105	58 - 131
m,p-Xylene	40.0	42.2		ppb v/v		106	65 - 125
Methylene Chloride	20.0	21.9		ppb v/v		109	67 - 127
o-Xylene	20.0	21.0		ppb v/v		105	65 - 125
Styrene	20.0	21.9		ppb v/v		109	67 - 127
Tetrachloroethene	20.0	19.9		ppb v/v		99	63 - 123
Toluene	20.0	22.1		ppb v/v		110	68 - 128
trans-1,2-Dichloroethene	20.0	22.5		ppb v/v		112	72 - 132
trans-1,3-Dichloropropene	20.0	20.3		ppb v/v		102	66 - 126
Trichloroethene	20.0	21.8		ppb v/v		109	70 - 130
Trichlorofluoromethane	20.0	22.0		ppb v/v		110	71 - 131
Vinyl acetate	20.0	23.5		ppb v/v		117	65 - 134
Vinyl chloride	20.0	22.0		ppb v/v		110	59 - 152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	110	120		ug/m3 Air		110	69 - 129
1,1,2,2-Tetrachloroethane	140	143		ug/m3 Air		104	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	150	169		ug/m3 Air		110	70 - 130
1,1,2-Trichloroethane	110	110		ug/m3 Air		101	64 - 124
1,1-Dichloroethane	81	89.5		ug/m3 Air		111	71 - 131
1,1-Dichloroethene	79	88.6		ug/m3 Air		112	72 - 132
1,2,4-Trichlorobenzene	150	132		ug/m3 Air		89	58 - 138
1,2,4-Trimethylbenzene	98	102		ug/m3 Air		104	60 - 132
1,2-Dibromoethane (EDB)	150	157		ug/m3 Air		102	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	155		ug/m3 Air		111	74 - 134
1,2-Dichlorobenzene	120	125		ug/m3 Air		104	62 - 126
1,2-Dichloroethane	81	88.3		ug/m3 Air		109	71 - 131
1,2-Dichloropropane	92	103		ug/m3 Air		111	72 - 132
1,3,5-Trimethylbenzene	98	101		ug/m3 Air		103	65 - 125
1,3-Dichlorobenzene	120	129		ug/m3 Air		107	59 - 130
1,4-Dichlorobenzene	120	130		ug/m3 Air		108	58 - 132
2-Butanone (MEK)	59	67.6		ug/m3 Air		115	73 - 133
2-Hexanone	82	86.4		ug/m3 Air		105	69 - 129
4-Ethyltoluene	98	104		ug/m3 Air		105	66 - 129
4-Methyl-2-pentanone (MIBK)	82	95.0		ug/m3 Air		116	74 - 134
Acetone	48	54.7		ug/m3 Air		115	65 - 125
Benzene	64	69.2		ug/m3 Air		108	68 - 128
Benzyl chloride	83	75.5		ug/m3 Air		91	67 - 127
Bromodichloromethane	130	149		ug/m3 Air		111	71 - 131

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-218593/3
Matrix: Air
Analysis Batch: 218593

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	210	222		ug/m3 Air		107	66 - 126
Bromomethane	78	86.0		ug/m3 Air		111	73 - 134
Carbon disulfide	62	66.9		ug/m3 Air		107	71 - 131
Carbon tetrachloride	130	136		ug/m3 Air		108	63 - 126
Chlorobenzene	92	94.2		ug/m3 Air		102	63 - 123
Chloroethane	53	60.3		ug/m3 Air		114	73 - 133
Chloroform	98	107		ug/m3 Air		110	70 - 130
Chloromethane	41	45.2		ug/m3 Air		110	61 - 140
cis-1,2-Dichloroethene	79	88.0		ug/m3 Air		111	70 - 130
cis-1,3-Dichloropropene	91	103		ug/m3 Air		113	72 - 132
Dibromochloromethane	170	176		ug/m3 Air		103	66 - 126
Dichlorodifluoromethane	99	116		ug/m3 Air		117	69 - 129
Ethylbenzene	87	89.7		ug/m3 Air		103	64 - 124
Hexachlorobutadiene	210	224		ug/m3 Air		105	58 - 131
m,p-Xylene	170	183		ug/m3 Air		106	65 - 125
Methylene Chloride	69	76.0		ug/m3 Air		109	67 - 127
o-Xylene	87	91.2		ug/m3 Air		105	65 - 125
Styrene	85	93.3		ug/m3 Air		109	67 - 127
Tetrachloroethene	140	135		ug/m3 Air		99	63 - 123
Toluene	75	83.1		ug/m3 Air		110	68 - 128
trans-1,2-Dichloroethene	79	89.1		ug/m3 Air		112	72 - 132
trans-1,3-Dichloropropene	91	92.2		ug/m3 Air		102	66 - 126
Trichloroethene	110	117		ug/m3 Air		109	70 - 130
Trichlorofluoromethane	110	124		ug/m3 Air		110	71 - 131
Vinyl acetate	70	82.7		ug/m3 Air		117	65 - 134
Vinyl chloride	51	56.2		ug/m3 Air		110	59 - 152

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 130*
4-Bromofluorobenzene (Surr)	*107*		*70 - 130*
Toluene-d8 (Surr)	*108*		*70 - 130*

Lab Sample ID: LCSD 320-218593/4
Matrix: Air
Analysis Batch: 218593

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	20.0	21.5		ppb v/v		108	69 - 129	2	25
1,1,2,2-Tetrachloroethane	20.0	20.4		ppb v/v		102	64 - 124	2	25
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	21.6		ppb v/v		108	70 - 130	2	25
1,1,2-Trichloroethane	20.0	19.8		ppb v/v		99	64 - 124	2	25
1,1-Dichloroethane	20.0	21.7		ppb v/v		109	71 - 131	2	25
1,1-Dichloroethene	20.0	21.9		ppb v/v		109	72 - 132	2	25
1,2,4-Trichlorobenzene	20.0	17.0		ppb v/v		85	58 - 138	5	25
1,2,4-Trimethylbenzene	20.0	20.5		ppb v/v		102	60 - 132	1	25
1,2-Dibromoethane (EDB)	20.0	20.1		ppb v/v		101	64 - 124	1	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-218593/4
Matrix: Air
Analysis Batch: 218593

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	21.9		ppb v/v		110	74 - 134	1	25
1,2-Dichlorobenzene	20.0	20.9		ppb v/v		105	62 - 126	0	25
1,2-Dichloroethane	20.0	21.2		ppb v/v		106	71 - 131	3	25
1,2-Dichloropropane	20.0	21.6		ppb v/v		108	72 - 132	3	25
1,3,5-Trimethylbenzene	20.0	19.9		ppb v/v		100	65 - 125	3	25
1,3-Dichlorobenzene	20.0	21.7		ppb v/v		109	59 - 130	1	25
1,4-Dichlorobenzene	20.0	22.2		ppb v/v		111	58 - 132	2	25
2-Butanone (MEK)	20.0	22.6		ppb v/v		113	73 - 133	1	25
2-Hexanone	20.0	20.7		ppb v/v		104	69 - 129	2	25
4-Ethyltoluene	20.0	21.3		ppb v/v		106	66 - 129	1	25
4-Methyl-2-pentanone (MIBK)	20.0	22.3		ppb v/v		111	74 - 134	4	25
Acetone	20.0	21.9		ppb v/v		109	65 - 125	5	25
Benzene	20.0	21.2		ppb v/v		106	68 - 128	2	25
Benzyl chloride	16.0	15.3		ppb v/v		96	67 - 127	5	25
Bromodichloromethane	20.0	21.7		ppb v/v		108	71 - 131	3	25
Bromoform	20.0	21.0		ppb v/v		105	66 - 126	2	25
Bromomethane	20.0	22.1		ppb v/v		111	73 - 134	0	25
Carbon disulfide	20.0	21.0		ppb v/v		105	71 - 131	2	25
Carbon tetrachloride	20.0	21.1		ppb v/v		105	63 - 126	3	25
Chlorobenzene	20.0	20.2		ppb v/v		101	63 - 123	1	25
Chloroethane	20.0	22.6		ppb v/v		113	73 - 133	1	25
Chloroform	20.0	21.6		ppb v/v		108	70 - 130	2	25
Chloromethane	20.0	21.5		ppb v/v		107	61 - 140	2	25
cis-1,2-Dichloroethene	20.0	22.0		ppb v/v		110	70 - 130	1	25
cis-1,3-Dichloropropene	20.0	22.0		ppb v/v		110	72 - 132	3	25
Dibromochloromethane	20.0	20.3		ppb v/v		102	66 - 126	1	25
Dichlorodifluoromethane	20.0	22.4		ppb v/v		112	69 - 129	4	25
Ethylbenzene	20.0	20.5		ppb v/v		102	64 - 124	1	25
Hexachlorobutadiene	20.0	20.5		ppb v/v		103	58 - 131	3	25
m,p-Xylene	40.0	41.6		ppb v/v		104	65 - 125	2	25
Methylene Chloride	20.0	21.3		ppb v/v		106	67 - 127	3	25
o-Xylene	20.0	20.7		ppb v/v		103	65 - 125	1	25
Styrene	20.0	21.7		ppb v/v		108	67 - 127	1	25
Tetrachloroethene	20.0	19.7		ppb v/v		99	63 - 123	1	25
Toluene	20.0	21.7		ppb v/v		108	68 - 128	2	25
trans-1,2-Dichloroethene	20.0	22.1		ppb v/v		111	72 - 132	1	25
trans-1,3-Dichloropropene	20.0	20.0		ppb v/v		100	66 - 126	1	25
Trichloroethene	20.0	21.4		ppb v/v		107	70 - 130	2	25
Trichlorofluoromethane	20.0	21.6		ppb v/v		108	71 - 131	2	25
Vinyl acetate	20.0	23.0		ppb v/v		115	65 - 134	2	25
Vinyl chloride	20.0	21.7		ppb v/v		109	59 - 152	1	25

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	110	118		ug/m3 Air		108	69 - 129	2	25
1,1,2,2-Tetrachloroethane	140	140		ug/m3 Air		102	64 - 124	2	25
1,1,2-Trichloro-1,2,2-trifluoroethane	150	166		ug/m3 Air		108	70 - 130	2	25
1,1,2-Trichloroethane	110	108		ug/m3 Air		99	64 - 124	2	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-218593/4
Matrix: Air
Analysis Batch: 218593

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethane	81	88.0		ug/m3 Air		109	71 - 131	2	25
1,1-Dichloroethene	79	86.7		ug/m3 Air		109	72 - 132	2	25
1,2,4-Trichlorobenzene	150	126		ug/m3 Air		85	58 - 138	5	25
1,2,4-Trimethylbenzene	98	101		ug/m3 Air		102	60 - 132	1	25
1,2-Dibromoethane (EDB)	150	155		ug/m3 Air		101	64 - 124	1	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	153		ug/m3 Air		110	74 - 134	1	25
1,2-Dichlorobenzene	120	126		ug/m3 Air		105	62 - 126	0	25
1,2-Dichloroethane	81	85.9		ug/m3 Air		106	71 - 131	3	25
1,2-Dichloropropane	92	99.9		ug/m3 Air		108	72 - 132	3	25
1,3,5-Trimethylbenzene	98	98.1		ug/m3 Air		100	65 - 125	3	25
1,3-Dichlorobenzene	120	131		ug/m3 Air		109	59 - 130	1	25
1,4-Dichlorobenzene	120	133		ug/m3 Air		111	58 - 132	2	25
2-Butanone (MEK)	59	66.7		ug/m3 Air		113	73 - 133	1	25
2-Hexanone	82	85.0		ug/m3 Air		104	69 - 129	2	25
4-Ethyltoluene	98	105		ug/m3 Air		106	66 - 129	1	25
4-Methyl-2-pentanone (MIBK)	82	91.3		ug/m3 Air		111	74 - 134	4	25
Acetone	48	52.0		ug/m3 Air		109	65 - 125	5	25
Benzene	64	67.7		ug/m3 Air		106	68 - 128	2	25
Benzyl chloride	83	79.3		ug/m3 Air		96	67 - 127	5	25
Bromodichloromethane	130	145		ug/m3 Air		108	71 - 131	3	25
Bromoform	210	218		ug/m3 Air		105	66 - 126	2	25
Bromomethane	78	85.8		ug/m3 Air		111	73 - 134	0	25
Carbon disulfide	62	65.5		ug/m3 Air		105	71 - 131	2	25
Carbon tetrachloride	130	132		ug/m3 Air		105	63 - 126	3	25
Chlorobenzene	92	93.0		ug/m3 Air		101	63 - 123	1	25
Chloroethane	53	59.6		ug/m3 Air		113	73 - 133	1	25
Chloroform	98	106		ug/m3 Air		108	70 - 130	2	25
Chloromethane	41	44.4		ug/m3 Air		107	61 - 140	2	25
cis-1,2-Dichloroethene	79	87.2		ug/m3 Air		110	70 - 130	1	25
cis-1,3-Dichloropropene	91	99.9		ug/m3 Air		110	72 - 132	3	25
Dibromochloromethane	170	173		ug/m3 Air		102	66 - 126	1	25
Dichlorodifluoromethane	99	111		ug/m3 Air		112	69 - 129	4	25
Ethylbenzene	87	88.9		ug/m3 Air		102	64 - 124	1	25
Hexachlorobutadiene	210	219		ug/m3 Air		103	58 - 131	3	25
m,p-Xylene	170	181		ug/m3 Air		104	65 - 125	2	25
Methylene Chloride	69	73.8		ug/m3 Air		106	67 - 127	3	25
o-Xylene	87	89.9		ug/m3 Air		103	65 - 125	1	25
Styrene	85	92.3		ug/m3 Air		108	67 - 127	1	25
Tetrachloroethene	140	134		ug/m3 Air		99	63 - 123	1	25
Toluene	75	81.6		ug/m3 Air		108	68 - 128	2	25
trans-1,2-Dichloroethene	79	87.8		ug/m3 Air		111	72 - 132	1	25
trans-1,3-Dichloropropene	91	90.9		ug/m3 Air		100	66 - 126	1	25
Trichloroethene	110	115		ug/m3 Air		107	70 - 130	2	25
Trichlorofluoromethane	110	121		ug/m3 Air		108	71 - 131	2	25
Vinyl acetate	70	80.8		ug/m3 Air		115	65 - 134	2	25
Vinyl chloride	51	55.6		ug/m3 Air		109	59 - 152	1	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-218593/4
Matrix: Air
Analysis Batch: 218593

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

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	105		70 - 130
4-Bromofluorobenzene (Surr)	105		70 - 130
Toluene-d8 (Surr)	108		70 - 130

QC Association Summary

Client: Apex Companies LLC
Project/Site: NuStar Van REM

TestAmerica Job ID: 320-37748-1

Air - GC/MS VOA

Analysis Batch: 218593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-37748-1	SVE_South_Pre carbon_032918	Total/NA	Air	TO-15	
320-37748-2	SVE_South_Post carbon_032918	Total/NA	Air	TO-15	
320-37748-2 - DL	SVE_South_Post carbon_032918	Total/NA	Air	TO-15	
MB 320-218593/7	Method Blank	Total/NA	Air	TO-15	
LCS 320-218593/3	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-218593/4	Lab Control Sample Dup	Total/NA	Air	TO-15	

Client Sample ID: SVE_South_Pre carbon_032918

Lab Sample ID: 320-37748-1

Date Collected: 03/29/18 11:04

Matrix: Air

Date Received: 04/03/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		18.8	18.3 mL	250 mL	218593	04/18/18 20:56	AP1	TAL SAC

Client Sample ID: SVE_South_Post carbon_032918

Lab Sample ID: 320-37748-2

Date Collected: 03/29/18 11:06

Matrix: Air

Date Received: 04/03/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		1	355 mL	250 mL	218593	04/18/18 21:49	AP1	TAL SAC
Total/NA	Analysis	TO-15	DL	3.56	100 mL	250 mL	218593	04/19/18 06:59	AP1	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Apex Companies LLC
Project/Site: NuStar Van REM

TestAmerica Job ID: 320-37748-1

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-18
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-18 *
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-18 *
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-18
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-18
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Portland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
N/A	N/A	N/A	None on record.	

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Apex Companies LLC
Project/Site: NuStar Van REM

TestAmerica Job ID: 320-37748-1

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Apex Companies LLC
Project/Site: NuStar Van REM

TestAmerica Job ID: 320-37748-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-37748-1	SVE_South_Pre carbon_032918	Air	03/29/18 11:04	04/03/18 08:50
320-37748-2	SVE_South_Post carbon_032918	Air	03/29/18 11:06	04/03/18 08:50

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	**Project Manager:** Stephanie Salisbury	**Samples Collected By:** Kyle Kline
Company Name: Apex Companies	**Phone:** 503 924 4704 x 1925	
Address: 3015 SW 1st Ave	**Email:** SSalisbury@Apexcos.com	
City/State/Zip Portland OR 97201		
Phone: 503 924 4704	**Site Contact:**	
FAX: —	**TA Contact:**	
Project Name: Nustar Van REM	**Anaylsis Turnaround Time**	
Site/Location: Vancouver WA	Standard (Specific): X	
P O # 1126-21	Rush (Specifiy):	

COC No: 1 of 1 COCs

For Lab Use Only:
Walk-in Client:
Lab Sampling:

Job / SDG No.:
(See below for Add'l Items)

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25.3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SUE_South_Pre Carbon_033118	3/31/18	1103	1104	-27	-1	3400	0037	X														
SUE_South_Post-carbon_033118	3/31/18	1105	1106	-28	-1	3400	0049	X														

	Temperature (Fahrenheit)		
	Start	Interior	Ambient
	Stop		

	Temperature (Fahrenheit)		
	Start	Interior	Ambient
	Stop		

320-37748 Chain of Custody

Special Instructions/QC Requirements & Comments: Email Results TO: SSalisbury@Apexcos.com

Samples Shipped by: Kyle Kline	**Date / Time:** 4/2/18 1120	**Samples Received by:** 4/2/18 1225
Samples Relinquished by:	**Date / Time:**	**Received by:** TAPAC 4/2/18 1300
Relinquished by:	**Date / Time:** 4/2/18 1300	**Received by:** 4-3-18 0850
Lab Use Only: **Shipper Name:**	**Opened by:**	**Condition:**

TA SAC

4/2/18 1700 TA-POC

Form No. CA-C-WI-003, Rev. 1, dated 05/10/2013

Login Sample Receipt Checklist

Client: Apex Companies LLC

Job Number: 320-37748-1

Login Number: 37748
List Number: 1
Creator: Branscum, Cassie

List Source: TestAmerica Sacramento

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Canister QC Certification
Batch Certification

Date Cleaned/Batch ID: 2-23-18 320-36405

Date of QC: 2/28/18

Data File Number: MS9022820

320-36405 Chain of Custody

(*File ID for certification analysis of canister designated below*)

CANISTER ID NUMBERS

*	34000049
	34001403
	34000037
	34000517
	34000168
	34001424

	7704
	7836
	34001452
	34001331
	34001511
	34000101

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED.

Pam
1st level Reviewed By:

3/1/18
Date:

2nd level Reviewed By:

3/5/18
Date:

Q:\DOCUMENT-MANAGEMENT\FORMS\QA-814 BATCH CAN QC 20171023.DOC
QA-814

RE 10232017

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36405-1

SDG No.:

Client Sample ID: 34000049 Lab Sample ID: 320-36405-1

Matrix: Air Lab File ID: MS9022820.D

Analysis Method: TO-15 Date Collected: 02/23/2018 00:00

Sample wt/vol: 33(mL) Date Analyzed: 03/01/2018 03:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 210489 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
67-64-1	Acetone	2.0	J	5.0	0.18
107-02-8	Acrolein	ND		2.0	0.22
107-13-1	Acrylonitrile	ND		2.0	0.19
107-05-1	Allyl chloride	ND		0.80	0.11
71-43-2	Benzene	ND		0.40	0.079
100-44-7	Benzyl chloride	ND		0.80	0.16
75-27-4	Bromodichloromethane	ND		0.30	0.066
75-25-2	Bromoform	ND		0.40	0.070
74-83-9	Bromomethane	ND		0.80	0.34
106-99-0	1,3-Butadiene	ND		0.80	0.15
106-97-8	n-Butane	ND		0.40	0.15
78-93-3	2-Butanone (MEK)	0.26	J	0.80	0.20
75-65-0	tert-Butyl alcohol (TBA)	ND		2.0	0.11
104-51-8	n-Butylbenzene	ND		0.40	0.18
135-98-8	sec-Butylbenzene	ND		0.40	0.070
98-06-6	tert-Butylbenzene	ND		0.80	0.068
75-15-0	Carbon disulfide	ND		0.80	0.078
56-23-5	Carbon tetrachloride	ND		0.80	0.064
108-90-7	Chlorobenzene	ND		0.30	0.064
75-45-6	Chlorodifluoromethane	ND		0.80	0.27
75-00-3	Chloroethane	ND		0.80	0.31
67-66-3	Chloroform	ND		0.30	0.095
74-87-3	Chloromethane	ND		0.80	0.20
95-49-8	2-Chlorotoluene	ND		0.40	0.080
110-82-7	Cyclohexane	ND		0.40	0.084
124-48-1	Dibromochloromethane	ND		0.40	0.079
106-93-4	1,2-Dibromoethane (EDB)	ND		0.80	0.075
74-95-3	Dibromomethane	ND		0.40	0.057
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16
95-50-1	1,2-Dichlorobenzene	ND		0.40	0.13
541-73-1	1,3-Dichlorobenzene	ND		0.40	0.11
106-46-7	1,4-Dichlorobenzene	ND		0.40	0.15
75-71-8	Dichlorodifluoromethane	ND		0.40	0.15
75-34-3	1,1-Dichloroethane	ND		0.30	0.072
107-06-2	1,2-Dichloroethane	ND		0.80	0.088

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36405-1

SDG No.:

Client Sample ID: 34000049 Lab Sample ID: 320-36405-1

Matrix: Air Lab File ID: MS9022820.D

Analysis Method: TO-15 Date Collected: 02/23/2018 00:00

Sample wt/vol: 33(mL) Date Analyzed: 03/01/2018 03:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 210489 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-35-4	1,1-Dichloroethene	ND		0.80	0.13
156-59-2	cis-1,2-Dichloroethene	ND		0.40	0.089
156-60-5	trans-1,2-Dichloroethene	ND		0.40	0.10
78-87-5	1,2-Dichloropropane	ND		0.40	0.24
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.10
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.088
123-91-1	1,4-Dioxane	ND		0.80	0.10
141-78-6	Ethyl acetate	ND		0.30	0.18
100-41-4	Ethylbenzene	ND		0.40	0.063
622-96-8	4-Ethyltoluene	ND		0.40	0.19
142-82-5	n-Heptane	ND		0.80	0.063
87-68-3	Hexachlorobutadiene	ND		2.0	0.43
110-54-3	n-Hexane	ND		0.80	0.075
591-78-6	2-Hexanone	ND		0.40	0.087
98-82-8	Isopropylbenzene	ND		0.80	0.10
99-87-6	4-Isopropyltoluene	ND		0.80	0.12
1634-04-4	Methyl-t-Butyl Ether (MTBE)	ND		0.80	0.12
80-62-6	Methyl methacrylate	ND		0.80	0.16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14
75-09-2	Methylene Chloride	ND		0.40	0.072
98-83-9	alpha-Methylstyrene	ND		0.40	0.065
91-20-3	Naphthalene	ND		0.80	0.56
111-65-9	n-Octane	ND		0.40	0.055
109-66-0	n-Pentane	ND		0.80	0.26
115-07-1	Propylene	0.11	J	0.40	0.099
103-65-1	N-Propylbenzene	ND		0.40	0.059
100-42-5	Styrene	ND		0.40	0.059
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.40	0.069
127-18-4	Tetrachloroethene	ND		0.40	0.051
109-99-9	Tetrahydrofuran	ND		0.80	0.21
108-88-3	Toluene	ND		0.40	0.051
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	0.43
71-55-6	1,1,1-Trichloroethane	ND		0.30	0.065
79-00-5	1,1,2-Trichloroethane	ND		0.40	0.067

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-36405-1

SDG No.:

Client Sample ID: 34000049 Lab Sample ID: 320-36405-1

Matrix: Air Lab File ID: MS9022820.D

Analysis Method: TO-15 Date Collected: 02/23/2018 00:00

Sample wt/vol: 33(mL) Date Analyzed: 03/01/2018 03:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 210489 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-01-6	Trichloroethene	ND		0.40	0.11
75-69-4	Trichlorofluoromethane	ND		0.40	0.20
96-18-4	1,2,3-Trichloropropane	ND		0.40	0.17
95-63-6	1,2,4-Trimethylbenzene	ND		0.80	0.16
108-67-8	1,3,5-Trimethylbenzene	ND		0.40	0.13
540-84-1	2,2,4-Trimethylpentane	ND		0.40	0.071
108-05-4	Vinyl acetate	ND		0.80	0.15
593-60-2	Vinyl bromide	ND		0.80	0.26
75-01-4	Vinyl chloride	ND		0.40	0.12
179601-23-1	m,p-Xylene	ND		0.80	0.10
95-47-6	o-Xylene	ND		0.40	0.054
1330-20-7	Xylenes, Total	ND		1.2	0.074

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	94		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		70-130
2037-26-5	Toluene-d8 (Surr)	102		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D
Lims ID: 320-36405-A-1
Client ID: 34000049
Sample Type: Client
Inject. Date: 01-Mar-2018 03:58:30 ALS Bottle#: 15 Worklist Smp#: 20
Purge Vol: 5.000 mL Dil. Factor: 1.0000
Sample Info: 320-36405-A-1
Misc. Info.: 500
Operator ID: RG Instrument ID: ATMS9

Method: \\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\TO15_ATMS9N.m
Limit Group: MSA - TO15 - ICAL
Last Update: 01-Mar-2018 09:05:42 Calib Date: 09-Feb-2018 00:05:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\ATMS9\20180208-53859.b\MS9020812.D

Column 1 : RTX Volatiles (0.32 mm) Det: MS SCAN
Process Host: XAWRK006

First Level Reviewer: girr Date: 01-Mar-2018 09:05:46

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ppb v/v	Flags
* 1 Chlorobromomethane (IS)	130	12.312	12.324	-0.012	93	72147	4.00	
* 2 1,4-Difluorobenzene	114	14.405	14.411	-0.006	99	300636	4.00	
* 3 Chlorobenzene-d5 (IS)	117	20.330	20.330	0.000	98	206603	4.00	
$ 4 1,2-Dichloroethane-d4 (Sur	65	13.480	13.487	-0.013	97	119581	4.13	
$ 5 Toluene-d8 (Surr)	100	17.569	17.567	-0.006	98	155506	4.07	
$ 6 4-Bromofluorobenzene (Surr	174	22.259	22.259	0.000	97	102624	3.78	
14 Propene	41	4.270	4.253	0.012	72	1772	0.1082	
18 Chloromethane	50	4.787	4.770	0.012	9	1369	0.0694	
22 Butane	43	4.988	4.995	-0.012	78	941	0.0262	
31 Acetone	43	7.677	7.627	0.043	97	59688	1.98	
47 Methylene Chloride	49	8.893	8.891	-0.006	96	1291	0.0510	
54 2-Butanone (MEK)	72	11.375	11.310	0.054	99	2782	0.2637	
85 Toluene	91	17.721	17.713	0.000	92	2627	0.0304	
87 2-Hexanone	58	18.396	18.365	0.031	95	2803	0.0754	
126 1,2,4-Trichlorobenzene	180	26.694	26.700	-0.006	55	500	0.0394	

Reagents:

VAMSIS20_00109 Amount Added: 50.00 Units: mL Run Reagent

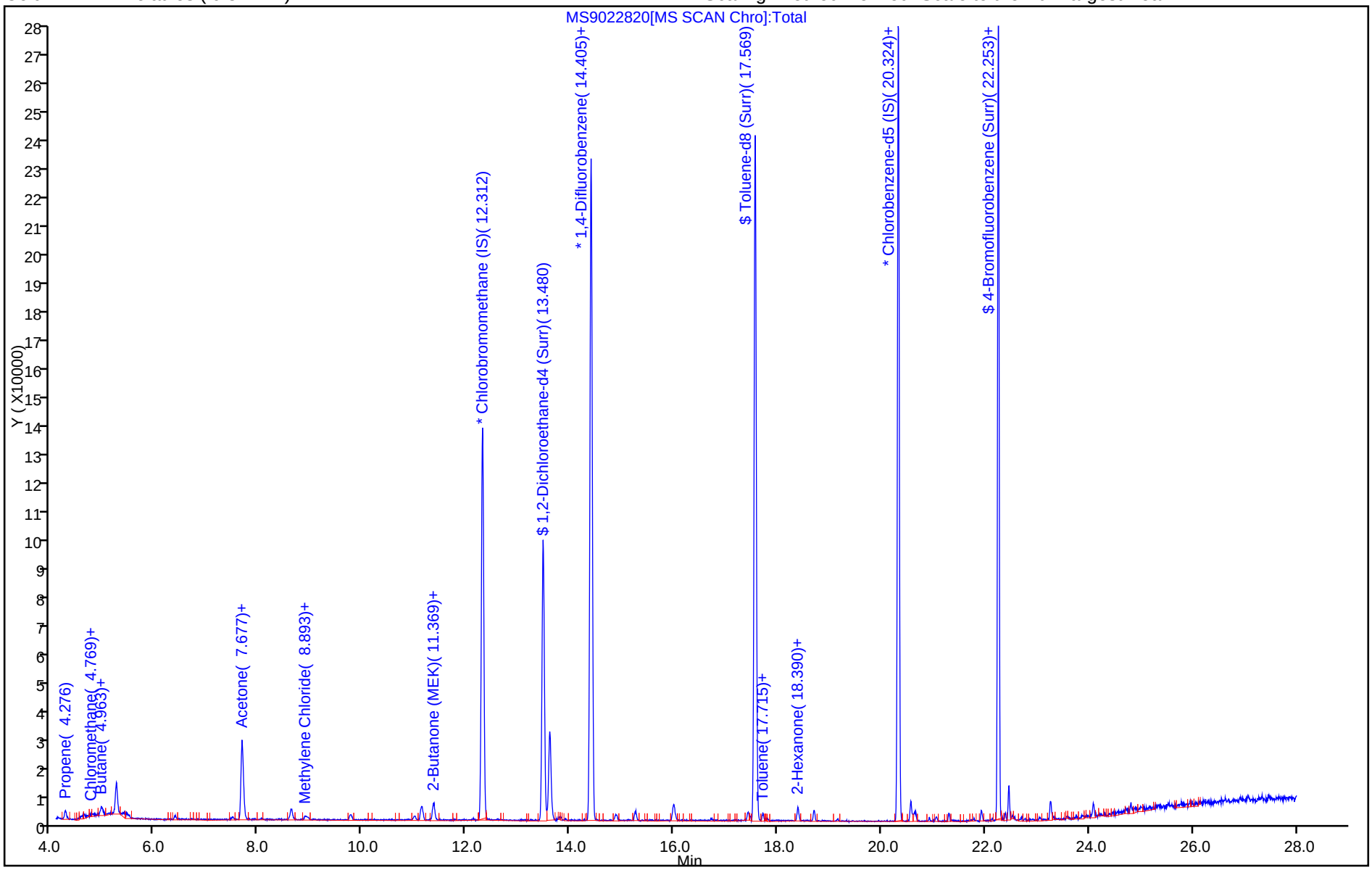
Report Date: 01-Mar-2018 09:05:47 Chrom Revision: 2.2 08-Feb-2018 13:38:42

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D

Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9	Operator ID:	RG
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1	Worklist Smp#:	20
Client ID:	34000049				
Purge Vol:	5.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	15
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		

Column: RTX Volatiles (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



Report Date: 01-Mar-2018 09:05:47 Chrom Revision: 2.2 08-Feb-2018 13:38:42

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D

Injection Date: 01-Mar-2018 03:58:30 Instrument ID: ATMS9

Lims ID: 320-36405-A-1 Lab Sample ID: 320-36405-1

Client ID: 34000049

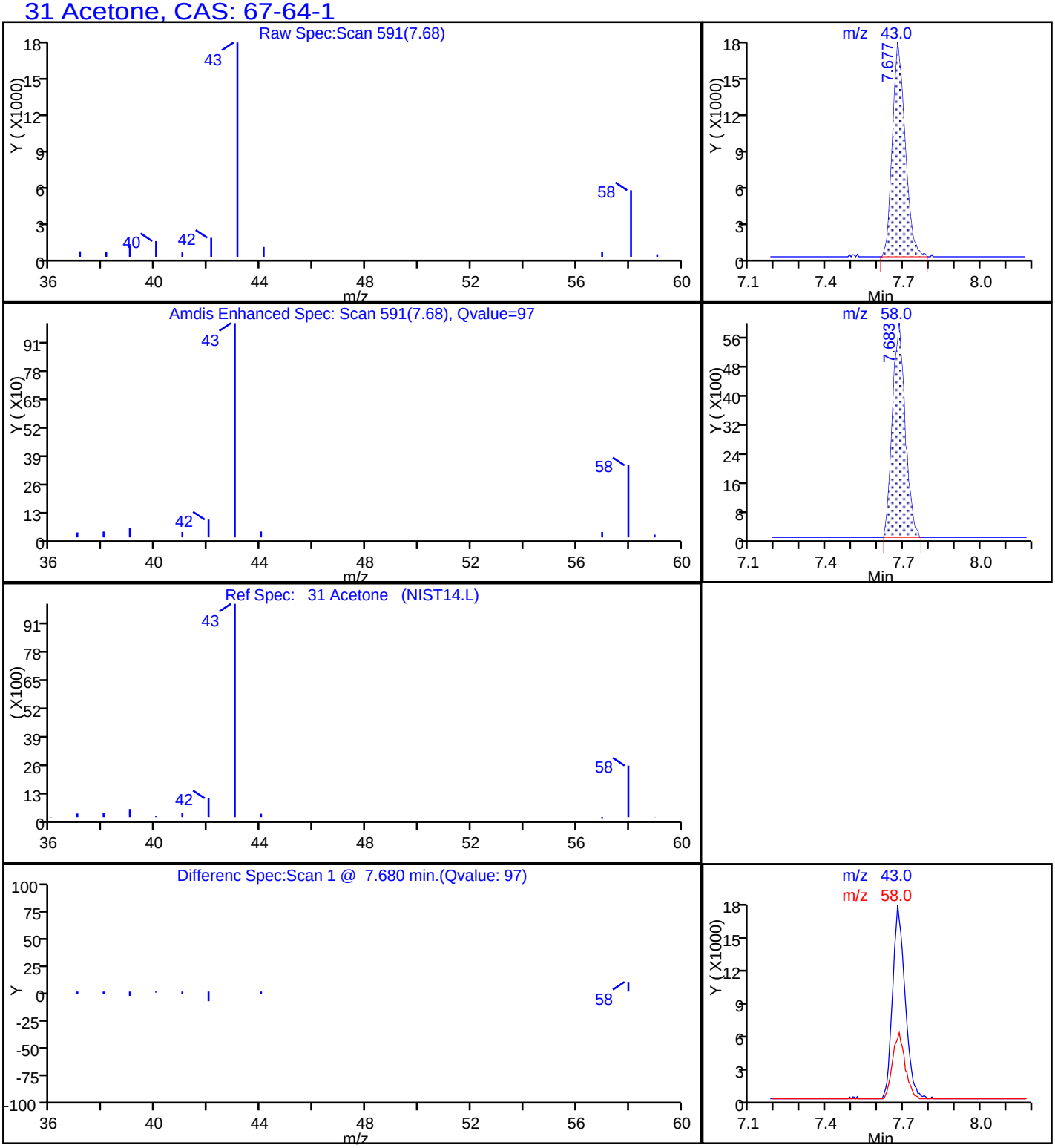
Operator ID: RG ALS Bottle#: 15 Worklist Smp#: 20

Purge Vol: 5.000 mL Dil. Factor: 1.0000

Method: TO15_ATMS9N Limit Group: MSA - TO15 - ICAL

Column: RTX Volatiles (0.32 mm) Detector MS SCAN

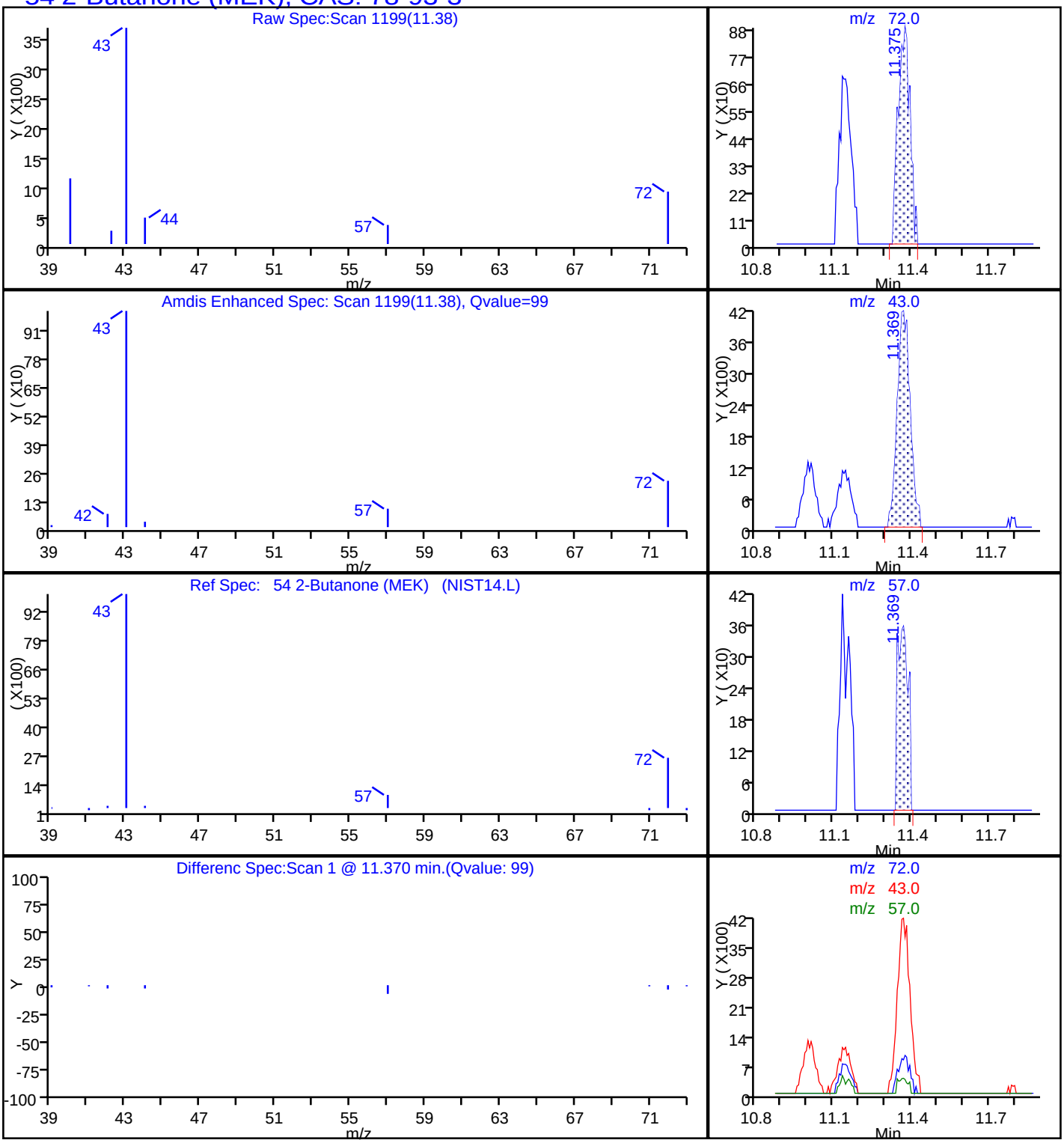
31 Acetone, CAS: 67-64-1



TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

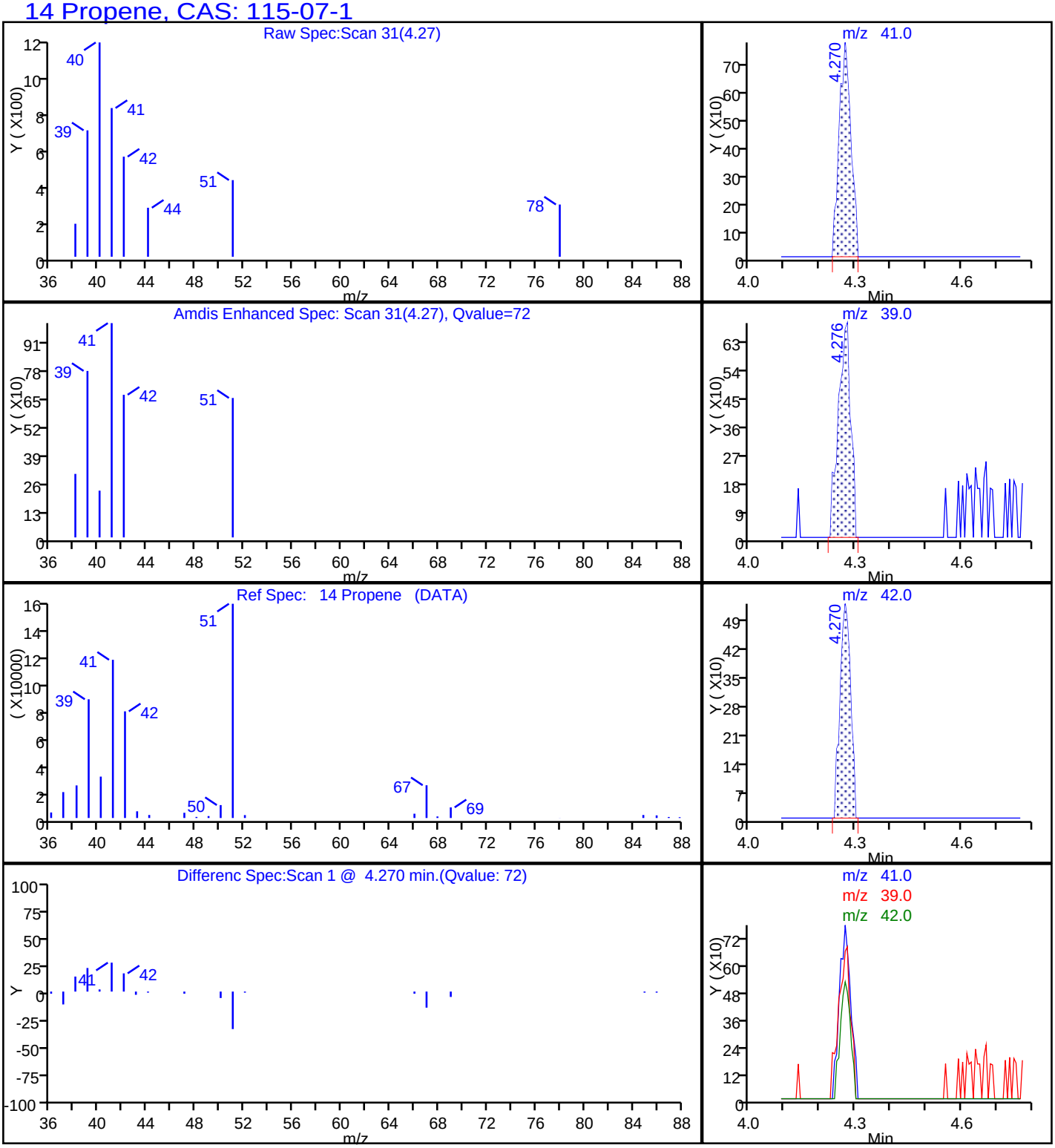
54 2-Butanone (MEK), CAS: 78-93-3



TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

14 Propene, CAS: 115-07-1



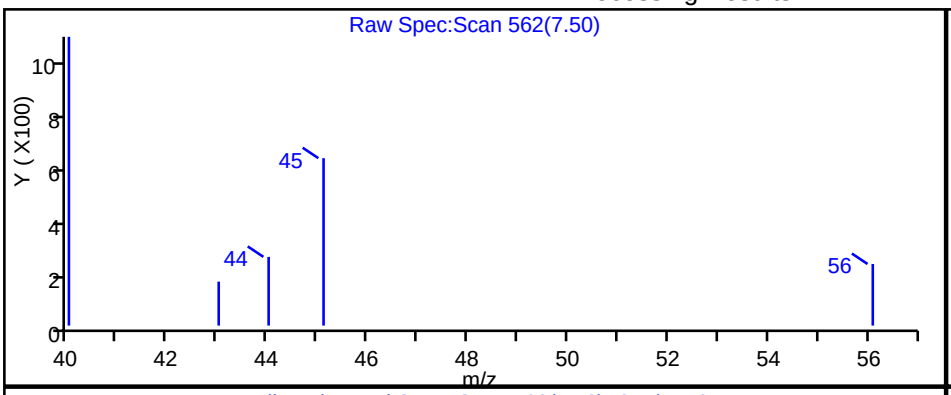
User Disabled Compound Report

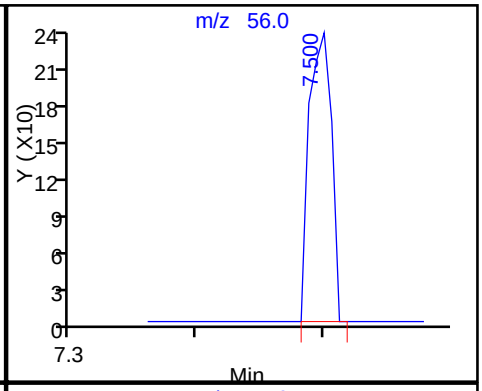
TestAmerica Sacramento

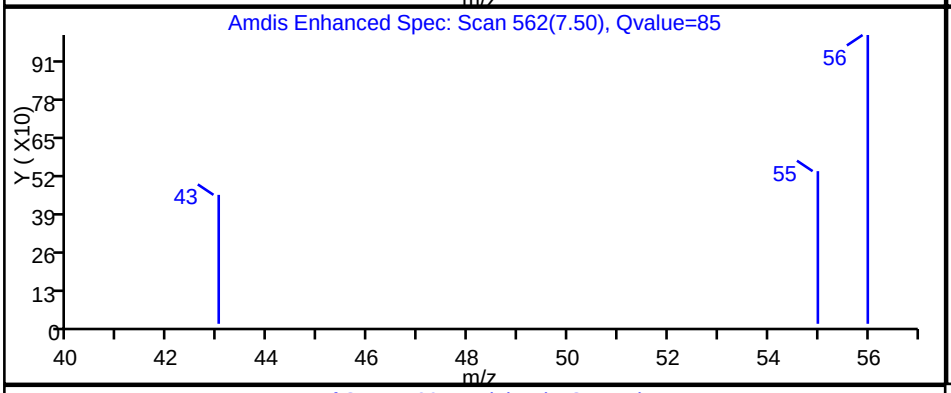
Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

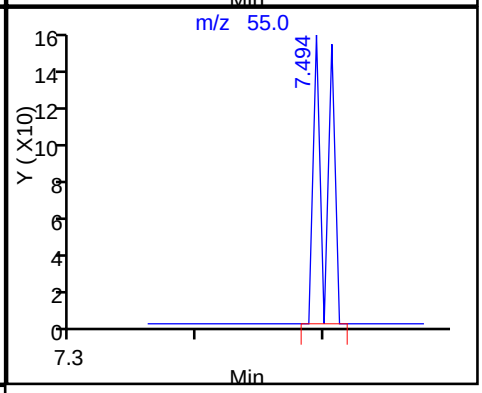
29 Acrolein, CAS: 107-02-8

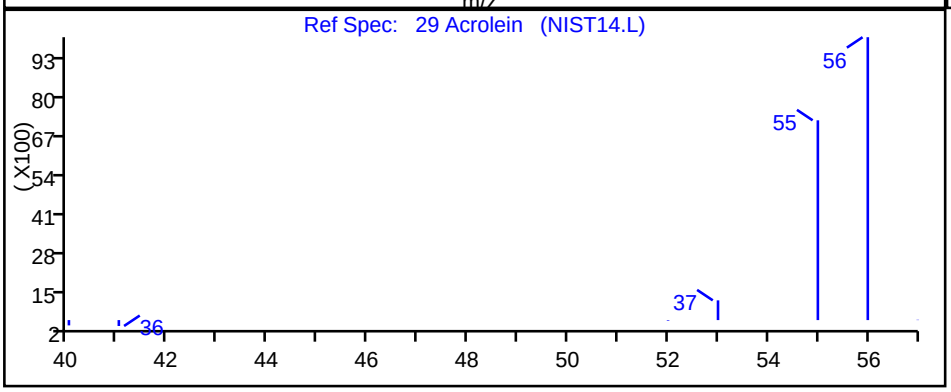
Processing Results











RT	Mass	Response	Amount
7.50	56.00	286	0.032070
7.49	55.00	114	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

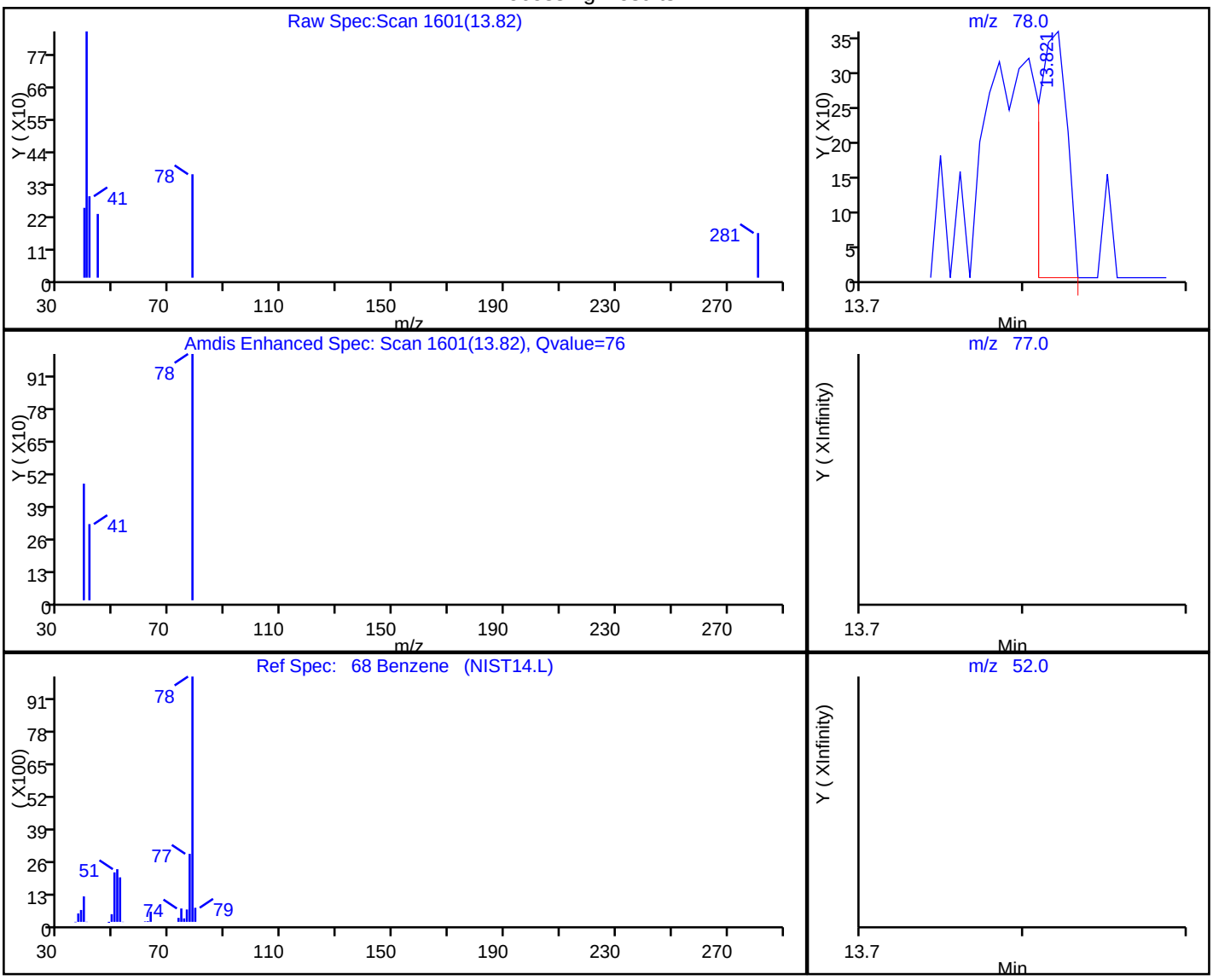
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

68 Benzene, CAS: 71-43-2

Processing Results



RT	Mass	Response	Amount
13.82	78.00	424	0.006265
13.81	77.00	0	
13.81	52.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

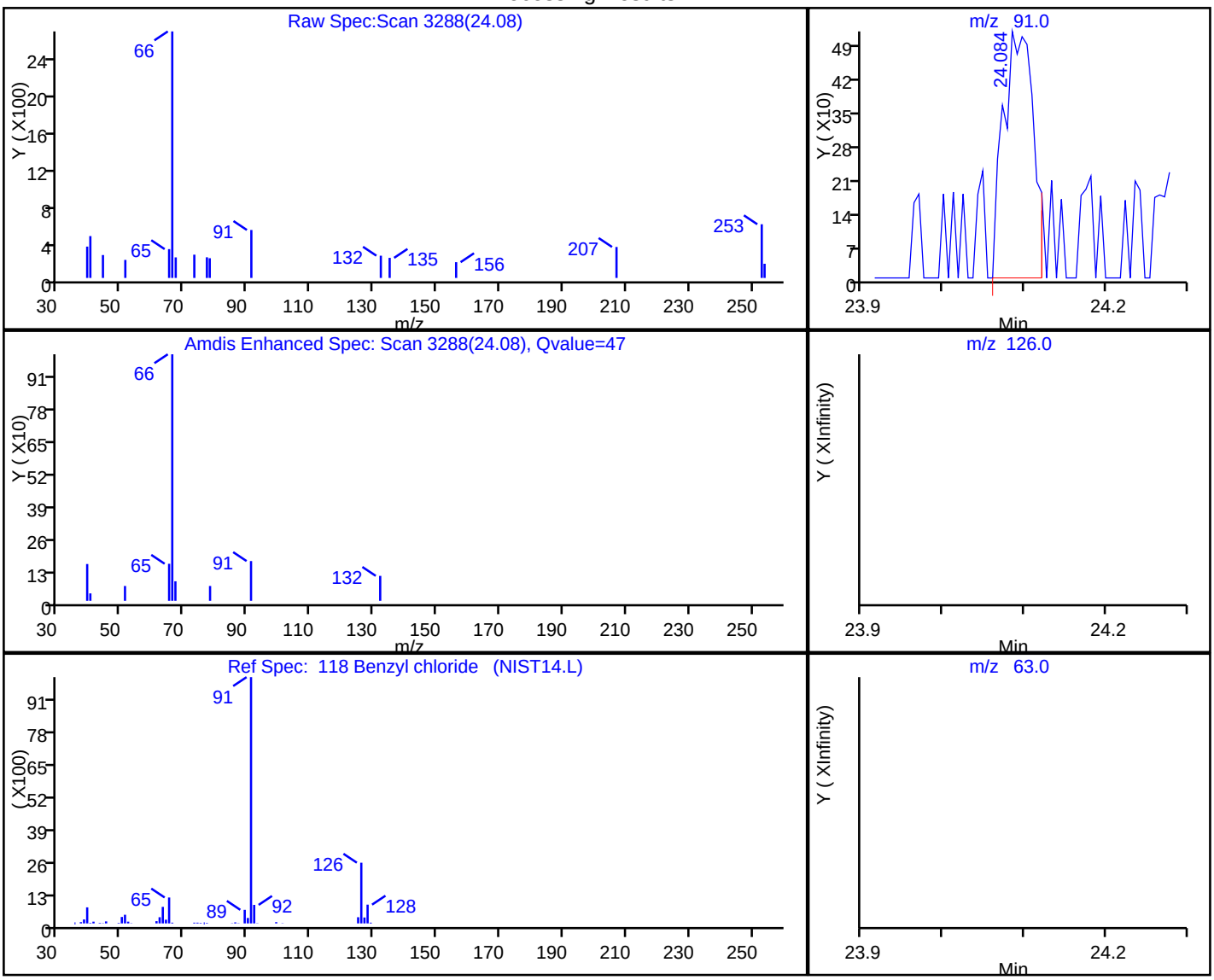
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

118 Benzyl chloride, CAS: 100-44-7

Processing Results



RT	Mass	Response	Amount
24.08	91.00	1325	0.009444
24.10	126.00	0	
24.10	63.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

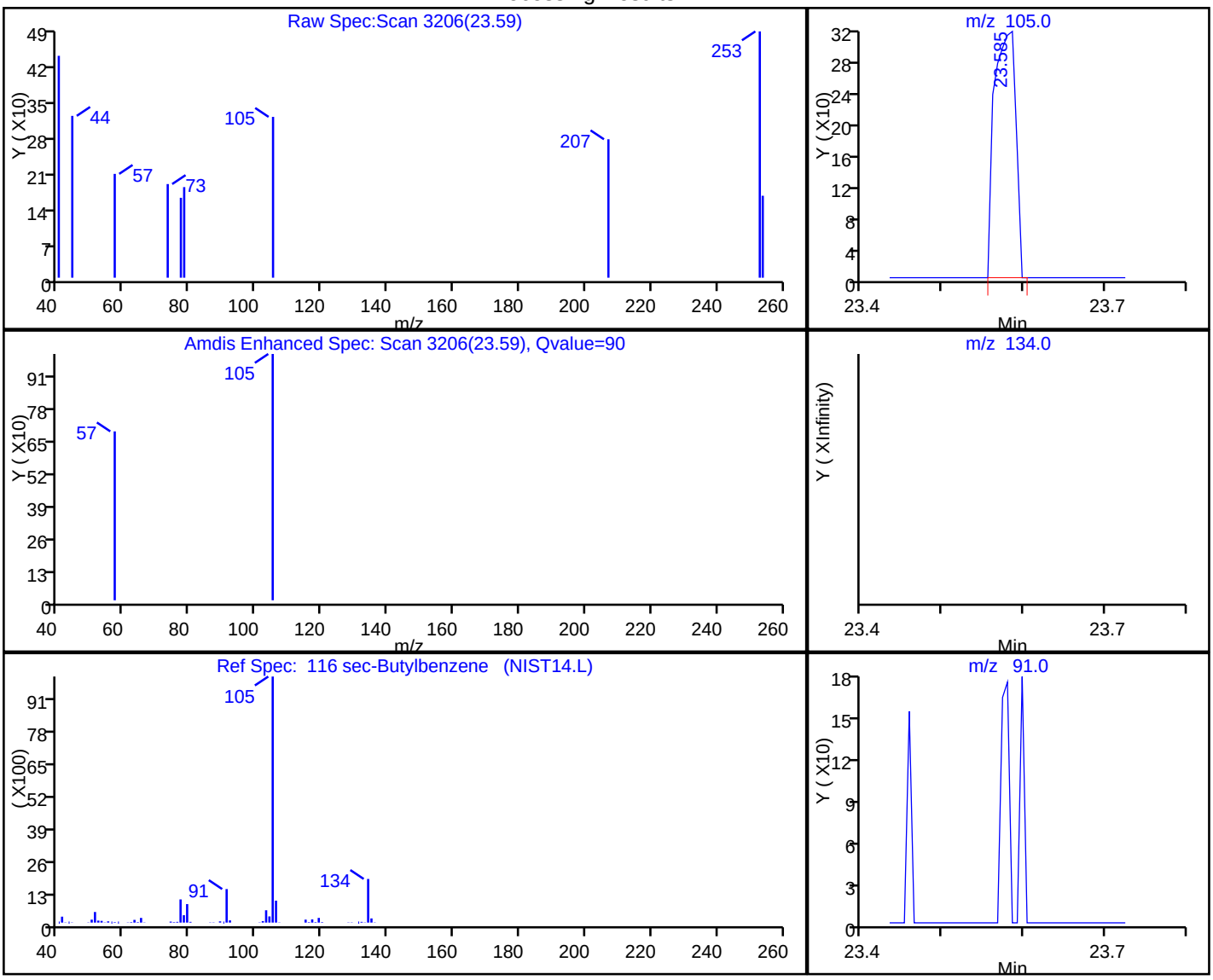
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

116 sec-Butylbenzene, CAS: 135-98-8

Processing Results



RT	Mass	Response	Amount
23.59	105.00	582	0.003549
23.58	134.00	0	
23.58	91.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

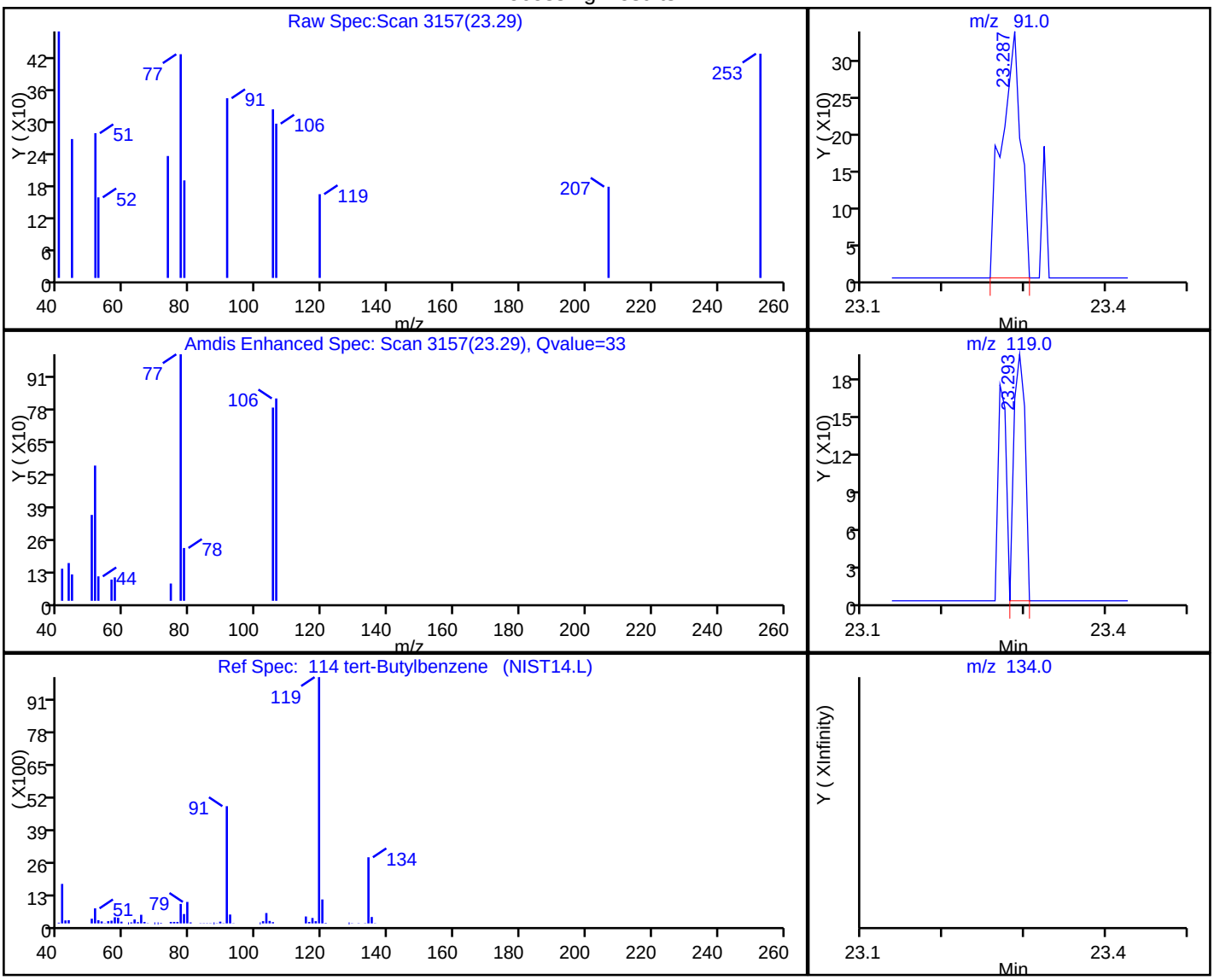
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

114 tert-Butylbenzene, CAS: 98-06-6

Processing Results



RT	Mass	Response	Amount
23.29	91.00	553	0.006778
23.29	119.00	184	
23.28	134.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

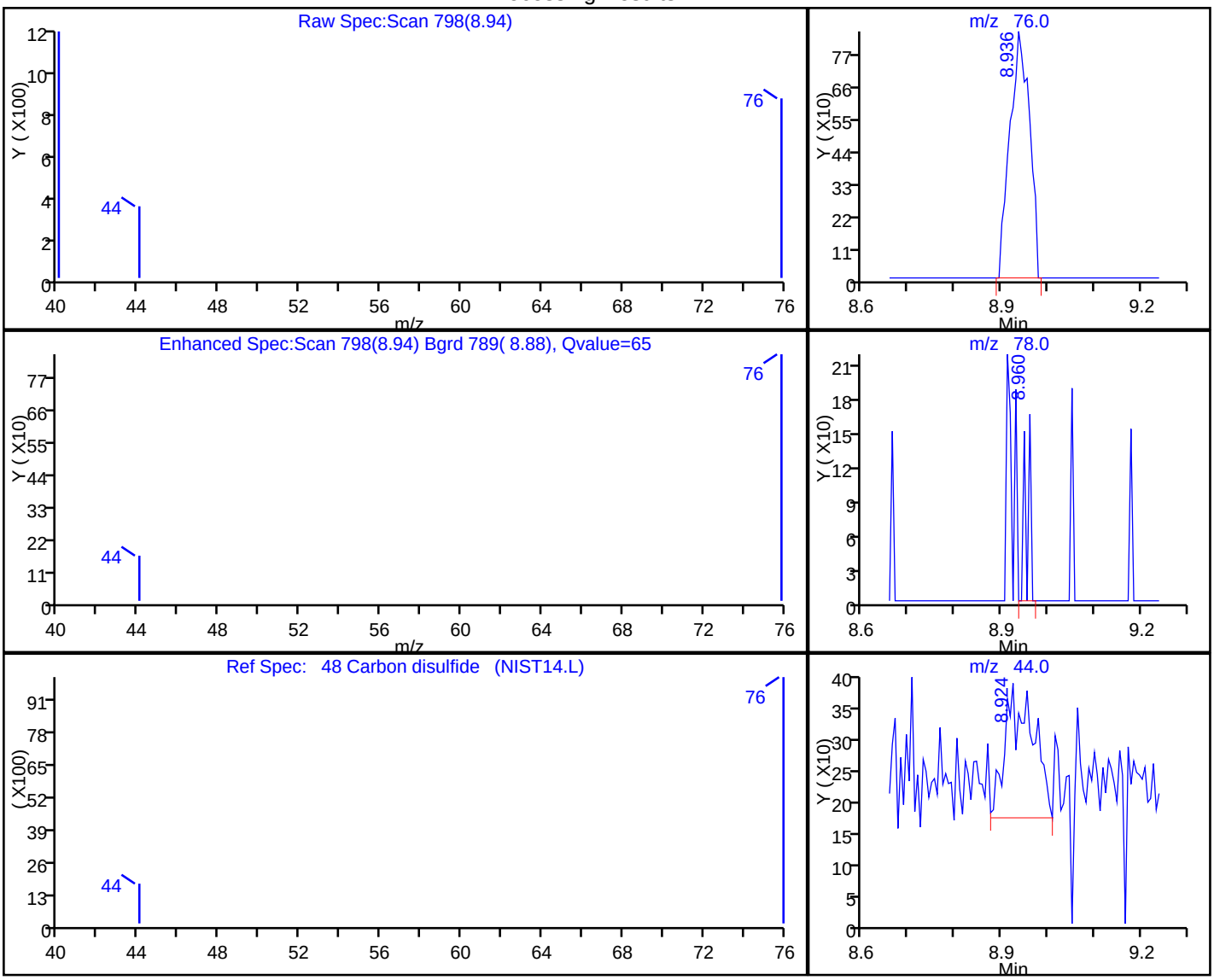
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

48 Carbon disulfide, CAS: 75-15-0

Processing Results



RT	Mass	Response	Amount
8.94	76.00	2496	0.056712
8.96	78.00	115	
8.92	44.00	899	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

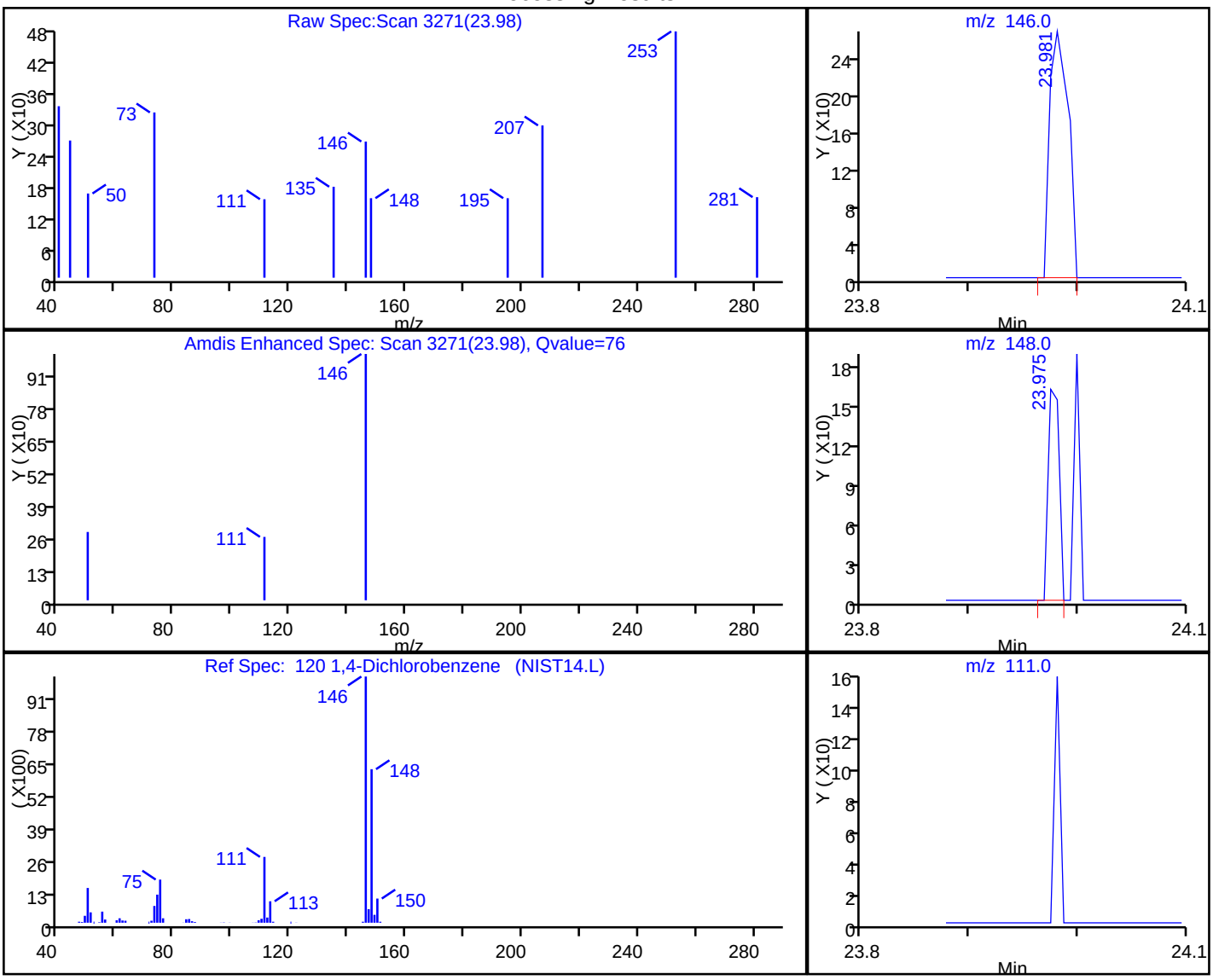
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

120 1,4-Dichlorobenzene, CAS: 106-46-7

Processing Results



RT	Mass	Response	Amount
23.98	146.00	313	0.004169
23.97	148.00	115	
23.99	111.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

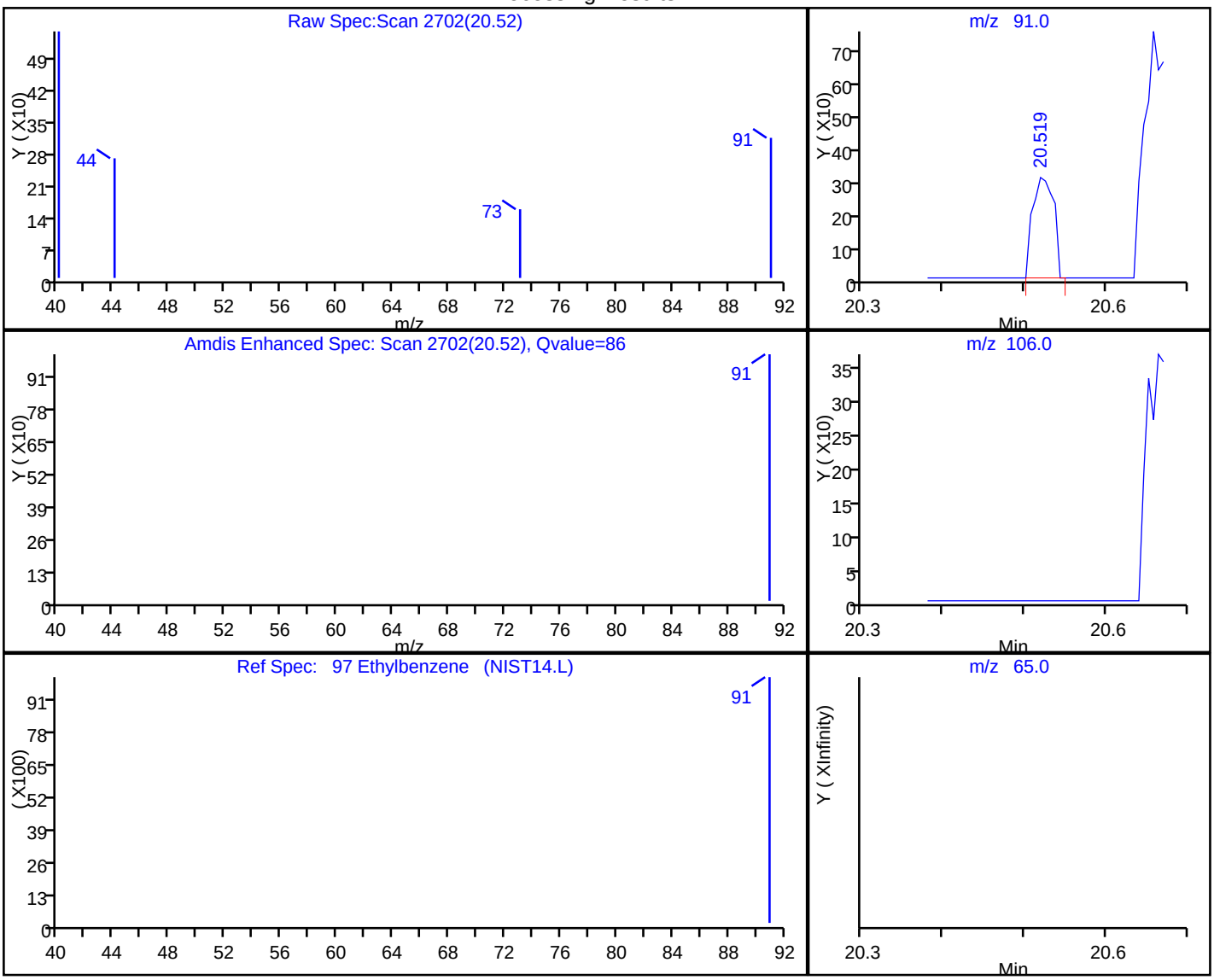
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

97 Ethylbenzene, CAS: 100-41-4

Processing Results



RT	Mass	Response	Amount
20.52	91.00	559	0.004743
20.53	106.00	0	
20.53	65.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

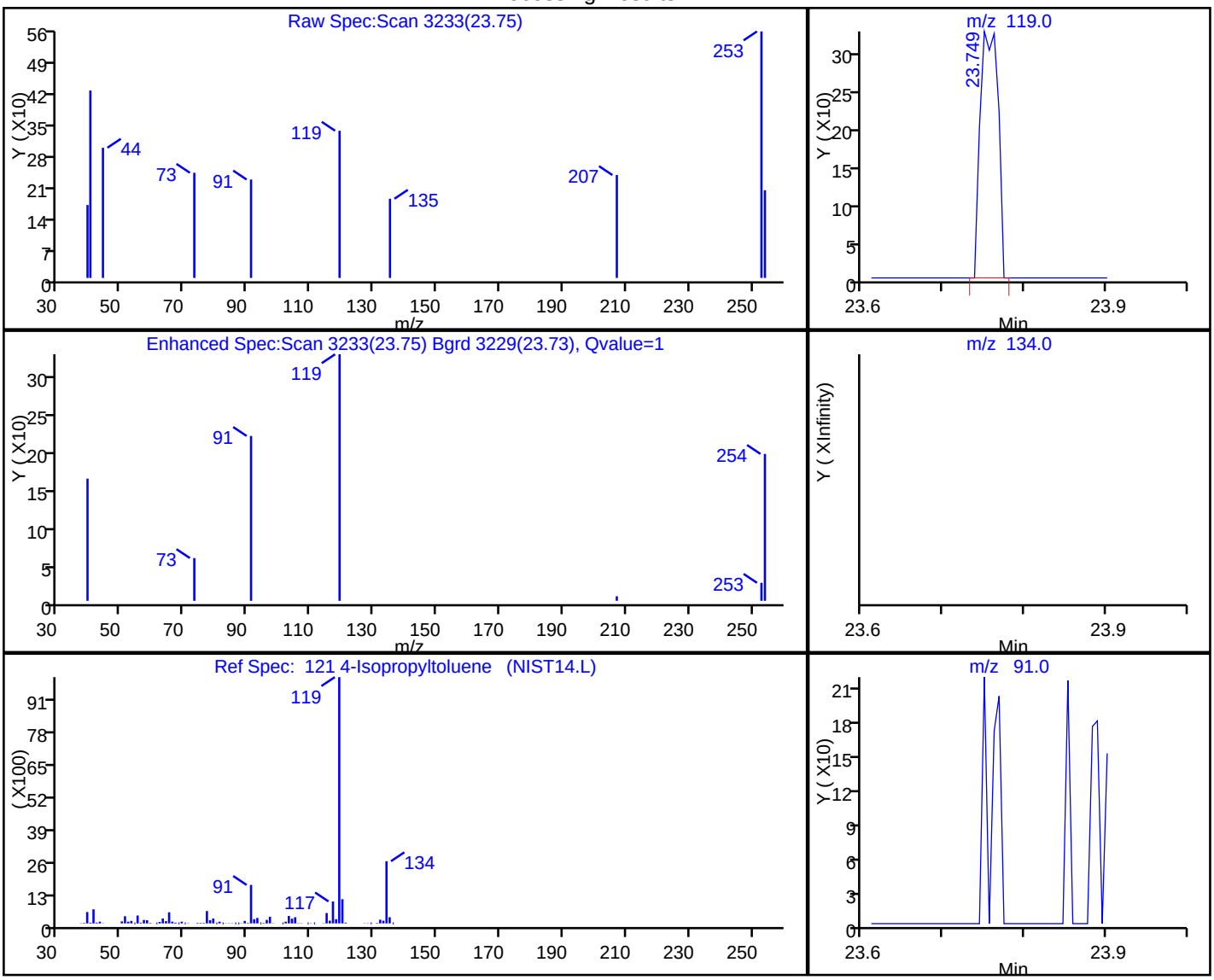
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

121 4-Isopropyltoluene, CAS: 99-87-6

Processing Results



RT	Mass	Response	Amount
23.75	119.00	505	0.003551
23.76	134.00	0	
23.76	91.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

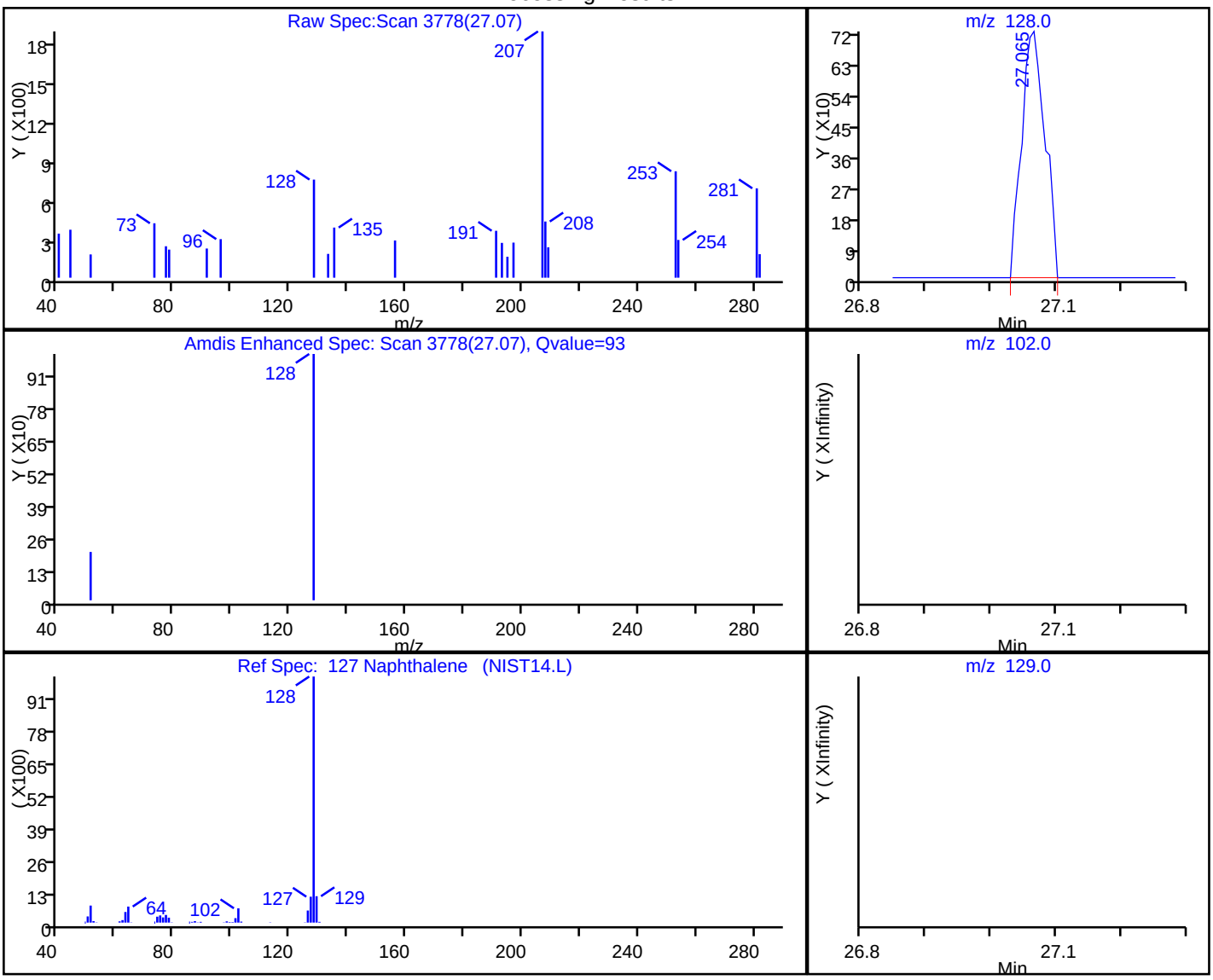
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

127 Naphthalene, CAS: 91-20-3

Processing Results



RT	Mass	Response	Amount
27.07	128.00	1825	0.009633
27.06	102.00	0	
27.06	129.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

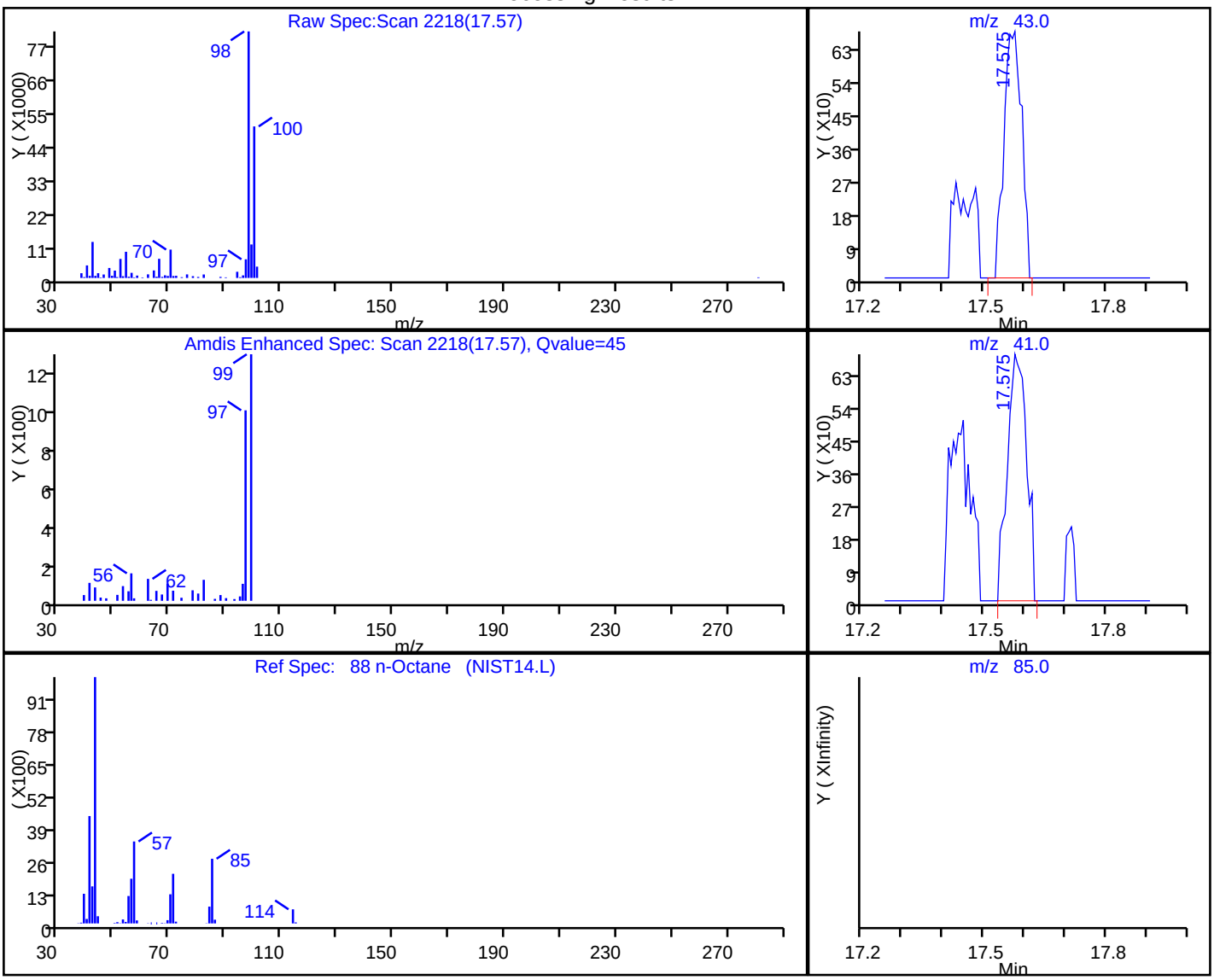
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

88 n-Octane, CAS: 111-65-9

Processing Results



RT	Mass	Response	Amount
17.57	43.00	2068	0.034805
17.57	41.00	2242	
17.58	85.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

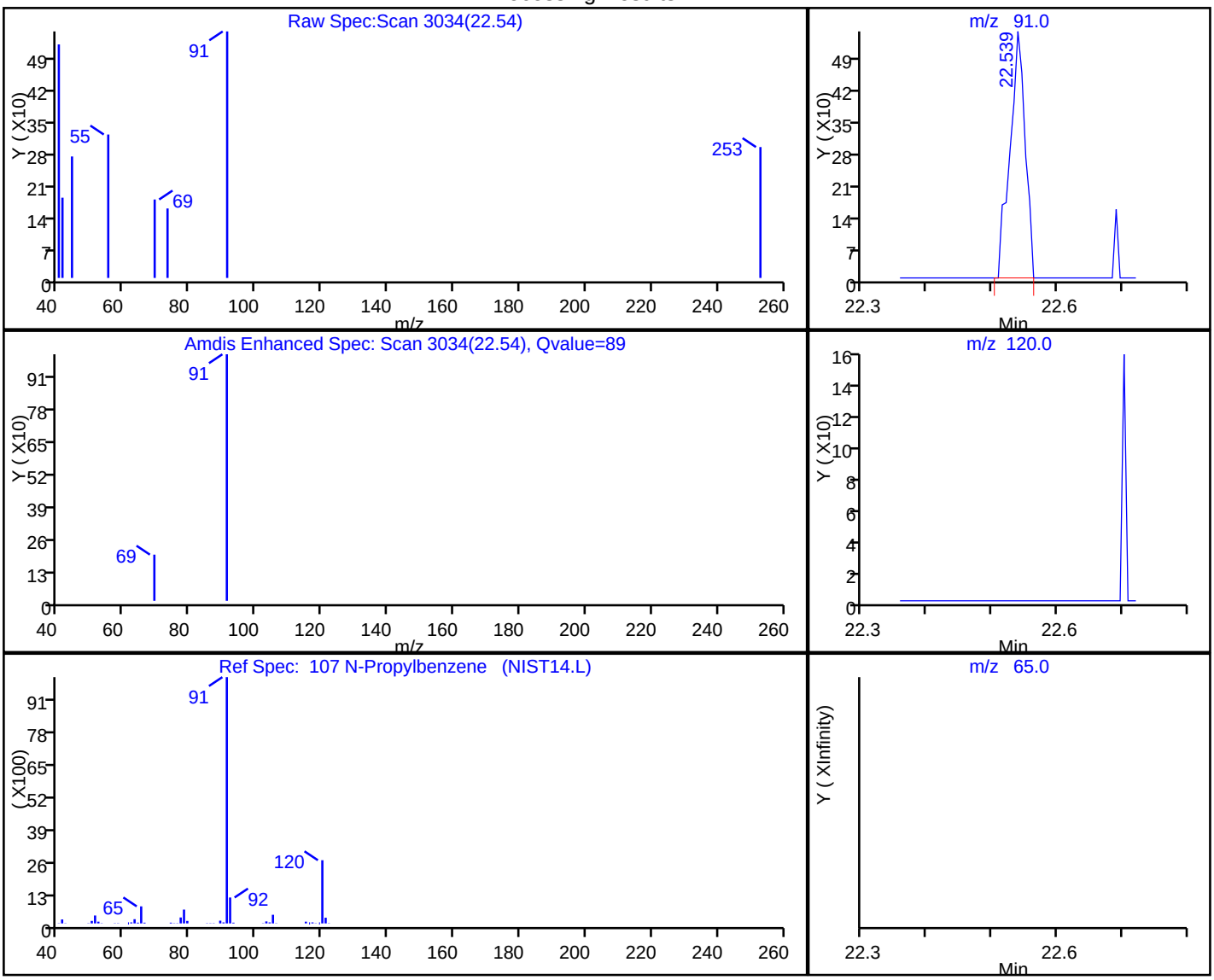
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

107 N-Propylbenzene, CAS: 103-65-1

Processing Results



RT	Mass	Response	Amount
22.54	91.00	896	0.005468
22.54	120.00	0	
22.54	65.00	0	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

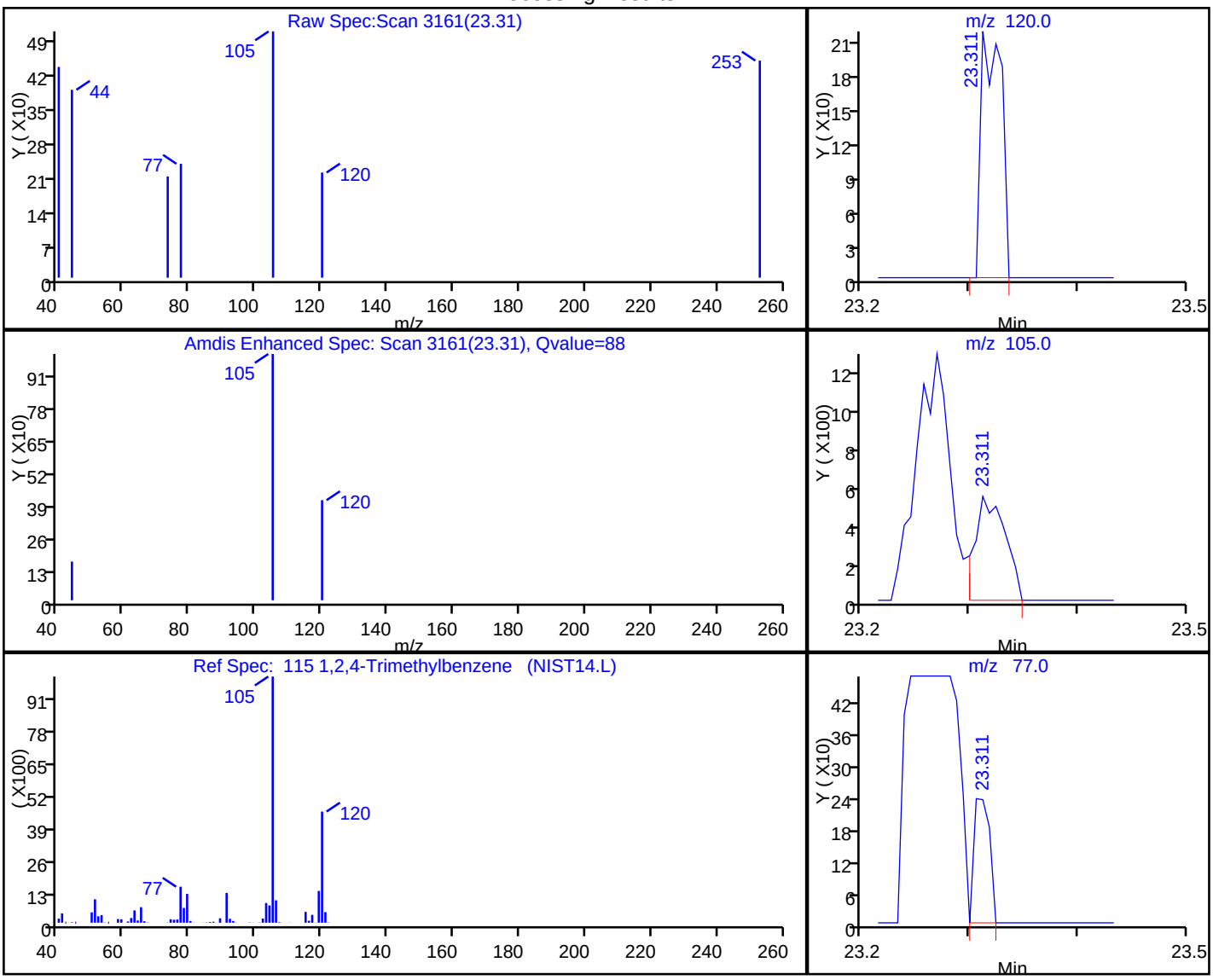
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

115 1,2,4-Trimethylbenzene, CAS: 95-63-6

Processing Results



RT	Mass	Response	Amount
23.31	120.00	283	0.005127
23.31	105.00	986	
23.31	77.00	238	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

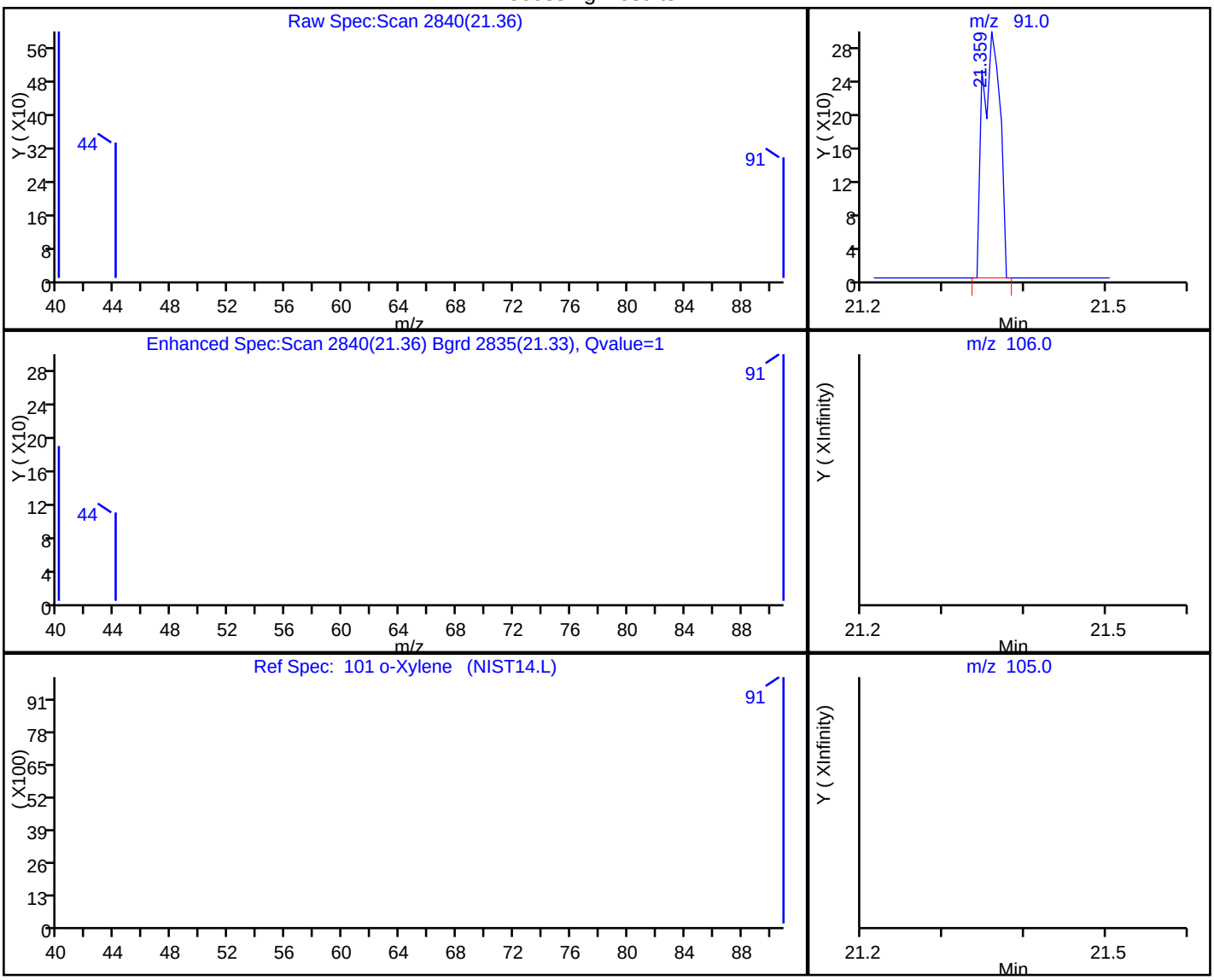
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180228-54649.b\MS9022820.D				
Injection Date:	01-Mar-2018 03:58:30	Instrument ID:	ATMS9		
Lims ID:	320-36405-A-1	Lab Sample ID:	320-36405-1		
Client ID:	34000049				
Operator ID:	RG	ALS Bottle#:	15	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

101 o-Xylene, CAS: 95-47-6

Processing Results



RT	Mass	Response	Amount
21.36	91.00	425	0.004514
21.36	106.00	0	
21.36	105.00	0	
21.37	78.00	112	

Reviewer: girr, 01-Mar-2018 09:05:46

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-38487-1
Client Project/Site: NuStar Vapor Testing

For:
Apex Companies LLC
3015 SW 1st Avenue
Portland, Oregon 97201

Attn: Heather Gosack

Kristine D. Allen

Authorized for release by:
5/10/2018 5:31:31 PM

Kristine Allen, Manager of Project Management
(253)248-4970
kristine.allen@testamericainc.com

Table of Contents

Definitions/Glossary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Qualifiers

Air - GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
*	RPD of the LCS and LCSD exceeds the control limits

Glossary

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

Job ID: 320-38487-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-38487-1

Comments
No additional comments.

Receipt
The samples were received on 4/25/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice.

Air - GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Benzyl Chloride in low in the LCS/LCSD 320-221728. Chloroethane is high in the LCSD 320-221728/22. These analytes are not reported from this batch.

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

Detection Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Client Sample ID: SVE_South_Pre carbon_042418 — Lab Sample ID: 320-38487-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	35		23		ppb v/v	56.9		TO-15	Total/NA
Ethylbenzene	38		23		ppb v/v	56.9		TO-15	Total/NA
Tetrachloroethene	1700		23		ppb v/v	56.9		TO-15	Total/NA
Trichloroethene	64		23		ppb v/v	56.9		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	140		90		ug/m3 Air	56.9		TO-15	Total/NA
Ethylbenzene	170		99		ug/m3 Air	56.9		TO-15	Total/NA
Tetrachloroethene	12000		150		ug/m3 Air	56.9		TO-15	Total/NA
Trichloroethene	350		120		ug/m3 Air	56.9		TO-15	Total/NA

Client Sample ID: SVE_South_Post carbon_042418 — Lab Sample ID: 320-38487-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	1.5		0.30		ppb v/v	1		TO-15	Total/NA
1,1-Dichloroethane	0.84		0.30		ppb v/v	1		TO-15	Total/NA
1,1-Dichloroethene	1.1		0.80		ppb v/v	1		TO-15	Total/NA
1,2,4-Trimethylbenzene	1.1		0.80		ppb v/v	1		TO-15	Total/NA
4-Ethyltoluene	0.40		0.40		ppb v/v	1		TO-15	Total/NA
Carbon disulfide	1.3		0.80		ppb v/v	1		TO-15	Total/NA
Chloroform	0.37		0.30		ppb v/v	1		TO-15	Total/NA
Dichlorodifluoromethane	0.58		0.40		ppb v/v	1		TO-15	Total/NA
Ethylbenzene	3.7		0.40		ppb v/v	1		TO-15	Total/NA
m,p-Xylene	2.7		0.80		ppb v/v	1		TO-15	Total/NA
Methylene Chloride	0.43		0.40		ppb v/v	1		TO-15	Total/NA
o-Xylene	1.4		0.40		ppb v/v	1		TO-15	Total/NA
Tetrachloroethene	0.97		0.40		ppb v/v	1		TO-15	Total/NA
Toluene	0.83		0.40		ppb v/v	1		TO-15	Total/NA
trans-1,2-Dichloroethene	1.9		0.40		ppb v/v	1		TO-15	Total/NA
Trichloroethene	14		0.40		ppb v/v	1		TO-15	Total/NA
Vinyl chloride	0.57		0.40		ppb v/v	1		TO-15	Total/NA
cis-1,2-Dichloroethene - DL	120		1.6		ppb v/v	3.97		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	8.4		1.6		ug/m3 Air	1		TO-15	Total/NA
1,1-Dichloroethane	3.4		1.2		ug/m3 Air	1		TO-15	Total/NA
1,1-Dichloroethene	4.2		3.2		ug/m3 Air	1		TO-15	Total/NA
1,2,4-Trimethylbenzene	5.3		3.9		ug/m3 Air	1		TO-15	Total/NA
4-Ethyltoluene	2.0		2.0		ug/m3 Air	1		TO-15	Total/NA
Carbon disulfide	4.0		2.5		ug/m3 Air	1		TO-15	Total/NA
Chloroform	1.8		1.5		ug/m3 Air	1		TO-15	Total/NA
Dichlorodifluoromethane	2.8		2.0		ug/m3 Air	1		TO-15	Total/NA
Ethylbenzene	16		1.7		ug/m3 Air	1		TO-15	Total/NA
m,p-Xylene	12		3.5		ug/m3 Air	1		TO-15	Total/NA
Methylene Chloride	1.5		1.4		ug/m3 Air	1		TO-15	Total/NA
o-Xylene	5.9		1.7		ug/m3 Air	1		TO-15	Total/NA
Tetrachloroethene	6.6		2.7		ug/m3 Air	1		TO-15	Total/NA
Toluene	3.1		1.5		ug/m3 Air	1		TO-15	Total/NA
trans-1,2-Dichloroethene	7.6		1.6		ug/m3 Air	1		TO-15	Total/NA
Trichloroethene	76		2.1		ug/m3 Air	1		TO-15	Total/NA
Vinyl chloride	1.4		1.0		ug/m3 Air	1		TO-15	Total/NA
cis-1,2-Dichloroethene - DL	470		6.3		ug/m3 Air	3.97		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Client Sample ID: SVE_South_Pre carbon_042418
Date Collected: 04/24/18 07:49
Date Received: 04/25/18 09:00
Sample Container: Summa Canister 6L

Lab Sample ID: 320-38487-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		17		ppb v/v			05/06/18 02:10	56.9
1,1,2,2-Tetrachloroethane	ND		23		ppb v/v			05/06/18 02:10	56.9
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		23		ppb v/v			05/06/18 02:10	56.9
1,1,2-Trichloroethane	ND		23		ppb v/v			05/06/18 02:10	56.9
1,1-Dichloroethane	ND		17		ppb v/v			05/06/18 02:10	56.9
1,1-Dichloroethene	ND		46		ppb v/v			05/06/18 02:10	56.9
1,2,4-Trichlorobenzene	ND		110		ppb v/v			05/06/18 02:10	56.9
1,2,4-Trimethylbenzene	ND		46		ppb v/v			05/06/18 02:10	56.9
1,2-Dibromoethane (EDB)	ND		46		ppb v/v			05/06/18 02:10	56.9
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		23		ppb v/v			05/06/18 02:10	56.9
1,2-Dichlorobenzene	ND		23		ppb v/v			05/06/18 02:10	56.9
1,2-Dichloroethane	ND		46		ppb v/v			05/06/18 02:10	56.9
1,2-Dichloropropane	ND		23		ppb v/v			05/06/18 02:10	56.9
1,3,5-Trimethylbenzene	ND		23		ppb v/v			05/06/18 02:10	56.9
1,3-Dichlorobenzene	ND		23		ppb v/v			05/06/18 02:10	56.9
1,4-Dichlorobenzene	ND		23		ppb v/v			05/06/18 02:10	56.9
2-Butanone (MEK)	ND		46		ppb v/v			05/06/18 02:10	56.9
2-Hexanone	ND		23		ppb v/v			05/06/18 02:10	56.9
4-Ethyltoluene	ND		23		ppb v/v			05/06/18 02:10	56.9
4-Methyl-2-pentanone (MIBK)	ND		23		ppb v/v			05/06/18 02:10	56.9
Acetone	ND		280		ppb v/v			05/06/18 02:10	56.9
Benzene	ND		23		ppb v/v			05/06/18 02:10	56.9
Benzyl chloride	ND		46		ppb v/v			05/06/18 02:10	56.9
Bromodichloromethane	ND		17		ppb v/v			05/06/18 02:10	56.9
Bromoform	ND		23		ppb v/v			05/06/18 02:10	56.9
Bromomethane	ND		46		ppb v/v			05/06/18 02:10	56.9
Carbon disulfide	ND		46		ppb v/v			05/06/18 02:10	56.9
Carbon tetrachloride	ND		46		ppb v/v			05/06/18 02:10	56.9
Chlorobenzene	ND		17		ppb v/v			05/06/18 02:10	56.9
Chloroethane	ND		46		ppb v/v			05/06/18 02:10	56.9
Chloroform	ND		17		ppb v/v			05/06/18 02:10	56.9
Chloromethane	ND		46		ppb v/v			05/06/18 02:10	56.9
cis-1,2-Dichloroethene	**35**		23		ppb v/v			05/06/18 02:10	56.9
cis-1,3-Dichloropropene	ND		23		ppb v/v			05/06/18 02:10	56.9
Dibromochloromethane	ND		23		ppb v/v			05/06/18 02:10	56.9
Dichlorodifluoromethane	ND		23		ppb v/v			05/06/18 02:10	56.9
Ethylbenzene	**38**		23		ppb v/v			05/06/18 02:10	56.9
Hexachlorobutadiene	ND		110		ppb v/v			05/06/18 02:10	56.9
m,p-Xylene	ND		46		ppb v/v			05/06/18 02:10	56.9
Methylene Chloride	ND		23		ppb v/v			05/06/18 02:10	56.9
o-Xylene	ND		23		ppb v/v			05/06/18 02:10	56.9
Styrene	ND		23		ppb v/v			05/06/18 02:10	56.9
Tetrachloroethene	**1700**		23		ppb v/v			05/06/18 02:10	56.9
Toluene	ND		23		ppb v/v			05/06/18 02:10	56.9
trans-1,2-Dichloroethene	ND		23		ppb v/v			05/06/18 02:10	56.9
trans-1,3-Dichloropropene	ND		23		ppb v/v			05/06/18 02:10	56.9
Trichloroethene	**64**		23		ppb v/v			05/06/18 02:10	56.9
Trichlorofluoromethane	ND		23		ppb v/v			05/06/18 02:10	56.9

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Client Sample ID: SVE_South_Pre carbon_042418
Date Collected: 04/24/18 07:49
Date Received: 04/25/18 09:00
Sample Container: Summa Canister 6L

Lab Sample ID: 320-38487-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl acetate	ND		46		ppb v/v			05/06/18 02:10	56.9
Vinyl chloride	ND		23		ppb v/v			05/06/18 02:10	56.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		93		ug/m3 Air			05/06/18 02:10	56.9
1,1,2,2-Tetrachloroethane	ND		160		ug/m3 Air			05/06/18 02:10	56.9
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		170		ug/m3 Air			05/06/18 02:10	56.9
1,1,2-Trichloroethane	ND		120		ug/m3 Air			05/06/18 02:10	56.9
1,1-Dichloroethane	ND		69		ug/m3 Air			05/06/18 02:10	56.9
1,1-Dichloroethene	ND		180		ug/m3 Air			05/06/18 02:10	56.9
1,2,4-Trichlorobenzene	ND		840		ug/m3 Air			05/06/18 02:10	56.9
1,2,4-Trimethylbenzene	ND		220		ug/m3 Air			05/06/18 02:10	56.9
1,2-Dibromoethane (EDB)	ND		350		ug/m3 Air			05/06/18 02:10	56.9
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		160		ug/m3 Air			05/06/18 02:10	56.9
1,2-Dichlorobenzene	ND		140		ug/m3 Air			05/06/18 02:10	56.9
1,2-Dichloroethane	ND		180		ug/m3 Air			05/06/18 02:10	56.9
1,2-Dichloropropane	ND		110		ug/m3 Air			05/06/18 02:10	56.9
1,3,5-Trimethylbenzene	ND		110		ug/m3 Air			05/06/18 02:10	56.9
1,3-Dichlorobenzene	ND		140		ug/m3 Air			05/06/18 02:10	56.9
1,4-Dichlorobenzene	ND		140		ug/m3 Air			05/06/18 02:10	56.9
2-Butanone (MEK)	ND		130		ug/m3 Air			05/06/18 02:10	56.9
2-Hexanone	ND		93		ug/m3 Air			05/06/18 02:10	56.9
4-Ethyltoluene	ND		110		ug/m3 Air			05/06/18 02:10	56.9
4-Methyl-2-pentanone (MIBK)	ND		93		ug/m3 Air			05/06/18 02:10	56.9
Acetone	ND		680		ug/m3 Air			05/06/18 02:10	56.9
Benzene	ND		73		ug/m3 Air			05/06/18 02:10	56.9
Benzyl chloride	ND		240		ug/m3 Air			05/06/18 02:10	56.9
Bromodichloromethane	ND		110		ug/m3 Air			05/06/18 02:10	56.9
Bromoform	ND		240		ug/m3 Air			05/06/18 02:10	56.9
Bromomethane	ND		180		ug/m3 Air			05/06/18 02:10	56.9
Carbon disulfide	ND		140		ug/m3 Air			05/06/18 02:10	56.9
Carbon tetrachloride	ND		290		ug/m3 Air			05/06/18 02:10	56.9
Chlorobenzene	ND		79		ug/m3 Air			05/06/18 02:10	56.9
Chloroethane	ND		120		ug/m3 Air			05/06/18 02:10	56.9
Chloroform	ND		83		ug/m3 Air			05/06/18 02:10	56.9
Chloromethane	ND		94		ug/m3 Air			05/06/18 02:10	56.9
cis-1,2-Dichloroethene	**140**		90		ug/m3 Air			05/06/18 02:10	56.9
cis-1,3-Dichloropropene	ND		100		ug/m3 Air			05/06/18 02:10	56.9
Dibromochloromethane	ND		190		ug/m3 Air			05/06/18 02:10	56.9
Dichlorodifluoromethane	ND		110		ug/m3 Air			05/06/18 02:10	56.9
Ethylbenzene	**170**		99		ug/m3 Air			05/06/18 02:10	56.9
Hexachlorobutadiene	ND		1200		ug/m3 Air			05/06/18 02:10	56.9
m,p-Xylene	ND		200		ug/m3 Air			05/06/18 02:10	56.9
Methylene Chloride	ND		79		ug/m3 Air			05/06/18 02:10	56.9
o-Xylene	ND		99		ug/m3 Air			05/06/18 02:10	56.9
Styrene	ND		97		ug/m3 Air			05/06/18 02:10	56.9
Tetrachloroethene	**12000**		150		ug/m3 Air			05/06/18 02:10	56.9
Toluene	ND		86		ug/m3 Air			05/06/18 02:10	56.9
trans-1,2-Dichloroethene	ND		90		ug/m3 Air			05/06/18 02:10	56.9

Client Sample ID: SVE_South_Pre carbon_042418

Lab Sample ID: 320-38487-1
Matrix: Air
Date Collected: 04/24/18 07:49
Date Received: 04/25/18 09:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		100		ug/m3 Air			05/06/18 02:10	56.9
Trichloroethene	**350**		120		ug/m3 Air			05/06/18 02:10	56.9
Trichlorofluoromethane	ND		130		ug/m3 Air			05/06/18 02:10	56.9
Vinyl acetate	ND		160		ug/m3 Air			05/06/18 02:10	56.9
Vinyl chloride	ND		58		ug/m3 Air			05/06/18 02:10	56.9

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 130*		*05/06/18 02:10*	*56.9*
4-Bromofluorobenzene (Surr)	*78*		*70 - 130*		*05/06/18 02:10*	*56.9*
Toluene-d8 (Surr)	*100*		*70 - 130*		*05/06/18 02:10*	*56.9*

Client Sample ID: SVE_South_Post carbon_042418

Lab Sample ID: 320-38487-2
Matrix: Air
Date Collected: 04/24/18 07:51
Date Received: 04/25/18 09:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**1.5**		0.30		ppb v/v			05/06/18 01:15	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			05/06/18 01:15	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			05/06/18 01:15	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			05/06/18 01:15	1
1,1-Dichloroethane	**0.84**		0.30		ppb v/v			05/06/18 01:15	1
1,1-Dichloroethene	**1.1**		0.80		ppb v/v			05/06/18 01:15	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			05/06/18 01:15	1
1,2,4-Trimethylbenzene	**1.1**		0.80		ppb v/v			05/06/18 01:15	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			05/06/18 01:15	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			05/06/18 01:15	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			05/06/18 01:15	1
1,2-Dichloroethane	ND		0.80		ppb v/v			05/06/18 01:15	1
1,2-Dichloropropane	ND		0.40		ppb v/v			05/06/18 01:15	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			05/06/18 01:15	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			05/06/18 01:15	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			05/06/18 01:15	1
2-Butanone (MEK)	ND		0.80		ppb v/v			05/06/18 01:15	1
2-Hexanone	ND		0.40		ppb v/v			05/06/18 01:15	1
4-Ethyltoluene	**0.40**		0.40		ppb v/v			05/06/18 01:15	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			05/06/18 01:15	1
Acetone	ND		5.0		ppb v/v			05/06/18 01:15	1
Benzene	ND		0.40		ppb v/v			05/06/18 01:15	1
Benzyl chloride	ND		0.80		ppb v/v			05/06/18 01:15	1
Bromodichloromethane	ND		0.30		ppb v/v			05/06/18 01:15	1
Bromoform	ND		0.40		ppb v/v			05/06/18 01:15	1
Bromomethane	ND		0.80		ppb v/v			05/06/18 01:15	1
Carbon disulfide	**1.3**		0.80		ppb v/v			05/06/18 01:15	1
Carbon tetrachloride	ND		0.80		ppb v/v			05/06/18 01:15	1
Chlorobenzene	ND		0.30		ppb v/v			05/06/18 01:15	1
Chloroethane	ND		0.80		ppb v/v			05/06/18 01:15	1
Chloroform	**0.37**		0.30		ppb v/v			05/06/18 01:15	1

Client Sample ID: SVE_South_Post carbon_042418
Lab Sample ID: 320-38487-2
Date Collected: 04/24/18 07:51
Matrix: Air
Date Received: 04/25/18 09:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	ND		0.80		ppb v/v			05/06/18 01:15	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			05/06/18 01:15	1
Dibromochloromethane	ND		0.40		ppb v/v			05/06/18 01:15	1
Dichlorodifluoromethane	**0.58**		0.40		ppb v/v			05/06/18 01:15	1
Ethylbenzene	**3.7**		0.40		ppb v/v			05/06/18 01:15	1
Hexachlorobutadiene	ND		2.0		ppb v/v			05/06/18 01:15	1
m,p-Xylene	**2.7**		0.80		ppb v/v			05/06/18 01:15	1
Methylene Chloride	**0.43**		0.40		ppb v/v			05/06/18 01:15	1
o-Xylene	**1.4**		0.40		ppb v/v			05/06/18 01:15	1
Styrene	ND		0.40		ppb v/v			05/06/18 01:15	1
Tetrachloroethene	**0.97**		0.40		ppb v/v			05/06/18 01:15	1
Toluene	**0.83**		0.40		ppb v/v			05/06/18 01:15	1
trans-1,2-Dichloroethene	**1.9**		0.40		ppb v/v			05/06/18 01:15	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			05/06/18 01:15	1
Trichloroethene	**14**		0.40		ppb v/v			05/06/18 01:15	1
Trichlorofluoromethane	ND		0.40		ppb v/v			05/06/18 01:15	1
Vinyl acetate	ND		0.80		ppb v/v			05/06/18 01:15	1
Vinyl chloride	**0.57**		0.40		ppb v/v			05/06/18 01:15	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**8.4**		1.6		ug/m3 Air			05/06/18 01:15	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			05/06/18 01:15	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			05/06/18 01:15	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			05/06/18 01:15	1
1,1-Dichloroethane	**3.4**		1.2		ug/m3 Air			05/06/18 01:15	1
1,1-Dichloroethene	**4.2**		3.2		ug/m3 Air			05/06/18 01:15	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			05/06/18 01:15	1
1,2,4-Trimethylbenzene	**5.3**		3.9		ug/m3 Air			05/06/18 01:15	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			05/06/18 01:15	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			05/06/18 01:15	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			05/06/18 01:15	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			05/06/18 01:15	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			05/06/18 01:15	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			05/06/18 01:15	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			05/06/18 01:15	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			05/06/18 01:15	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			05/06/18 01:15	1
2-Hexanone	ND		1.6		ug/m3 Air			05/06/18 01:15	1
4-Ethyltoluene	**2.0**		2.0		ug/m3 Air			05/06/18 01:15	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			05/06/18 01:15	1
Acetone	ND		12		ug/m3 Air			05/06/18 01:15	1
Benzene	ND		1.3		ug/m3 Air			05/06/18 01:15	1
Benzyl chloride	ND		4.1		ug/m3 Air			05/06/18 01:15	1
Bromodichloromethane	ND		2.0		ug/m3 Air			05/06/18 01:15	1
Bromoform	ND		4.1		ug/m3 Air			05/06/18 01:15	1
Bromomethane	ND		3.1		ug/m3 Air			05/06/18 01:15	1
Carbon disulfide	**4.0**		2.5		ug/m3 Air			05/06/18 01:15	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			05/06/18 01:15	1
Chlorobenzene	ND		1.4		ug/m3 Air			05/06/18 01:15	1

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Client Sample ID: SVE_South_Post carbon_042418
Date Collected: 04/24/18 07:51
Date Received: 04/25/18 09:00
Sample Container: Summa Canister 6L

Lab Sample ID: 320-38487-2
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		2.1		ug/m3 Air			05/06/18 01:15	1
Chloroform	**1.8**		1.5		ug/m3 Air			05/06/18 01:15	1
Chloromethane	ND		1.7		ug/m3 Air			05/06/18 01:15	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			05/06/18 01:15	1
Dibromochloromethane	ND		3.4		ug/m3 Air			05/06/18 01:15	1
Dichlorodifluoromethane	**2.8**		2.0		ug/m3 Air			05/06/18 01:15	1
Ethylbenzene	**16**		1.7		ug/m3 Air			05/06/18 01:15	1
Hexachlorobutadiene	ND		21		ug/m3 Air			05/06/18 01:15	1
m,p-Xylene	**12**		3.5		ug/m3 Air			05/06/18 01:15	1
Methylene Chloride	**1.5**		1.4		ug/m3 Air			05/06/18 01:15	1
o-Xylene	**5.9**		1.7		ug/m3 Air			05/06/18 01:15	1
Styrene	ND		1.7		ug/m3 Air			05/06/18 01:15	1
Tetrachloroethene	**6.6**		2.7		ug/m3 Air			05/06/18 01:15	1
Toluene	**3.1**		1.5		ug/m3 Air			05/06/18 01:15	1
trans-1,2-Dichloroethene	**7.6**		1.6		ug/m3 Air			05/06/18 01:15	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			05/06/18 01:15	1
Trichloroethene	**76**		2.1		ug/m3 Air			05/06/18 01:15	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			05/06/18 01:15	1
Vinyl acetate	ND		2.8		ug/m3 Air			05/06/18 01:15	1
Vinyl chloride	**1.4**		1.0		ug/m3 Air			05/06/18 01:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*		*05/06/18 01:15*	*1*
4-Bromofluorobenzene (Surr)	*99*		*70 - 130*		*05/06/18 01:15*	*1*
Toluene-d8 (Surr)	*99*		*70 - 130*		*05/06/18 01:15*	*1*

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**120**		1.6		ppb v/v			05/07/18 23:16	3.97

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**470**		6.3		ug/m3 Air			05/07/18 23:16	3.97

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*		*05/07/18 23:16*	*3.97*
4-Bromofluorobenzene (Surr)	*96*		*70 - 130*		*05/07/18 23:16*	*3.97*
Toluene-d8 (Surr)	*105*		*70 - 130*		*05/07/18 23:16*	*3.97*

Surrogate Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		DCA	BFB	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
320-38487-1	SVE_South_Pre carbon_042418	94	78	100
320-38487-2	SVE_South_Post carbon_042418	100	99	99
320-38487-2 - DL	SVE_South_Post carbon_042418	99	96	105
LCS 320-221623/3	Lab Control Sample	103	107	101
LCS 320-221728/4	Lab Control Sample	101	107	101
LCSD 320-221623/4	Lab Control Sample Dup	101	106	101
LCSD 320-221728/22	Lab Control Sample Dup	101	109	101
MB 320-221623/6	Method Blank	97	82	100
MB 320-221728/7	Method Blank	96	82	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 320-221623/6
Matrix: Air
Analysis Batch: 221623

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.30		ppb v/v			05/05/18 14:43	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			05/05/18 14:43	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			05/05/18 14:43	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			05/05/18 14:43	1
1,1-Dichloroethane	ND		0.30		ppb v/v			05/05/18 14:43	1
1,1-Dichloroethene	ND		0.80		ppb v/v			05/05/18 14:43	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			05/05/18 14:43	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			05/05/18 14:43	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			05/05/18 14:43	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			05/05/18 14:43	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			05/05/18 14:43	1
1,2-Dichloroethane	ND		0.80		ppb v/v			05/05/18 14:43	1
1,2-Dichloropropane	ND		0.40		ppb v/v			05/05/18 14:43	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			05/05/18 14:43	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			05/05/18 14:43	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			05/05/18 14:43	1
2-Butanone (MEK)	ND		0.80		ppb v/v			05/05/18 14:43	1
2-Hexanone	ND		0.40		ppb v/v			05/05/18 14:43	1
4-Ethyltoluene	ND		0.40		ppb v/v			05/05/18 14:43	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			05/05/18 14:43	1
Acetone	ND		5.0		ppb v/v			05/05/18 14:43	1
Benzene	ND		0.40		ppb v/v			05/05/18 14:43	1
Benzyl chloride	ND		0.80		ppb v/v			05/05/18 14:43	1
Bromodichloromethane	ND		0.30		ppb v/v			05/05/18 14:43	1
Bromoform	ND		0.40		ppb v/v			05/05/18 14:43	1
Bromomethane	ND		0.80		ppb v/v			05/05/18 14:43	1
Carbon disulfide	ND		0.80		ppb v/v			05/05/18 14:43	1
Carbon tetrachloride	ND		0.80		ppb v/v			05/05/18 14:43	1
Chlorobenzene	ND		0.30		ppb v/v			05/05/18 14:43	1
Chloroethane	ND		0.80		ppb v/v			05/05/18 14:43	1
Chloroform	ND		0.30		ppb v/v			05/05/18 14:43	1
Chloromethane	ND		0.80		ppb v/v			05/05/18 14:43	1
cis-1,2-Dichloroethene	ND		0.40		ppb v/v			05/05/18 14:43	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			05/05/18 14:43	1
Dibromochloromethane	ND		0.40		ppb v/v			05/05/18 14:43	1
Dichlorodifluoromethane	ND		0.40		ppb v/v			05/05/18 14:43	1
Ethylbenzene	ND		0.40		ppb v/v			05/05/18 14:43	1
Hexachlorobutadiene	ND		2.0		ppb v/v			05/05/18 14:43	1
m,p-Xylene	ND		0.80		ppb v/v			05/05/18 14:43	1
Methylene Chloride	ND		0.40		ppb v/v			05/05/18 14:43	1
o-Xylene	ND		0.40		ppb v/v			05/05/18 14:43	1
Styrene	ND		0.40		ppb v/v			05/05/18 14:43	1
Tetrachloroethene	ND		0.40		ppb v/v			05/05/18 14:43	1
Toluene	ND		0.40		ppb v/v			05/05/18 14:43	1
trans-1,2-Dichloroethene	ND		0.40		ppb v/v			05/05/18 14:43	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			05/05/18 14:43	1
Trichloroethene	ND		0.40		ppb v/v			05/05/18 14:43	1
Trichlorofluoromethane	ND		0.40		ppb v/v			05/05/18 14:43	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-221623/6
Matrix: Air
Analysis Batch: 221623

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl acetate	ND		0.80		ppb v/v			05/05/18 14:43	1
Vinyl chloride	ND		0.40		ppb v/v			05/05/18 14:43	1

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.6		ug/m3 Air			05/05/18 14:43	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			05/05/18 14:43	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			05/05/18 14:43	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			05/05/18 14:43	1
1,1-Dichloroethane	ND		1.2		ug/m3 Air			05/05/18 14:43	1
1,1-Dichloroethene	ND		3.2		ug/m3 Air			05/05/18 14:43	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			05/05/18 14:43	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			05/05/18 14:43	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			05/05/18 14:43	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			05/05/18 14:43	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			05/05/18 14:43	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			05/05/18 14:43	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			05/05/18 14:43	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			05/05/18 14:43	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			05/05/18 14:43	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			05/05/18 14:43	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			05/05/18 14:43	1
2-Hexanone	ND		1.6		ug/m3 Air			05/05/18 14:43	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			05/05/18 14:43	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			05/05/18 14:43	1
Acetone	ND		12		ug/m3 Air			05/05/18 14:43	1
Benzene	ND		1.3		ug/m3 Air			05/05/18 14:43	1
Benzyl chloride	ND		4.1		ug/m3 Air			05/05/18 14:43	1
Bromodichloromethane	ND		2.0		ug/m3 Air			05/05/18 14:43	1
Bromoform	ND		4.1		ug/m3 Air			05/05/18 14:43	1
Bromomethane	ND		3.1		ug/m3 Air			05/05/18 14:43	1
Carbon disulfide	ND		2.5		ug/m3 Air			05/05/18 14:43	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			05/05/18 14:43	1
Chlorobenzene	ND		1.4		ug/m3 Air			05/05/18 14:43	1
Chloroethane	ND		2.1		ug/m3 Air			05/05/18 14:43	1
Chloroform	ND		1.5		ug/m3 Air			05/05/18 14:43	1
Chloromethane	ND		1.7		ug/m3 Air			05/05/18 14:43	1
cis-1,2-Dichloroethene	ND		1.6		ug/m3 Air			05/05/18 14:43	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			05/05/18 14:43	1
Dibromochloromethane	ND		3.4		ug/m3 Air			05/05/18 14:43	1
Dichlorodifluoromethane	ND		2.0		ug/m3 Air			05/05/18 14:43	1
Ethylbenzene	ND		1.7		ug/m3 Air			05/05/18 14:43	1
Hexachlorobutadiene	ND		21		ug/m3 Air			05/05/18 14:43	1
m,p-Xylene	ND		3.5		ug/m3 Air			05/05/18 14:43	1
Methylene Chloride	ND		1.4		ug/m3 Air			05/05/18 14:43	1
o-Xylene	ND		1.7		ug/m3 Air			05/05/18 14:43	1
Styrene	ND		1.7		ug/m3 Air			05/05/18 14:43	1
Tetrachloroethene	ND		2.7		ug/m3 Air			05/05/18 14:43	1
Toluene	ND		1.5		ug/m3 Air			05/05/18 14:43	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-221623/6
Matrix: Air
Analysis Batch: 221623

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		1.6		ug/m3 Air			05/05/18 14:43	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			05/05/18 14:43	1
Trichloroethene	ND		2.1		ug/m3 Air			05/05/18 14:43	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			05/05/18 14:43	1
Vinyl acetate	ND		2.8		ug/m3 Air			05/05/18 14:43	1
Vinyl chloride	ND		1.0		ug/m3 Air			05/05/18 14:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 130*		*05/05/18 14:43*	*1*
4-Bromofluorobenzene (Surr)	*82*		*70 - 130*		*05/05/18 14:43*	*1*
Toluene-d8 (Surr)	*100*		*70 - 130*		*05/05/18 14:43*	*1*

Lab Sample ID: LCS 320-221623/3
Matrix: Air
Analysis Batch: 221623

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	22.6		ppb v/v		113	69 - 129
1,1,2,2-Tetrachloroethane	20.0	22.4		ppb v/v		112	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	22.4		ppb v/v		112	70 - 130
1,1,2-Trichloroethane	20.0	22.0		ppb v/v		110	64 - 124
1,1-Dichloroethane	20.0	22.8		ppb v/v		114	71 - 131
1,1-Dichloroethene	20.0	22.7		ppb v/v		113	72 - 132
1,2,4-Trichlorobenzene	20.0	20.6		ppb v/v		103	58 - 138
1,2,4-Trimethylbenzene	20.0	20.3		ppb v/v		102	60 - 132
1,2-Dibromoethane (EDB)	20.0	23.1		ppb v/v		115	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	21.6		ppb v/v		108	74 - 134
1,2-Dichlorobenzene	20.0	22.7		ppb v/v		114	62 - 126
1,2-Dichloroethane	20.0	23.1		ppb v/v		116	71 - 131
1,2-Dichloropropane	20.0	22.4		ppb v/v		112	72 - 132
1,3,5-Trimethylbenzene	20.0	21.0		ppb v/v		105	65 - 125
1,3-Dichlorobenzene	20.0	25.6		ppb v/v		128	59 - 130
1,4-Dichlorobenzene	20.0	26.2		ppb v/v		131	58 - 132
2-Butanone (MEK)	20.0	21.4		ppb v/v		107	73 - 133
2-Hexanone	20.0	17.1		ppb v/v		86	69 - 129
4-Ethyltoluene	20.0	21.8		ppb v/v		109	66 - 129
4-Methyl-2-pentanone (MIBK)	20.0	19.0		ppb v/v		95	74 - 134
Acetone	20.0	21.6		ppb v/v		108	65 - 125
Benzene	20.0	21.7		ppb v/v		108	68 - 128
Benzyl chloride	16.0	13.4		ppb v/v		84	67 - 127
Bromodichloromethane	20.0	22.7		ppb v/v		114	71 - 131
Bromoform	20.0	23.2		ppb v/v		116	66 - 126
Bromomethane	20.0	21.9		ppb v/v		110	73 - 134
Carbon disulfide	20.0	22.1		ppb v/v		110	71 - 131
Carbon tetrachloride	20.0	22.7		ppb v/v		113	63 - 126
Chlorobenzene	20.0	21.8		ppb v/v		109	63 - 123

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-221623/3
Matrix: Air
Analysis Batch: 221623

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloroethane	20.0	21.8		ppb v/v		109	73 - 133
Chloroform	20.0	22.6		ppb v/v		113	70 - 130
Chloromethane	20.0	20.9		ppb v/v		104	61 - 140
cis-1,2-Dichloroethene	20.0	23.2		ppb v/v		116	70 - 130
cis-1,3-Dichloropropene	20.0	22.6		ppb v/v		113	72 - 132
Dibromochloromethane	20.0	22.6		ppb v/v		113	66 - 126
Dichlorodifluoromethane	20.0	21.8		ppb v/v		109	69 - 129
Ethylbenzene	20.0	22.2		ppb v/v		111	64 - 124
Hexachlorobutadiene	20.0	21.4		ppb v/v		107	58 - 131
m,p-Xylene	40.0	44.0		ppb v/v		110	65 - 125
Methylene Chloride	20.0	22.4		ppb v/v		112	67 - 127
o-Xylene	20.0	21.4		ppb v/v		107	65 - 125
Styrene	20.0	23.5		ppb v/v		117	67 - 127
Tetrachloroethene	20.0	20.9		ppb v/v		104	63 - 123
Toluene	20.0	20.5		ppb v/v		103	68 - 128
trans-1,2-Dichloroethene	20.0	23.9		ppb v/v		120	72 - 132
trans-1,3-Dichloropropene	20.0	23.6		ppb v/v		118	66 - 126
Trichloroethene	20.0	22.0		ppb v/v		110	70 - 130
Trichlorofluoromethane	20.0	21.8		ppb v/v		109	71 - 131
Vinyl acetate	20.0	21.9		ppb v/v		109	65 - 134
Vinyl chloride	20.0	22.2		ppb v/v		111	59 - 152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	110	124		ug/m3 Air		113	69 - 129
1,1,2,2-Tetrachloroethane	140	154		ug/m3 Air		112	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	150	171		ug/m3 Air		112	70 - 130
1,1,2-Trichloroethane	110	120		ug/m3 Air		110	64 - 124
1,1-Dichloroethane	81	92.5		ug/m3 Air		114	71 - 131
1,1-Dichloroethene	79	89.8		ug/m3 Air		113	72 - 132
1,2,4-Trichlorobenzene	150	153		ug/m3 Air		103	58 - 138
1,2,4-Trimethylbenzene	98	99.9		ug/m3 Air		102	60 - 132
1,2-Dibromoethane (EDB)	150	177		ug/m3 Air		115	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	151		ug/m3 Air		108	74 - 134
1,2-Dichlorobenzene	120	137		ug/m3 Air		114	62 - 126
1,2-Dichloroethane	81	93.6		ug/m3 Air		116	71 - 131
1,2-Dichloropropane	92	104		ug/m3 Air		112	72 - 132
1,3,5-Trimethylbenzene	98	103		ug/m3 Air		105	65 - 125
1,3-Dichlorobenzene	120	154		ug/m3 Air		128	59 - 130
1,4-Dichlorobenzene	120	158		ug/m3 Air		131	58 - 132
2-Butanone (MEK)	59	63.2		ug/m3 Air		107	73 - 133
2-Hexanone	82	70.1		ug/m3 Air		86	69 - 129
4-Ethyltoluene	98	107		ug/m3 Air		109	66 - 129
4-Methyl-2-pentanone (MIBK)	82	77.9		ug/m3 Air		95	74 - 134
Acetone	48	51.3		ug/m3 Air		108	65 - 125
Benzene	64	69.2		ug/m3 Air		108	68 - 128
Benzyl chloride	83	69.5		ug/m3 Air		84	67 - 127
Bromodichloromethane	130	152		ug/m3 Air		114	71 - 131

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-221623/3
Matrix: Air
Analysis Batch: 221623

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	210	240		ug/m3 Air		116	66 - 126
Bromomethane	78	85.2		ug/m3 Air		110	73 - 134
Carbon disulfide	62	68.8		ug/m3 Air		110	71 - 131
Carbon tetrachloride	130	143		ug/m3 Air		113	63 - 126
Chlorobenzene	92	100		ug/m3 Air		109	63 - 123
Chloroethane	53	57.5		ug/m3 Air		109	73 - 133
Chloroform	98	110		ug/m3 Air		113	70 - 130
Chloromethane	41	43.2		ug/m3 Air		104	61 - 140
cis-1,2-Dichloroethene	79	92.1		ug/m3 Air		116	70 - 130
cis-1,3-Dichloropropene	91	103		ug/m3 Air		113	72 - 132
Dibromochloromethane	170	192		ug/m3 Air		113	66 - 126
Dichlorodifluoromethane	99	108		ug/m3 Air		109	69 - 129
Ethylbenzene	87	96.4		ug/m3 Air		111	64 - 124
Hexachlorobutadiene	210	229		ug/m3 Air		107	58 - 131
m,p-Xylene	170	191		ug/m3 Air		110	65 - 125
Methylene Chloride	69	77.7		ug/m3 Air		112	67 - 127
o-Xylene	87	92.8		ug/m3 Air		107	65 - 125
Styrene	85	100		ug/m3 Air		117	67 - 127
Tetrachloroethene	140	142		ug/m3 Air		104	63 - 123
Toluene	75	77.3		ug/m3 Air		103	68 - 128
trans-1,2-Dichloroethene	79	94.8		ug/m3 Air		120	72 - 132
trans-1,3-Dichloropropene	91	107		ug/m3 Air		118	66 - 126
Trichloroethene	110	118		ug/m3 Air		110	70 - 130
Trichlorofluoromethane	110	123		ug/m3 Air		109	71 - 131
Vinyl acetate	70	76.9		ug/m3 Air		109	65 - 134
Vinyl chloride	51	56.7		ug/m3 Air		111	59 - 152

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 130*
4-Bromofluorobenzene (Surr)	*107*		*70 - 130*
Toluene-d8 (Surr)	*101*		*70 - 130*

Lab Sample ID: LCSD 320-221623/4
Matrix: Air
Analysis Batch: 221623

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	20.0	22.6		ppb v/v		113	69 - 129	0	25
1,1,2,2-Tetrachloroethane	20.0	22.0		ppb v/v		110	64 - 124	2	25
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	22.2		ppb v/v		111	70 - 130	1	25
1,1,2-Trichloroethane	20.0	21.6		ppb v/v		108	64 - 124	2	25
1,1-Dichloroethane	20.0	22.8		ppb v/v		114	71 - 131	0	25
1,1-Dichloroethene	20.0	22.6		ppb v/v		113	72 - 132	0	25
1,2,4-Trichlorobenzene	20.0	20.9		ppb v/v		105	58 - 138	2	25
1,2,4-Trimethylbenzene	20.0	20.5		ppb v/v		102	60 - 132	1	25
1,2-Dibromoethane (EDB)	20.0	22.7		ppb v/v		113	64 - 124	2	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-221623/4
Matrix: Air
Analysis Batch: 221623

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	21.8		ppb v/v		109	74 - 134	1	25
1,2-Dichlorobenzene	20.0	22.3		ppb v/v		112	62 - 126	2	25
1,2-Dichloroethane	20.0	22.6		ppb v/v		113	71 - 131	2	25
1,2-Dichloropropane	20.0	21.9		ppb v/v		110	72 - 132	2	25
1,3,5-Trimethylbenzene	20.0	20.5		ppb v/v		103	65 - 125	2	25
1,3-Dichlorobenzene	20.0	24.8		ppb v/v		124	59 - 130	3	25
1,4-Dichlorobenzene	20.0	25.2		ppb v/v		126	58 - 132	4	25
2-Butanone (MEK)	20.0	21.2		ppb v/v		106	73 - 133	1	25
2-Hexanone	20.0	16.8		ppb v/v		84	69 - 129	2	25
4-Ethyltoluene	20.0	21.2		ppb v/v		106	66 - 129	3	25
4-Methyl-2-pentanone (MIBK)	20.0	18.8		ppb v/v		94	74 - 134	1	25
Acetone	20.0	21.0		ppb v/v		105	65 - 125	3	25
Benzene	20.0	21.3		ppb v/v		106	68 - 128	2	25
Benzyl chloride	16.0	13.4		ppb v/v		84	67 - 127	0	25
Bromodichloromethane	20.0	22.1		ppb v/v		111	71 - 131	3	25
Bromoform	20.0	22.8		ppb v/v		114	66 - 126	2	25
Bromomethane	20.0	22.1		ppb v/v		110	73 - 134	1	25
Carbon disulfide	20.0	22.1		ppb v/v		110	71 - 131	0	25
Carbon tetrachloride	20.0	22.2		ppb v/v		111	63 - 126	2	25
Chlorobenzene	20.0	21.4		ppb v/v		107	63 - 123	2	25
Chloroethane	20.0	21.8		ppb v/v		109	73 - 133	0	25
Chloroform	20.0	22.6		ppb v/v		113	70 - 130	0	25
Chloromethane	20.0	21.0		ppb v/v		105	61 - 140	1	25
cis-1,2-Dichloroethene	20.0	23.4		ppb v/v		117	70 - 130	1	25
cis-1,3-Dichloropropene	20.0	22.2		ppb v/v		111	72 - 132	2	25
Dibromochloromethane	20.0	22.0		ppb v/v		110	66 - 126	2	25
Dichlorodifluoromethane	20.0	21.9		ppb v/v		109	69 - 129	1	25
Ethylbenzene	20.0	21.6		ppb v/v		108	64 - 124	3	25
Hexachlorobutadiene	20.0	21.4		ppb v/v		107	58 - 131	0	25
m,p-Xylene	40.0	43.1		ppb v/v		108	65 - 125	2	25
Methylene Chloride	20.0	22.3		ppb v/v		112	67 - 127	0	25
o-Xylene	20.0	20.9		ppb v/v		105	65 - 125	2	25
Styrene	20.0	23.1		ppb v/v		115	67 - 127	2	25
Tetrachloroethene	20.0	20.5		ppb v/v		102	63 - 123	2	25
Toluene	20.0	20.1		ppb v/v		101	68 - 128	2	25
trans-1,2-Dichloroethene	20.0	23.7		ppb v/v		119	72 - 132	1	25
trans-1,3-Dichloropropene	20.0	23.3		ppb v/v		116	66 - 126	1	25
Trichloroethene	20.0	21.7		ppb v/v		108	70 - 130	2	25
Trichlorofluoromethane	20.0	21.6		ppb v/v		108	71 - 131	1	25
Vinyl acetate	20.0	21.7		ppb v/v		109	65 - 134	1	25
Vinyl chloride	20.0	22.3		ppb v/v		111	59 - 152	0	25

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	110	123		ug/m3 Air		113	69 - 129	0	25
1,1,2,2-Tetrachloroethane	140	151		ug/m3 Air		110	64 - 124	2	25
1,1,2-Trichloro-1,2,2-trifluoroethane	150	170		ug/m3 Air		111	70 - 130	1	25
1,1,2-Trichloroethane	110	118		ug/m3 Air		108	64 - 124	2	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-221623/4
Matrix: Air
Analysis Batch: 221623

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethane	81	92.3		ug/m3 Air		114	71 - 131	0	25
1,1-Dichloroethene	79	89.6		ug/m3 Air		113	72 - 132	0	25
1,2,4-Trichlorobenzene	150	155		ug/m3 Air		105	58 - 138	2	25
1,2,4-Trimethylbenzene	98	101		ug/m3 Air		102	60 - 132	1	25
1,2-Dibromoethane (EDB)	150	174		ug/m3 Air		113	64 - 124	2	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	152		ug/m3 Air		109	74 - 134	1	25
1,2-Dichlorobenzene	120	134		ug/m3 Air		112	62 - 126	2	25
1,2-Dichloroethane	81	91.6		ug/m3 Air		113	71 - 131	2	25
1,2-Dichloropropane	92	101		ug/m3 Air		110	72 - 132	2	25
1,3,5-Trimethylbenzene	98	101		ug/m3 Air		103	65 - 125	2	25
1,3-Dichlorobenzene	120	149		ug/m3 Air		124	59 - 130	3	25
1,4-Dichlorobenzene	120	152		ug/m3 Air		126	58 - 132	4	25
2-Butanone (MEK)	59	62.6		ug/m3 Air		106	73 - 133	1	25
2-Hexanone	82	68.7		ug/m3 Air		84	69 - 129	2	25
4-Ethyltoluene	98	104		ug/m3 Air		106	66 - 129	3	25
4-Methyl-2-pentanone (MIBK)	82	76.8		ug/m3 Air		94	74 - 134	1	25
Acetone	48	50.0		ug/m3 Air		105	65 - 125	3	25
Benzene	64	67.9		ug/m3 Air		106	68 - 128	2	25
Benzyl chloride	83	69.6		ug/m3 Air		84	67 - 127	0	25
Bromodichloromethane	130	148		ug/m3 Air		111	71 - 131	3	25
Bromoform	210	235		ug/m3 Air		114	66 - 126	2	25
Bromomethane	78	85.8		ug/m3 Air		110	73 - 134	1	25
Carbon disulfide	62	68.8		ug/m3 Air		110	71 - 131	0	25
Carbon tetrachloride	130	140		ug/m3 Air		111	63 - 126	2	25
Chlorobenzene	92	98.3		ug/m3 Air		107	63 - 123	2	25
Chloroethane	53	57.5		ug/m3 Air		109	73 - 133	0	25
Chloroform	98	110		ug/m3 Air		113	70 - 130	0	25
Chloromethane	41	43.4		ug/m3 Air		105	61 - 140	1	25
cis-1,2-Dichloroethene	79	92.7		ug/m3 Air		117	70 - 130	1	25
cis-1,3-Dichloropropene	91	101		ug/m3 Air		111	72 - 132	2	25
Dibromochloromethane	170	188		ug/m3 Air		110	66 - 126	2	25
Dichlorodifluoromethane	99	108		ug/m3 Air		109	69 - 129	1	25
Ethylbenzene	87	94.0		ug/m3 Air		108	64 - 124	3	25
Hexachlorobutadiene	210	228		ug/m3 Air		107	58 - 131	0	25
m,p-Xylene	170	187		ug/m3 Air		108	65 - 125	2	25
Methylene Chloride	69	77.5		ug/m3 Air		112	67 - 127	0	25
o-Xylene	87	90.8		ug/m3 Air		105	65 - 125	2	25
Styrene	85	98.3		ug/m3 Air		115	67 - 127	2	25
Tetrachloroethene	140	139		ug/m3 Air		102	63 - 123	2	25
Toluene	75	75.9		ug/m3 Air		101	68 - 128	2	25
trans-1,2-Dichloroethene	79	94.1		ug/m3 Air		119	72 - 132	1	25
trans-1,3-Dichloropropene	91	106		ug/m3 Air		116	66 - 126	1	25
Trichloroethene	110	116		ug/m3 Air		108	70 - 130	2	25
Trichlorofluoromethane	110	121		ug/m3 Air		108	71 - 131	1	25
Vinyl acetate	70	76.4		ug/m3 Air		109	65 - 134	1	25
Vinyl chloride	51	56.9		ug/m3 Air		111	59 - 152	0	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-221623/4
Matrix: Air
Analysis Batch: 221623

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

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 130*
4-Bromofluorobenzene (Surr)	*106*		*70 - 130*
Toluene-d8 (Surr)	*101*		*70 - 130*

Lab Sample ID: MB 320-221728/7
Matrix: Air
Analysis Batch: 221728

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.30		ppb v/v			05/07/18 15:52	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			05/07/18 15:52	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			05/07/18 15:52	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			05/07/18 15:52	1
1,1-Dichloroethane	ND		0.30		ppb v/v			05/07/18 15:52	1
1,1-Dichloroethene	ND		0.80		ppb v/v			05/07/18 15:52	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			05/07/18 15:52	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			05/07/18 15:52	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			05/07/18 15:52	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			05/07/18 15:52	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			05/07/18 15:52	1
1,2-Dichloroethane	ND		0.80		ppb v/v			05/07/18 15:52	1
1,2-Dichloropropane	ND		0.40		ppb v/v			05/07/18 15:52	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			05/07/18 15:52	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			05/07/18 15:52	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			05/07/18 15:52	1
2-Butanone (MEK)	ND		0.80		ppb v/v			05/07/18 15:52	1
2-Hexanone	ND		0.40		ppb v/v			05/07/18 15:52	1
4-Ethyltoluene	ND		0.40		ppb v/v			05/07/18 15:52	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			05/07/18 15:52	1
Acetone	ND		5.0		ppb v/v			05/07/18 15:52	1
Benzene	ND		0.40		ppb v/v			05/07/18 15:52	1
Benzyl chloride	ND		0.80		ppb v/v			05/07/18 15:52	1
Bromodichloromethane	ND		0.30		ppb v/v			05/07/18 15:52	1
Bromoform	ND		0.40		ppb v/v			05/07/18 15:52	1
Bromomethane	ND		0.80		ppb v/v			05/07/18 15:52	1
Carbon disulfide	ND		0.80		ppb v/v			05/07/18 15:52	1
Carbon tetrachloride	ND		0.80		ppb v/v			05/07/18 15:52	1
Chlorobenzene	ND		0.30		ppb v/v			05/07/18 15:52	1
Chloroethane	ND		0.80		ppb v/v			05/07/18 15:52	1
Chloroform	ND		0.30		ppb v/v			05/07/18 15:52	1
Chloromethane	ND		0.80		ppb v/v			05/07/18 15:52	1
cis-1,2-Dichloroethene	ND		0.40		ppb v/v			05/07/18 15:52	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			05/07/18 15:52	1
Dibromochloromethane	ND		0.40		ppb v/v			05/07/18 15:52	1
Dichlorodifluoromethane	ND		0.40		ppb v/v			05/07/18 15:52	1
Ethylbenzene	ND		0.40		ppb v/v			05/07/18 15:52	1
Hexachlorobutadiene	ND		2.0		ppb v/v			05/07/18 15:52	1
m,p-Xylene	ND		0.80		ppb v/v			05/07/18 15:52	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-221728/7
Matrix: Air
Analysis Batch: 221728

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylene Chloride	ND		0.40		ppb v/v			05/07/18 15:52	1
o-Xylene	ND		0.40		ppb v/v			05/07/18 15:52	1
Styrene	ND		0.40		ppb v/v			05/07/18 15:52	1
Tetrachloroethene	ND		0.40		ppb v/v			05/07/18 15:52	1
Toluene	ND		0.40		ppb v/v			05/07/18 15:52	1
trans-1,2-Dichloroethene	ND		0.40		ppb v/v			05/07/18 15:52	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			05/07/18 15:52	1
Trichloroethene	ND		0.40		ppb v/v			05/07/18 15:52	1
Trichlorofluoromethane	ND		0.40		ppb v/v			05/07/18 15:52	1
Vinyl acetate	ND		0.80		ppb v/v			05/07/18 15:52	1
Vinyl chloride	ND		0.40		ppb v/v			05/07/18 15:52	1

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.6		ug/m3 Air			05/07/18 15:52	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			05/07/18 15:52	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			05/07/18 15:52	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			05/07/18 15:52	1
1,1-Dichloroethane	ND		1.2		ug/m3 Air			05/07/18 15:52	1
1,1-Dichloroethene	ND		3.2		ug/m3 Air			05/07/18 15:52	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			05/07/18 15:52	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			05/07/18 15:52	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			05/07/18 15:52	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			05/07/18 15:52	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			05/07/18 15:52	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			05/07/18 15:52	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			05/07/18 15:52	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			05/07/18 15:52	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			05/07/18 15:52	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			05/07/18 15:52	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			05/07/18 15:52	1
2-Hexanone	ND		1.6		ug/m3 Air			05/07/18 15:52	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			05/07/18 15:52	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			05/07/18 15:52	1
Acetone	ND		12		ug/m3 Air			05/07/18 15:52	1
Benzene	ND		1.3		ug/m3 Air			05/07/18 15:52	1
Benzyl chloride	ND		4.1		ug/m3 Air			05/07/18 15:52	1
Bromodichloromethane	ND		2.0		ug/m3 Air			05/07/18 15:52	1
Bromoform	ND		4.1		ug/m3 Air			05/07/18 15:52	1
Bromomethane	ND		3.1		ug/m3 Air			05/07/18 15:52	1
Carbon disulfide	ND		2.5		ug/m3 Air			05/07/18 15:52	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			05/07/18 15:52	1
Chlorobenzene	ND		1.4		ug/m3 Air			05/07/18 15:52	1
Chloroethane	ND		2.1		ug/m3 Air			05/07/18 15:52	1
Chloroform	ND		1.5		ug/m3 Air			05/07/18 15:52	1
Chloromethane	ND		1.7		ug/m3 Air			05/07/18 15:52	1
cis-1,2-Dichloroethene	ND		1.6		ug/m3 Air			05/07/18 15:52	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			05/07/18 15:52	1
Dibromochloromethane	ND		3.4		ug/m3 Air			05/07/18 15:52	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-221728/7
Matrix: Air
Analysis Batch: 221728

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		2.0		ug/m3 Air			05/07/18 15:52	1
Ethylbenzene	ND		1.7		ug/m3 Air			05/07/18 15:52	1
Hexachlorobutadiene	ND		21		ug/m3 Air			05/07/18 15:52	1
m,p-Xylene	ND		3.5		ug/m3 Air			05/07/18 15:52	1
Methylene Chloride	ND		1.4		ug/m3 Air			05/07/18 15:52	1
o-Xylene	ND		1.7		ug/m3 Air			05/07/18 15:52	1
Styrene	ND		1.7		ug/m3 Air			05/07/18 15:52	1
Tetrachloroethene	ND		2.7		ug/m3 Air			05/07/18 15:52	1
Toluene	ND		1.5		ug/m3 Air			05/07/18 15:52	1
trans-1,2-Dichloroethene	ND		1.6		ug/m3 Air			05/07/18 15:52	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			05/07/18 15:52	1
Trichloroethene	ND		2.1		ug/m3 Air			05/07/18 15:52	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			05/07/18 15:52	1
Vinyl acetate	ND		2.8		ug/m3 Air			05/07/18 15:52	1
Vinyl chloride	ND		1.0		ug/m3 Air			05/07/18 15:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 130*		*05/07/18 15:52*	*1*
4-Bromofluorobenzene (Surr)	*82*		*70 - 130*		*05/07/18 15:52*	*1*
Toluene-d8 (Surr)	*101*		*70 - 130*		*05/07/18 15:52*	*1*

Lab Sample ID: LCS 320-221728/4
Matrix: Air
Analysis Batch: 221728

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	22.1		ppb v/v		111	69 - 129
1,1,2,2-Tetrachloroethane	20.0	21.7		ppb v/v		108	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	21.8		ppb v/v		109	70 - 130
1,1,2-Trichloroethane	20.0	21.7		ppb v/v		109	64 - 124
1,1-Dichloroethane	20.0	22.3		ppb v/v		111	71 - 131
1,1-Dichloroethene	20.0	21.9		ppb v/v		109	72 - 132
1,2,4-Trichlorobenzene	20.0	20.7		ppb v/v		103	58 - 138
1,2,4-Trimethylbenzene	20.0	19.9		ppb v/v		100	60 - 132
1,2-Dibromoethane (EDB)	20.0	22.5		ppb v/v		112	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	21.3		ppb v/v		106	74 - 134
1,2-Dichlorobenzene	20.0	21.9		ppb v/v		109	62 - 126
1,2-Dichloroethane	20.0	22.2		ppb v/v		111	71 - 131
1,2-Dichloropropane	20.0	21.8		ppb v/v		109	72 - 132
1,3,5-Trimethylbenzene	20.0	20.1		ppb v/v		101	65 - 125
1,3-Dichlorobenzene	20.0	24.5		ppb v/v		122	59 - 130
1,4-Dichlorobenzene	20.0	24.9		ppb v/v		125	58 - 132
2-Butanone (MEK)	20.0	20.8		ppb v/v		104	73 - 133
2-Hexanone	20.0	15.3		ppb v/v		77	69 - 129
4-Ethyltoluene	20.0	20.9		ppb v/v		104	66 - 129
4-Methyl-2-pentanone (MIBK)	20.0	17.8		ppb v/v		89	74 - 134

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-221728/4
Matrix: Air
Analysis Batch: 221728

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	21.2		ppb v/v		106	65 - 125
Benzene	20.0	21.1		ppb v/v		105	68 - 128
Benzyl chloride	16.0	9.70	*	ppb v/v		61	67 - 127
Bromodichloromethane	20.0	21.9		ppb v/v		110	71 - 131
Bromoform	20.0	22.7		ppb v/v		114	66 - 126
Bromomethane	20.0	21.6		ppb v/v		108	73 - 134
Carbon disulfide	20.0	21.6		ppb v/v		108	71 - 131
Carbon tetrachloride	20.0	21.9		ppb v/v		110	63 - 126
Chlorobenzene	20.0	21.3		ppb v/v		107	63 - 123
Chloroethane	20.0	21.3		ppb v/v		107	73 - 133
Chloroform	20.0	22.1		ppb v/v		111	70 - 130
Chloromethane	20.0	21.5		ppb v/v		107	61 - 140
cis-1,2-Dichloroethene	20.0	22.8		ppb v/v		114	70 - 130
cis-1,3-Dichloropropene	20.0	21.9		ppb v/v		110	72 - 132
Dibromochloromethane	20.0	21.9		ppb v/v		110	66 - 126
Dichlorodifluoromethane	20.0	21.1		ppb v/v		106	69 - 129
Ethylbenzene	20.0	21.8		ppb v/v		109	64 - 124
Hexachlorobutadiene	20.0	21.1		ppb v/v		105	58 - 131
m,p-Xylene	40.0	43.0		ppb v/v		108	65 - 125
Methylene Chloride	20.0	21.6		ppb v/v		108	67 - 127
o-Xylene	20.0	20.8		ppb v/v		104	65 - 125
Styrene	20.0	22.7		ppb v/v		114	67 - 127
Tetrachloroethene	20.0	20.4		ppb v/v		102	63 - 123
Toluene	20.0	20.1		ppb v/v		100	68 - 128
trans-1,2-Dichloroethene	20.0	23.3		ppb v/v		116	72 - 132
trans-1,3-Dichloropropene	20.0	22.8		ppb v/v		114	66 - 126
Trichloroethene	20.0	21.5		ppb v/v		108	70 - 130
Trichlorofluoromethane	20.0	21.0		ppb v/v		105	71 - 131
Vinyl acetate	20.0	20.9		ppb v/v		104	65 - 134
Vinyl chloride	20.0	21.8		ppb v/v		109	59 - 152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	110	121		ug/m3 Air		111	69 - 129
1,1,2,2-Tetrachloroethane	140	149		ug/m3 Air		108	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	150	167		ug/m3 Air		109	70 - 130
1,1,2-Trichloroethane	110	119		ug/m3 Air		109	64 - 124
1,1-Dichloroethane	81	90.1		ug/m3 Air		111	71 - 131
1,1-Dichloroethene	79	86.8		ug/m3 Air		109	72 - 132
1,2,4-Trichlorobenzene	150	153		ug/m3 Air		103	58 - 138
1,2,4-Trimethylbenzene	98	98.0		ug/m3 Air		100	60 - 132
1,2-Dibromoethane (EDB)	150	173		ug/m3 Air		112	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	149		ug/m3 Air		106	74 - 134
1,2-Dichlorobenzene	120	132		ug/m3 Air		109	62 - 126
1,2-Dichloroethane	81	89.7		ug/m3 Air		111	71 - 131
1,2-Dichloropropane	92	101		ug/m3 Air		109	72 - 132
1,3,5-Trimethylbenzene	98	98.9		ug/m3 Air		101	65 - 125
1,3-Dichlorobenzene	120	147		ug/m3 Air		122	59 - 130

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-221728/4
Matrix: Air
Analysis Batch: 221728

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	120	150		ug/m3 Air		125	58 - 132
2-Butanone (MEK)	59	61.3		ug/m3 Air		104	73 - 133
2-Hexanone	82	62.8		ug/m3 Air		77	69 - 129
4-Ethyltoluene	98	103		ug/m3 Air		104	66 - 129
4-Methyl-2-pentanone (MIBK)	82	72.8		ug/m3 Air		89	74 - 134
Acetone	48	50.2		ug/m3 Air		106	65 - 125
Benzene	64	67.3		ug/m3 Air		105	68 - 128
Benzyl chloride	83	50.2	*	ug/m3 Air		61	67 - 127
Bromodichloromethane	130	147		ug/m3 Air		110	71 - 131
Bromoform	210	235		ug/m3 Air		114	66 - 126
Bromomethane	78	83.9		ug/m3 Air		108	73 - 134
Carbon disulfide	62	67.3		ug/m3 Air		108	71 - 131
Carbon tetrachloride	130	138		ug/m3 Air		110	63 - 126
Chlorobenzene	92	98.1		ug/m3 Air		107	63 - 123
Chloroethane	53	56.3		ug/m3 Air		107	73 - 133
Chloroform	98	108		ug/m3 Air		111	70 - 130
Chloromethane	41	44.3		ug/m3 Air		107	61 - 140
cis-1,2-Dichloroethene	79	90.5		ug/m3 Air		114	70 - 130
cis-1,3-Dichloropropene	91	99.6		ug/m3 Air		110	72 - 132
Dibromochloromethane	170	187		ug/m3 Air		110	66 - 126
Dichlorodifluoromethane	99	105		ug/m3 Air		106	69 - 129
Ethylbenzene	87	94.5		ug/m3 Air		109	64 - 124
Hexachlorobutadiene	210	225		ug/m3 Air		105	58 - 131
m,p-Xylene	170	187		ug/m3 Air		108	65 - 125
Methylene Chloride	69	75.0		ug/m3 Air		108	67 - 127
o-Xylene	87	90.5		ug/m3 Air		104	65 - 125
Styrene	85	96.8		ug/m3 Air		114	67 - 127
Tetrachloroethene	140	138		ug/m3 Air		102	63 - 123
Toluene	75	75.6		ug/m3 Air		100	68 - 128
trans-1,2-Dichloroethene	79	92.3		ug/m3 Air		116	72 - 132
trans-1,3-Dichloropropene	91	103		ug/m3 Air		114	66 - 126
Trichloroethene	110	116		ug/m3 Air		108	70 - 130
Trichlorofluoromethane	110	118		ug/m3 Air		105	71 - 131
Vinyl acetate	70	73.4		ug/m3 Air		104	65 - 134
Vinyl chloride	51	55.7		ug/m3 Air		109	59 - 152

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 130*
4-Bromofluorobenzene (Surr)	*107*		*70 - 130*
Toluene-d8 (Surr)	*101*		*70 - 130*

Lab Sample ID: LCSD 320-221728/22
Matrix: Air
Analysis Batch: 221728

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	20.0	23.2		ppb v/v		116	69 - 129	5	25
1,1,2,2-Tetrachloroethane	20.0	22.2		ppb v/v		111	64 - 124	2	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-221728/22
Matrix: Air
Analysis Batch: 221728

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	23.0		ppb v/v		115	70 - 130	5	25
1,1,2-Trichloroethane	20.0	22.8		ppb v/v		114	64 - 124	5	25
1,1-Dichloroethane	20.0	23.3		ppb v/v		117	71 - 131	5	25
1,1-Dichloroethene	20.0	23.0		ppb v/v		115	72 - 132	5	25
1,2,4-Trichlorobenzene	20.0	19.8		ppb v/v		99	58 - 138	4	25
1,2,4-Trimethylbenzene	20.0	20.2		ppb v/v		101	60 - 132	1	25
1,2-Dibromoethane (EDB)	20.0	23.4		ppb v/v		117	64 - 124	4	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	22.3		ppb v/v		112	74 - 134	5	25
1,2-Dichlorobenzene	20.0	22.2		ppb v/v		111	62 - 126	1	25
1,2-Dichloroethane	20.0	23.3		ppb v/v		116	71 - 131	5	25
1,2-Dichloropropane	20.0	22.9		ppb v/v		114	72 - 132	5	25
1,3,5-Trimethylbenzene	20.0	20.9		ppb v/v		105	65 - 125	4	25
1,3-Dichlorobenzene	20.0	25.1		ppb v/v		125	59 - 130	3	25
1,4-Dichlorobenzene	20.0	25.6		ppb v/v		128	58 - 132	2	25
2-Butanone (MEK)	20.0	21.5		ppb v/v		107	73 - 133	3	25
2-Hexanone	20.0	15.3		ppb v/v		76	69 - 129	0	25
4-Ethyltoluene	20.0	21.8		ppb v/v		109	66 - 129	4	25
4-Methyl-2-pentanone (MIBK)	20.0	18.0		ppb v/v		90	74 - 134	1	25
Acetone	20.0	21.5		ppb v/v		107	65 - 125	1	25
Benzene	20.0	22.2		ppb v/v		111	68 - 128	5	25
Benzyl chloride	16.0	9.69	*	ppb v/v		61	67 - 127	0	25
Bromodichloromethane	20.0	23.0		ppb v/v		115	71 - 131	5	25
Bromoform	20.0	23.5		ppb v/v		117	66 - 126	3	25
Bromomethane	20.0	22.6		ppb v/v		113	73 - 134	4	25
Carbon disulfide	20.0	22.7		ppb v/v		114	71 - 131	5	25
Carbon tetrachloride	20.0	23.0		ppb v/v		115	63 - 126	5	25
Chlorobenzene	20.0	22.2		ppb v/v		111	63 - 123	4	25
Chloroethane	20.0	29.0	*	ppb v/v		145	73 - 133	30	25
Chloroform	20.0	23.1		ppb v/v		116	70 - 130	5	25
Chloromethane	20.0	21.9		ppb v/v		110	61 - 140	2	25
cis-1,2-Dichloroethene	20.0	23.9		ppb v/v		119	70 - 130	5	25
cis-1,3-Dichloropropene	20.0	23.1		ppb v/v		116	72 - 132	5	25
Dibromochloromethane	20.0	22.9		ppb v/v		114	66 - 126	4	25
Dichlorodifluoromethane	20.0	22.4		ppb v/v		112	69 - 129	6	25
Ethylbenzene	20.0	22.6		ppb v/v		113	64 - 124	4	25
Hexachlorobutadiene	20.0	21.0		ppb v/v		105	58 - 131	0	25
m,p-Xylene	40.0	44.7		ppb v/v		112	65 - 125	4	25
Methylene Chloride	20.0	22.7		ppb v/v		114	67 - 127	5	25
o-Xylene	20.0	21.6		ppb v/v		108	65 - 125	4	25
Styrene	20.0	23.5		ppb v/v		117	67 - 127	3	25
Tetrachloroethene	20.0	21.4		ppb v/v		107	63 - 123	5	25
Toluene	20.0	21.1		ppb v/v		106	68 - 128	5	25
trans-1,2-Dichloroethene	20.0	24.5		ppb v/v		122	72 - 132	5	25
trans-1,3-Dichloropropene	20.0	24.0		ppb v/v		120	66 - 126	5	25
Trichloroethene	20.0	22.6		ppb v/v		113	70 - 130	5	25
Trichlorofluoromethane	20.0	22.3		ppb v/v		112	71 - 131	6	25
Vinyl acetate	20.0	21.9		ppb v/v		110	65 - 134	5	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-221728/22
Matrix: Air
Analysis Batch: 221728

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride			20.0	22.4		ppb v/v		112	59 - 152	3	25

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane			110	127		ug/m3 Air		116	69 - 129	5	25
1,1,2,2-Tetrachloroethane			140	152		ug/m3 Air		111	64 - 124	2	25
1,1,2-Trichloro-1,2,2-trifluoroethane			150	176		ug/m3 Air		115	70 - 130	5	25
1,1,2-Trichloroethane			110	124		ug/m3 Air		114	64 - 124	5	25
1,1-Dichloroethane			81	94.4		ug/m3 Air		117	71 - 131	5	25
1,1-Dichloroethene			79	91.3		ug/m3 Air		115	72 - 132	5	25
1,2,4-Trichlorobenzene			150	147		ug/m3 Air		99	58 - 138	4	25
1,2,4-Trimethylbenzene			98	99.2		ug/m3 Air		101	60 - 132	1	25
1,2-Dibromoethane (EDB)			150	180		ug/m3 Air		117	64 - 124	4	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane			140	156		ug/m3 Air		112	74 - 134	5	25
1,2-Dichlorobenzene			120	134		ug/m3 Air		111	62 - 126	1	25
1,2-Dichloroethane			81	94.2		ug/m3 Air		116	71 - 131	5	25
1,2-Dichloropropane			92	106		ug/m3 Air		114	72 - 132	5	25
1,3,5-Trimethylbenzene			98	103		ug/m3 Air		105	65 - 125	4	25
1,3-Dichlorobenzene			120	151		ug/m3 Air		125	59 - 130	3	25
1,4-Dichlorobenzene			120	154		ug/m3 Air		128	58 - 132	2	25
2-Butanone (MEK)			59	63.3		ug/m3 Air		107	73 - 133	3	25
2-Hexanone			82	62.5		ug/m3 Air		76	69 - 129	0	25
4-Ethyltoluene			98	107		ug/m3 Air		109	66 - 129	4	25
4-Methyl-2-pentanone (MIBK)			82	73.8		ug/m3 Air		90	74 - 134	1	25
Acetone			48	51.0		ug/m3 Air		107	65 - 125	1	25
Benzene			64	70.8		ug/m3 Air		111	68 - 128	5	25
Benzyl chloride			83	50.2	*	ug/m3 Air		61	67 - 127	0	25
Bromodichloromethane			130	154		ug/m3 Air		115	71 - 131	5	25
Bromoform			210	243		ug/m3 Air		117	66 - 126	3	25
Bromomethane			78	87.7		ug/m3 Air		113	73 - 134	4	25
Carbon disulfide			62	70.8		ug/m3 Air		114	71 - 131	5	25
Carbon tetrachloride			130	145		ug/m3 Air		115	63 - 126	5	25
Chlorobenzene			92	102		ug/m3 Air		111	63 - 123	4	25
Chloroethane			53	76.6	*	ug/m3 Air		145	73 - 133	30	25
Chloroform			98	113		ug/m3 Air		116	70 - 130	5	25
Chloromethane			41	45.3		ug/m3 Air		110	61 - 140	2	25
cis-1,2-Dichloroethene			79	94.7		ug/m3 Air		119	70 - 130	5	25
cis-1,3-Dichloropropene			91	105		ug/m3 Air		116	72 - 132	5	25
Dibromochloromethane			170	195		ug/m3 Air		114	66 - 126	4	25
Dichlorodifluoromethane			99	111		ug/m3 Air		112	69 - 129	6	25
Ethylbenzene			87	98.1		ug/m3 Air		113	64 - 124	4	25
Hexachlorobutadiene			210	224		ug/m3 Air		105	58 - 131	0	25
m,p-Xylene			170	194		ug/m3 Air		112	65 - 125	4	25
Methylene Chloride			69	78.9		ug/m3 Air		114	67 - 127	5	25
o-Xylene			87	93.8		ug/m3 Air		108	65 - 125	4	25
Styrene			85	100		ug/m3 Air		117	67 - 127	3	25
Tetrachloroethene			140	145		ug/m3 Air		107	63 - 123	5	25
Toluene			75	79.6		ug/m3 Air		106	68 - 128	5	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-221728/22
Matrix: Air
Analysis Batch: 221728

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
trans-1,2-Dichloroethene			79	97.0		ug/m3 Air		122	72 - 132	5	25
trans-1,3-Dichloropropene			91	109		ug/m3 Air		120	66 - 126	5	25
Trichloroethene			110	121		ug/m3 Air		113	70 - 130	5	25
Trichlorofluoromethane			110	126		ug/m3 Air		112	71 - 131	6	25
Vinyl acetate			70	77.2		ug/m3 Air		110	65 - 134	5	25
Vinyl chloride			51	57.3		ug/m3 Air		112	59 - 152	3	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 130*
4-Bromofluorobenzene (Surr)	*109*		*70 - 130*
Toluene-d8 (Surr)	*101*		*70 - 130*

QC Association Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Air - GC/MS VOA

Analysis Batch: 221623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38487-1	SVE_South_Pre carbon_042418	Total/NA	Air	TO-15	
320-38487-2	SVE_South_Post carbon_042418	Total/NA	Air	TO-15	
MB 320-221623/6	Method Blank	Total/NA	Air	TO-15	
LCS 320-221623/3	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-221623/4	Lab Control Sample Dup	Total/NA	Air	TO-15	

Analysis Batch: 221728

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-38487-2 - DL	SVE_South_Post carbon_042418	Total/NA	Air	TO-15	
MB 320-221728/7	Method Blank	Total/NA	Air	TO-15	
LCS 320-221728/4	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-221728/22	Lab Control Sample Dup	Total/NA	Air	TO-15	

Lab Chronicle

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Client Sample ID: SVE_South_Pre carbon_042418

Lab Sample ID: 320-38487-1

Date Collected: 04/24/18 07:49

Matrix: Air

Date Received: 04/25/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		56.9	6.49 mL	250 mL	221623	05/06/18 02:10	AP1	TAL SAC

Client Sample ID: SVE_South_Post carbon_042418

Lab Sample ID: 320-38487-2

Date Collected: 04/24/18 07:51

Matrix: Air

Date Received: 04/25/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		1	397 mL	250 mL	221623	05/06/18 01:15	AP1	TAL SAC
Total/NA	Analysis	TO-15	DL	3.97	100 mL	250 mL	221728	05/07/18 23:16	AP1	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Portland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
N/A	N/A	N/A	None on record.	

Method Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-38487-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-38487-1	SVE_South_Pre carbon_042418	Air	04/24/18 07:49	04/25/18 09:00
320-38487-2	SVE_South_Post carbon_042418	Air	04/24/18 07:51	04/25/18 09:00

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	Project Manager: Stephanie Salisbury	Samples Collected By: Kyle Kline	COC No:
Company Name: Apex Companies	Phone: 503 924-4704 x 1925		1 of 1 COCs
Address: 3015 SW 1st Ave	Email: SSalisbury@Apexcos.com		
City/State/Zip Portland OR 97201			For Lab Use Only:
Phone: 503-924-4704	Site Contact: —		Walk-in Client:
FAX: —	TA Contact: —		Lab Sampling:
Project Name: Nustar Van REM	Anaylsis Turnaround Time		Job / SDG No.:
Site/Location: Vancouver, WA	Standard (Specific): X		(See below for Add'l Items)
PO# 1126-21	Rush (Specifiy):		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25.3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SVE_South_Pre carbon_042418	4/24/18	0748	0749	-30	-3	34001193		X														
SVE_South_Post carbon_042418	4/24/18	0750	0751	-30	-3	34000249		X														

	Temperature (Fahrenheit)		
	Interior	Ambient	
Start			
Stop			

	Temperature (Fahrenheit)		
	Interior	Ambient	
Start			
Stop			

320-38487 Chain of Custody

Special Instructions/QC Requirements & Comments: Email Results to: SSalisbury@Apexcos.com 2.1

Samples Shipped by: Kyle Kline	Date / Time: 4/24/18 1010	Samples Received by: [signature]	4/24/18 1230
Samples Relinquished by: [signature]	Date / Time: 4/24/18 1300	Received by: [signature]	TAT
Relinquished by: [signature]	Date / Time: 4/24/18 1700	Received by: [signature] 4-25-18 0900	
Lab Use Only: Shipper Name:	Opened by:	Condition:	

Form No. CA-C-WI-003, Rev. 1, dated 05/10/2013

5/10/2018

Login Sample Receipt Checklist

Client: Apex Companies LLC

Job Number: 320-38487-1

Login Number: 38487
List Number: 1
Creator: Branscum, Cassie

List Source: TestAmerica Sacramento

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Canister QC Certification
Batch Certification

320-37486 Chain of Custody

Date Cleaned/Batch ID B03-26-18

Date of QC 3/28/18

Data File Number C:\MSDChem\1\DATA\180328\

(*File ID for certification analysis of canister designated below*)

CANISTER ID NUMBERS

*	34000286 MS70328R26.d
	7754
	34001372
	34000470
	34000249
	34001193

	34000494
	34001467
	34001273
	34000155
	8025
	34000248

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED.

1st level Reviewed By: _____ Date: 3/30/18

2nd level Reviewed By: _____ Date: 4/1/18

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37486-1

SDG No.:

Client Sample ID: 34000286 Lab Sample ID: 320-37486-1

Matrix: Air Lab File ID: MS7032826.D

Analysis Method: TO-15 Date Collected: 03/26/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 03/29/2018 08:59

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 215219 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
67-64-1	Acetone	0.28	J	5.0	0.18
107-02-8	Acrolein	ND		2.0	0.22
107-13-1	Acrylonitrile	ND		2.0	0.19
107-05-1	Allyl chloride	ND		0.80	0.11
71-43-2	Benzene	ND		0.40	0.079
100-44-7	Benzyl chloride	ND		0.80	0.16
75-27-4	Bromodichloromethane	ND		0.30	0.066
75-25-2	Bromoform	ND		0.40	0.070
74-83-9	Bromomethane	ND		0.80	0.34
106-99-0	1,3-Butadiene	ND		0.80	0.15
106-97-8	n-Butane	ND		0.40	0.15
78-93-3	2-Butanone (MEK)	ND		0.80	0.20
75-65-0	tert-Butyl alcohol (TBA)	ND		2.0	0.11
104-51-8	n-Butylbenzene	ND		0.40	0.18
135-98-8	sec-Butylbenzene	ND		0.40	0.070
98-06-6	tert-Butylbenzene	ND		0.80	0.068
75-15-0	Carbon disulfide	ND		0.80	0.078
56-23-5	Carbon tetrachloride	ND		0.80	0.064
108-90-7	Chlorobenzene	ND		0.30	0.064
75-45-6	Chlorodifluoromethane	ND		0.80	0.27
75-00-3	Chloroethane	ND		0.80	0.31
67-66-3	Chloroform	ND		0.30	0.095
74-87-3	Chloromethane	ND		0.80	0.20
95-49-8	2-Chlorotoluene	ND		0.40	0.080
110-82-7	Cyclohexane	ND		0.40	0.084
124-48-1	Dibromochloromethane	ND		0.40	0.079
106-93-4	1,2-Dibromoethane (EDB)	ND		0.80	0.075
74-95-3	Dibromomethane	ND		0.40	0.057
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16
95-50-1	1,2-Dichlorobenzene	ND		0.40	0.13
541-73-1	1,3-Dichlorobenzene	ND		0.40	0.11
106-46-7	1,4-Dichlorobenzene	ND		0.40	0.15
75-71-8	Dichlorodifluoromethane	ND		0.40	0.15
75-34-3	1,1-Dichloroethane	ND		0.30	0.072
107-06-2	1,2-Dichloroethane	ND		0.80	0.088

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37486-1

SDG No.:

Client Sample ID: 34000286 Lab Sample ID: 320-37486-1

Matrix: Air Lab File ID: MS7032826.D

Analysis Method: TO-15 Date Collected: 03/26/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 03/29/2018 08:59

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 215219 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-35-4	1,1-Dichloroethene	ND		0.80	0.13
156-59-2	cis-1,2-Dichloroethene	ND		0.40	0.089
156-60-5	trans-1,2-Dichloroethene	ND		0.40	0.10
78-87-5	1,2-Dichloropropane	ND		0.40	0.24
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.10
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.088
123-91-1	1,4-Dioxane	ND		0.80	0.10
141-78-6	Ethyl acetate	ND		0.30	0.18
100-41-4	Ethylbenzene	ND		0.40	0.063
622-96-8	4-Ethyltoluene	ND		0.40	0.19
142-82-5	n-Heptane	ND		0.80	0.063
87-68-3	Hexachlorobutadiene	ND		2.0	0.43
110-54-3	n-Hexane	ND		0.80	0.075
591-78-6	2-Hexanone	ND		0.40	0.087
98-82-8	Isopropylbenzene	ND		0.80	0.10
99-87-6	4-Isopropyltoluene	ND		0.80	0.12
1634-04-4	Methyl-t-Butyl Ether (MTBE)	ND		0.80	0.12
80-62-6	Methyl methacrylate	ND		0.80	0.16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14
75-09-2	Methylene Chloride	ND		0.40	0.072
98-83-9	alpha-Methylstyrene	ND		0.40	0.065
91-20-3	Naphthalene	ND		0.80	0.56
111-65-9	n-Octane	ND		0.40	0.055
109-66-0	n-Pentane	ND		0.80	0.26
115-07-1	Propylene	ND		0.40	0.099
103-65-1	N-Propylbenzene	ND		0.40	0.059
100-42-5	Styrene	ND		0.40	0.059
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.40	0.069
127-18-4	Tetrachloroethene	ND		0.40	0.051
109-99-9	Tetrahydrofuran	ND		0.80	0.21
108-88-3	Toluene	ND		0.40	0.051
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	0.43
71-55-6	1,1,1-Trichloroethane	ND		0.30	0.065
79-00-5	1,1,2-Trichloroethane	ND		0.40	0.067

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37486-1

SDG No.:

Client Sample ID: 34000286 Lab Sample ID: 320-37486-1

Matrix: Air Lab File ID: MS7032826.D

Analysis Method: TO-15 Date Collected: 03/26/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 03/29/2018 08:59

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 215219 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-01-6	Trichloroethene	ND		0.40	0.11
75-69-4	Trichlorofluoromethane	ND		0.40	0.20
96-18-4	1,2,3-Trichloropropane	ND		0.40	0.17
95-63-6	1,2,4-Trimethylbenzene	ND		0.80	0.16
108-67-8	1,3,5-Trimethylbenzene	ND		0.40	0.13
540-84-1	2,2,4-Trimethylpentane	ND		0.40	0.071
108-05-4	Vinyl acetate	ND		0.80	0.15
593-60-2	Vinyl bromide	ND		0.80	0.26
75-01-4	Vinyl chloride	ND		0.40	0.12
179601-23-1	m,p-Xylene	ND		0.80	0.10
95-47-6	o-Xylene	ND		0.40	0.054
1330-20-7	Xylenes, Total	ND		1.2	0.074

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	82		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	115		70-130
2037-26-5	Toluene-d8 (Surr)	101		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\ATMS7\20180328-55917.b\MS7032826.D
Lims ID: 320-37486-A-1
Client ID: 34000286
Sample Type: Client
Inject. Date: 29-Mar-2018 08:59:30 ALS Bottle#: 4 Worklist Smp#: 25
Purge Vol: 5.000 mL Dil. Factor: 1.0000
Sample Info: 320-37486-A-1
Misc. Info.: 500 mL CAN CERT
Operator ID: LHS Instrument ID: ATMS7

Method: \\ChromNA\Sacramento\ChromData\ATMS7\20180328-55917.b\TO15_ATMS7N.m
Limit Group: MSA - TO15 - ICAL
Last Update: 29-Mar-2018 09:39:16 Calib Date: 15-Mar-2018 21:16:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\ATMS7\20180315-55361.b\MS7031511.D

Column 1 : RTX Volatiles (0.32 mm) Det: MS SCAN
Process Host: XAWRK031

First Level Reviewer: leeh Date: 29-Mar-2018 09:39:16

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ppb v/v	Flags
* 1 Chlorobromomethane (IS)	130	12.248	12.266	-0.018	93	30321	4.00	
* 2 1,4-Difluorobenzene	114	14.395	14.426	-0.031	96	126850	4.00	
* 3 Chlorobenzene-d5 (IS)	117	21.075	21.099	-0.024	91	130595	4.00	
$ 4 1,2-Dichloroethane-d4 (Sur	65	13.446	13.442	-0.025	96	55082	4.60	
$ 5 Toluene-d8 (Surr)	100	17.802	17.783	-0.018	97	89651	4.06	
$ 6 4-Bromofluorobenzene (Surr	95	23.624	23.615	-0.018	87	79904	3.29	
32 Acetone	43	7.411	7.326	0.067	44	3993	0.2803	
73 n-Octane	43	17.796	17.819	-0.061	43	944	0.0267	

Reagents:

VAMSIS20_00126 Amount Added: 50.00 Units: mL Run Reagent

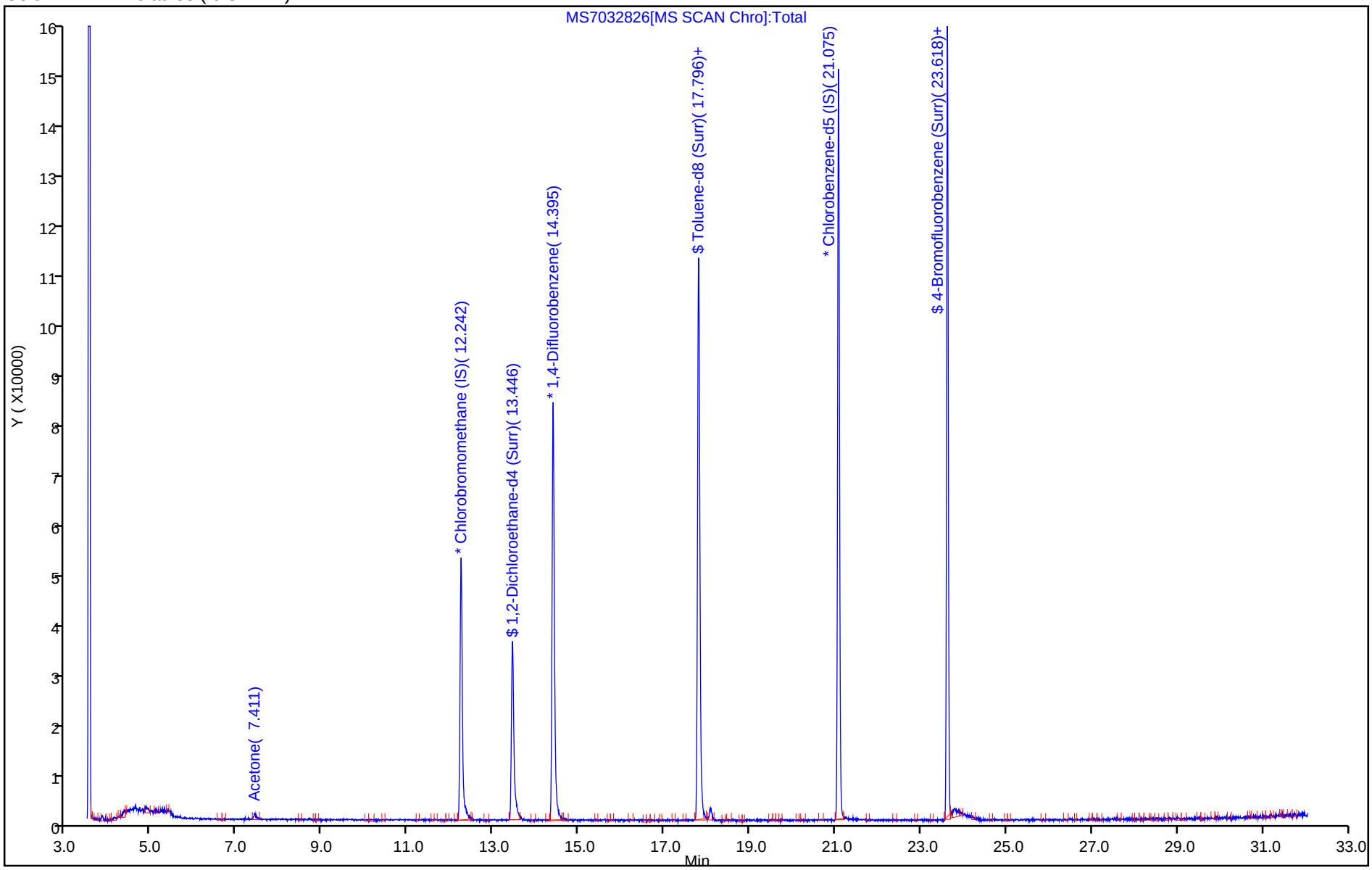
Report Date: 29-Mar-2018 09:39:22 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS7\20180328-55917.b\MS7032826.D

Injection Date:	29-Mar-2018 08:59:30	Instrument ID:	ATMS7	Operator ID:	LHS
Lims ID:	320-37486-A-1	Lab Sample ID:	320-37486-1	Worklist Smp#:	25
Client ID:	34000286				
Purge Vol:	5.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	4
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		

Column: RTX Volatiles (0.32 mm)



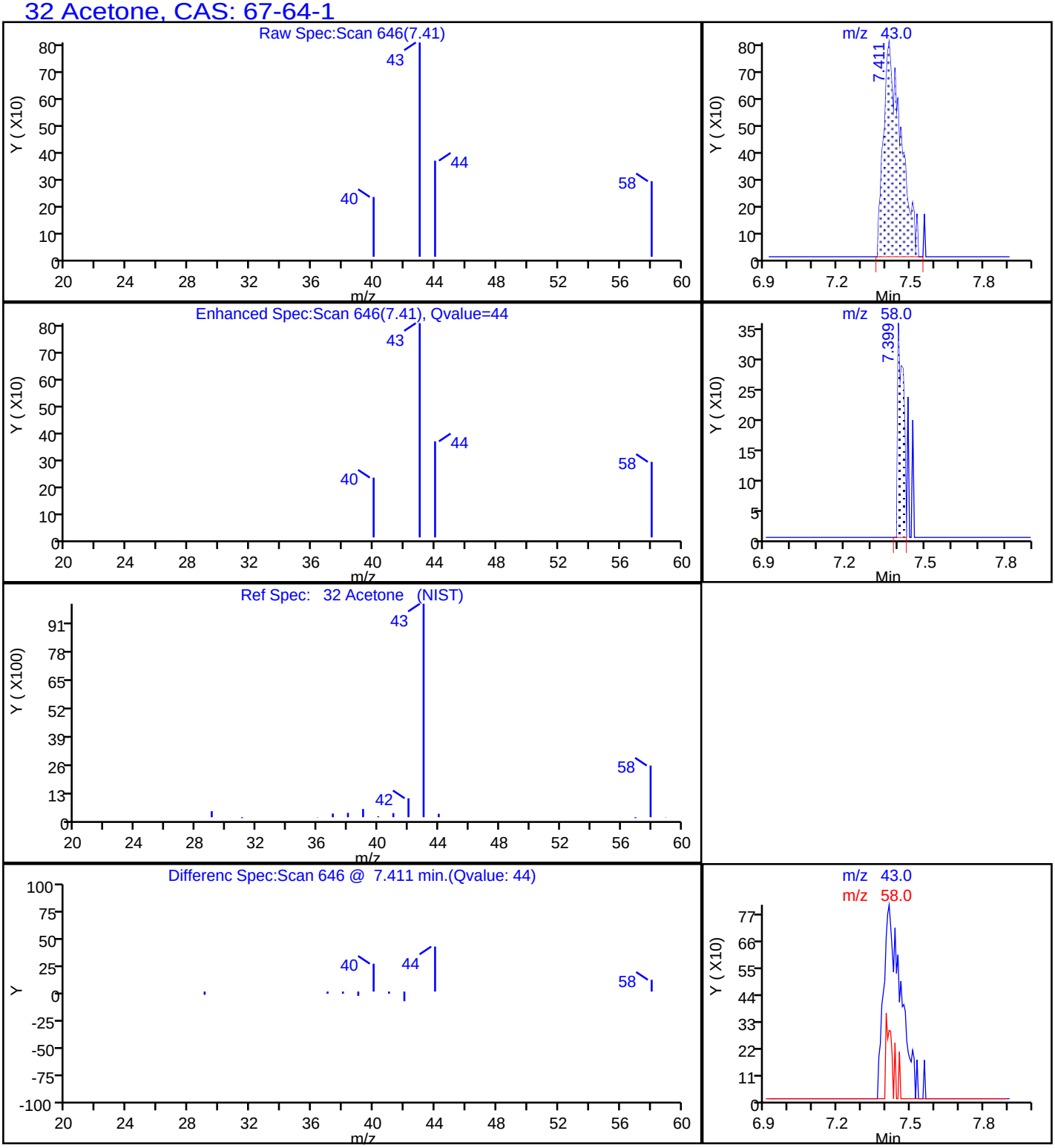
Report Date: 29-Mar-2018 09:39:22 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS7\20180328-55917.b\MS7032826.D

Injection Date:	29-Mar-2018 08:59:30	Instrument ID:	ATMS7		
Lims ID:	320-37486-A-1	Lab Sample ID:	320-37486-1		
Client ID:	34000286				
Operator ID:	LHS	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

32 Acetone, CAS: 67-64-1



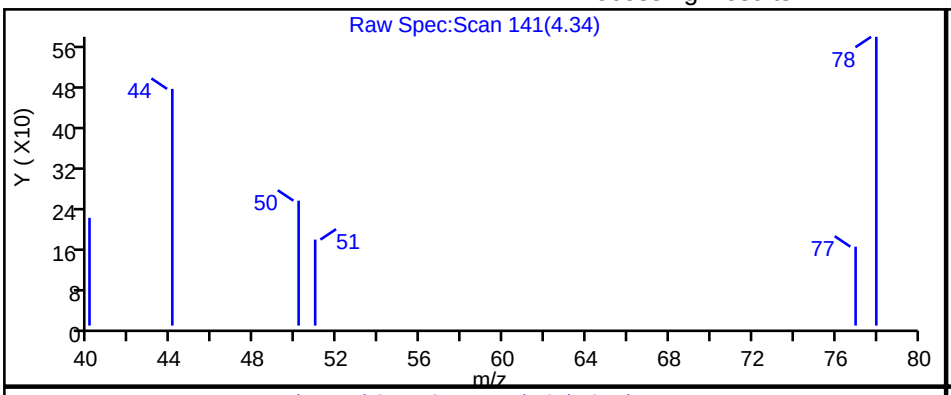
User Disabled Compound Report

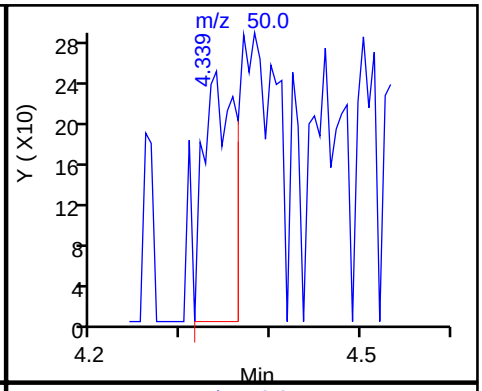
TestAmerica Sacramento

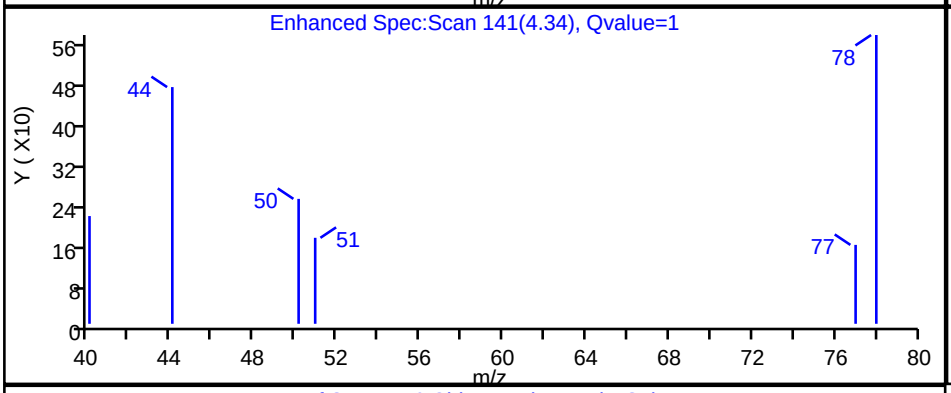
Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20180328-55917.b\MS7032826.D				
Injection Date:	29-Mar-2018 08:59:30	Instrument ID:	ATMS7		
Lims ID:	320-37486-A-1	Lab Sample ID:	320-37486-1		
Client ID:	34000286				
Operator ID:	LHS	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

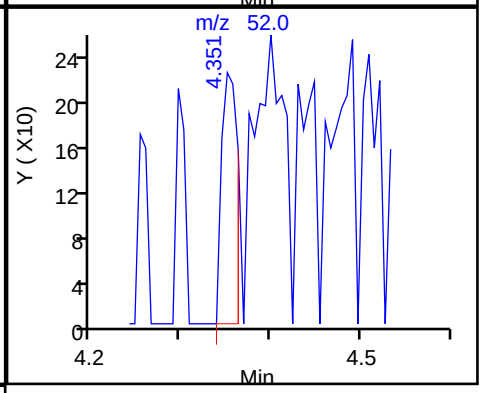
16 Chloromethane, CAS: 74-87-3

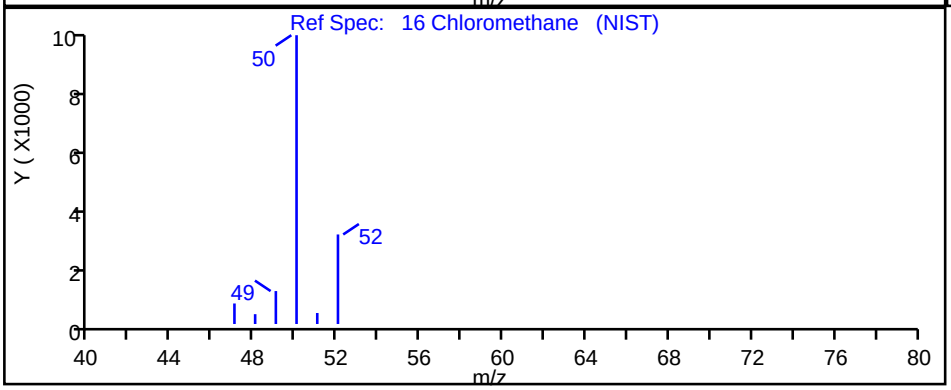
Processing Results











RT	Mass	Response	Amount
4.34	50.00	589	0.089891
4.35	52.00	272	

Reviewer: leeh, 29-Mar-2018 09:39:16

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

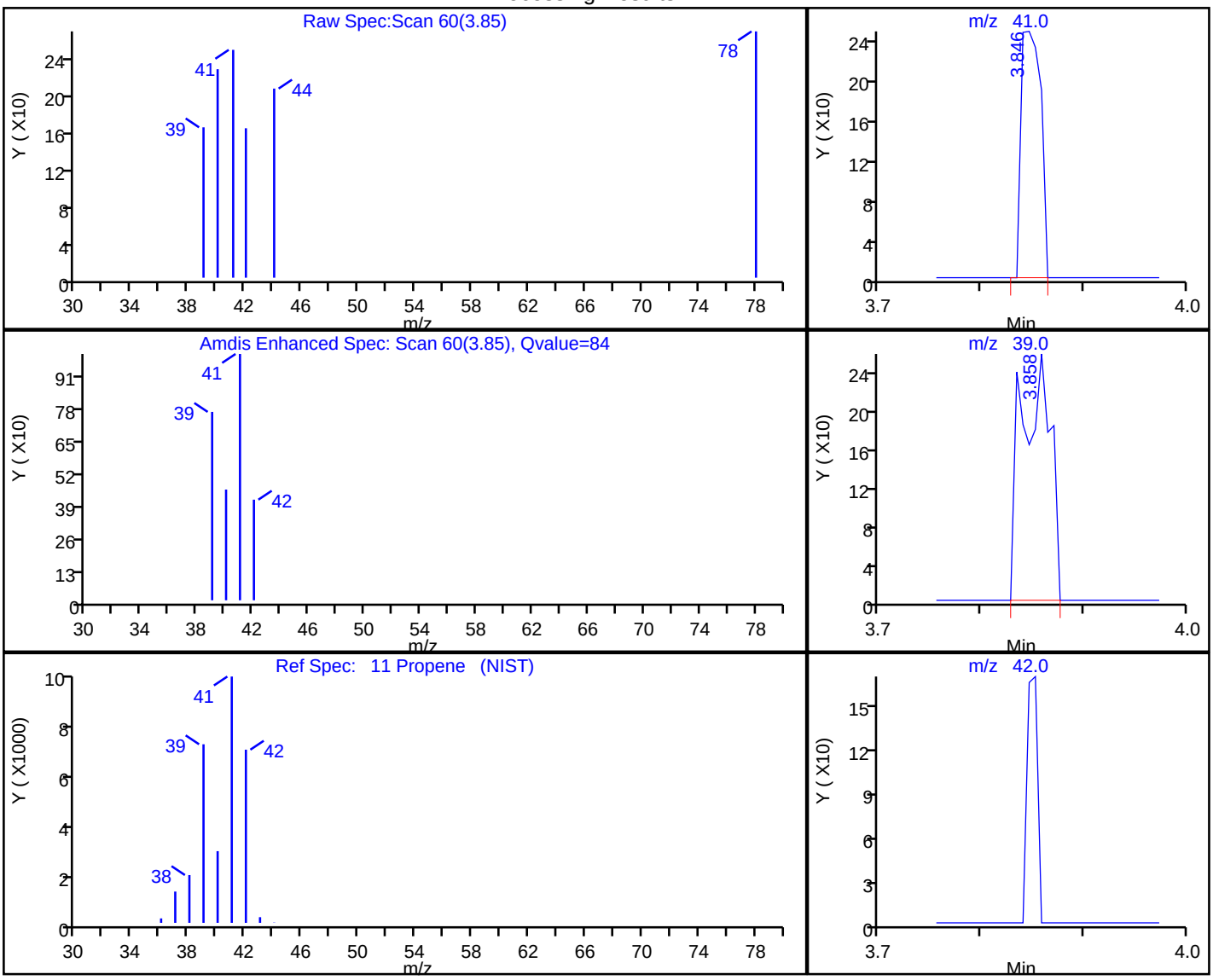
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS7\20180328-55917.b\MS7032826.D				
Injection Date:	29-Mar-2018 08:59:30	Instrument ID:	ATMS7		
Lims ID:	320-37486-A-1	Lab Sample ID:	320-37486-1		
Client ID:	34000286				
Operator ID:	LHS	ALS Bottle#:	4	Worklist Smp#:	25
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS7N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

11 Propene, CAS: 115-07-1

Processing Results



RT	Mass	Response	Amount
3.85	41.00	333	0.045587
3.86	39.00	504	
3.86	42.00	0	

Reviewer: leeh, 29-Mar-2018 09:39:16

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-39464-1
Client Project/Site: NuStar Vapor Testing

For:
Apex Companies LLC
3015 SW 1st Avenue
Portland, Oregon 97201

Attn: Stephanie Salisbury

Kristine D. Allen

Authorized for release by:
5/29/2018 4:34:45 PM

Kristine Allen, Manager of Project Management
(253)248-4970
kristine.allen@testamericainc.com

Table of Contents

Glossary

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

Job ID: 320-39464-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-39464-1

Comments
No additional comments.

Receipt
The samples were received on 5/18/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice.

Air - GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

Detection Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-39464-1

Client Sample ID: SVE_South_Pre carbon_051618 — Lab Sample ID: 320-39464-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	42		17		ppb v/v	41.3		TO-15	Total/NA
Tetrachloroethene	1200		17		ppb v/v	41.3		TO-15	Total/NA
Trichloroethene	69		17		ppb v/v	41.3		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	160		65		ug/m3 Air	41.3		TO-15	Total/NA
Tetrachloroethene	7800		110		ug/m3 Air	41.3		TO-15	Total/NA
Trichloroethene	370		89		ug/m3 Air	41.3		TO-15	Total/NA

Client Sample ID: SVE_South_Post carbon_051618 — Lab Sample ID: 320-39464-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	1.3		1.2		ppb v/v	3.88		TO-15	Total/NA
1,1,2-Trichloro-1,2,2-trifluoroethane	15		1.6		ppb v/v	3.88		TO-15	Total/NA
Carbon disulfide	13		3.1		ppb v/v	3.88		TO-15	Total/NA
cis-1,2-Dichloroethene	120		1.6		ppb v/v	3.88		TO-15	Total/NA
trans-1,2-Dichloroethene	1.7		1.6		ppb v/v	3.88		TO-15	Total/NA
Trichloroethene	6.2		1.6		ppb v/v	3.88		TO-15	Total/NA

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1,1-Trichloroethane	7.1		6.4		ug/m3 Air	3.88		TO-15	Total/NA
1,1,2-Trichloro-1,2,2-trifluoroethane	110		12		ug/m3 Air	3.88		TO-15	Total/NA
Carbon disulfide	40		9.7		ug/m3 Air	3.88		TO-15	Total/NA
cis-1,2-Dichloroethene	480		6.2		ug/m3 Air	3.88		TO-15	Total/NA
trans-1,2-Dichloroethene	6.6		6.2		ug/m3 Air	3.88		TO-15	Total/NA
Trichloroethene	33		8.3		ug/m3 Air	3.88		TO-15	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: SVE_South_Pre carbon_051618
Lab Sample ID: 320-39464-1
Date Collected: 05/16/18 07:59
Matrix: Air
Date Received: 05/18/18 09:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		12		ppb v/v			05/28/18 05:00	41.3
1,1,2,2-Tetrachloroethane	ND		17		ppb v/v			05/28/18 05:00	41.3
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		17		ppb v/v			05/28/18 05:00	41.3
1,1,2-Trichloroethane	ND		17		ppb v/v			05/28/18 05:00	41.3
1,1-Dichloroethane	ND		12		ppb v/v			05/28/18 05:00	41.3
1,1-Dichloroethene	ND		33		ppb v/v			05/28/18 05:00	41.3
1,2,4-Trichlorobenzene	ND		83		ppb v/v			05/28/18 05:00	41.3
1,2,4-Trimethylbenzene	ND		33		ppb v/v			05/28/18 05:00	41.3
1,2-Dibromoethane (EDB)	ND		33		ppb v/v			05/28/18 05:00	41.3
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		17		ppb v/v			05/28/18 05:00	41.3
1,2-Dichlorobenzene	ND		17		ppb v/v			05/28/18 05:00	41.3
1,2-Dichloroethane	ND		33		ppb v/v			05/28/18 05:00	41.3
1,2-Dichloropropane	ND		17		ppb v/v			05/28/18 05:00	41.3
1,3,5-Trimethylbenzene	ND		17		ppb v/v			05/28/18 05:00	41.3
1,3-Dichlorobenzene	ND		17		ppb v/v			05/28/18 05:00	41.3
1,4-Dichlorobenzene	ND		17		ppb v/v			05/28/18 05:00	41.3
2-Butanone (MEK)	ND		33		ppb v/v			05/28/18 05:00	41.3
2-Hexanone	ND		17		ppb v/v			05/28/18 05:00	41.3
4-Ethyltoluene	ND		17		ppb v/v			05/28/18 05:00	41.3
4-Methyl-2-pentanone (MIBK)	ND		17		ppb v/v			05/28/18 05:00	41.3
Acetone	ND		210		ppb v/v			05/28/18 05:00	41.3
Benzene	ND		17		ppb v/v			05/28/18 05:00	41.3
Benzyl chloride	ND		33		ppb v/v			05/28/18 05:00	41.3
Bromodichloromethane	ND		12		ppb v/v			05/28/18 05:00	41.3
Bromoform	ND		17		ppb v/v			05/28/18 05:00	41.3
Bromomethane	ND		33		ppb v/v			05/28/18 05:00	41.3
Carbon disulfide	ND		33		ppb v/v			05/28/18 05:00	41.3
Carbon tetrachloride	ND		33		ppb v/v			05/28/18 05:00	41.3
Chlorobenzene	ND		12		ppb v/v			05/28/18 05:00	41.3
Chloroethane	ND		33		ppb v/v			05/28/18 05:00	41.3
Chloroform	ND		12		ppb v/v			05/28/18 05:00	41.3
Chloromethane	ND		33		ppb v/v			05/28/18 05:00	41.3
cis-1,2-Dichloroethene	**42**		17		ppb v/v			05/28/18 05:00	41.3
cis-1,3-Dichloropropene	ND		17		ppb v/v			05/28/18 05:00	41.3
Dibromochloromethane	ND		17		ppb v/v			05/28/18 05:00	41.3
Dichlorodifluoromethane	ND		17		ppb v/v			05/28/18 05:00	41.3
Ethylbenzene	ND		17		ppb v/v			05/28/18 05:00	41.3
Hexachlorobutadiene	ND		83		ppb v/v			05/28/18 05:00	41.3
m,p-Xylene	ND		33		ppb v/v			05/28/18 05:00	41.3
Methylene Chloride	ND		17		ppb v/v			05/28/18 05:00	41.3
o-Xylene	ND		17		ppb v/v			05/28/18 05:00	41.3
Styrene	ND		17		ppb v/v			05/28/18 05:00	41.3
Tetrachloroethene	**1200**		17		ppb v/v			05/28/18 05:00	41.3
Toluene	ND		17		ppb v/v			05/28/18 05:00	41.3
trans-1,2-Dichloroethene	ND		17		ppb v/v			05/28/18 05:00	41.3
trans-1,3-Dichloropropene	ND		17		ppb v/v			05/28/18 05:00	41.3
Trichloroethene	**69**		17		ppb v/v			05/28/18 05:00	41.3
Trichlorofluoromethane	ND		17		ppb v/v			05/28/18 05:00	41.3

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-39464-1

Client Sample ID: SVE_South_Pre carbon_051618
Date Collected: 05/16/18 07:59
Date Received: 05/18/18 09:00
Sample Container: Summa Canister 6L

Lab Sample ID: 320-39464-1
Matrix: Air

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl acetate	ND		33		ppb v/v			05/28/18 05:00	41.3
Vinyl chloride	ND		17		ppb v/v			05/28/18 05:00	41.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		68		ug/m3 Air			05/28/18 05:00	41.3
1,1,2,2-Tetrachloroethane	ND		110		ug/m3 Air			05/28/18 05:00	41.3
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		130		ug/m3 Air			05/28/18 05:00	41.3
1,1,2-Trichloroethane	ND		90		ug/m3 Air			05/28/18 05:00	41.3
1,1-Dichloroethane	ND		50		ug/m3 Air			05/28/18 05:00	41.3
1,1-Dichloroethene	ND		130		ug/m3 Air			05/28/18 05:00	41.3
1,2,4-Trichlorobenzene	ND		610		ug/m3 Air			05/28/18 05:00	41.3
1,2,4-Trimethylbenzene	ND		160		ug/m3 Air			05/28/18 05:00	41.3
1,2-Dibromoethane (EDB)	ND		250		ug/m3 Air			05/28/18 05:00	41.3
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		120		ug/m3 Air			05/28/18 05:00	41.3
1,2-Dichlorobenzene	ND		99		ug/m3 Air			05/28/18 05:00	41.3
1,2-Dichloroethane	ND		130		ug/m3 Air			05/28/18 05:00	41.3
1,2-Dichloropropane	ND		76		ug/m3 Air			05/28/18 05:00	41.3
1,3,5-Trimethylbenzene	ND		81		ug/m3 Air			05/28/18 05:00	41.3
1,3-Dichlorobenzene	ND		99		ug/m3 Air			05/28/18 05:00	41.3
1,4-Dichlorobenzene	ND		99		ug/m3 Air			05/28/18 05:00	41.3
2-Butanone (MEK)	ND		97		ug/m3 Air			05/28/18 05:00	41.3
2-Hexanone	ND		68		ug/m3 Air			05/28/18 05:00	41.3
4-Ethyltoluene	ND		81		ug/m3 Air			05/28/18 05:00	41.3
4-Methyl-2-pentanone (MIBK)	ND		68		ug/m3 Air			05/28/18 05:00	41.3
Acetone	ND		490		ug/m3 Air			05/28/18 05:00	41.3
Benzene	ND		53		ug/m3 Air			05/28/18 05:00	41.3
Benzyl chloride	ND		170		ug/m3 Air			05/28/18 05:00	41.3
Bromodichloromethane	ND		83		ug/m3 Air			05/28/18 05:00	41.3
Bromoform	ND		170		ug/m3 Air			05/28/18 05:00	41.3
Bromomethane	ND		130		ug/m3 Air			05/28/18 05:00	41.3
Carbon disulfide	ND		100		ug/m3 Air			05/28/18 05:00	41.3
Carbon tetrachloride	ND		210		ug/m3 Air			05/28/18 05:00	41.3
Chlorobenzene	ND		57		ug/m3 Air			05/28/18 05:00	41.3
Chloroethane	ND		87		ug/m3 Air			05/28/18 05:00	41.3
Chloroform	ND		60		ug/m3 Air			05/28/18 05:00	41.3
Chloromethane	ND		68		ug/m3 Air			05/28/18 05:00	41.3
cis-1,2-Dichloroethene	**160**		65		ug/m3 Air			05/28/18 05:00	41.3
cis-1,3-Dichloropropene	ND		75		ug/m3 Air			05/28/18 05:00	41.3
Dibromochloromethane	ND		140		ug/m3 Air			05/28/18 05:00	41.3
Dichlorodifluoromethane	ND		82		ug/m3 Air			05/28/18 05:00	41.3
Ethylbenzene	ND		72		ug/m3 Air			05/28/18 05:00	41.3
Hexachlorobutadiene	ND		880		ug/m3 Air			05/28/18 05:00	41.3
m,p-Xylene	ND		140		ug/m3 Air			05/28/18 05:00	41.3
Methylene Chloride	ND		57		ug/m3 Air			05/28/18 05:00	41.3
o-Xylene	ND		72		ug/m3 Air			05/28/18 05:00	41.3
Styrene	ND		70		ug/m3 Air			05/28/18 05:00	41.3
Tetrachloroethene	**7800**		110		ug/m3 Air			05/28/18 05:00	41.3
Toluene	ND		62		ug/m3 Air			05/28/18 05:00	41.3
trans-1,2-Dichloroethene	ND		65		ug/m3 Air			05/28/18 05:00	41.3

Client Sample ID: SVE_South_Pre carbon_051618

Lab Sample ID: 320-39464-1
Matrix: Air
Date Collected: 05/16/18 07:59
Date Received: 05/18/18 09:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		75		ug/m3 Air			05/28/18 05:00	41.3
Trichloroethene	**370**		89		ug/m3 Air			05/28/18 05:00	41.3
Trichlorofluoromethane	ND		93		ug/m3 Air			05/28/18 05:00	41.3
Vinyl acetate	ND		120		ug/m3 Air			05/28/18 05:00	41.3
Vinyl chloride	ND		42		ug/m3 Air			05/28/18 05:00	41.3

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 130*		*05/28/18 05:00*	*41.3*
4-Bromofluorobenzene (Surr)	*84*		*70 - 130*		*05/28/18 05:00*	*41.3*
Toluene-d8 (Surr)	*99*		*70 - 130*		*05/28/18 05:00*	*41.3*

Client Sample ID: SVE_South_Post carbon_051618

Lab Sample ID: 320-39464-2
Matrix: Air
Date Collected: 05/16/18 08:01
Date Received: 05/18/18 09:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**1.3**		1.2		ppb v/v			05/28/18 05:53	3.88
1,1,2,2-Tetrachloroethane	ND		1.6		ppb v/v			05/28/18 05:53	3.88
1,1,2-Trichloro-1,2,2-trifluoroethane	**15**		1.6		ppb v/v			05/28/18 05:53	3.88
1,1,2-Trichloroethane	ND		1.6		ppb v/v			05/28/18 05:53	3.88
1,1-Dichloroethane	ND		1.2		ppb v/v			05/28/18 05:53	3.88
1,1-Dichloroethene	ND		3.1		ppb v/v			05/28/18 05:53	3.88
1,2,4-Trichlorobenzene	ND		7.8		ppb v/v			05/28/18 05:53	3.88
1,2,4-Trimethylbenzene	ND		3.1		ppb v/v			05/28/18 05:53	3.88
1,2-Dibromoethane (EDB)	ND		3.1		ppb v/v			05/28/18 05:53	3.88
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		1.6		ppb v/v			05/28/18 05:53	3.88
1,2-Dichlorobenzene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
1,2-Dichloroethane	ND		3.1		ppb v/v			05/28/18 05:53	3.88
1,2-Dichloropropane	ND		1.6		ppb v/v			05/28/18 05:53	3.88
1,3,5-Trimethylbenzene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
1,3-Dichlorobenzene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
1,4-Dichlorobenzene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
2-Butanone (MEK)	ND		3.1		ppb v/v			05/28/18 05:53	3.88
2-Hexanone	ND		1.6		ppb v/v			05/28/18 05:53	3.88
4-Ethyltoluene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
4-Methyl-2-pentanone (MIBK)	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Acetone	ND		19		ppb v/v			05/28/18 05:53	3.88
Benzene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Benzyl chloride	ND		3.1		ppb v/v			05/28/18 05:53	3.88
Bromodichloromethane	ND		1.2		ppb v/v			05/28/18 05:53	3.88
Bromoform	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Bromomethane	ND		3.1		ppb v/v			05/28/18 05:53	3.88
Carbon disulfide	**13**		3.1		ppb v/v			05/28/18 05:53	3.88
Carbon tetrachloride	ND		3.1		ppb v/v			05/28/18 05:53	3.88
Chlorobenzene	ND		1.2		ppb v/v			05/28/18 05:53	3.88
Chloroethane	ND		3.1		ppb v/v			05/28/18 05:53	3.88

Client Sample ID: SVE_South_Post carbon_051618
Lab Sample ID: 320-39464-2
Date Collected: 05/16/18 08:01
Matrix: Air
Date Received: 05/18/18 09:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	ND		1.2		ppb v/v			05/28/18 05:53	3.88
Chloromethane	ND		3.1		ppb v/v			05/28/18 05:53	3.88
cis-1,2-Dichloroethene	**120**		1.6		ppb v/v			05/28/18 05:53	3.88
cis-1,3-Dichloropropene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Dibromochloromethane	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Dichlorodifluoromethane	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Ethylbenzene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Hexachlorobutadiene	ND		7.8		ppb v/v			05/28/18 05:53	3.88
m,p-Xylene	ND		3.1		ppb v/v			05/28/18 05:53	3.88
Methylene Chloride	ND		1.6		ppb v/v			05/28/18 05:53	3.88
o-Xylene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Styrene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Tetrachloroethene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Toluene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
trans-1,2-Dichloroethene	**1.7**		1.6		ppb v/v			05/28/18 05:53	3.88
trans-1,3-Dichloropropene	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Trichloroethene	**6.2**		1.6		ppb v/v			05/28/18 05:53	3.88
Trichlorofluoromethane	ND		1.6		ppb v/v			05/28/18 05:53	3.88
Vinyl acetate	ND		3.1		ppb v/v			05/28/18 05:53	3.88
Vinyl chloride	ND		1.6		ppb v/v			05/28/18 05:53	3.88

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	**7.1**		6.4		ug/m3 Air			05/28/18 05:53	3.88
1,1,2,2-Tetrachloroethane	ND		11		ug/m3 Air			05/28/18 05:53	3.88
1,1,2-Trichloro-1,2,2-trifluoroethane	**110**		12		ug/m3 Air			05/28/18 05:53	3.88
1,1,2-Trichloroethane	ND		8.5		ug/m3 Air			05/28/18 05:53	3.88
1,1-Dichloroethane	ND		4.7		ug/m3 Air			05/28/18 05:53	3.88
1,1-Dichloroethene	ND		12		ug/m3 Air			05/28/18 05:53	3.88
1,2,4-Trichlorobenzene	ND		58		ug/m3 Air			05/28/18 05:53	3.88
1,2,4-Trimethylbenzene	ND		15		ug/m3 Air			05/28/18 05:53	3.88
1,2-Dibromoethane (EDB)	ND		24		ug/m3 Air			05/28/18 05:53	3.88
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		11		ug/m3 Air			05/28/18 05:53	3.88
1,2-Dichlorobenzene	ND		9.3		ug/m3 Air			05/28/18 05:53	3.88
1,2-Dichloroethane	ND		13		ug/m3 Air			05/28/18 05:53	3.88
1,2-Dichloropropane	ND		7.2		ug/m3 Air			05/28/18 05:53	3.88
1,3,5-Trimethylbenzene	ND		7.6		ug/m3 Air			05/28/18 05:53	3.88
1,3-Dichlorobenzene	ND		9.3		ug/m3 Air			05/28/18 05:53	3.88
1,4-Dichlorobenzene	ND		9.3		ug/m3 Air			05/28/18 05:53	3.88
2-Butanone (MEK)	ND		9.2		ug/m3 Air			05/28/18 05:53	3.88
2-Hexanone	ND		6.4		ug/m3 Air			05/28/18 05:53	3.88
4-Ethyltoluene	ND		7.6		ug/m3 Air			05/28/18 05:53	3.88
4-Methyl-2-pentanone (MIBK)	ND		6.4		ug/m3 Air			05/28/18 05:53	3.88
Acetone	ND		46		ug/m3 Air			05/28/18 05:53	3.88
Benzene	ND		5.0		ug/m3 Air			05/28/18 05:53	3.88
Benzyl chloride	ND		16		ug/m3 Air			05/28/18 05:53	3.88
Bromodichloromethane	ND		7.8		ug/m3 Air			05/28/18 05:53	3.88
Bromoform	ND		16		ug/m3 Air			05/28/18 05:53	3.88
Bromomethane	ND		12		ug/m3 Air			05/28/18 05:53	3.88

Client Sample ID: SVE_South_Post carbon_051618
Lab Sample ID: 320-39464-2
Date Collected: 05/16/18 08:01
Matrix: Air
Date Received: 05/18/18 09:00
Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon disulfide	**40**		9.7		ug/m3 Air			05/28/18 05:53	3.88
Carbon tetrachloride	ND		20		ug/m3 Air			05/28/18 05:53	3.88
Chlorobenzene	ND		5.4		ug/m3 Air			05/28/18 05:53	3.88
Chloroethane	ND		8.2		ug/m3 Air			05/28/18 05:53	3.88
Chloroform	ND		5.7		ug/m3 Air			05/28/18 05:53	3.88
Chloromethane	ND		6.4		ug/m3 Air			05/28/18 05:53	3.88
cis-1,2-Dichloroethene	**480**		6.2		ug/m3 Air			05/28/18 05:53	3.88
cis-1,3-Dichloropropene	ND		7.0		ug/m3 Air			05/28/18 05:53	3.88
Dibromochloromethane	ND		13		ug/m3 Air			05/28/18 05:53	3.88
Dichlorodifluoromethane	ND		7.7		ug/m3 Air			05/28/18 05:53	3.88
Ethylbenzene	ND		6.7		ug/m3 Air			05/28/18 05:53	3.88
Hexachlorobutadiene	ND		83		ug/m3 Air			05/28/18 05:53	3.88
m,p-Xylene	ND		13		ug/m3 Air			05/28/18 05:53	3.88
Methylene Chloride	ND		5.4		ug/m3 Air			05/28/18 05:53	3.88
o-Xylene	ND		6.7		ug/m3 Air			05/28/18 05:53	3.88
Styrene	ND		6.6		ug/m3 Air			05/28/18 05:53	3.88
Tetrachloroethene	ND		11		ug/m3 Air			05/28/18 05:53	3.88
Toluene	ND		5.8		ug/m3 Air			05/28/18 05:53	3.88
trans-1,2-Dichloroethene	**6.6**		6.2		ug/m3 Air			05/28/18 05:53	3.88
trans-1,3-Dichloropropene	ND		7.0		ug/m3 Air			05/28/18 05:53	3.88
Trichloroethene	**33**		8.3		ug/m3 Air			05/28/18 05:53	3.88
Trichlorofluoromethane	ND		8.7		ug/m3 Air			05/28/18 05:53	3.88
Vinyl acetate	ND		11		ug/m3 Air			05/28/18 05:53	3.88
Vinyl chloride	ND		4.0		ug/m3 Air			05/28/18 05:53	3.88

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 130*		*05/28/18 05:53*	*3.88*
4-Bromofluorobenzene (Surr)	*86*		*70 - 130*		*05/28/18 05:53*	*3.88*
Toluene-d8 (Surr)	*100*		*70 - 130*		*05/28/18 05:53*	*3.88*

Surrogate Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-39464-1

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		DCA	BFB	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
320-39464-1	SVE_South_Pre carbon_051618	100	84	99
320-39464-2	SVE_South_Post carbon_051618	101	86	100
LCS 320-225760/4	Lab Control Sample	107	105	104
LCSD 320-225760/5	Lab Control Sample Dup	107	107	103
MB 320-225760/10	Method Blank	99	88	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Lab Sample ID: MB 320-225760/10
Matrix: Air
Analysis Batch: 225760

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		0.30		ppb v/v			05/27/18 20:04	1
1,1,2,2-Tetrachloroethane	ND		0.40		ppb v/v			05/27/18 20:04	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40		ppb v/v			05/27/18 20:04	1
1,1,2-Trichloroethane	ND		0.40		ppb v/v			05/27/18 20:04	1
1,1-Dichloroethane	ND		0.30		ppb v/v			05/27/18 20:04	1
1,1-Dichloroethene	ND		0.80		ppb v/v			05/27/18 20:04	1
1,2,4-Trichlorobenzene	ND		2.0		ppb v/v			05/27/18 20:04	1
1,2,4-Trimethylbenzene	ND		0.80		ppb v/v			05/27/18 20:04	1
1,2-Dibromoethane (EDB)	ND		0.80		ppb v/v			05/27/18 20:04	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40		ppb v/v			05/27/18 20:04	1
1,2-Dichlorobenzene	ND		0.40		ppb v/v			05/27/18 20:04	1
1,2-Dichloroethane	ND		0.80		ppb v/v			05/27/18 20:04	1
1,2-Dichloropropane	ND		0.40		ppb v/v			05/27/18 20:04	1
1,3,5-Trimethylbenzene	ND		0.40		ppb v/v			05/27/18 20:04	1
1,3-Dichlorobenzene	ND		0.40		ppb v/v			05/27/18 20:04	1
1,4-Dichlorobenzene	ND		0.40		ppb v/v			05/27/18 20:04	1
2-Butanone (MEK)	ND		0.80		ppb v/v			05/27/18 20:04	1
2-Hexanone	ND		0.40		ppb v/v			05/27/18 20:04	1
4-Ethyltoluene	ND		0.40		ppb v/v			05/27/18 20:04	1
4-Methyl-2-pentanone (MIBK)	ND		0.40		ppb v/v			05/27/18 20:04	1
Acetone	ND		5.0		ppb v/v			05/27/18 20:04	1
Benzene	ND		0.40		ppb v/v			05/27/18 20:04	1
Benzyl chloride	ND		0.80		ppb v/v			05/27/18 20:04	1
Bromodichloromethane	ND		0.30		ppb v/v			05/27/18 20:04	1
Bromoform	ND		0.40		ppb v/v			05/27/18 20:04	1
Bromomethane	ND		0.80		ppb v/v			05/27/18 20:04	1
Carbon disulfide	ND		0.80		ppb v/v			05/27/18 20:04	1
Carbon tetrachloride	ND		0.80		ppb v/v			05/27/18 20:04	1
Chlorobenzene	ND		0.30		ppb v/v			05/27/18 20:04	1
Chloroethane	ND		0.80		ppb v/v			05/27/18 20:04	1
Chloroform	ND		0.30		ppb v/v			05/27/18 20:04	1
Chloromethane	ND		0.80		ppb v/v			05/27/18 20:04	1
cis-1,2-Dichloroethene	ND		0.40		ppb v/v			05/27/18 20:04	1
cis-1,3-Dichloropropene	ND		0.40		ppb v/v			05/27/18 20:04	1
Dibromochloromethane	ND		0.40		ppb v/v			05/27/18 20:04	1
Dichlorodifluoromethane	ND		0.40		ppb v/v			05/27/18 20:04	1
Ethylbenzene	ND		0.40		ppb v/v			05/27/18 20:04	1
Hexachlorobutadiene	ND		2.0		ppb v/v			05/27/18 20:04	1
m,p-Xylene	ND		0.80		ppb v/v			05/27/18 20:04	1
Methylene Chloride	ND		0.40		ppb v/v			05/27/18 20:04	1
o-Xylene	ND		0.40		ppb v/v			05/27/18 20:04	1
Styrene	ND		0.40		ppb v/v			05/27/18 20:04	1
Tetrachloroethene	ND		0.40		ppb v/v			05/27/18 20:04	1
Toluene	ND		0.40		ppb v/v			05/27/18 20:04	1
trans-1,2-Dichloroethene	ND		0.40		ppb v/v			05/27/18 20:04	1
trans-1,3-Dichloropropene	ND		0.40		ppb v/v			05/27/18 20:04	1
Trichloroethene	ND		0.40		ppb v/v			05/27/18 20:04	1
Trichlorofluoromethane	ND		0.40		ppb v/v			05/27/18 20:04	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-225760/10
Matrix: Air
Analysis Batch: 225760

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl acetate	ND		0.80		ppb v/v			05/27/18 20:04	1
Vinyl chloride	ND		0.40		ppb v/v			05/27/18 20:04	1

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.6		ug/m3 Air			05/27/18 20:04	1
1,1,2,2-Tetrachloroethane	ND		2.7		ug/m3 Air			05/27/18 20:04	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3.1		ug/m3 Air			05/27/18 20:04	1
1,1,2-Trichloroethane	ND		2.2		ug/m3 Air			05/27/18 20:04	1
1,1-Dichloroethane	ND		1.2		ug/m3 Air			05/27/18 20:04	1
1,1-Dichloroethene	ND		3.2		ug/m3 Air			05/27/18 20:04	1
1,2,4-Trichlorobenzene	ND		15		ug/m3 Air			05/27/18 20:04	1
1,2,4-Trimethylbenzene	ND		3.9		ug/m3 Air			05/27/18 20:04	1
1,2-Dibromoethane (EDB)	ND		6.1		ug/m3 Air			05/27/18 20:04	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.8		ug/m3 Air			05/27/18 20:04	1
1,2-Dichlorobenzene	ND		2.4		ug/m3 Air			05/27/18 20:04	1
1,2-Dichloroethane	ND		3.2		ug/m3 Air			05/27/18 20:04	1
1,2-Dichloropropane	ND		1.8		ug/m3 Air			05/27/18 20:04	1
1,3,5-Trimethylbenzene	ND		2.0		ug/m3 Air			05/27/18 20:04	1
1,3-Dichlorobenzene	ND		2.4		ug/m3 Air			05/27/18 20:04	1
1,4-Dichlorobenzene	ND		2.4		ug/m3 Air			05/27/18 20:04	1
2-Butanone (MEK)	ND		2.4		ug/m3 Air			05/27/18 20:04	1
2-Hexanone	ND		1.6		ug/m3 Air			05/27/18 20:04	1
4-Ethyltoluene	ND		2.0		ug/m3 Air			05/27/18 20:04	1
4-Methyl-2-pentanone (MIBK)	ND		1.6		ug/m3 Air			05/27/18 20:04	1
Acetone	ND		12		ug/m3 Air			05/27/18 20:04	1
Benzene	ND		1.3		ug/m3 Air			05/27/18 20:04	1
Benzyl chloride	ND		4.1		ug/m3 Air			05/27/18 20:04	1
Bromodichloromethane	ND		2.0		ug/m3 Air			05/27/18 20:04	1
Bromoform	ND		4.1		ug/m3 Air			05/27/18 20:04	1
Bromomethane	ND		3.1		ug/m3 Air			05/27/18 20:04	1
Carbon disulfide	ND		2.5		ug/m3 Air			05/27/18 20:04	1
Carbon tetrachloride	ND		5.0		ug/m3 Air			05/27/18 20:04	1
Chlorobenzene	ND		1.4		ug/m3 Air			05/27/18 20:04	1
Chloroethane	ND		2.1		ug/m3 Air			05/27/18 20:04	1
Chloroform	ND		1.5		ug/m3 Air			05/27/18 20:04	1
Chloromethane	ND		1.7		ug/m3 Air			05/27/18 20:04	1
cis-1,2-Dichloroethene	ND		1.6		ug/m3 Air			05/27/18 20:04	1
cis-1,3-Dichloropropene	ND		1.8		ug/m3 Air			05/27/18 20:04	1
Dibromochloromethane	ND		3.4		ug/m3 Air			05/27/18 20:04	1
Dichlorodifluoromethane	ND		2.0		ug/m3 Air			05/27/18 20:04	1
Ethylbenzene	ND		1.7		ug/m3 Air			05/27/18 20:04	1
Hexachlorobutadiene	ND		21		ug/m3 Air			05/27/18 20:04	1
m,p-Xylene	ND		3.5		ug/m3 Air			05/27/18 20:04	1
Methylene Chloride	ND		1.4		ug/m3 Air			05/27/18 20:04	1
o-Xylene	ND		1.7		ug/m3 Air			05/27/18 20:04	1
Styrene	ND		1.7		ug/m3 Air			05/27/18 20:04	1
Tetrachloroethene	ND		2.7		ug/m3 Air			05/27/18 20:04	1
Toluene	ND		1.5		ug/m3 Air			05/27/18 20:04	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: MB 320-225760/10
Matrix: Air
Analysis Batch: 225760

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		1.6		ug/m3 Air			05/27/18 20:04	1
trans-1,3-Dichloropropene	ND		1.8		ug/m3 Air			05/27/18 20:04	1
Trichloroethene	ND		2.1		ug/m3 Air			05/27/18 20:04	1
Trichlorofluoromethane	ND		2.2		ug/m3 Air			05/27/18 20:04	1
Vinyl acetate	ND		2.8		ug/m3 Air			05/27/18 20:04	1
Vinyl chloride	ND		1.0		ug/m3 Air			05/27/18 20:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 130*		*05/27/18 20:04*	*1*
4-Bromofluorobenzene (Surr)	*88*		*70 - 130*		*05/27/18 20:04*	*1*
Toluene-d8 (Surr)	*101*		*70 - 130*		*05/27/18 20:04*	*1*

Lab Sample ID: LCS 320-225760/4
Matrix: Air
Analysis Batch: 225760

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	21.7		ppb v/v		109	69 - 129
1,1,2,2-Tetrachloroethane	20.0	21.6		ppb v/v		108	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	21.2		ppb v/v		106	70 - 130
1,1,2-Trichloroethane	20.0	21.1		ppb v/v		105	64 - 124
1,1-Dichloroethane	20.0	23.1		ppb v/v		115	71 - 131
1,1-Dichloroethene	20.0	23.2		ppb v/v		116	72 - 132
1,2,4-Trichlorobenzene	20.0	19.1		ppb v/v		96	58 - 138
1,2,4-Trimethylbenzene	20.0	19.2		ppb v/v		96	60 - 132
1,2-Dibromoethane (EDB)	20.0	20.9		ppb v/v		104	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	20.8		ppb v/v		104	74 - 134
1,2-Dichlorobenzene	20.0	19.1		ppb v/v		96	62 - 126
1,2-Dichloroethane	20.0	22.9		ppb v/v		115	71 - 131
1,2-Dichloropropane	20.0	22.2		ppb v/v		111	72 - 132
1,3,5-Trimethylbenzene	20.0	19.5		ppb v/v		97	65 - 125
1,3-Dichlorobenzene	20.0	20.9		ppb v/v		104	59 - 130
1,4-Dichlorobenzene	20.0	20.5		ppb v/v		102	58 - 132
2-Butanone (MEK)	20.0	21.3		ppb v/v		107	73 - 133
2-Hexanone	20.0	22.0		ppb v/v		110	69 - 129
4-Ethyltoluene	20.0	20.4		ppb v/v		102	66 - 129
4-Methyl-2-pentanone (MIBK)	20.0	22.2		ppb v/v		111	74 - 134
Acetone	20.0	22.2		ppb v/v		111	65 - 125
Benzene	20.0	21.5		ppb v/v		108	68 - 128
Benzyl chloride	16.0	16.9		ppb v/v		106	67 - 127
Bromodichloromethane	20.0	22.5		ppb v/v		112	71 - 131
Bromoform	20.0	22.3		ppb v/v		111	66 - 126
Bromomethane	20.0	21.4		ppb v/v		107	73 - 134
Carbon disulfide	20.0	22.6		ppb v/v		113	71 - 131
Carbon tetrachloride	20.0	22.0		ppb v/v		110	63 - 126
Chlorobenzene	20.0	20.6		ppb v/v		103	63 - 123

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-225760/4
Matrix: Air
Analysis Batch: 225760

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloroethane	20.0	22.2		ppb v/v		111	73 - 133
Chloroform	20.0	22.5		ppb v/v		113	70 - 130
Chloromethane	20.0	23.5		ppb v/v		117	61 - 140
cis-1,2-Dichloroethene	20.0	22.5		ppb v/v		113	70 - 130
cis-1,3-Dichloropropene	20.0	22.3		ppb v/v		112	72 - 132
Dibromochloromethane	20.0	21.6		ppb v/v		108	66 - 126
Dichlorodifluoromethane	20.0	21.2		ppb v/v		106	69 - 129
Ethylbenzene	20.0	20.9		ppb v/v		105	64 - 124
Hexachlorobutadiene	20.0	20.1		ppb v/v		101	58 - 131
m,p-Xylene	40.0	40.9		ppb v/v		102	65 - 125
Methylene Chloride	20.0	22.5		ppb v/v		113	67 - 127
o-Xylene	20.0	20.2		ppb v/v		101	65 - 125
Styrene	20.0	21.6		ppb v/v		108	67 - 127
Tetrachloroethene	20.0	20.6		ppb v/v		103	63 - 123
Toluene	20.0	21.2		ppb v/v		106	68 - 128
trans-1,2-Dichloroethene	20.0	23.7		ppb v/v		118	72 - 132
trans-1,3-Dichloropropene	20.0	21.7		ppb v/v		108	66 - 126
Trichloroethene	20.0	21.0		ppb v/v		105	70 - 130
Trichlorofluoromethane	20.0	21.9		ppb v/v		109	71 - 131
Vinyl acetate	20.0	24.1		ppb v/v		121	65 - 134
Vinyl chloride	20.0	22.5		ppb v/v		113	59 - 152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	110	118		ug/m3 Air		109	69 - 129
1,1,2,2-Tetrachloroethane	140	148		ug/m3 Air		108	64 - 124
1,1,2-Trichloro-1,2,2-trifluoroethane	150	162		ug/m3 Air		106	70 - 130
1,1,2-Trichloroethane	110	115		ug/m3 Air		105	64 - 124
1,1-Dichloroethane	81	93.4		ug/m3 Air		115	71 - 131
1,1-Dichloroethene	79	92.1		ug/m3 Air		116	72 - 132
1,2,4-Trichlorobenzene	150	142		ug/m3 Air		96	58 - 138
1,2,4-Trimethylbenzene	98	94.6		ug/m3 Air		96	60 - 132
1,2-Dibromoethane (EDB)	150	161		ug/m3 Air		104	64 - 124
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	146		ug/m3 Air		104	74 - 134
1,2-Dichlorobenzene	120	115		ug/m3 Air		96	62 - 126
1,2-Dichloroethane	81	92.8		ug/m3 Air		115	71 - 131
1,2-Dichloropropane	92	103		ug/m3 Air		111	72 - 132
1,3,5-Trimethylbenzene	98	95.8		ug/m3 Air		97	65 - 125
1,3-Dichlorobenzene	120	125		ug/m3 Air		104	59 - 130
1,4-Dichlorobenzene	120	123		ug/m3 Air		102	58 - 132
2-Butanone (MEK)	59	62.8		ug/m3 Air		107	73 - 133
2-Hexanone	82	90.0		ug/m3 Air		110	69 - 129
4-Ethyltoluene	98	100		ug/m3 Air		102	66 - 129
4-Methyl-2-pentanone (MIBK)	82	91.0		ug/m3 Air		111	74 - 134
Acetone	48	52.6		ug/m3 Air		111	65 - 125
Benzene	64	68.8		ug/m3 Air		108	68 - 128
Benzyl chloride	83	87.7		ug/m3 Air		106	67 - 127
Bromodichloromethane	130	151		ug/m3 Air		112	71 - 131

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCS 320-225760/4
Matrix: Air
Analysis Batch: 225760

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	210	230		ug/m3 Air		111	66 - 126
Bromomethane	78	83.2		ug/m3 Air		107	73 - 134
Carbon disulfide	62	70.3		ug/m3 Air		113	71 - 131
Carbon tetrachloride	130	139		ug/m3 Air		110	63 - 126
Chlorobenzene	92	94.9		ug/m3 Air		103	63 - 123
Chloroethane	53	58.5		ug/m3 Air		111	73 - 133
Chloroform	98	110		ug/m3 Air		113	70 - 130
Chloromethane	41	48.4		ug/m3 Air		117	61 - 140
cis-1,2-Dichloroethene	79	89.3		ug/m3 Air		113	70 - 130
cis-1,3-Dichloropropene	91	101		ug/m3 Air		112	72 - 132
Dibromochloromethane	170	184		ug/m3 Air		108	66 - 126
Dichlorodifluoromethane	99	105		ug/m3 Air		106	69 - 129
Ethylbenzene	87	90.9		ug/m3 Air		105	64 - 124
Hexachlorobutadiene	210	215		ug/m3 Air		101	58 - 131
m,p-Xylene	170	178		ug/m3 Air		102	65 - 125
Methylene Chloride	69	78.3		ug/m3 Air		113	67 - 127
o-Xylene	87	87.7		ug/m3 Air		101	65 - 125
Styrene	85	92.1		ug/m3 Air		108	67 - 127
Tetrachloroethene	140	139		ug/m3 Air		103	63 - 123
Toluene	75	79.7		ug/m3 Air		106	68 - 128
trans-1,2-Dichloroethene	79	93.8		ug/m3 Air		118	72 - 132
trans-1,3-Dichloropropene	91	98.3		ug/m3 Air		108	66 - 126
Trichloroethene	110	113		ug/m3 Air		105	70 - 130
Trichlorofluoromethane	110	123		ug/m3 Air		109	71 - 131
Vinyl acetate	70	84.9		ug/m3 Air		121	65 - 134
Vinyl chloride	51	57.6		ug/m3 Air		113	59 - 152

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 130*
4-Bromofluorobenzene (Surr)	*105*		*70 - 130*
Toluene-d8 (Surr)	*104*		*70 - 130*

Lab Sample ID: LCSD 320-225760/5
Matrix: Air
Analysis Batch: 225760

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	20.0	21.3		ppb v/v		106	69 - 129	2	25
1,1,2,2-Tetrachloroethane	20.0	21.6		ppb v/v		108	64 - 124	0	25
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	20.5		ppb v/v		103	70 - 130	3	25
1,1,2-Trichloroethane	20.0	20.9		ppb v/v		104	64 - 124	1	25
1,1-Dichloroethane	20.0	22.6		ppb v/v		113	71 - 131	2	25
1,1-Dichloroethene	20.0	22.7		ppb v/v		114	72 - 132	2	25
1,2,4-Trichlorobenzene	20.0	20.4		ppb v/v		102	58 - 138	6	25
1,2,4-Trimethylbenzene	20.0	19.2		ppb v/v		96	60 - 132	0	25
1,2-Dibromoethane (EDB)	20.0	20.8		ppb v/v		104	64 - 124	0	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-225760/5
Matrix: Air
Analysis Batch: 225760

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichloro-1,1,2,2-tetrafluoroethane	20.0	19.5		ppb v/v		98	74 - 134	6	25
1,2-Dichlorobenzene	20.0	19.1		ppb v/v		95	62 - 126	0	25
1,2-Dichloroethane	20.0	22.4		ppb v/v		112	71 - 131	3	25
1,2-Dichloropropane	20.0	21.9		ppb v/v		109	72 - 132	2	25
1,3,5-Trimethylbenzene	20.0	19.6		ppb v/v		98	65 - 125	1	25
1,3-Dichlorobenzene	20.0	21.0		ppb v/v		105	59 - 130	1	25
1,4-Dichlorobenzene	20.0	20.6		ppb v/v		103	58 - 132	0	25
2-Butanone (MEK)	20.0	21.6		ppb v/v		108	73 - 133	2	25
2-Hexanone	20.0	23.0		ppb v/v		115	69 - 129	5	25
4-Ethyltoluene	20.0	20.4		ppb v/v		102	66 - 129	0	25
4-Methyl-2-pentanone (MIBK)	20.0	22.4		ppb v/v		112	74 - 134	1	25
Acetone	20.0	21.9		ppb v/v		110	65 - 125	1	25
Benzene	20.0	21.0		ppb v/v		105	68 - 128	3	25
Benzyl chloride	16.0	17.2		ppb v/v		108	67 - 127	2	25
Bromodichloromethane	20.0	22.1		ppb v/v		110	71 - 131	2	25
Bromoform	20.0	22.1		ppb v/v		110	66 - 126	1	25
Bromomethane	20.0	20.8		ppb v/v		104	73 - 134	3	25
Carbon disulfide	20.0	22.0		ppb v/v		110	71 - 131	3	25
Carbon tetrachloride	20.0	21.5		ppb v/v		107	63 - 126	2	25
Chlorobenzene	20.0	20.5		ppb v/v		103	63 - 123	0	25
Chloroethane	20.0	21.8		ppb v/v		109	73 - 133	2	25
Chloroform	20.0	22.0		ppb v/v		110	70 - 130	2	25
Chloromethane	20.0	22.5		ppb v/v		112	61 - 140	4	25
cis-1,2-Dichloroethene	20.0	22.1		ppb v/v		110	70 - 130	2	25
cis-1,3-Dichloropropene	20.0	21.9		ppb v/v		109	72 - 132	2	25
Dibromochloromethane	20.0	21.4		ppb v/v		107	66 - 126	1	25
Dichlorodifluoromethane	20.0	20.1		ppb v/v		101	69 - 129	5	25
Ethylbenzene	20.0	21.0		ppb v/v		105	64 - 124	0	25
Hexachlorobutadiene	20.0	20.5		ppb v/v		102	58 - 131	2	25
m,p-Xylene	40.0	41.3		ppb v/v		103	65 - 125	1	25
Methylene Chloride	20.0	22.0		ppb v/v		110	67 - 127	3	25
o-Xylene	20.0	20.3		ppb v/v		101	65 - 125	0	25
Styrene	20.0	21.9		ppb v/v		110	67 - 127	1	25
Tetrachloroethene	20.0	20.3		ppb v/v		101	63 - 123	1	25
Toluene	20.0	20.5		ppb v/v		103	68 - 128	3	25
trans-1,2-Dichloroethene	20.0	23.1		ppb v/v		116	72 - 132	2	25
trans-1,3-Dichloropropene	20.0	21.7		ppb v/v		109	66 - 126	0	25
Trichloroethene	20.0	20.3		ppb v/v		102	70 - 130	3	25
Trichlorofluoromethane	20.0	21.4		ppb v/v		107	71 - 131	2	25
Vinyl acetate	20.0	23.6		ppb v/v		118	65 - 134	2	25
Vinyl chloride	20.0	21.3		ppb v/v		106	59 - 152	6	25

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	110	116		ug/m3 Air		106	69 - 129	2	25
1,1,2,2-Tetrachloroethane	140	149		ug/m3 Air		108	64 - 124	0	25
1,1,2-Trichloro-1,2,2-trifluoroethane	150	157		ug/m3 Air		103	70 - 130	3	25
1,1,2-Trichloroethane	110	114		ug/m3 Air		104	64 - 124	1	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-225760/5
Matrix: Air
Analysis Batch: 225760

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethane	81	91.4		ug/m3 Air		113	71 - 131	2	25
1,1-Dichloroethene	79	90.1		ug/m3 Air		114	72 - 132	2	25
1,2,4-Trichlorobenzene	150	151		ug/m3 Air		102	58 - 138	6	25
1,2,4-Trimethylbenzene	98	94.3		ug/m3 Air		96	60 - 132	0	25
1,2-Dibromoethane (EDB)	150	160		ug/m3 Air		104	64 - 124	0	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	140	137		ug/m3 Air		98	74 - 134	6	25
1,2-Dichlorobenzene	120	115		ug/m3 Air		95	62 - 126	0	25
1,2-Dichloroethane	81	90.5		ug/m3 Air		112	71 - 131	3	25
1,2-Dichloropropane	92	101		ug/m3 Air		109	72 - 132	2	25
1,3,5-Trimethylbenzene	98	96.4		ug/m3 Air		98	65 - 125	1	25
1,3-Dichlorobenzene	120	126		ug/m3 Air		105	59 - 130	1	25
1,4-Dichlorobenzene	120	124		ug/m3 Air		103	58 - 132	0	25
2-Butanone (MEK)	59	63.8		ug/m3 Air		108	73 - 133	2	25
2-Hexanone	82	94.4		ug/m3 Air		115	69 - 129	5	25
4-Ethyltoluene	98	100		ug/m3 Air		102	66 - 129	0	25
4-Methyl-2-pentanone (MIBK)	82	91.9		ug/m3 Air		112	74 - 134	1	25
Acetone	48	52.1		ug/m3 Air		110	65 - 125	1	25
Benzene	64	67.0		ug/m3 Air		105	68 - 128	3	25
Benzyl chloride	83	89.2		ug/m3 Air		108	67 - 127	2	25
Bromodichloromethane	130	148		ug/m3 Air		110	71 - 131	2	25
Bromoform	210	228		ug/m3 Air		110	66 - 126	1	25
Bromomethane	78	80.7		ug/m3 Air		104	73 - 134	3	25
Carbon disulfide	62	68.6		ug/m3 Air		110	71 - 131	3	25
Carbon tetrachloride	130	135		ug/m3 Air		107	63 - 126	2	25
Chlorobenzene	92	94.5		ug/m3 Air		103	63 - 123	0	25
Chloroethane	53	57.6		ug/m3 Air		109	73 - 133	2	25
Chloroform	98	107		ug/m3 Air		110	70 - 130	2	25
Chloromethane	41	46.4		ug/m3 Air		112	61 - 140	4	25
cis-1,2-Dichloroethene	79	87.5		ug/m3 Air		110	70 - 130	2	25
cis-1,3-Dichloropropene	91	99.3		ug/m3 Air		109	72 - 132	2	25
Dibromochloromethane	170	182		ug/m3 Air		107	66 - 126	1	25
Dichlorodifluoromethane	99	99.5		ug/m3 Air		101	69 - 129	5	25
Ethylbenzene	87	91.0		ug/m3 Air		105	64 - 124	0	25
Hexachlorobutadiene	210	218		ug/m3 Air		102	58 - 131	2	25
m,p-Xylene	170	179		ug/m3 Air		103	65 - 125	1	25
Methylene Chloride	69	76.3		ug/m3 Air		110	67 - 127	3	25
o-Xylene	87	87.9		ug/m3 Air		101	65 - 125	0	25
Styrene	85	93.3		ug/m3 Air		110	67 - 127	1	25
Tetrachloroethene	140	138		ug/m3 Air		101	63 - 123	1	25
Toluene	75	77.3		ug/m3 Air		103	68 - 128	3	25
trans-1,2-Dichloroethene	79	91.6		ug/m3 Air		116	72 - 132	2	25
trans-1,3-Dichloropropene	91	98.5		ug/m3 Air		109	66 - 126	0	25
Trichloroethene	110	109		ug/m3 Air		102	70 - 130	3	25
Trichlorofluoromethane	110	120		ug/m3 Air		107	71 - 131	2	25
Vinyl acetate	70	83.2		ug/m3 Air		118	65 - 134	2	25
Vinyl chloride	51	54.3		ug/m3 Air		106	59 - 152	6	25

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Lab Sample ID: LCSD 320-225760/5
Matrix: Air
Analysis Batch: 225760

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

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	107		70 - 130
4-Bromofluorobenzene (Surr)	107		70 - 130
Toluene-d8 (Surr)	103		70 - 130

QC Association Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-39464-1

Air - GC/MS VOA

Analysis Batch: 225760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-39464-1	SVE_South_Pre carbon_051618	Total/NA	Air	TO-15	
320-39464-2	SVE_South_Post carbon_051618	Total/NA	Air	TO-15	
MB 320-225760/10	Method Blank	Total/NA	Air	TO-15	
LCS 320-225760/4	Lab Control Sample	Total/NA	Air	TO-15	
LCSD 320-225760/5	Lab Control Sample Dup	Total/NA	Air	TO-15	

Lab Chronicle

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-39464-1

Client Sample ID: SVE_South_Pre carbon_051618

Lab Sample ID: 320-39464-1

Date Collected: 05/16/18 07:59

Matrix: Air

Date Received: 05/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		41.3	9 mL	250 mL	225760	05/28/18 05:00	AP1	TAL SAC

Client Sample ID: SVE_South_Post carbon_051618

Lab Sample ID: 320-39464-2

Date Collected: 05/16/18 08:01

Matrix: Air

Date Received: 05/18/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	TO-15		3.88	100 mL	250 mL	225760	05/28/18 05:53	AP1	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-39464-1

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-18
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-18
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
L-A-B	DoD ELAP		L2468	01-20-21
Louisiana	NELAP	6	30612	06-30-18
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-18
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-18
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-18
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

Laboratory: TestAmerica Portland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
N/A	N/A	N/A	None on record.	

Method Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-39464-1

Method	Method Description	Protocol	Laboratory
TO-15	Volatile Organic Compounds in Ambient Air	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Apex Companies LLC
Project/Site: NuStar Vapor Testing

TestAmerica Job ID: 320-39464-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-39464-1	SVE_South_Pre carbon_051618	Air	05/16/18 07:59	05/18/18 09:00
320-39464-2	SVE_South_Post carbon_051618	Air	05/16/18 08:01	05/18/18 09:00

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Canister Samples Chain of Custody Record

TestAmerica Laboratories, Inc. assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact Information	**Project Manager:** Stephanie Salisbury	**Samples Collected By:** Kyle Kline
Company Name: Apex companies	**Phone:** 503-924-4704 x 1925	
Address: 3015 SW First Ave	**Email:** SSalisbury@Apexcos.com	
City/State/Zip Portland OR 97201		
Phone: (503) 924 4704	**Site Contact:**	
FAX:	**TA Contact:**	
Project Name: NuStar Van REM	**Anaylsis Turnaround Time**	
Site/Location: Vancouver, WA	Standard (Specific): X	
PO # 1126-21	Rush (Specifiy):	

COC No: 1 of 1 COCs

For Lab Use Only:
Walk-in Client:
Lab Sampling:

Job / SDG No.:
(See below for Add'l Items)

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, 'Hg (Start)'	Canister Vacuum in Field, 'Hg (Stop)'	Flow Controller ID	Canister ID	TO-15 (Med / Std / Low / SIM)	MA-APH	EPA 3C	EPA 25C / 25.3	ASTM D-1946 / 1945 / 3588	EPA 15/16	TO-3	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)	Sample Specific Notes:
SVE_South_Pre Carbon_051618	5/16/18	0758	0759	-30	-1	34000267		X														
SVE_South_Post carbon_051618	5/16/18	0800	0801	-30	-3	34001529		X														

320-39464 Chain of Custody

	Temperature (Fahrenheit)		
Start	Interior	Ambient	
Stop			

	Temperature (Fahrenheit)		
Start	Interior	Ambient	
Stop			

Special Instructions/QC Requirements & Comments: Email Results To: SSalisbury@Apexcos.com

Samples Shipped by: Kyle Kline	**Date / Time:** 5/17/18 0900	**Samples Received by:** Jessica Nye	5/17/18 1225
Samples Relinquished by: Kyle Kline	**Date / Time:**	**Received by:**	
Relinquished by: Jessica Nye	**Date / Time:** 5/17/18 1300	**Received by:** Al Reagan	5/17/18 1300
Lab Use Only: **Shipper Name:** Al Reagan	**Opened by:** 5/17/18 1700	**Condition:** Carie Sansen 5-18-18 0900 TA SAC	

4.4

Form No. CA-C-WI-003, Rev. 1, dated 05/10/2013

5/29/2018

Login Sample Receipt Checklist

Client: Apex Companies LLC

Job Number: 320-39464-1

Login Number: 39464
List Number: 1
Creator: Branscum, Cassie

List Source: TestAmerica Sacramento

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Canister QC Certification
Batch Certification

Date Cleaned/Batch ID: B03-30-18 4/9/18

Date of QC: ~~4/11/18~~ ~~4/6/18~~ 4/6/18 mg

Data File Number: C:\MSDCHEM\1\DATA\~~180409~~ 180410 ~~180414~~

320-37702 Chain of Custody

(*File ID for certification analysis of canister designated below*)

CANISTER ID NUMBERS

*	34000173 ms9040920.d ~~4/6/18 mg ms9040420.d~~		7898
	34000259		34000294
	34001257		34001529
	34000426		34000267
	7908		34000493
	34000425		8301

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED.

1st level Reviewed By: 4/6/18 mg Date: 4/10/18 4/5/18 mg

2nd level Reviewed By: Date: 4/6/18

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37702-1

SDG No.:

Client Sample ID: 34000173 Lab Sample ID: 320-37702-1

Matrix: Air Lab File ID: MS9040920.D

Analysis Method: TO-15 Date Collected: 03/30/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 04/10/2018 10:06

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 216998 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
67-64-1	Acetone	0.99	J	5.0	0.18
107-02-8	Acrolein	ND		2.0	0.22
107-13-1	Acrylonitrile	1.3	J	2.0	0.19
107-05-1	Allyl chloride	ND		0.80	0.11
71-43-2	Benzene	ND		0.40	0.079
100-44-7	Benzyl chloride	ND		0.80	0.16
75-27-4	Bromodichloromethane	ND		0.30	0.066
75-25-2	Bromoform	ND		0.40	0.070
74-83-9	Bromomethane	ND		0.80	0.34
106-99-0	1,3-Butadiene	ND		0.80	0.15
106-97-8	n-Butane	ND		0.40	0.15
78-93-3	2-Butanone (MEK)	ND		0.80	0.20
75-65-0	tert-Butyl alcohol (TBA)	ND		2.0	0.11
104-51-8	n-Butylbenzene	ND		0.40	0.18
135-98-8	sec-Butylbenzene	ND		0.40	0.070
98-06-6	tert-Butylbenzene	ND		0.80	0.068
75-15-0	Carbon disulfide	0.12	J B	0.80	0.078
56-23-5	Carbon tetrachloride	ND		0.80	0.064
108-90-7	Chlorobenzene	ND		0.30	0.064
75-45-6	Chlorodifluoromethane	ND		0.80	0.27
75-00-3	Chloroethane	ND		0.80	0.31
67-66-3	Chloroform	ND		0.30	0.095
74-87-3	Chloromethane	ND		0.80	0.20
95-49-8	2-Chlorotoluene	ND		0.40	0.080
110-82-7	Cyclohexane	ND		0.40	0.084
124-48-1	Dibromochloromethane	ND		0.40	0.079
106-93-4	1,2-Dibromoethane (EDB)	ND		0.80	0.075
74-95-3	Dibromomethane	ND		0.40	0.057
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16
95-50-1	1,2-Dichlorobenzene	ND		0.40	0.13
541-73-1	1,3-Dichlorobenzene	ND		0.40	0.11
106-46-7	1,4-Dichlorobenzene	ND		0.40	0.15
75-71-8	Dichlorodifluoromethane	ND		0.40	0.15
75-34-3	1,1-Dichloroethane	ND		0.30	0.072
107-06-2	1,2-Dichloroethane	ND		0.80	0.088

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37702-1

SDG No.:

Client Sample ID: 34000173 Lab Sample ID: 320-37702-1

Matrix: Air Lab File ID: MS9040920.D

Analysis Method: TO-15 Date Collected: 03/30/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 04/10/2018 10:06

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 216998 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-35-4	1,1-Dichloroethene	ND		0.80	0.13
156-59-2	cis-1,2-Dichloroethene	ND		0.40	0.089
156-60-5	trans-1,2-Dichloroethene	ND		0.40	0.10
78-87-5	1,2-Dichloropropane	ND		0.40	0.24
10061-01-5	cis-1,3-Dichloropropene	ND		0.40	0.10
10061-02-6	trans-1,3-Dichloropropene	ND		0.40	0.088
123-91-1	1,4-Dioxane	ND		0.80	0.10
141-78-6	Ethyl acetate	ND		0.30	0.18
100-41-4	Ethylbenzene	ND		0.40	0.063
622-96-8	4-Ethyltoluene	ND		0.40	0.19
142-82-5	n-Heptane	ND		0.80	0.063
87-68-3	Hexachlorobutadiene	ND		2.0	0.43
110-54-3	n-Hexane	ND		0.80	0.075
591-78-6	2-Hexanone	ND		0.40	0.087
98-82-8	Isopropylbenzene	ND		0.80	0.10
99-87-6	4-Isopropyltoluene	ND		0.80	0.12
1634-04-4	Methyl-t-Butyl Ether (MTBE)	ND		0.80	0.12
80-62-6	Methyl methacrylate	ND		0.80	0.16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14
75-09-2	Methylene Chloride	0.34	J	0.40	0.072
98-83-9	alpha-Methylstyrene	ND		0.40	0.065
91-20-3	Naphthalene	ND		0.80	0.56
111-65-9	n-Octane	ND		0.40	0.055
109-66-0	n-Pentane	ND		0.80	0.26
115-07-1	Propylene	ND		0.40	0.099
103-65-1	N-Propylbenzene	ND		0.40	0.059
100-42-5	Styrene	0.070	J	0.40	0.059
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.40	0.069
127-18-4	Tetrachloroethene	ND		0.40	0.051
109-99-9	Tetrahydrofuran	ND		0.80	0.21
108-88-3	Toluene	ND		0.40	0.051
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	0.43
71-55-6	1,1,1-Trichloroethane	ND		0.30	0.065
79-00-5	1,1,2-Trichloroethane	ND		0.40	0.067

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37702-1

SDG No.:

Client Sample ID: 34000173 Lab Sample ID: 320-37702-1

Matrix: Air Lab File ID: MS9040920.D

Analysis Method: TO-15 Date Collected: 03/30/2018 00:00

Sample wt/vol: 500(mL) Date Analyzed: 04/10/2018 10:06

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-Volatiles ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 216998 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-01-6	Trichloroethene	ND		0.40	0.11
75-69-4	Trichlorofluoromethane	ND		0.40	0.20
96-18-4	1,2,3-Trichloropropane	ND		0.40	0.17
95-63-6	1,2,4-Trimethylbenzene	ND		0.80	0.16
108-67-8	1,3,5-Trimethylbenzene	ND		0.40	0.13
540-84-1	2,2,4-Trimethylpentane	ND		0.40	0.071
108-05-4	Vinyl acetate	ND		0.80	0.15
593-60-2	Vinyl bromide	ND		0.80	0.26
75-01-4	Vinyl chloride	ND		0.40	0.12
179601-23-1	m,p-Xylene	ND		0.80	0.10
95-47-6	o-Xylene	ND		0.40	0.054
1330-20-7	Xylenes, Total	ND		1.2	0.074

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	94		70-130
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-130
2037-26-5	Toluene-d8 (Surr)	100		70-130

Report Date: 10-Apr-2018 11:02:38 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D
Lims ID: 320-37702-A-1
Client ID: 34000173
Sample Type: Client
Inject. Date: 10-Apr-2018 10:06:30 ALS Bottle#: 10 Worklist Smp#: 20
Purge Vol: 5.000 mL Dil. Factor: 1.0000
Sample Info: 320-37702-A-1
Misc. Info.: 500 mL CAN CERT
Operator ID: LHS Instrument ID: ATMS9

Method: \\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\TO15_ATMS9N.m
Limit Group: MSA - TO15 - ICAL
Last Update: 10-Apr-2018 10:59:22 Calib Date: 09-Apr-2018 13:05:30
Integrator: RTE ID Type: Deconvolution ID
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040903.D

Column 1 : RTX Volatiles (0.32 mm) Det: MS SCAN
Process Host: XAWRK003

First Level Reviewer: leeh Date: 10-Apr-2018 10:59:22

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ppb v/v	Flags
* 1 Chlorobromomethane (IS)	130	12.312	12.312	0.000	95	38571	4.00	
* 2 1,4-Difluorobenzene	114	14.405	14.405	0.000	100	165620	4.00	
* 3 Chlorobenzene-d5 (IS)	117	20.324	20.324	0.000	99	95491	4.00	
$ 4 1,2-Dichloroethane-d4 (Sur	65	13.480	13.480	0.000	98	58242	4.02	
$ 5 Toluene-d8 (Surr)	100	17.562	17.562	0.000	98	75544	3.99	
$ 6 4-Bromofluorobenzene (Surr	174	22.253	22.253	0.000	98	33291	3.74	
14 Propene	41	4.258	4.251	0.007	29	566	0.0558	
18 Chloromethane	50	4.775	4.754	0.019	92	1327	0.1108	
31 Acetone	43	7.677	7.689	-0.012	97	22020	0.9889	
47 Methylene Chloride	49	8.887	8.887	0.000	97	5594	0.3432	
48 Carbon disulfide	76	8.936	8.924	0.012	98	8353	0.1194	
42 Acrylonitrile	53	9.058	9.058	0.001	94	10895	1.33	
75 n-Heptane	43	13.931	13.931	-0.005	73	784	0.0361	
85 Toluene	91	17.721	17.715	0.007	61	949	0.0215	
100 Styrene	104	21.383	21.383	0.000	94	1925	0.0700	

Reagents:

VAMSIS20_00137 Amount Added: 50.00 Units: mL Run Reagent

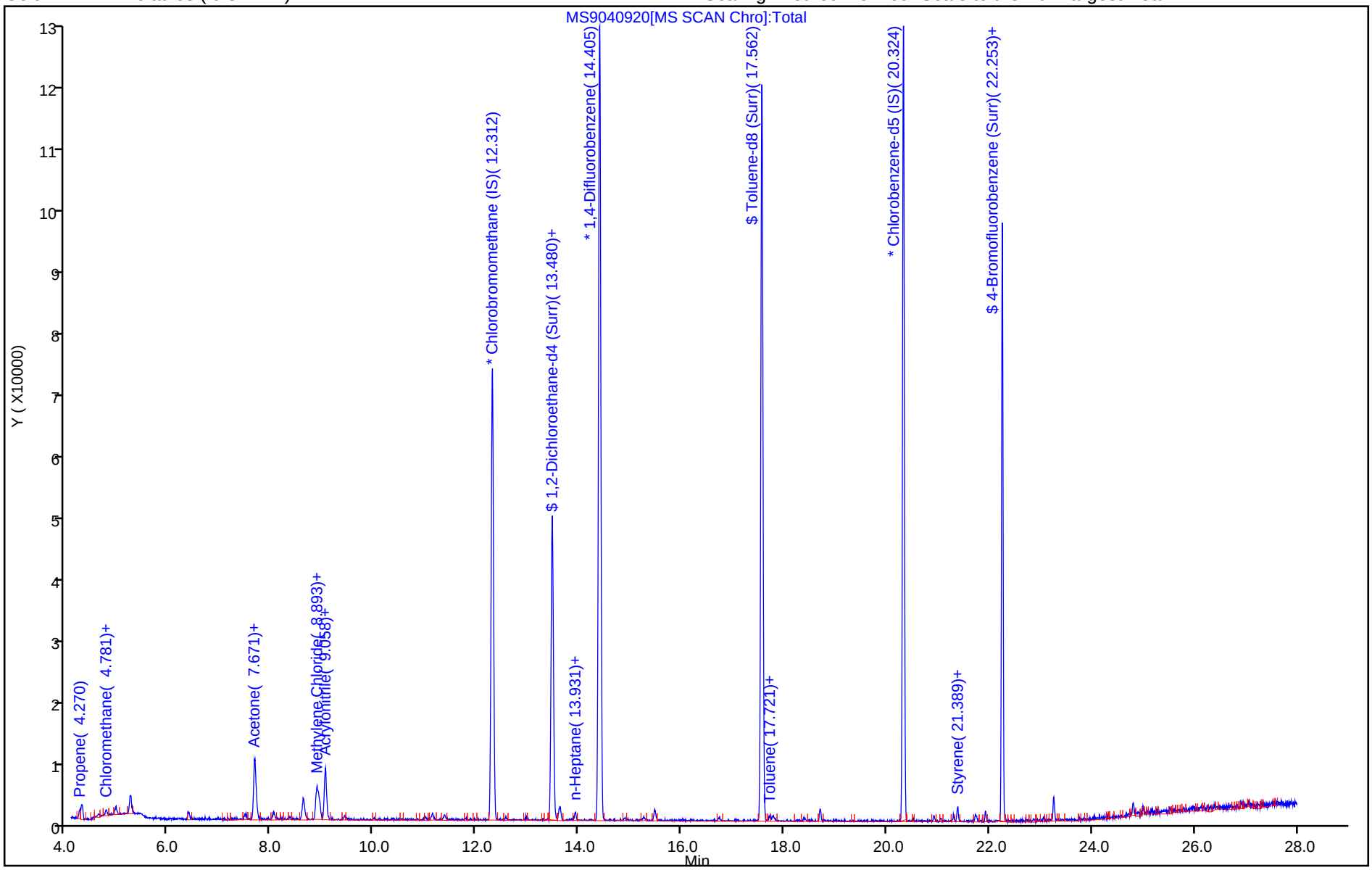
Report Date: 10-Apr-2018 11:02:38 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D

Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9	Operator ID:	LHS
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1	Worklist Smp#:	20
Client ID:	34000173				
Purge Vol:	5.000 mL	Dil. Factor:	1.0000	ALS Bottle#:	10
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		

Column: RTX Volatiles (0.32 mm) Y Scaling: Method Defined: Scale to the Nth Largest Peak: 2



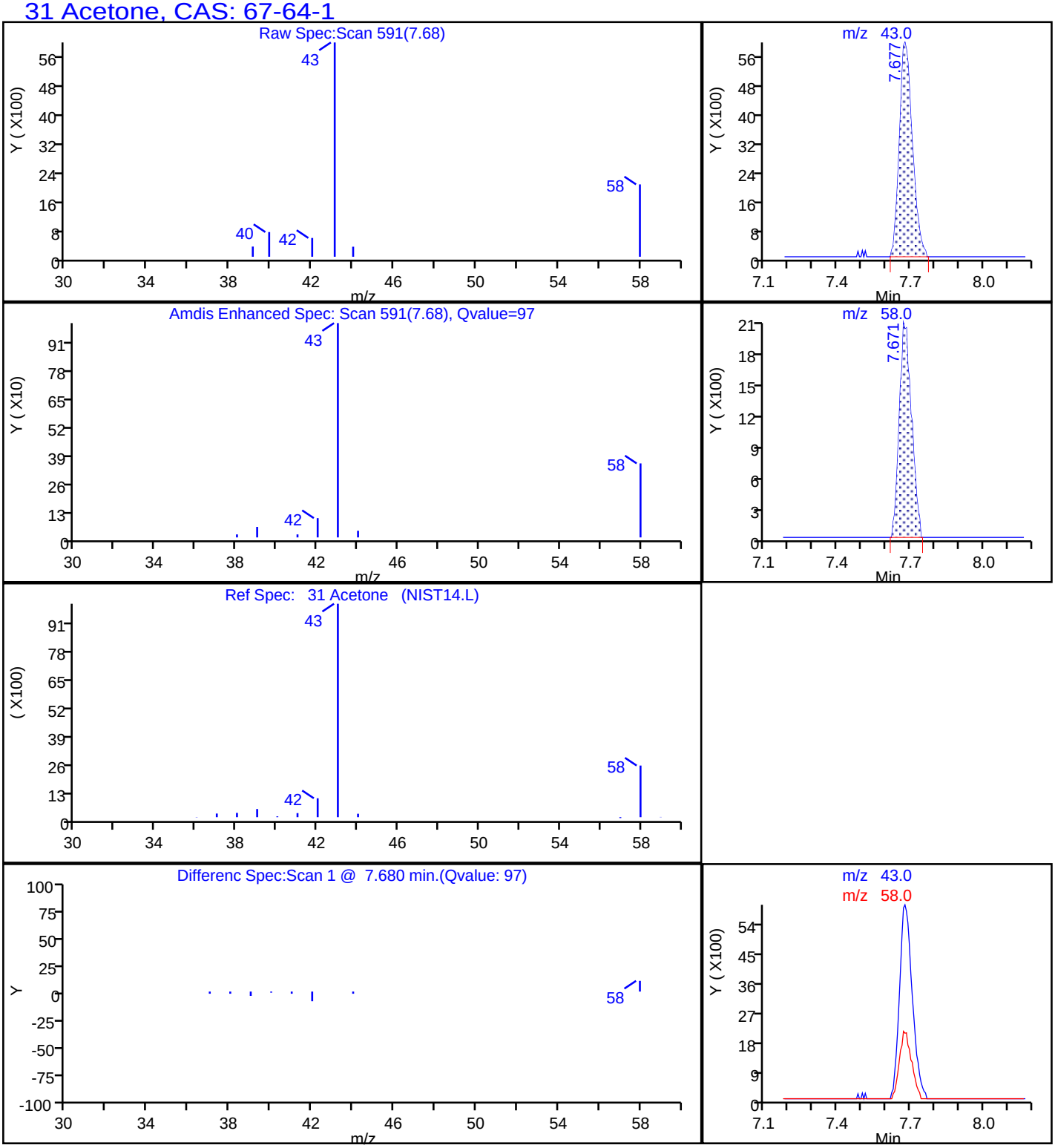
Report Date: 10-Apr-2018 11:02:39 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D

Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

31 Acetone, CAS: 67-64-1



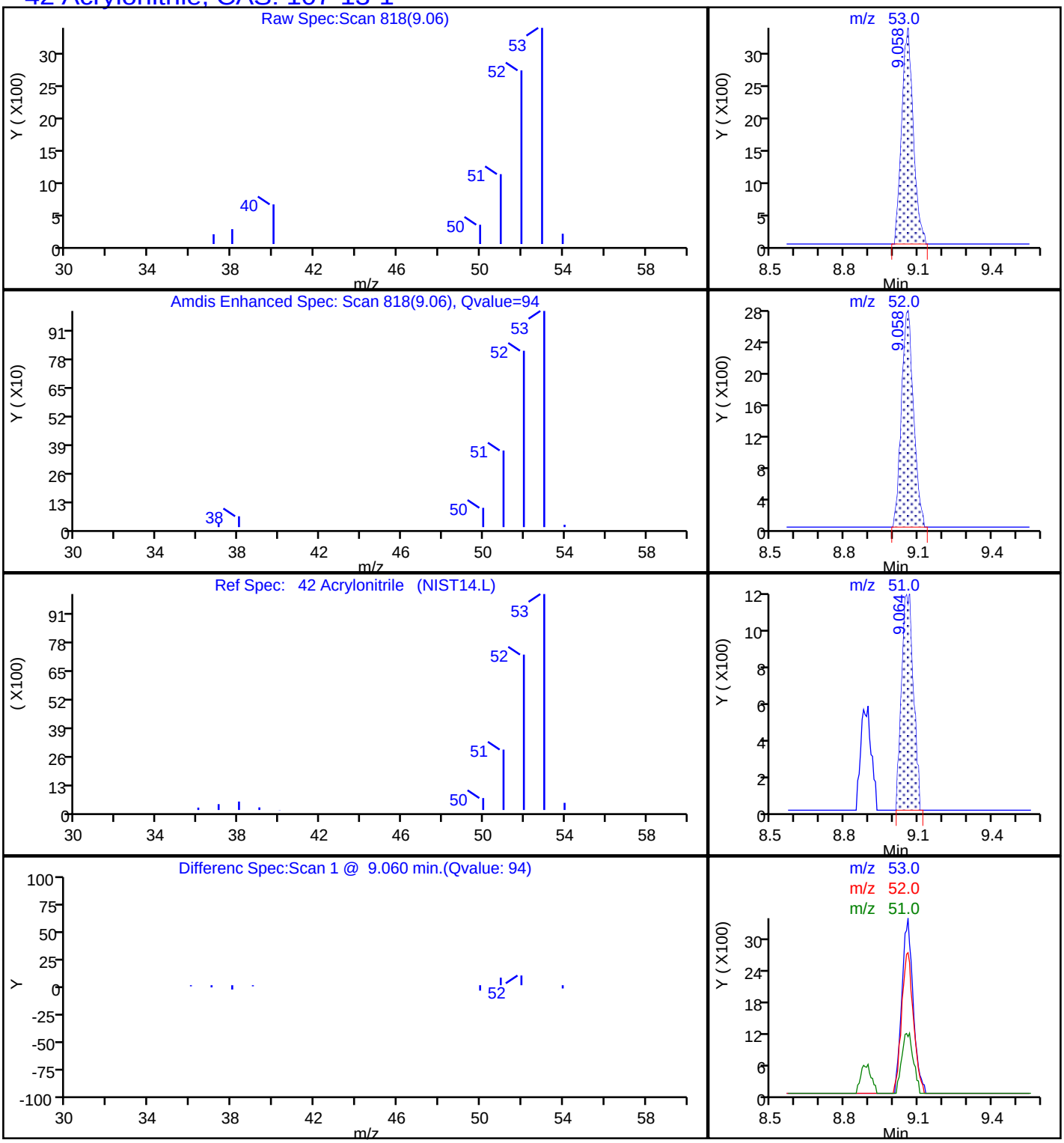
Report Date: 10-Apr-2018 11:02:39 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D

Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

42 Acrylonitrile, CAS: 107-13-1



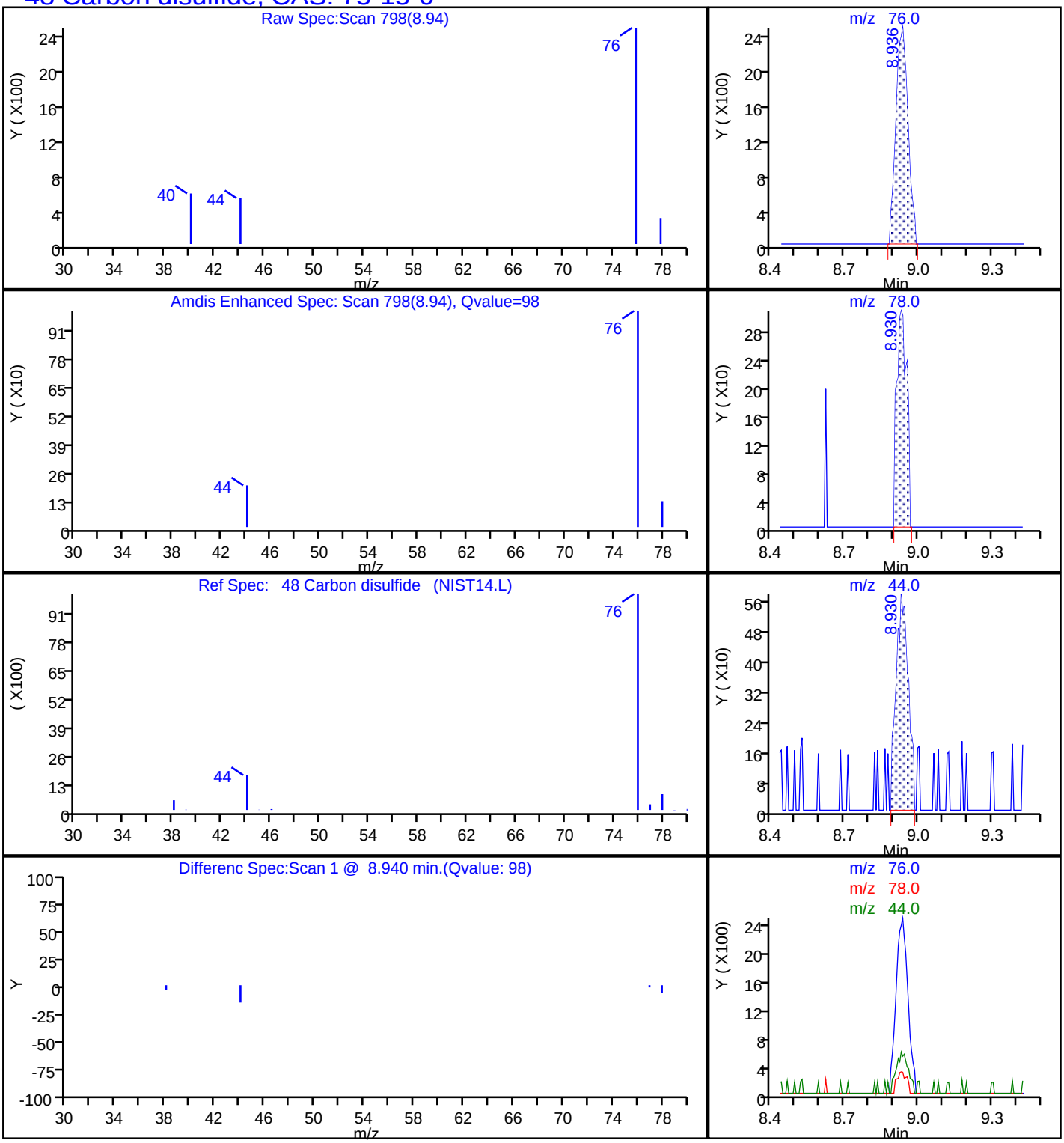
Report Date: 10-Apr-2018 11:02:39 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D

Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

48 Carbon disulfide, CAS: 75-15-0



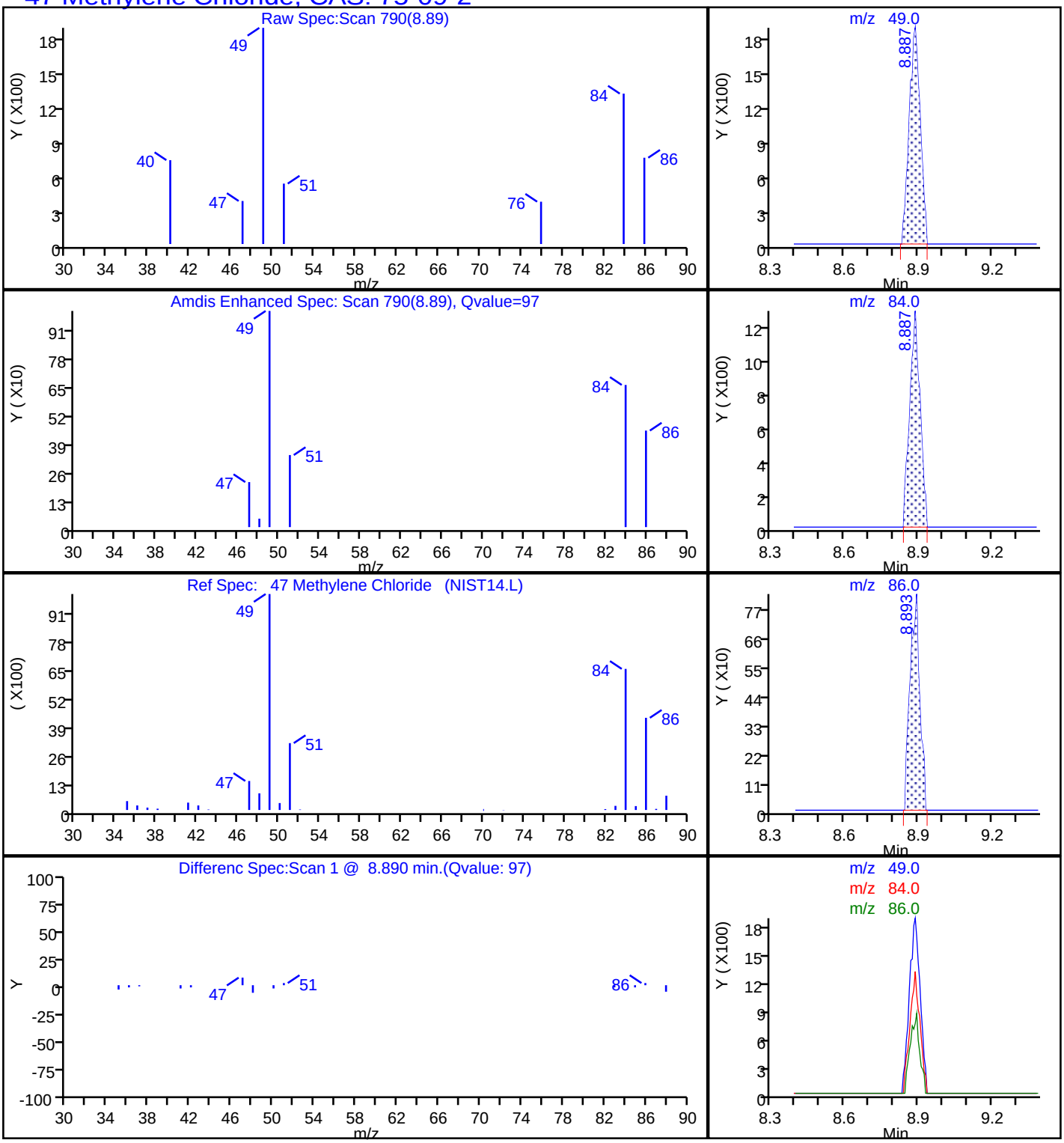
Report Date: 10-Apr-2018 11:02:39 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D

Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

47 Methylene Chloride, CAS: 75-09-2



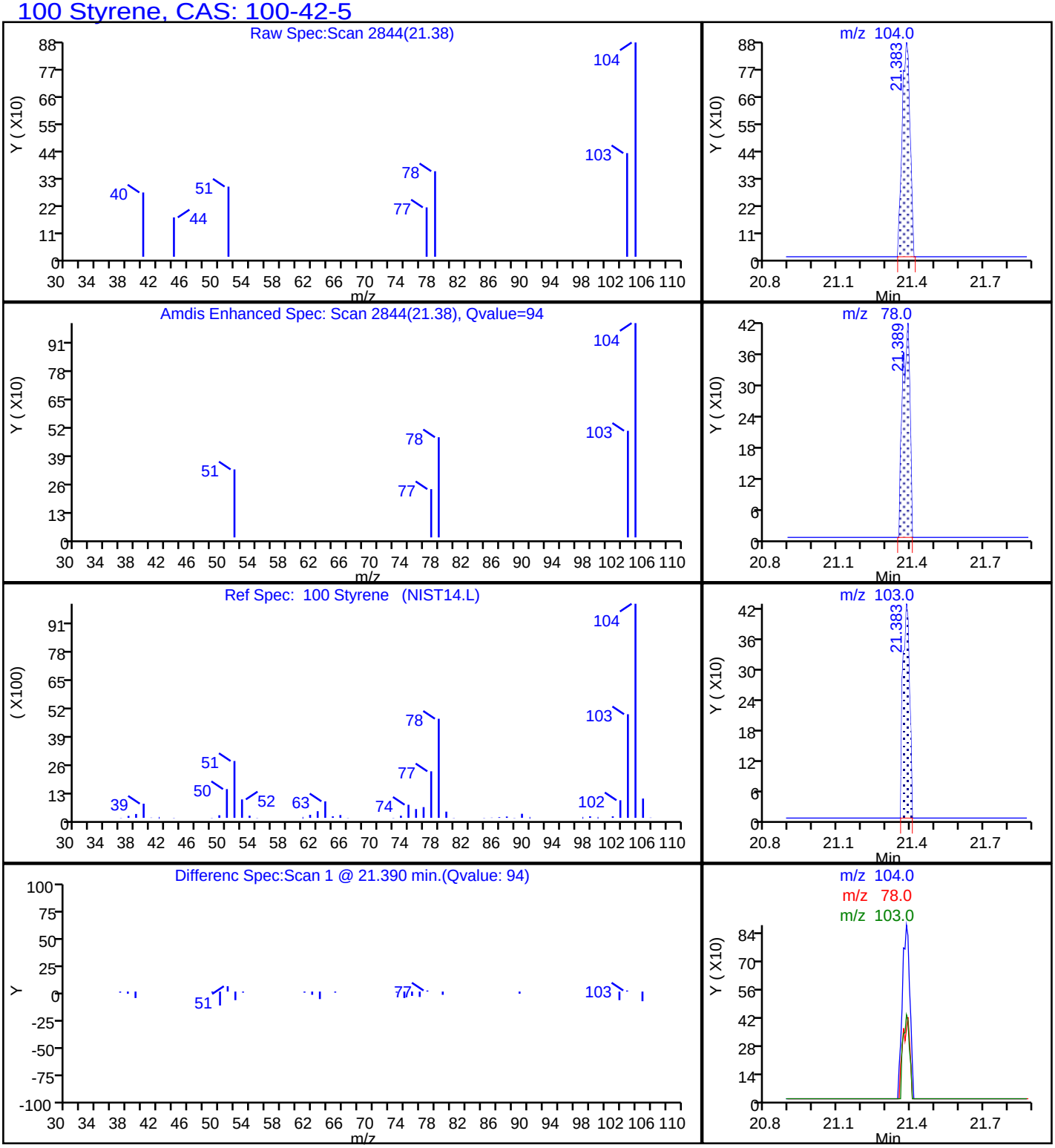
Report Date: 10-Apr-2018 11:02:40 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D

Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

100 Styrene, CAS: 100-42-5



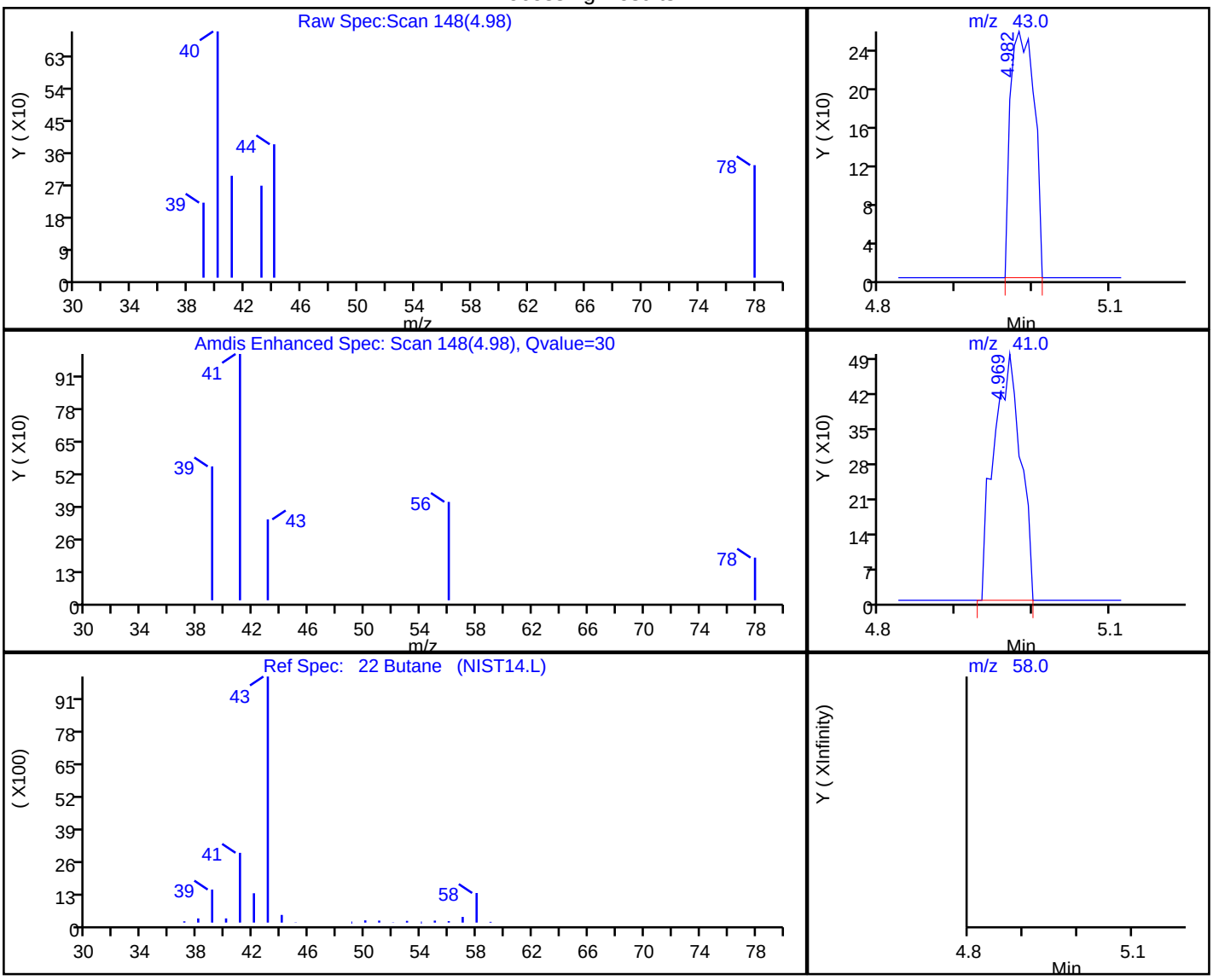
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

22 Butane, CAS: 106-97-8

Processing Results



RT	Mass	Response	Amount
4.98	43.00	561	0.028030
4.97	41.00	1200	
4.97	58.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
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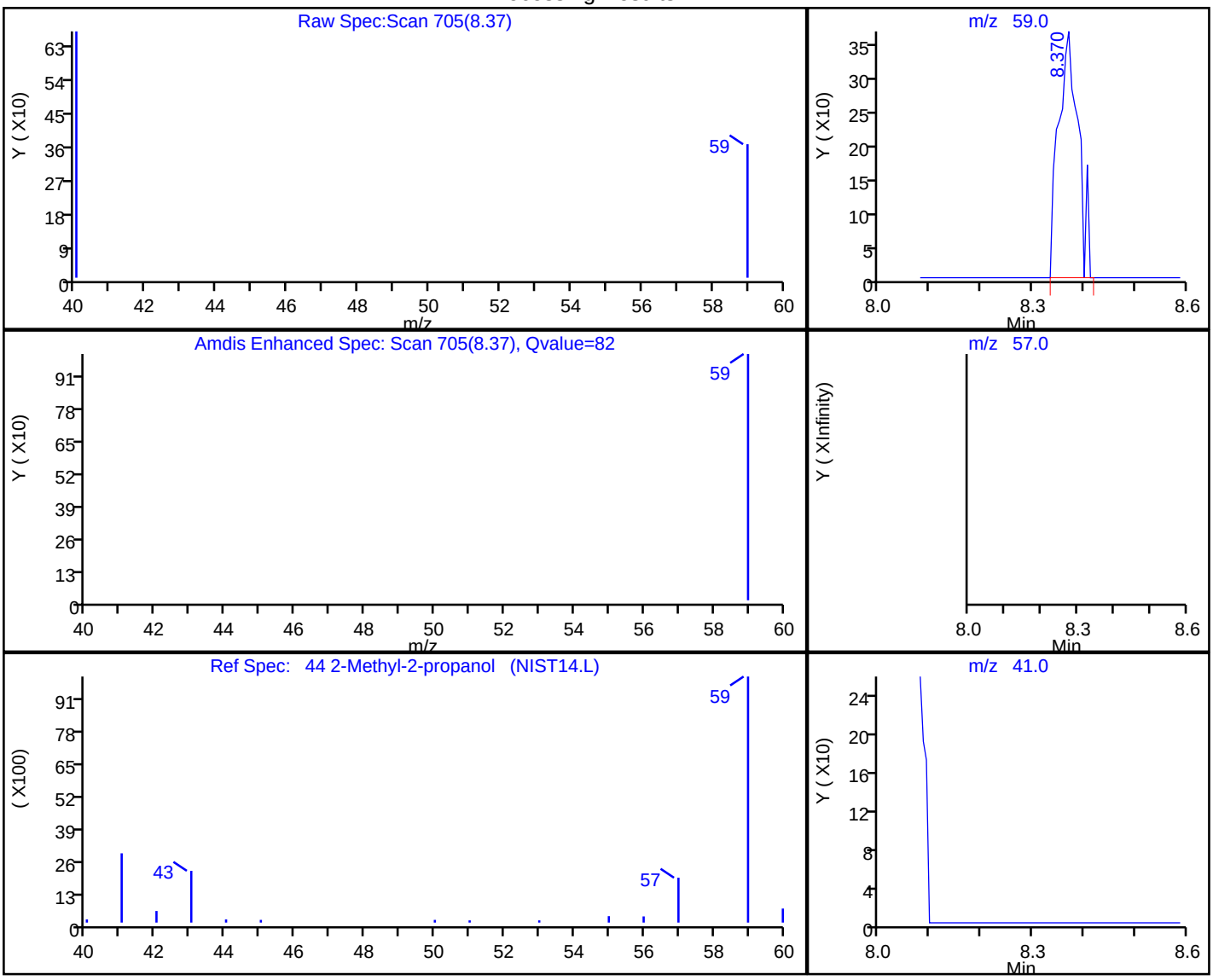
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

44 2-Methyl-2-propanol, CAS: 75-65-0

Processing Results



RT	Mass	Response	Amount
8.37	59.00	976	0.035363
8.33	57.00	0	
8.33	41.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

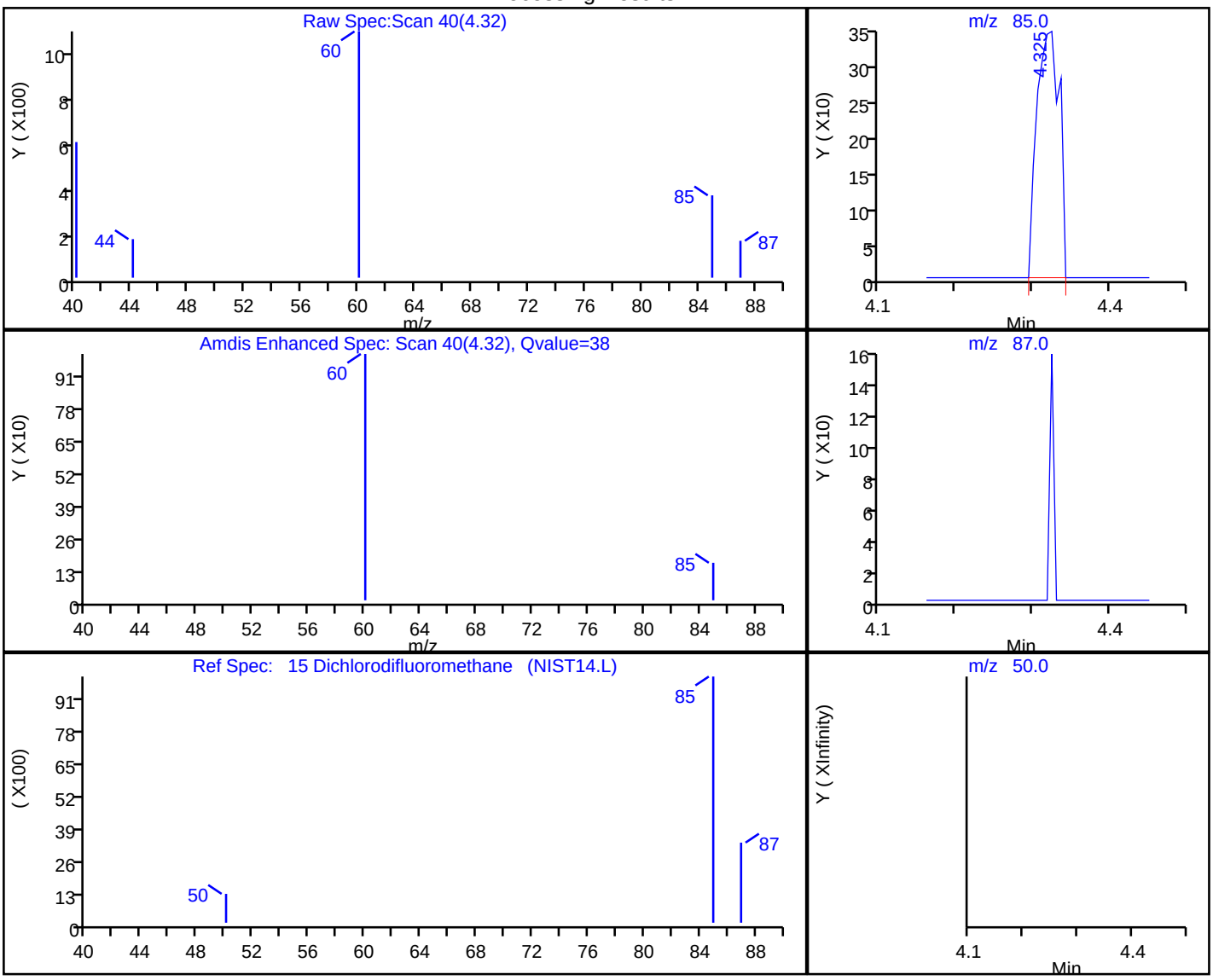
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

15 Dichlorodifluoromethane, CAS: 75-71-8

Processing Results



RT	Mass	Response	Amount
4.32	85.00	709	0.028579
4.31	87.00	0	
4.31	50.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

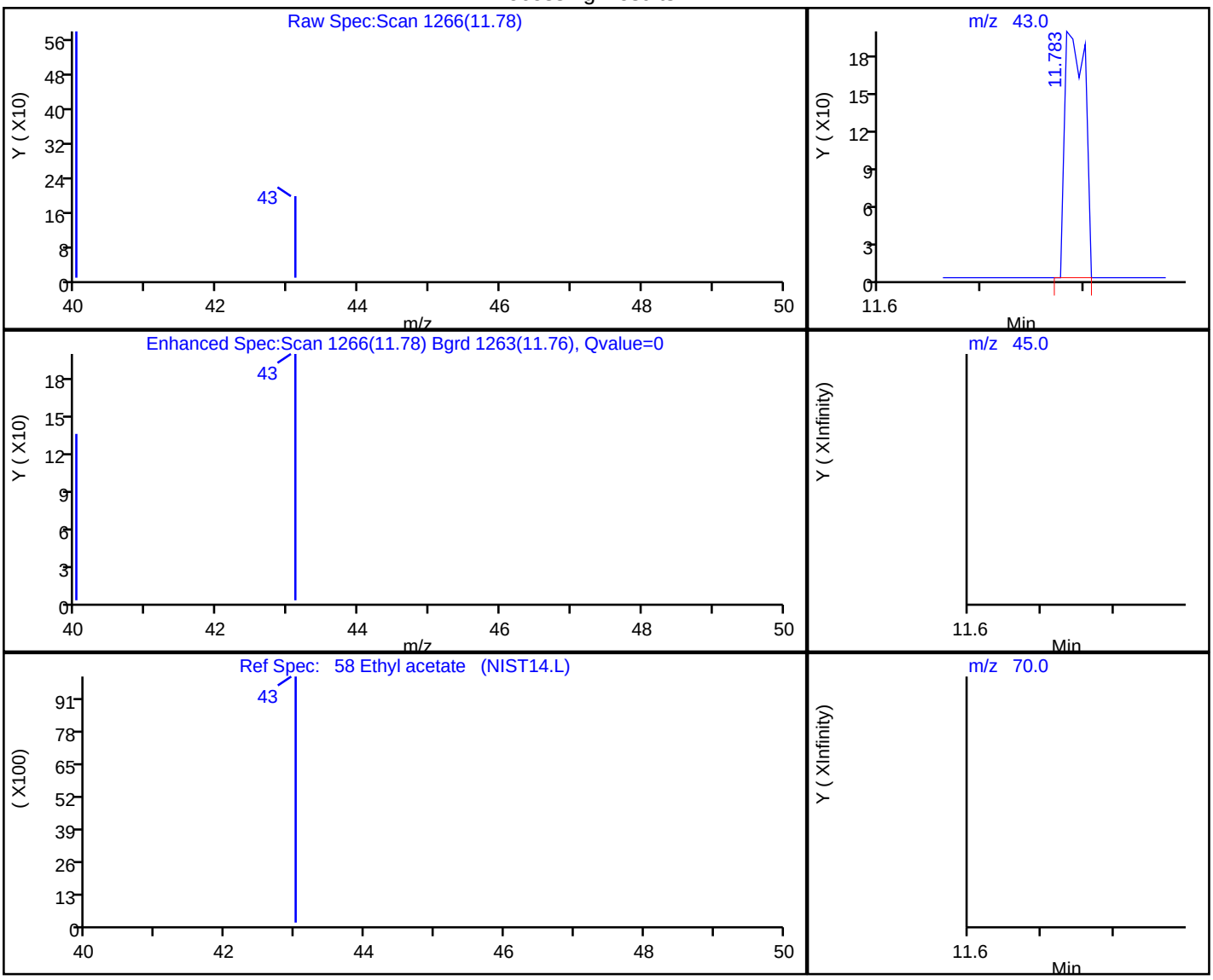
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

58 Ethyl acetate, CAS: 141-78-6

Processing Results



RT	Mass	Response	Amount
11.78	43.00	260	0.010518
11.77	45.00	0	
11.77	70.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

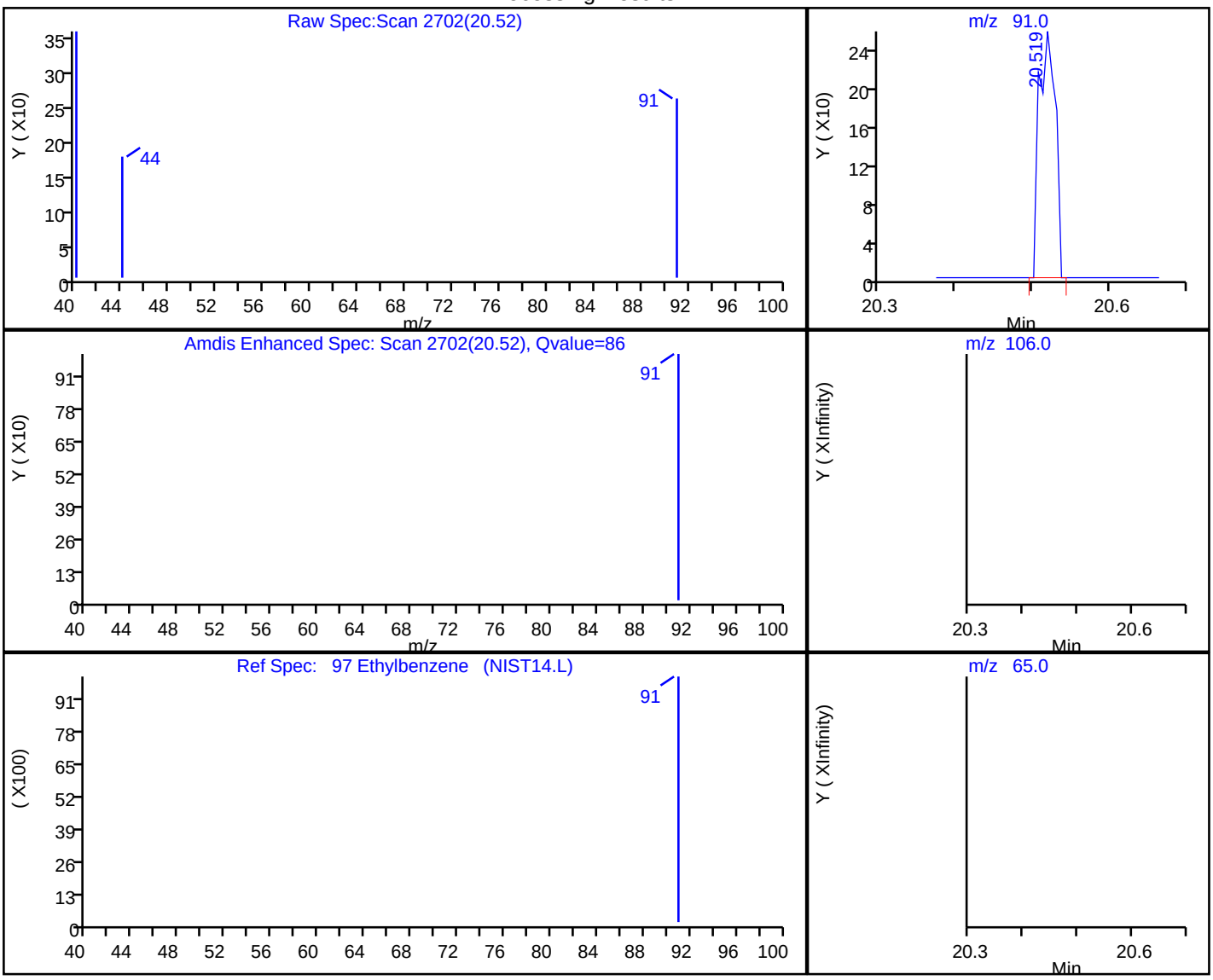
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

97 Ethylbenzene, CAS: 100-41-4

Processing Results



RT	Mass	Response	Amount
20.52	91.00	385	0.007788
20.52	106.00	0	
20.52	65.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

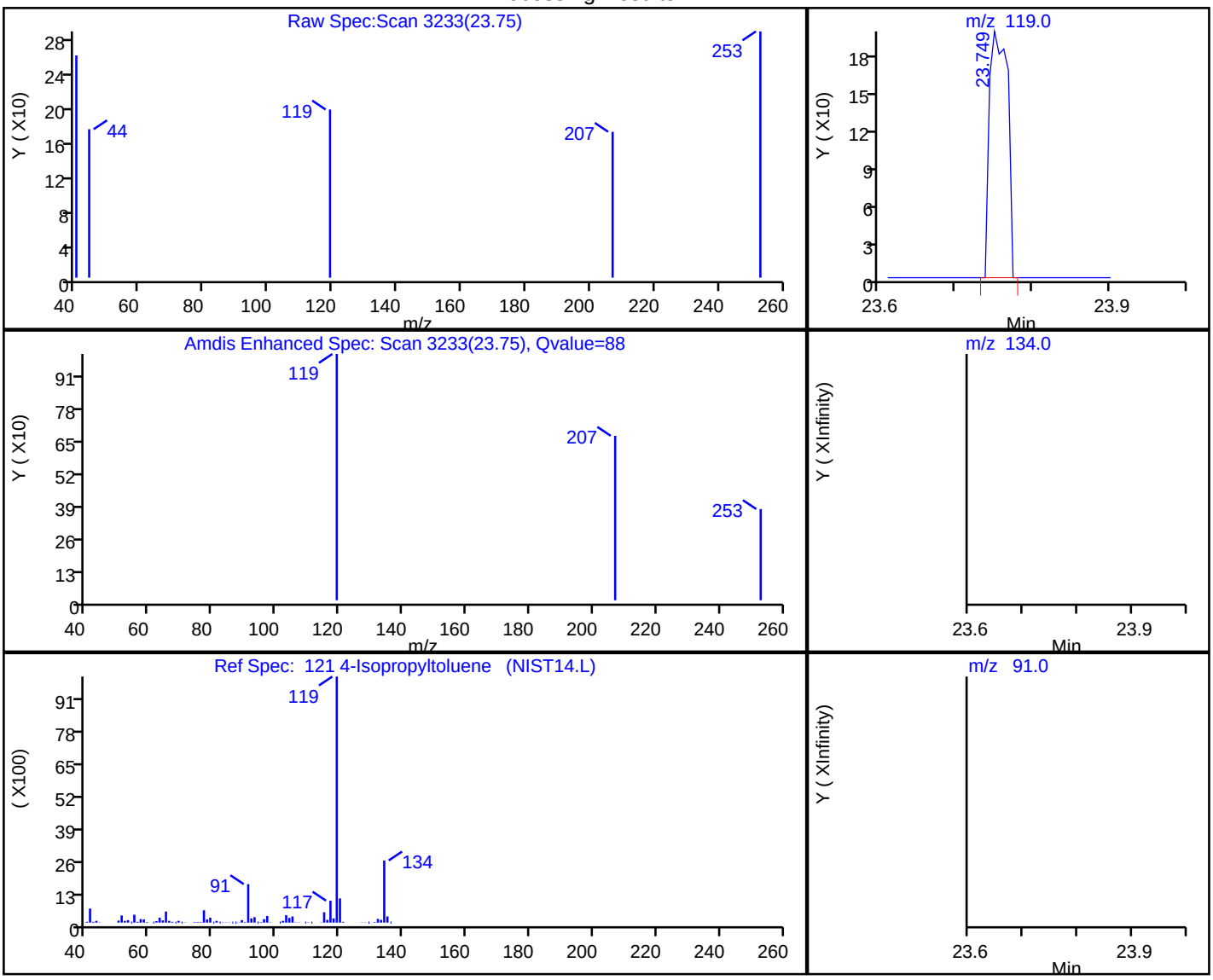
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

121 4-Isopropyltoluene, CAS: 99-87-6

Processing Results



RT	Mass	Response	Amount
23.75	119.00	322	0.006383
23.76	134.00	0	
23.76	91.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
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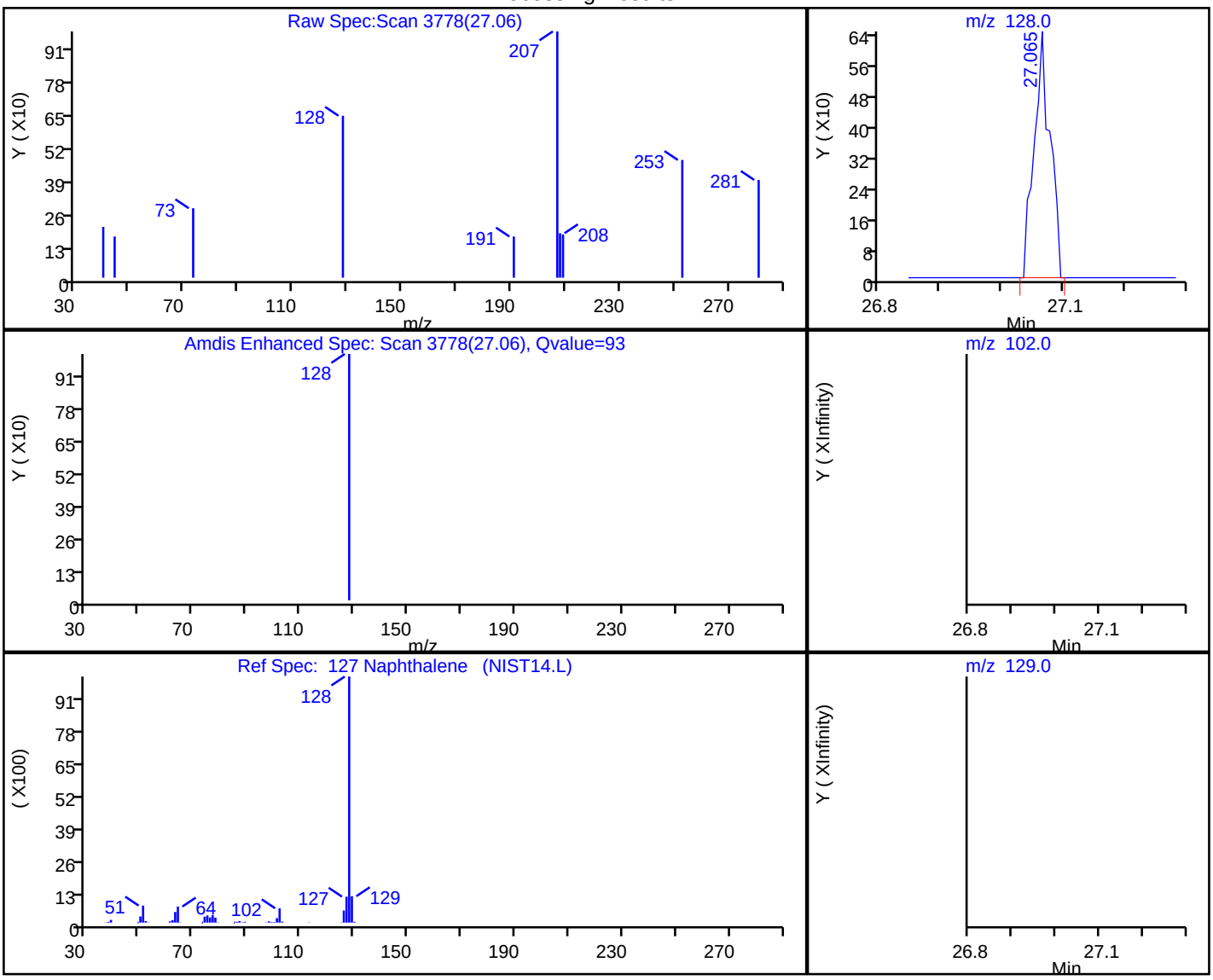
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

127 Naphthalene, CAS: 91-20-3

Processing Results



RT	Mass	Response	Amount
27.06	128.00	1160	0.031185
27.06	102.00	0	
27.06	129.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

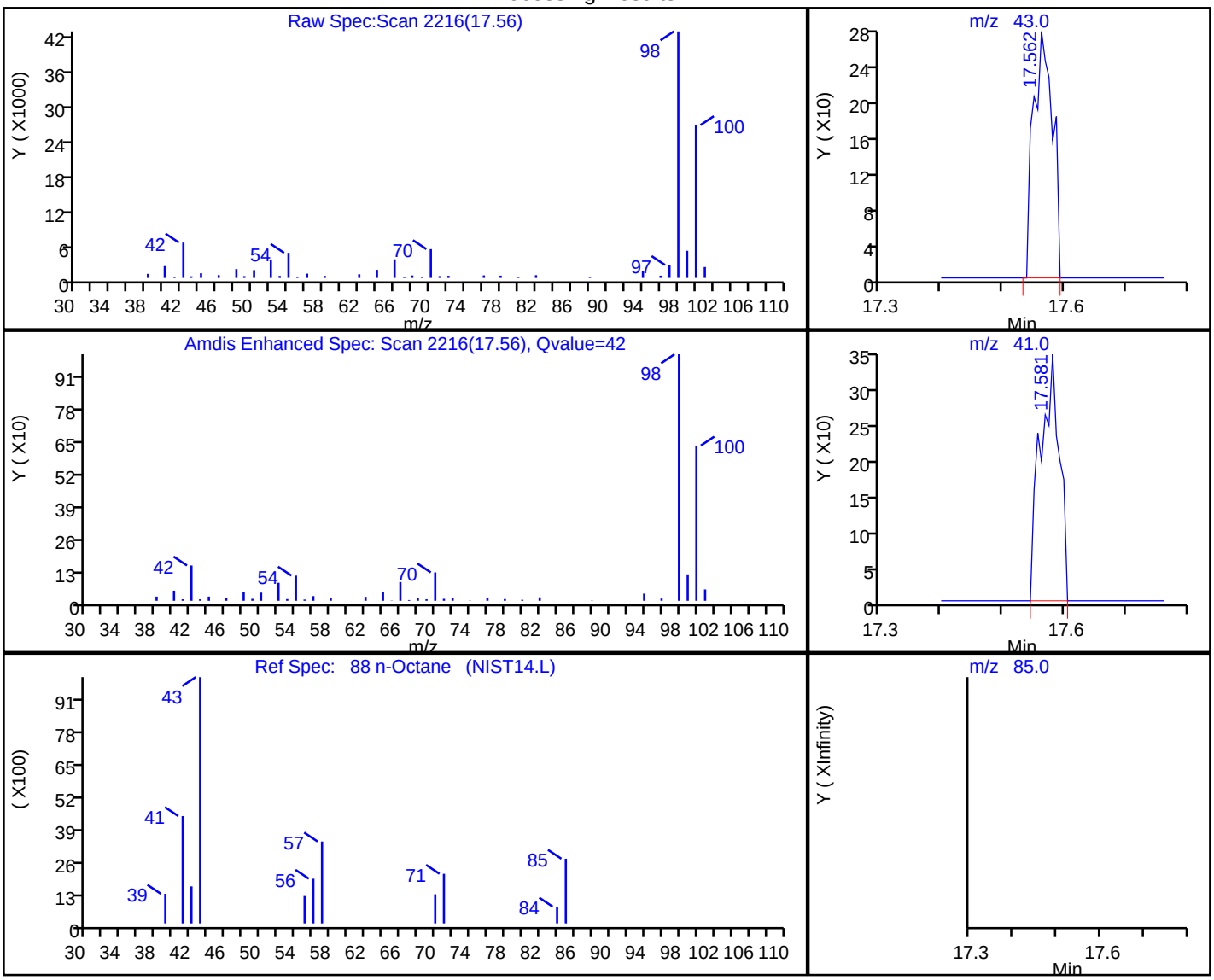
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

88 n-Octane, CAS: 111-65-9

Processing Results



RT	Mass	Response	Amount
17.56	43.00	595	0.018607
17.58	41.00	752	
17.58	85.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

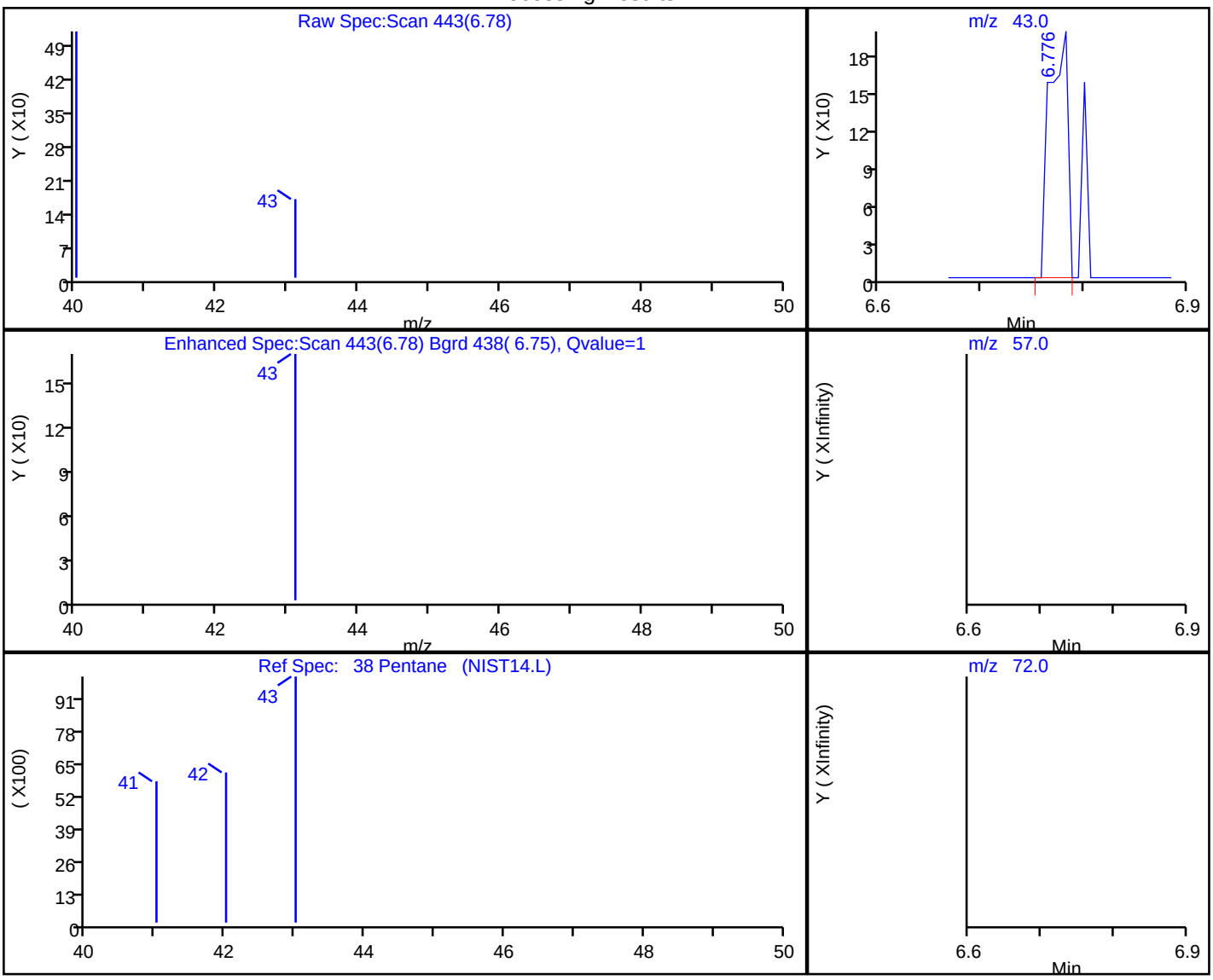
User Disabled Compound Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
Injection Date:	10-Apr-2018 10:06:30	Instrument ID:	ATMS9		
Lims ID:	320-37702-A-1	Lab Sample ID:	320-37702-1		
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

38 Pentane, CAS: 109-66-0

Processing Results



RT	Mass	Response	Amount
6.78	43.00	246	0.012188
6.78	57.00	0	
6.78	72.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

User Disabled Compound Report

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Data File:	\\ChromNA\Sacramento\ChromData\ATMS9\20180409-56431.b\MS9040920.D				
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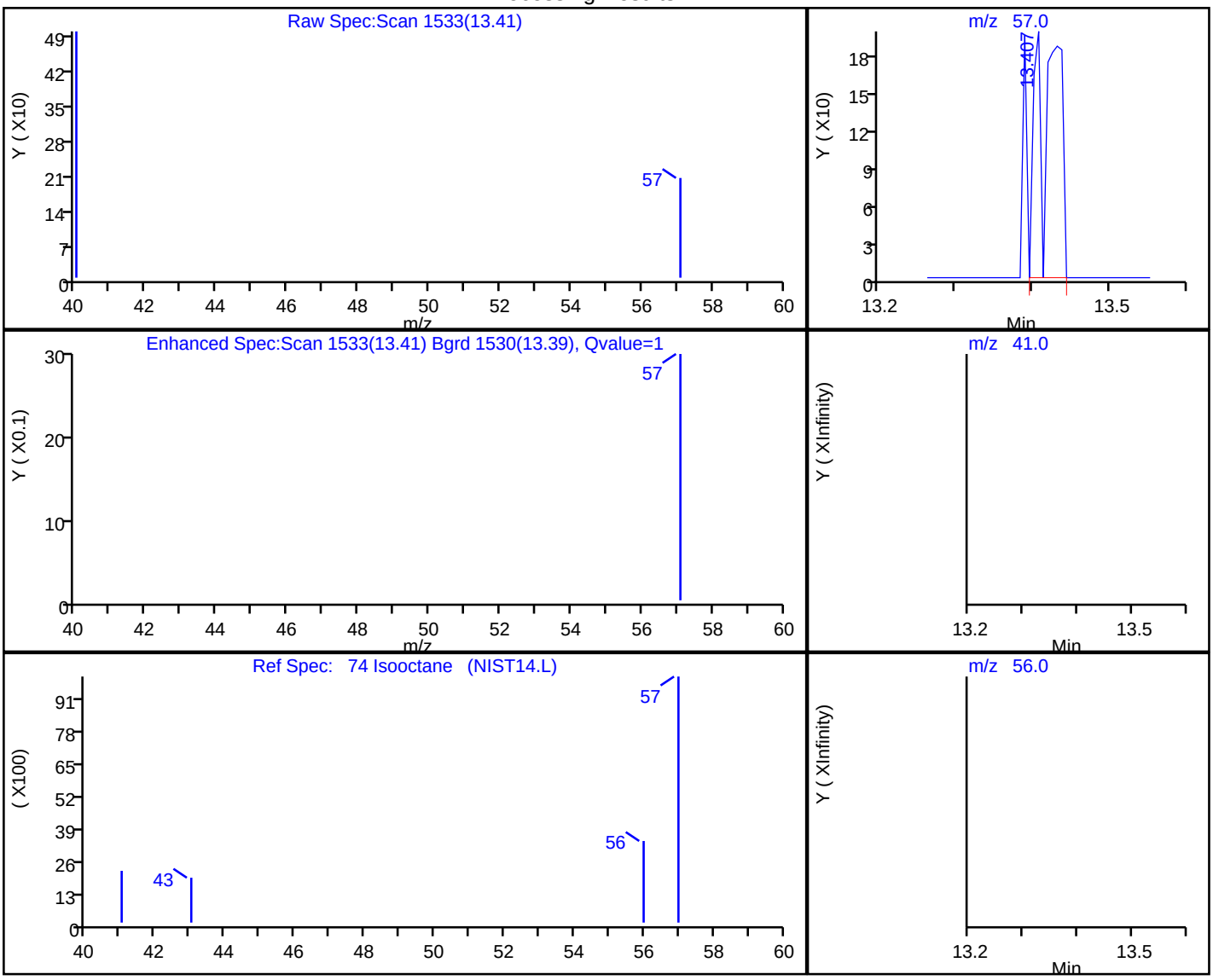
Client ID:	34000173				
Operator ID:	LHS	ALS Bottle#:	10	Worklist Smp#:	20
Purge Vol:	5.000 mL	Dil. Factor:	1.0000		
Method:	TO15_ATMS9N	Limit Group:	MSA - TO15 - ICAL		
Column:	RTX Volatiles (0.32 mm)	Detector	MS SCAN		

74 Isooctane, CAS: 540-84-1

Processing Results



RT	Mass	Response	Amount
13.41	57.00	400	0.006701
13.41	41.00	0	
13.41	56.00	0	

Reviewer: leeh, 10-Apr-2018 10:59:22

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

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

April 03, 2018

Analytical Report for Service Request No: K1802564

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

RE: NuStar Vancouver / 1126-21

Dear Stephanie,

Enclosed are the results of the sample(s) submitted to our laboratory March 20, 2018
For your reference, these analyses have been assigned our service request number **K1802564.**

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

Table of Contents

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.pjlabs.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/anlayte is offered by that state.

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

ALS Environmental

CHAIN OF CUSTODY
87943

001

SR# K1802964

COC Set____of____

COC#_____

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

Project Name: NUSTAR VANCOUM	Project Number: 1126-21		
Project Manager: S. SALISBURY			
Company: APEX COS			
Address: 3015 SW 1st Ave PDX OR			
Phone #: 503 924 4704	email: see comment		
Sampler Signature:	Sampler Printed Name: Megan Masterson		

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-8		3-19-18	1615	W	2	X	X	X						
2. MW-16		3-19-18	1652	W	2	X	X	X						
3. MW-12		3-20-18	0805	W	2	X	X	X						
4. MW-12 DUP		3-20-18	0805	W	2	X	X	X						
5.														
6.														
7.														
8.														
9.														
10.														

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#_____

Bill To:_____

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

___ Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments:

Email results to SSALISBURY@APEXCOS.COM

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other_____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Megan Masterson	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
Firm: Apex	Firm: 3/20/18 0931	Firm	Firm	Firm	Firm
Date/Time: 3/20/18 / 0831	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

PC MA

Cooler Receipt and Preservation Form

Client Apex - Nustar Service Request *K18* 025604

Received: 3/20/18 Opened: 3/20/18 By: AR Unloaded: 3/20/18 By: AR

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 NA	Tracking Number NA	Filed
0.0	-0.1	N/A	—	-0.1	~~DM~~ CF372	57943		

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: _____

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

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	03/19/18 - 03/20/18
Sample Matrix:	Water	**Date Received:**	03/20/18
Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Nitrite as Nitrogen

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
MW-8	K1802564-001	ND U	0.10	2	03/20/18 16:24	
MW-16	K1802564-002	ND U	0.10	2	03/20/18 17:07	
MW-12	K1802564-003	ND U	0.10	2	03/20/18 15:27	
MW-12 DUP	K1802564-004	ND U	0.10	2	03/20/18 17:17	
Method Blank	K1802564-MB1	ND U	0.050	1	03/20/18 20:51	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project	NuStar Vancouver/1126-21	**Date Collected:**	03/20/18
Sample Matrix:	Water	**Date Received:**	03/20/18
Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary

Nitrite as Nitrogen

Sample Name:	Lab Code:	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
MW-12	K1802564-003DUP	0.10	ND U	ND U	NC	NC	20	03/20/18
Batch QC	K1802573-004DUP	0.10	ND U	ND U	NC	NC	20	03/20/18

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

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

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	N/A
Sample Matrix:	Water	**Date Received:**	N/A
		Date Analyzed:	03/20/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrite as Nitrogen

Sample Name:	Batch QC	**Units:**	mg/L
Lab Code:	K1802573-004	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike K1802573-004MS			**Duplicate Matrix Spike** K1802573-004DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrite as Nitrogen	ND U	7.93	8.00	99	7.92	8.00	99	90-110	<1	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	03/20/18
Sample Matrix:	Water	**Date Received:**	03/20/18
		Date Analyzed:	03/20/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrite as Nitrogen

Sample Name:	MW-12	**Units:**	mg/L
Lab Code:	K1802564-003	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		K1802564-003MS			K1802564-003DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrite as Nitrogen	ND U	7.81	8.00	98	7.93	8.00	99	90-110	1	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Analyzed:**	03/20/18
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Nitrite as Nitrogen

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	584327

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1802564-LCS1	2.42	2.50	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	03/19/18 - 03/20/18
Sample Matrix:	Water	**Date Received:**	03/20/18
Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Nitrate as Nitrogen

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
MW-8	K1802564-001	**284**	5.0	100	03/23/18 18:16	
MW-16	K1802564-002	**15.7**	0.25	5	03/20/18 16:56	
MW-12	K1802564-003	ND U	0.10	2	03/20/18 15:27	
MW-12 DUP	K1802564-004	ND U	0.10	2	03/20/18 17:17	
Method Blank	K1802564-MB1	ND U	0.050	1	03/20/18 20:51	
Method Blank	K1802564-MB2	ND U	0.050	1	03/23/18 13:24	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project	NuStar Vancouver/1126-21	**Date Collected:**	03/20/18
Sample Matrix:	Water	**Date Received:**	03/20/18
Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Nitrate as Nitrogen

Sample Name:	Lab Code:	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
Batch QC	K1802560-001DUP	0.10	4.87	4.84	4.86	<1	20	03/20/18
MW-12	K1802564-003DUP	0.10	ND U	ND U	NC	NC	20	03/20/18
Batch QC	K1802573-004DUP	0.10	ND U	ND U	NC	NC	20	03/20/18
Batch QC	K1802734-001DUP	0.10	0.20	0.21	0.204	8	20	03/23/18
Batch QC	K1802744-008DUP	0.10	0.68	0.68	0.679	<1	20	03/23/18

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	N/A
Sample Matrix:	Water	**Date Received:**	N/A
		Date Analyzed:	03/20/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrate as Nitrogen

Sample Name:	Batch QC	**Units:**	mg/L
Lab Code:	K1802560-001	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		K1802560-001MS			K1802560-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	4.87	13.2	8.00	104	13.3	8.00	105	90-110	<1	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	N/A
Sample Matrix:	Water	**Date Received:**	N/A
		Date Analyzed:	03/23/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrate as Nitrogen

Sample Name:	Batch QC	**Units:**	mg/L
Lab Code:	K1802744-008	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike K1802744-008MS			**Duplicate Matrix Spike** K1802744-008DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	0.68	8.70	8.00	100	8.78	8.00	101	90-110	<1	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	N/A
Sample Matrix:	Water	**Date Received:**	N/A
		Date Analyzed:	03/23/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrate as Nitrogen

Sample Name:	Batch QC	**Units:**	mg/L
Lab Code:	K1802734-001	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		K1802734-001MS			K1802734-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	0.20	8.17	8.00	100	8.30	8.00	101	90-110	2	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	N/A
Sample Matrix:	Water	**Date Received:**	N/A
		Date Analyzed:	03/20/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrate as Nitrogen

Sample Name:	Batch QC	**Units:**	mg/L
Lab Code:	K1802573-004	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike K1802573-004MS			**Duplicate Matrix Spike** K1802573-004DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	ND U	8.14	8.00	102	8.14	8.00	102	90-110	<1	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	03/20/18
Sample Matrix:	Water	**Date Received:**	03/20/18
		Date Analyzed:	03/20/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrate as Nitrogen

Sample Name:	MW-12	**Units:**	mg/L
Lab Code:	K1802564-003	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		K1802564-003MS			K1802564-003DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	ND U	7.86	8.00	98	7.93	8.00	99	90-110	<1	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Analyzed:**	03/20/18
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Nitrate as Nitrogen

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	584327

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1802564-LCS1	2.52	2.50	101	90-110

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Analyzed:**	03/23/18
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Nitrate as Nitrogen

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	584793

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1802564-LCS2	2.52	2.50	101	90-110

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	03/19/18 - 03/20/18
Sample Matrix:	Water	**Date Received:**	03/20/18
Analysis Method:	350.1	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA

Ammonia as Nitrogen

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
MW-8	K1802564-001	ND U	0.40	1	03/29/18 15:15	3/29/18	
MW-16	K1802564-002	ND U	0.40	1	03/29/18 15:15	3/29/18	
MW-12	K1802564-003	**39.4**	8.0	20	03/29/18 15:15	3/29/18	
MW-12 DUP	K1802564-004	**39.9**	8.0	20	03/29/18 15:15	3/29/18	
Method Blank	K1802564-MB1	ND U	0.40	1	03/29/18 15:15	3/29/18	

ALS Group USA, Corp.

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QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project	NuStar Vancouver/1126-21	**Date Collected:**	03/19/18
Sample Matrix:	Water	**Date Received:**	03/20/18
		Date Analyzed:	03/29/18

Replicate Sample Summary

General Chemistry Parameters

Sample Name:	MW-8	**Units:**	mg/L
Lab Code:	K1802564-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1802564-001DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.40	ND U	ND U	NC	NC	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Collected:**	03/19/18
Sample Matrix:	Water	**Date Received:**	03/20/18
		Date Analyzed:	03/29/18
		Date Extracted:	03/29/18

Duplicate Matrix Spike Summary
Ammonia as Nitrogen

Sample Name:	MW-8	**Units:**	mg/L
Lab Code:	K1802564-001	**Basis:**	NA
Analysis Method:	350.1		
Prep Method:	Method		

		Matrix Spike			Duplicate Matrix Spike					
		K1802564-001MS			K1802564-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	ND U	1.01	1.00	101	1.02	1.00	102	75-125	<1	20

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802564
Project:	NuStar Vancouver/1126-21	**Date Analyzed:**	03/29/18
Sample Matrix:	Water	**Date Extracted:**	03/29/18

Lab Control Sample Summary
Ammonia as Nitrogen

Analysis Method:	350.1	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	585503

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1802564-LCS1	6.3	6.2	102	85-115

April 09, 2018 Service Request No:K1802604

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

Laboratory Results for: NuStar Van GWM

Dear Stephanie,

Enclosed are the results of the sample(s) submitted to our laboratory March 21, 2018
For your reference, these analyses have been assigned our service request number **K1802604.**

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

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

Narrative Documents

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

Client: Apex Companies, LLC
Project: NuStar Van GWM
Sample Matrix: Water

Service Request: K1802604
Date Received: 03/21/2018

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:

Nine water samples were received for analysis at ALS Environmental on 03/21/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 04/09/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-26			Lab ID: K1802604-001			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	30.0			8.0	mg/L	350.1
Nitrate as Nitrogen	271			5.0	mg/L	300.0

CLIENT ID: S-2			Lab ID: K1802604-002			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	6.1			2.0	mg/L	350.1
Nitrate as Nitrogen	1.25			0.10	mg/L	300.0

CLIENT ID: S-1			Lab ID: K1802604-003			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	35.5			8.0	mg/L	350.1
Nitrate as Nitrogen	11.4			0.25	mg/L	300.0
Nitrite as Nitrogen	0.24			0.10	mg/L	300.0

CLIENT ID: MW-14			Lab ID: K1802604-004			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	50.7			16	mg/L	350.1
Nitrate as Nitrogen	17.1			1.0	mg/L	300.0

CLIENT ID: MW-1			Lab ID: K1802604-006			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	6.2			2.0	mg/L	350.1
Nitrate as Nitrogen	1.84			0.10	mg/L	300.0

CLIENT ID: MW-3			Lab ID: K1802604-007			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Nitrate as Nitrogen	19.7			0.50	mg/L	300.0

CLIENT ID: MW-13			Lab ID: K1802604-009			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	191			40	mg/L	350.1

Sample Receipt Information

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

Client: Apex Companies, LLC **Service Request:**K1802604
Project: NuStar Van GWM/1126-21

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1802604-001	MW-26	3/20/2018	1556
K1802604-002	S-2	3/20/2018	1510
K1802604-003	S-1	3/20/2018	1437
K1802604-004	MW-14	3/20/2018	1350
K1802604-005	MW-19i	3/20/2018	1224
K1802604-006	MW-1	3/20/2018	1140
K1802604-007	MW-3	3/20/2018	1111
K1802604-008	MW-24D	3/20/2018	1026
K1802604-009	MW-13	3/20/2018	0928

ALS Environmental

CHAIN OF CUSTODY
87943

001

SR# K1802604

COC Set 1 of 1

COC#

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

Project Name	NuStar Van GWM
Project Number	1126-21
Project Manager	S. SALISBURY
Company	Apex Cos
Address	3015 SW 1st AVE, PDX OR
Phone#	503-924-4704
email	See comment
Sampler Signature	
Sampler Printed Name	Megan Masterson

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-26		3-20-18	1556	W	2	X	X	X						
2. S-2			1510		2	X	X	X						
3. S-1			1437		2	X	X	X						
4. MW-14			1350		2	X	X	X						
5. MW-19			1224		2	X	X	X						
6. MW-1			1140		2	X	X	X						
7. MW-3			1111		2	X	X	X						
8. MW-24D			1026		2	X	X	X						
9. MW-13			0928		2	X	X	X						
10.														

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#

Bill To:

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

X Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments: PLEASE EMAIL RESULTS TO: SSALISBURY@APEXCOS.COM

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Megan Masterson	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
Firm: Apex	Firm: 312 1110 0826	Firm	Firm: APEX 3/21/18 1140	Firm	Firm
Date/Time: 3-21-18 0826	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

PC MH

Cooler Receipt and Preservation Form

Client Apex Service Request K18 026044

Received: 3/21/18 Opened: 3/21/18 By: [illegible] Unloaded: 3/21/18 By: [illegible]

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 (NA)	Tracking Number (NA)	Filed
0.2	0.2	3.7	3.7	0	365			
1.0	0.9	—	—	-0.1	378			

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

SHORT HOLD TIME

Notes, Discrepancies, & Resolutions: _____

Miscellaneous Forms

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

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.pjlabs.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/anlayte is offered by that state.

Acronyms

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

Client: Apex Companies, LLC **Service Request:** K1802604
Project: NuStar Van GWM/1126-21

Sample Name: MW-26 **Date Collected:** 03/20/18
Lab Code: K1802604-001 **Date Received:** 03/21/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: S-2 **Date Collected:** 03/20/18
Lab Code: K1802604-002 **Date Received:** 03/21/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: S-1 **Date Collected:** 03/20/18
Lab Code: K1802604-003 **Date Received:** 03/21/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-14 **Date Collected:** 03/20/18
Lab Code: K1802604-004 **Date Received:** 03/21/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Client: Apex Companies, LLC **Service Request:** K1802604
Project: NuStar Van GWM/1126-21

Sample Name: MW-19i **Date Collected:** 03/20/18
Lab Code: K1802604-005 **Date Received:** 03/21/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-1 **Date Collected:** 03/20/18
Lab Code: K1802604-006 **Date Received:** 03/21/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-3 **Date Collected:** 03/20/18
Lab Code: K1802604-007 **Date Received:** 03/21/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-24D **Date Collected:** 03/20/18
Lab Code: K1802604-008 **Date Received:** 03/21/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21		

Sample Name:	MW-13	**Date Collected:**	03/20/18
Lab Code:	K1802604-009	**Date Received:**	03/21/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Results

ALS Environmental—Kelso Laboratory
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General Chemistry

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Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/20/18 15:56
Sample Matrix:	Water	**Date Received:**	03/21/18 11:40
Sample Name:	MW-26	**Basis:**	NA
Lab Code:	K1802604-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**30.0**	mg/L	8.0	20	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	**271**	mg/L	5.0	100	03/21/18 20:38	NA	
Nitrite as Nitrogen	300.0	ND Ui	mg/L	0.25	5	03/21/18 20:26	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/20/18 15:10
Sample Matrix:	Water	**Date Received:**	03/21/18 11:40
Sample Name:	S-2	**Basis:**	NA
Lab Code:	K1802604-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**6.1**	mg/L	2.0	5	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	**1.25**	mg/L	0.10	2	03/21/18 20:49	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 20:49	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/20/18 14:37
Sample Matrix:	Water	**Date Received:**	03/21/18 11:40
Sample Name:	S-1	**Basis:**	NA
Lab Code:	K1802604-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**35.5**	mg/L	8.0	20	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	**11.4**	mg/L	0.25	5	03/22/18 08:58	NA	
Nitrite as Nitrogen	300.0	**0.24**	mg/L	0.10	2	03/21/18 21:16	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/20/18 13:50
Sample Matrix:	Water	**Date Received:**	03/21/18 11:40
Sample Name:	MW-14	**Basis:**	NA
Lab Code:	K1802604-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**50.7**	mg/L	16	40	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	**17.1**	mg/L	1.0	20	03/21/18 21:37	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 21:26	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/20/18 12:24
Sample Matrix:	Water	**Date Received:**	03/21/18 11:40
Sample Name:	MW-19i	**Basis:**	NA
Lab Code:	K1802604-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.40	1	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 21:48	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 21:48	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/20/18 11:40
Sample Matrix:	Water	**Date Received:**	03/21/18 11:40
Sample Name:	MW-1	**Basis:**	NA
Lab Code:	K1802604-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**6.2**	mg/L	2.0	5	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	**1.84**	mg/L	0.10	2	03/21/18 22:32	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 22:32	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/20/18 11:11
Sample Matrix:	Water	**Date Received:**	03/21/18 11:40
Sample Name:	MW-3	**Basis:**	NA
Lab Code:	K1802604-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.40	1	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	**19.7**	mg/L	0.50	10	03/22/18 09:09	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 22:54	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/20/18 10:26
Sample Matrix:	Water	**Date Received:**	03/21/18 11:40
Sample Name:	MW-24D	**Basis:**	NA
Lab Code:	K1802604-008		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.40	1	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 23:05	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 23:05	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/20/18 09:28
Sample Matrix:	Water	**Date Received:**	03/21/18 11:40
Sample Name:	MW-13	**Basis:**	NA
Lab Code:	K1802604-009		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**191**	mg/L	40	100	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 23:16	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/21/18 23:16	NA	

QC Summary Forms

ALS Environmental—Kelso Laboratory
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Phone (360) 577-7222 Fax (360) 425-9096
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General Chemistry

ALS Environmental—Kelso Laboratory
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Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1802604-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.40	1	03/29/18 15:15	03/29/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	03/21/18 09:45	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	03/21/18 09:45	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802604
Project:	NuStar Van GWM/1126-21	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1802604-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	03/21/18 20:15	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	03/21/18 20:15	

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

Service Request: K1802604
Date Analyzed: 03/21/18 - 03/29/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1802604-LCS1

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.3	6.2	102	85-115
Nitrate as Nitrogen	300.0	2.52	2.50	101	90-110
Nitrite as Nitrogen	300.0	2.41	2.50	97	90-110

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

Service Request: K1802604
Date Analyzed: 03/21/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1802604-LCS2

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Nitrate as Nitrogen	300.0	2.52	2.50	101	90-110
Nitrite as Nitrogen	300.0	2.41	2.50	96	90-110

April 09, 2018 Service Request No:K1802664

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

Laboratory Results for: NuStar Van GWM

Dear Stephanie,

Enclosed are the results of the sample(s) submitted to our laboratory March 22, 2018
For your reference, these analyses have been assigned our service request number **K1802664.**

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

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

Narrative Documents

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Client: Apex Companies, LLC
Project: NuStar Van GWM
Sample Matrix: Water

Service Request: K1802664
Date Received: 03/22/2018

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:

Fifteen water samples were received for analysis at ALS Environmental on 03/22/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

Method 300.0, 03/22/2018:The matrix spike recovery of Nitrate as Nitrogen for sample MW-24i were outside control criteria because of suspected matrix interference. As a result of the interference, the results for this analyte contained a potential high bias. No further corrective action was taken.

Approved by _____ Date 04/09/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-24i			Lab ID: K1802664-001			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	0.687			0.050	mg/L	350.1
Nitrate as Nitrogen	7.36			0.10	mg/L	300.0

CLIENT ID: EX			Lab ID: K1802664-002			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	302			25	mg/L	350.1
Nitrate as Nitrogen	1.22			0.10	mg/L	300.0
Nitrite as Nitrogen	0.47			0.10	mg/L	300.0

CLIENT ID: MW-19			Lab ID: K1802664-003			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	150			5.0	mg/L	350.1
Nitrate as Nitrogen	47.8			1.0	mg/L	300.0

CLIENT ID: MW-5			Lab ID: K1802664-004			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Nitrate as Nitrogen	2.63			0.10	mg/L	300.0

CLIENT ID: MW-7			Lab ID: K1802664-005			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	13.4			0.50	mg/L	350.1

CLIENT ID: MW-9			Lab ID: K1802664-006			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Nitrate as Nitrogen	230			5.0	mg/L	300.0

CLIENT ID: MW-7DUP			Lab ID: K1802664-007			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	16.9			0.50	mg/L	350.1

CLIENT ID: MW-19DUP			Lab ID: K1802664-008			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	152			5.0	mg/L	350.1
Nitrate as Nitrogen	46.5			1.0	mg/L	300.0

CLIENT ID: MW-18i			Lab ID: K1802664-009			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Nitrate as Nitrogen	0.75			0.10	mg/L	300.0

CLIENT ID: MW-25i			Lab ID: K1802664-010			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Nitrate as Nitrogen	0.40			0.10	mg/L	300.0

CLIENT ID: MW-23i			Lab ID: K1802664-011			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Nitrate as Nitrogen	0.72			0.10	mg/L	300.0

SAMPLE DETECTION SUMMARY

CLIENT ID: MP-1			Lab ID: K1802664-012			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	7.13			0.50	mg/L	350.1
Nitrate as Nitrogen	37.8			1.0	mg/L	300.0

CLIENT ID: MW-20i			Lab ID: K1802664-013			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	1.01			0.050	mg/L	350.1
Nitrate as Nitrogen	1.06			0.10	mg/L	300.0

CLIENT ID: MW-23s			Lab ID: K1802664-014			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Nitrate as Nitrogen	0.16			0.10	mg/L	300.0

CLIENT ID: MW-21i-105			Lab ID: K1802664-015			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	13.0			2.5	mg/L	350.1
Nitrate as Nitrogen	15.8			1.0	mg/L	300.0
Nitrite as Nitrogen	0.10			0.10	mg/L	300.0

Sample Receipt Information

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Client: Apex Companies, LLC **Service Request:**K1802664
Project: NuStar Van GWM/1126-21

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1802664-001	MW-24i	3/21/2018	1223
K1802664-002	EX	3/21/2018	1145
K1802664-003	MW-19	3/21/2018	1047
K1802664-004	MW-5	3/21/2018	1000
K1802664-005	MW-7	3/21/2018	0908
K1802664-006	MW-9	3/21/2018	0825
K1802664-007	MW-7DUP	3/21/2018	0908
K1802664-008	MW-19DUP	3/21/2018	1047
K1802664-009	MW-18i	3/21/2018	1558
K1802664-010	MW-25i	3/21/2018	1517
K1802664-011	MW-23i	3/21/2018	1417
K1802664-012	MP-1	3/21/2018	1316
K1802664-013	MW-20i	3/21/2018	1630
K1802664-014	MW-23s	3/22/2018	0803
K1802664-015	MW-21i-105	3/22/2018	0858

ALS Environmental

CHAIN OF CUSTODY
87943

001

SR# R1802664

COC Set 1 of 2

COC#

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Project Name: Nustar Van Gum | Project Number: 1126-21
Project Manager: S. SALISBURY
Company: APEX COMPANIES
Address: 3015 SW 1ST AVE, PDX OR
Phone #: 503 924 4704 | email: See comments
Sampler Signature: | Sampler Printed Name: Megan Masterson

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-24i		3-21-18	1223	W	2	X	X	X						
2. EX			1145		2	X	X	X						
3. MW-19			1047		2	X	X	X						
4. MW-5			1000		2	X	X	X						
5. MW-7			0908		2	X	X	X						
6. MW-9			0825		2	X	X	X						
7. MW-70UP			0908		2	X	X	X						
8. MW-19 DUP			1047		2	X	X	X						
9. MW-18i			1558		2	X	X	X						
10. MW-25i			1517		2	X	X	X						

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. CLP Like Summary (no raw data)
___ IV. Data Validation Report
___ V. EDD

Invoice Information

P.O.# 1126-21
Bill To: Apex

Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments: PLEASE EMAIL RESULTS TO: SSALISBURY@APEXCOS.COM

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Megan Masterson	Printed Name:	Printed Name	Printed Name: ALS-K	Printed Name	Printed Name
Firm: Apex	Firm:	Firm	Firm:	Firm	Firm
Date/Time: 3/22/18 0920	Date/Time: 3/22/18 0928	Date/Time	Date/Time: 3-22-18 1300	Date/Time	Date/Time

ALS Environmental

CHAIN OF CUSTODY
87943

001

SR# R1802604

COC Set 2 of 2

COC#

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Project Name	Project Number:
Project Manager	
Company See Page 1	
Address	
Phone #	email
Sampler Signature	Sampler Printed Name: Megan Masterson

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-23i		3-21-18	1417	W	2	X	X	X						
2. MP-1		1	1316		2	X	X	X						
3. MW-20i		1	1430		2	X	X	X						
4. MW-23s		3-22-18	0803		2	X	X	X						
5. MW-21i-105		3-22-18	0858		2	X	X	X						
6.														
7.														
8.														
9.														
10.														

Report Requirements

- ___ I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

Invoice Information

P.O.# 11216-21

Bill To: Apex

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

X Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments: SEE PAGE 1

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name Megan M.	Printed Name	Printed Name	Printed Name DANIEL PRUPTON	Printed Name	Printed Name
Firm Apex	Firm	Firm	Firm ALS-K	Firm	Firm
Date/Time 3/22/18 0920	Date/Time 3/22/18 0925	Date/Time	Date/Time 3-22-18 1300	Date/Time	Date/Time

ALS

PC 414

Cooler Receipt and Preservation Form

Client ALEX Cannabis Service Request K18 02664

Received: 3-22-18 Opened: 3-22-18 By: NSP Unloaded: 3-22-18 By: NSP

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 NA	Tracking Number NA	Filed
2.9	2.8	4.4	4.3	-0.1	386			

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:
MW-32S	~~MW-32S~~ MW-23S	Cummings

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

Notes, Discrepancies, & Resolutions: _____

SHORT HOLD TIME

Miscellaneous Forms

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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.pjlabs.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/anlayte is offered by that state.

Acronyms

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

Client: Apex Companies, LLC **Service Request:** K1802664
Project: NuStar Van GWM/1126-21

Sample Name: MW-24i **Date Collected:** 03/21/18
Lab Code: K1802664-001 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: EX **Date Collected:** 03/21/18
Lab Code: K1802664-002 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-19 **Date Collected:** 03/21/18
Lab Code: K1802664-003 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-5 **Date Collected:** 03/21/18
Lab Code: K1802664-004 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Client: Apex Companies, LLC **Service Request:** K1802664
Project: NuStar Van GWM/1126-21

Sample Name: MW-7 **Date Collected:** 03/21/18
Lab Code: K1802664-005 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-9 **Date Collected:** 03/21/18
Lab Code: K1802664-006 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-7DUP **Date Collected:** 03/21/18
Lab Code: K1802664-007 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-19DUP **Date Collected:** 03/21/18
Lab Code: K1802664-008 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Client: Apex Companies, LLC **Service Request:** K1802664
Project: NuStar Van GWM/1126-21

Sample Name: MW-18i **Date Collected:** 03/21/18
Lab Code: K1802664-009 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-25i **Date Collected:** 03/21/18
Lab Code: K1802664-010 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-23i **Date Collected:** 03/21/18
Lab Code: K1802664-011 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MP-1 **Date Collected:** 03/21/18
Lab Code: K1802664-012 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Client: Apex Companies, LLC **Service Request:** K1802664
Project: NuStar Van GWM/1126-21

Sample Name: MW-20i **Date Collected:** 03/21/18
Lab Code: K1802664-013 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-23s **Date Collected:** 03/22/18
Lab Code: K1802664-014 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-21i-105 **Date Collected:** 03/22/18
Lab Code: K1802664-015 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Results

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

General Chemistry

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Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 12:23
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-24i	**Basis:**	NA
Lab Code:	K1802664-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.687**	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**7.36**	mg/L	0.10	2	03/22/18 17:55	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 17:55	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 11:45
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	EX	**Basis:**	NA
Lab Code:	K1802664-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**302**	mg/L	25	500	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**1.22**	mg/L	0.10	2	03/22/18 18:36	NA	
Nitrite as Nitrogen	300.0	**0.47**	mg/L	0.10	2	03/22/18 18:36	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 10:47
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-19	**Basis:**	NA
Lab Code:	K1802664-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**150**	mg/L	5.0	100	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**47.8**	mg/L	1.0	20	03/22/18 21:48	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 18:46	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 10:00
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-5	**Basis:**	NA
Lab Code:	K1802664-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**2.63**	mg/L	0.10	2	03/22/18 18:56	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 18:56	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 09:08
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-7	**Basis:**	NA
Lab Code:	K1802664-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**13.4**	mg/L	0.50	10	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 19:06	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 19:06	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 08:25
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-9	**Basis:**	NA
Lab Code:	K1802664-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**230**	mg/L	5.0	100	03/22/18 23:01	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 19:16	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 09:08
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-7DUP	**Basis:**	NA
Lab Code:	K1802664-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**16.9**	mg/L	0.50	10	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 21:38	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 21:38	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 10:47
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-19DUP	**Basis:**	NA
Lab Code:	K1802664-008		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**152**	mg/L	5.0	100	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**46.5**	mg/L	1.0	20	03/22/18 23:21	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:47	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 15:58
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-18i	**Basis:**	NA
Lab Code:	K1802664-009		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**0.75**	mg/L	0.10	2	03/22/18 20:57	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:57	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 15:17
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-25i	**Basis:**	NA
Lab Code:	K1802664-010		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**0.40**	mg/L	0.10	2	03/22/18 20:07	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:07	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 14:17
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-23i	**Basis:**	NA
Lab Code:	K1802664-011		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**0.72**	mg/L	0.10	2	03/22/18 20:17	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:17	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 13:16
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MP-1	**Basis:**	NA
Lab Code:	K1802664-012		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**7.13**	mg/L	0.50	10	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**37.8**	mg/L	1.0	20	03/22/18 23:31	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:27	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 16:30
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-20i	**Basis:**	NA
Lab Code:	K1802664-013		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**1.01**	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**1.06**	mg/L	0.10	2	03/22/18 20:37	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:37	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 08:03
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-23s	**Basis:**	NA
Lab Code:	K1802664-014		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**0.16**	mg/L	0.10	2	03/22/18 21:08	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 21:08	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 08:58
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-21i-105	**Basis:**	NA
Lab Code:	K1802664-015		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**13.0**	mg/L	2.5	50	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**15.8**	mg/L	1.0	20	03/22/18 23:51	NA	
Nitrite as Nitrogen	300.0	**0.10**	mg/L	0.10	2	03/22/18 21:18	NA	

QC Summary Forms

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

General Chemistry

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

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1802664-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	03/22/18 17:25	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	03/22/18 17:25	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1802664-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	03/23/18 01:44	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	03/23/18 01:44	

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

Service Request:K1802664
Date Collected:03/21/18
Date Received:03/22/18
Date Analyzed:03/22/18 - 04/04/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MW-24i
Lab Code: K1802664-001

Units:mg/L
Basis:NA

			Matrix Spike K1802664-001MS			Duplicate Matrix Spike K1802664-001DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	350.1	0.687	1.60	1.00	92	1.64	1.00	96	75-125	3	20
Nitrate as Nitrogen	300.0	7.36	16.4	8.00	113 *	16.4	8.00	113 *	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	8.46	8.00	106	8.47	8.00	106	90-110	<1	20

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

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

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

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QA/QC Report

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

Service Request:K1802664
Date Collected:03/21/18
Date Received:03/22/18
Date Analyzed:3/23/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MW-7
Lab Code: K1802664-005

Units:mg/L
Basis:NA

			Matrix Spike K1802664-005MS			Duplicate Matrix Spike K1802664-005DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	300.0	ND U	8.60	8.00	107	8.63	8.00	108	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	8.42	8.00	105	8.45	8.00	106	90-110	<1	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18
Sample Matrix:	Water	**Date Received:**	03/22/18
		Date Analyzed:	04/4/18
		Date Extracted:	04/4/18

Duplicate Matrix Spike Summary
Ammonia as Nitrogen

Sample Name:	MW-25i	**Units:**	mg/L
Lab Code:	K1802664-010	**Basis:**	NA
Analysis Method:	350.1		
Prep Method:	Method		

		Matrix Spike				Duplicate Matrix Spike					
		K1802664-010MS				K1802664-010DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	ND U	0.988	1.00	99	0.961	1.00	96	75-125	3	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18
Sample Matrix:	Water	**Date Received:**	03/22/18
		Date Analyzed:	03/22/18 - 04/04/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-24i	**Units:**	mg/L
Lab Code:	K1802664-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1802664-001DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	0.687	0.652	0.670	5	20
Nitrate as Nitrogen	300.0	0.10	7.36	7.31	7.34	<1	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

ALS Group USA, Corp.

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QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18
Sample Matrix:	Water	**Date Received:**	03/22/18
		Date Analyzed:	03/23/18

Replicate Sample Summary

General Chemistry Parameters

Sample Name:	MW-7	**Units:**	mg/L
Lab Code:	K1802664-005	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1802664-005DUP Result	Average	RPD	RPD Limit
Nitrate as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

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QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18
Sample Matrix:	Water	**Date Received:**	03/22/18
		Date Analyzed:	04/04/18

Replicate Sample Summary

General Chemistry Parameters

Sample Name:	MW-25i	**Units:**	mg/L
Lab Code:	K1802664-010	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1802664-010DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	ND U	ND U	NC	NC	20

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

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

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

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

Service Request: K1802664
Date Analyzed: 03/22/18 - 04/04/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1802664-LCS1

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.02	6.17	97	85-115
Nitrate as Nitrogen	300.0	2.68	2.50	107	90-110
Nitrite as Nitrogen	300.0	2.58	2.50	103	90-110

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

Service Request: K1802664
Date Analyzed: 03/23/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1802664-LCS2

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Nitrate as Nitrogen	300.0	2.67	2.50	107	90-110
Nitrite as Nitrogen	300.0	2.58	2.50	103	90-110

July 19, 2018 Revised Service Request No:K1802664.01

Kelsi Evans
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201-4707

Laboratory Results for: NuStar Van GWM

Dear Kelsi,

Enclosed is the revised report for the sample(s) submitted to our laboratory Marach 22, 2018. For your reference, these analyses have been assigned our service request number K1802664.

The sample ID for -014 has been corrected.

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

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

REVISED
9:47 am, Jul 19, 2018

Narrative Documents

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

REVISED
10:23 am, Jul 19, 2018

Client: Apex Companies, LLC
Project: NuStar Van GWM
Sample Matrix: Water

Service Request: K1802664
Date Received: 03/22/2018

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:

Fifteen water samples were received for analysis at ALS Environmental on 03/22/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

Method 300.0, 03/22/2018:The matrix spike recovery of Nitrate as Nitrogen for sample MW-24i were outside control criteria because of suspected matrix interference. As a result of the interference, the results for this analyte contained a potential high bias. No further corrective action was taken.

Approved by Noe D. Dan Date 07/19/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-24i			Lab ID: K1802664-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.687			0.050	mg/L	350.1
Nitrate as Nitrogen	7.36			0.10	mg/L	300.0

CLIENT ID: EX			Lab ID: K1802664-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	302			25	mg/L	350.1
Nitrate as Nitrogen	1.22			0.10	mg/L	300.0
Nitrite as Nitrogen	0.47			0.10	mg/L	300.0

CLIENT ID: MW-19			Lab ID: K1802664-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	150			5.0	mg/L	350.1
Nitrate as Nitrogen	47.8			1.0	mg/L	300.0

CLIENT ID: MW-5			Lab ID: K1802664-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	2.63			0.10	mg/L	300.0

CLIENT ID: MW-7			Lab ID: K1802664-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	13.4			0.50	mg/L	350.1

CLIENT ID: MW-9			Lab ID: K1802664-006			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	230			5.0	mg/L	300.0

CLIENT ID: MW-7DUP			Lab ID: K1802664-007			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	16.9			0.50	mg/L	350.1

CLIENT ID: MW-19DUP			Lab ID: K1802664-008			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	152			5.0	mg/L	350.1
Nitrate as Nitrogen	46.5			1.0	mg/L	300.0

CLIENT ID: MW-18i			Lab ID: K1802664-009			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	0.75			0.10	mg/L	300.0

CLIENT ID: MW-25i			Lab ID: K1802664-010			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	0.40			0.10	mg/L	300.0

CLIENT ID: MW-23i			Lab ID: K1802664-011			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	0.72			0.10	mg/L	300.0

SAMPLE DETECTION SUMMARY

CLIENT ID: MP-1			Lab ID: K1802664-012			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	7.13			0.50	mg/L	350.1
Nitrate as Nitrogen	37.8			1.0	mg/L	300.0

CLIENT ID: MW-20i			Lab ID: K1802664-013			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	1.01			0.050	mg/L	350.1
Nitrate as Nitrogen	1.06			0.10	mg/L	300.0

CLIENT ID: MW-32s			Lab ID: K1802664-014			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	0.16			0.10	mg/L	300.0

CLIENT ID: MW-21i-105			Lab ID: K1802664-015			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	13.0			2.5	mg/L	350.1
Nitrate as Nitrogen	15.8			1.0	mg/L	300.0
Nitrite as Nitrogen	0.10			0.10	mg/L	300.0

Sample Receipt Information

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

REVISED
10:23 am, Jul 19, 2018

Client: Apex Companies, LLC **Service Request:**K1802664
Project: NuStar Van GWM/1126-21

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1802664-001	MW-24i	3/21/2018	1223
K1802664-002	EX	3/21/2018	1145
K1802664-003	MW-19	3/21/2018	1047
K1802664-004	MW-5	3/21/2018	1000
K1802664-005	MW-7	3/21/2018	0908
K1802664-006	MW-9	3/21/2018	0825
K1802664-007	MW-7DUP	3/21/2018	0908
K1802664-008	MW-19DUP	3/21/2018	1047
K1802664-009	MW-18i	3/21/2018	1558
K1802664-010	MW-25i	3/21/2018	1517
K1802664-011	MW-23i	3/21/2018	1417
K1802664-012	MP-1	3/21/2018	1316
K1802664-013	MW-20i	3/21/2018	1630
K1802664-014	MW-32s	3/22/2018	0803
K1802664-015	MW-21i-105	3/22/2018	0858

ALS Environmental

CHAIN OF CUSTODY
87943

001

SR# R1802664

COC Set 1 of 2

COC#

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

Project Name: Nustar Van Gum | Project Number: 1126-21
Project Manager: S. SALISBURY
Company: APEX COMPANIES
Address: 3015 SW 1ST AVE, PDX OR
Phone #: 503 924 4704 | email: See comments
Sampler Signature: | Sampler Printed Name: Megan Masterson

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-24i		3-21-18	1223	W	2	X	X	X						
2. EX			1145		2	X	X	X						
3. MW-19			1047		2	X	X	X						
4. MW-5			1000		2	X	X	X						
5. MW-7			0908		2	X	X	X						
6. MW-9			0825		2	X	X	X						
7. MW-70UP			0908		2	X	X	X						
8. MW-19 DUP			1047		2	X	X	X						
9. MW-18i			1558		2	X	X	X						
10. MW-25i			1517		2	X	X	X						

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. CLP Like Summary (no raw data)
___ IV. Data Validation Report
___ V. EDD

Invoice Information

P.O.# 1126-21
Bill To: Apex

Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments: PLEASE EMAIL RESULTS TO: SSALISBURY@APEXCOS.COM

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Megan Masterson	Printed Name:	Printed Name	Printed Name: ALS-K	Printed Name	Printed Name
Firm: Apex	Firm:	Firm	Firm:	Firm	Firm
Date/Time: 3/22/18 0920	Date/Time: 3/22/18 0928	Date/Time	Date/Time: 3-22-18 1300	Date/Time	Date/Time

ALS Environmental

CHAIN OF CUSTODY
87943

001

SR# R1802604

COC Set 2 of 2

COC#

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

Project Name	Project Number:
Project Manager	
Company See Page 1	
Address	
Phone #	email
Sampler Signature	Sampler Printed Name: Megan Masterson

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-23i		3-21-18	1417	W	2	X	X	X						
2. MP-1		1	1316		2	X	X	X						
3. MW-20i		1	1430		2	X	X	X						
4. MW-23s		3-22-18	0803		2	X	X	X						
5. MW-21i-105		3-22-18	0858		2	X	X	X						
6.														
7.														
8.														
9.														
10.														

Report Requirements

- ___ I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

Invoice Information

P.O.# 11216-21

Bill To: Apex

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

X Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments: SEE PAGE 1

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name Megan M.	Printed Name	Printed Name	Printed Name DANIEL PRUPTON	Printed Name	Printed Name
Firm Apex	Firm	Firm	Firm ALS-K	Firm	Firm
Date/Time 3/22/18 0920	Date/Time 3/22/18 0925	Date/Time	Date/Time 3-22-18 1300	Date/Time	Date/Time

ALS

PC 414

Cooler Receipt and Preservation Form

Client ALEX Cannabis Service Request K18 02664

Received: 3-22-18 Opened: 3-22-18 By: NSP Unloaded: 3-22-18 By: NSP

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 NA	Tracking Number NA	Filed
2.9	2.8	4.4	4.3	-0.1	386			

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:
MW-32S	~~MW-32S~~ MW-23S	Cummings

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

Notes, Discrepancies, & Resolutions: _____

SHORT HOLD TIME

Miscellaneous Forms

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

REVISED
10:22 am, Jul 19, 2018

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.pjlabs.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/anlayte is offered by that state.

Acronyms

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

Client: Apex Companies, LLC **Service Request:** K1802664
Project: NuStar Van GWM/1126-21

Sample Name: MW-24i **Date Collected:** 03/21/18
Lab Code: K1802664-001 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: EX **Date Collected:** 03/21/18
Lab Code: K1802664-002 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-19 **Date Collected:** 03/21/18
Lab Code: K1802664-003 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-5 **Date Collected:** 03/21/18
Lab Code: K1802664-004 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Client: Apex Companies, LLC **Service Request:** K1802664
Project: NuStar Van GWM/1126-21

Sample Name: MW-7 **Date Collected:** 03/21/18
Lab Code: K1802664-005 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-9 **Date Collected:** 03/21/18
Lab Code: K1802664-006 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-7DUP **Date Collected:** 03/21/18
Lab Code: K1802664-007 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-19DUP **Date Collected:** 03/21/18
Lab Code: K1802664-008 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Client: Apex Companies, LLC **Service Request:** K1802664
Project: NuStar Van GWM/1126-21

Sample Name: MW-18i **Date Collected:** 03/21/18
Lab Code: K1802664-009 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-25i **Date Collected:** 03/21/18
Lab Code: K1802664-010 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MW-23i **Date Collected:** 03/21/18
Lab Code: K1802664-011 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name: MP-1 **Date Collected:** 03/21/18
Lab Code: K1802664-012 **Date Received:** 03/22/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21		

Sample Name:	MW-20i	**Date Collected:**	03/21/18
Lab Code:	K1802664-013	**Date Received:**	03/22/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name:	MW-32s	**Date Collected:**	03/22/18
Lab Code:	K1802664-014	**Date Received:**	03/22/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Name:	MW-21i-105	**Date Collected:**	03/22/18
Lab Code:	K1802664-015	**Date Received:**	03/22/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		NLEE
350.1	ABUVEL	ABUVEL

Sample Results

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REVISED
10:22 am, Jul 19, 2018

General Chemistry

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Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 12:23
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-24i	**Basis:**	NA
Lab Code:	K1802664-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.687**	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**7.36**	mg/L	0.10	2	03/22/18 17:55	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 17:55	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 11:45
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	EX	**Basis:**	NA
Lab Code:	K1802664-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**302**	mg/L	25	500	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**1.22**	mg/L	0.10	2	03/22/18 18:36	NA	
Nitrite as Nitrogen	300.0	**0.47**	mg/L	0.10	2	03/22/18 18:36	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 10:47
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-19	**Basis:**	NA
Lab Code:	K1802664-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**150**	mg/L	5.0	100	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**47.8**	mg/L	1.0	20	03/22/18 21:48	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 18:46	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 10:00
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-5	**Basis:**	NA
Lab Code:	K1802664-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**2.63**	mg/L	0.10	2	03/22/18 18:56	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 18:56	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 09:08
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-7	**Basis:**	NA
Lab Code:	K1802664-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**13.4**	mg/L	0.50	10	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 19:06	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 19:06	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 08:25
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-9	**Basis:**	NA
Lab Code:	K1802664-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**230**	mg/L	5.0	100	03/22/18 23:01	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 19:16	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 09:08
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-7DUP	**Basis:**	NA
Lab Code:	K1802664-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**16.9**	mg/L	0.50	10	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 21:38	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 21:38	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 10:47
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-19DUP	**Basis:**	NA
Lab Code:	K1802664-008		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**152**	mg/L	5.0	100	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**46.5**	mg/L	1.0	20	03/22/18 23:21	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:47	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 15:58
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-18i	**Basis:**	NA
Lab Code:	K1802664-009		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**0.75**	mg/L	0.10	2	03/22/18 20:57	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:57	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 15:17
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-25i	**Basis:**	NA
Lab Code:	K1802664-010		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**0.40**	mg/L	0.10	2	03/22/18 20:07	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:07	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 14:17
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-23i	**Basis:**	NA
Lab Code:	K1802664-011		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**0.72**	mg/L	0.10	2	03/22/18 20:17	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:17	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 13:16
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MP-1	**Basis:**	NA
Lab Code:	K1802664-012		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**7.13**	mg/L	0.50	10	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**37.8**	mg/L	1.0	20	03/22/18 23:31	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:27	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18 16:30
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-20i	**Basis:**	NA
Lab Code:	K1802664-013		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**1.01**	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**1.06**	mg/L	0.10	2	03/22/18 20:37	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 20:37	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 08:03
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-32s	**Basis:**	NA
Lab Code:	K1802664-014		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**0.16**	mg/L	0.10	2	03/22/18 21:08	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/22/18 21:08	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 08:58
Sample Matrix:	Water	**Date Received:**	03/22/18 13:00
Sample Name:	MW-21i-105	**Basis:**	NA
Lab Code:	K1802664-015		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**13.0**	mg/L	2.5	50	04/04/18 19:12	04/04/18	
Nitrate as Nitrogen	300.0	**15.8**	mg/L	1.0	20	03/22/18 23:51	NA	
Nitrite as Nitrogen	300.0	**0.10**	mg/L	0.10	2	03/22/18 21:18	NA	

QC Summary Forms

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1317 South 13th Avenue, Kelso, WA 98626
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General Chemistry

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Phone (360) 577-7222 Fax (360) 425-9096
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Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1802664-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	03/22/18 17:25	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	03/22/18 17:25	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1802664-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	03/23/18 01:44	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	03/23/18 01:44	

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QA/QC Report

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

Service Request:K1802664
Date Collected:03/21/18
Date Received:03/22/18
Date Analyzed:03/22/18 - 04/04/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MW-24i
Lab Code: K1802664-001

Units:mg/L
Basis:NA

			Matrix Spike K1802664-001MS			Duplicate Matrix Spike K1802664-001DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	350.1	0.687	1.60	1.00	92	1.64	1.00	96	75-125	3	20
Nitrate as Nitrogen	300.0	7.36	16.4	8.00	113 *	16.4	8.00	113 *	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	8.46	8.00	106	8.47	8.00	106	90-110	<1	20

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

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

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

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QA/QC Report

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

Service Request:K1802664
Date Collected:03/21/18
Date Received:03/22/18
Date Analyzed:3/23/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MW-7
Lab Code: K1802664-005

Units:mg/L
Basis:NA

			Matrix Spike K1802664-005MS			Duplicate Matrix Spike K1802664-005DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	300.0	ND U	8.60	8.00	107	8.63	8.00	108	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	8.42	8.00	105	8.45	8.00	106	90-110	<1	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18
Sample Matrix:	Water	**Date Received:**	03/22/18
		Date Analyzed:	04/4/18
		Date Extracted:	04/4/18

Duplicate Matrix Spike Summary
Ammonia as Nitrogen

Sample Name:	MW-25i	**Units:**	mg/L
Lab Code:	K1802664-010	**Basis:**	NA
Analysis Method:	350.1		
Prep Method:	Method		

		Matrix Spike			Duplicate Matrix Spike					
		K1802664-010MS			K1802664-010DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	ND U	0.988	1.00	99	0.961	1.00	96	75-125	3	20

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

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

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

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QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18
Sample Matrix:	Water	**Date Received:**	03/22/18
		Date Analyzed:	03/22/18 - 04/04/18

Replicate Sample Summary

General Chemistry Parameters

Sample Name:	MW-24i	**Units:**	mg/L
Lab Code:	K1802664-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1802664-001DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	0.687	0.652	0.670	5	20
Nitrate as Nitrogen	300.0	0.10	7.36	7.31	7.34	<1	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18
Sample Matrix:	Water	**Date Received:**	03/22/18
		Date Analyzed:	03/23/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-7	**Units:**	mg/L
Lab Code:	K1802664-005	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1802664-005DUP Result	Average	RPD	RPD Limit
Nitrate as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

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QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802664
Project	NuStar Van GWM/1126-21	**Date Collected:**	03/21/18
Sample Matrix:	Water	**Date Received:**	03/22/18
		Date Analyzed:	04/04/18

Replicate Sample Summary

General Chemistry Parameters

Sample Name:	MW-25i	**Units:**	mg/L
Lab Code:	K1802664-010	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1802664-010DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	ND U	ND U	NC	NC	20

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

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

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

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

Service Request: K1802664
Date Analyzed: 03/22/18 - 04/04/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1802664-LCS1

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.02	6.17	97	85-115
Nitrate as Nitrogen	300.0	2.68	2.50	107	90-110
Nitrite as Nitrogen	300.0	2.58	2.50	103	90-110

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

Service Request: K1802664
Date Analyzed: 03/23/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1802664-LCS2

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Nitrate as Nitrogen	300.0	2.67	2.50	107	90-110
Nitrite as Nitrogen	300.0	2.58	2.50	103	90-110

April 11, 2018 Service Request No:K1802744

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

Laboratory Results for: NuStar Van GWM

Dear Stephanie,

Enclosed are the results of the sample(s) submitted to our laboratory March 23, 2018
For your reference, these analyses have been assigned our service request number **K1802744.**

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

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

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
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Client: Apex Companies, LLC
Project: NuStar Van GWM
Sample Matrix: Water

Service Request: K1802744
Date Received: 03/23/2018

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:

Eight water samples were received for analysis at ALS Environmental on 03/23/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 04/11/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-21i-40			Lab ID: K1802744-001			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	0.071			0.050	mg/L	350.1
Nitrate as Nitrogen	1.70			0.10	mg/L	300.0

CLIENT ID: MW-22i			Lab ID: K1802744-002			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	1.25			0.050	mg/L	350.1
Nitrate as Nitrogen	0.63			0.10	mg/L	300.0

CLIENT ID: MGMS3-40			Lab ID: K1802744-003			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	1.55			0.050	mg/L	350.1

CLIENT ID: MGMS2-40			Lab ID: K1802744-004			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	84.2			2.5	mg/L	350.1

CLIENT ID: MGMS3-60			Lab ID: K1802744-005			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	0.272			0.050	mg/L	350.1
Nitrate as Nitrogen	0.39			0.10	mg/L	300.0

CLIENT ID: MGMS1-60			Lab ID: K1802744-006			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	0.054			0.050	mg/L	350.1
Nitrate as Nitrogen	3.18			0.10	mg/L	300.0

CLIENT ID: MGMS1-43			Lab ID: K1802744-007			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	214			25	mg/L	350.1

CLIENT ID: MGMS2-60			Lab ID: K1802744-008			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen	0.153			0.050	mg/L	350.1
Nitrate as Nitrogen	0.68			0.10	mg/L	300.0

Sample Receipt Information

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

Client: Apex Companies, LLC **Service Request:**K1802744

Project: NuStar Van GWM/1126-21

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1802744-001	MW-21i-40	3/22/2018	0945
K1802744-002	MW-22i	3/22/2018	1036
K1802744-003	MGMS3-40	3/22/2018	1211
K1802744-004	MGMS2-40	3/22/2018	1311
K1802744-005	MGMS3-60	3/22/2018	1146
K1802744-006	MGMS1-60	3/22/2018	1350
K1802744-007	MGMS1-43	3/22/2018	1421
K1802744-008	MGMS2-60	3/22/2018	1245

ALS Environmental

CHAIN OF CUSTODY
87943

001

SR# Y1802744

COC Set 1 of 1

COC#

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

Project Name	NuStar Van Gwm
Project Number	1126-21
Project Manager	STEPHANIE SALISBURY
Company	APEX COMPANIES
Address	3015 SW 1st AVE, PDX, OR
Phone #	503 924 4704
email	See comment box
Sampler Signature	
Sampler Printed Name	Megan Masterson

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-21 - 40		3-22-18	0945											
2. MW-22			1036											
3. MGMS3-40			1211											
4. MGMS2 - 40			1311											
5. MGMS3-60			1146											
6. MGMS1-60			1350											
7. MGMS1-43			1421											
8. MGMS2-60			1245											
9.														
10.														

Report Requirements

- ___ I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

Invoice Information

P.O.#

Bill To:

Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments: PLEASE EMAIL RESULTS TO: SSALISBURY@APEXCOS.COM

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

[@LAB]

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature: Shauna Murphy	Signature:	Signature	Signature: Cody Graves	Signature	Signature
Printed Name: Shauna C. Murphy	Printed Name:	Printed Name	Printed Name:	Printed Name	Printed Name
Firm: Apex Companies	Firm:	Firm	Firm:	Firm	Firm
Date/Time: 3.22.2018	Date/Time: 3/23/18 1015	Date/Time	Date/Time: 3/23/18 1445	Date/Time	Date/Time

PC MH

Cooler Receipt and Preservation Form

Client Apex Service Request K1802744

Received: 3/23/18 Opened: 3/23/18 By: [illegible] Unloaded: 3/23/18 By: [illegible]

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 NA	Tracking Number NA	Filed
0.7	0.6	5.6	5.5	-0.1	322	87943		

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* [illegible]
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
MW 22 I	125 Sulfuric				x	H2SO4	1/2 mL	Gen P/L 17-1	KM	1500
MW 22D	125 Sulfuric				x	H2SO4	1/2 mL	Gen P/L 17-1	KM	1500

Notes, Discrepancies, & Resolutions: Client did not specify analysis requested on the COC.

SHORT HOLD TIME

Miscellaneous Forms

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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.pjlabs.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/anlayte is offered by that state.

Acronyms

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

Client: Apex Companies, LLC **Service Request:** K1802744
Project: NuStar Van GWM/1126-21

Sample Name: MW-21i-40 **Date Collected:** 03/22/18
Lab Code: K1802744-001 **Date Received:** 03/23/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	ABUVEL	ABUVEL

Sample Name: MW-22i **Date Collected:** 03/22/18
Lab Code: K1802744-002 **Date Received:** 03/23/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	ABUVEL	ABUVEL

Sample Name: MGMS3-40 **Date Collected:** 03/22/18
Lab Code: K1802744-003 **Date Received:** 03/23/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	ABUVEL	ABUVEL

Sample Name: MGMS2-40 **Date Collected:** 03/22/18
Lab Code: K1802744-004 **Date Received:** 03/23/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	ABUVEL	ABUVEL

Client: Apex Companies, LLC **Service Request:** K1802744
Project: NuStar Van GWM/1126-21

Sample Name: MGMS3-60 **Date Collected:** 03/22/18
Lab Code: K1802744-005 **Date Received:** 03/23/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	ABUVEL	ABUVEL

Sample Name: MGMS1-60 **Date Collected:** 03/22/18
Lab Code: K1802744-006 **Date Received:** 03/23/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	ABUVEL	ABUVEL

Sample Name: MGMS1-43 **Date Collected:** 03/22/18
Lab Code: K1802744-007 **Date Received:** 03/23/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	ABUVEL	ABUVEL

Sample Name: MGMS2-60 **Date Collected:** 03/22/18
Lab Code: K1802744-008 **Date Received:** 03/23/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	ABUVEL	ABUVEL

Sample Results

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General Chemistry

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Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 09:45
Sample Matrix:	Water	**Date Received:**	03/23/18 14:15
Sample Name:	MW-21i-40	**Basis:**	NA
Lab Code:	K1802744-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.071**	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**1.70**	mg/L	0.10	2	03/23/18 21:10	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 21:10	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 10:36
Sample Matrix:	Water	**Date Received:**	03/23/18 14:15
Sample Name:	MW-22i	**Basis:**	NA
Lab Code:	K1802744-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**1.25**	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	**0.63**	mg/L	0.10	2	03/23/18 21:21	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 21:21	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 12:11
Sample Matrix:	Water	**Date Received:**	03/23/18 14:15
Sample Name:	MGMS3-40	**Basis:**	NA
Lab Code:	K1802744-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**1.55**	mg/L	0.050	1	04/05/18 12:29	04/05/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 17:34	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 17:34	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 13:11
Sample Matrix:	Water	**Date Received:**	03/23/18 14:15
Sample Name:	MGMS2-40	**Basis:**	NA
Lab Code:	K1802744-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**84.2**	mg/L	2.5	50	04/05/18 18:37	04/05/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 17:44	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 17:44	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 11:46
Sample Matrix:	Water	**Date Received:**	03/23/18 14:15
Sample Name:	MGMS3-60	**Basis:**	NA
Lab Code:	K1802744-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.272**	mg/L	0.050	1	04/05/18 12:29	04/05/18	
Nitrate as Nitrogen	300.0	**0.39**	mg/L	0.10	2	03/23/18 17:55	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 17:55	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 13:50
Sample Matrix:	Water	**Date Received:**	03/23/18 14:15
Sample Name:	MGMS1-60	**Basis:**	NA
Lab Code:	K1802744-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.054**	mg/L	0.050	1	04/05/18 12:29	04/05/18	
Nitrate as Nitrogen	300.0	**3.18**	mg/L	0.10	2	03/23/18 18:06	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 18:06	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 14:21
Sample Matrix:	Water	**Date Received:**	03/23/18 14:15
Sample Name:	MGMS1-43	**Basis:**	NA
Lab Code:	K1802744-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**214**	mg/L	25	500	04/05/18 12:29	04/05/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 16:30	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 16:30	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18 12:45
Sample Matrix:	Water	**Date Received:**	03/23/18 14:15
Sample Name:	MGMS2-60	**Basis:**	NA
Lab Code:	K1802744-008		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.153**	mg/L	0.050	1	04/05/18 12:29	04/05/18	
Nitrate as Nitrogen	300.0	**0.68**	mg/L	0.10	2	03/23/18 15:48	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	03/23/18 15:48	NA	

QC Summary Forms

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General Chemistry

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Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1802744-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/04/18 10:05	04/04/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	03/23/18 13:24	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	03/23/18 13:24	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1802744-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	04/05/18 12:29	04/05/18	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request:K1802744
Date Collected:03/22/18
Date Received:03/23/18
Date Analyzed:3/23/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MGMS2-60
Lab Code: K1802744-008

Units:mg/L
Basis:NA

			Matrix Spike K1802744-008MS			Duplicate Matrix Spike K1802744-008DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	300.0	0.68	8.70	8.00	100	8.78	8.00	101	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	7.87	8.00	98	7.96	8.00	100	90-110	1	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project	NuStar Van GWM/1126-21	**Date Collected:**	03/22/18
Sample Matrix:	Water	**Date Received:**	03/23/18
		Date Analyzed:	03/23/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MGMS2-60	**Units:**	mg/L
Lab Code:	K1802744-008	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1802744-008DUP Result	Average	RPD	RPD Limit
Nitrate as Nitrogen	300.0	0.10	0.68	0.68	0.679	<1	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

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

Service Request: K1802744
Date Analyzed: 03/23/18 - 04/04/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1802744-LCS1

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.02	6.17	97	85-115
Nitrate as Nitrogen	300.0	2.52	2.50	101	90-110
Nitrite as Nitrogen	300.0	2.43	2.50	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1802744
Project:	NuStar Van GWM/1126-21	**Date Analyzed:**	04/05/18
Sample Matrix:	Water	**Date Extracted:**	04/05/18

Lab Control Sample Summary
Ammonia as Nitrogen

Analysis Method:	350.1	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	586224

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1802744-LCS2	6.36	6.17	103	85-115

July 12, 2018 Service Request No:K1806113

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

Laboratory Results for: NuStar Vancouver

Dear Stephanie,

Enclosed are the results of the sample(s) submitted to our laboratory June 28, 2018
For your reference, these analyses have been assigned our service request number **K1806113.**

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

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

Narrative Documents

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

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

Service Request: K1806113
Date Received: 06/28/2018

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:

One ground water sample was received for analysis at ALS Environmental on 06/28/2018. The sample was received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Davis Date 07/12/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-24D			Lab ID: K1806113-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.160			0.050	mg/L	350.1

Sample Receipt Information

ALS Environmental—Kelso Laboratory
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Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Apex Companies, LLC **Service Request:**K1806113
Project: NuStar Vancouver/1126-21

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1806113-001	MW-24D	6/27/2018	1420

ALS Environmental — Vancouver / Kelso

CHAIN OF CUSTODY
90562

001

SR# K1806013

COC Set 1 of 1

COC#

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

Project Name	NuStar
Project Number	1126-21
Project Manager	Stephanie Bosze-Salisbury
Company	Apex Companies
Address	3015 SW 1st Ave, Portland, OR
Phone #	
email	Kelsi.Evans@apexcos.com
Sampler Signature	
Sampler Printed Name	Jake Munsey

CLIENT SAMPLE ID	LABID	SAMPLING Date	Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-24D		6/27/18	1420	GW			X	X						
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.# 1126-21

Bill To:

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

___ Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By: @ LAB	Received By: @ LAB	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Jake Munsey	Printed Name: HW	Printed Name: BHuman	Printed Name: Cody Graves	Printed Name	Printed Name
Firm: Apex Companies	Firm: 6/28/18 0815	Firm: HW	Firm: ALS 6/28/18 1200	Firm	Firm
Date/Time: 6/28/18	Date/Time	Date/Time: 6/28/18 1200	Date/Time	Date/Time	Date/Time

PC MH

Cooler Receipt and Preservation Form

Client Apex Service Request *K18* 06113

Received: 6/28/18 Opened: 6/28/18 By: CG Unloaded: 6/28/18 By: CG

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 NA	Tracking Number NA	Filed
0.0	-0.1	—	—	-0.1	371	90562		

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:*_____

SHORT HOLD TIME

Miscellaneous Forms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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.pjlabs.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/anlayte is offered by that state.

Acronyms

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

Client:	Apex Companies, LLC	**Service Request:**	K1806113
Project:	NuStar Vancouver/1126-21		

Sample Name:	MW-24D	**Date Collected:**	06/27/18
Lab Code:	K1806113-001	**Date Received:**	06/28/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
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General Chemistry

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1317 South 13th Avenue, Kelso, WA 98626
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www.alsglobal.com

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806113
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/27/18 14:20
Sample Matrix:	Ground Water	**Date Received:**	06/28/18 12:00
Sample Name:	MW-24D	**Basis:**	NA
Lab Code:	K1806113-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.160**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	06/28/18 16:47	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	06/28/18 16:47	NA	

QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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General Chemistry

ALS Environmental—Kelso Laboratory
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Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806113
Project:	NuStar Vancouver/1126-21	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806113-MB		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	06/28/18 10:34	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	06/28/18 10:34	NA	

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

Service Request: K1806113
Date Analyzed: 06/28/18 - 07/06/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1806113-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.39	6.17	103	85-115
Nitrate as Nitrogen	300.0	2.57	2.50	103	90-110
Nitrite as Nitrogen	300.0	2.51	2.50	100	90-110

July 19, 2018 Service Request No:K1806163

Kelsi Evans
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201-4707

Laboratory Results for: NuStar Vancouver

Dear Kelsi,

Enclosed are the results of the sample(s) submitted to our laboratory June 29, 2018
For your reference, these analyses have been assigned our service request number **K1806163.**

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

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

Narrative Documents

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

ALS Environmental

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

Service Request: K1806163
Date Received: 06/29/2018

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:

Eleven ground water samples were received for analysis at ALS Environmental on 06/29/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

Nitrite as Nitrogen by Method 300.0: Samples MW-14, MW-17, MW-24i, EX-1, MW-19, S-1, S-2, MP-1 and MP-3 were initially analyzed within the holding time, however they were over diluted. They were rediluted and reanalyzed past the holding time. The data was flagged to indicate the holding time violation.

Nitrate as Nitrogen by Method 300.0: Samples MW-14, MW-17, MW-19 and MP-3 were initially analyzed within the holding time, however they required differing dilutions. They were rediluted and reanalyzed past the holding time. The data was flagged to indicate the holding time violation.

Approved by Noe D. Davis Date 07/19/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-14			Lab ID: K1806163-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	31.6			2.5	mg/L	350.1
Nitrate as Nitrogen	104			2.5	mg/L	300.0

CLIENT ID: MW-23i			Lab ID: K1806163-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	0.53			0.10	mg/L	300.0

CLIENT ID: MW-17			Lab ID: K1806163-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	7.84			0.10	mg/L	300.0

CLIENT ID: MW-24i			Lab ID: K1806163-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	2.37			0.10	mg/L	300.0

CLIENT ID: EX-1			Lab ID: K1806163-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	119			10	mg/L	350.1

CLIENT ID: MW-19			Lab ID: K1806163-006			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	194			5.0	mg/L	350.1

CLIENT ID: S-1			Lab ID: K1806163-007			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	3.02			0.25	mg/L	300.0

CLIENT ID: S-2			Lab ID: K1806163-008			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	8.05			0.25	mg/L	350.1
Nitrate as Nitrogen	3.28			0.10	mg/L	300.0
Nitrite as Nitrogen	0.054			0.050	mg/L	300.0

CLIENT ID: MP-1			Lab ID: K1806163-009			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	8.71			0.50	mg/L	350.1
Nitrate as Nitrogen	38.2			0.50	mg/L	300.0

CLIENT ID: MP-3			Lab ID: K1806163-010			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	18.8			0.50	mg/L	350.1
Nitrate as Nitrogen	138			0.10	mg/L	300.0
Nitrite as Nitrogen	0.42			0.10	mg/L	300.0

Sample Receipt Information

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

Client: Apex Companies, LLC **Service Request:**K1806163
Project: NuStar Vancouver/1126

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1806163-001	MW-14	6/28/2018	1639
K1806163-002	MW-23i	6/28/2018	1550
K1806163-003	MW-17	6/28/2018	1502
K1806163-004	MW-24i	6/28/2018	1106
K1806163-005	EX-1	6/28/2018	0953
K1806163-006	MW-19	6/28/2018	0852
K1806163-007	S-1	6/28/2018	1327
K1806163-008	S-2	6/28/2018	1405
K1806163-009	MP-1	6/28/2018	1215
K1806163-010	MP-3	6/28/2018	1147
K1806163-011	MW-19 DUP	6/28/2018	0852

ALS Environmental

CHAIN OF CUSTODY
90562

001

SR# K1806163

COC Set 1 of 2

COC#

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

Project Name	NuStar Vancouver
Project Number	1126
Project Manager	Stephanie Basze-Salisbury, Kelsi Evans
Company	Apex Companies
Address	3015 SW 1st Ave, Portland, OR
Phone #	503-924-4704
email	Kelsi.Evans@apexcos.com
Sampler Signature	
Sampler Printed Name	Jake Munsey

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-14		6/28/18	1639	GW			X	X						
2. MW-23I'		6/28/18	1550	GW			X	X						
3. MW-17		6/28/18	1502	GW			X	X						
4. MW-24I'		6/28/18	1106	GW			X	X						
5. EX-1		6/28/18	0953	GW			X	X						
6. MW-19		6/28/18	0852	GW			X	X						
7. S-1		6/28/18	1327	GW			X	X						
8. S-2		6/28/18	1405	GW			X	X						
9. MP-1		6/28/18	1215	GW			X	X						
10. MP-3		6/28/18	1147	GW			X	X						

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#

Bill To:

Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
___ Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature: John Munsey	Signature: B Buchman AW	Signature	Signature: Javier Rendon	Signature	Signature
Printed Name: Jake Munsey	Printed Name:	Printed Name	Printed Name: ALS-K	Printed Name	Printed Name
Firm: Apex Companies	Firm: 6/29/18 0928	Firm	Firm: 6-29-18 1530	Firm	Firm
Date/Time: 6/29/18 0930	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

ALS Environmental

CHAIN OF CUSTODY
90562

001

SR#_____

COC Set 2 of 2

COC#_____

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

Project Name: NuStar Vancouver	Project Number: 1126
Project Manager: Stephanie Bosze-Salisbury, Kelsi Evans	
Company: Apex Companies	
Address: 3015 SW 1st Ave, Portland, OR	
Phone #: 503-924-4704	email: Kelsi.Evans@apexcos.com
Sampler Signature:	Sampler Printed Name: Jake Munsey

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-19 DUP		6/28/18	0852	GW			X	X						
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#_____

Bill To:_____

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

___ Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other_____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature:	Signature:	Signature	Signature:	Signature	Signature
Printed Name: Jake Munsey	Printed Name: HW	Printed Name	Printed Name: ALS-K	Printed Name	Printed Name
Firm: Apex Companies	Firm: ALS	Firm	Firm	Firm	Firm
Date/Time: 6/29/18 0930	Date/Time: 6/29/18 0928	Date/Time	Date/Time: 6-29-18 1330	Date/Time	Date/Time

PC MK

Cooler Receipt and Preservation Form

Client APEX Companies Service Request *K18* 06163

Received: 6-29-18 Opened: 6-29-18 By: ASP Unloaded: 6-29-18 By: ASP

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 NA	Tracking Number (NA)	Filed
0.8	1.0	N/A	N/A	+0.2	380	90562		

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:

DO NOT RECEIVE SAMPLE: MW-19 Dup

SHORT HOLD TIME

Miscellaneous Forms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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.pjlabs.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/anlayte is offered by that state.

Acronyms

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

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126		

Sample Name:	MW-14	**Date Collected:**	06/28/18
Lab Code:	K1806163-001	**Date Received:**	06/29/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name:	MW-23i	**Date Collected:**	06/28/18
Lab Code:	K1806163-002	**Date Received:**	06/29/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		JCHAN
350.1	IFRANKS	IFRANKS

Sample Name:	MW-17	**Date Collected:**	06/28/18
Lab Code:	K1806163-003	**Date Received:**	06/29/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name:	MW-24i	**Date Collected:**	06/28/18
Lab Code:	K1806163-004	**Date Received:**	06/29/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		JCHAN
350.1	IFRANKS	IFRANKS

Client: Apex Companies, LLC
Project: NuStar Vancouver/1126
Service Request: K1806163

Sample Name: EX-1
Lab Code: K1806163-005
Sample Matrix: Ground Water
Date Collected: 06/28/18
Date Received: 06/29/18

Analysis Method	Extracted/Digested By	Analyzed By
300.0		JCHAN
350.1	IFRANKS	IFRANKS

Sample Name: MW-19
Lab Code: K1806163-006
Sample Matrix: Ground Water
Date Collected: 06/28/18
Date Received: 06/29/18

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: S-1
Lab Code: K1806163-007
Sample Matrix: Ground Water
Date Collected: 06/28/18
Date Received: 06/29/18

Analysis Method	Extracted/Digested By	Analyzed By
300.0		JCHAN
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: S-2
Lab Code: K1806163-008
Sample Matrix: Ground Water
Date Collected: 06/28/18
Date Received: 06/29/18

Analysis Method	Extracted/Digested By	Analyzed By
300.0		JCHAN
350.1	IFRANKS	IFRANKS

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126		

Sample Name:	MP-1	**Date Collected:**	06/28/18
Lab Code:	K1806163-009	**Date Received:**	06/29/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		JCHAN
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name:	MP-3	**Date Collected:**	06/28/18
Lab Code:	K1806163-010	**Date Received:**	06/29/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Results

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

General Chemistry

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

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 16:39
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	MW-14	**Basis:**	NA
Lab Code:	K1806163-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**31.6**	mg/L	2.5	50	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**104**	mg/L	2.5	50	07/02/18 21:01	NA	*
Nitrite as Nitrogen	300.0	ND U	mg/L	2.5	50	07/02/18 21:01	NA	*

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 15:50
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	MW-23i	**Basis:**	NA
Lab Code:	K1806163-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.53**	mg/L	0.10	2	06/30/18 01:30	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	06/30/18 13:30	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 15:02
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	MW-17	**Basis:**	NA
Lab Code:	K1806163-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**7.84**	mg/L	0.10	2	07/02/18 18:53	NA	*
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 18:53	NA	*

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 11:06
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	MW-24i	**Basis:**	NA
Lab Code:	K1806163-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**2.37**	mg/L	0.10	2	06/30/18 03:10	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	06/30/18 15:10	NA	*

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 09:53
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	EX-1	**Basis:**	NA
Lab Code:	K1806163-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**119**	mg/L	10	200	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	06/30/18 03:20	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	06/30/18 15:20	NA	*

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 08:52
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	MW-19	**Basis:**	NA
Lab Code:	K1806163-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**194**	mg/L	5.0	100	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 21:22	NA	*
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 21:22	NA	*

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 13:27
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	S-1	**Basis:**	NA
Lab Code:	K1806163-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	1.3	25	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**3.02**	mg/L	0.25	5	06/30/18 03:42	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 21:33	NA	*

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 14:05
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	S-2	**Basis:**	NA
Lab Code:	K1806163-008		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**8.05**	mg/L	0.25	5	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**3.28**	mg/L	0.10	2	06/30/18 03:53	NA	
Nitrite as Nitrogen	300.0	**0.054**	mg/L	0.050	1	06/30/18 15:53	NA	*

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 12:15
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	MP-1	**Basis:**	NA
Lab Code:	K1806163-009		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**8.71**	mg/L	0.50	10	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**38.2**	mg/L	0.50	10	06/30/18 04:04	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 21:44	NA	*

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18 11:47
Sample Matrix:	Ground Water	**Date Received:**	06/29/18 13:30
Sample Name:	MP-3	**Basis:**	NA
Lab Code:	K1806163-010		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**18.8**	mg/L	0.50	10	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**138**	mg/L	0.10	2	07/02/18 21:54	NA	*
Nitrite as Nitrogen	300.0	**0.42**	mg/L	0.10	2	07/02/18 22:05	NA	*

QC Summary Forms

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

General Chemistry

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

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806163-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	06/29/18 09:59	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	06/29/18 09:59	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806163-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	06/29/18 20:05	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	06/29/18 20:05	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806163-MB3		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	06/29/18 09:59	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	06/29/18 09:59	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806163-MB4		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	07/02/18 12:52	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	07/02/18 12:52	

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18
Sample Matrix:	Ground Water	**Date Received:**	06/29/18
		Date Analyzed:	07/2/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrite as Nitrogen

Sample Name:	MW-14	**Units:**	mg/L
Lab Code:	K1806163-001	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		K1806163-001MS			K1806163-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrite as Nitrogen	ND U	7.28	8.00	91	7.33	8.00	92	90-110	<1	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project:	NuStar Vancouver/1126	**Date Collected:**	06/28/18
Sample Matrix:	Ground Water	**Date Received:**	06/29/18
		Date Analyzed:	06/30/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrate as Nitrogen

Sample Name:	MW-23i	**Units:**	mg/L
Lab Code:	K1806163-002	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		K1806163-002MS			K1806163-002DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	0.53	8.76	8.00	103	8.31	8.00	97	90-110	5	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project	NuStar Vancouver/1126	**Date Collected:**	06/28/18
Sample Matrix:	Ground Water	**Date Received:**	06/29/18
		Date Analyzed:	07/02/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-14	**Units:**	mg/L
Lab Code:	K1806163-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806163-001DUP Result	Average	RPD	RPD Limit
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project	NuStar Vancouver/1126	**Date Collected:**	06/28/18
Sample Matrix:	Ground Water	**Date Received:**	06/29/18
		Date Analyzed:	06/30/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-23i	**Units:**	mg/L
Lab Code:	K1806163-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806163-002DUP Result	Average	RPD	RPD Limit
Nitrate as Nitrogen	300.0	0.10	0.53	0.53	0.528	<1	20

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

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

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

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project	NuStar Vancouver/1126	**Date Collected:**	06/28/18
Sample Matrix:	Ground Water	**Date Received:**	06/29/18
		Date Analyzed:	07/02/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-17	**Units:**	mg/L
Lab Code:	K1806163-003	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806163-003DUP1 Result	Average	RPD	RPD Limit
Nitrate as Nitrogen	300.0	0.10	7.84	7.92	7.88	1	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806163
Project	NuStar Vancouver/1126	**Date Collected:**	06/28/18
Sample Matrix:	Ground Water	**Date Received:**	06/29/18
		Date Analyzed:	07/02/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-17	**Units:**	mg/L
Lab Code:	K1806163-003	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806163-003DUP2 Result	Average	RPD	RPD Limit
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

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

Service Request: K1806163
Date Analyzed: 06/29/18 - 07/06/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1806163-LCS1

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.39	6.17	103	85-115
Nitrate as Nitrogen	300.0	2.42	2.50	97	90-110
Nitrite as Nitrogen	300.0	2.30	2.50	92	90-110

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

Service Request: K1806163
Date Analyzed: 07/06/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1806163-LCS2

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.16	6.17	100	85-115

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

Service Request: K1806163
Date Analyzed: 07/02/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1806163-LCS4

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Nitrate as Nitrogen	300.0	2.32	2.50	93	90-110
Nitrite as Nitrogen	300.0	2.25	2.50	90	90-110

July 13, 2018 Service Request No:K1806179

Kelsi Evans
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201-4707

Laboratory Results for: NuStar Vancouver

Dear Kelsi,

Enclosed are the results of the sample(s) submitted to our laboratory June 30, 2018
For your reference, these analyses have been assigned our service request number **K1806179.**

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

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

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
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ALS Environmental

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

Service Request: K1806179
Date Received: 06/30/2018

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:

Ten ground water samples were received for analysis at ALS Environmental on 06/30/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

Method 300.0, 07/02/2018:Samples MW-9, MW-8, MW-21i-105, MW-10 and MW-26 for Nitrite as Nitrogen were received and initially analyzed within holding time, but were reanalyze past holding time due to samples being over diluted. The data was flagged to indicate the holding time violation.
Method 300.0, 07/02/2018:Sample MW-10 for Nitrate as Nitrogen was received and initially analyzed within holding time, but was reanalyzed past holding time due to being over range. The data was flagged to indicate the holding time violation.

Approved by Noe D. Davis Date 07/13/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-5			Lab ID: K1806179-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.819			0.050	mg/L	350.1

CLIENT ID: MW-7			Lab ID: K1806179-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	7.90			0.50	mg/L	350.1
Nitrate as Nitrogen	10.8			0.10	mg/L	300.0
Nitrite as Nitrogen	0.10			0.10	mg/L	300.0

CLIENT ID: MW-9			Lab ID: K1806179-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	14.2			0.50	mg/L	350.1
Nitrate as Nitrogen	382			5.0	mg/L	300.0
Nitrite as Nitrogen	0.61			0.10	mg/L	300.0

CLIENT ID: MW-8			Lab ID: K1806179-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	333			5.0	mg/L	300.0

CLIENT ID: MW-25i			Lab ID: K1806179-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	0.27			0.10	mg/L	300.0

CLIENT ID: MW-21i-40			Lab ID: K1806179-006			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	5.12			0.10	mg/L	300.0

CLIENT ID: MW-21i-105			Lab ID: K1806179-007			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	12.3			0.50	mg/L	350.1
Nitrate as Nitrogen	13.1			1.0	mg/L	300.0

CLIENT ID: MW-22i			Lab ID: K1806179-008			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.469			0.050	mg/L	350.1

CLIENT ID: MW-10			Lab ID: K1806179-009			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	29.0			1.3	mg/L	350.1
Nitrate as Nitrogen	486			10	mg/L	300.0

CLIENT ID: MW-26			Lab ID: K1806179-010			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	22.4			1.3	mg/L	350.1
Nitrate as Nitrogen	213			5.0	mg/L	300.0

Sample Receipt Information

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

Client: Apex Companies, LLC **Service Request:**K1806179

Project: NuStar Vancouver/1126-21

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1806179-001	MW-5	6/29/2018	1637
K1806179-002	MW-7	6/29/2018	1531
K1806179-003	MW-9	6/29/2018	1448
K1806179-004	MW-8	6/29/2018	1410
K1806179-005	MW-25i	6/29/2018	1320
K1806179-006	MW-21i-40	6/29/2018	1225
K1806179-007	MW-21i-105	6/29/2018	1134
K1806179-008	MW-22i	6/29/2018	1037
K1806179-009	MW-10	6/29/2018	0955
K1806179-010	MW-26	6/29/2018	0901

ALS Environmental

CHAIN OF CUSTODY
90562

001

SR# K1806179

COC Set 1 of 1

COC#

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www.alsglobal.com

Project Name: NuStar Vancouver	Project Number: 1126-21
Project Manager: Stephanie Salisbury, Kelsi Evans	
Company: Apex Companies	
Address: 3015 SW 1st Ave Portland, OR	
Phone #: 503-924-4704	email: Kelsi.evans@apexcos.com
Sampler Signature: John Munsey	Sampler Printed Name: Jake Munsey

CLIENT SAMPLE ID	LABID	SAMPLING Date	Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-5		6/29/18	1637	GW			X	X						
2. MW-7		6/29/18	1531	GW			X	X						
3. MW-9 DUP		6/29/18	1448	GW			X	X						
4. MW-8		6/29/18	1410	GW			X	X						
5. MW-25i		6/29/18	1320	GW			X	X						
6. MW-21i-40		6/29/18	1225	GW			X	X						
7. MW-21i-105		6/29/18	1134	GW			X	X						
8. MW-22i		6/29/18	1037	GW			X	X						
9. MW-10		6/29/18	0955	GW			X	X						
10. MW-26		6/29/18	0901	GW			X	X						

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#

Bill To:

Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
___ Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature: John Munsey	Signature: David Dunbar	Signature	Signature	Signature	Signature
Printed Name: Jake Munsey	Printed Name: ALS-K	Printed Name	Printed Name	Printed Name	Printed Name
Firm: Apex Companies	Firm: 6-30-18 1132	Firm	Firm	Firm	Firm
Date/Time: 6/30/18 1132	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

PC MH

Cooler Receipt and Preservation Form

Client Alex Service Request K18 06179

Received: 6-30-18 Opened: 6-30-18 By: JSP Unloaded: 6-30-18 By: JSP

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 NA	Tracking Number (NA)	Filed
2.0	2.0	NA	NA	0.0	360	90562		

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: _____

SHORT HOLD TIME

Miscellaneous Forms

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Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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.pjlabs.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/anlayte is offered by that state.

Acronyms

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

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21		

Sample Name:	MW-5	**Date Collected:**	06/29/18
Lab Code:	K1806179-001	**Date Received:**	06/30/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MCHAPPELLE
350.1	IFRANKS	IFRANKS

Sample Name:	MW-7	**Date Collected:**	06/29/18
Lab Code:	K1806179-002	**Date Received:**	06/30/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MCHAPPELLE
350.1	IFRANKS	IFRANKS

Sample Name:	MW-9	**Date Collected:**	06/29/18
Lab Code:	K1806179-003	**Date Received:**	06/30/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MCHAPPELLE
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name:	MW-8	**Date Collected:**	06/29/18
Lab Code:	K1806179-004	**Date Received:**	06/30/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MCHAPPELLE
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Client: Apex Companies, LLC **Service Request:** K1806179
Project: NuStar Vancouver/1126-21

Sample Name: MW-25i **Date Collected:** 06/29/18
Lab Code: K1806179-005 **Date Received:** 06/30/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MCHAPPELLE
350.1	IFRANKS	IFRANKS

Sample Name: MW-21i-40 **Date Collected:** 06/29/18
Lab Code: K1806179-006 **Date Received:** 06/30/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MCHAPPELLE
350.1	IFRANKS	IFRANKS

Sample Name: MW-21i-105 **Date Collected:** 06/29/18
Lab Code: K1806179-007 **Date Received:** 06/30/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MCHAPPELLE
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MW-22i **Date Collected:** 06/29/18
Lab Code: K1806179-008 **Date Received:** 06/30/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MCHAPPELLE
350.1	IFRANKS	IFRANKS

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21		

Sample Name:	MW-10	**Date Collected:**	06/29/18
Lab Code:	K1806179-009	**Date Received:**	06/30/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name:	MW-26	**Date Collected:**	06/29/18
Lab Code:	K1806179-010	**Date Received:**	06/30/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MCHAPPELLE
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Results

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1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

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Phone (360) 577-7222 Fax (360) 425-9096
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Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 16:37
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-5	**Basis:**	NA
Lab Code:	K1806179-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.819**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	06/30/18 13:19	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	06/30/18 13:19	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 15:31
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-7	**Basis:**	NA
Lab Code:	K1806179-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**7.90**	mg/L	0.50	10	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**10.8**	mg/L	0.10	2	06/30/18 14:01	NA	
Nitrite as Nitrogen	300.0	**0.10**	mg/L	0.10	2	06/30/18 14:01	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 14:48
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-9	**Basis:**	NA
Lab Code:	K1806179-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**14.2**	mg/L	0.50	10	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**382**	mg/L	5.0	100	06/30/18 14:12	NA	
Nitrite as Nitrogen	300.0	**0.61**	mg/L	0.10	2	07/02/18 10:58	NA	*

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 14:10
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-8	**Basis:**	NA
Lab Code:	K1806179-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**333**	mg/L	5.0	100	06/30/18 14:22	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 11:39	NA	*

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 13:20
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-25i	**Basis:**	NA
Lab Code:	K1806179-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.27**	mg/L	0.10	2	06/30/18 14:33	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	06/30/18 14:33	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 12:25
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-21i-40	**Basis:**	NA
Lab Code:	K1806179-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**5.12**	mg/L	0.10	2	06/30/18 14:44	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	06/30/18 14:44	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 11:34
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-21i-105	**Basis:**	NA
Lab Code:	K1806179-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**12.3**	mg/L	0.50	10	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**13.1**	mg/L	1.0	20	06/30/18 14:54	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 11:49	NA	*

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 10:37
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-22i	**Basis:**	NA
Lab Code:	K1806179-008		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.469**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	06/30/18 15:26	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	06/30/18 15:26	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 09:55
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-10	**Basis:**	NA
Lab Code:	K1806179-009		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**29.0**	mg/L	1.3	25	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**486**	mg/L	10	200	07/02/18 12:09	NA	*
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 11:59	NA	*

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18 09:01
Sample Matrix:	Ground Water	**Date Received:**	06/30/18 11:32
Sample Name:	MW-26	**Basis:**	NA
Lab Code:	K1806179-010		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**22.4**	mg/L	1.3	25	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**213**	mg/L	5.0	100	06/30/18 16:11	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 12:19	NA	*

QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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www.alsglobal.com

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Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806179-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	06/30/18 12:47	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	07/02/18 10:24	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806179-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	07/02/18 10:24	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	07/03/18 10:42	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806179-MB3		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	07/03/18 10:42	

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QA/QC Report

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

Service Request:K1806179
Date Collected:06/29/18
Date Received:06/30/18
Date Analyzed:06/30/18 - 07/06/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MW-5
Lab Code: K1806179-001

Units:mg/L
Basis:NA

			Matrix Spike K1806179-001MS			Duplicate Matrix Spike K1806179-001DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	350.1	0.819	1.74	1.00	92	1.81	1.00	100	75-125	4	20
Nitrate as Nitrogen	300.0	ND U	3.89	4.00	97	3.93	4.00	98	90-110	1	20
Nitrite as Nitrogen	300.0	ND U	3.76	4.00	94	3.78	4.00	95	90-110	<1	20

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

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

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

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Superset Reference:18-0000471762 rev 00

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18
Sample Matrix:	Ground Water	**Date Received:**	06/30/18
		Date Analyzed:	07/2/18
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Nitrite as Nitrogen

Sample Name:	MW-9	**Units:**	mg/L
Lab Code:	K1806179-003	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		K1806179-003MS			K1806179-003DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrite as Nitrogen	0.61	8.59	8.00	100	8.73	8.00	101	90-110	2	20

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

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

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

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dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project:	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18
Sample Matrix:	Ground Water	**Date Received:**	06/30/18
		Date Analyzed:	07/6/18
		Date Extracted:	07/6/18

Duplicate Matrix Spike Summary
Ammonia as Nitrogen

Sample Name:	MW-22i	**Units:**	mg/L
Lab Code:	K1806179-008	**Basis:**	NA
Analysis Method:	350.1		
Prep Method:	Method		

		Matrix Spike			Duplicate Matrix Spike					
		K1806179-008MS			K1806179-008DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	0.469	1.45	1.00	98	1.42	1.00	96	75-125	2	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18
Sample Matrix:	Ground Water	**Date Received:**	06/30/18
		Date Analyzed:	06/30/18 - 07/06/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-5	**Units:**	mg/L
Lab Code:	K1806179-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806179-001DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	0.819	0.762	0.791	7	20
Nitrate as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18
Sample Matrix:	Ground Water	**Date Received:**	06/30/18
		Date Analyzed:	07/02/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-9	**Units:**	mg/L
Lab Code:	K1806179-003	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806179-003DUP Result	Average	RPD	RPD Limit
Nitrite as Nitrogen	300.0	0.10	0.61	0.62	0.615	<1	20

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

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

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

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1806179
Project	NuStar Vancouver/1126-21	**Date Collected:**	06/29/18
Sample Matrix:	Ground Water	**Date Received:**	06/30/18
		Date Analyzed:	07/06/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-22i	**Units:**	mg/L
Lab Code:	K1806179-008	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806179-008DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	0.469	0.482	0.476	3	20

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

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

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

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

Service Request: K1806179
Date Analyzed: 06/30/18 - 07/06/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1806179-LCS1

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.16	6.17	100	85-115
Nitrate as Nitrogen	300.0	2.42	2.50	97	90-110
Nitrite as Nitrogen	300.0	2.30	2.50	92	90-110

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

Service Request: K1806179
Date Analyzed: 07/02/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1806179-LCS2

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Nitrate as Nitrogen	300.0	2.51	2.50	100	90-110
Nitrite as Nitrogen	300.0	2.47	2.50	99	90-110

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

Service Request: K1806179
Date Analyzed: 07/03/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1806179-LCS3

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Nitrate as Nitrogen	300.0	2.56	2.50	103	90-110
Nitrite as Nitrogen	300.0	2.52	2.50	101	90-110

July 12, 2018 Service Request No:K1806193

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

Laboratory Results for: NuStar Vancouver

Dear Stephanie,

Enclosed are the results of the sample(s) submitted to our laboratory July 02, 2018
For your reference, these analyses have been assigned our service request number **K1806193.**

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

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

Narrative Documents

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

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

Service Request: K1806193
Date Received: 07/02/2018

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:

Sixteen ground water samples were received for analysis at ALS Environmental on 07/02/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Dan Date 07/12/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: MGMS3-1	Lab ID: K1806193-001					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	0.46			0.10	mg/L	300.0

CLIENT ID: MGMS3-2	Lab ID: K1806193-002					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	0.43			0.10	mg/L	300.0

CLIENT ID: MGMS3-3	Lab ID: K1806193-003					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.100			0.050	mg/L	350.1
Nitrate as Nitrogen	0.29			0.10	mg/L	300.0

CLIENT ID: MGMS3-4	Lab ID: K1806193-004					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.971			0.050	mg/L	350.1

CLIENT ID: MGMS2-2	Lab ID: K1806193-006					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.050			0.050	mg/L	350.1
Nitrate as Nitrogen	0.28			0.10	mg/L	300.0

CLIENT ID: MGMS2-3	Lab ID: K1806193-007					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	0.77			0.10	mg/L	300.0

CLIENT ID: MGMS2-4	Lab ID: K1806193-008					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	83.6			5.0	mg/L	350.1
Nitrate as Nitrogen	0.76			0.10	mg/L	300.0

CLIENT ID: MGMS1-1	Lab ID: K1806193-009					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.134			0.050	mg/L	350.1
Nitrate as Nitrogen	0.11			0.10	mg/L	300.0

CLIENT ID: MGMS1-2	Lab ID: K1806193-010					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	1.83			0.10	mg/L	300.0

CLIENT ID: MGMS1-3	Lab ID: K1806193-011					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	198			5.0	mg/L	350.1

CLIENT ID: MW-13	Lab ID: K1806193-012					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	23.5			2.5	mg/L	350.1

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-12			Lab ID: K1806193-013			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	33.0			2.5	mg/L	350.1

CLIENT ID: EW-1			Lab ID: K1806193-014			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	2.91			0.10	mg/L	300.0

CLIENT ID: MW-6			Lab ID: K1806193-015			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	4.17			0.50	mg/L	350.1

CLIENT ID: MW-1			Lab ID: K1806193-016			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	1.47			0.050	mg/L	350.1

Sample Receipt Information

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

Client: Apex Companies, LLC **Service Request:**K1806193

Project: NuStar Vancouver/1126-21

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1806193-001	MGMS3-1	7/1/2018	1732
K1806193-002	MGMS3-2	7/1/2018	1719
K1806193-003	MGMS3-3	7/1/2018	1656
K1806193-004	MGMS3-4	7/1/2018	1620
K1806193-005	MGMS2-1	7/1/2018	1539
K1806193-006	MGMS2-2	7/1/2018	1527
K1806193-007	MGMS2-3	7/1/2018	1509
K1806193-008	MGMS2-4	7/1/2018	1447
K1806193-009	MGMS1-1	7/1/2018	1409
K1806193-010	MGMS1-2	7/1/2018	1346
K1806193-011	MGMS1-3	7/1/2018	1319
K1806193-012	MW-13	7/1/2018	1155
K1806193-013	MW-12	7/1/2018	1101
K1806193-014	EW-1	7/1/2018	1011
K1806193-015	MW-6	7/1/2018	0932
K1806193-016	MW-1	7/1/2018	0847

ALS Environmental

CHAIN OF CUSTODY
90562

001

SR# K1806193

COC Set 1 of 2

COC#

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

Project Name	NuStar Vancouver
Project Number	1126-21
Project Manager	Stephanie Salisbury, Kelsi Evans
Company	Apex Companies
Address	3015 SW 1st Ave Portland, OR
Phone #	503-924-4704
email	Kelsi.Evans@apexcos.com
Sampler Signature	
Sampler Printed Name	Jake Mursey

	CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1	MGMS3-1		7/1/18	1732	GW	2		X	X						
2	MGMS3-2		7/1/18	1719	GW	2		X	X						
3	MGMS3-3		7/1/18	1656	GW	2		X	X						
4	MGMS3-4		7/1/18	1620	GW	2		X	X						
5	MGMS2-1		7/1/18	1539	GW	2		X	X						
6	MGMS2-2		7/1/18	1527	GW	2		X	X						
7	MGMS2-3		7/1/18	1509	GW	2		X	X						
8	MGMS2-4		7/1/18	1447	GW	2		X	X						
9	MGMS1-1		7/1/18	1409	GW	2		X	X						
10	MGMS1-2		7/1/18	1346	GW	2		X	X						

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. CLP Like Summary (no raw data)
___ IV. Data Validation Report
___ V. EDD

Invoice Information

P.O.#
Bill To:

Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
___ Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
	BBECKMAN		CODY GRAVES		
Printed Name	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
Jake Mursey	HW		ALS		
Firm	Firm	Firm	Firm	Firm	Firm
Apex Companies	7/2/18 0800		7/2/18 1000		
Date/Time 7/2/18 0800	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

ALS Environmental

CHAIN OF CUSTODY
90562

001

SR# K1806193

COC Set 2 of 2

COC#

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

Project Name: NuStar Vancouver	Project Number: 1126-21
Project Manager: Stephanie Salisbury, Kelsi Evans	
Company: Apex Companies	
Address: 3015 SW 1st Ave, Portland, OR	
Phone #: 503-924-4704	email: Kelsi.evans@apexcos.com
Sampler Signature:	Sampler Printed Name: Jake Mussey

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MGMS1-3		7/1/18	1319	GW	2		X	X						
2. MW-13		7/1/18	1155	GW	2		X	X						
3. MW-12		7/1/18	1101	GW	2		X	X						
4. EW-1		7/1/18	1011	GW	2		X	X						
5. MW-6		7/1/18	0932	GW	2		X	X						
6. MW-1		7/1/18	0847	GW	2		X	X						
7.														
8.														
9.														
10.														

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#

Bill To:

Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
___ Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature:	Signature:	Signature	Signature:	Signature	Signature
Printed Name: Jake Mussey	Printed Name:	Printed Name	Printed Name: CODY GRAVES	Printed Name	Printed Name
Firm: Apex Companies	Firm:	Firm	Firm: ALS	Firm	Firm
Date/Time: 7/2/18 0800	Date/Time: 7/2/18 0800	Date/Time	Date/Time: 7/2/18 1003	Date/Time	Date/Time

PC MH

Cooler Receipt and Preservation Form

Client APEX Service Request K18 06193

Received: 7/2/18 Opened: 7/2/18 By: CG Unloaded: 7/2/18 By: CG

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 NA	Tracking Number (NA)	Filed
1.4	1.4	—	—	0.0	365	90562		

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: _____

SHORT HOLD TIME

Miscellaneous Forms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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.pjlabs.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/anlayte is offered by that state.

Acronyms

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

Client: Apex Companies, LLC **Service Request:** K1806193
Project: NuStar Vancouver/1126-21

Sample Name: MGMS3-1 **Date Collected:** 07/1/18
Lab Code: K1806193-001 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MGMS3-2 **Date Collected:** 07/1/18
Lab Code: K1806193-002 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MGMS3-3 **Date Collected:** 07/1/18
Lab Code: K1806193-003 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MGMS3-4 **Date Collected:** 07/1/18
Lab Code: K1806193-004 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Client: Apex Companies, LLC **Service Request:** K1806193
Project: NuStar Vancouver/1126-21

Sample Name: MGMS2-1 **Date Collected:** 07/1/18
Lab Code: K1806193-005 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MGMS2-2 **Date Collected:** 07/1/18
Lab Code: K1806193-006 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MGMS2-3 **Date Collected:** 07/1/18
Lab Code: K1806193-007 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MGMS2-4 **Date Collected:** 07/1/18
Lab Code: K1806193-008 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Client: Apex Companies, LLC **Service Request:** K1806193
Project: NuStar Vancouver/1126-21

Sample Name: MGMS1-1 **Date Collected:** 07/1/18
Lab Code: K1806193-009 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MGMS1-2 **Date Collected:** 07/1/18
Lab Code: K1806193-010 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MGMS1-3 **Date Collected:** 07/1/18
Lab Code: K1806193-011 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MW-13 **Date Collected:** 07/1/18
Lab Code: K1806193-012 **Date Received:** 07/2/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21		

Sample Name:	MW-12	**Date Collected:**	07/1/18
Lab Code:	K1806193-013	**Date Received:**	07/2/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name:	EW-1	**Date Collected:**	07/1/18
Lab Code:	K1806193-014	**Date Received:**	07/2/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name:	MW-6	**Date Collected:**	07/1/18
Lab Code:	K1806193-015	**Date Received:**	07/2/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name:	MW-1	**Date Collected:**	07/1/18
Lab Code:	K1806193-016	**Date Received:**	07/2/18
Sample Matrix:	Ground Water		

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Results

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

General Chemistry

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

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 17:32
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS3-1	**Basis:**	NA
Lab Code:	K1806193-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.46**	mg/L	0.10	2	07/02/18 15:57	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 15:57	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 17:19
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS3-2	**Basis:**	NA
Lab Code:	K1806193-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.43**	mg/L	0.10	2	07/02/18 17:01	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 17:01	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 16:56
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS3-3	**Basis:**	NA
Lab Code:	K1806193-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.100**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.29**	mg/L	0.10	2	07/02/18 17:12	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 17:12	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 16:20
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS3-4	**Basis:**	NA
Lab Code:	K1806193-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.971**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 17:22	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 17:22	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 15:39
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS2-1	**Basis:**	NA
Lab Code:	K1806193-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 17:33	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 17:33	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 15:27
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS2-2	**Basis:**	NA
Lab Code:	K1806193-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.050**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.28**	mg/L	0.10	2	07/02/18 17:44	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 17:44	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 15:09
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS2-3	**Basis:**	NA
Lab Code:	K1806193-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.77**	mg/L	0.10	2	07/02/18 17:54	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 17:54	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 14:47
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS2-4	**Basis:**	NA
Lab Code:	K1806193-008		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**83.6**	mg/L	5.0	100	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.76**	mg/L	0.10	2	07/02/18 18:05	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 18:05	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 14:09
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS1-1	**Basis:**	NA
Lab Code:	K1806193-009		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.134**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.11**	mg/L	0.10	2	07/02/18 18:21	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 18:21	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 13:46
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS1-2	**Basis:**	NA
Lab Code:	K1806193-010		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**1.83**	mg/L	0.10	2	07/02/18 19:36	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 19:36	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 13:19
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MGMS1-3	**Basis:**	NA
Lab Code:	K1806193-011		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**198**	mg/L	5.0	100	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 19:46	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 19:46	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 11:55
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MW-13	**Basis:**	NA
Lab Code:	K1806193-012		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**23.5**	mg/L	2.5	50	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 19:57	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 19:57	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 11:01
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MW-12	**Basis:**	NA
Lab Code:	K1806193-013		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**33.0**	mg/L	2.5	50	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 20:08	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 20:08	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 10:11
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	EW-1	**Basis:**	NA
Lab Code:	K1806193-014		

General Chemistry Parameters

Analyte Name	Analysis Method	Result		Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND	U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**2.91**		mg/L	0.10	2	07/02/18 20:18	NA	
Nitrite as Nitrogen	300.0	ND	U	mg/L	0.10	2	07/02/18 20:18	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 09:32
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MW-6	**Basis:**	NA
Lab Code:	K1806193-015		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**4.17**	mg/L	0.50	10	07/10/18 15:06	07/10/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 20:29	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 20:29	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18 08:47
Sample Matrix:	Ground Water	**Date Received:**	07/02/18 10:00
Sample Name:	MW-1	**Basis:**	NA
Lab Code:	K1806193-016		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**1.47**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 14:18	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/02/18 14:18	NA	

QC Summary Forms

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

General Chemistry

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

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806193-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	07/02/18 12:52	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	07/02/18 12:52	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806193-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806193-MB3		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/10/18 15:06	07/10/18	

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

Service Request:K1806193
Date Collected:07/01/18
Date Received:07/02/18
Date Analyzed:07/02/18 - 07/06/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MGMS3-1
Lab Code: K1806193-001

Units:mg/L
Basis:NA

			Matrix Spike K1806193-001MS			Duplicate Matrix Spike K1806193-001DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	350.1	ND U	1.12	1.00	112	1.09	1.00	109	75-125	3	20
Nitrate as Nitrogen	300.0	0.46	7.97	8.00	94	8.11	8.00	96	90-110	2	20
Nitrite as Nitrogen	300.0	ND U	7.37	8.00	92	7.40	8.00	92	90-110	<1	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18
Sample Matrix:	Ground Water	**Date Received:**	07/02/18
		Date Analyzed:	07/6/18
		Date Extracted:	07/6/18

Duplicate Matrix Spike Summary
Ammonia as Nitrogen

Sample Name:	EW-1	**Units:**	mg/L
Lab Code:	K1806193-014	**Basis:**	NA
Analysis Method:	350.1		
Prep Method:	Method		

		Matrix Spike			Duplicate Matrix Spike					
		K1806193-014MS			K1806193-014DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen	ND U	1.02	1.00	102	1.05	1.00	105	75-125	2	20

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

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

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

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:K1806193
Date Collected:07/01/18
Date Received:07/02/18
Date Analyzed:7/2/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MW-1
Lab Code: K1806193-016

Units:mg/L
Basis:NA

			Matrix Spike K1806193-016MS			Duplicate Matrix Spike K1806193-016DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	300.0	ND U	7.34	8.00	92	7.36	8.00	92	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	7.24	8.00	91	7.24	8.00	91	90-110	<1	20

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

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

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

Printed 7/11/2018 5:01:35 PM

Superset Reference:18-0000472047 rev 00

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18
Sample Matrix:	Ground Water	**Date Received:**	07/02/18
		Date Analyzed:	07/02/18 - 07/06/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MGMS3-1	**Units:**	mg/L
Lab Code:	K1806193-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806193-001DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	ND U	ND U	NC	NC	20
Nitrate as Nitrogen	300.0	0.10	0.46	0.43	0.449	7	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18
Sample Matrix:	Ground Water	**Date Received:**	07/02/18
		Date Analyzed:	07/06/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	EW-1	**Units:**	mg/L
Lab Code:	K1806193-014	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806193-014DUP Result	Average	RPD	RPD Limit
Ammonia as Nitrogen	350.1	0.050	ND U	ND U	NC	NC	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project	NuStar Vancouver/1126-21	**Date Collected:**	07/01/18
Sample Matrix:	Ground Water	**Date Received:**	07/02/18
		Date Analyzed:	07/02/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-1	**Units:**	mg/L
Lab Code:	K1806193-016	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806193-016DUP Result	Average	RPD	RPD Limit
Nitrate as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

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

Service Request: K1806193
Date Analyzed: 07/02/18 - 07/06/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1806193-LCS1

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.16	6.17	100	85-115
Nitrate as Nitrogen	300.0	2.32	2.50	93	90-110
Nitrite as Nitrogen	300.0	2.25	2.50	90	90-110

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Analyzed:**	07/06/18
Sample Matrix:	Ground Water	**Date Extracted:**	07/06/18

Lab Control Sample Summary
Ammonia as Nitrogen

Analysis Method:	350.1	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	597903

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1806193-LCS2	6.46	6.17	105	85-115

Client:	Apex Companies, LLC	**Service Request:**	K1806193
Project:	NuStar Vancouver/1126-21	**Date Analyzed:**	07/10/18
Sample Matrix:	Ground Water	**Date Extracted:**	07/10/18

Lab Control Sample Summary
Ammonia as Nitrogen

Analysis Method:	350.1	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	598113

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1806193-LCS3	5.89	6.17	95	85-115

July 12, 2018 Service Request No:K1806242

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

Laboratory Results for: NuStar Vancouver

Dear Stephanie,

Enclosed are the results of the sample(s) submitted to our laboratory July 03, 2018
For your reference, these analyses have been assigned our service request number **K1806242.**

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

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

Narrative Documents

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

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

Service Request: K1806242
Date Received: 07/03/2018

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:

Seven ground water samples were received for analysis at ALS Environmental on 07/03/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Diaz Date 07/12/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-2			Lab ID: K1806242-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	9.85			0.50	mg/L	350.1

CLIENT ID: MW-3			Lab ID: K1806242-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.569			0.050	mg/L	350.1
Nitrate as Nitrogen	15.4			0.25	mg/L	300.0
Nitrite as Nitrogen	1.49			0.10	mg/L	300.0

CLIENT ID: MW-19i			Lab ID: K1806242-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.158			0.050	mg/L	350.1

CLIENT ID: MW-1S			Lab ID: K1806242-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	6.06			0.10	mg/L	300.0

CLIENT ID: MW-20i			Lab ID: K1806242-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Ammonia as Nitrogen	0.115			0.050	mg/L	350.1
Nitrate as Nitrogen	0.37			0.10	mg/L	300.0

CLIENT ID: MW-18i			Lab ID: K1806242-006			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	1.13			0.10	mg/L	300.0

CLIENT ID: MW-16			Lab ID: K1806242-007			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Nitrate as Nitrogen	19.4			0.50	mg/L	300.0

Sample Receipt Information

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

Client: Apex Companies, LLC **Service Request:**K1806242

Project: NuStar Vancouver/1126-21

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1806242-001	MW-2	7/2/2018	1324
K1806242-002	MW-3	7/2/2018	1247
K1806242-003	MW-19i	7/2/2018	1125
K1806242-004	MW-1S	7/2/2018	1050
K1806242-005	MW-20i	7/2/2018	0954
K1806242-006	MW-18i	7/2/2018	0910
K1806242-007	MW-16	7/2/2018	0827

ALS Environmental

CHAIN OF CUSTODY
90562

001

SR# K180242

COC Set 1 of 1

COC#

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

Project Name	NuStar Vancouver
Project Number	7126-21
Project Manager	Stephanie Salisbury, Kelsi Evans
Company	Apex Companies
Address	3015 SW 1st Ave Portland, OR
Phone #	
email	Kelsi.Evans@apexcos.com
Sampler Signature	
Sampler Printed Name	Jake Mulsey

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	48H 300.0 / NO2	48H 300.0 / NO3	28D 350.1 / Ammonia T	1	2	3	4	5	Remarks
1. MW-2		7/2/18	1324	GW	2	X	Y	Y						
2. MW-3		7/2/18	1247	GW										
3. MW-19i		7/2/18	1125	GW										
4. MW-15		7/2/18	1050	GW										
5. MW-20i		7/2/18	0954	GW										
6. MW-18i		7/2/18	0910	GW										
7. MW-16		7/2/18	0827	GW										
8.														
9.														
10.														

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#_____

Bill To:_____

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

___ Standard

Requested Report Date

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 Tl 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 Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other_____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Jake Mulsey	Printed Name: AW	Printed Name	Printed Name: ALS-K	Printed Name	Printed Name
Firm: Apex Companies	Firm: 7/3/18 0830	Firm	Firm: 7-3-18 1120	Firm	Firm
Date/Time: 7/3/18	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

PC MTL

Cooler Receipt and Preservation Form

Client APEX Co. Service Request *K18* 06242

Received: 7-3-18 Opened: 7-3-18 By: ASP Unloaded: 7-3-18 By: ASP

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 NA	Tracking Number (NA)	Filed
6.0	6.0	NA	NA	0.0	352	80562		

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: RECEIVED LITTLE TO NO VOLUME FOR SAMPLE MW-20; UNPRESERVED BOTTLE

SHORT HOLD TIME

Miscellaneous Forms

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

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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.pjlabs.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/anlayte is offered by that state.

Acronyms

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

Client: Apex Companies, LLC **Service Request:** K1806242
Project: NuStar Vancouver/1126-21

Sample Name: MW-2 **Date Collected:** 07/2/18
Lab Code: K1806242-001 **Date Received:** 07/3/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MW-3 **Date Collected:** 07/2/18
Lab Code: K1806242-002 **Date Received:** 07/3/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MW-19i **Date Collected:** 07/2/18
Lab Code: K1806242-003 **Date Received:** 07/3/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MW-1S **Date Collected:** 07/2/18
Lab Code: K1806242-004 **Date Received:** 07/3/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Client: Apex Companies, LLC **Service Request:** K1806242
Project: NuStar Vancouver/1126-21

Sample Name: MW-20i **Date Collected:** 07/2/18
Lab Code: K1806242-005 **Date Received:** 07/3/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MW-18i **Date Collected:** 07/2/18
Lab Code: K1806242-006 **Date Received:** 07/3/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Name: MW-16 **Date Collected:** 07/2/18
Lab Code: K1806242-007 **Date Received:** 07/3/18
Sample Matrix: Ground Water

Analysis Method	Extracted/Digested By	Analyzed By
300.0		MRODRIGUEZ
350.1	IFRANKS	IFRANKS

Sample Results

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

General Chemistry

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

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18 13:24
Sample Matrix:	Ground Water	**Date Received:**	07/03/18 11:20
Sample Name:	MW-2	**Basis:**	NA
Lab Code:	K1806242-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**9.85**	mg/L	0.50	10	07/10/18 15:06	07/10/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/03/18 14:15	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/03/18 14:15	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18 12:47
Sample Matrix:	Ground Water	**Date Received:**	07/03/18 11:20
Sample Name:	MW-3	**Basis:**	NA
Lab Code:	K1806242-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.569**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**15.4**	mg/L	0.25	5	07/03/18 17:01	NA	
Nitrite as Nitrogen	300.0	**1.49**	mg/L	0.10	2	07/03/18 14:25	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18 11:25
Sample Matrix:	Ground Water	**Date Received:**	07/03/18 11:20
Sample Name:	MW-19i	**Basis:**	NA
Lab Code:	K1806242-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.158**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.10	2	07/03/18 14:35	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/03/18 14:35	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18 10:50
Sample Matrix:	Ground Water	**Date Received:**	07/03/18 11:20
Sample Name:	MW-1S	**Basis:**	NA
Lab Code:	K1806242-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**6.06**	mg/L	0.10	2	07/03/18 13:25	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/03/18 13:25	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18 09:54
Sample Matrix:	Ground Water	**Date Received:**	07/03/18 11:20
Sample Name:	MW-20i	**Basis:**	NA
Lab Code:	K1806242-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	**0.115**	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**0.37**	mg/L	0.10	2	07/03/18 14:05	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/03/18 14:05	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18 09:10
Sample Matrix:	Ground Water	**Date Received:**	07/03/18 11:20
Sample Name:	MW-18i	**Basis:**	NA
Lab Code:	K1806242-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**1.13**	mg/L	0.10	2	07/03/18 14:45	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/03/18 14:45	NA	

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18 08:27
Sample Matrix:	Ground Water	**Date Received:**	07/03/18 11:20
Sample Name:	MW-16	**Basis:**	NA
Lab Code:	K1806242-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	**19.4**	mg/L	0.50	10	07/03/18 20:07	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.10	2	07/03/18 14:56	NA	

QC Summary Forms

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

General Chemistry

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

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806242-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/06/18 10:16	07/06/18	
Nitrate as Nitrogen	300.0	ND U	mg/L	0.050	1	07/03/18 12:40	NA	
Nitrite as Nitrogen	300.0	ND U	mg/L	0.050	1	07/03/18 12:40	NA	

Analytical Report

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K1806242-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen	350.1	ND U	mg/L	0.050	1	07/10/18 15:06	07/10/18	

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:K1806242
Date Collected:07/02/18
Date Received:07/03/18
Date Analyzed:7/3/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MW-2
Lab Code: K1806242-001

Units:mg/L
Basis:NA

			Matrix Spike K1806242-001MS			Duplicate Matrix Spike K1806242-001DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	300.0	ND U	8.01	8.00	100	8.02	8.00	100	90-110	<1	20
Nitrite as Nitrogen	300.0	ND U	8.04	8.00	101	8.05	8.00	101	90-110	<1	20

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

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

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

ALS Group USA, Corp.
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QA/QC Report

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

Service Request:K1806242
Date Collected:07/02/18
Date Received:07/03/18
Date Analyzed:7/3/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MW-19i
Lab Code: K1806242-003

Units:mg/L
Basis:NA

			Matrix Spike K1806242-003MS			Duplicate Matrix Spike K1806242-003DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	300.0	ND U	8.03	8.00	100	7.82	8.00	98	90-110	3	20
Nitrite as Nitrogen	300.0	ND U	8.05	8.00	101	7.81	8.00	98	90-110	3	20

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

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

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

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

Service Request:K1806242
Date Collected:07/02/18
Date Received:07/03/18
Date Analyzed:7/3/18

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: MW-1S
Lab Code: K1806242-004

Units:mg/L
Basis:NA

			Matrix Spike K1806242-004MS			Duplicate Matrix Spike K1806242-004DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate as Nitrogen	300.0	6.06	14.4	8.00	105	14.6	8.00	107	90-110	1	20
Nitrite as Nitrogen	300.0	ND U	8.02	8.00	100	8.14	8.00	102	90-110	1	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18
Sample Matrix:	Ground Water	**Date Received:**	07/03/18
		Date Analyzed:	07/03/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-2	**Units:**	mg/L
Lab Code:	K1806242-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806242-001DUP Result	Average	RPD	RPD Limit
Nitrate as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18
Sample Matrix:	Ground Water	**Date Received:**	07/03/18
		Date Analyzed:	07/03/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-19i	**Units:**	mg/L
Lab Code:	K1806242-003	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806242-003DUP Result	Average	RPD	RPD Limit
Nitrate as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project	NuStar Vancouver/1126-21	**Date Collected:**	07/02/18
Sample Matrix:	Ground Water	**Date Received:**	07/03/18
		Date Analyzed:	07/03/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	MW-1S	**Units:**	mg/L
Lab Code:	K1806242-004	**Basis:**	NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample K1806242-004DUP Result	Average	RPD	RPD Limit
Nitrate as Nitrogen	300.0	0.10	6.06	6.00	6.03	<1	20
Nitrite as Nitrogen	300.0	0.10	ND U	ND U	NC	NC	20

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

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

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

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

Service Request: K1806242
Date Analyzed: 07/03/18 - 07/06/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
K1806242-LCS1

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen	350.1	6.46	6.17	105	85-115
Nitrate as Nitrogen	300.0	2.56	2.50	103	90-110
Nitrite as Nitrogen	300.0	2.52	2.50	101	90-110

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QA/QC Report

Client:	Apex Companies, LLC	**Service Request:**	K1806242
Project:	NuStar Vancouver/1126-21	**Date Analyzed:**	07/10/18
Sample Matrix:	Ground Water	**Date Extracted:**	07/10/18

Lab Control Sample Summary
Ammonia as Nitrogen

Analysis Method:	350.1	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	598113

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1806242-LCS2	5.89	6.17	95	85-115

ANALYTICAL REPORT

April 03, 2018

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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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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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.

ESC Sample ID	Project Sample ID	Method
L980397-02	MGMS1-43	8260C
L980397-19	MW-14	8260C

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	J0	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	J	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

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	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

Wet Chemistry by Method 9060A

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

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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	J0	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	J	0.186	0.500	1	03/27/2018 21:58	WG1090159

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

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	J0	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

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
(S) 4-Bromofluorobenzene	*99.9*			*80.0-120*		*03/30/2018 02:36*	WG1090159

Wet Chemistry by Method 9060A

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

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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	J0	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	J	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	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
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

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	J0	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	J	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	J	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	J	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

Wet Chemistry by Method 9060A

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

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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	J0	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	J	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

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	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

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	J0	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

Wet Chemistry by Method 9060A

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

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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	J0	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

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	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

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 00:17	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	J0	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

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	J0	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

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	J0	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

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	J0	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

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	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

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	J0	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	J	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

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	J0	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

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	J0	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

Wet Chemistry by Method 9060A

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

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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	J0	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

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	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

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	J6	0.133	0.500	1	03/28/2018 02:57	WG1090159
Bromodichloromethane	U	J6	0.0800	0.500	1	03/28/2018 02:57	WG1090159
Bromochloromethane	U	J6	0.145	0.500	1	03/28/2018 02:57	WG1090159
Bromoform	U	J6	0.186	0.500	1	03/28/2018 02:57	WG1090159
Bromomethane	U	J0	0.157	2.50	1	03/28/2018 02:57	WG1090159
Carbon tetrachloride	U	J6	0.159	0.500	1	03/28/2018 02:57	WG1090159
Chlorobenzene	U	J6	0.140	0.500	1	03/28/2018 02:57	WG1090159
Chlorodibromomethane	U	J6	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	J6	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	J6	0.111	0.500	1	03/28/2018 02:57	WG1090159
4-Chlorotoluene	U	J6	0.0972	0.500	1	03/28/2018 02:57	WG1090159
1,2-Dibromo-3-Chloropropane	U	J6	0.325	2.50	1	03/28/2018 02:57	WG1090159
1,2-Dibromoethane	U	J6	0.193	0.500	1	03/28/2018 02:57	WG1090159
Dibromomethane	U	J6	0.117	0.500	1	03/28/2018 02:57	WG1090159
1,2-Dichlorobenzene	U	J6	0.101	0.500	1	03/28/2018 02:57	WG1090159
1,3-Dichlorobenzene	U	J6	0.130	0.500	1	03/28/2018 02:57	WG1090159
1,4-Dichlorobenzene	U	J6	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	J6	0.114	0.500	1	03/28/2018 02:57	WG1090159
1,2-Dichloroethane	U	J6	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	J6	0.0933	0.500	1	03/28/2018 02:57	WG1090159
trans-1,2-Dichloroethene	1.29	J6	0.152	0.500	1	03/28/2018 02:57	WG1090159
1,2-Dichloropropane	U	J6	0.190	0.500	1	03/28/2018 02:57	WG1090159
1,1-Dichloropropene	U	J6	0.128	0.500	1	03/28/2018 02:57	WG1090159
1,3-Dichloropropane	U	J6	0.147	1.00	1	03/28/2018 02:57	WG1090159
cis-1,3-Dichloropropene	U	J6	0.0976	0.500	1	03/28/2018 02:57	WG1090159
trans-1,3-Dichloropropene	U	J6	0.222	0.500	1	03/28/2018 02:57	WG1090159
trans-1,4-Dichloro-2-butene	U	J6	0.257	5.00	1	03/28/2018 02:57	WG1090159
2,2-Dichloropropane	U	J6	0.0929	0.500	1	03/28/2018 02:57	WG1090159
Hexachloro-1,3-butadiene	U	J6	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	J6	1.07	2.50	1	03/28/2018 02:57	WG1090159
1,1,1,2-Tetrachloroethane	U	J6	0.120	0.500	1	03/28/2018 02:57	WG1090159
1,1,2,2-Tetrachloroethane	U	J6	0.130	0.500	1	03/28/2018 02:57	WG1090159
1,1,2-Trichlorotrifluoroethane	U	J6	0.164	0.500	1	03/28/2018 02:57	WG1090159
Tetrachloroethene	0.203	J J6	0.199	0.500	1	03/28/2018 02:57	WG1090159
1,2,3-Trichlorobenzene	U	J6	0.164	0.500	1	03/28/2018 02:57	WG1090159
1,2,4-Trichlorobenzene	U	J6	0.355	0.500	1	03/28/2018 02:57	WG1090159
1,1,1-Trichloroethane	U	J6	0.0940	0.500	1	03/28/2018 02:57	WG1090159
1,1,2-Trichloroethane	U	J6	0.186	0.500	1	03/28/2018 02:57	WG1090159
Trichloroethene	0.261	J	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	J6	0.247	2.50	1	03/28/2018 02:57	WG1090159
Vinyl acetate	U	J6	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

Wet Chemistry by Method 9060A

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

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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	J0	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	J	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

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	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

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	J0	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	J	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

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	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

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	J0	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

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	J0	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	J0	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	J0	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

Wet Chemistry by Method 9060A

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

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Bromobenzene	U		0.133	0.500	1	03/28/2018 13:22	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	J0	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	J	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	J0	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	J	0.186	0.500	1	03/28/2018 13:22	WG1090417

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	J0	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

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 13:41	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	J0	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	J0	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	J0	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

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	J0	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	J0	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	J0	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

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	J0	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	J	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	J0	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	J0	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

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	J0	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	J0	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	J0	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

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	J0	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	J0	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	J	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	J0	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

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	J0	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	J	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	J0	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	J0	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

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	J0	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	J0	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	J0	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

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	B J	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	J0	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	J0	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

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	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	J0	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

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	J0	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	J0	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	J0	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

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	J0	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	J	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	J0	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	J	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	J0	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

Wet Chemistry by Method 9060A

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

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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 ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
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	J0	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	J0	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

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	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	J0	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

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	J0	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	J0	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	J0	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

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	J0	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	J0	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	J0	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

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
(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

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	J0	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	J0	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	J0	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

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
(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

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	J0	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

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	J0	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

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	J0	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

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	J0	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

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	J0	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

Method Blank (MB)

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

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
TOC (Total Organic Carbon)	425	J	102	1000

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 ug/l	DUP Result ug/l	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 ug/l	DUP Result ug/l	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 ug/l	LCS Result ug/l	LCSD Result ug/l	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 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 %
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
	ug/l		ug/l	ug/l
TOC (Total Organic Carbon)	U		102	1000

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
	ug/l	ug/l		%		%
TOC (Total Organic Carbon)	227	268	1	16.4	J	20

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
	ug/l	ug/l	ug/l	%	%	%			%	%
TOC (Total Organic Carbon)	75000	79100	78800	105	105	85.0-115			0.469	20

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
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
TOC (Total Organic Carbon)	50000	1670	57200	57300	111	111	1	80.0-120			0.227	20

Method Blank (MB)

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

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

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

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

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	J	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
	ug/l		ug/l	ug/l
Methane	U		2.91	10.0

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
	ug/l	ug/l		%		%
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
	ug/l	ug/l	ug/l	%	%	%			%	%
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

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
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*

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 %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
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 %	LCS Qualifier	LCSD Qualifier	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*				

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 %
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		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

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	J6	J6	12.4	21
Vinyl acetate	125	U	23.7	27.1	19.0	21.7	1	30.0-160	J6	J6	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*				

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

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
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 ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
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	

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 %	LCS Qualifier
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*	

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	J	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

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*

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	J4
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 %	LCS Qualifier
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*	

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.

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	LAO00356
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

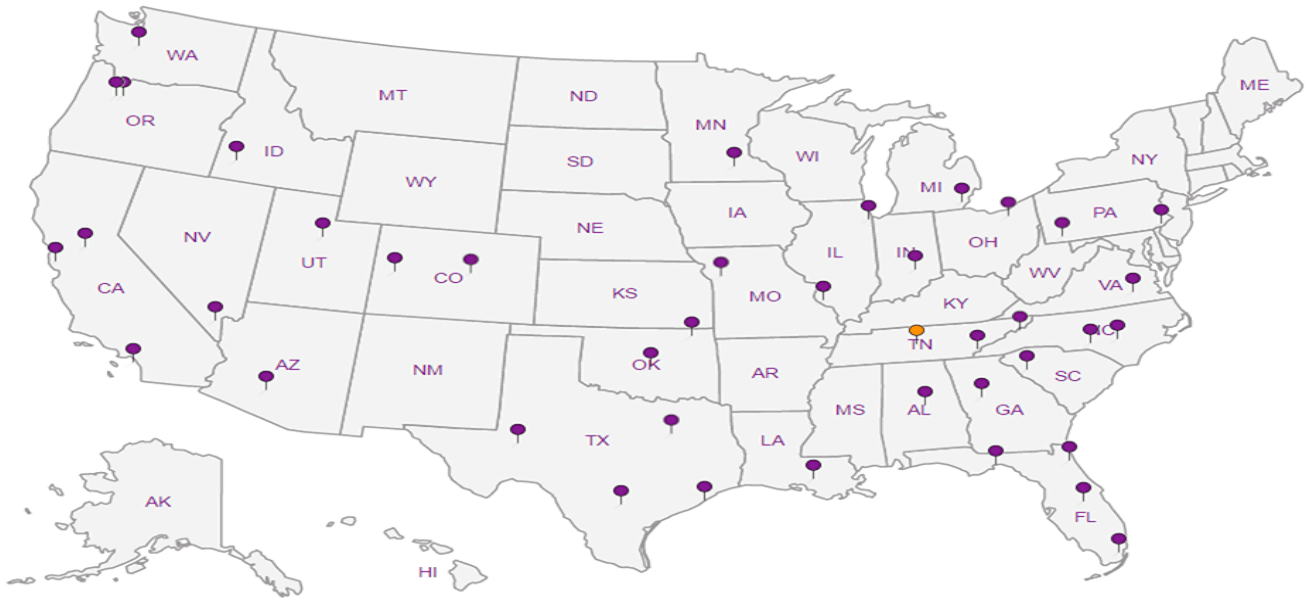
Third Party Federal Accreditations

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.



Pace Analytical
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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.

L980397

C004

Page: 1 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

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: Volatile Halocarbons (EPA 8260B)	TOC	Methane, Ethane, Ethene	Cu (EPA 6010)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Requested Analysis Filtered (Y/N)																	Y/N	Y/N				
1	EX	WT	G			3/21/2018	11:45		6				6					X	X	X			-01
2	MGMS1-43	WT	G			3/22/2018	14:21		6				6					X	X	X			-02
3	MGMS1-60	WT	G			3/22/2018	13:50		3				3					X					-03
4	MGMS2-40	WT	G			3/22/2018	13:11		6				6					X	X	X			-04
5	MGMS2-60	WT	G			3/22/2018	12:45		3				3					X					-05
6	MGMS3-40	WT	G			3/22/2018	12:11		6				6					X	X	X			-06
7	MGMS3-60	WT	G			3/22/2018	11:46		3				3					X					-07
8	MP-1	WT	G			3/21/2018	13:16		6				6					X	X	X			-08
9	MW-1	WT	G			3/20/2018	11:40		3				3					X					-09
10	MW-3	WT	G			3/20/2018	11:11		3				3					X					-10
11	MW-5	WT	G			3/21/2018	10:00		3				3					X					-11
12	MW-7	WT	G			03/21/18	9:08		6				6					X	X	X			-12

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Megan Masterson / Apex	3/23/18	15:00		3/24/18	0845	

4196 3255 8949 / 8450

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Megan Masterson

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 3/23/18

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.3 / 1.0	4.2		

*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.

167 total

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CHAIN-OF-CUSTODY / Analytical Request Document

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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
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Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: WA

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
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ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Volatile Halocarbons (EPA 8260B)	TOC	Methane, Ethane, Ethene	Cu (EPA 6010)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-7 DUP	WT	G			3/21/18	9:08		3				3					X						-13
2	MW-8	WT	G			3/19/18	16:15		3				3					X						-14
3	MW-9	WT	G			3/21/18	8:25		3				3					X						-15
4	MW-12	WT	G			3/20/18	8:05		6				6					X	X	X				-16
5	MW-12 DUP	WT	G			3/20/18	8:05		3				3					X						-17
6	MW-12 MS	WT	G			3/20/18	8:05		3				3					X						
7	MW-12 MSD	WT	G			3/20/18	8:05		3				3					X						
8	MW-13	WT	G			3/20/18	9:28		6				6					X	X	X				-18
9	MW-14	WT	G			3/20/18	13:50		6				6					X	X	X				-19
10	MW-16	WT	G			3/19/18	16:52		3				3					X						-20
11	MW-18i	WT	G			3/21/18	15:58		3				3					X						-21
12	MW-19	WT	G			3/21/18	10:47		6				6					X	X	X				-22

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
							1.3 4.2

4196 3258 9449/8950

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Megan Masterson

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 3/23/18

Temp in °C	Received on Ice (Y/N)	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.

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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L980397

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

Section D — Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Volatile Halocarbons (EPA 8260B)	TOC	Methane, Ethane, Ethene	Cu (EPA 6010)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-19 DUP	WT	G			3/21/18	10:47		3				3					X						-23
2	MW-19i	WT	G			3/20/18	12:24		3				3					X						-24
3	MW-20i	WT	G			3/21/18	16:30		3				3					X						-25
4	MW-21i-40	WT	G			3/22/18	9:45		3				3					X						-26
5	MW-21i-105	WT	G			3/22/18	8:58		3				3					X						-27
6	MW-22i	WT	G			3/22/18	10:36		3				3					X						-28
7	MW-23i	WT	G			3/21/18	14:17		3				3					X						-29
8	MW-24i	WT	G			3/21/18	12:23		6				6					X	X	X				-30
9	MW-24d	WT	G			3/20/18	10:26		3				3					X						-31
10	MW-25i	WT	G			3/21/18	15:17		3				3					X						-32
11	MW-26	WT	G			3/20/18	15:56		6				6					X	X	X				-33
12	MW-32s	WT	G			3/22/18	8:03		3				3					X						-34

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
				[signature]	3/24/18	0845	
							1.3 / 1.0 °C; 4.2 °C; 1; 50

4196 3255 8949 8950

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Megan Masterson

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 3/23/18

Temp in °C | Received on Ice (Y/N) | 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.

Pace Analytical
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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.

L980397

Page: 4 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

Section D — Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Volatile Halocarbons (EPA 8260B)	TOC	Methane, Ethane, Ethene	Cu (EPA 6010)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	S-1	WT	G			3/20/2018	14:37		4			1	3					X			X			-35
2	S-2	WT	G			3/20/2018	15:10		4			1	3					X			X			-36
3	FB-031918	WT	G			3/19/2018	15:25		3				3					X						-37
4	FB-032018	WT	G			3/20/2018	7:35		3				3					X						-38
5	FB-032118	WT	G			3/21/2018	7:30		3				3					X						-39
6	FB-302218	WT	G			3/22/2018	10:05		3				3					X						-40
7	EQ BLANK	WT	G			3/22/2018	10:00		3				3					X						-41
8		WT	G																					
9		WT	G																					
10		WT	G																					
11		WT	G																					
12		WT	G																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
							1.3 4.2

4196 3255 8949/8950

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Megan Masterson

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 3/23/18

Temp in °C	Received on Ice (Y/N)	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: ASHCREPOR		SDG#	L980397
Cooler Received/Opened On: 3/4/18		Temperature:	1.3, 4.2
Received By: Kelly Mercer			
Signature: Kelly Mercer			

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?		✓	

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

July 13, 2018

APEX Companies - Portland, OR

Sample Delivery Group:	L1007508
Samples Received:	07/07/2018
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

Brian Ford
Project Manager

TABLE OF CONTENTS

MW-2 L1007508-01 GW

Collected by: Jake Munsey | Collected date/time: 07/02/18 13:24 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 13:52	07/09/18 13:52	JSD

MW-3 L1007508-02 GW

Collected by: Jake Munsey | Collected date/time: 07/02/18 12:47 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 14:12	07/09/18 14:12	JSD

MW-19I L1007508-03 GW

Collected by: Jake Munsey | Collected date/time: 07/02/18 11:25 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 14:31	07/09/18 14:31	JSD

MW-15 L1007508-04 GW

Collected by: Jake Munsey | Collected date/time: 07/02/18 10:50 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 14:51	07/09/18 14:51	JSD

MW-20I L1007508-05 GW

Collected by: Jake Munsey | Collected date/time: 07/02/18 09:54 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 15:10	07/09/18 15:10	JSD

MW-18I L1007508-06 GW

Collected by: Jake Munsey | Collected date/time: 07/02/18 09:10 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 15:30	07/09/18 15:30	JSD

MW-16 L1007508-07 GW

Collected by: Jake Munsey | Collected date/time: 07/02/18 08:27 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 15:50	07/09/18 15:50	JSD

MGMS3-1 L1007508-08 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 17:32 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 16:10	07/09/18 16:10	JSD

MGMS3-2 L1007508-09 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 17:19 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 16:29	07/09/18 16:29	JSD

MGMS3-3 L1007508-10 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 16:56 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 16:48	07/09/18 16:48	JSD

MGMS3-4 L1007508-11 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 16:20 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 17:08	07/09/18 17:08	JSD

MGMS3-4 DUP L1007508-12 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 16:20 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 17:28	07/09/18 17:28	JSD

MGMS2-1 L1007508-13 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 15:39 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 17:48	07/09/18 17:48	JSD

MGMS2-2 L1007508-14 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 15:27 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 18:07	07/09/18 18:07	JSD

MGMS2-3 L1007508-15 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 15:09 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 18:27	07/09/18 18:27	JSD

MGMS2-4 L1007508-16 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 14:47 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 18:46	07/09/18 18:46	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136672	10	07/12/18 05:29	07/12/18 05:29	RAS

MGMS1-1 L1007508-17 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 14:09 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 19:06	07/09/18 19:06	JSD

MGMS1-2 L1007508-18 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 13:46 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 19:25	07/09/18 19:25	JSD

MGMS1-3 L1007508-19 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 13:19 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 19:44	07/09/18 19:44	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136672	50	07/12/18 05:51	07/12/18 05:51	RAS

MW-13 L1007508-20 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 11:55 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135361	1	07/09/18 20:03	07/09/18 20:03	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136672	50	07/12/18 06:13	07/12/18 06:13	RAS

MW-12 L1007508-21 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 11:01 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 02:03	07/10/18 02:03	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136636	1	07/12/18 01:31	07/12/18 01:31	RAS

MW-12 DUP L1007508-22 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 11:01 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 02:23	07/10/18 02:23	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136636	1	07/12/18 01:53	07/12/18 01:53	RAS

EW-1 L1007508-23 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 10:11 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 02:42	07/10/18 02:42	JSD

MW-6 L1007508-24 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 09:32 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 03:01	07/10/18 03:01	JSD

MW-1 L1007508-25 GW

Collected by: Jake Munsey | Collected date/time: 07/01/18 08:47 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 03:20	07/10/18 03:20	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136636	1	07/12/18 02:15	07/12/18 02:15	RAS

MW-5 L1007508-26 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 16:37 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 03:39	07/10/18 03:39	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136636	1	07/12/18 02:36	07/12/18 02:36	RAS

MW-7 L1007508-27 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 15:31 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 03:59	07/10/18 03:59	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136636	1	07/12/18 02:58	07/12/18 02:58	RAS

MW-7 DUP L1007508-28 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 15:31 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 04:18	07/10/18 04:18	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136636	1	07/12/18 03:20	07/12/18 03:20	RAS

MW- 9 L1007508-29 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 14:48 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 04:37	07/10/18 04:37	JSD
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136636	10	07/12/18 03:41	07/12/18 03:41	RAS

MW-8 L1007508-30 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 14:10 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 04:57	07/10/18 04:57	JSD

MW-25I L1007508-31 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 13:20 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 05:16	07/10/18 05:16	JSD

MW-21I-40 L1007508-32 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 12:25 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 05:35	07/10/18 05:35	JSD

MW-21I-105 L1007508-33 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 11:34 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 05:55	07/10/18 05:55	JSD

MW-22I L1007508-34 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 10:37 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135547	1	07/10/18 06:14	07/10/18 06:14	JSD

MW-10 L1007508-35 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 09:55 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 22:32	07/10/18 22:32	LRL

MW-26 L1007508-36 GW

Collected by: Jake Munsey | Collected date/time: 06/29/18 09:01 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 22:52	07/10/18 22:52	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	10	07/11/18 19:20	07/11/18 19:20	DWR

MW-14 L1007508-37 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 16:39 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 23:11	07/10/18 23:11	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	10	07/11/18 19:40	07/11/18 19:40	DWR

MW-23I L1007508-38 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 15:50 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 23:31	07/10/18 23:31	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	1	07/11/18 20:00	07/11/18 20:00	DWR

MW-17 L1007508-39 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 15:02 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 23:49	07/10/18 23:49	LRL

MW-24I L1007508-40 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 11:06 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/11/18 00:08	07/11/18 00:08	LRL

EX-1 L1007508-41 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 09:53 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/11/18 00:27	07/11/18 00:27	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	10	07/11/18 20:20	07/11/18 20:20	DWR

MW-19 L1007508-42 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 08:52 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/11/18 00:46	07/11/18 00:46	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	50	07/11/18 20:40	07/11/18 20:40	DWR

MW-19 DUP L1007508-43 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 08:52 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/11/18 01:05	07/11/18 01:05	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	50	07/11/18 21:00	07/11/18 21:00	DWR

S-1 L1007508-44 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 13:27 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/11/18 01:25	07/11/18 01:25	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	1	07/11/18 21:20	07/11/18 21:20	DWR

S-2 L1007508-45 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 14:05 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/11/18 01:44	07/11/18 01:44	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	1	07/11/18 21:40	07/11/18 21:40	DWR

MP-1 L1007508-46 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 12:15 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/11/18 02:04	07/11/18 02:04	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	10	07/11/18 21:59	07/11/18 21:59	DWR

MP-3 L1007508-47 GW

Collected by: Jake Munsey | Collected date/time: 06/28/18 11:47 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/11/18 02:23	07/11/18 02:23	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	10	07/11/18 22:19	07/11/18 22:19	DWR

MW-24D L1007508-48 GW

Collected by: Jake Munsey | Collected date/time: 06/27/18 14:20 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/11/18 02:42	07/11/18 02:42	LRL
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1136397	1	07/11/18 19:00	07/11/18 19:00	DWR

FIELD BLANK L1007508-49 GW

Collected by: Jake Munsey | Collected date/time: 07/02/18 14:13 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 21:53	07/10/18 21:53	LRL

EQUIPMENT BLANK L1007508-50 GW

Collected by: Jake Munsey | Collected date/time: 07/02/18 14:12 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 22:12	07/10/18 22:12	LRL

TRIP BLANK 1 L1007508-51 GW

Collected by: Jake Munsey | Collected date/time: 06/27/18 00:00 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 20:53	07/10/18 20:53	LRL

TRIP BLANK 2 L1007508-52 GW

Collected by: Jake Munsey | Collected date/time: 06/27/18 00:00 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 21:13	07/10/18 21:13	LRL

TRIP BLANK 3 L1007508-53 GW

Collected by: Jake Munsey | Collected date/time: 06/27/18 00:00 | Received date/time: 07/07/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1135755	1	07/10/18 21:33	07/10/18 21:33	LRL

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
Project Manager

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	07/09/2018 13:52	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 13:52	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 13:52	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 13:52	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 13:52	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 13:52	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 13:52	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 13:52	WG1135361
Chloroethane	3.01	J3	0.141	2.50	1	07/09/2018 13:52	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 13:52	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 13:52	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 13:52	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 13:52	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 13:52	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 13:52	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 13:52	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 13:52	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 13:52	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 13:52	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 13:52	WG1135361
1,1-Dichloroethane	U		0.114	0.500	1	07/09/2018 13:52	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 13:52	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 13:52	WG1135361
cis-1,2-Dichloroethene	U		0.0933	0.500	1	07/09/2018 13:52	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 13:52	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 13:52	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 13:52	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 13:52	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 13:52	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 13:52	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 13:52	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 13:52	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 13:52	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 13:52	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 13:52	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 13:52	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 13:52	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 13:52	WG1135361
Tetrachloroethene	U		0.199	0.500	1	07/09/2018 13:52	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 13:52	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 13:52	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 13:52	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 13:52	WG1135361
Trichloroethene	U		0.153	0.500	1	07/09/2018 13:52	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 13:52	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 13:52	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 13:52	WG1135361
Vinyl chloride	U	J3	0.118	0.500	1	07/09/2018 13:52	WG1135361
(S) Toluene-d8	*99.1*			*80.0-120*		*07/09/2018 13:52*	WG1135361
(S) Dibromofluoromethane	*98.4*			*76.0-123*		*07/09/2018 13:52*	WG1135361
(S) 4-Bromofluorobenzene	*93.1*			*80.0-120*		*07/09/2018 13:52*	WG1135361

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	07/09/2018 14:12	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 14:12	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 14:12	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 14:12	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 14:12	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 14:12	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 14:12	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 14:12	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 14:12	WG1135361
Chloroform	0.439	J	0.0860	0.500	1	07/09/2018 14:12	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 14:12	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 14:12	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 14:12	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 14:12	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 14:12	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 14:12	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 14:12	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 14:12	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 14:12	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 14:12	WG1135361
1,1-Dichloroethane	3.22		0.114	0.500	1	07/09/2018 14:12	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 14:12	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 14:12	WG1135361
cis-1,2-Dichloroethene	64.5		0.0933	0.500	1	07/09/2018 14:12	WG1135361
trans-1,2-Dichloroethene	1.62		0.152	0.500	1	07/09/2018 14:12	WG1135361
1,2-Dichloropropane	1.07		0.190	0.500	1	07/09/2018 14:12	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 14:12	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 14:12	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 14:12	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 14:12	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 14:12	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 14:12	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 14:12	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 14:12	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 14:12	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 14:12	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 14:12	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 14:12	WG1135361
Tetrachloroethene	180		0.199	0.500	1	07/09/2018 14:12	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 14:12	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 14:12	WG1135361
1,1,1-Trichloroethane	2.58		0.0940	0.500	1	07/09/2018 14:12	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 14:12	WG1135361
Trichloroethene	43.1		0.153	0.500	1	07/09/2018 14:12	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 14:12	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 14:12	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 14:12	WG1135361
Vinyl chloride	U	J3	0.118	0.500	1	07/09/2018 14:12	WG1135361
(S) Toluene-d8	*98.2*			*80.0-120*		*07/09/2018 14:12*	WG1135361
(S) Dibromofluoromethane	*98.4*			*76.0-123*		*07/09/2018 14:12*	WG1135361
(S) 4-Bromofluorobenzene	*92.3*			*80.0-120*		*07/09/2018 14:12*	WG1135361

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	07/09/2018 14:31	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 14:31	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 14:31	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 14:31	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 14:31	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 14:31	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 14:31	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 14:31	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 14:31	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 14:31	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 14:31	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 14:31	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 14:31	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 14:31	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 14:31	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 14:31	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 14:31	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 14:31	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 14:31	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 14:31	WG1135361
1,1-Dichloroethane	U		0.114	0.500	1	07/09/2018 14:31	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 14:31	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 14:31	WG1135361
cis-1,2-Dichloroethene	0.212	J	0.0933	0.500	1	07/09/2018 14:31	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 14:31	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 14:31	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 14:31	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 14:31	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 14:31	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 14:31	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 14:31	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 14:31	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 14:31	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 14:31	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 14:31	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 14:31	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 14:31	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 14:31	WG1135361
Tetrachloroethene	0.223	J	0.199	0.500	1	07/09/2018 14:31	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 14:31	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 14:31	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 14:31	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 14:31	WG1135361
Trichloroethene	U		0.153	0.500	1	07/09/2018 14:31	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 14:31	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 14:31	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 14:31	WG1135361
Vinyl chloride	U	J3	0.118	0.500	1	07/09/2018 14:31	WG1135361
(S) Toluene-d8	*97.1*			*80.0-120*		*07/09/2018 14:31*	WG1135361
(S) Dibromofluoromethane	*98.3*			*76.0-123*		*07/09/2018 14:31*	WG1135361
(S) 4-Bromofluorobenzene	*91.2*			*80.0-120*		*07/09/2018 14:31*	WG1135361

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	07/09/2018 14:51	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 14:51	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 14:51	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 14:51	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 14:51	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 14:51	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 14:51	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 14:51	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 14:51	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 14:51	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 14:51	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 14:51	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 14:51	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 14:51	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 14:51	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 14:51	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 14:51	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 14:51	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 14:51	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 14:51	WG1135361
1,1-Dichloroethane	U		0.114	0.500	1	07/09/2018 14:51	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 14:51	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 14:51	WG1135361
cis-1,2-Dichloroethene	U		0.0933	0.500	1	07/09/2018 14:51	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 14:51	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 14:51	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 14:51	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 14:51	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 14:51	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 14:51	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 14:51	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 14:51	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 14:51	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 14:51	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 14:51	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 14:51	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 14:51	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 14:51	WG1135361
Tetrachloroethene	0.596		0.199	0.500	1	07/09/2018 14:51	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 14:51	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 14:51	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 14:51	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 14:51	WG1135361
Trichloroethene	U		0.153	0.500	1	07/09/2018 14:51	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 14:51	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 14:51	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 14:51	WG1135361
Vinyl chloride	U	J3	0.118	0.500	1	07/09/2018 14:51	WG1135361
(S) Toluene-d8	*99.6*			*80.0-120*		*07/09/2018 14:51*	WG1135361
(S) Dibromofluoromethane	*98.3*			*76.0-123*		*07/09/2018 14:51*	WG1135361
(S) 4-Bromofluorobenzene	*90.9*			*80.0-120*		*07/09/2018 14:51*	WG1135361

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	07/09/2018 15:10	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 15:10	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 15:10	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 15:10	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 15:10	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 15:10	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 15:10	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 15:10	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 15:10	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 15:10	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 15:10	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 15:10	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 15:10	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 15:10	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 15:10	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 15:10	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 15:10	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 15:10	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 15:10	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 15:10	WG1135361
1,1-Dichloroethane	0.436	J	0.114	0.500	1	07/09/2018 15:10	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 15:10	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 15:10	WG1135361
cis-1,2-Dichloroethene	9.72		0.0933	0.500	1	07/09/2018 15:10	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 15:10	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 15:10	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 15:10	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 15:10	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 15:10	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 15:10	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 15:10	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 15:10	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 15:10	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 15:10	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 15:10	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 15:10	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 15:10	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 15:10	WG1135361
Tetrachloroethene	2.27		0.199	0.500	1	07/09/2018 15:10	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 15:10	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 15:10	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 15:10	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 15:10	WG1135361
Trichloroethene	1.60		0.153	0.500	1	07/09/2018 15:10	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 15:10	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 15:10	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 15:10	WG1135361
Vinyl chloride	U	J3	0.118	0.500	1	07/09/2018 15:10	WG1135361
(S) Toluene-d8	*98.4*			*80.0-120*		*07/09/2018 15:10*	WG1135361
(S) Dibromofluoromethane	*99.2*			*76.0-123*		*07/09/2018 15:10*	WG1135361
(S) 4-Bromofluorobenzene	*91.7*			*80.0-120*		*07/09/2018 15:10*	WG1135361

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	07/09/2018 15:30	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 15:30	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 15:30	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 15:30	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 15:30	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 15:30	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 15:30	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 15:30	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 15:30	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 15:30	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 15:30	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 15:30	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 15:30	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 15:30	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 15:30	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 15:30	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 15:30	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 15:30	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 15:30	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 15:30	WG1135361
1,1-Dichloroethane	U		0.114	0.500	1	07/09/2018 15:30	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 15:30	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 15:30	WG1135361
cis-1,2-Dichloroethene	0.626		0.0933	0.500	1	07/09/2018 15:30	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 15:30	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 15:30	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 15:30	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 15:30	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 15:30	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 15:30	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 15:30	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 15:30	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 15:30	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 15:30	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 15:30	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 15:30	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 15:30	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 15:30	WG1135361
Tetrachloroethene	0.557		0.199	0.500	1	07/09/2018 15:30	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 15:30	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 15:30	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 15:30	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 15:30	WG1135361
Trichloroethene	0.320	J	0.153	0.500	1	07/09/2018 15:30	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 15:30	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 15:30	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 15:30	WG1135361
Vinyl chloride	U	J3	0.118	0.500	1	07/09/2018 15:30	WG1135361
(S) Toluene-d8	*97.1*			*80.0-120*		*07/09/2018 15:30*	WG1135361
(S) Dibromofluoromethane	*99.6*			*76.0-123*		*07/09/2018 15:30*	WG1135361
(S) 4-Bromofluorobenzene	*92.4*			*80.0-120*		*07/09/2018 15:30*	WG1135361

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	07/09/2018 15:50	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 15:50	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 15:50	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 15:50	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 15:50	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 15:50	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 15:50	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 15:50	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 15:50	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 15:50	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 15:50	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 15:50	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 15:50	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 15:50	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 15:50	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 15:50	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 15:50	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 15:50	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 15:50	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 15:50	WG1135361
1,1-Dichloroethane	0.500	J	0.114	0.500	1	07/09/2018 15:50	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 15:50	WG1135361
1,1-Dichloroethene	0.209	J	0.188	0.500	1	07/09/2018 15:50	WG1135361
cis-1,2-Dichloroethene	9.61		0.0933	0.500	1	07/09/2018 15:50	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 15:50	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 15:50	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 15:50	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 15:50	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 15:50	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 15:50	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 15:50	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 15:50	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 15:50	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 15:50	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 15:50	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 15:50	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 15:50	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 15:50	WG1135361
Tetrachloroethene	72.5		0.199	0.500	1	07/09/2018 15:50	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 15:50	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 15:50	WG1135361
1,1,1-Trichloroethane	0.855		0.0940	0.500	1	07/09/2018 15:50	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 15:50	WG1135361
Trichloroethene	7.36		0.153	0.500	1	07/09/2018 15:50	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 15:50	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 15:50	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 15:50	WG1135361
Vinyl chloride	U	J3	0.118	0.500	1	07/09/2018 15:50	WG1135361
(S) Toluene-d8	*97.4*			*80.0-120*		*07/09/2018 15:50*	WG1135361
(S) Dibromofluoromethane	*98.2*			*76.0-123*		*07/09/2018 15:50*	WG1135361
(S) 4-Bromofluorobenzene	*90.2*			*80.0-120*		*07/09/2018 15:50*	WG1135361

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	07/09/2018 16:10	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 16:10	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 16:10	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 16:10	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 16:10	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 16:10	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 16:10	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 16:10	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 16:10	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 16:10	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 16:10	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 16:10	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 16:10	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 16:10	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 16:10	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 16:10	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 16:10	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 16:10	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 16:10	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 16:10	WG1135361
1,1-Dichloroethane	0.247	J	0.114	0.500	1	07/09/2018 16:10	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 16:10	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 16:10	WG1135361
cis-1,2-Dichloroethene	3.98		0.0933	0.500	1	07/09/2018 16:10	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 16:10	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 16:10	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 16:10	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 16:10	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 16:10	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 16:10	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 16:10	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 16:10	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 16:10	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 16:10	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 16:10	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 16:10	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 16:10	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 16:10	WG1135361
Tetrachloroethene	5.63		0.199	0.500	1	07/09/2018 16:10	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 16:10	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 16:10	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 16:10	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 16:10	WG1135361
Trichloroethene	4.06		0.153	0.500	1	07/09/2018 16:10	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 16:10	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 16:10	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 16:10	WG1135361
Vinyl chloride	0.359	J J3	0.118	0.500	1	07/09/2018 16:10	WG1135361
(S) Toluene-d8	*99.8*			*80.0-120*		*07/09/2018 16:10*	WG1135361
(S) Dibromofluoromethane	*99.7*			*76.0-123*		*07/09/2018 16:10*	WG1135361
(S) 4-Bromofluorobenzene	*94.1*			*80.0-120*		*07/09/2018 16:10*	WG1135361

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	07/09/2018 16:29	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 16:29	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 16:29	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 16:29	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 16:29	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 16:29	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 16:29	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 16:29	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 16:29	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 16:29	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 16:29	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 16:29	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 16:29	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 16:29	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 16:29	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 16:29	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 16:29	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 16:29	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 16:29	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 16:29	WG1135361
1,1-Dichloroethane	U		0.114	0.500	1	07/09/2018 16:29	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 16:29	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 16:29	WG1135361
cis-1,2-Dichloroethene	1.71		0.0933	0.500	1	07/09/2018 16:29	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 16:29	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 16:29	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 16:29	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 16:29	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 16:29	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 16:29	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 16:29	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 16:29	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 16:29	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 16:29	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 16:29	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 16:29	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 16:29	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 16:29	WG1135361
Tetrachloroethene	1.82		0.199	0.500	1	07/09/2018 16:29	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 16:29	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 16:29	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 16:29	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 16:29	WG1135361
Trichloroethene	1.04		0.153	0.500	1	07/09/2018 16:29	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 16:29	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 16:29	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 16:29	WG1135361
Vinyl chloride	0.359	J J3	0.118	0.500	1	07/09/2018 16:29	WG1135361
(S) Toluene-d8	*98.2*			*80.0-120*		*07/09/2018 16:29*	WG1135361
(S) Dibromofluoromethane	*99.1*			*76.0-123*		*07/09/2018 16:29*	WG1135361
(S) 4-Bromofluorobenzene	*91.7*			*80.0-120*		*07/09/2018 16:29*	WG1135361

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	07/09/2018 16:48	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 16:48	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 16:48	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 16:48	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 16:48	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 16:48	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 16:48	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 16:48	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 16:48	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 16:48	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 16:48	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 16:48	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 16:48	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 16:48	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 16:48	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 16:48	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 16:48	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 16:48	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 16:48	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 16:48	WG1135361
1,1-Dichloroethane	0.671		0.114	0.500	1	07/09/2018 16:48	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 16:48	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 16:48	WG1135361
cis-1,2-Dichloroethene	12.7		0.0933	0.500	1	07/09/2018 16:48	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 16:48	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 16:48	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 16:48	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 16:48	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 16:48	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 16:48	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 16:48	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 16:48	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 16:48	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 16:48	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 16:48	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 16:48	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 16:48	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 16:48	WG1135361
Tetrachloroethene	2.70		0.199	0.500	1	07/09/2018 16:48	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 16:48	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 16:48	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 16:48	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 16:48	WG1135361
Trichloroethene	1.92		0.153	0.500	1	07/09/2018 16:48	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 16:48	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 16:48	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 16:48	WG1135361
Vinyl chloride	3.36	J3	0.118	0.500	1	07/09/2018 16:48	WG1135361
(S) Toluene-d8	*99.0*			*80.0-120*		*07/09/2018 16:48*	WG1135361
(S) Dibromofluoromethane	*98.9*			*76.0-123*		*07/09/2018 16:48*	WG1135361
(S) 4-Bromofluorobenzene	*91.9*			*80.0-120*		*07/09/2018 16:48*	WG1135361

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	07/09/2018 17:08	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 17:08	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 17:08	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 17:08	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 17:08	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 17:08	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 17:08	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 17:08	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 17:08	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 17:08	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 17:08	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 17:08	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 17:08	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 17:08	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 17:08	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 17:08	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 17:08	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 17:08	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 17:08	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 17:08	WG1135361
1,1-Dichloroethane	1.39		0.114	0.500	1	07/09/2018 17:08	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 17:08	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 17:08	WG1135361
cis-1,2-Dichloroethene	7.58		0.0933	0.500	1	07/09/2018 17:08	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 17:08	WG1135361
1,2-Dichloropropane	0.279	J	0.190	0.500	1	07/09/2018 17:08	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 17:08	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 17:08	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 17:08	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 17:08	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 17:08	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 17:08	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 17:08	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 17:08	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 17:08	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 17:08	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 17:08	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 17:08	WG1135361
Tetrachloroethene	0.498	J	0.199	0.500	1	07/09/2018 17:08	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 17:08	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 17:08	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 17:08	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 17:08	WG1135361
Trichloroethene	0.169	J	0.153	0.500	1	07/09/2018 17:08	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 17:08	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 17:08	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 17:08	WG1135361
Vinyl chloride	8.98	J3	0.118	0.500	1	07/09/2018 17:08	WG1135361
(S) Toluene-d8	*97.5*			*80.0-120*		*07/09/2018 17:08*	WG1135361
(S) Dibromofluoromethane	*97.4*			*76.0-123*		*07/09/2018 17:08*	WG1135361
(S) 4-Bromofluorobenzene	*91.7*			*80.0-120*		*07/09/2018 17:08*	WG1135361

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	07/09/2018 17:28	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 17:28	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 17:28	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 17:28	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 17:28	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 17:28	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 17:28	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 17:28	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 17:28	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 17:28	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 17:28	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 17:28	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 17:28	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 17:28	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 17:28	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 17:28	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 17:28	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 17:28	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 17:28	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 17:28	WG1135361
1,1-Dichloroethane	1.96		0.114	0.500	1	07/09/2018 17:28	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 17:28	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 17:28	WG1135361
cis-1,2-Dichloroethene	9.43		0.0933	0.500	1	07/09/2018 17:28	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 17:28	WG1135361
1,2-Dichloropropane	0.318	J	0.190	0.500	1	07/09/2018 17:28	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 17:28	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 17:28	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 17:28	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 17:28	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 17:28	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 17:28	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 17:28	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 17:28	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 17:28	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 17:28	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 17:28	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 17:28	WG1135361
Tetrachloroethene	0.630		0.199	0.500	1	07/09/2018 17:28	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 17:28	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 17:28	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 17:28	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 17:28	WG1135361
Trichloroethene	0.163	J	0.153	0.500	1	07/09/2018 17:28	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 17:28	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 17:28	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 17:28	WG1135361
Vinyl chloride	17.3	J3	0.118	0.500	1	07/09/2018 17:28	WG1135361
(S) Toluene-d8	*97.1*			*80.0-120*		*07/09/2018 17:28*	WG1135361
(S) Dibromofluoromethane	*99.2*			*76.0-123*		*07/09/2018 17:28*	WG1135361
(S) 4-Bromofluorobenzene	*93.7*			*80.0-120*		*07/09/2018 17:28*	WG1135361

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	07/09/2018 17:48	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 17:48	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 17:48	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 17:48	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 17:48	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 17:48	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 17:48	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 17:48	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 17:48	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 17:48	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 17:48	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 17:48	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 17:48	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 17:48	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 17:48	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 17:48	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 17:48	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 17:48	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 17:48	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 17:48	WG1135361
1,1-Dichloroethane	0.531		0.114	0.500	1	07/09/2018 17:48	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 17:48	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 17:48	WG1135361
cis-1,2-Dichloroethene	13.8		0.0933	0.500	1	07/09/2018 17:48	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 17:48	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 17:48	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 17:48	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 17:48	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 17:48	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 17:48	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 17:48	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 17:48	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 17:48	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 17:48	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 17:48	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 17:48	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 17:48	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 17:48	WG1135361
Tetrachloroethene	4.47		0.199	0.500	1	07/09/2018 17:48	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 17:48	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 17:48	WG1135361
1,1,1-Trichloroethane	0.191	J	0.0940	0.500	1	07/09/2018 17:48	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 17:48	WG1135361
Trichloroethene	4.85		0.153	0.500	1	07/09/2018 17:48	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 17:48	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 17:48	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 17:48	WG1135361
Vinyl chloride	4.60	J3	0.118	0.500	1	07/09/2018 17:48	WG1135361
(S) Toluene-d8	*99.2*			*80.0-120*		*07/09/2018 17:48*	WG1135361
(S) Dibromofluoromethane	*100*			*76.0-123*		*07/09/2018 17:48*	WG1135361
(S) 4-Bromofluorobenzene	*92.3*			*80.0-120*		*07/09/2018 17:48*	WG1135361

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	07/09/2018 18:07	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 18:07	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 18:07	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 18:07	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 18:07	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 18:07	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 18:07	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 18:07	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 18:07	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 18:07	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 18:07	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 18:07	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 18:07	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 18:07	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 18:07	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 18:07	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 18:07	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 18:07	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 18:07	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 18:07	WG1135361
1,1-Dichloroethane	0.446	J	0.114	0.500	1	07/09/2018 18:07	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 18:07	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 18:07	WG1135361
cis-1,2-Dichloroethene	6.74		0.0933	0.500	1	07/09/2018 18:07	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 18:07	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 18:07	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 18:07	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 18:07	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 18:07	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 18:07	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 18:07	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 18:07	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 18:07	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 18:07	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 18:07	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 18:07	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 18:07	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 18:07	WG1135361
Tetrachloroethene	4.40		0.199	0.500	1	07/09/2018 18:07	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 18:07	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 18:07	WG1135361
1,1,1-Trichloroethane	0.175	J	0.0940	0.500	1	07/09/2018 18:07	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 18:07	WG1135361
Trichloroethene	3.42		0.153	0.500	1	07/09/2018 18:07	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 18:07	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 18:07	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 18:07	WG1135361
Vinyl chloride	3.87	J3	0.118	0.500	1	07/09/2018 18:07	WG1135361
(S) Toluene-d8	*98.0*			*80.0-120*		*07/09/2018 18:07*	WG1135361
(S) Dibromofluoromethane	*101*			*76.0-123*		*07/09/2018 18:07*	WG1135361
(S) 4-Bromofluorobenzene	*92.2*			*80.0-120*		*07/09/2018 18:07*	WG1135361

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	07/09/2018 18:27	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 18:27	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 18:27	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 18:27	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 18:27	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 18:27	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 18:27	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 18:27	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 18:27	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 18:27	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 18:27	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 18:27	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 18:27	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 18:27	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 18:27	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 18:27	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 18:27	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 18:27	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 18:27	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 18:27	WG1135361
1,1-Dichloroethane	0.726		0.114	0.500	1	07/09/2018 18:27	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 18:27	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 18:27	WG1135361
cis-1,2-Dichloroethene	14.1		0.0933	0.500	1	07/09/2018 18:27	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 18:27	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 18:27	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 18:27	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 18:27	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 18:27	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 18:27	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 18:27	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 18:27	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 18:27	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 18:27	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 18:27	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 18:27	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 18:27	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 18:27	WG1135361
Tetrachloroethene	19.6		0.199	0.500	1	07/09/2018 18:27	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 18:27	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 18:27	WG1135361
1,1,1-Trichloroethane	0.200	J	0.0940	0.500	1	07/09/2018 18:27	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 18:27	WG1135361
Trichloroethene	10.1		0.153	0.500	1	07/09/2018 18:27	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 18:27	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 18:27	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 18:27	WG1135361
Vinyl chloride	1.58	J3	0.118	0.500	1	07/09/2018 18:27	WG1135361
(S) Toluene-d8	*98.2*			*80.0-120*		*07/09/2018 18:27*	WG1135361
(S) Dibromofluoromethane	*100*			*76.0-123*		*07/09/2018 18:27*	WG1135361
(S) 4-Bromofluorobenzene	*91.9*			*80.0-120*		*07/09/2018 18:27*	WG1135361

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	07/09/2018 18:46	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 18:46	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 18:46	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 18:46	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 18:46	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 18:46	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 18:46	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 18:46	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 18:46	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 18:46	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 18:46	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 18:46	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 18:46	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 18:46	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 18:46	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 18:46	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 18:46	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 18:46	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 18:46	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 18:46	WG1135361
1,1-Dichloroethane	12.7		0.114	0.500	1	07/09/2018 18:46	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 18:46	WG1135361
1,1-Dichloroethene	5.93		0.188	0.500	1	07/09/2018 18:46	WG1135361
cis-1,2-Dichloroethene	151		0.933	5.00	10	07/12/2018 05:29	WG1136672
trans-1,2-Dichloroethene	0.971		0.152	0.500	1	07/09/2018 18:46	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 18:46	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 18:46	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 18:46	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 18:46	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 18:46	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 18:46	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 18:46	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 18:46	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 18:46	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 18:46	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 18:46	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 18:46	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 18:46	WG1135361
Tetrachloroethene	62.1		0.199	0.500	1	07/09/2018 18:46	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 18:46	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 18:46	WG1135361
1,1,1-Trichloroethane	1.04		0.0940	0.500	1	07/09/2018 18:46	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 18:46	WG1135361
Trichloroethene	48.9		0.153	0.500	1	07/09/2018 18:46	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 18:46	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 18:46	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 18:46	WG1135361
Vinyl chloride	38.2	J3	0.118	0.500	1	07/09/2018 18:46	WG1135361
(S) Toluene-d8	*98.3*			*80.0-120*		*07/09/2018 18:46*	WG1135361
(S) Toluene-d8	*107*			*80.0-120*		*07/12/2018 05:29*	WG1136672
(S) Dibromofluoromethane	*97.4*			*76.0-123*		*07/09/2018 18:46*	WG1135361
(S) Dibromofluoromethane	*85.5*			*76.0-123*		*07/12/2018 05:29*	WG1136672
(S) 4-Bromofluorobenzene	*92.6*			*80.0-120*		*07/09/2018 18:46*	WG1135361
(S) 4-Bromofluorobenzene	*93.6*			*80.0-120*		*07/12/2018 05:29*	WG1136672

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	07/09/2018 19:06	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 19:06	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 19:06	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 19:06	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 19:06	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 19:06	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 19:06	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 19:06	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 19:06	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 19:06	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 19:06	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 19:06	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 19:06	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 19:06	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 19:06	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 19:06	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 19:06	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 19:06	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 19:06	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 19:06	WG1135361
1,1-Dichloroethane	3.30		0.114	0.500	1	07/09/2018 19:06	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 19:06	WG1135361
1,1-Dichloroethene	0.462	J	0.188	0.500	1	07/09/2018 19:06	WG1135361
cis-1,2-Dichloroethene	104		0.0933	0.500	1	07/09/2018 19:06	WG1135361
trans-1,2-Dichloroethene	0.357	J	0.152	0.500	1	07/09/2018 19:06	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 19:06	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 19:06	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 19:06	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 19:06	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 19:06	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 19:06	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 19:06	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 19:06	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 19:06	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 19:06	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 19:06	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 19:06	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 19:06	WG1135361
Tetrachloroethene	18.5		0.199	0.500	1	07/09/2018 19:06	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 19:06	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 19:06	WG1135361
1,1,1-Trichloroethane	0.132	J	0.0940	0.500	1	07/09/2018 19:06	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 19:06	WG1135361
Trichloroethene	36.6		0.153	0.500	1	07/09/2018 19:06	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 19:06	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 19:06	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 19:06	WG1135361
Vinyl chloride	0.556	J3	0.118	0.500	1	07/09/2018 19:06	WG1135361
(S) Toluene-d8	*97.9*			*80.0-120*		*07/09/2018 19:06*	WG1135361
(S) Dibromofluoromethane	*99.1*			*76.0-123*		*07/09/2018 19:06*	WG1135361
(S) 4-Bromofluorobenzene	*92.5*			*80.0-120*		*07/09/2018 19:06*	WG1135361

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	07/09/2018 19:25	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 19:25	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 19:25	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 19:25	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 19:25	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 19:25	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 19:25	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 19:25	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 19:25	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 19:25	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 19:25	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 19:25	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 19:25	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 19:25	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 19:25	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 19:25	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 19:25	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 19:25	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 19:25	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 19:25	WG1135361
1,1-Dichloroethane	0.894		0.114	0.500	1	07/09/2018 19:25	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 19:25	WG1135361
1,1-Dichloroethene	U		0.188	0.500	1	07/09/2018 19:25	WG1135361
cis-1,2-Dichloroethene	11.8		0.0933	0.500	1	07/09/2018 19:25	WG1135361
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/09/2018 19:25	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 19:25	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 19:25	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 19:25	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 19:25	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 19:25	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 19:25	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 19:25	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 19:25	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 19:25	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 19:25	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 19:25	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 19:25	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 19:25	WG1135361
Tetrachloroethene	18.4		0.199	0.500	1	07/09/2018 19:25	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 19:25	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 19:25	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 19:25	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 19:25	WG1135361
Trichloroethene	8.45		0.153	0.500	1	07/09/2018 19:25	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 19:25	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 19:25	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 19:25	WG1135361
Vinyl chloride	U	J3	0.118	0.500	1	07/09/2018 19:25	WG1135361
(S) Toluene-d8	*97.0*			*80.0-120*		*07/09/2018 19:25*	WG1135361
(S) Dibromofluoromethane	*99.2*			*76.0-123*		*07/09/2018 19:25*	WG1135361
(S) 4-Bromofluorobenzene	*91.5*			*80.0-120*		*07/09/2018 19:25*	WG1135361

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	07/09/2018 19:44	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 19:44	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 19:44	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 19:44	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 19:44	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 19:44	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 19:44	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 19:44	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 19:44	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 19:44	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 19:44	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 19:44	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 19:44	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 19:44	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 19:44	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 19:44	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 19:44	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 19:44	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 19:44	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 19:44	WG1135361
1,1-Dichloroethane	116		0.114	0.500	1	07/09/2018 19:44	WG1135361
1,2-Dichloroethane	U		0.108	0.500	1	07/09/2018 19:44	WG1135361
1,1-Dichloroethene	13.8		0.188	0.500	1	07/09/2018 19:44	WG1135361
cis-1,2-Dichloroethene	1880		4.66	25.0	50	07/12/2018 05:51	WG1136672
trans-1,2-Dichloroethene	32.8		0.152	0.500	1	07/09/2018 19:44	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 19:44	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 19:44	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 19:44	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 19:44	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 19:44	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 19:44	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 19:44	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 19:44	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 19:44	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 19:44	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 19:44	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 19:44	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 19:44	WG1135361
Tetrachloroethene	107		0.199	0.500	1	07/09/2018 19:44	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 19:44	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 19:44	WG1135361
1,1,1-Trichloroethane	0.588		0.0940	0.500	1	07/09/2018 19:44	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 19:44	WG1135361
Trichloroethene	246		7.65	25.0	50	07/12/2018 05:51	WG1136672
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 19:44	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 19:44	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 19:44	WG1135361
Vinyl chloride	118	J3	0.118	0.500	1	07/09/2018 19:44	WG1135361
(S) Toluene-d8	*97.2*			*80.0-120*		*07/09/2018 19:44*	WG1135361
(S) Toluene-d8	*110*			*80.0-120*		*07/12/2018 05:51*	WG1136672
(S) Dibromofluoromethane	*98.8*			*76.0-123*		*07/09/2018 19:44*	WG1135361
(S) Dibromofluoromethane	*96.6*			*76.0-123*		*07/12/2018 05:51*	WG1136672
(S) 4-Bromofluorobenzene	*93.2*			*80.0-120*		*07/09/2018 19:44*	WG1135361
(S) 4-Bromofluorobenzene	*95.5*			*80.0-120*		*07/12/2018 05:51*	WG1136672

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	07/09/2018 20:03	WG1135361
Bromodichloromethane	U		0.0800	0.500	1	07/09/2018 20:03	WG1135361
Bromochloromethane	U		0.145	0.500	1	07/09/2018 20:03	WG1135361
Bromoform	U		0.186	0.500	1	07/09/2018 20:03	WG1135361
Bromomethane	U		0.157	2.50	1	07/09/2018 20:03	WG1135361
Carbon tetrachloride	U		0.159	0.500	1	07/09/2018 20:03	WG1135361
Chlorobenzene	U		0.140	0.500	1	07/09/2018 20:03	WG1135361
Chlorodibromomethane	U		0.128	0.500	1	07/09/2018 20:03	WG1135361
Chloroethane	U	J3	0.141	2.50	1	07/09/2018 20:03	WG1135361
Chloroform	U		0.0860	0.500	1	07/09/2018 20:03	WG1135361
Chloromethane	U		0.153	1.25	1	07/09/2018 20:03	WG1135361
2-Chlorotoluene	U		0.111	0.500	1	07/09/2018 20:03	WG1135361
4-Chlorotoluene	U		0.0972	0.500	1	07/09/2018 20:03	WG1135361
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/09/2018 20:03	WG1135361
1,2-Dibromoethane	U		0.193	0.500	1	07/09/2018 20:03	WG1135361
Dibromomethane	U		0.117	0.500	1	07/09/2018 20:03	WG1135361
1,2-Dichlorobenzene	U		0.101	0.500	1	07/09/2018 20:03	WG1135361
1,3-Dichlorobenzene	U		0.130	0.500	1	07/09/2018 20:03	WG1135361
1,4-Dichlorobenzene	U		0.121	0.500	1	07/09/2018 20:03	WG1135361
Dichlorodifluoromethane	U	J3	0.127	2.50	1	07/09/2018 20:03	WG1135361
1,1-Dichloroethane	18.3		0.114	0.500	1	07/09/2018 20:03	WG1135361
1,2-Dichloroethane	0.148	J	0.108	0.500	1	07/09/2018 20:03	WG1135361
1,1-Dichloroethene	5.98		0.188	0.500	1	07/09/2018 20:03	WG1135361
cis-1,2-Dichloroethene	1680		4.66	25.0	50	07/12/2018 06:13	WG1136672
trans-1,2-Dichloroethene	26.9		0.152	0.500	1	07/09/2018 20:03	WG1135361
1,2-Dichloropropane	U		0.190	0.500	1	07/09/2018 20:03	WG1135361
1,1-Dichloropropene	U		0.128	0.500	1	07/09/2018 20:03	WG1135361
1,3-Dichloropropane	U		0.147	1.00	1	07/09/2018 20:03	WG1135361
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/09/2018 20:03	WG1135361
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/09/2018 20:03	WG1135361
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/09/2018 20:03	WG1135361
2,2-Dichloropropane	U		0.0929	0.500	1	07/09/2018 20:03	WG1135361
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/09/2018 20:03	WG1135361
Iodomethane	U		0.377	10.0	1	07/09/2018 20:03	WG1135361
Methylene Chloride	U		1.07	2.50	1	07/09/2018 20:03	WG1135361
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/09/2018 20:03	WG1135361
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/09/2018 20:03	WG1135361
1,1,2-Trichlorotrifluoroethane	U	J3	0.164	0.500	1	07/09/2018 20:03	WG1135361
Tetrachloroethene	U		0.199	0.500	1	07/09/2018 20:03	WG1135361
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/09/2018 20:03	WG1135361
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/09/2018 20:03	WG1135361
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/09/2018 20:03	WG1135361
1,1,2-Trichloroethane	U		0.186	0.500	1	07/09/2018 20:03	WG1135361
Trichloroethene	0.781		0.153	0.500	1	07/09/2018 20:03	WG1135361
Trichlorofluoromethane	U		0.130	2.50	1	07/09/2018 20:03	WG1135361
1,2,3-Trichloropropane	U		0.247	2.50	1	07/09/2018 20:03	WG1135361
Vinyl acetate	U		0.645	5.00	1	07/09/2018 20:03	WG1135361
Vinyl chloride	2030		5.90	25.0	50	07/12/2018 06:13	WG1136672
(S) Toluene-d8	*98.1*			*80.0-120*		*07/09/2018 20:03*	WG1135361
(S) Toluene-d8	*112*			*80.0-120*		*07/12/2018 06:13*	WG1136672
(S) Dibromofluoromethane	*97.4*			*76.0-123*		*07/09/2018 20:03*	WG1135361
(S) Dibromofluoromethane	*81.0*			*76.0-123*		*07/12/2018 06:13*	WG1136672
(S) 4-Bromofluorobenzene	*92.5*			*80.0-120*		*07/09/2018 20:03*	WG1135361
(S) 4-Bromofluorobenzene	*79.7*	J2		*80.0-120*		*07/12/2018 06:13*	WG1136672

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	07/10/2018 02:03	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 02:03	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 02:03	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 02:03	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 02:03	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 02:03	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 02:03	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 02:03	WG1135547
Chloroethane	9.73		0.141	2.50	1	07/12/2018 01:31	WG1136636
Chloroform	U		0.0860	0.500	1	07/10/2018 02:03	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 02:03	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 02:03	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 02:03	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 02:03	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 02:03	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 02:03	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 02:03	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 02:03	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 02:03	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 02:03	WG1135547
1,1-Dichloroethane	0.913		0.114	0.500	1	07/10/2018 02:03	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 02:03	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 02:03	WG1135547
cis-1,2-Dichloroethene	4.02		0.0933	0.500	1	07/10/2018 02:03	WG1135547
trans-1,2-Dichloroethene	1.57		0.152	0.500	1	07/10/2018 02:03	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 02:03	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 02:03	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 02:03	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 02:03	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 02:03	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 02:03	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 02:03	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 02:03	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 02:03	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 02:03	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 02:03	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 02:03	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 02:03	WG1135547
Tetrachloroethene	0.304	J	0.199	0.500	1	07/10/2018 02:03	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 02:03	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 02:03	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 02:03	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 02:03	WG1135547
Trichloroethene	0.996		0.153	0.500	1	07/10/2018 02:03	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 02:03	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 02:03	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 02:03	WG1135547
Vinyl chloride	1.45		0.118	0.500	1	07/12/2018 01:31	WG1136636
(S) Toluene-d8	*99.9*			*80.0-120*		*07/10/2018 02:03*	WG1135547
(S) Toluene-d8	*106*			*80.0-120*		*07/12/2018 01:31*	WG1136636
(S) Dibromofluoromethane	*100*			*76.0-123*		*07/10/2018 02:03*	WG1135547
(S) Dibromofluoromethane	*85.5*			*76.0-123*		*07/12/2018 01:31*	WG1136636
(S) 4-Bromofluorobenzene	*89.8*			*80.0-120*		*07/10/2018 02:03*	WG1135547
(S) 4-Bromofluorobenzene	*95.9*			*80.0-120*		*07/12/2018 01:31*	WG1136636

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	07/10/2018 02:23	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 02:23	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 02:23	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 02:23	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 02:23	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 02:23	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 02:23	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 02:23	WG1135547
Chloroethane	8.34		0.141	2.50	1	07/12/2018 01:53	WG1136636
Chloroform	U		0.0860	0.500	1	07/10/2018 02:23	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 02:23	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 02:23	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 02:23	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 02:23	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 02:23	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 02:23	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 02:23	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 02:23	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 02:23	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 02:23	WG1135547
1,1-Dichloroethane	0.829		0.114	0.500	1	07/10/2018 02:23	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 02:23	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 02:23	WG1135547
cis-1,2-Dichloroethene	3.86		0.0933	0.500	1	07/10/2018 02:23	WG1135547
trans-1,2-Dichloroethene	1.56		0.152	0.500	1	07/10/2018 02:23	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 02:23	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 02:23	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 02:23	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 02:23	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 02:23	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 02:23	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 02:23	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 02:23	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 02:23	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 02:23	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 02:23	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 02:23	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 02:23	WG1135547
Tetrachloroethene	0.289	J	0.199	0.500	1	07/10/2018 02:23	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 02:23	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 02:23	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 02:23	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 02:23	WG1135547
Trichloroethene	0.977		0.153	0.500	1	07/10/2018 02:23	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 02:23	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 02:23	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 02:23	WG1135547
Vinyl chloride	1.30		0.118	0.500	1	07/12/2018 01:53	WG1136636
(S) Toluene-d8	*98.6*			*80.0-120*		*07/10/2018 02:23*	WG1135547
(S) Toluene-d8	*109*			*80.0-120*		*07/12/2018 01:53*	WG1136636
(S) Dibromofluoromethane	*96.9*			*76.0-123*		*07/10/2018 02:23*	WG1135547
(S) Dibromofluoromethane	*84.7*			*76.0-123*		*07/12/2018 01:53*	WG1136636
(S) 4-Bromofluorobenzene	*90.8*			*80.0-120*		*07/10/2018 02:23*	WG1135547
(S) 4-Bromofluorobenzene	*90.2*			*80.0-120*		*07/12/2018 01:53*	WG1136636

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	07/10/2018 02:42	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 02:42	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 02:42	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 02:42	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 02:42	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 02:42	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 02:42	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 02:42	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 02:42	WG1135547
Chloroform	1.94		0.0860	0.500	1	07/10/2018 02:42	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 02:42	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 02:42	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 02:42	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 02:42	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 02:42	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 02:42	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 02:42	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 02:42	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 02:42	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 02:42	WG1135547
1,1-Dichloroethane	0.134	J	0.114	0.500	1	07/10/2018 02:42	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 02:42	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 02:42	WG1135547
cis-1,2-Dichloroethene	1.15	B	0.0933	0.500	1	07/10/2018 02:42	WG1135547
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 02:42	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 02:42	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 02:42	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 02:42	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 02:42	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 02:42	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 02:42	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 02:42	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 02:42	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 02:42	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 02:42	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 02:42	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 02:42	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 02:42	WG1135547
Tetrachloroethene	30.7		0.199	0.500	1	07/10/2018 02:42	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 02:42	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 02:42	WG1135547
1,1,1-Trichloroethane	0.559		0.0940	0.500	1	07/10/2018 02:42	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 02:42	WG1135547
Trichloroethene	7.59		0.153	0.500	1	07/10/2018 02:42	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 02:42	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 02:42	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 02:42	WG1135547
Vinyl chloride	U		0.118	0.500	1	07/10/2018 02:42	WG1135547
(S) Toluene-d8	*99.8*			*80.0-120*		*07/10/2018 02:42*	WG1135547
(S) Dibromofluoromethane	*99.4*			*76.0-123*		*07/10/2018 02:42*	WG1135547
(S) 4-Bromofluorobenzene	*92.3*			*80.0-120*		*07/10/2018 02:42*	WG1135547

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	07/10/2018 03:01	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 03:01	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 03:01	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 03:01	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 03:01	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 03:01	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 03:01	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 03:01	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 03:01	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 03:01	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 03:01	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 03:01	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 03:01	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 03:01	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 03:01	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 03:01	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 03:01	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 03:01	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 03:01	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 03:01	WG1135547
1,1-Dichloroethane	U		0.114	0.500	1	07/10/2018 03:01	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 03:01	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 03:01	WG1135547
cis-1,2-Dichloroethene	U		0.0933	0.500	1	07/10/2018 03:01	WG1135547
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 03:01	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 03:01	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 03:01	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 03:01	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 03:01	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 03:01	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 03:01	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 03:01	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 03:01	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 03:01	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 03:01	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 03:01	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 03:01	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 03:01	WG1135547
Tetrachloroethene	U		0.199	0.500	1	07/10/2018 03:01	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 03:01	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 03:01	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 03:01	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 03:01	WG1135547
Trichloroethene	U		0.153	0.500	1	07/10/2018 03:01	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 03:01	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 03:01	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 03:01	WG1135547
Vinyl chloride	U		0.118	0.500	1	07/10/2018 03:01	WG1135547
(S) Toluene-d8	*96.2*			*80.0-120*		*07/10/2018 03:01*	WG1135547
(S) Dibromofluoromethane	*98.7*			*76.0-123*		*07/10/2018 03:01*	WG1135547
(S) 4-Bromofluorobenzene	*93.8*			*80.0-120*		*07/10/2018 03:01*	WG1135547

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	07/10/2018 03:20	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 03:20	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 03:20	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 03:20	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 03:20	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 03:20	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 03:20	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 03:20	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 03:20	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 03:20	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 03:20	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 03:20	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 03:20	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 03:20	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 03:20	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 03:20	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 03:20	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 03:20	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 03:20	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 03:20	WG1135547
1,1-Dichloroethane	6.70		0.114	0.500	1	07/10/2018 03:20	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 03:20	WG1135547
1,1-Dichloroethene	0.204	J	0.188	0.500	1	07/10/2018 03:20	WG1135547
cis-1,2-Dichloroethene	16.1		0.0933	0.500	1	07/10/2018 03:20	WG1135547
trans-1,2-Dichloroethene	0.303	J	0.152	0.500	1	07/10/2018 03:20	WG1135547
1,2-Dichloropropane	0.427	J	0.190	0.500	1	07/10/2018 03:20	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 03:20	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 03:20	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 03:20	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 03:20	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 03:20	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 03:20	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 03:20	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 03:20	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 03:20	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 03:20	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 03:20	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 03:20	WG1135547
Tetrachloroethene	0.530		0.199	0.500	1	07/10/2018 03:20	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 03:20	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 03:20	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 03:20	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 03:20	WG1135547
Trichloroethene	1.63		0.153	0.500	1	07/10/2018 03:20	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 03:20	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 03:20	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 03:20	WG1135547
Vinyl chloride	10.5		0.118	0.500	1	07/12/2018 02:15	WG1136636
(S) Toluene-d8	*99.8*			*80.0-120*		*07/10/2018 03:20*	WG1135547
(S) Toluene-d8	*112*			*80.0-120*		*07/12/2018 02:15*	WG1136636
(S) Dibromofluoromethane	*99.7*			*76.0-123*		*07/10/2018 03:20*	WG1135547
(S) Dibromofluoromethane	*87.0*			*76.0-123*		*07/12/2018 02:15*	WG1136636
(S) 4-Bromofluorobenzene	*91.5*			*80.0-120*		*07/10/2018 03:20*	WG1135547
(S) 4-Bromofluorobenzene	*95.6*			*80.0-120*		*07/12/2018 02:15*	WG1136636

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	07/10/2018 03:39	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 03:39	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 03:39	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 03:39	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 03:39	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 03:39	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 03:39	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 03:39	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 03:39	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 03:39	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 03:39	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 03:39	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 03:39	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 03:39	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 03:39	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 03:39	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 03:39	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 03:39	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 03:39	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 03:39	WG1135547
1,1-Dichloroethane	0.561		0.114	0.500	1	07/10/2018 03:39	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 03:39	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 03:39	WG1135547
cis-1,2-Dichloroethene	45.5		0.0933	0.500	1	07/10/2018 03:39	WG1135547
trans-1,2-Dichloroethene	0.174	J	0.152	0.500	1	07/10/2018 03:39	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 03:39	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 03:39	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 03:39	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 03:39	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 03:39	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 03:39	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 03:39	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 03:39	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 03:39	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 03:39	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 03:39	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 03:39	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 03:39	WG1135547
Tetrachloroethene	21.3		0.199	0.500	1	07/10/2018 03:39	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 03:39	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 03:39	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 03:39	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 03:39	WG1135547
Trichloroethene	11.8		0.153	0.500	1	07/10/2018 03:39	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 03:39	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 03:39	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 03:39	WG1135547
Vinyl chloride	1.17		0.118	0.500	1	07/12/2018 02:36	WG1136636
(S) Toluene-d8	*100*			*80.0-120*		*07/10/2018 03:39*	WG1135547
(S) Toluene-d8	*113*			*80.0-120*		*07/12/2018 02:36*	WG1136636
(S) Dibromofluoromethane	*99.8*			*76.0-123*		*07/10/2018 03:39*	WG1135547
(S) Dibromofluoromethane	*81.9*			*76.0-123*		*07/12/2018 02:36*	WG1136636
(S) 4-Bromofluorobenzene	*92.0*			*80.0-120*		*07/10/2018 03:39*	WG1135547
(S) 4-Bromofluorobenzene	*89.1*			*80.0-120*		*07/12/2018 02:36*	WG1136636

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	07/10/2018 03:59	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 03:59	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 03:59	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 03:59	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 03:59	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 03:59	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 03:59	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 03:59	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 03:59	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 03:59	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 03:59	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 03:59	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 03:59	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 03:59	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 03:59	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 03:59	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 03:59	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 03:59	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 03:59	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 03:59	WG1135547
1,1-Dichloroethane	0.461	J	0.114	0.500	1	07/10/2018 03:59	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 03:59	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 03:59	WG1135547
cis-1,2-Dichloroethene	5.50		0.0933	0.500	1	07/10/2018 03:59	WG1135547
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 03:59	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 03:59	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 03:59	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 03:59	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 03:59	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 03:59	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 03:59	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 03:59	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 03:59	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 03:59	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 03:59	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 03:59	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 03:59	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 03:59	WG1135547
Tetrachloroethene	9.89		0.199	0.500	1	07/10/2018 03:59	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 03:59	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 03:59	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 03:59	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 03:59	WG1135547
Trichloroethene	3.53		0.153	0.500	1	07/10/2018 03:59	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 03:59	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 03:59	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 03:59	WG1135547
Vinyl chloride	1.47		0.118	0.500	1	07/12/2018 02:58	WG1136636
(S) Toluene-d8	*97.6*			*80.0-120*		*07/10/2018 03:59*	WG1135547
(S) Toluene-d8	*108*			*80.0-120*		*07/12/2018 02:58*	WG1136636
(S) Dibromofluoromethane	*97.7*			*76.0-123*		*07/10/2018 03:59*	WG1135547
(S) Dibromofluoromethane	*82.6*			*76.0-123*		*07/12/2018 02:58*	WG1136636
(S) 4-Bromofluorobenzene	*92.4*			*80.0-120*		*07/10/2018 03:59*	WG1135547
(S) 4-Bromofluorobenzene	*95.3*			*80.0-120*		*07/12/2018 02:58*	WG1136636

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	07/10/2018 04:18	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 04:18	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 04:18	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 04:18	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 04:18	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 04:18	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 04:18	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 04:18	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 04:18	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 04:18	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 04:18	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 04:18	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 04:18	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 04:18	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 04:18	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 04:18	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 04:18	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 04:18	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 04:18	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 04:18	WG1135547
1,1-Dichloroethane	0.437	J	0.114	0.500	1	07/10/2018 04:18	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 04:18	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 04:18	WG1135547
cis-1,2-Dichloroethene	5.41		0.0933	0.500	1	07/10/2018 04:18	WG1135547
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 04:18	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 04:18	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 04:18	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 04:18	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 04:18	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 04:18	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 04:18	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 04:18	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 04:18	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 04:18	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 04:18	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 04:18	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 04:18	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 04:18	WG1135547
Tetrachloroethene	8.94		0.199	0.500	1	07/10/2018 04:18	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 04:18	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 04:18	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 04:18	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 04:18	WG1135547
Trichloroethene	3.48		0.153	0.500	1	07/10/2018 04:18	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 04:18	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 04:18	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 04:18	WG1135547
Vinyl chloride	1.55		0.118	0.500	1	07/12/2018 03:20	WG1136636
(S) Toluene-d8	*96.8*			*80.0-120*		*07/10/2018 04:18*	WG1135547
(S) Toluene-d8	*109*			*80.0-120*		*07/12/2018 03:20*	WG1136636
(S) Dibromofluoromethane	*99.7*			*76.0-123*		*07/10/2018 04:18*	WG1135547
(S) Dibromofluoromethane	*90.0*			*76.0-123*		*07/12/2018 03:20*	WG1136636
(S) 4-Bromofluorobenzene	*92.2*			*80.0-120*		*07/10/2018 04:18*	WG1135547
(S) 4-Bromofluorobenzene	*96.0*			*80.0-120*		*07/12/2018 03:20*	WG1136636

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	07/10/2018 04:37	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 04:37	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 04:37	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 04:37	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 04:37	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 04:37	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 04:37	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 04:37	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 04:37	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 04:37	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 04:37	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 04:37	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 04:37	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 04:37	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 04:37	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 04:37	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 04:37	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 04:37	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 04:37	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 04:37	WG1135547
1,1-Dichloroethane	6.86		0.114	0.500	1	07/10/2018 04:37	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 04:37	WG1135547
1,1-Dichloroethene	1.63		0.188	0.500	1	07/10/2018 04:37	WG1135547
cis-1,2-Dichloroethene	169		0.933	5.00	10	07/12/2018 03:41	WG1136636
trans-1,2-Dichloroethene	8.28		0.152	0.500	1	07/10/2018 04:37	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 04:37	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 04:37	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 04:37	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 04:37	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 04:37	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 04:37	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 04:37	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 04:37	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 04:37	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 04:37	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 04:37	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 04:37	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 04:37	WG1135547
Tetrachloroethene	332		1.99	5.00	10	07/12/2018 03:41	WG1136636
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 04:37	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 04:37	WG1135547
1,1,1-Trichloroethane	3.46		0.0940	0.500	1	07/10/2018 04:37	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 04:37	WG1135547
Trichloroethene	182		0.153	0.500	1	07/10/2018 04:37	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 04:37	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 04:37	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 04:37	WG1135547
Vinyl chloride	2.42	J	1.18	5.00	10	07/12/2018 03:41	WG1136636
(S) Toluene-d8	*99.5*			*80.0-120*		*07/10/2018 04:37*	WG1135547
(S) Toluene-d8	*112*			*80.0-120*		*07/12/2018 03:41*	WG1136636
(S) Dibromofluoromethane	*102*			*76.0-123*		*07/10/2018 04:37*	WG1135547
(S) Dibromofluoromethane	*84.5*			*76.0-123*		*07/12/2018 03:41*	WG1136636
(S) 4-Bromofluorobenzene	*92.5*			*80.0-120*		*07/10/2018 04:37*	WG1135547
(S) 4-Bromofluorobenzene	*89.8*			*80.0-120*		*07/12/2018 03:41*	WG1136636

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	07/10/2018 04:57	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 04:57	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 04:57	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 04:57	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 04:57	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 04:57	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 04:57	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 04:57	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 04:57	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 04:57	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 04:57	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 04:57	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 04:57	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 04:57	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 04:57	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 04:57	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 04:57	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 04:57	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 04:57	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 04:57	WG1135547
1,1-Dichloroethane	0.139	J	0.114	0.500	1	07/10/2018 04:57	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 04:57	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 04:57	WG1135547
cis-1,2-Dichloroethene	2.57		0.0933	0.500	1	07/10/2018 04:57	WG1135547
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 04:57	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 04:57	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 04:57	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 04:57	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 04:57	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 04:57	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 04:57	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 04:57	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 04:57	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 04:57	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 04:57	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 04:57	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 04:57	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 04:57	WG1135547
Tetrachloroethene	5.36		0.199	0.500	1	07/10/2018 04:57	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 04:57	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 04:57	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 04:57	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 04:57	WG1135547
Trichloroethene	0.368	J	0.153	0.500	1	07/10/2018 04:57	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 04:57	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 04:57	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 04:57	WG1135547
Vinyl chloride	U		0.118	0.500	1	07/10/2018 04:57	WG1135547
(S) Toluene-d8	*98.2*			*80.0-120*		*07/10/2018 04:57*	WG1135547
(S) Dibromofluoromethane	*99.8*			*76.0-123*		*07/10/2018 04:57*	WG1135547
(S) 4-Bromofluorobenzene	*92.7*			*80.0-120*		*07/10/2018 04:57*	WG1135547

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	07/10/2018 05:16	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 05:16	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 05:16	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 05:16	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 05:16	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 05:16	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 05:16	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 05:16	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 05:16	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 05:16	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 05:16	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 05:16	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 05:16	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 05:16	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 05:16	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 05:16	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 05:16	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 05:16	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 05:16	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 05:16	WG1135547
1,1-Dichloroethane	U		0.114	0.500	1	07/10/2018 05:16	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 05:16	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 05:16	WG1135547
cis-1,2-Dichloroethene	0.274	B J	0.0933	0.500	1	07/10/2018 05:16	WG1135547
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 05:16	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 05:16	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 05:16	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 05:16	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 05:16	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 05:16	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 05:16	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 05:16	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 05:16	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 05:16	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 05:16	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 05:16	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 05:16	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 05:16	WG1135547
Tetrachloroethene	U		0.199	0.500	1	07/10/2018 05:16	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 05:16	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 05:16	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 05:16	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 05:16	WG1135547
Trichloroethene	U		0.153	0.500	1	07/10/2018 05:16	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 05:16	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 05:16	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 05:16	WG1135547
Vinyl chloride	U		0.118	0.500	1	07/10/2018 05:16	WG1135547
(S) Toluene-d8	*99.5*			*80.0-120*		*07/10/2018 05:16*	WG1135547
(S) Dibromofluoromethane	*99.9*			*76.0-123*		*07/10/2018 05:16*	WG1135547
(S) 4-Bromofluorobenzene	*92.7*			*80.0-120*		*07/10/2018 05:16*	WG1135547

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	07/10/2018 05:35	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 05:35	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 05:35	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 05:35	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 05:35	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 05:35	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 05:35	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 05:35	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 05:35	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 05:35	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 05:35	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 05:35	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 05:35	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 05:35	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 05:35	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 05:35	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 05:35	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 05:35	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 05:35	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 05:35	WG1135547
1,1-Dichloroethane	2.55		0.114	0.500	1	07/10/2018 05:35	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 05:35	WG1135547
1,1-Dichloroethene	0.747		0.188	0.500	1	07/10/2018 05:35	WG1135547
cis-1,2-Dichloroethene	63.2		0.0933	0.500	1	07/10/2018 05:35	WG1135547
trans-1,2-Dichloroethene	0.526		0.152	0.500	1	07/10/2018 05:35	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 05:35	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 05:35	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 05:35	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 05:35	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 05:35	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 05:35	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 05:35	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 05:35	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 05:35	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 05:35	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 05:35	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 05:35	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 05:35	WG1135547
Tetrachloroethene	26.0		0.199	0.500	1	07/10/2018 05:35	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 05:35	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 05:35	WG1135547
1,1,1-Trichloroethane	0.145	J	0.0940	0.500	1	07/10/2018 05:35	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 05:35	WG1135547
Trichloroethene	17.0		0.153	0.500	1	07/10/2018 05:35	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 05:35	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 05:35	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 05:35	WG1135547
Vinyl chloride	U		0.118	0.500	1	07/10/2018 05:35	WG1135547
(S) Toluene-d8	*98.4*			*80.0-120*		*07/10/2018 05:35*	WG1135547
(S) Dibromofluoromethane	*99.3*			*76.0-123*		*07/10/2018 05:35*	WG1135547
(S) 4-Bromofluorobenzene	*93.5*			*80.0-120*		*07/10/2018 05:35*	WG1135547

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	07/10/2018 05:55	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 05:55	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 05:55	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 05:55	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 05:55	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 05:55	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 05:55	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 05:55	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 05:55	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 05:55	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 05:55	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 05:55	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 05:55	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 05:55	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 05:55	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 05:55	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 05:55	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 05:55	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 05:55	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 05:55	WG1135547
1,1-Dichloroethane	U		0.114	0.500	1	07/10/2018 05:55	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 05:55	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 05:55	WG1135547
cis-1,2-Dichloroethene	1.92		0.0933	0.500	1	07/10/2018 05:55	WG1135547
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 05:55	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 05:55	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 05:55	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 05:55	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 05:55	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 05:55	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 05:55	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 05:55	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 05:55	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 05:55	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 05:55	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 05:55	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 05:55	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 05:55	WG1135547
Tetrachloroethene	1.76		0.199	0.500	1	07/10/2018 05:55	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 05:55	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 05:55	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 05:55	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 05:55	WG1135547
Trichloroethene	1.28		0.153	0.500	1	07/10/2018 05:55	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 05:55	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 05:55	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 05:55	WG1135547
Vinyl chloride	U		0.118	0.500	1	07/10/2018 05:55	WG1135547
(S) Toluene-d8	*97.2*			*80.0-120*		*07/10/2018 05:55*	WG1135547
(S) Dibromofluoromethane	*98.9*			*76.0-123*		*07/10/2018 05:55*	WG1135547
(S) 4-Bromofluorobenzene	*94.2*			*80.0-120*		*07/10/2018 05:55*	WG1135547

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	07/10/2018 06:14	WG1135547
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 06:14	WG1135547
Bromochloromethane	U		0.145	0.500	1	07/10/2018 06:14	WG1135547
Bromoform	U		0.186	0.500	1	07/10/2018 06:14	WG1135547
Bromomethane	U		0.157	2.50	1	07/10/2018 06:14	WG1135547
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 06:14	WG1135547
Chlorobenzene	U		0.140	0.500	1	07/10/2018 06:14	WG1135547
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 06:14	WG1135547
Chloroethane	U		0.141	2.50	1	07/10/2018 06:14	WG1135547
Chloroform	U		0.0860	0.500	1	07/10/2018 06:14	WG1135547
Chloromethane	U		0.153	1.25	1	07/10/2018 06:14	WG1135547
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 06:14	WG1135547
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 06:14	WG1135547
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 06:14	WG1135547
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 06:14	WG1135547
Dibromomethane	U		0.117	0.500	1	07/10/2018 06:14	WG1135547
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 06:14	WG1135547
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 06:14	WG1135547
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 06:14	WG1135547
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 06:14	WG1135547
1,1-Dichloroethane	0.516		0.114	0.500	1	07/10/2018 06:14	WG1135547
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 06:14	WG1135547
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 06:14	WG1135547
cis-1,2-Dichloroethene	12.4		0.0933	0.500	1	07/10/2018 06:14	WG1135547
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 06:14	WG1135547
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 06:14	WG1135547
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 06:14	WG1135547
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 06:14	WG1135547
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 06:14	WG1135547
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 06:14	WG1135547
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 06:14	WG1135547
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 06:14	WG1135547
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 06:14	WG1135547
Iodomethane	U		0.377	10.0	1	07/10/2018 06:14	WG1135547
Methylene Chloride	U		1.07	2.50	1	07/10/2018 06:14	WG1135547
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 06:14	WG1135547
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 06:14	WG1135547
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 06:14	WG1135547
Tetrachloroethene	2.77		0.199	0.500	1	07/10/2018 06:14	WG1135547
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 06:14	WG1135547
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 06:14	WG1135547
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 06:14	WG1135547
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 06:14	WG1135547
Trichloroethene	8.11		0.153	0.500	1	07/10/2018 06:14	WG1135547
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 06:14	WG1135547
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 06:14	WG1135547
Vinyl acetate	U	J3	0.645	5.00	1	07/10/2018 06:14	WG1135547
Vinyl chloride	U		0.118	0.500	1	07/10/2018 06:14	WG1135547
(S) Toluene-d8	*98.0*			*80.0-120*		*07/10/2018 06:14*	WG1135547
(S) Dibromofluoromethane	*100*			*76.0-123*		*07/10/2018 06:14*	WG1135547
(S) 4-Bromofluorobenzene	*93.4*			*80.0-120*		*07/10/2018 06:14*	WG1135547

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	07/10/2018 22:32	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 22:32	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 22:32	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 22:32	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 22:32	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 22:32	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 22:32	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 22:32	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 22:32	WG1135755
Chloroform	U		0.0860	0.500	1	07/10/2018 22:32	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 22:32	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 22:32	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 22:32	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 22:32	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 22:32	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 22:32	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 22:32	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 22:32	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 22:32	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 22:32	WG1135755
1,1-Dichloroethane	0.161	J	0.114	0.500	1	07/10/2018 22:32	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 22:32	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 22:32	WG1135755
cis-1,2-Dichloroethene	0.782		0.0933	0.500	1	07/10/2018 22:32	WG1135755
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 22:32	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 22:32	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 22:32	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 22:32	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 22:32	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 22:32	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 22:32	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 22:32	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 22:32	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 22:32	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/10/2018 22:32	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 22:32	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 22:32	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 22:32	WG1135755
Tetrachloroethene	5.69		0.199	0.500	1	07/10/2018 22:32	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 22:32	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 22:32	WG1135755
1,1,1-Trichloroethane	0.145	J	0.0940	0.500	1	07/10/2018 22:32	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 22:32	WG1135755
Trichloroethene	5.82		0.153	0.500	1	07/10/2018 22:32	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 22:32	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 22:32	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 22:32	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/10/2018 22:32	WG1135755
(S) Toluene-d8	*97.6*			*80.0-120*		*07/10/2018 22:32*	WG1135755
(S) Dibromofluoromethane	*100*			*76.0-123*		*07/10/2018 22:32*	WG1135755
(S) 4-Bromofluorobenzene	*92.7*			*80.0-120*		*07/10/2018 22:32*	WG1135755

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	07/10/2018 22:52	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 22:52	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 22:52	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 22:52	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 22:52	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 22:52	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 22:52	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 22:52	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 22:52	WG1135755
Chloroform	U		0.0860	0.500	1	07/10/2018 22:52	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 22:52	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 22:52	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 22:52	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 22:52	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 22:52	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 22:52	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 22:52	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 22:52	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 22:52	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 22:52	WG1135755
1,1-Dichloroethane	5.05		0.114	0.500	1	07/10/2018 22:52	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 22:52	WG1135755
1,1-Dichloroethene	1.46		0.188	0.500	1	07/10/2018 22:52	WG1135755
cis-1,2-Dichloroethene	114		0.0933	0.500	1	07/10/2018 22:52	WG1135755
trans-1,2-Dichloroethene	1.88		0.152	0.500	1	07/10/2018 22:52	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 22:52	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 22:52	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 22:52	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 22:52	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 22:52	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 22:52	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 22:52	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 22:52	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 22:52	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/10/2018 22:52	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 22:52	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 22:52	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 22:52	WG1135755
Tetrachloroethene	138		0.199	0.500	1	07/10/2018 22:52	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 22:52	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 22:52	WG1135755
1,1,1-Trichloroethane	1.94		0.0940	0.500	1	07/10/2018 22:52	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 22:52	WG1135755
Trichloroethene	221		1.53	5.00	10	07/11/2018 19:20	WG1136397
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 22:52	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 22:52	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 22:52	WG1135755
Vinyl chloride	1.02		0.118	0.500	1	07/10/2018 22:52	WG1135755
(S) Toluene-d8	*98.3*			*80.0-120*		*07/10/2018 22:52*	WG1135755
(S) Toluene-d8	*99.1*			*80.0-120*		*07/11/2018 19:20*	WG1136397
(S) Dibromofluoromethane	*101*			*76.0-123*		*07/10/2018 22:52*	WG1135755
(S) Dibromofluoromethane	*101*			*76.0-123*		*07/11/2018 19:20*	WG1136397
(S) 4-Bromofluorobenzene	*91.2*			*80.0-120*		*07/10/2018 22:52*	WG1135755
(S) 4-Bromofluorobenzene	*107*			*80.0-120*		*07/11/2018 19:20*	WG1136397

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	07/10/2018 23:11	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 23:11	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 23:11	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 23:11	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 23:11	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 23:11	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 23:11	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 23:11	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 23:11	WG1135755
Chloroform	U		0.0860	0.500	1	07/10/2018 23:11	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 23:11	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 23:11	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 23:11	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 23:11	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 23:11	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 23:11	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 23:11	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 23:11	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 23:11	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 23:11	WG1135755
1,1-Dichloroethane	10.5		0.114	0.500	1	07/10/2018 23:11	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 23:11	WG1135755
1,1-Dichloroethene	2.54		0.188	0.500	1	07/10/2018 23:11	WG1135755
cis-1,2-Dichloroethene	255		0.933	5.00	10	07/11/2018 19:40	WG1136397
trans-1,2-Dichloroethene	2.52		0.152	0.500	1	07/10/2018 23:11	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 23:11	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 23:11	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 23:11	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 23:11	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 23:11	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 23:11	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 23:11	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 23:11	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 23:11	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/10/2018 23:11	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 23:11	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 23:11	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 23:11	WG1135755
Tetrachloroethene	34.9		0.199	0.500	1	07/10/2018 23:11	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 23:11	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 23:11	WG1135755
1,1,1-Trichloroethane	1.57		0.0940	0.500	1	07/10/2018 23:11	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 23:11	WG1135755
Trichloroethene	247		1.53	5.00	10	07/11/2018 19:40	WG1136397
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 23:11	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 23:11	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 23:11	WG1135755
Vinyl chloride	0.687		0.118	0.500	1	07/10/2018 23:11	WG1135755
(S) Toluene-d8	*96.1*			*80.0-120*		*07/10/2018 23:11*	WG1135755
(S) Toluene-d8	*99.4*			*80.0-120*		*07/11/2018 19:40*	WG1136397
(S) Dibromofluoromethane	*101*			*76.0-123*		*07/10/2018 23:11*	WG1135755
(S) Dibromofluoromethane	*104*			*76.0-123*		*07/11/2018 19:40*	WG1136397
(S) 4-Bromofluorobenzene	*94.1*			*80.0-120*		*07/10/2018 23:11*	WG1135755
(S) 4-Bromofluorobenzene	*100*			*80.0-120*		*07/11/2018 19:40*	WG1136397

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	07/10/2018 23:31	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 23:31	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 23:31	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 23:31	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 23:31	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 23:31	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 23:31	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 23:31	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 23:31	WG1135755
Chloroform	U		0.0860	0.500	1	07/10/2018 23:31	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 23:31	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 23:31	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 23:31	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 23:31	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 23:31	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 23:31	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 23:31	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 23:31	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 23:31	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 23:31	WG1135755
1,1-Dichloroethane	U		0.114	0.500	1	07/10/2018 23:31	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 23:31	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 23:31	WG1135755
cis-1,2-Dichloroethene	0.202	J	0.0933	0.500	1	07/11/2018 20:00	WG1136397
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 23:31	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 23:31	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 23:31	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 23:31	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 23:31	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 23:31	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 23:31	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 23:31	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 23:31	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 23:31	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/10/2018 23:31	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 23:31	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 23:31	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 23:31	WG1135755
Tetrachloroethene	0.247	J	0.199	0.500	1	07/10/2018 23:31	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 23:31	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 23:31	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 23:31	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 23:31	WG1135755
Trichloroethene	0.212	J	0.153	0.500	1	07/11/2018 20:00	WG1136397
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 23:31	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 23:31	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 23:31	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/10/2018 23:31	WG1135755
(S) Toluene-d8	*97.1*			*80.0-120*		*07/10/2018 23:31*	WG1135755
(S) Toluene-d8	*99.5*			*80.0-120*		*07/11/2018 20:00*	WG1136397
(S) Dibromofluoromethane	*99.1*			*76.0-123*		*07/10/2018 23:31*	WG1135755
(S) Dibromofluoromethane	*102*			*76.0-123*		*07/11/2018 20:00*	WG1136397
(S) 4-Bromofluorobenzene	*91.7*			*80.0-120*		*07/10/2018 23:31*	WG1135755
(S) 4-Bromofluorobenzene	*107*			*80.0-120*		*07/11/2018 20:00*	WG1136397

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	07/10/2018 23:49	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 23:49	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 23:49	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 23:49	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 23:49	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 23:49	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 23:49	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 23:49	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 23:49	WG1135755
Chloroform	U		0.0860	0.500	1	07/10/2018 23:49	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 23:49	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 23:49	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 23:49	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 23:49	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 23:49	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 23:49	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 23:49	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 23:49	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 23:49	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 23:49	WG1135755
1,1-Dichloroethane	0.516		0.114	0.500	1	07/10/2018 23:49	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 23:49	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 23:49	WG1135755
cis-1,2-Dichloroethene	2.66		0.0933	0.500	1	07/10/2018 23:49	WG1135755
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 23:49	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 23:49	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 23:49	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 23:49	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 23:49	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 23:49	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 23:49	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 23:49	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 23:49	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 23:49	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/10/2018 23:49	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 23:49	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 23:49	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 23:49	WG1135755
Tetrachloroethene	3.73		0.199	0.500	1	07/10/2018 23:49	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 23:49	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 23:49	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 23:49	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 23:49	WG1135755
Trichloroethene	9.00		0.153	0.500	1	07/10/2018 23:49	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 23:49	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 23:49	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 23:49	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/10/2018 23:49	WG1135755
(S) Toluene-d8	*98.3*			*80.0-120*		*07/10/2018 23:49*	WG1135755
(S) Dibromofluoromethane	*99.9*			*76.0-123*		*07/10/2018 23:49*	WG1135755
(S) 4-Bromofluorobenzene	*90.8*			*80.0-120*		*07/10/2018 23:49*	WG1135755

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	07/11/2018 00:08	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/11/2018 00:08	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/11/2018 00:08	WG1135755
Bromoform	U		0.186	0.500	1	07/11/2018 00:08	WG1135755
Bromomethane	U		0.157	2.50	1	07/11/2018 00:08	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/11/2018 00:08	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/11/2018 00:08	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/11/2018 00:08	WG1135755
Chloroethane	U		0.141	2.50	1	07/11/2018 00:08	WG1135755
Chloroform	U		0.0860	0.500	1	07/11/2018 00:08	WG1135755
Chloromethane	U		0.153	1.25	1	07/11/2018 00:08	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/11/2018 00:08	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/11/2018 00:08	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/11/2018 00:08	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/11/2018 00:08	WG1135755
Dibromomethane	U		0.117	0.500	1	07/11/2018 00:08	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/11/2018 00:08	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/11/2018 00:08	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/11/2018 00:08	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/11/2018 00:08	WG1135755
1,1-Dichloroethane	1.44		0.114	0.500	1	07/11/2018 00:08	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/11/2018 00:08	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/11/2018 00:08	WG1135755
cis-1,2-Dichloroethene	13.6		0.0933	0.500	1	07/11/2018 00:08	WG1135755
trans-1,2-Dichloroethene	1.09		0.152	0.500	1	07/11/2018 00:08	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/11/2018 00:08	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/11/2018 00:08	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/11/2018 00:08	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/11/2018 00:08	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/11/2018 00:08	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/11/2018 00:08	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/11/2018 00:08	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/11/2018 00:08	WG1135755
Iodomethane	U		0.377	10.0	1	07/11/2018 00:08	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/11/2018 00:08	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/11/2018 00:08	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/11/2018 00:08	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/11/2018 00:08	WG1135755
Tetrachloroethene	10.3		0.199	0.500	1	07/11/2018 00:08	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/11/2018 00:08	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/11/2018 00:08	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/11/2018 00:08	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/11/2018 00:08	WG1135755
Trichloroethene	5.93		0.153	0.500	1	07/11/2018 00:08	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/11/2018 00:08	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/11/2018 00:08	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/11/2018 00:08	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/11/2018 00:08	WG1135755
(S) Toluene-d8	*98.5*			*80.0-120*		*07/11/2018 00:08*	WG1135755
(S) Dibromofluoromethane	*101*			*76.0-123*		*07/11/2018 00:08*	WG1135755
(S) 4-Bromofluorobenzene	*93.2*			*80.0-120*		*07/11/2018 00:08*	WG1135755

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	07/11/2018 00:27	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/11/2018 00:27	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/11/2018 00:27	WG1135755
Bromoform	U		0.186	0.500	1	07/11/2018 00:27	WG1135755
Bromomethane	U		0.157	2.50	1	07/11/2018 00:27	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/11/2018 00:27	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/11/2018 00:27	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/11/2018 00:27	WG1135755
Chloroethane	42.9		0.141	2.50	1	07/11/2018 00:27	WG1135755
Chloroform	U		0.0860	0.500	1	07/11/2018 00:27	WG1135755
Chloromethane	U		0.153	1.25	1	07/11/2018 00:27	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/11/2018 00:27	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/11/2018 00:27	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/11/2018 00:27	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/11/2018 00:27	WG1135755
Dibromomethane	U		0.117	0.500	1	07/11/2018 00:27	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/11/2018 00:27	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/11/2018 00:27	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/11/2018 00:27	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/11/2018 00:27	WG1135755
1,1-Dichloroethane	4.55		0.114	0.500	1	07/11/2018 00:27	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/11/2018 00:27	WG1135755
1,1-Dichloroethene	1.11		0.188	0.500	1	07/11/2018 00:27	WG1135755
cis-1,2-Dichloroethene	722		0.933	5.00	10	07/11/2018 20:20	WG1136397
trans-1,2-Dichloroethene	8.72		0.152	0.500	1	07/11/2018 00:27	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/11/2018 00:27	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/11/2018 00:27	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/11/2018 00:27	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/11/2018 00:27	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/11/2018 00:27	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/11/2018 00:27	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/11/2018 00:27	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/11/2018 00:27	WG1135755
Iodomethane	U		0.377	10.0	1	07/11/2018 00:27	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/11/2018 00:27	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/11/2018 00:27	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/11/2018 00:27	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/11/2018 00:27	WG1135755
Tetrachloroethene	1.91		0.199	0.500	1	07/11/2018 00:27	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/11/2018 00:27	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/11/2018 00:27	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/11/2018 00:27	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/11/2018 00:27	WG1135755
Trichloroethene	0.758		0.153	0.500	1	07/11/2018 00:27	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/11/2018 00:27	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/11/2018 00:27	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/11/2018 00:27	WG1135755
Vinyl chloride	424		1.18	5.00	10	07/11/2018 20:20	WG1136397
(S) Toluene-d8	*98.7*			*80.0-120*		*07/11/2018 00:27*	WG1135755
(S) Toluene-d8	*100*			*80.0-120*		*07/11/2018 20:20*	WG1136397
(S) Dibromofluoromethane	*99.5*			*76.0-123*		*07/11/2018 00:27*	WG1135755
(S) Dibromofluoromethane	*102*			*76.0-123*		*07/11/2018 20:20*	WG1136397
(S) 4-Bromofluorobenzene	*91.3*			*80.0-120*		*07/11/2018 00:27*	WG1135755
(S) 4-Bromofluorobenzene	*105*			*80.0-120*		*07/11/2018 20:20*	WG1136397

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	07/11/2018 00:46	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/11/2018 00:46	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/11/2018 00:46	WG1135755
Bromoform	U		0.186	0.500	1	07/11/2018 00:46	WG1135755
Bromomethane	U		0.157	2.50	1	07/11/2018 00:46	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/11/2018 00:46	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/11/2018 00:46	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/11/2018 00:46	WG1135755
Chloroethane	U		0.141	2.50	1	07/11/2018 00:46	WG1135755
Chloroform	U		0.0860	0.500	1	07/11/2018 00:46	WG1135755
Chloromethane	U		0.153	1.25	1	07/11/2018 00:46	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/11/2018 00:46	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/11/2018 00:46	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/11/2018 00:46	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/11/2018 00:46	WG1135755
Dibromomethane	U		0.117	0.500	1	07/11/2018 00:46	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/11/2018 00:46	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/11/2018 00:46	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/11/2018 00:46	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/11/2018 00:46	WG1135755
1,1-Dichloroethane	81.6		0.114	0.500	1	07/11/2018 00:46	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/11/2018 00:46	WG1135755
1,1-Dichloroethene	35.6		0.188	0.500	1	07/11/2018 00:46	WG1135755
cis-1,2-Dichloroethene	3890		4.66	25.0	50	07/11/2018 20:40	WG1136397
trans-1,2-Dichloroethene	16.4		0.152	0.500	1	07/11/2018 00:46	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/11/2018 00:46	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/11/2018 00:46	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/11/2018 00:46	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/11/2018 00:46	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/11/2018 00:46	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/11/2018 00:46	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/11/2018 00:46	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/11/2018 00:46	WG1135755
Iodomethane	U		0.377	10.0	1	07/11/2018 00:46	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/11/2018 00:46	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/11/2018 00:46	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/11/2018 00:46	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/11/2018 00:46	WG1135755
Tetrachloroethene	163		0.199	0.500	1	07/11/2018 00:46	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/11/2018 00:46	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/11/2018 00:46	WG1135755
1,1,1-Trichloroethane	10.9		0.0940	0.500	1	07/11/2018 00:46	WG1135755
1,1,2-Trichloroethane	0.210	J	0.186	0.500	1	07/11/2018 00:46	WG1135755
Trichloroethene	148		0.153	0.500	1	07/11/2018 00:46	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/11/2018 00:46	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/11/2018 00:46	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/11/2018 00:46	WG1135755
Vinyl chloride	773		5.90	25.0	50	07/11/2018 20:40	WG1136397
(S) Toluene-d8	*96.8*			*80.0-120*		*07/11/2018 00:46*	WG1135755
(S) Toluene-d8	*99.6*			*80.0-120*		*07/11/2018 20:40*	WG1136397
(S) Dibromofluoromethane	*98.4*			*76.0-123*		*07/11/2018 00:46*	WG1135755
(S) Dibromofluoromethane	*103*			*76.0-123*		*07/11/2018 20:40*	WG1136397
(S) 4-Bromofluorobenzene	*91.6*			*80.0-120*		*07/11/2018 00:46*	WG1135755
(S) 4-Bromofluorobenzene	*102*			*80.0-120*		*07/11/2018 20:40*	WG1136397

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	07/11/2018 01:05	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/11/2018 01:05	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/11/2018 01:05	WG1135755
Bromoform	U		0.186	0.500	1	07/11/2018 01:05	WG1135755
Bromomethane	U		0.157	2.50	1	07/11/2018 01:05	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/11/2018 01:05	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/11/2018 01:05	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/11/2018 01:05	WG1135755
Chloroethane	U		0.141	2.50	1	07/11/2018 01:05	WG1135755
Chloroform	U		0.0860	0.500	1	07/11/2018 01:05	WG1135755
Chloromethane	U		0.153	1.25	1	07/11/2018 01:05	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/11/2018 01:05	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/11/2018 01:05	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/11/2018 01:05	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/11/2018 01:05	WG1135755
Dibromomethane	U		0.117	0.500	1	07/11/2018 01:05	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/11/2018 01:05	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/11/2018 01:05	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/11/2018 01:05	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/11/2018 01:05	WG1135755
1,1-Dichloroethane	80.2		0.114	0.500	1	07/11/2018 01:05	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/11/2018 01:05	WG1135755
1,1-Dichloroethene	36.3		0.188	0.500	1	07/11/2018 01:05	WG1135755
cis-1,2-Dichloroethene	4190		4.66	25.0	50	07/11/2018 21:00	WG1136397
trans-1,2-Dichloroethene	18.4		0.152	0.500	1	07/11/2018 01:05	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/11/2018 01:05	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/11/2018 01:05	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/11/2018 01:05	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/11/2018 01:05	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/11/2018 01:05	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/11/2018 01:05	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/11/2018 01:05	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/11/2018 01:05	WG1135755
Iodomethane	U		0.377	10.0	1	07/11/2018 01:05	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/11/2018 01:05	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/11/2018 01:05	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/11/2018 01:05	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/11/2018 01:05	WG1135755
Tetrachloroethene	177		9.95	25.0	50	07/11/2018 21:00	WG1136397
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/11/2018 01:05	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/11/2018 01:05	WG1135755
1,1,1-Trichloroethane	11.7		0.0940	0.500	1	07/11/2018 01:05	WG1135755
1,1,2-Trichloroethane	0.244	J	0.186	0.500	1	07/11/2018 01:05	WG1135755
Trichloroethene	191		0.153	0.500	1	07/11/2018 01:05	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/11/2018 01:05	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/11/2018 01:05	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/11/2018 01:05	WG1135755
Vinyl chloride	799		5.90	25.0	50	07/11/2018 21:00	WG1136397
(S) Toluene-d8	*97.4*			*80.0-120*		*07/11/2018 01:05*	WG1135755
(S) Toluene-d8	*101*			*80.0-120*		*07/11/2018 21:00*	WG1136397
(S) Dibromofluoromethane	*99.7*			*76.0-123*		*07/11/2018 01:05*	WG1135755
(S) Dibromofluoromethane	*103*			*76.0-123*		*07/11/2018 21:00*	WG1136397
(S) 4-Bromofluorobenzene	*91.2*			*80.0-120*		*07/11/2018 01:05*	WG1135755
(S) 4-Bromofluorobenzene	*102*			*80.0-120*		*07/11/2018 21:00*	WG1136397

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	07/11/2018 01:25	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/11/2018 01:25	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/11/2018 01:25	WG1135755
Bromoform	U		0.186	0.500	1	07/11/2018 01:25	WG1135755
Bromomethane	U		0.157	2.50	1	07/11/2018 01:25	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/11/2018 01:25	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/11/2018 01:25	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/11/2018 01:25	WG1135755
Chloroethane	U		0.141	2.50	1	07/11/2018 01:25	WG1135755
Chloroform	U		0.0860	0.500	1	07/11/2018 01:25	WG1135755
Chloromethane	U		0.153	1.25	1	07/11/2018 01:25	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/11/2018 01:25	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/11/2018 01:25	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/11/2018 01:25	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/11/2018 01:25	WG1135755
Dibromomethane	U		0.117	0.500	1	07/11/2018 01:25	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/11/2018 01:25	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/11/2018 01:25	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/11/2018 01:25	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/11/2018 01:25	WG1135755
1,1-Dichloroethane	1.01		0.114	0.500	1	07/11/2018 01:25	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/11/2018 01:25	WG1135755
1,1-Dichloroethene	0.336	J	0.188	0.500	1	07/11/2018 01:25	WG1135755
cis-1,2-Dichloroethene	3.62		0.0933	0.500	1	07/11/2018 21:20	WG1136397
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/11/2018 01:25	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/11/2018 01:25	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/11/2018 01:25	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/11/2018 01:25	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/11/2018 01:25	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/11/2018 01:25	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/11/2018 01:25	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/11/2018 01:25	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/11/2018 01:25	WG1135755
Iodomethane	U		0.377	10.0	1	07/11/2018 01:25	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/11/2018 01:25	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/11/2018 01:25	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/11/2018 01:25	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/11/2018 01:25	WG1135755
Tetrachloroethene	3.16		0.199	0.500	1	07/11/2018 21:20	WG1136397
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/11/2018 01:25	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/11/2018 01:25	WG1135755
1,1,1-Trichloroethane	0.901		0.0940	0.500	1	07/11/2018 01:25	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/11/2018 01:25	WG1135755
Trichloroethene	24.2		0.153	0.500	1	07/11/2018 01:25	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/11/2018 01:25	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/11/2018 01:25	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/11/2018 01:25	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/11/2018 21:20	WG1136397
(S) Toluene-d8	*100*			*80.0-120*		*07/11/2018 01:25*	WG1135755
(S) Toluene-d8	*100*			*80.0-120*		*07/11/2018 21:20*	WG1136397
(S) Dibromofluoromethane	*100*			*76.0-123*		*07/11/2018 01:25*	WG1135755
(S) Dibromofluoromethane	*103*			*76.0-123*		*07/11/2018 21:20*	WG1136397
(S) 4-Bromofluorobenzene	*93.7*			*80.0-120*		*07/11/2018 01:25*	WG1135755
(S) 4-Bromofluorobenzene	*107*			*80.0-120*		*07/11/2018 21:20*	WG1136397

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	07/11/2018 01:44	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/11/2018 01:44	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/11/2018 01:44	WG1135755
Bromoform	U		0.186	0.500	1	07/11/2018 01:44	WG1135755
Bromomethane	U		0.157	2.50	1	07/11/2018 01:44	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/11/2018 01:44	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/11/2018 01:44	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/11/2018 01:44	WG1135755
Chloroethane	U		0.141	2.50	1	07/11/2018 01:44	WG1135755
Chloroform	U		0.0860	0.500	1	07/11/2018 01:44	WG1135755
Chloromethane	U		0.153	1.25	1	07/11/2018 01:44	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/11/2018 01:44	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/11/2018 01:44	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/11/2018 01:44	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/11/2018 01:44	WG1135755
Dibromomethane	U		0.117	0.500	1	07/11/2018 01:44	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/11/2018 01:44	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/11/2018 01:44	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/11/2018 01:44	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/11/2018 01:44	WG1135755
1,1-Dichloroethane	4.13		0.114	0.500	1	07/11/2018 01:44	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/11/2018 01:44	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/11/2018 01:44	WG1135755
cis-1,2-Dichloroethene	23.2		0.0933	0.500	1	07/11/2018 01:44	WG1135755
trans-1,2-Dichloroethene	0.562		0.152	0.500	1	07/11/2018 01:44	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/11/2018 01:44	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/11/2018 01:44	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/11/2018 01:44	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/11/2018 01:44	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/11/2018 01:44	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/11/2018 01:44	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/11/2018 01:44	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/11/2018 01:44	WG1135755
Iodomethane	U		0.377	10.0	1	07/11/2018 01:44	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/11/2018 01:44	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/11/2018 01:44	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/11/2018 01:44	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/11/2018 01:44	WG1135755
Tetrachloroethene	U		0.199	0.500	1	07/11/2018 01:44	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/11/2018 01:44	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/11/2018 01:44	WG1135755
1,1,1-Trichloroethane	1.00		0.0940	0.500	1	07/11/2018 01:44	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/11/2018 01:44	WG1135755
Trichloroethene	2.34		0.153	0.500	1	07/11/2018 01:44	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/11/2018 01:44	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/11/2018 01:44	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/11/2018 01:44	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/11/2018 21:40	WG1136397
(S) Toluene-d8	*97.3*			*80.0-120*		*07/11/2018 01:44*	WG1135755
(S) Toluene-d8	*99.1*			*80.0-120*		*07/11/2018 21:40*	WG1136397
(S) Dibromofluoromethane	*100*			*76.0-123*		*07/11/2018 01:44*	WG1135755
(S) Dibromofluoromethane	*103*			*76.0-123*		*07/11/2018 21:40*	WG1136397
(S) 4-Bromofluorobenzene	*92.3*			*80.0-120*		*07/11/2018 01:44*	WG1135755
(S) 4-Bromofluorobenzene	*106*			*80.0-120*		*07/11/2018 21:40*	WG1136397

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	07/11/2018 02:04	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/11/2018 02:04	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/11/2018 02:04	WG1135755
Bromoform	U		0.186	0.500	1	07/11/2018 02:04	WG1135755
Bromomethane	U		0.157	2.50	1	07/11/2018 02:04	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/11/2018 02:04	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/11/2018 02:04	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/11/2018 02:04	WG1135755
Chloroethane	U		0.141	2.50	1	07/11/2018 02:04	WG1135755
Chloroform	U		0.0860	0.500	1	07/11/2018 02:04	WG1135755
Chloromethane	U		0.153	1.25	1	07/11/2018 02:04	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/11/2018 02:04	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/11/2018 02:04	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/11/2018 02:04	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/11/2018 02:04	WG1135755
Dibromomethane	U		0.117	0.500	1	07/11/2018 02:04	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/11/2018 02:04	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/11/2018 02:04	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/11/2018 02:04	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/11/2018 02:04	WG1135755
1,1-Dichloroethane	10.2		0.114	0.500	1	07/11/2018 02:04	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/11/2018 02:04	WG1135755
1,1-Dichloroethene	9.34		0.188	0.500	1	07/11/2018 02:04	WG1135755
cis-1,2-Dichloroethene	353		0.933	5.00	10	07/11/2018 21:59	WG1136397
trans-1,2-Dichloroethene	1.74		0.152	0.500	1	07/11/2018 02:04	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/11/2018 02:04	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/11/2018 02:04	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/11/2018 02:04	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/11/2018 02:04	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/11/2018 02:04	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/11/2018 02:04	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/11/2018 02:04	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/11/2018 02:04	WG1135755
Iodomethane	U		0.377	10.0	1	07/11/2018 02:04	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/11/2018 02:04	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/11/2018 02:04	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/11/2018 02:04	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/11/2018 02:04	WG1135755
Tetrachloroethene	747		1.99	5.00	10	07/11/2018 21:59	WG1136397
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/11/2018 02:04	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/11/2018 02:04	WG1135755
1,1,1-Trichloroethane	0.555		0.0940	0.500	1	07/11/2018 02:04	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/11/2018 02:04	WG1135755
Trichloroethene	140		0.153	0.500	1	07/11/2018 02:04	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/11/2018 02:04	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/11/2018 02:04	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/11/2018 02:04	WG1135755
Vinyl chloride	5.26		0.118	0.500	1	07/11/2018 02:04	WG1135755
(S) Toluene-d8	*102*			*80.0-120*		*07/11/2018 02:04*	WG1135755
(S) Toluene-d8	*101*			*80.0-120*		*07/11/2018 21:59*	WG1136397
(S) Dibromofluoromethane	*101*			*76.0-123*		*07/11/2018 02:04*	WG1135755
(S) Dibromofluoromethane	*105*			*76.0-123*		*07/11/2018 21:59*	WG1136397
(S) 4-Bromofluorobenzene	*92.2*			*80.0-120*		*07/11/2018 02:04*	WG1135755
(S) 4-Bromofluorobenzene	*104*			*80.0-120*		*07/11/2018 21:59*	WG1136397

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	07/11/2018 02:23	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/11/2018 02:23	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/11/2018 02:23	WG1135755
Bromoform	U		0.186	0.500	1	07/11/2018 02:23	WG1135755
Bromomethane	U		0.157	2.50	1	07/11/2018 02:23	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/11/2018 02:23	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/11/2018 02:23	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/11/2018 02:23	WG1135755
Chloroethane	U		0.141	2.50	1	07/11/2018 02:23	WG1135755
Chloroform	U		0.0860	0.500	1	07/11/2018 02:23	WG1135755
Chloromethane	U		0.153	1.25	1	07/11/2018 02:23	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/11/2018 02:23	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/11/2018 02:23	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/11/2018 02:23	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/11/2018 02:23	WG1135755
Dibromomethane	U		0.117	0.500	1	07/11/2018 02:23	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/11/2018 02:23	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/11/2018 02:23	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/11/2018 02:23	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/11/2018 02:23	WG1135755
1,1-Dichloroethane	5.24		0.114	0.500	1	07/11/2018 02:23	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/11/2018 02:23	WG1135755
1,1-Dichloroethene	1.78		0.188	0.500	1	07/11/2018 02:23	WG1135755
cis-1,2-Dichloroethene	203		0.933	5.00	10	07/11/2018 22:19	WG1136397
trans-1,2-Dichloroethene	1.31		0.152	0.500	1	07/11/2018 02:23	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/11/2018 02:23	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/11/2018 02:23	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/11/2018 02:23	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/11/2018 02:23	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/11/2018 02:23	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/11/2018 02:23	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/11/2018 02:23	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/11/2018 02:23	WG1135755
Iodomethane	U		0.377	10.0	1	07/11/2018 02:23	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/11/2018 02:23	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/11/2018 02:23	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/11/2018 02:23	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/11/2018 02:23	WG1135755
Tetrachloroethene	398		1.99	5.00	10	07/11/2018 22:19	WG1136397
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/11/2018 02:23	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/11/2018 02:23	WG1135755
1,1,1-Trichloroethane	1.82		0.0940	0.500	1	07/11/2018 02:23	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/11/2018 02:23	WG1135755
Trichloroethene	65.1		0.153	0.500	1	07/11/2018 02:23	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/11/2018 02:23	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/11/2018 02:23	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/11/2018 02:23	WG1135755
Vinyl chloride	8.96		0.118	0.500	1	07/11/2018 02:23	WG1135755
(S) Toluene-d8	*99.8*			*80.0-120*		*07/11/2018 02:23*	WG1135755
(S) Toluene-d8	*98.5*			*80.0-120*		*07/11/2018 22:19*	WG1136397
(S) Dibromofluoromethane	*99.5*			*76.0-123*		*07/11/2018 02:23*	WG1135755
(S) Dibromofluoromethane	*105*			*76.0-123*		*07/11/2018 22:19*	WG1136397
(S) 4-Bromofluorobenzene	*92.6*			*80.0-120*		*07/11/2018 02:23*	WG1135755
(S) 4-Bromofluorobenzene	*100*			*80.0-120*		*07/11/2018 22:19*	WG1136397

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	07/11/2018 02:42	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/11/2018 02:42	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/11/2018 02:42	WG1135755
Bromoform	U		0.186	0.500	1	07/11/2018 02:42	WG1135755
Bromomethane	U		0.157	2.50	1	07/11/2018 02:42	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/11/2018 02:42	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/11/2018 02:42	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/11/2018 02:42	WG1135755
Chloroethane	U		0.141	2.50	1	07/11/2018 02:42	WG1135755
Chloroform	U		0.0860	0.500	1	07/11/2018 02:42	WG1135755
Chloromethane	U		0.153	1.25	1	07/11/2018 02:42	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/11/2018 02:42	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/11/2018 02:42	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/11/2018 02:42	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/11/2018 02:42	WG1135755
Dibromomethane	U		0.117	0.500	1	07/11/2018 02:42	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/11/2018 02:42	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/11/2018 02:42	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/11/2018 02:42	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/11/2018 02:42	WG1135755
1,1-Dichloroethane	U		0.114	0.500	1	07/11/2018 02:42	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/11/2018 02:42	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/11/2018 02:42	WG1135755
cis-1,2-Dichloroethene	U		0.0933	0.500	1	07/11/2018 19:00	WG1136397
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/11/2018 02:42	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/11/2018 02:42	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/11/2018 02:42	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/11/2018 02:42	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/11/2018 02:42	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/11/2018 02:42	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/11/2018 02:42	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/11/2018 02:42	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/11/2018 02:42	WG1135755
Iodomethane	U		0.377	10.0	1	07/11/2018 02:42	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/11/2018 02:42	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/11/2018 02:42	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/11/2018 02:42	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/11/2018 02:42	WG1135755
Tetrachloroethene	U		0.199	0.500	1	07/11/2018 19:00	WG1136397
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/11/2018 02:42	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/11/2018 02:42	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/11/2018 02:42	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/11/2018 02:42	WG1135755
Trichloroethene	U		0.153	0.500	1	07/11/2018 02:42	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/11/2018 02:42	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/11/2018 02:42	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/11/2018 02:42	WG1135755
Vinyl chloride	0.275	J	0.118	0.500	1	07/11/2018 02:42	WG1135755
(S) Toluene-d8	*96.5*			*80.0-120*		*07/11/2018 02:42*	WG1135755
(S) Toluene-d8	*97.7*			*80.0-120*		*07/11/2018 19:00*	WG1136397
(S) Dibromofluoromethane	*100*			*76.0-123*		*07/11/2018 02:42*	WG1135755
(S) Dibromofluoromethane	*104*			*76.0-123*		*07/11/2018 19:00*	WG1136397
(S) 4-Bromofluorobenzene	*91.4*			*80.0-120*		*07/11/2018 02:42*	WG1135755
(S) 4-Bromofluorobenzene	*101*			*80.0-120*		*07/11/2018 19:00*	WG1136397

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	07/10/2018 21:53	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 21:53	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 21:53	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 21:53	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 21:53	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 21:53	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 21:53	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 21:53	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 21:53	WG1135755
Chloroform	0.408	J	0.0860	0.500	1	07/10/2018 21:53	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 21:53	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 21:53	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 21:53	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 21:53	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 21:53	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 21:53	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 21:53	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 21:53	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 21:53	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 21:53	WG1135755
1,1-Dichloroethane	U		0.114	0.500	1	07/10/2018 21:53	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 21:53	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 21:53	WG1135755
cis-1,2-Dichloroethene	U		0.0933	0.500	1	07/10/2018 21:53	WG1135755
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 21:53	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 21:53	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 21:53	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 21:53	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 21:53	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 21:53	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 21:53	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 21:53	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 21:53	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 21:53	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/10/2018 21:53	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 21:53	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 21:53	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 21:53	WG1135755
Tetrachloroethene	U		0.199	0.500	1	07/10/2018 21:53	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 21:53	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 21:53	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 21:53	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 21:53	WG1135755
Trichloroethene	U		0.153	0.500	1	07/10/2018 21:53	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 21:53	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 21:53	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 21:53	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/10/2018 21:53	WG1135755
(S) Toluene-d8	*99.1*			*80.0-120*		*07/10/2018 21:53*	WG1135755
(S) Dibromofluoromethane	*101*			*76.0-123*		*07/10/2018 21:53*	WG1135755
(S) 4-Bromofluorobenzene	*94.4*			*80.0-120*		*07/10/2018 21:53*	WG1135755

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	07/10/2018 22:12	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 22:12	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 22:12	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 22:12	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 22:12	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 22:12	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 22:12	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 22:12	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 22:12	WG1135755
Chloroform	0.338	J	0.0860	0.500	1	07/10/2018 22:12	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 22:12	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 22:12	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 22:12	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 22:12	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 22:12	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 22:12	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 22:12	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 22:12	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 22:12	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 22:12	WG1135755
1,1-Dichloroethane	U		0.114	0.500	1	07/10/2018 22:12	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 22:12	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 22:12	WG1135755
cis-1,2-Dichloroethene	U		0.0933	0.500	1	07/10/2018 22:12	WG1135755
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 22:12	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 22:12	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 22:12	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 22:12	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 22:12	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 22:12	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 22:12	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 22:12	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 22:12	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 22:12	WG1135755
Methylene Chloride	U		1.07	2.50	1	07/10/2018 22:12	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 22:12	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 22:12	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 22:12	WG1135755
Tetrachloroethene	U		0.199	0.500	1	07/10/2018 22:12	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 22:12	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 22:12	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 22:12	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 22:12	WG1135755
Trichloroethene	U		0.153	0.500	1	07/10/2018 22:12	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 22:12	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 22:12	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 22:12	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/10/2018 22:12	WG1135755
(S) Toluene-d8	*97.2*			*80.0-120*		*07/10/2018 22:12*	WG1135755
(S) Dibromofluoromethane	*99.5*			*76.0-123*		*07/10/2018 22:12*	WG1135755
(S) 4-Bromofluorobenzene	*93.2*			*80.0-120*		*07/10/2018 22:12*	WG1135755

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	07/10/2018 20:53	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 20:53	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 20:53	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 20:53	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 20:53	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 20:53	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 20:53	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 20:53	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 20:53	WG1135755
Chloroform	U		0.0860	0.500	1	07/10/2018 20:53	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 20:53	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 20:53	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 20:53	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 20:53	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 20:53	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 20:53	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 20:53	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 20:53	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 20:53	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 20:53	WG1135755
1,1-Dichloroethane	U		0.114	0.500	1	07/10/2018 20:53	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 20:53	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 20:53	WG1135755
cis-1,2-Dichloroethene	U		0.0933	0.500	1	07/10/2018 20:53	WG1135755
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 20:53	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 20:53	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 20:53	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 20:53	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 20:53	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 20:53	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 20:53	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 20:53	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 20:53	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 20:53	WG1135755
Methylene Chloride	1.66	J	1.07	2.50	1	07/10/2018 20:53	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 20:53	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 20:53	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 20:53	WG1135755
Tetrachloroethene	U		0.199	0.500	1	07/10/2018 20:53	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 20:53	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 20:53	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 20:53	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 20:53	WG1135755
Trichloroethene	U		0.153	0.500	1	07/10/2018 20:53	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 20:53	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 20:53	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 20:53	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/10/2018 20:53	WG1135755
(S) Toluene-d8	*97.2*			*80.0-120*		*07/10/2018 20:53*	WG1135755
(S) Dibromofluoromethane	*99.3*			*76.0-123*		*07/10/2018 20:53*	WG1135755
(S) 4-Bromofluorobenzene	*92.1*			*80.0-120*		*07/10/2018 20:53*	WG1135755

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	07/10/2018 21:13	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 21:13	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 21:13	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 21:13	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 21:13	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 21:13	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 21:13	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 21:13	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 21:13	WG1135755
Chloroform	U		0.0860	0.500	1	07/10/2018 21:13	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 21:13	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 21:13	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 21:13	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 21:13	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 21:13	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 21:13	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 21:13	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 21:13	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 21:13	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 21:13	WG1135755
1,1-Dichloroethane	U		0.114	0.500	1	07/10/2018 21:13	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 21:13	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 21:13	WG1135755
cis-1,2-Dichloroethene	U		0.0933	0.500	1	07/10/2018 21:13	WG1135755
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 21:13	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 21:13	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 21:13	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 21:13	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 21:13	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 21:13	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 21:13	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 21:13	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 21:13	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 21:13	WG1135755
Methylene Chloride	1.41	J	1.07	2.50	1	07/10/2018 21:13	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 21:13	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 21:13	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 21:13	WG1135755
Tetrachloroethene	U		0.199	0.500	1	07/10/2018 21:13	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 21:13	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 21:13	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 21:13	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 21:13	WG1135755
Trichloroethene	U		0.153	0.500	1	07/10/2018 21:13	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 21:13	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 21:13	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 21:13	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/10/2018 21:13	WG1135755
(S) Toluene-d8	*97.3*			*80.0-120*		*07/10/2018 21:13*	WG1135755
(S) Dibromofluoromethane	*99.5*			*76.0-123*		*07/10/2018 21:13*	WG1135755
(S) 4-Bromofluorobenzene	*91.4*			*80.0-120*		*07/10/2018 21:13*	WG1135755

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	07/10/2018 21:33	WG1135755
Bromodichloromethane	U		0.0800	0.500	1	07/10/2018 21:33	WG1135755
Bromochloromethane	U		0.145	0.500	1	07/10/2018 21:33	WG1135755
Bromoform	U		0.186	0.500	1	07/10/2018 21:33	WG1135755
Bromomethane	U		0.157	2.50	1	07/10/2018 21:33	WG1135755
Carbon tetrachloride	U		0.159	0.500	1	07/10/2018 21:33	WG1135755
Chlorobenzene	U		0.140	0.500	1	07/10/2018 21:33	WG1135755
Chlorodibromomethane	U		0.128	0.500	1	07/10/2018 21:33	WG1135755
Chloroethane	U		0.141	2.50	1	07/10/2018 21:33	WG1135755
Chloroform	U		0.0860	0.500	1	07/10/2018 21:33	WG1135755
Chloromethane	U		0.153	1.25	1	07/10/2018 21:33	WG1135755
2-Chlorotoluene	U		0.111	0.500	1	07/10/2018 21:33	WG1135755
4-Chlorotoluene	U		0.0972	0.500	1	07/10/2018 21:33	WG1135755
1,2-Dibromo-3-Chloropropane	U		0.325	2.50	1	07/10/2018 21:33	WG1135755
1,2-Dibromoethane	U		0.193	0.500	1	07/10/2018 21:33	WG1135755
Dibromomethane	U		0.117	0.500	1	07/10/2018 21:33	WG1135755
1,2-Dichlorobenzene	U		0.101	0.500	1	07/10/2018 21:33	WG1135755
1,3-Dichlorobenzene	U		0.130	0.500	1	07/10/2018 21:33	WG1135755
1,4-Dichlorobenzene	U		0.121	0.500	1	07/10/2018 21:33	WG1135755
Dichlorodifluoromethane	U		0.127	2.50	1	07/10/2018 21:33	WG1135755
1,1-Dichloroethane	U		0.114	0.500	1	07/10/2018 21:33	WG1135755
1,2-Dichloroethane	U		0.108	0.500	1	07/10/2018 21:33	WG1135755
1,1-Dichloroethene	U		0.188	0.500	1	07/10/2018 21:33	WG1135755
cis-1,2-Dichloroethene	U		0.0933	0.500	1	07/10/2018 21:33	WG1135755
trans-1,2-Dichloroethene	U		0.152	0.500	1	07/10/2018 21:33	WG1135755
1,2-Dichloropropane	U		0.190	0.500	1	07/10/2018 21:33	WG1135755
1,1-Dichloropropene	U		0.128	0.500	1	07/10/2018 21:33	WG1135755
1,3-Dichloropropane	U		0.147	1.00	1	07/10/2018 21:33	WG1135755
cis-1,3-Dichloropropene	U		0.0976	0.500	1	07/10/2018 21:33	WG1135755
trans-1,3-Dichloropropene	U		0.222	0.500	1	07/10/2018 21:33	WG1135755
trans-1,4-Dichloro-2-butene	U		0.257	5.00	1	07/10/2018 21:33	WG1135755
2,2-Dichloropropane	U		0.0929	0.500	1	07/10/2018 21:33	WG1135755
Hexachloro-1,3-butadiene	U		0.157	1.00	1	07/10/2018 21:33	WG1135755
Iodomethane	U		0.377	10.0	1	07/10/2018 21:33	WG1135755
Methylene Chloride	1.50	J	1.07	2.50	1	07/10/2018 21:33	WG1135755
1,1,1,2-Tetrachloroethane	U		0.120	0.500	1	07/10/2018 21:33	WG1135755
1,1,2,2-Tetrachloroethane	U		0.130	0.500	1	07/10/2018 21:33	WG1135755
1,1,2-Trichlorotrifluoroethane	U		0.164	0.500	1	07/10/2018 21:33	WG1135755
Tetrachloroethene	U		0.199	0.500	1	07/10/2018 21:33	WG1135755
1,2,3-Trichlorobenzene	U		0.164	0.500	1	07/10/2018 21:33	WG1135755
1,2,4-Trichlorobenzene	U		0.355	0.500	1	07/10/2018 21:33	WG1135755
1,1,1-Trichloroethane	U		0.0940	0.500	1	07/10/2018 21:33	WG1135755
1,1,2-Trichloroethane	U		0.186	0.500	1	07/10/2018 21:33	WG1135755
Trichloroethene	U		0.153	0.500	1	07/10/2018 21:33	WG1135755
Trichlorofluoromethane	U		0.130	2.50	1	07/10/2018 21:33	WG1135755
1,2,3-Trichloropropane	U		0.247	2.50	1	07/10/2018 21:33	WG1135755
Vinyl acetate	U		0.645	5.00	1	07/10/2018 21:33	WG1135755
Vinyl chloride	U		0.118	0.500	1	07/10/2018 21:33	WG1135755
(S) Toluene-d8	*97.9*			*80.0-120*		*07/10/2018 21:33*	WG1135755
(S) Dibromofluoromethane	*99.8*			*76.0-123*		*07/10/2018 21:33*	WG1135755
(S) 4-Bromofluorobenzene	*92.5*			*80.0-120*		*07/10/2018 21:33*	WG1135755

Method Blank (MB)

(MB) R3324873-4 07/09/18 13:32

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

Method Blank (MB)

(MB) R3324873-4 07/09/18 13:32

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL 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	*98.0*			*80.0-120*
(S) Dibromofluoromethane	*98.4*			*76.0-123*
(S) 4-Bromofluorobenzene	*91.7*			*80.0-120*

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

(LCS) R3324873-1 07/09/18 12:13 • (LCSD) R3324873-2 07/09/18 12:33

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 %
Bromobenzene	25.0	24.3	24.5	97.3	98.0	79.0-120			0.717	20
Bromodichloromethane	25.0	25.4	25.1	102	100	76.0-120			1.33	20
Bromochloromethane	25.0	25.8	25.3	103	101	76.0-122			1.90	20
Bromoform	25.0	22.4	22.6	89.7	90.3	67.0-132			0.614	20
Bromomethane	25.0	23.5	19.9	93.9	79.6	18.0-160			16.5	20
Carbon tetrachloride	25.0	25.7	25.3	103	101	63.0-122			1.61	20
Chlorobenzene	25.0	25.2	25.6	101	102	79.0-121			1.59	20
Chlorodibromomethane	25.0	24.5	24.7	97.9	98.8	75.0-125			0.839	20
Chloroethane	25.0	27.0	21.0	108	84.1	47.0-152		J3	24.7	20
Chloroform	25.0	25.7	25.3	103	101	72.0-121			1.53	20
Chloromethane	25.0	27.0	23.9	108	95.5	48.0-139			12.1	20
2-Chlorotoluene	25.0	25.2	25.5	101	102	74.0-122			1.25	20
4-Chlorotoluene	25.0	24.4	24.9	97.7	99.4	79.0-120			1.79	20
1,2-Dibromo-3-Chloropropane	25.0	22.9	23.6	91.8	94.5	64.0-127			2.95	20
1,2-Dibromoethane	25.0	24.8	25.0	99.4	99.9	77.0-123			0.495	20
Dibromomethane	25.0	25.8	25.2	103	101	78.0-120			2.36	20
1,2-Dichlorobenzene	25.0	25.7	25.9	103	104	80.0-120			0.791	20
1,3-Dichlorobenzene	25.0	25.4	26.2	102	105	72.0-123			3.10	20
1,4-Dichlorobenzene	25.0	25.3	25.6	101	102	77.0-120			0.971	20
Dichlorodifluoromethane	25.0	29.4	23.7	118	94.9	49.0-155		J3	21.3	20
1,1-Dichloroethane	25.0	26.4	26.0	106	104	70.0-126			1.65	20
1,2-Dichloroethane	25.0	27.5	27.1	110	108	67.0-126			1.77	20

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

(LCS) R3324873-1 07/09/18 12:13 • (LCSD) R3324873-2 07/09/18 12:33

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 %
1,1-Dichloroethene	25.0	25.7	24.6	103	98.2	64.0-129			4.40	20
cis-1,2-Dichloroethene	25.0	25.3	25.2	101	101	73.0-120			0.258	20
trans-1,2-Dichloroethene	25.0	25.5	25.1	102	100	71.0-121			1.54	20
1,2-Dichloropropane	25.0	25.6	25.6	102	102	75.0-125			0.0916	20
1,1-Dichloropropene	25.0	27.1	27.0	108	108	71.0-129			0.602	20
1,3-Dichloropropane	25.0	25.9	25.8	103	103	80.0-121			0.254	20
cis-1,3-Dichloropropene	25.0	25.3	25.5	101	102	79.0-123			0.728	20
trans-1,3-Dichloropropene	25.0	25.5	25.8	102	103	74.0-127			1.44	20
trans-1,4-Dichloro-2-butene	25.0	24.9	24.7	99.4	98.8	55.0-134			0.584	20
2,2-Dichloropropane	25.0	24.7	23.6	98.8	94.4	60.0-125			4.61	20
Hexachloro-1,3-butadiene	25.0	23.1	24.2	92.5	96.8	64.0-131			4.47	20
Iodomethane	125	128	121	102	96.5	57.0-140			5.73	20
Methylene Chloride	25.0	24.7	24.0	98.9	95.8	66.0-121			3.15	20
1,1,1,2-Tetrachloroethane	25.0	24.9	25.0	99.6	99.9	75.0-122			0.367	20
1,1,2,2-Tetrachloroethane	25.0	23.4	23.5	93.7	94.1	71.0-122			0.406	20
1,1,2-Trichlorotrifluoroethane	25.0	23.1	18.1	92.5	72.4	61.0-136		J3	24.4	20
Tetrachloroethene	25.0	25.9	26.1	103	104	70.0-127			0.765	20
1,2,3-Trichlorobenzene	25.0	21.7	24.0	86.6	96.1	61.0-133			10.4	20
1,2,4-Trichlorobenzene	25.0	23.8	24.8	95.1	99.1	69.0-129			4.08	20
1,1,1-Trichloroethane	25.0	25.9	25.7	104	103	68.0-122			0.987	20
1,1,2-Trichloroethane	25.0	24.4	24.7	97.7	98.9	78.0-120			1.26	20
Trichloroethene	25.0	25.7	25.3	103	101	78.0-120			1.44	20
Trichlorofluoromethane	25.0	28.4	24.2	114	97.0	56.0-137			15.9	20
1,2,3-Trichloropropane	25.0	25.0	25.7	99.9	103	72.0-124			2.75	20
Vinyl acetate	125	142	139	113	111	46.0-160			2.02	20
Vinyl chloride	25.0	29.4	22.2	118	88.7	64.0-133		J3	28.1	20
(S) Toluene-d8				*98.2*	*98.4*	*80.0-120*				
(S) Dibromofluoromethane				*99.9*	*97.7*	*76.0-123*				
(S) 4-Bromofluorobenzene				*93.4*	*93.8*	*80.0-120*				

Method Blank (MB)

(MB) R3324860-4 07/09/18 22:21

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	0.192	J	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

Method Blank (MB)

(MB) R3324860-4 07/09/18 22:21

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL 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	*99.6*			*80.0-120*
(S) Dibromofluoromethane	*98.3*			*76.0-123*
(S) 4-Bromofluorobenzene	*93.1*			*80.0-120*

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

(LCS) R3324860-1 07/09/18 20:42 • (LCSD) R3324860-2 07/09/18 21:02

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 %
Bromobenzene	25.0	25.1	24.9	100	99.4	79.0-120			0.833	20
Bromodichloromethane	25.0	25.6	25.7	102	103	76.0-120			0.454	20
Bromochloromethane	25.0	25.4	25.7	102	103	76.0-122			0.949	20
Bromoform	25.0	22.0	21.6	87.8	86.5	67.0-132			1.50	20
Bromomethane	25.0	26.2	24.8	105	99.2	18.0-160			5.43	20
Carbon tetrachloride	25.0	27.0	27.0	108	108	63.0-122			0.358	20
Chlorobenzene	25.0	25.5	25.4	102	102	79.0-121			0.231	20
Chlorodibromomethane	25.0	24.3	24.1	97.2	96.4	75.0-125			0.837	20
Chloroethane	25.0	30.4	29.9	121	120	47.0-152			1.43	20
Chloroform	25.0	26.5	26.3	106	105	72.0-121			0.477	20
Chloromethane	25.0	28.0	26.9	112	107	48.0-139			4.32	20
2-Chlorotoluene	25.0	25.9	25.7	104	103	74.0-122			0.987	20
4-Chlorotoluene	25.0	25.2	25.1	101	101	79.0-120			0.319	20
1,2-Dibromo-3-Chloropropane	25.0	22.6	22.9	90.3	91.6	64.0-127			1.51	20
1,2-Dibromoethane	25.0	24.7	24.4	98.9	97.5	77.0-123			1.47	20
Dibromomethane	25.0	25.9	25.7	104	103	78.0-120			0.750	20
1,2-Dichlorobenzene	25.0	25.8	25.9	103	104	80.0-120			0.678	20
1,3-Dichlorobenzene	25.0	26.0	26.1	104	104	72.0-123			0.0749	20
1,4-Dichlorobenzene	25.0	26.0	25.7	104	103	77.0-120			1.37	20
Dichlorodifluoromethane	25.0	30.6	29.5	122	118	49.0-155			3.76	20
1,1-Dichloroethane	25.0	26.9	26.9	108	108	70.0-126			0.113	20
1,2-Dichloroethane	25.0	28.3	28.1	113	113	67.0-126			0.709	20

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

(LCS) R3324860-1 07/09/18 20:42 • (LCSD) R3324860-2 07/09/18 21:02

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 %
1,1-Dichloroethene	25.0	26.6	26.2	106	105	64.0-129			1.52	20
cis-1,2-Dichloroethene	25.0	26.9	26.2	108	105	73.0-120			2.48	20
trans-1,2-Dichloroethene	25.0	25.9	26.0	103	104	71.0-121			0.630	20
1,2-Dichloropropane	25.0	26.5	26.2	106	105	75.0-125			0.996	20
1,1-Dichloropropene	25.0	27.7	28.7	111	115	71.0-129			3.41	20
1,3-Dichloropropane	25.0	25.4	25.5	102	102	80.0-121			0.180	20
cis-1,3-Dichloropropene	25.0	24.9	24.8	99.7	99.2	79.0-123			0.461	20
trans-1,3-Dichloropropene	25.0	24.7	24.9	98.6	99.4	74.0-127			0.790	20
trans-1,4-Dichloro-2-butene	25.0	22.6	22.4	90.4	89.8	55.0-134			0.672	20
2,2-Dichloropropane	25.0	24.9	24.4	99.6	97.8	60.0-125			1.83	20
Hexachloro-1,3-butadiene	25.0	23.7	24.8	94.9	99.1	64.0-131			4.32	20
Iodomethane	125	131	127	105	102	57.0-140			3.11	20
Methylene Chloride	25.0	24.8	24.7	99.3	98.9	66.0-121			0.355	20
1,1,1,2-Tetrachloroethane	25.0	24.7	24.7	98.9	98.7	75.0-122			0.184	20
1,1,2,2-Tetrachloroethane	25.0	22.4	21.8	89.5	87.1	71.0-122			2.69	20
1,1,2-Trichlorotrifluoroethane	25.0	26.4	24.9	105	99.7	61.0-136			5.56	20
Tetrachloroethene	25.0	26.5	26.2	106	105	70.0-127			1.01	20
1,2,3-Trichlorobenzene	25.0	21.9	23.2	87.6	92.6	61.0-133			5.57	20
1,2,4-Trichlorobenzene	25.0	24.6	24.9	98.6	99.5	69.0-129			0.912	20
1,1,1-Trichloroethane	25.0	27.7	27.5	111	110	68.0-122			0.865	20
1,1,2-Trichloroethane	25.0	24.0	23.8	95.9	95.4	78.0-120			0.570	20
Trichloroethene	25.0	26.9	27.5	108	110	78.0-120			2.09	20
Trichlorofluoromethane	25.0	30.5	30.0	122	120	56.0-137			1.58	20
1,2,3-Trichloropropane	25.0	24.9	25.1	99.7	100	72.0-124			0.490	20
Vinyl acetate	125	106	82.7	85.0	66.1	46.0-160		J3	25.0	20
Vinyl chloride	25.0	31.2	32.4	125	130	64.0-133			3.98	20
(S) Toluene-d8				*97.2*	*96.5*	*80.0-120*				
(S) Dibromofluoromethane				*98.3*	*99.5*	*76.0-123*				
(S) 4-Bromofluorobenzene				*93.5*	*92.5*	*80.0-120*				

Method Blank (MB)

(MB) R3324648-3 07/10/18 19:35

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

Method Blank (MB)

(MB) R3324648-3 07/10/18 19:35

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL 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	*101*			*80.0-120*
(S) Dibromofluoromethane	*100*			*76.0-123*
(S) 4-Bromofluorobenzene	*92.6*			*80.0-120*

Laboratory Control Sample (LCS)

(LCS) R3324648-1 07/10/18 18:17

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromobenzene	25.0	24.1	96.4	79.0-120	
Bromodichloromethane	25.0	25.3	101	76.0-120	
Bromochloromethane	25.0	24.9	99.6	76.0-122	
Bromoform	25.0	21.9	87.7	67.0-132	
Bromomethane	25.0	22.9	91.7	18.0-160	
Carbon tetrachloride	25.0	24.9	99.7	63.0-122	
Chlorobenzene	25.0	24.4	97.8	79.0-121	
Chlorodibromomethane	25.0	24.0	96.1	75.0-125	
Chloroethane	25.0	26.7	107	47.0-152	
Chloroform	25.0	25.1	100	72.0-121	
Chloromethane	25.0	24.0	96.0	48.0-139	
2-Chlorotoluene	25.0	24.9	99.7	74.0-122	
4-Chlorotoluene	25.0	24.1	96.5	79.0-120	
1,2-Dibromo-3-Chloropropane	25.0	23.7	94.7	64.0-127	
1,2-Dibromoethane	25.0	24.1	96.2	77.0-123	
Dibromomethane	25.0	25.6	102	78.0-120	
1,2-Dichlorobenzene	25.0	25.6	102	80.0-120	
1,3-Dichlorobenzene	25.0	25.2	101	72.0-123	
1,4-Dichlorobenzene	25.0	25.3	101	77.0-120	
Dichlorodifluoromethane	25.0	24.3	97.2	49.0-155	
1,1-Dichloroethane	25.0	25.4	102	70.0-126	
1,2-Dichloroethane	25.0	27.4	110	67.0-126	

Laboratory Control Sample (LCS)

(LCS) R3324648-1 07/10/18 18:17

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,1-Dichloroethene	25.0	24.0	95.9	64.0-129	
cis-1,2-Dichloroethene	25.0	24.7	99.0	73.0-120	
trans-1,2-Dichloroethene	25.0	24.5	97.9	71.0-121	
1,2-Dichloropropane	25.0	25.2	101	75.0-125	
1,1-Dichloropropene	25.0	26.2	105	71.0-129	
1,3-Dichloropropane	25.0	25.2	101	80.0-121	
cis-1,3-Dichloropropene	25.0	24.4	97.8	79.0-123	
trans-1,3-Dichloropropene	25.0	24.9	99.5	74.0-127	
trans-1,4-Dichloro-2-butene	25.0	22.6	90.2	55.0-134	
2,2-Dichloropropane	25.0	23.5	94.0	60.0-125	
Hexachloro-1,3-butadiene	25.0	24.5	98.1	64.0-131	
Iodomethane	125	120	96.0	57.0-140	
Methylene Chloride	25.0	23.5	94.1	66.0-121	
1,1,1,2-Tetrachloroethane	25.0	24.4	97.6	75.0-122	
1,1,2,2-Tetrachloroethane	25.0	22.3	89.4	71.0-122	
1,1,2-Trichlorotrifluoroethane	25.0	22.8	91.3	61.0-136	
Tetrachloroethene	25.0	24.5	97.8	70.0-127	
1,2,3-Trichlorobenzene	25.0	24.0	96.1	61.0-133	
1,2,4-Trichlorobenzene	25.0	25.0	100	69.0-129	
1,1,1-Trichloroethane	25.0	25.9	103	68.0-122	
1,1,2-Trichloroethane	25.0	23.5	94.1	78.0-120	
Trichloroethene	25.0	25.3	101	78.0-120	
Trichlorofluoromethane	25.0	26.4	106	56.0-137	
1,2,3-Trichloropropane	25.0	24.6	98.2	72.0-124	
Vinyl acetate	125	104	83.2	46.0-160	
Vinyl chloride	25.0	27.1	108	64.0-133	
(S) Toluene-d8			*97.4*	*80.0-120*	
(S) Dibromofluoromethane			*98.7*	*76.0-123*	
(S) 4-Bromofluorobenzene			*93.0*	*80.0-120*	

Method Blank (MB)

(MB) R3324960-3 07/11/18 14:32

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
cis-1,2-Dichloroethene	U		0.0933	0.500
Tetrachloroethene	U		0.199	0.500
Trichloroethene	U		0.153	0.500
Vinyl chloride	U		0.118	0.500
(S) Toluene-d8	*99.5*			*80.0-120*
(S) Dibromofluoromethane	*102*			*76.0-123*
(S) 4-Bromofluorobenzene	*105*			*80.0-120*

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

(LCS) R3324960-1 07/11/18 13:32 • (LCSD) R3324960-2 07/11/18 13:52

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 %
cis-1,2-Dichloroethene	25.0	23.1	22.6	92.4	90.4	73.0-120			2.19	20
Tetrachloroethene	25.0	22.1	22.7	88.4	90.9	70.0-127			2.76	20
Trichloroethene	25.0	24.6	24.4	98.5	97.7	78.0-120			0.902	20
Vinyl chloride	25.0	24.4	24.4	97.8	97.8	64.0-133			0.00499	20
(S) Toluene-d8				*99.2*	*102*	*80.0-120*				
(S) Dibromofluoromethane				*98.3*	*98.4*	*76.0-123*				
(S) 4-Bromofluorobenzene				*111*	*110*	*80.0-120*				

Method Blank (MB)

(MB) R3325109-3 07/11/18 23:22

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloroethane	U		0.141	2.50
cis-1,2-Dichloroethene	U		0.0933	0.500
Tetrachloroethene	U		0.199	0.500
Vinyl chloride	U		0.118	0.500
(S) Toluene-d8	*109*			*80.0-120*
(S) Dibromofluoromethane	*86.6*			*76.0-123*
(S) 4-Bromofluorobenzene	*95.4*			*80.0-120*

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

(LCS) R3325109-1 07/11/18 21:54 • (LCSD) R3325109-2 07/11/18 22:16

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 %
Chloroethane	25.0	19.4	17.5	77.6	70.0	47.0-152			10.4	20
cis-1,2-Dichloroethene	25.0	20.4	18.7	81.6	74.8	73.0-120			8.74	20
Tetrachloroethene	25.0	25.8	26.9	103	107	70.0-127			3.99	20
Vinyl chloride	25.0	21.6	19.8	86.5	79.2	64.0-133			8.77	20
(S) Toluene-d8				*110*	*112*	*80.0-120*				
(S) Dibromofluoromethane				*97.6*	*85.7*	*76.0-123*				
(S) 4-Bromofluorobenzene				*94.9*	*95.2*	*80.0-120*				

Method Blank (MB)

(MB) R3325110-3 07/11/18 23:22

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
cis-1,2-Dichloroethene	U		0.0933	0.500
Trichloroethene	U		0.153	0.500
Vinyl chloride	U		0.118	0.500
(S) Toluene-d8	*109*			*80.0-120*
(S) Dibromofluoromethane	*86.6*			*76.0-123*
(S) 4-Bromofluorobenzene	*95.4*			*80.0-120*

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

(LCS) R3325110-1 07/11/18 21:54 • (LCSD) R3325110-2 07/11/18 22:16

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	%	%	%			%	%
cis-1,2-Dichloroethene	25.0	20.4	18.7	81.6	74.8	73.0-120			8.74	20
Trichloroethene	25.0	25.1	24.7	100	98.7	78.0-120			1.64	20
Vinyl chloride	25.0	21.6	19.8	86.5	79.2	64.0-133			8.77	20
(S) Toluene-d8				*110*	*112*	*80.0-120*				
(S) Dibromofluoromethane				*97.6*	*85.7*	*76.0-123*				
(S) 4-Bromofluorobenzene				*94.9*	*95.2*	*80.0-120*				

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.
(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, 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.
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.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.

Pace National 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 Pace National.

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	LAO00356
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

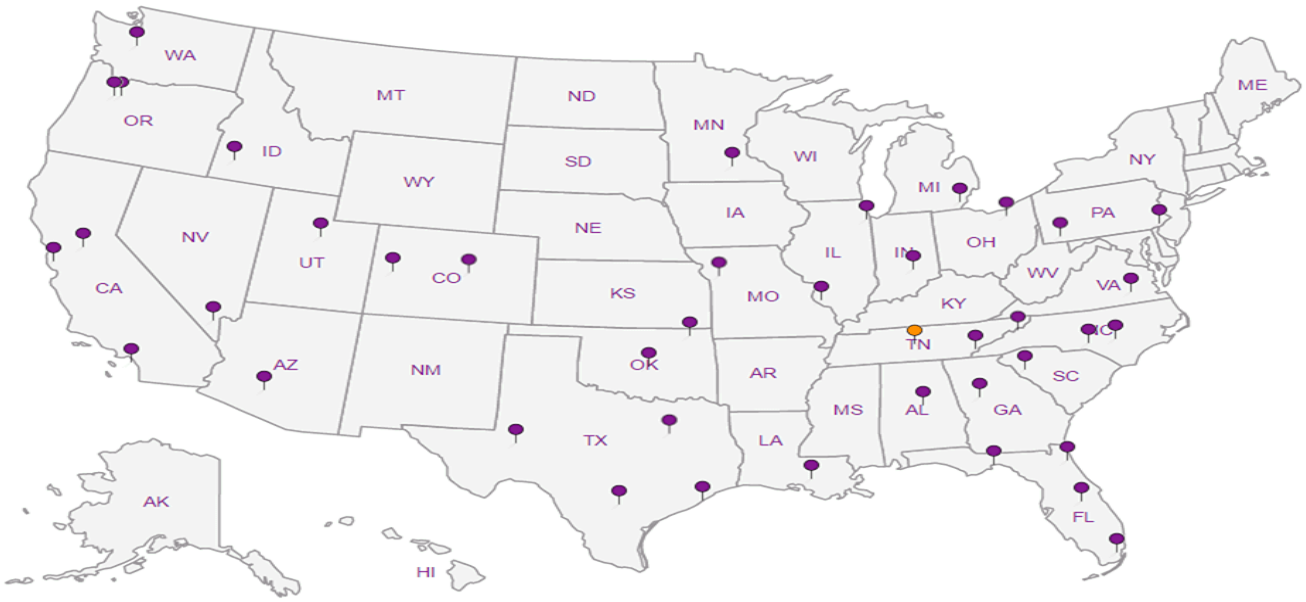
Third Party Federal Accreditations

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

Pace National 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. Pace National performs all testing at our central laboratory.



Pace Analytical
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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.

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Page: 1 of 5

Section A — Required Client Information:

Company:	Apex Companies, LLC
Address:	3015 SW 1st Ave
	Portland, OR 97201
Email To:	sbsalisbury@cascadiaassociates.com
Phone: 503-906-6577	Fax: n/a
Requested Due Date/TAT:	

Section B — Required Project Information:

Report To:	Stephanie Salisbury
Copy To:	kelsi.evans@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

Section D — Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Volatile Halocarbons (EPA 8260B)	TOC	Methane, Ethane, Ethene	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-2	WT	G			7/2/18	13:24		3				X						X				-01
2	MW-3	WT	G			7/2/18	12:47		3				X						X				-02
3	MW-19i	WT	G			7/2/18	11:25		3				X						X				-03
4	MW-15	WT	G			7/2/18	10:50		3				X						X				-04
5	MW-20i	WT	G			7/2/18	9:54		3				X						X				-05
6	MW-18i	WT	G			7/2/18	9:10		3				X						X				-06
7	MW-16	WT	G			7/2/18	8:27		3				X						X				-07
8	MGMS3-1	WT	G			7/1/18	17:32		3				X						X				-08
9	MGMS3-2	WT	G			7/1/18	17:19		3				X						X				-09
10	MGMS3-3	WT	G			7/1/18	16:56		3				X						X				-10
11	MGMS3-4	WT	G			7/1/18	16:20		3				X						X				-11
12	MGMS3-4 DUP	WT	G			7/1/18	16:20		3				X						X				-12

L1007508

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[illegible] APEX	7/5/18	1010	BSC	070618	1110	3.3	Y	N	N
	BSC	070618	1600		7/7/18	8145				
							2.3°C	Y	N	Y

4410 9283 2385
148 +3TB
+SL=Tb

2.3°C 11

SAMPLER NAME AND SIGNATURE		
PRINT Name of SAMPLER:	Jake Munsey	
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY): 7/5/18

Temp in °C | Received on Ice (Y/N) | 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.

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F-ALL-Q-020rev.07, 15-Feb-2007

BK

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Pace Analytical
www.pacelabs.com

Section A Required Client Information:

Company:	Apex Companies, LLC
Address:	3015 SW 1st Ave
	Portland, OR 97201
Email To:	sbsalisbury@cascadiaassociates.com
Phone: 503-906-6577	Fax: n/a
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Stephanie Salisbury, Kelsi Evans
Copy To:	Kelsi.Evans@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
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Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

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1	MGMS2-1	WT	G			7/1/18	15:39		3				X						X				L1007508 -13
2	MGMS2-2	WT	G			7/1/18	15:27		3				X						X				-14
3	MGMS2-3	WT	G			7/1/18	15:09		3				X						X				-15
4	MGMS2-4	WT	G			7/1/18	14:47		3				X						X				-16
5	MGMS1-1	WT	G			7/1/18	14:09		3				X						X				-17
6	MGMS1-2	WT	G			7/1/18	13:46		3				X						X				-18
7	MGMS1-3	WT	G			7/1/18	13:19		3				X						X				-19
8	MW-13	WT	G			7/1/18	11:55		3				X						X				-20
9	MW-12	WT	G			7/1/18	11:01		3				X						X				-21
10	MW-12 DUP	WT	G			7/1/18	11:01		3				X						X				-22
11	EW-1	WT	G			7/1/18	10:11		3				X						X				-23
12	MW-6	WT	G			7/1/18	9:32		3				X						X				-24

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Apex	7/5/18	1610		070618	1110
		070618	1600	SCI	7/7/18	8:48

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
2.3c	Y	N	Y

2.3c/5 11

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jake Munsey

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/5/18

*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.

Pace Analytical
www.pacelabs.com

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Copy To:	Kelsi.evans@apexcos.com
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Project Name:	NuStar Vancouver GWM
Project Number:	1126-21.002

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Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: WA

Section D Required Client Information

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1	MW-1	WT	G			7/1/18	8:47		3				X						X				-25
2	MW-5	WT	G			6/29/18	16:37		3				X						X				-26
3	MW-7	WT	G			6/29/18	15:31		3				X						X				-27
4	MW-7 DUP	WT	G			6/29/18	15:31		3				X						X				-28
5	MW-9	WT	G			6/29/18	14:48		3				X						X				-29
6	MW-8	WT	G			6/29/18	14:10		3				X						X				-30
7	MW-25i	WT	G			6/29/18	13:20		3				X						X				-31
8	MW-21i-40	WT	G			6/29/18	12:25		3				X						X				-32
9	MW-21i-105	WT	G			6/29/18	11:34		3				X						X				-33
10	MW-22i	WT	G			6/29/18	10:37		3				X						X				-34
11	MW-10	WT	G			6/29/18	9:55		3				X						X				-35
12	MW-26	WT	G			6/29/18	9:01		3				X						X				-36

4007508

Pace Project No./ Lab I.D.

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		7/5/18	1010		070618	1110	
		070618	1600		7/7/18	8:45	
							2.3° C / Y / N / Y

2.3 C

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jake Munsey

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/5/18

Temp in °C | Received on Ice (Y/N) | 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.

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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: 1 of 5

Section A — Required Client Information:

Company:	Apex Companies, LLC
Address:	3015 SW 1st Ave
	Portland, OR 97201
Email To:	sbsalisbury@cascadiaassociates.com
Phone: 503-906-6577	Fax: n/a
Requested Due Date/TAT:	

Section B — Required Project Information:

Report To:	Stephanie Salisbury, Kelsi Evans
Copy To:	kelsi.evans@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

Section D — Required Client Information

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: Volatile Halocarbons (EPA 8260B)	TOC	Methane, Ethane, Ethene	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-14	WT	G			6/28/2018	16:39		3				X					X				-37
2	MW-23i	WT	G			6/28/2018	15:50		3				X					X				-38
3	MW-17	WT	G			6/28/2018	15:02		3				X					X				-39
4	MW-24i	WT	G			6/28/2018	11:06		3				X					X				-40
5	EX-1	WT	G			6/28/2018	9:53		3				X					X				-41
6	MW-19	WT	G			6/28/2018	8:52		3				X					X				-42
7	MW-19 DUP	WT	G			6/28/2018	8:52		3				X					X				-43
8	S-1	WT	G			6/28/2018	13:27		3				X					X				-44
9	S-2	WT	G			6/28/2018	14:05		3				X					X				-45
10	MP-1	WT	G			6/28/2018	12:15		3				X					X				-46
11	MP-3	WT	G			6/28/2018	11:47		3				X					X				-47
12	MW-24D	WT	G			06/27/18	14:20		3				X					X				-48

L1007508

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		7/5/18	1010		070618	1110	
	EBE	070618	1600	84	7/7/18	8:45	

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
2.3	Y	N	Y

2.3 IR 11

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jake Munsey

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/5/18

*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.

F-ALL-Q-020rev.07, 15-Feb-2007

OK

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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: 5 of 5

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Apex Companies, LLC	Report To:	Stephanie Salisbury, Kelsi Evans	Attention:	
Address:	3015 SW 1st Ave	Copy To:	Kelsi.evans@apexcos.com	Company Name:	Apex Companies, LLC
	Portland, OR 97201			Address:	3015 SW 1st Ave
Email To:	sbsalisbury@cascadiaassociates.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	503-906-6577 Fax: n/a	Project Name:	NuStar Vancouver GWM	Pace Project Manager:	
Requested Due Date/TAT:		Project Number:	1126-21.002	Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: WA

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Volatile Halocarbons (EPA 8260B)	TOC	Methane, Ethane, Ethene	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Field Blank	WT	G			7/2/18	1413		3				X						X				-49
2	Equipment Blank	WT	G			7/2/18	1412		2				X						X				-50
3		WT	G																				
4		WT	G																				
5		WT	G																				
6		WT	G																				
7		WT	G																				
8		WT	G																				
9		WT	G																				
10		WT	G																				
11		WT	G																				
12		WT	G																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
* Run PCE Blanks		7/5/18	1010		070618	1110	
1 per cooler		070618	1600	PCI	7/7/18	8:45	
* Analyse samples ASAP							2.3°C Y N Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

2.3 ICT 11

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jake Munsey

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/5/18

*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.

F-ALL-Q-020rev.07, 15-Feb-2007

Cooler Receipt Form

Client: Apex LLC or Cascadia		SDG# L1007508	
Cooler Received/Opened On: 07/06/18		Temperature:	1.8 3.2
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?			
Preservation Correct / Checked?			

NOTE: One broken vial for sample "Trip Blank"
" " " for sample "MW-3"

2.3.5

ESC LAB SCIENCES
Cooler Receipt Form

Client: ASHCREPOR	SDG#	L1007508
Cooler Received/Opened On: 7/7/18	Temperature:	2.3
Received By: Kevin Turner		
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?			

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

July 16, 2018

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

RE: Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Dear Stephanie Bosze-Salisbury:
Enclosed are the analytical results for sample(s) received by the laboratory on July 06, 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,

Annika Asp
annika.asp@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Kelsi Evans, Apex Companies, LLC

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Minnesota Certification IDs

1700 Elm Street SE, 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 DW Certification #: MN00064
Arkansas WW 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
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
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
Wyoming UST Certification #: 2926.01 via A2LA

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785
Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification # : 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10438422001	**MP-1**	Water	06/28/18 12:15	07/06/18 09:50
10438422002	**MW-7**	Water	06/29/18 15:31	07/06/18 09:50
10438422003	**Ex-1**	Water	06/28/18 09:35	07/06/18 09:50
10438422004	**MW-24i**	Water	06/28/18 11:06	07/06/18 09:50
10438422005	**MW-12**	Water	07/01/18 11:01	07/06/18 09:50
10438422006	**MW-13**	Water	07/01/18 11:55	07/06/18 09:50
10438422007	**MW-14**	Water	06/28/18 16:39	07/06/18 09:50
10438422008	**MW-26**	Water	06/29/18 09:01	07/06/18 09:50
10438422009	**MW-19**	Water	06/28/18 08:52	07/06/18 09:50
10438422010	**MGMS2-4**	Water	07/01/18 14:47	07/06/18 09:50
10438422011	**MGMS1-3**	Water	07/01/18 13:19	07/06/18 09:50
10438422012	**MGMS3-4**	Water	07/01/18 16:20	07/06/18 09:50
10438422013	**Trip Blank**	Water	06/28/18 00:00	07/06/18 09:50

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SAMPLE ANALYTE COUNT

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10438422001	**MP-1**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422002	**MW-7**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422003	**Ex-1**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422004	**MW-24i**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422005	**MW-12**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422006	**MW-13**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422007	**MW-14**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422008	**MW-26**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422009	**MW-19**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422010	**MGMS2-4**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422011	**MGMS1-3**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V
10438422012	**MGMS3-4**	RSK 175	MJL	3	PASI-M
		SM 5310C	JK1	1	PASI-V

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1700 Elm Street - Suite 200
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(612)607-1700

PROJECT NARRATIVE

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Method: **RSK 175**
Description: RSK 175 AIR Headspace
Client: Apex Companies, LLC_Davis
Date: July 16, 2018

General Information:
12 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.
- Ex-1 (Lab ID: 10438422003)
- MP-1 (Lab ID: 10438422001)
- MW-14 (Lab ID: 10438422007)
- MW-19 (Lab ID: 10438422009)
- MW-24i (Lab ID: 10438422004)

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Method: **SM 5310C**
Description: 5310C TOC
Client: Apex Companies, LLC_Davis
Date: July 16, 2018

General Information:
12 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Sample: MP-1 **Lab ID: 10438422001** Collected: 06/28/18 12:15 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		07/07/18 11:04	74-84-0	
Ethene	ND	ug/L	10.0	1		07/07/18 11:04	74-85-1	
Methane	**2420**	ug/L	10.0	1		07/07/18 11:04	74-82-8	H3
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**8.2**	mg/L	1.0	1		07/11/18 06:17	7440-44-0	

Sample: MW-7 **Lab ID: 10438422002** Collected: 06/29/18 15:31 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		07/06/18 11:31	74-84-0	
Ethene	ND	ug/L	10.0	1		07/06/18 11:31	74-85-1	
Methane	**4080**	ug/L	10.0	1		07/06/18 11:31	74-82-8	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**5.0**	mg/L	1.0	1		07/11/18 07:08	7440-44-0	

Sample: Ex-1 **Lab ID: 10438422003** Collected: 06/28/18 09:35 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	**50.2**	ug/L	10.0	1		07/07/18 11:26	74-84-0	
Ethene	**99.2**	ug/L	10.0	1		07/07/18 11:26	74-85-1	
Methane	**10500**	ug/L	10.0	1		07/07/18 11:26	74-82-8	H3
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**43.6**	mg/L	1.0	1		07/11/18 07:25	7440-44-0	

Sample: MW-24i **Lab ID: 10438422004** Collected: 06/28/18 11:06 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		07/07/18 11:40	74-84-0	
Ethene	ND	ug/L	10.0	1		07/07/18 11:40	74-85-1	
Methane	ND	ug/L	10.0	1		07/07/18 11:40	74-82-8	H3
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	ND	mg/L	1.0	1		07/11/18 07:42	7440-44-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Sample: MW-12 **Lab ID: 10438422005** Collected: 07/01/18 11:01 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	**18.4**	ug/L	10.0	1		07/06/18 11:45	74-84-0	
Ethene	ND	ug/L	10.0	1		07/06/18 11:45	74-85-1	
Methane	**14300**	ug/L	10.0	1		07/06/18 11:45	74-82-8	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**66.0**	mg/L	4.0	4		07/11/18 15:47	7440-44-0	

Sample: MW-13 **Lab ID: 10438422006** Collected: 07/01/18 11:55 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		07/06/18 11:53	74-84-0	
Ethene	**500**	ug/L	10.0	1		07/06/18 11:53	74-85-1	
Methane	**23000**	ug/L	10.0	1		07/06/18 11:53	74-82-8	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**52.9**	mg/L	4.0	4		07/11/18 16:04	7440-44-0	

Sample: MW-14 **Lab ID: 10438422007** Collected: 06/28/18 16:39 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		07/06/18 11:17	74-84-0	
Ethene	ND	ug/L	10.0	1		07/06/18 11:17	74-85-1	
Methane	ND	ug/L	10.0	1		07/06/18 11:17	74-82-8	H3
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**6.6**	mg/L	1.0	1		07/11/18 09:06	7440-44-0	

Sample: MW-26 **Lab ID: 10438422008** Collected: 06/29/18 09:01 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	ND	ug/L	10.0	1		07/06/18 11:38	74-84-0	
Ethene	ND	ug/L	10.0	1		07/06/18 11:38	74-85-1	
Methane	**1590**	ug/L	10.0	1		07/06/18 11:38	74-82-8	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**3.9**	mg/L	1.0	1		07/11/18 09:23	7440-44-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Sample: MW-19 **Lab ID: 10438422009** Collected: 06/28/18 08:52 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	**23.8**	ug/L	10.0	1		07/06/18 11:24	74-84-0	
Ethene	**271**	ug/L	10.0	1		07/06/18 11:24	74-85-1	
Methane	**9200**	ug/L	10.0	1		07/06/18 11:24	74-82-8	H3
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**58.2**	mg/L	4.0	4		07/11/18 16:21	7440-44-0	

Sample: MGMS2-4 **Lab ID: 10438422010** Collected: 07/01/18 14:47 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	**24.1**	ug/L	10.0	1		07/06/18 12:00	74-84-0	
Ethene	ND	ug/L	10.0	1		07/06/18 12:00	74-85-1	
Methane	**806**	ug/L	10.0	1		07/06/18 12:00	74-82-8	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**5.2**	mg/L	1.0	1		07/11/18 04:53	7440-44-0	

Sample: MGMS1-3 **Lab ID: 10438422011** Collected: 07/01/18 13:19 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	**38.8**	ug/L	10.0	1		07/06/18 12:07	74-84-0	
Ethene	ND	ug/L	10.0	1		07/06/18 12:07	74-85-1	
Methane	**6880**	ug/L	10.0	1		07/06/18 12:07	74-82-8	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**7.5**	mg/L	1.0	1		07/11/18 09:56	7440-44-0	

Sample: MGMS3-4 **Lab ID: 10438422012** Collected: 07/01/18 16:20 Received: 07/06/18 09:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175							
Ethane	**28.9**	ug/L	10.0	1		07/06/18 12:14	74-84-0	
Ethene	**27.4**	ug/L	10.0	1		07/06/18 12:14	74-85-1	
Methane	**8360**	ug/L	10.0	1		07/06/18 12:14	74-82-8	
5310C TOC	Analytical Method: SM 5310C							
Total Organic Carbon	**4.6**	mg/L	1.0	1		07/11/18 04:36	7440-44-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

QC Batch: 548912 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10438422002, 10438422005, 10438422006, 10438422007, 10438422008, 10438422009, 10438422010, 10438422011, 10438422012

METHOD BLANK: 2983916 Matrix: Water
Associated Lab Samples: 10438422002, 10438422005, 10438422006, 10438422007, 10438422008, 10438422009, 10438422010, 10438422011, 10438422012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	07/06/18 10:51	
Ethene	ug/L	ND	10.0	07/06/18 10:51	
Methane	ug/L	ND	10.0	07/06/18 10:51	

LABORATORY CONTROL SAMPLE & LCSD: 2983917 2983918

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	105	104	92	91	85-115	1	20	
Ethene	ug/L	106	98.1	97.1	92	92	85-115	1	20	
Methane	ug/L	60.7	57.6	57.8	95	95	85-115	0	20	

SAMPLE DUPLICATE: 2983919

Parameter	Units	10438422012 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	28.9	30.1	4	20	
Ethene	ug/L	27.4	27.4	0	20	
Methane	ug/L	8360	8400	0	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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

QC Batch: 549020 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10438422001

METHOD BLANK: 2984930 Matrix: Water
Associated Lab Samples: 10438422001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	07/07/18 08:27	
Ethene	ug/L	ND	10.0	07/07/18 08:27	
Methane	ug/L	ND	10.0	07/07/18 08:27	

LABORATORY CONTROL SAMPLE & LCSD: 2984931 2984932

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	103	110	90	97	85-115	7	20	
Ethene	ug/L	106	95.8	103	90	97	85-115	7	20	
Methane	ug/L	60.7	56.9	61.2	94	101	85-115	7	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2984934 2984935

Parameter	Units	60273831006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethane	ug/L	ND	114	114	65.9	117	58	103	30-150	56	20	R1
Ethene	ug/L	ND	106	106	63.5	109	60	103	30-150	53	20	R1
Methane	ug/L	ND	60.7	60.7	40.4	67.4	60	105	30-150	50	20	R1

SAMPLE DUPLICATE: 2984933

Parameter	Units	40171742001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<10.0	ND		20	
Ethene	ug/L	<10.0	ND		20	
Methane	ug/L	291	304	4	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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(612)607-1700

QUALITY CONTROL DATA

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

QC Batch: 549021 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10438422003, 10438422004

METHOD BLANK: 2984936 Matrix: Water
Associated Lab Samples: 10438422003, 10438422004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	07/07/18 11:19	
Ethene	ug/L	ND	10.0	07/07/18 11:19	
Methane	ug/L	ND	10.0	07/07/18 11:19	

LABORATORY CONTROL SAMPLE & LCSD: 2984937 2984938

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	110	98.0	97	86	85-115	12	20	
Ethene	ug/L	106	103	91.5	97	86	85-115	12	20	
Methane	ug/L	60.7	61.2	54.7	101	90	85-115	11	20	

SAMPLE DUPLICATE: 2984939

Parameter	Units	10438422003 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	50.2	54.9	9	20	
Ethene	ug/L	99.2	106	7	20	
Methane	ug/L	10500	11600	10	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
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QUALITY CONTROL DATA

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

QC Batch: 147071 Analysis Method: SM 5310C
QC Batch Method: SM 5310C Analysis Description: 5310C TOC
Associated Lab Samples: 10438422010, 10438422012

METHOD BLANK: 581199 Matrix: Water
Associated Lab Samples: 10438422010, 10438422012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	07/10/18 20:43	

LABORATORY CONTROL SAMPLE: 581200

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 581201 581202

Parameter	Units	12111628001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	ND	25	25	25.7	25.2	102	101	80-120	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 581203 581204

Parameter	Units	10438428014 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	14.1	25	25	38.4	38.1	97	96	80-120	1	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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

QC Batch: 147073 Analysis Method: SM 5310C
QC Batch Method: SM 5310C Analysis Description: 5310C TOC
Associated Lab Samples: 10438422001, 10438422002, 10438422003, 10438422004, 10438422005, 10438422006, 10438422007, 10438422008, 10438422009, 10438422011

METHOD BLANK: 581242 Matrix: Water
Associated Lab Samples: 10438422001, 10438422002, 10438422003, 10438422004, 10438422005, 10438422006, 10438422007, 10438422008, 10438422009, 10438422011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Organic Carbon	mg/L	ND	1.0	07/11/18 05:43	

LABORATORY CONTROL SAMPLE: 581243

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	24.3	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 581244 581245

Parameter	Units	10438422001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	8.2	25	25	33.1	32.8	100	98	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 581246 581247

Parameter	Units	10438315002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	290	500	500	799	783	102	98	80-120	2	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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
PASI-V	Pace Analytical Services - Virginia

SAMPLE QUALIFIERS

Sample: 10438422001
[1] Sample was analyzed outside holding time; results are minimum values.

Sample: 10438422003
[1] Sample was analyzed outside holding time; results are minimum values.

Sample: 10438422004
[1] Sample was analyzed outside holding time; results are minimum values.

Sample: 10438422007
[1] Sample was analyzed outside holding time; results are minimum values.

Sample: 10438422009
[1] Sample was analyzed outside holding time; results are minimum values.

ANALYTE QUALIFIERS

H3	Sample was received or analysis requested beyond the recognized method holding time.
R1	RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1126-21.002 NuStar Vancouver
Pace Project No.: 10438422

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10438422001	**MP-1**	RSK 175	549020		
10438422002	**MW-7**	RSK 175	548912		
10438422003	**Ex-1**	RSK 175	549021		
10438422004	**MW-24i**	RSK 175	549021		
10438422005	**MW-12**	RSK 175	548912		
10438422006	**MW-13**	RSK 175	548912		
10438422007	**MW-14**	RSK 175	548912		
10438422008	**MW-26**	RSK 175	548912		
10438422009	**MW-19**	RSK 175	548912		
10438422010	**MGMS2-4**	RSK 175	548912		
10438422011	**MGMS1-3**	RSK 175	548912		
10438422012	**MGMS3-4**	RSK 175	548912		
10438422001	**MP-1**	SM 5310C	147073		
10438422002	**MW-7**	SM 5310C	147073		
10438422003	**Ex-1**	SM 5310C	147073		
10438422004	**MW-24i**	SM 5310C	147073		
10438422005	**MW-12**	SM 5310C	147073		
10438422006	**MW-13**	SM 5310C	147073		
10438422007	**MW-14**	SM 5310C	147073		
10438422008	**MW-26**	SM 5310C	147073		
10438422009	**MW-19**	SM 5310C	147073		
10438422010	**MGMS2-4**	SM 5310C	147071		
10438422011	**MGMS1-3**	SM 5310C	147073		
10438422012	**MGMS3-4**	SM 5310C	147071		

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Requ

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

WO# : 10438422

10438422

Section A Required Client Information:

Company:	Apex Companies, LLC
Address:	3015 SW 1st Ave
	Portland, OR 97201
Email To:	sbsalisbury@cascadiaassociates.com
Phone: 503-906-6577	Fax: n/a
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Stephanie Salisbury
Copy To:	kelsi.evans@apexcos.com
Purchase Order No.:	1126-21
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

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: Volatile Halocarbons (EPA 8260B)	TOC	Methane, Ethane, Ethene	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MP-1	WT	G			6/28/2018	12:15		4	X	X									X	X		001
2	MW-7	WT	G			6/29/2018	15:31		4	X	X									X	X		002
3	EX-1	WT	G			6/28/2018	9:35		4	X	X									X	X		003
4	MW-24i	WT	G			6/28/2018	11:06		4	X	X									X	X		004
5	MW-12	WT	G			7/1/2018	11:01		4	X	X									X	X		005
6	MW-13	WT	G			7/1/2018	11:55		4	X	X									X	X		006
7	MW-14	WT	G			6/28/2018	16:39		4	X	X									X	X		007
8	MW-26	WT	G			6/29/2018	9:01		4	X	X									X	X		008
9	MW-19	WT	G			6/28/2018	8:52		4	X	X									X	X		~~008~~ 009 MS/MSD
10	MGMS2-4	WT	G			7/1/2018	14:47		4	X	X									X	X		~~00~~ 010
11	MGMS1-3	WT	G			7/1/2018	13:19		4	X	X									X	X		011
12	MGMS3-4	WT	G			07/01/18	16:20		4	X	X									X	X		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
* Analyze Trip Blank	Jake Munsey	7/5/18	0915	Thermal Pace	7/6/18	950	3.5	Y	Y	Y
* Analyze BSK										
Samples ASAP										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jake Munsey

SIGNATURE of SAMPLER: Jake Munsey

DATE Signed (MM/DD/YY): 7/6/18

Temp in °C	Received on Ice (Y/N)	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.

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 02May2018 Page 1 of 2
	Document No.: F-MN-L-213-rev.23	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt **Client Name:** Apex **Project #:** **WO# : 10438422**

PM: AKA **Due Date: 07/13/18**

CLIENT: Apex_Davis

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number: 7475 9641 6133

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 Used: ☑ G87A9170600254 ☐ G87A9155100842 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 3.5 **Cooler Temp Corrected (°C):** 3.5 **Biological Tissue Frozen?** ☐ Yes ☐ No ☐ N/A

Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** HE 7/6/18

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?	☑ Yes	☐ No		1.
Chain of Custody Filled Out?	☑ Yes	☐ No		2.
Chain of Custody Relinquished?	☑ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No		5. Limited Hold
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		6.
Rush Turn Around Time Requested?	☐ Yes	☑ No		7.
Sufficient Volume?	☑ Yes	☐ No		8.
Correct Containers Used?	☑ Yes	☐ No		9.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☑ Yes	☐ No		12.
All containers needing acid/base preservation have been checked? All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC, DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes ☐ Yes ☑ Yes	☐ No ☐ No ☐ No	☑ N/A ☑ N/A ☐ N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N Sample # Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☑ Yes	☐ No	☐ N/A	14. 1/2 Trip Blanks have >6mm headspace
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased): 16307				

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

Person Contacted: Stephanie Bosze-Salisbury Date/Time: 7/6/18 10:54

Comments/Resolution: Client confirmed they do not need the trip analyzed. Client was also notified that some RSK samples arrived out of hold.

Project Manager Review: Anne Asp **Date:** 7/6/18

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).

Chain of Custody

WO# : 12111652

12111652

☐ Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: WA

Workorder: 10438422 Workorder Name: 1126-21.002 NuStar Vancouver Owner Received Date: 7/6/2018 Results Requested By: 7/13/2018

Report To	Subcontract To
Annika Asp Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-1700	Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: H2SO4						Requested Analysis: TOC												LAB USE ONLY
1	MP-1	PS	6/28/2018 12:15	10438422001	Water	1						X												
2	MW-7	PS	6/29/2018 15:31	10438422002	Water	1						X												
3	Ex-1	PS	6/28/2018 09:35	10438422003	Water	1						X												
4	MW-24i	PS	6/28/2018 11:06	10438422004	Water	1						X												
5	MW-12	PS	7/1/2018 11:01	10438422005	Water	1						X												
6	MW-13	PS	7/1/2018 11:55	10438422006	Water	1						X												
7	MW-14	PS	6/28/2018 16:39	10438422007	Water	1						X												
8	MW-26	PS	6/29/2018 09:01	10438422008	Water	1						X												
9	MW-19	PS	6/28/2018 08:52	10438422009	Water	1						X												
10	MGMS2-4	PS	7/1/2018 14:47	10438422010	Water	1						X												
11	MGMS1-3	PS	7/1/2018 13:19	10438422011	Water	1						X												
12	MGMS3-4	PS	7/1/2018 16:20	10438422012	Water	1						X												

Comments

Transfers	Released By	Date/Time	Received By	Date/Time
1	[signature] 7.6.18	7/6/18 1520	R Chr 7.6.18	1930
2	R CL 7.6.18	2345	B Mathews	7/9/18 0800
3				

Cooler Temperature on Receipt 0.8 °C | Custody Seal (Y) or N | Received on Ice (Y) or N | Samples Intact (Y) or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 15Mar2016 Page 1 of 1
	Document No.: F-VM-C-001-Rev.10	Issuing Authority: Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN

Project #: WO#: 12111652

PM: HRZ Due Date: 07/13/18

CLIENT: PACE MPLS

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other: _____

Tracking Number: _____

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 Used: ☑ 140792808 Type of Ice: ☐ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.9 Cooler Temp Corrected °C: 0.8 Biological Tissue Frozen? ☐ Yes ☐ No ☑ NA

Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 7.6.18 DC

Comments: BM 7/9/18

Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and Signature on COC?	☐ Yes	☑ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5. If Fecal: ☐ <8 hours ☐ >8, <24 hours ☐ >24 hours
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	12.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation will be checked and documented in the pH logbook.	☑ Yes	☐ No	☐ N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	☐ Yes	☐ No	☑ N/A	13.
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased): _____				

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

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

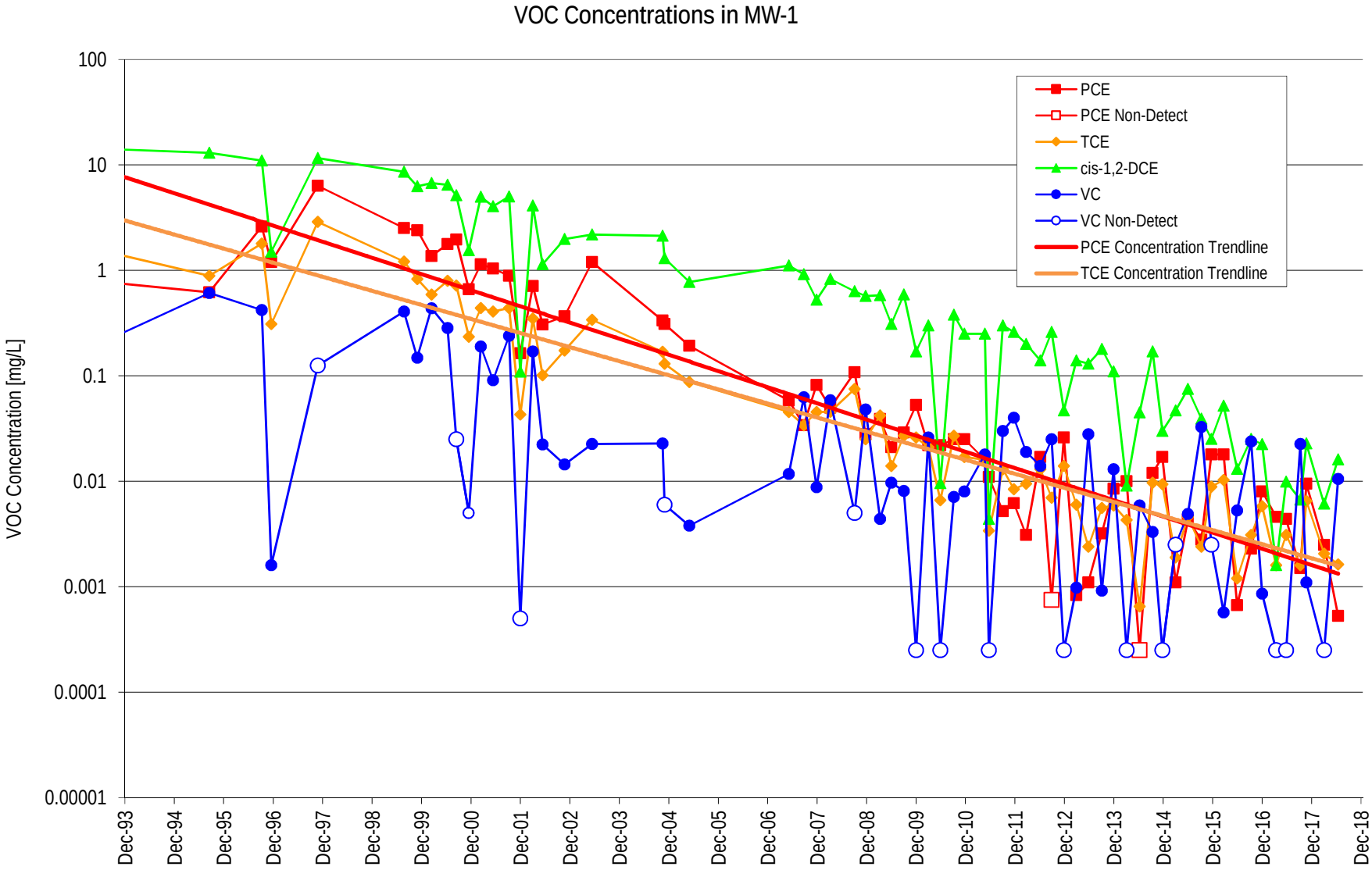
FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Carrie Jern Date: 7/10/18

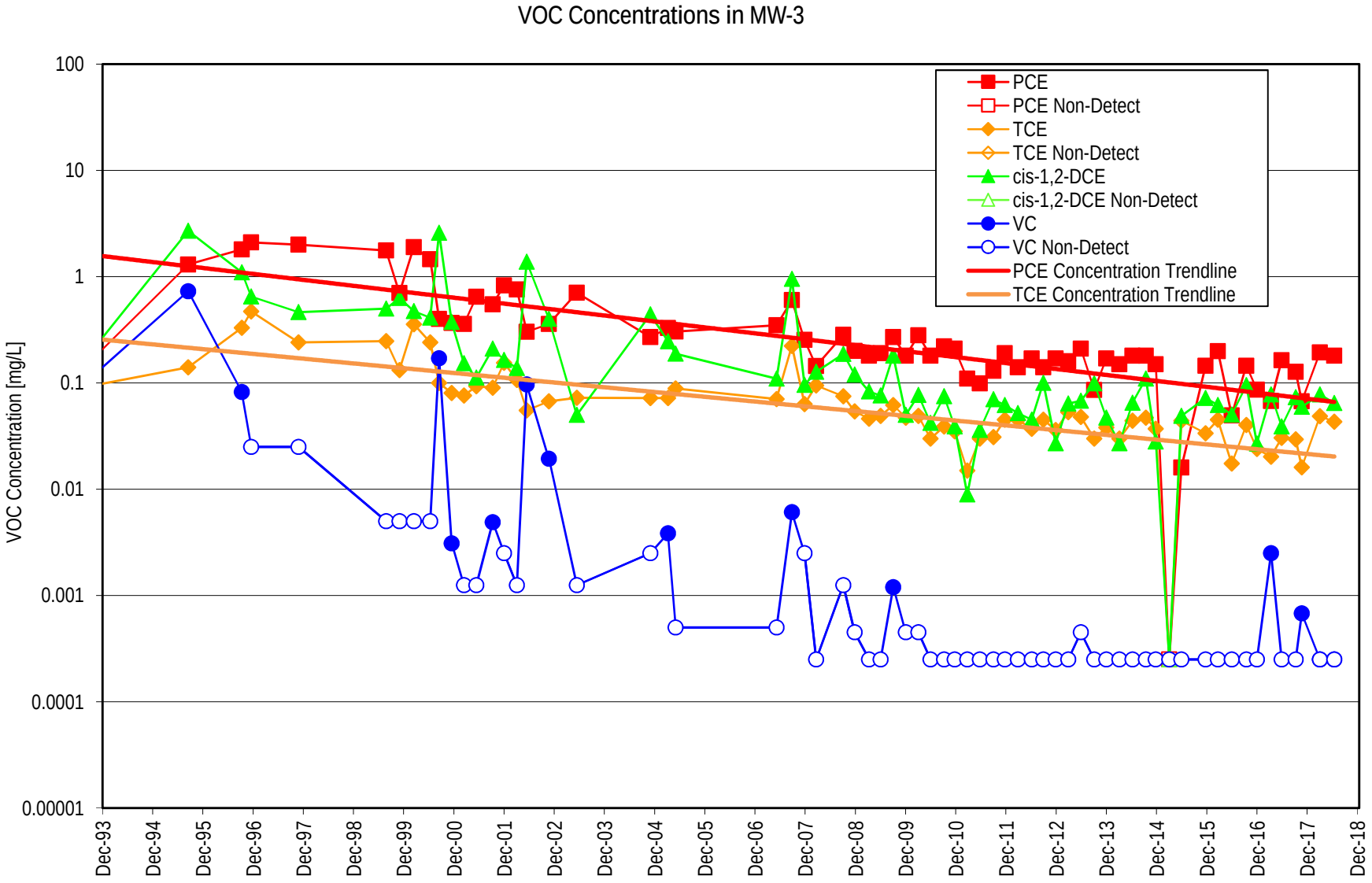
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

APPENDIX D

CONCENTRATION TREND PLOTS

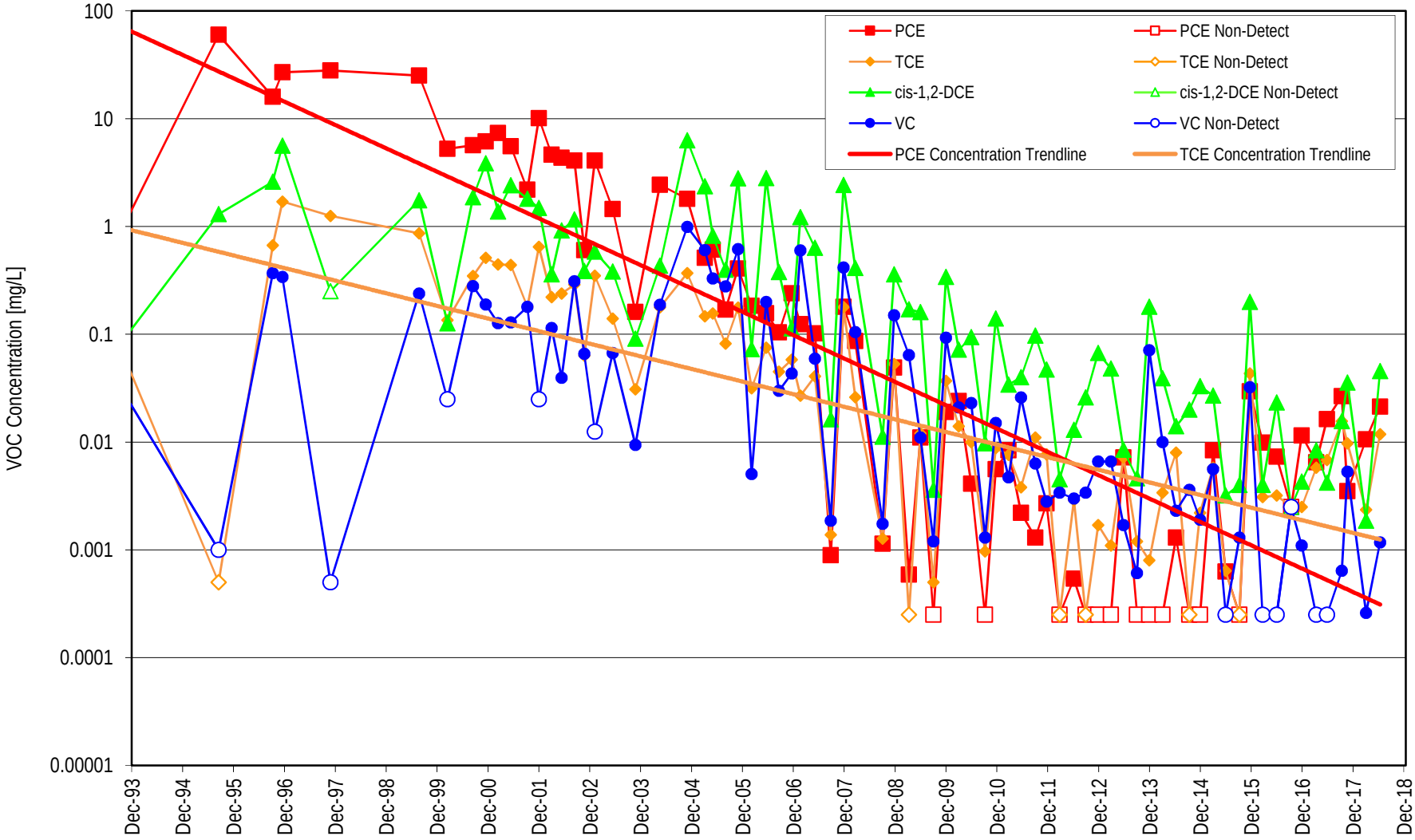


Note: Not detected values plotted at 1/2 the reporting limit.



Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-5



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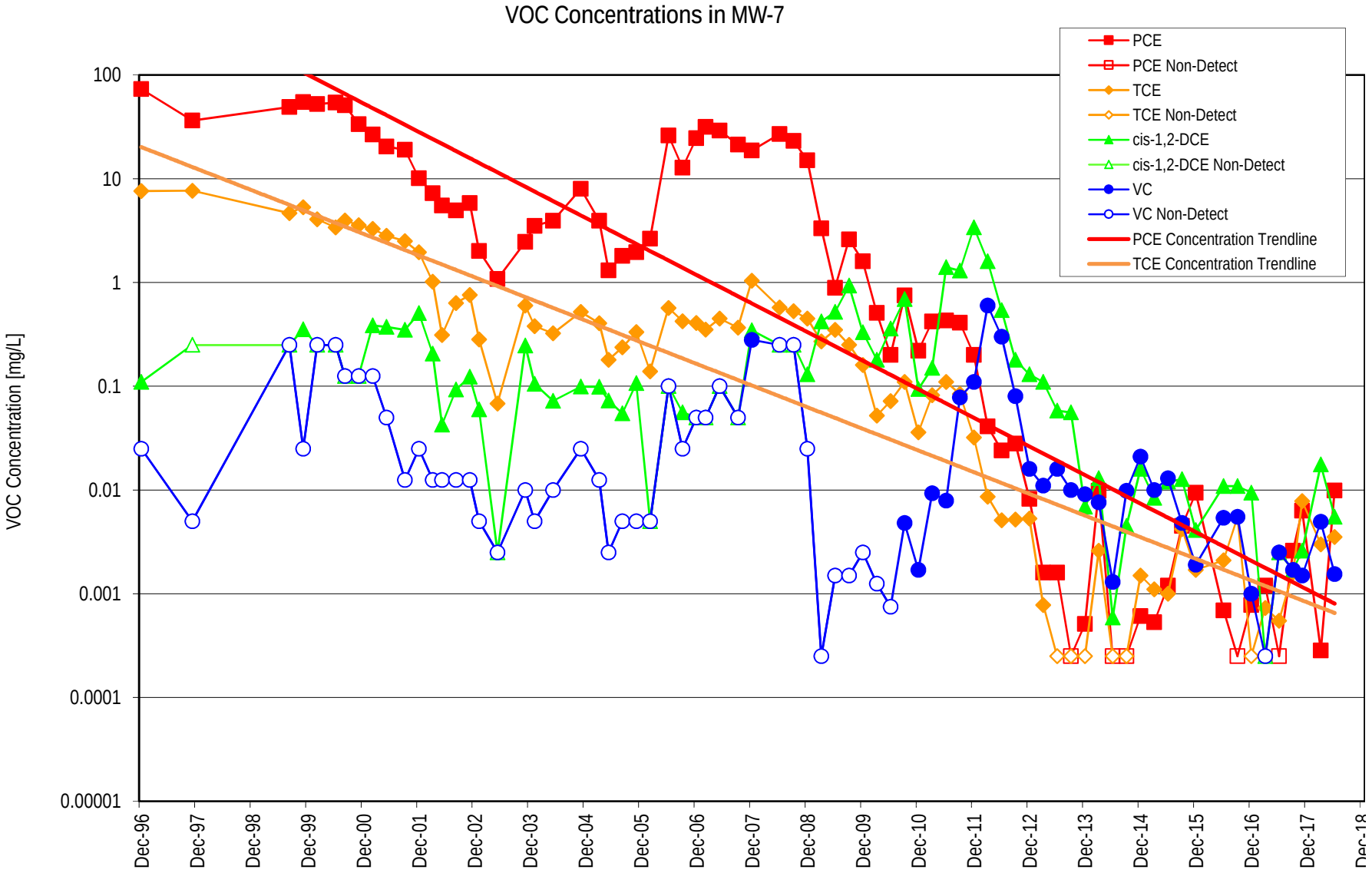
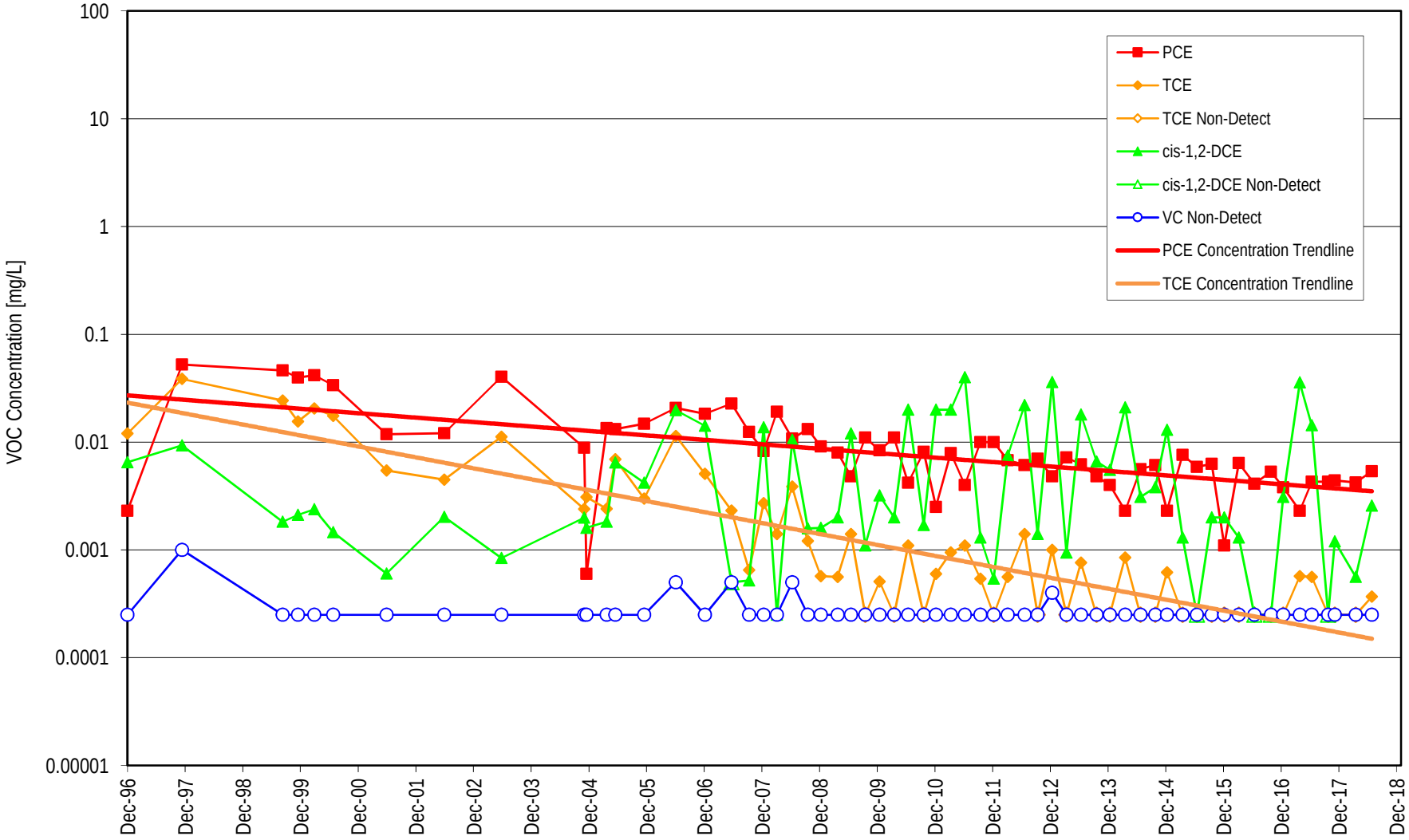


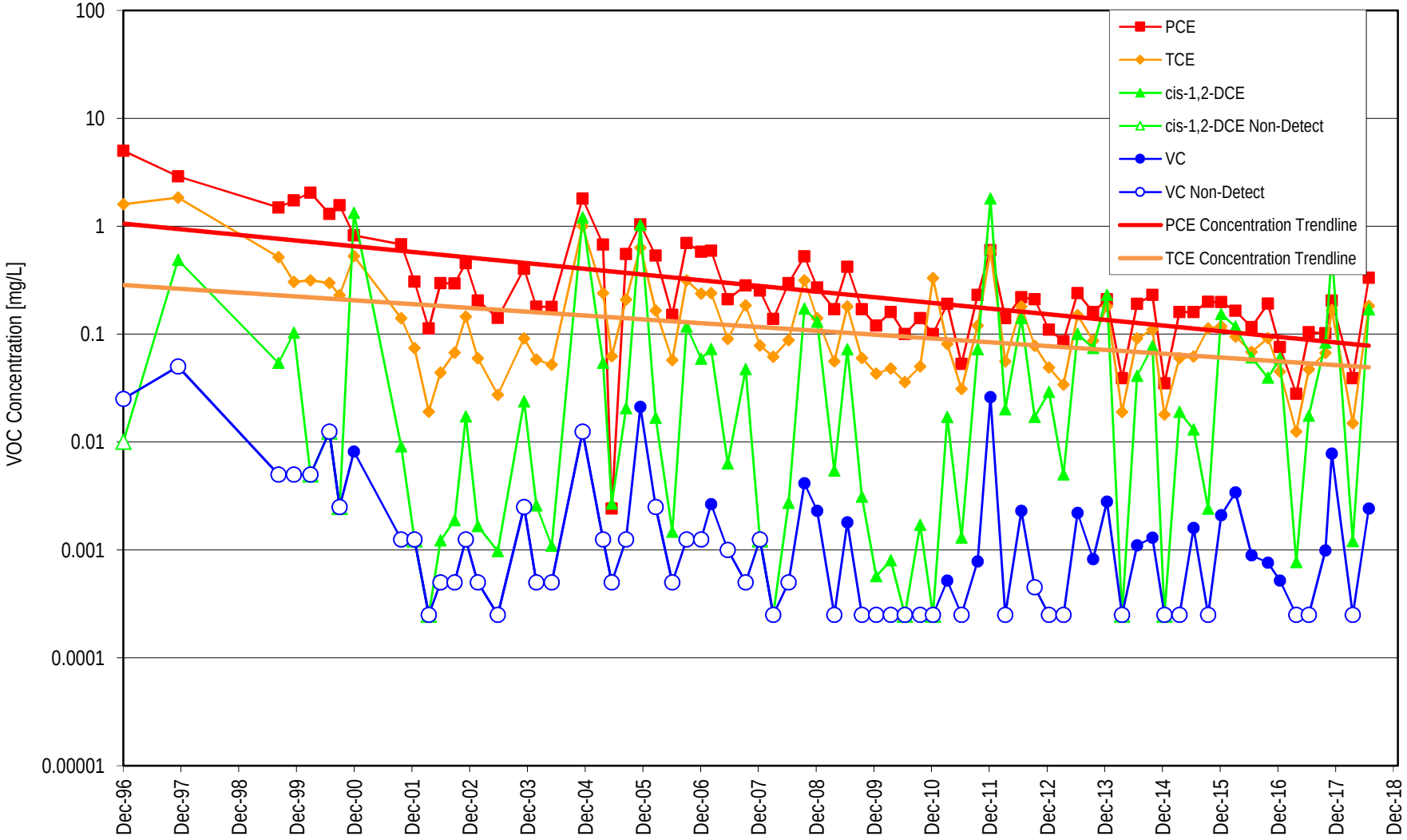
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-8



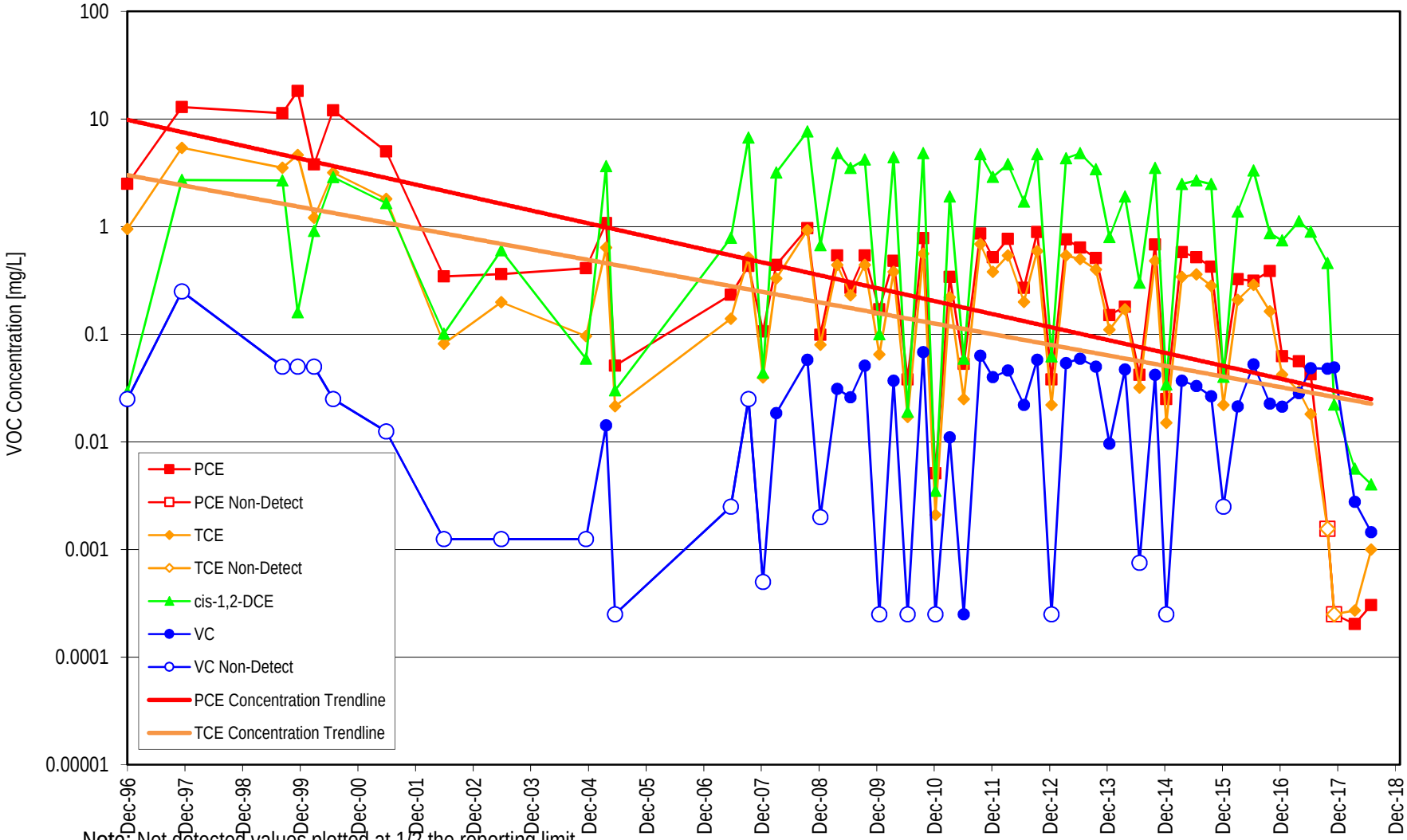
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-9



Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-12



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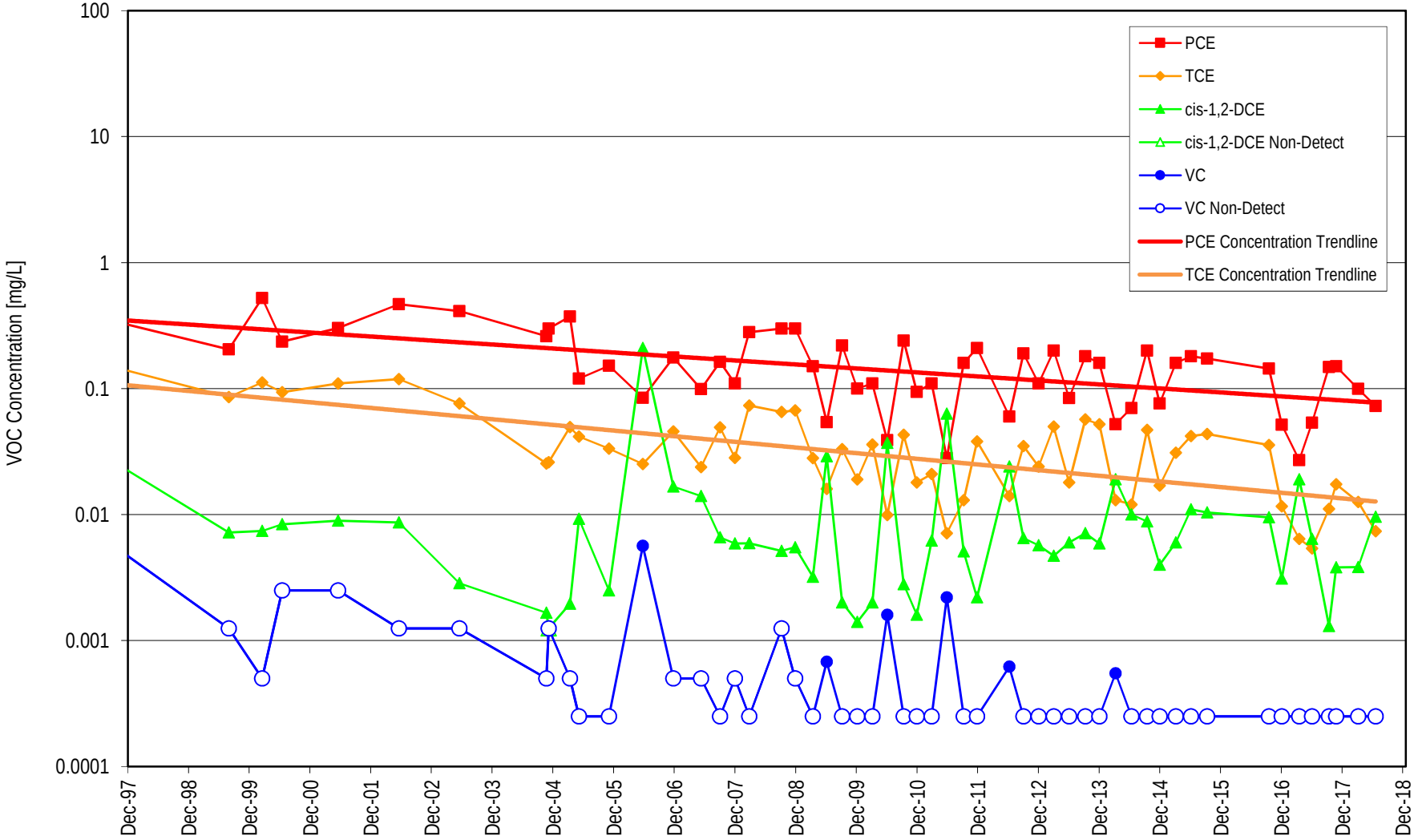
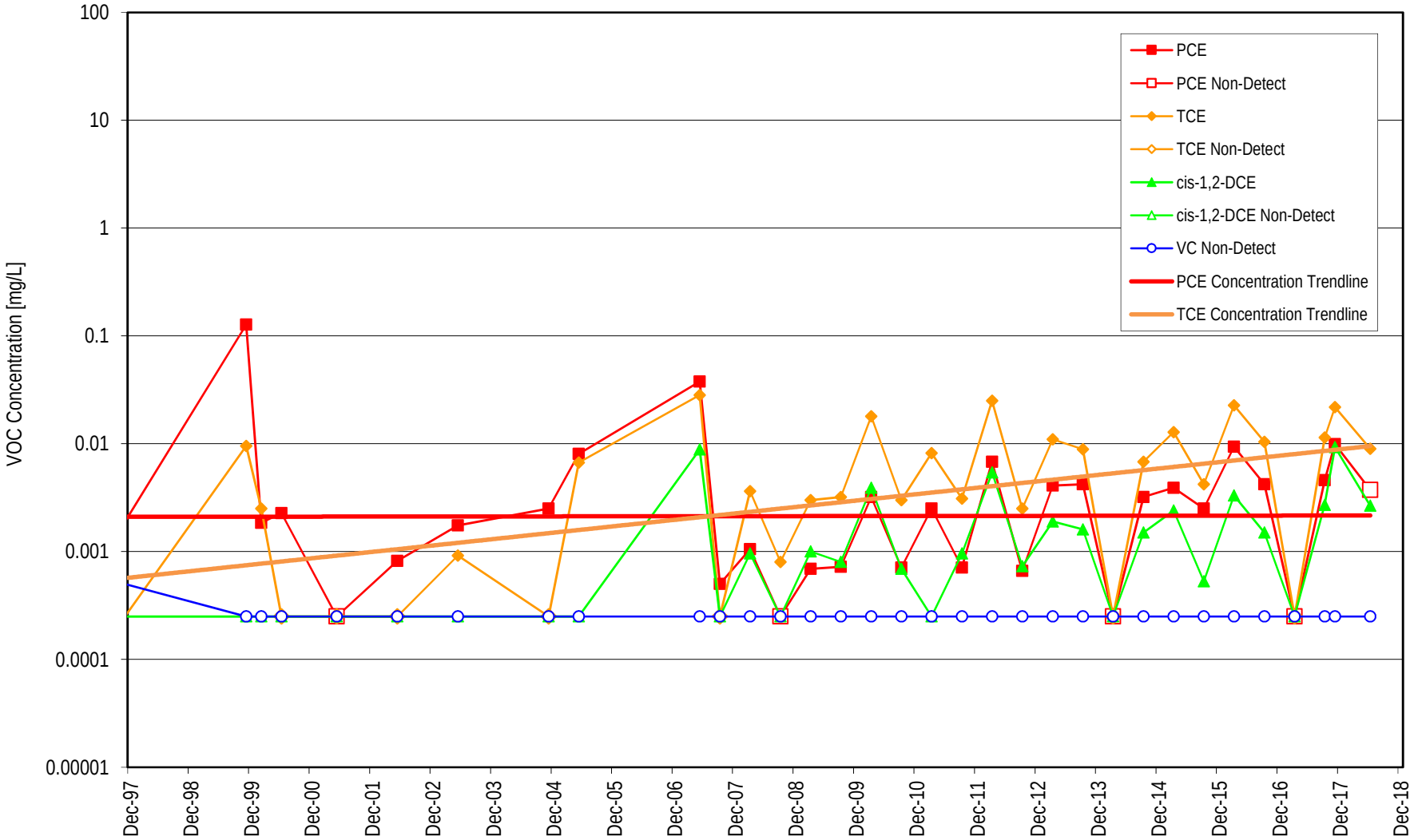
VOC Concentrations in MW-16



Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MW-17



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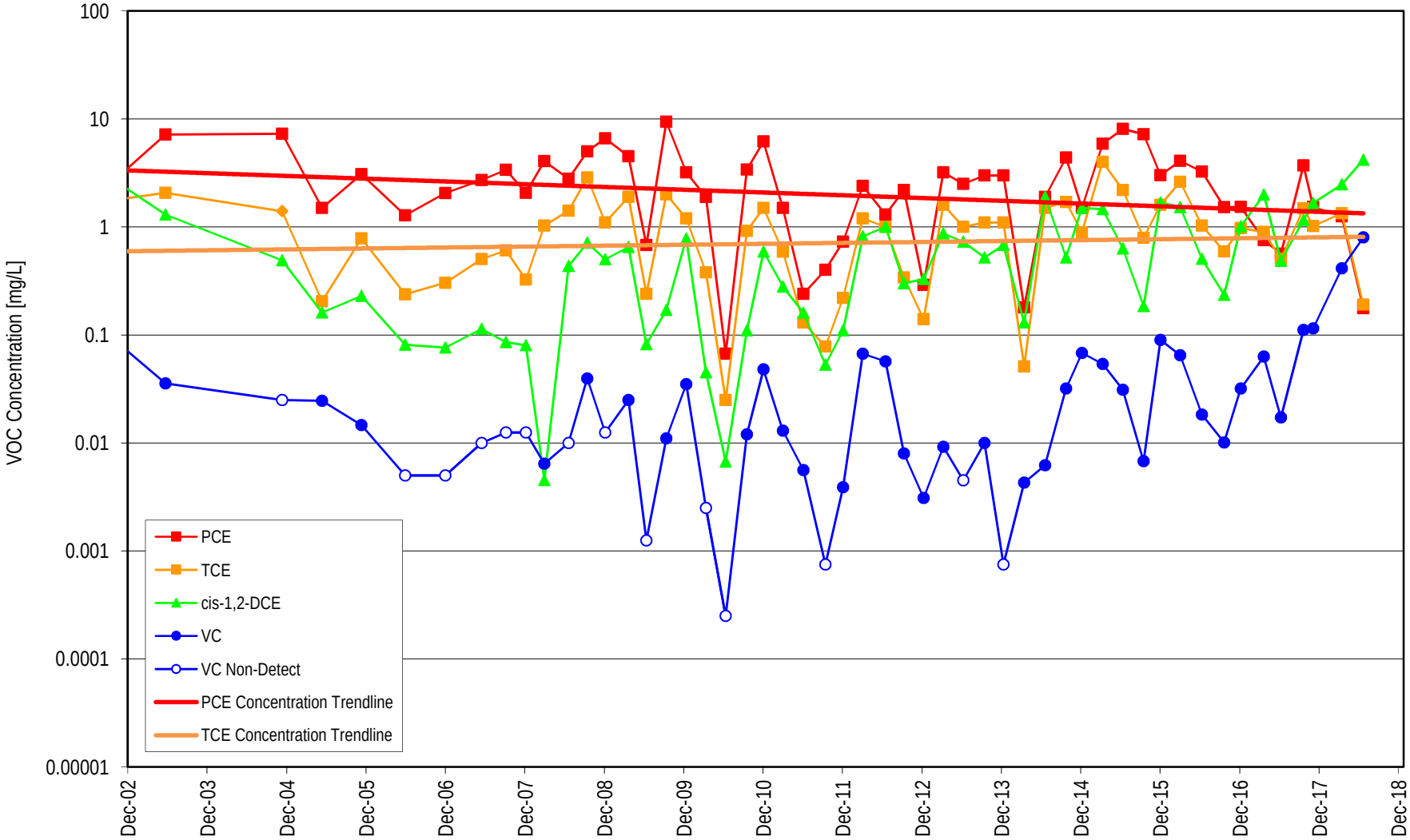
VOC Concentrations in MW-19



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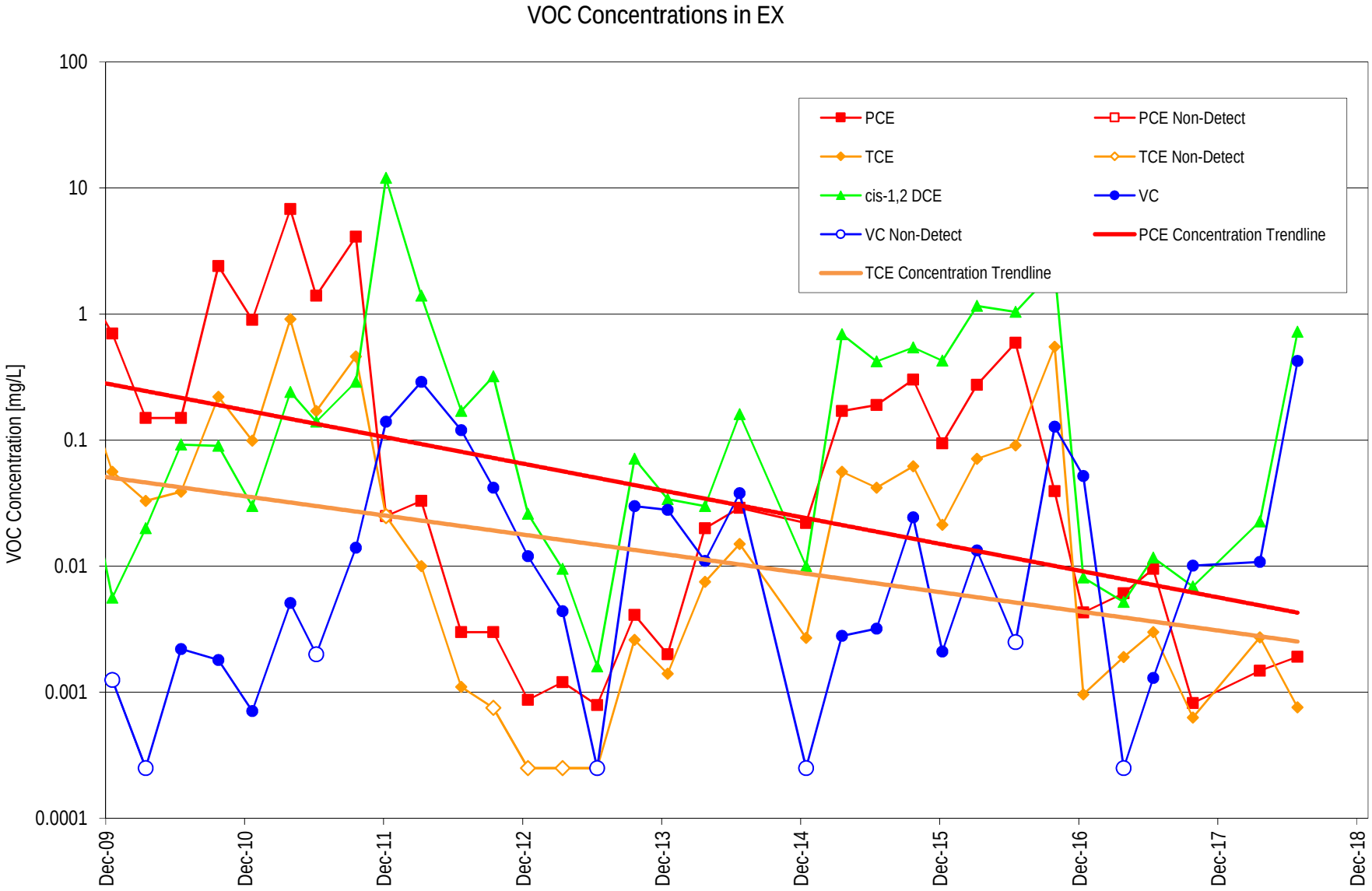

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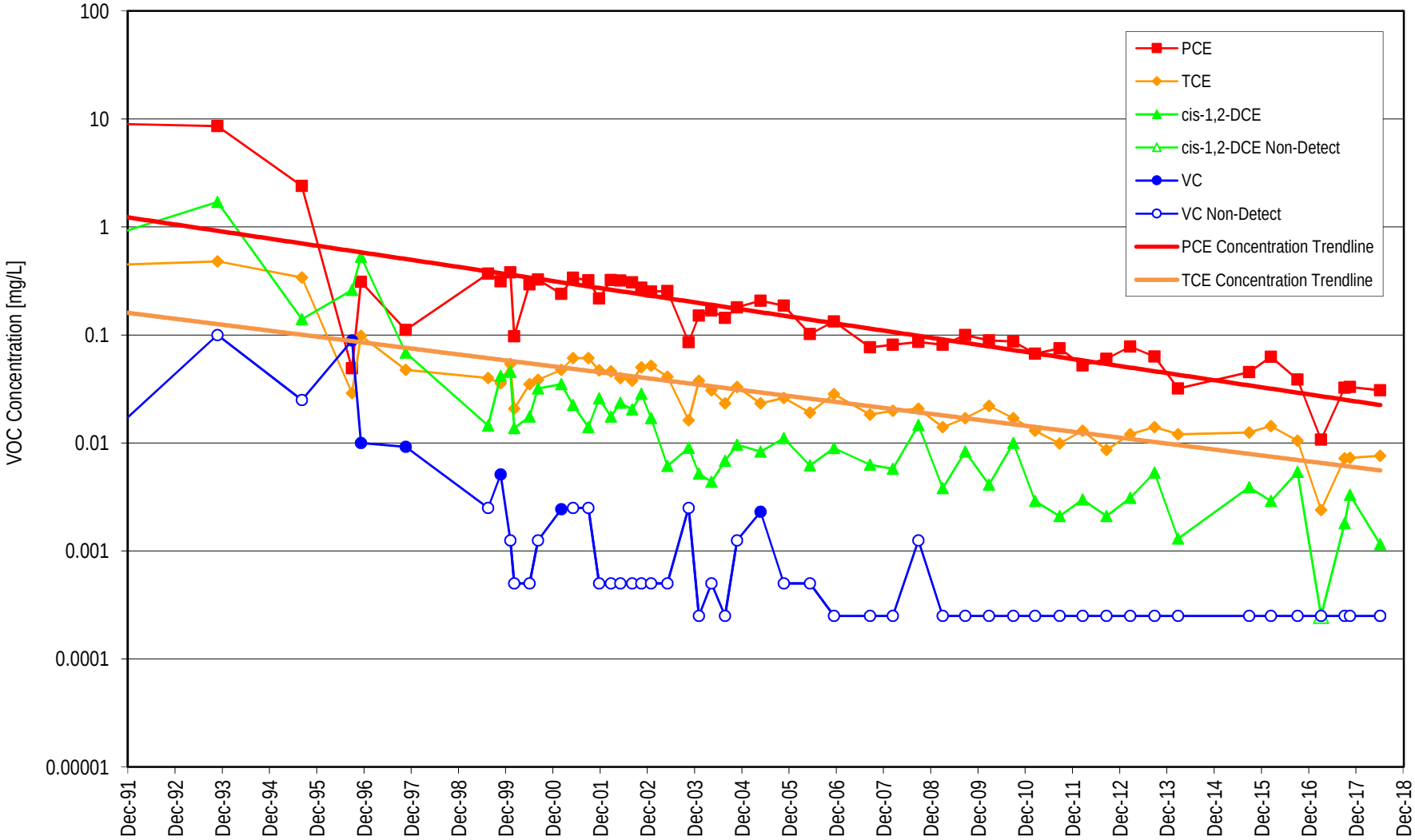
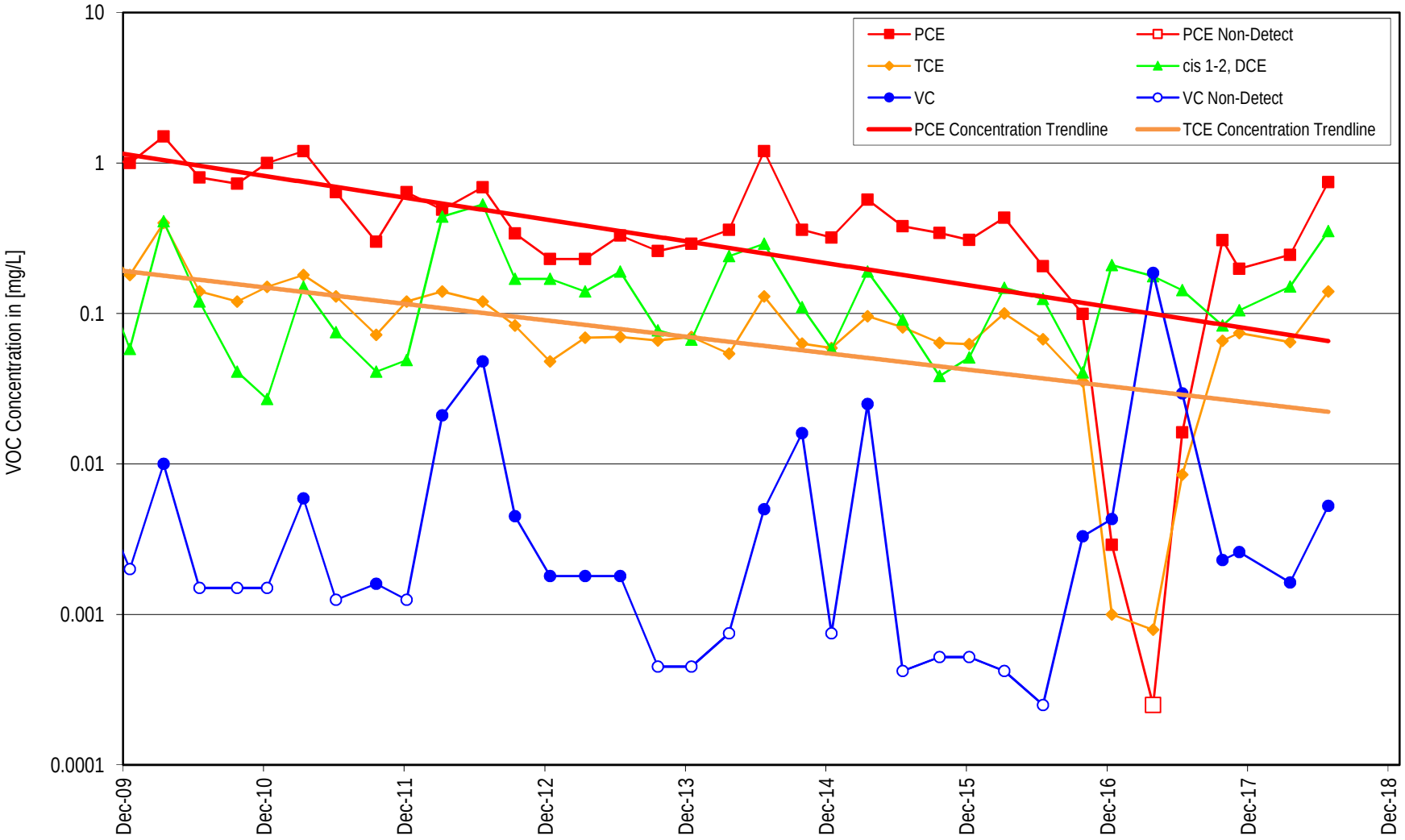
VOC Concentrations in EW-1



Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MP-1



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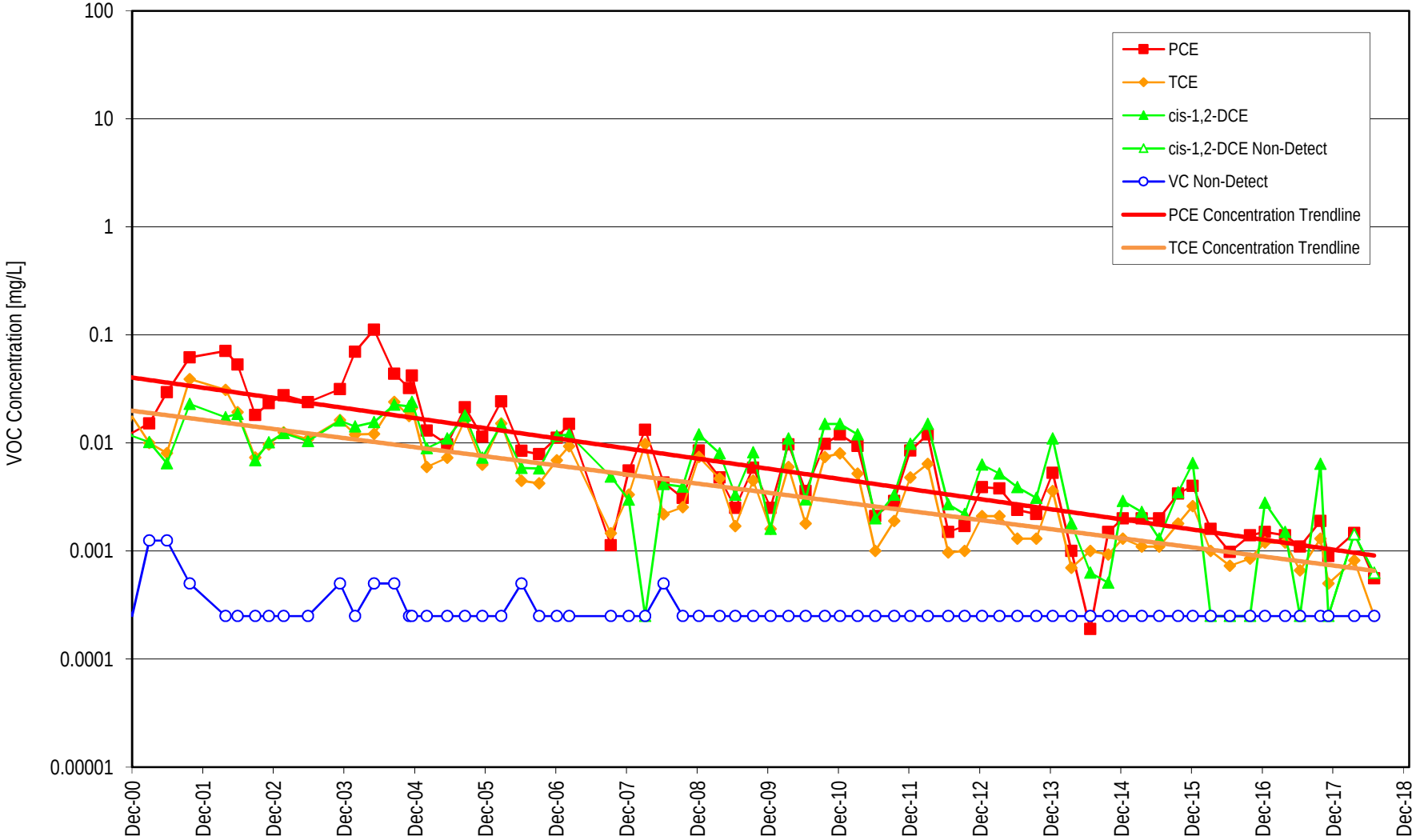
VOC Concentrations in MW-18i



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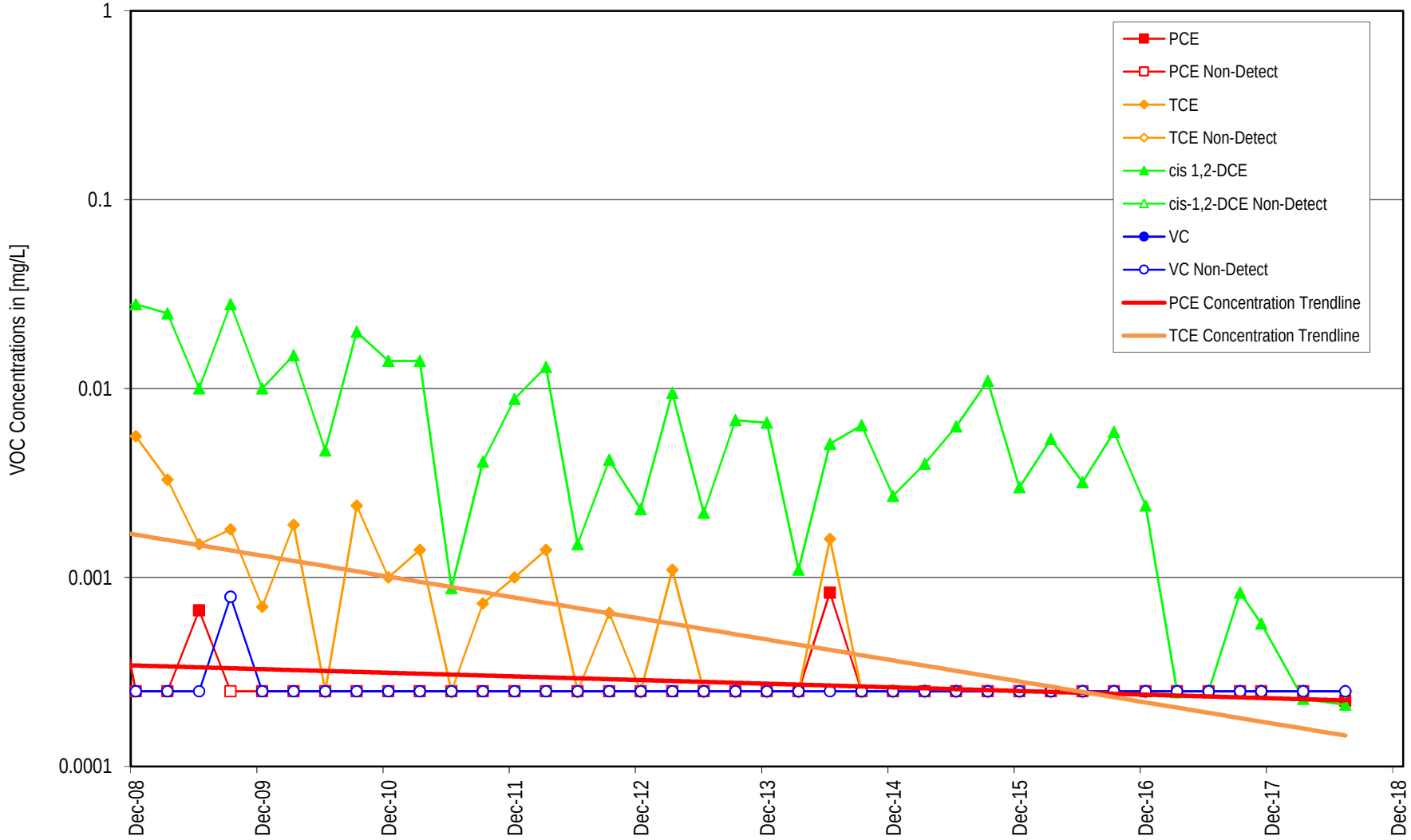
VOC Concentrations in MW-19i



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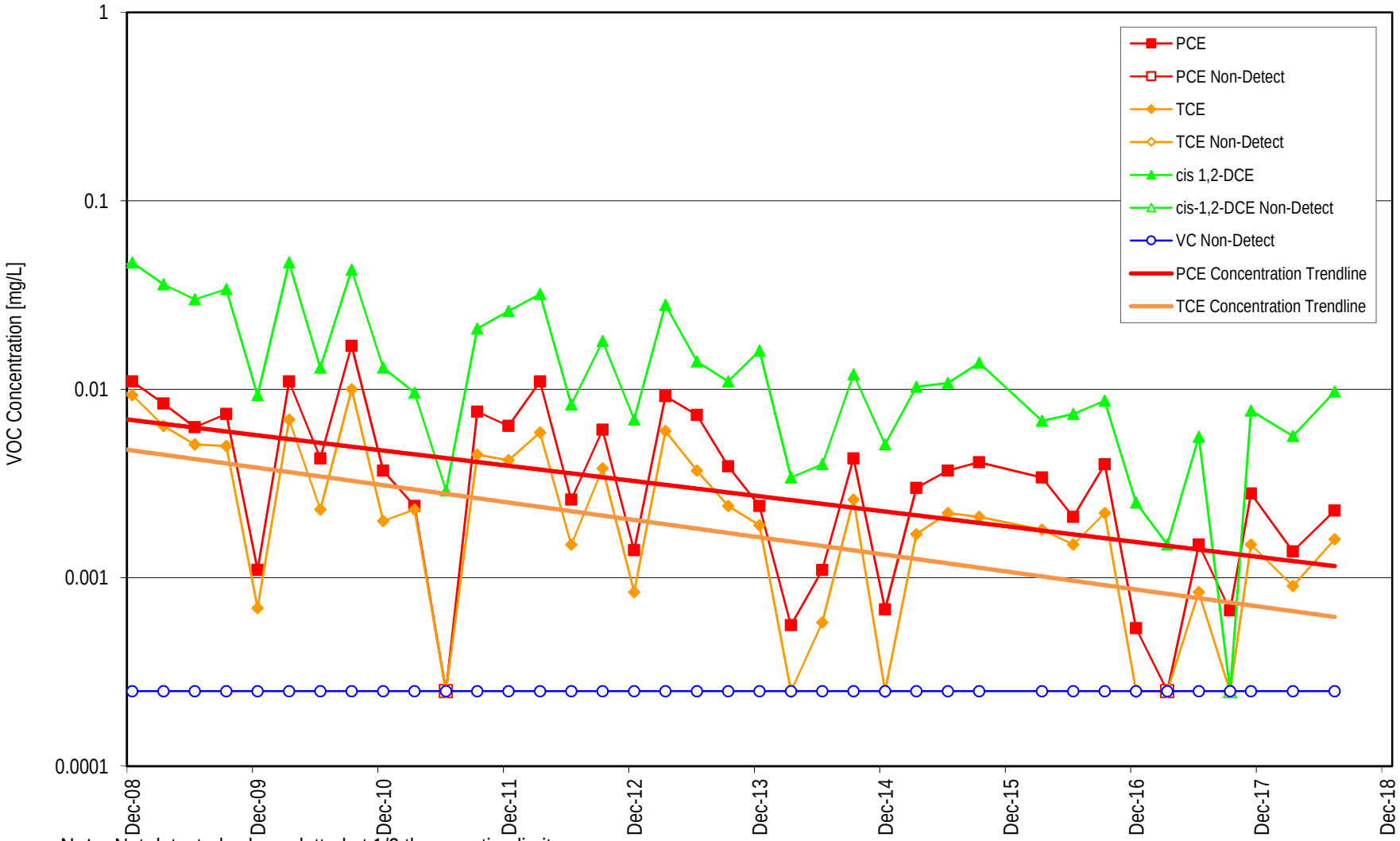
VOC Concentrations in MW-20i



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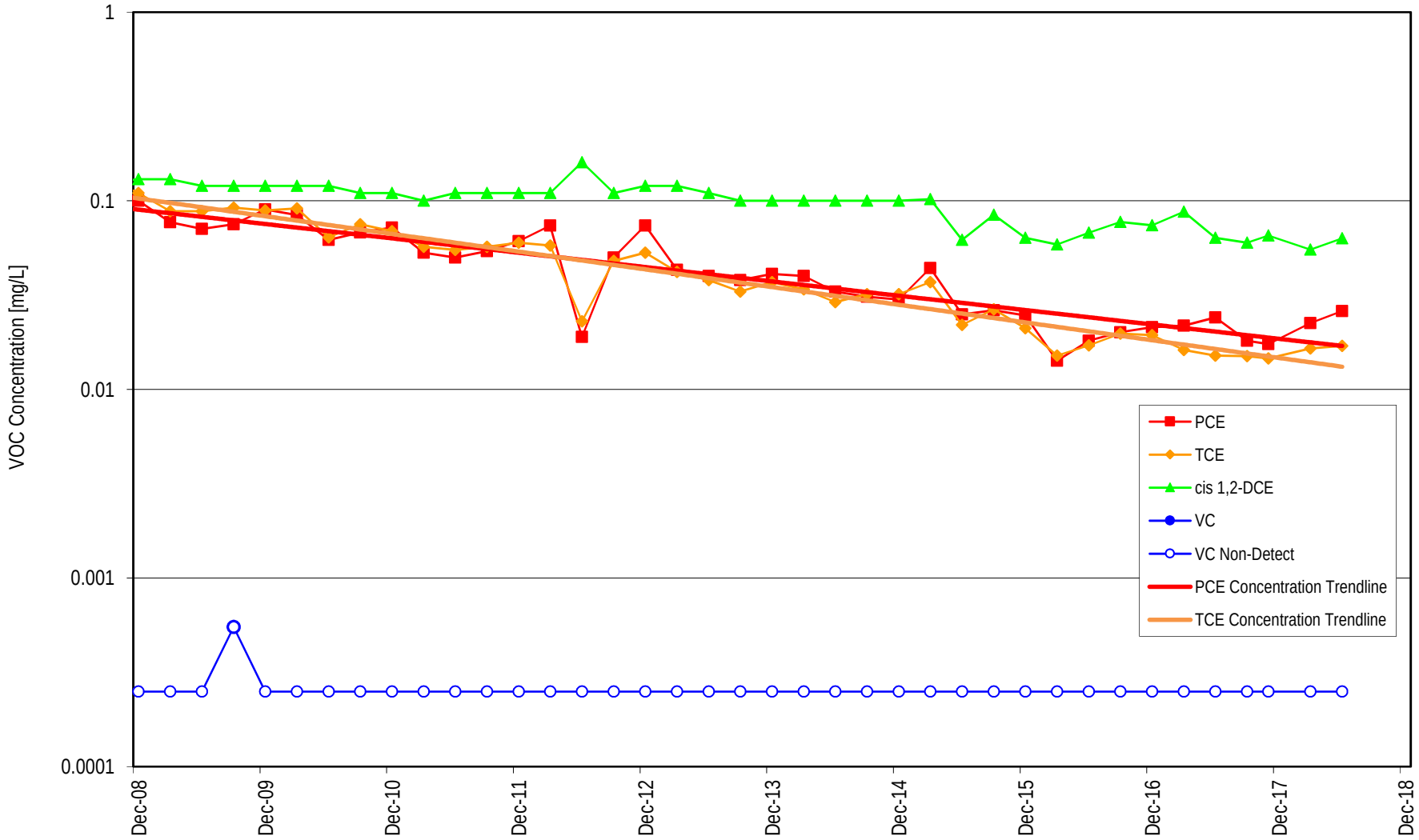
VOC Concentrations in MW-21i-40



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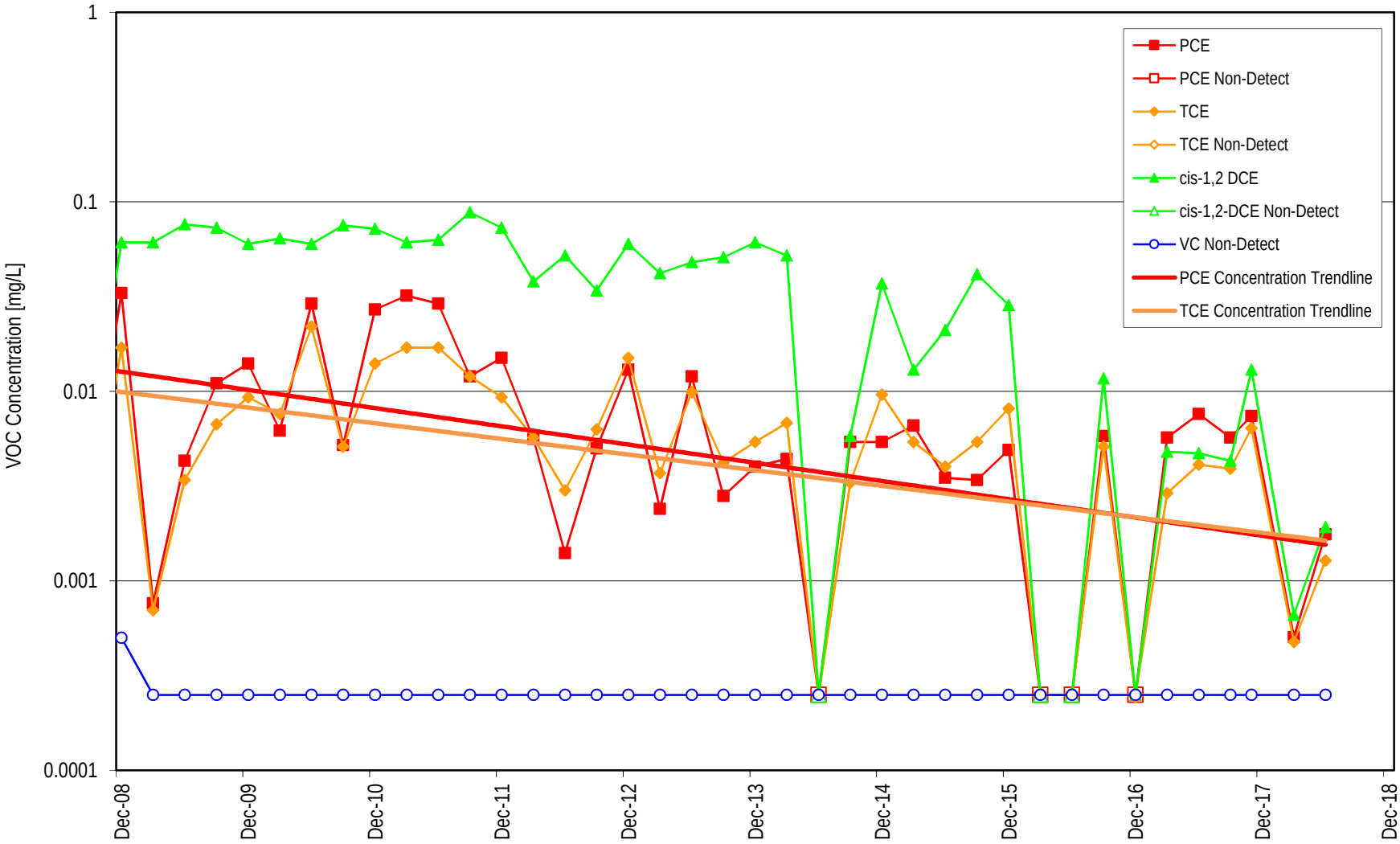
VOC Concentrations in MW-21i-105



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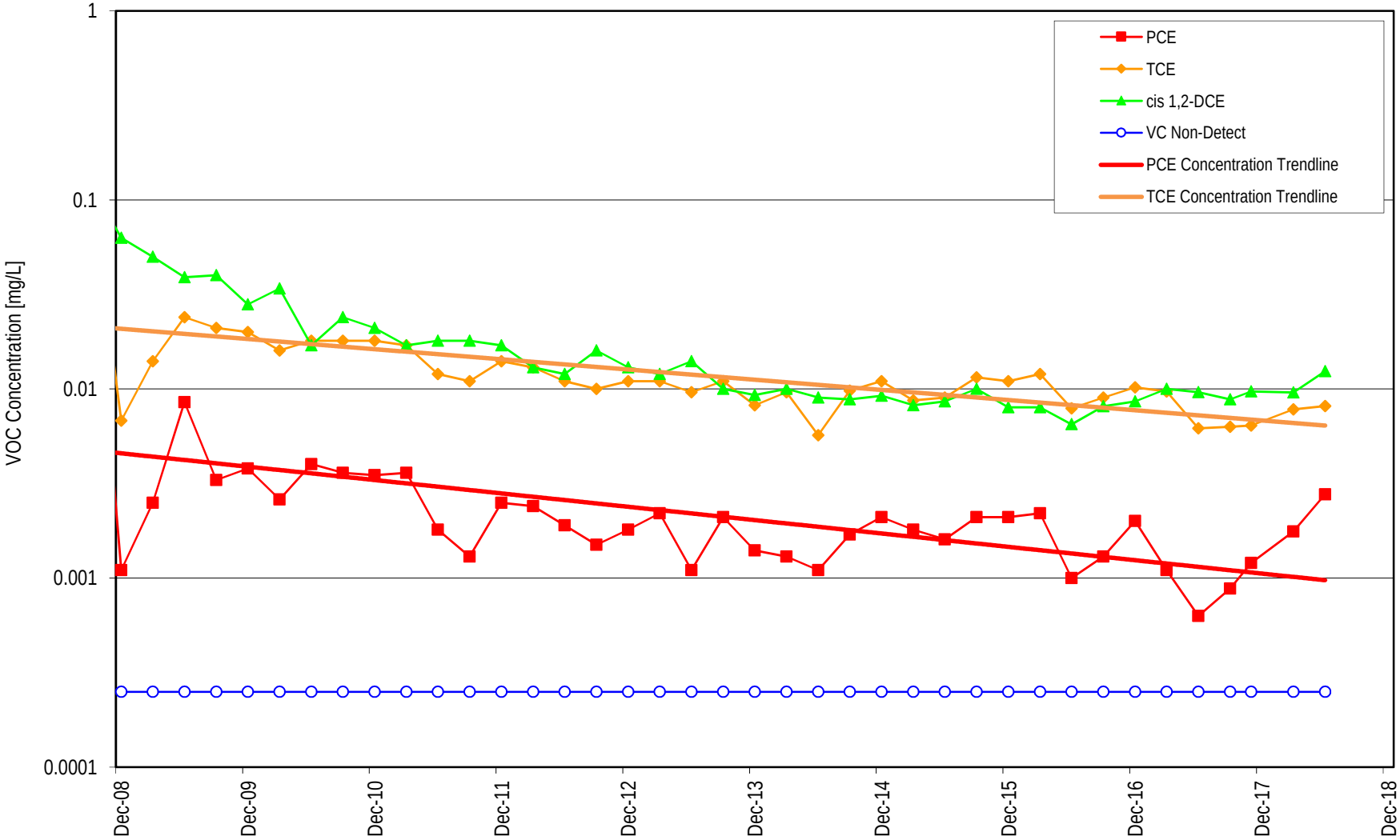
VOC Concentrations in MW-22i



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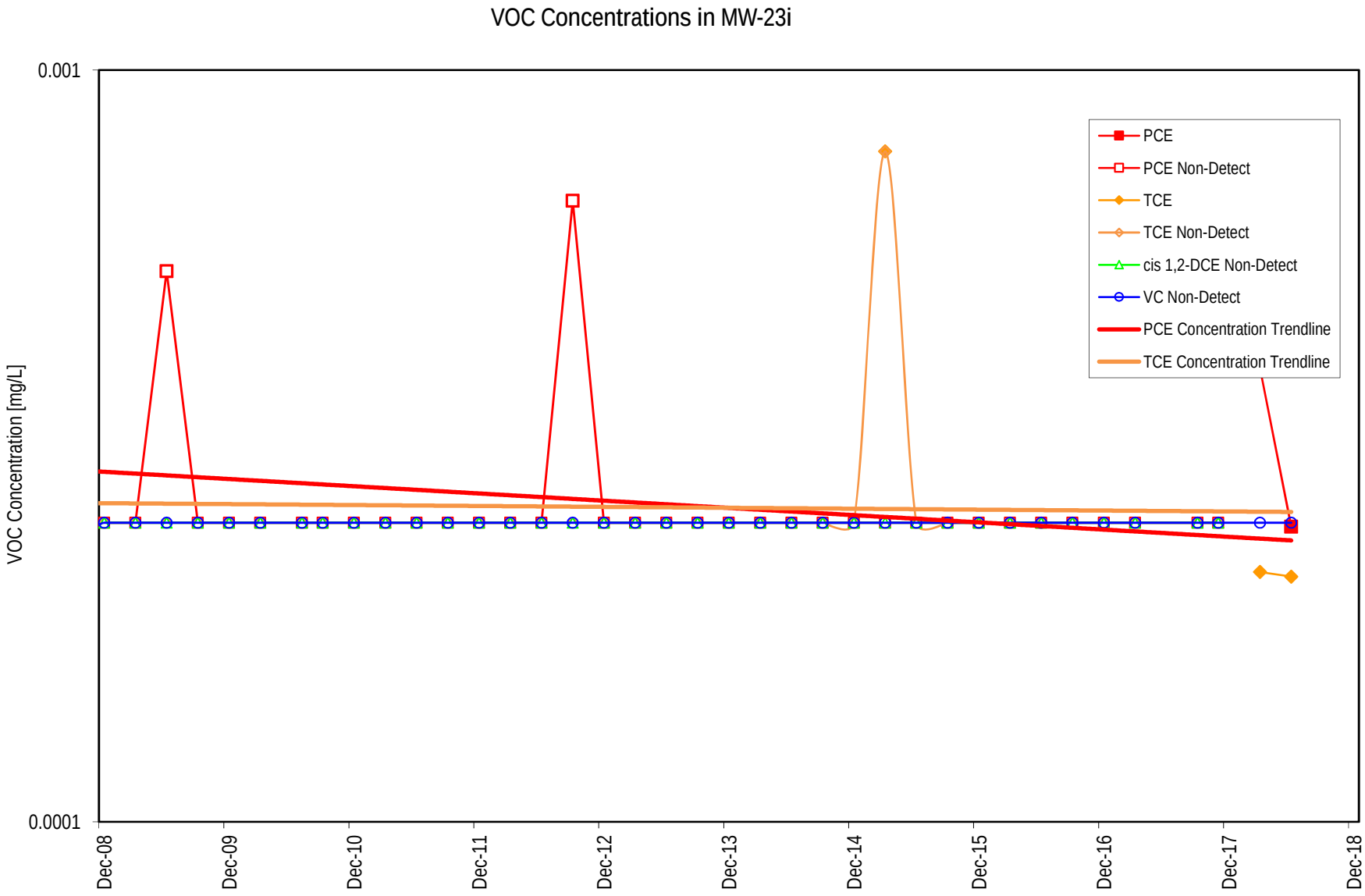

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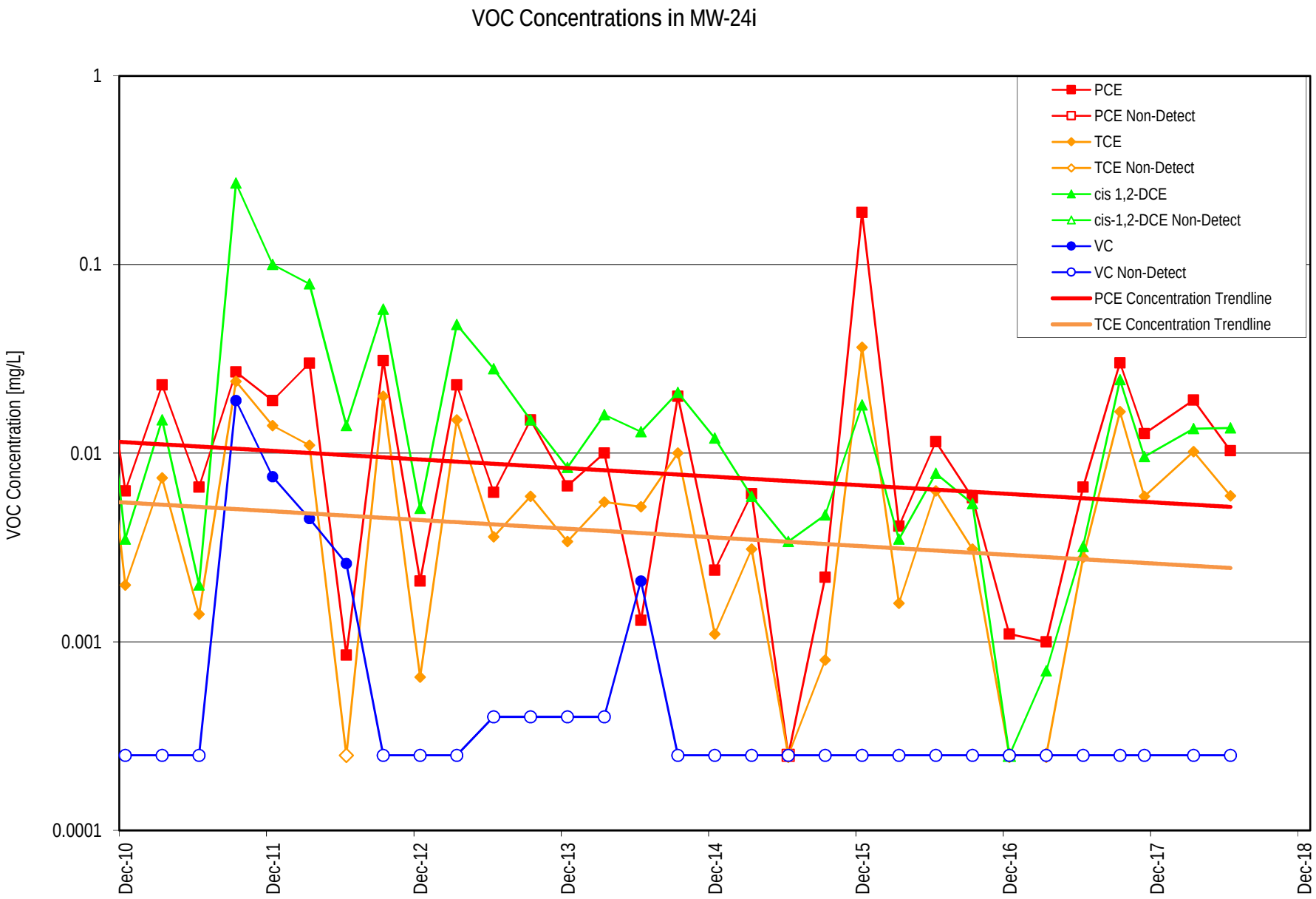
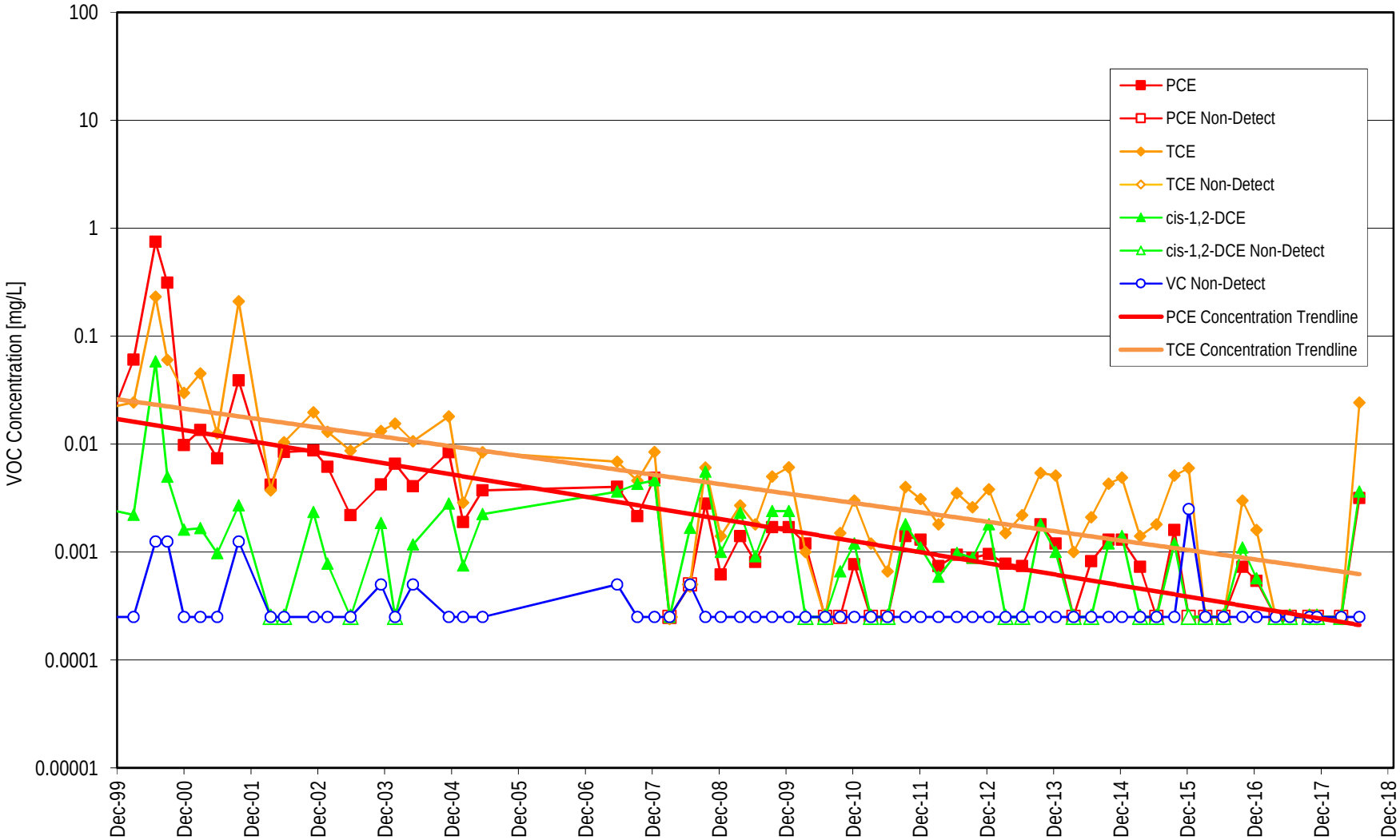


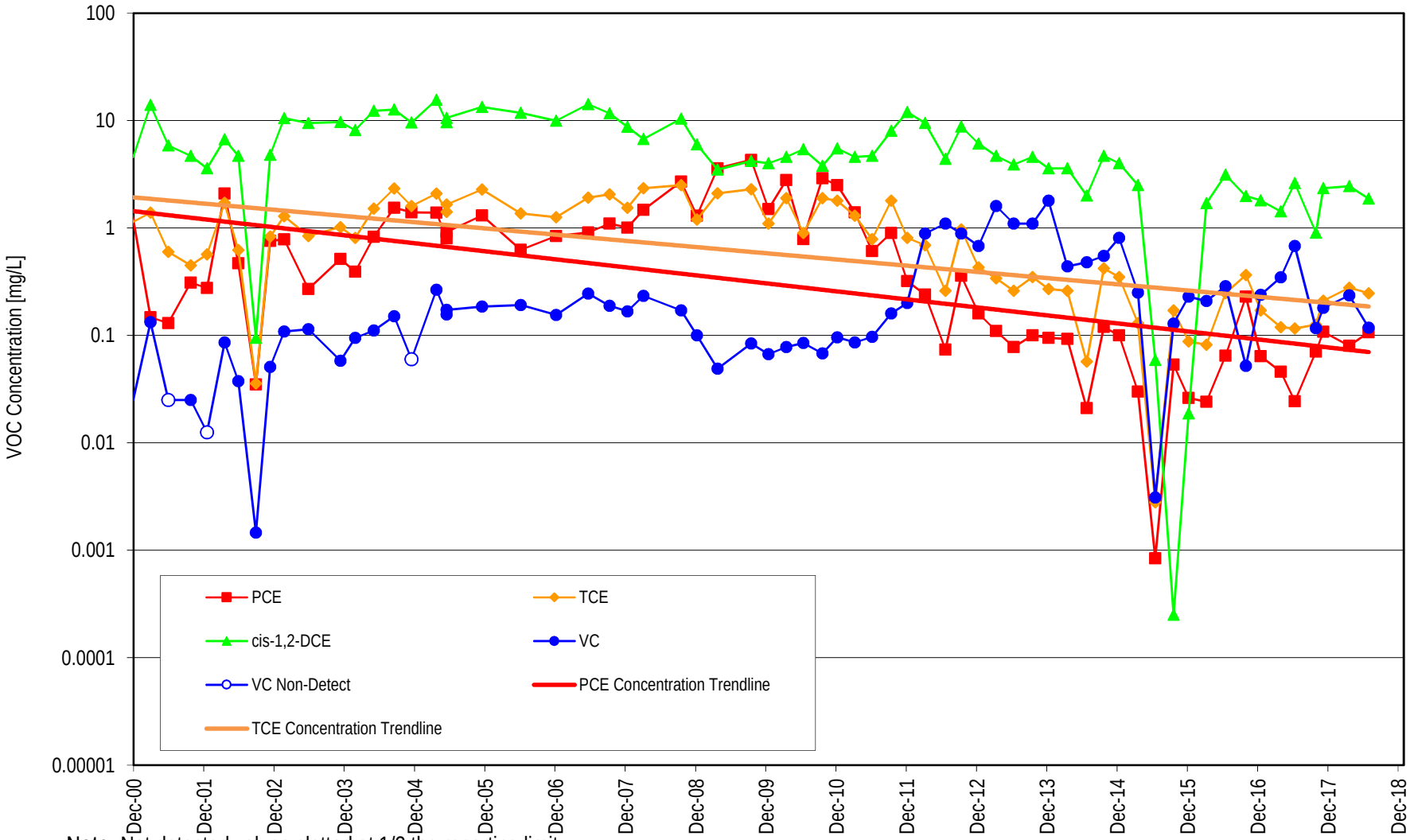
Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in S-1



Note: Not detected values plotted at 1/2 the reporting limit.

VOC Concentrations in MGMS1-43



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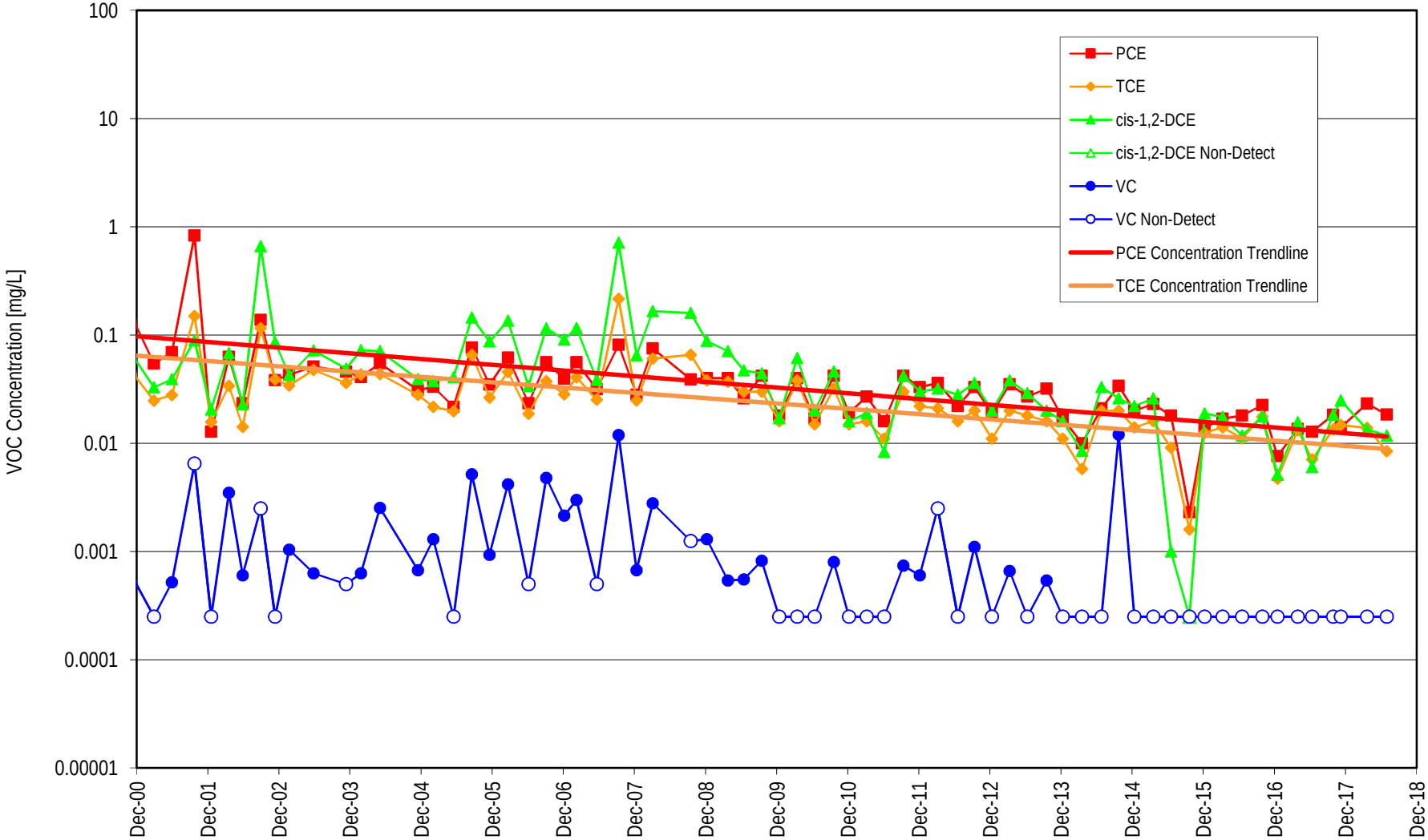
VOC Concentrations in MGMS1-60



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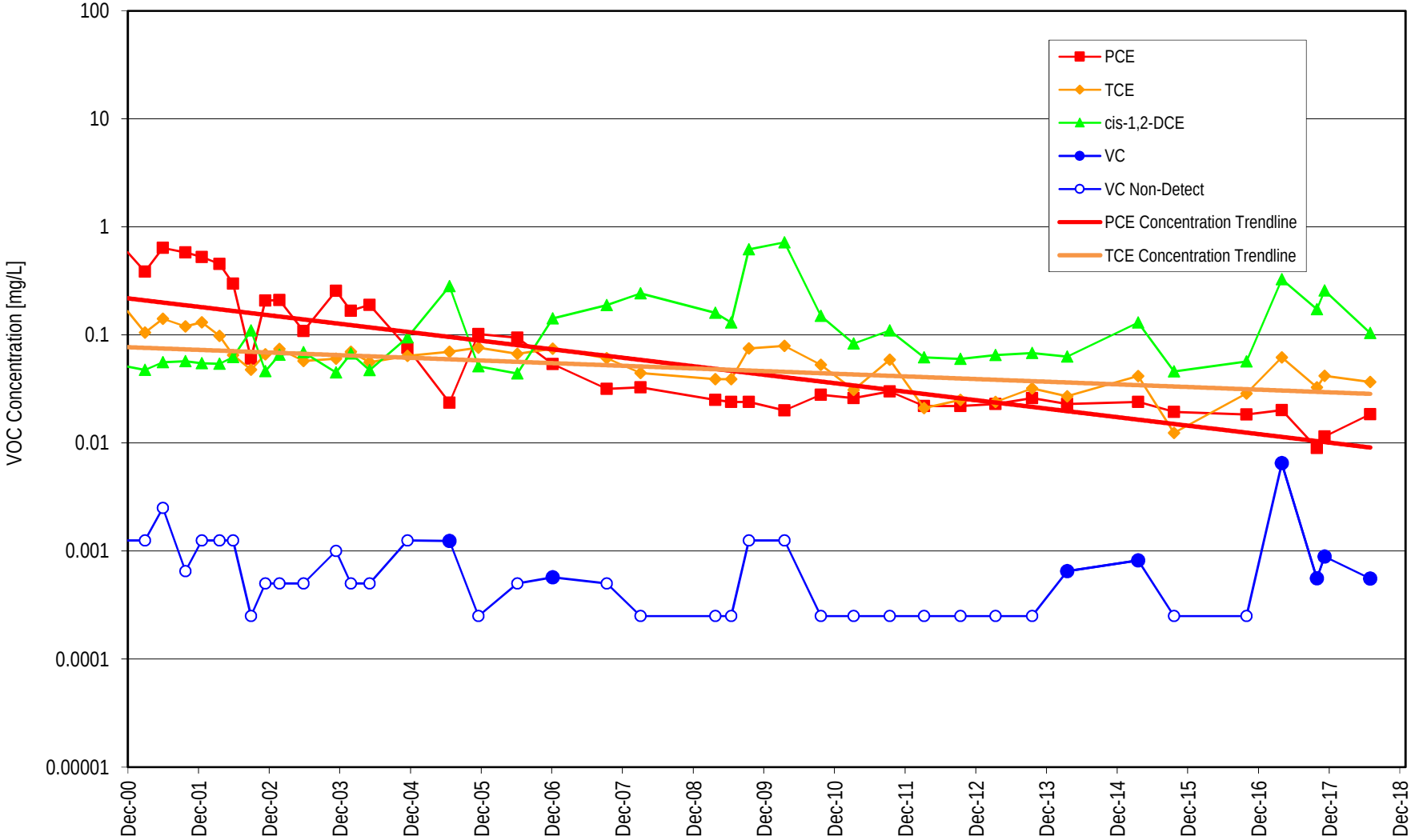
VOC Concentrations in MGMS1-110



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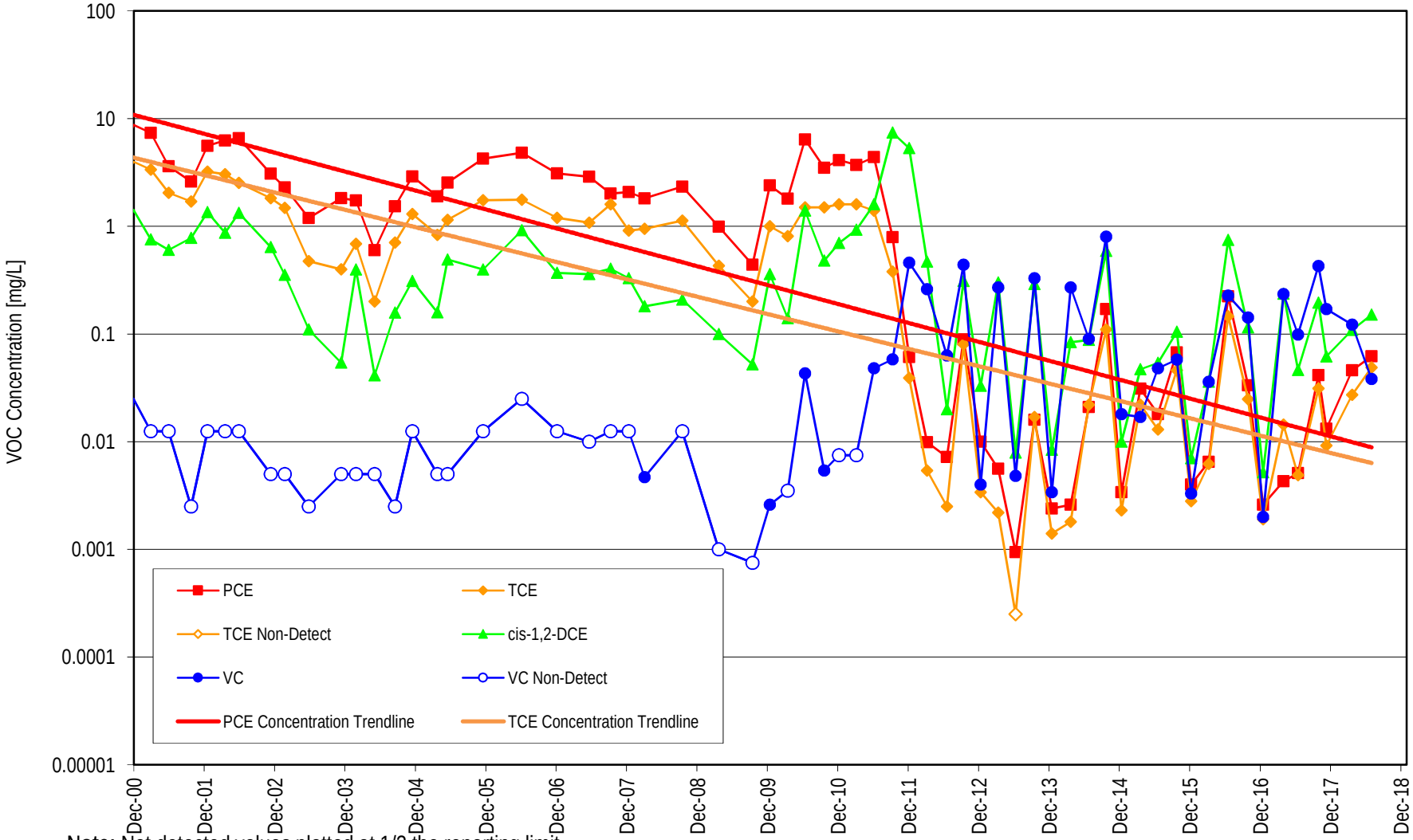
VOC Concentrations in MGMS2-40



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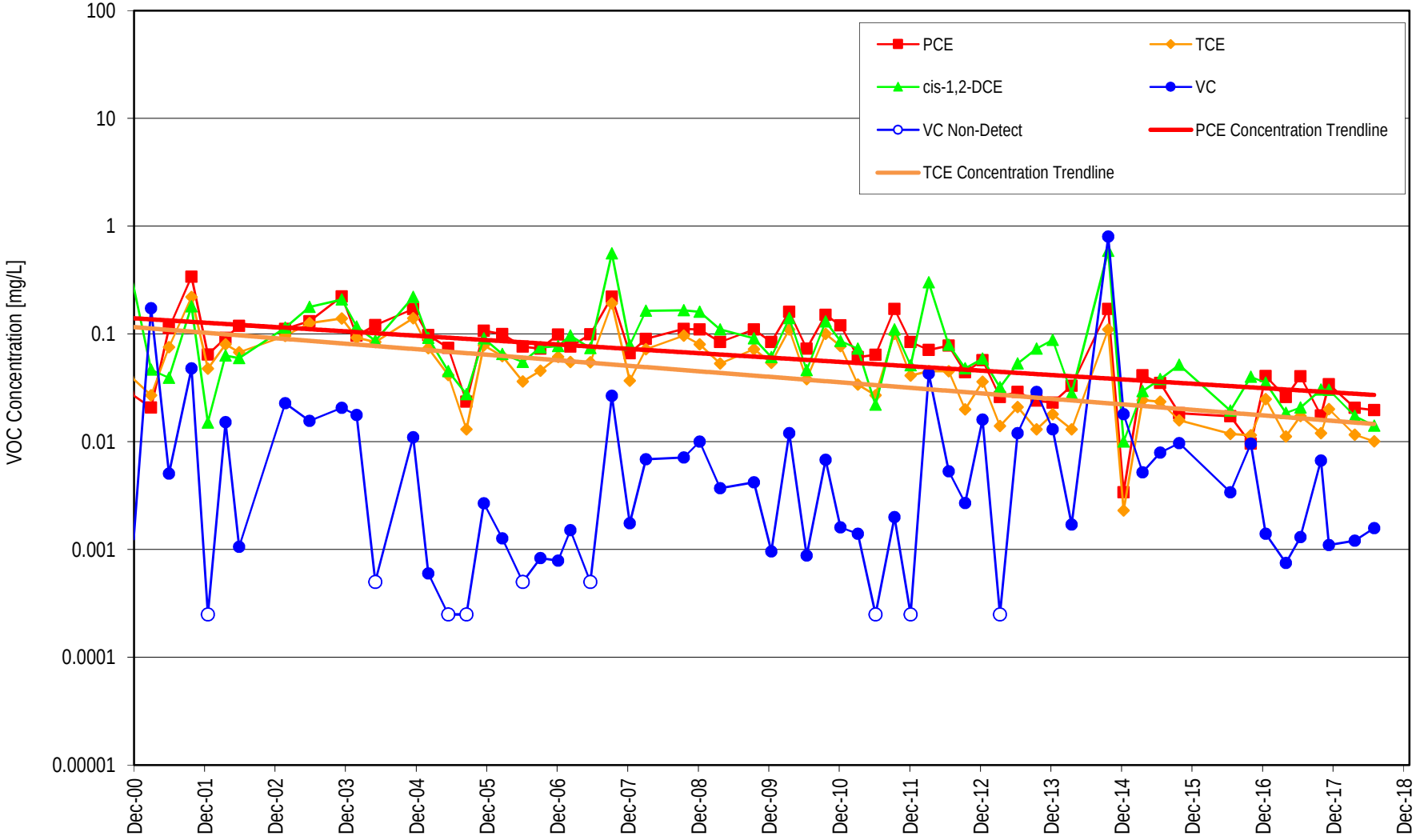
VOC Concentrations in MGMS2-60



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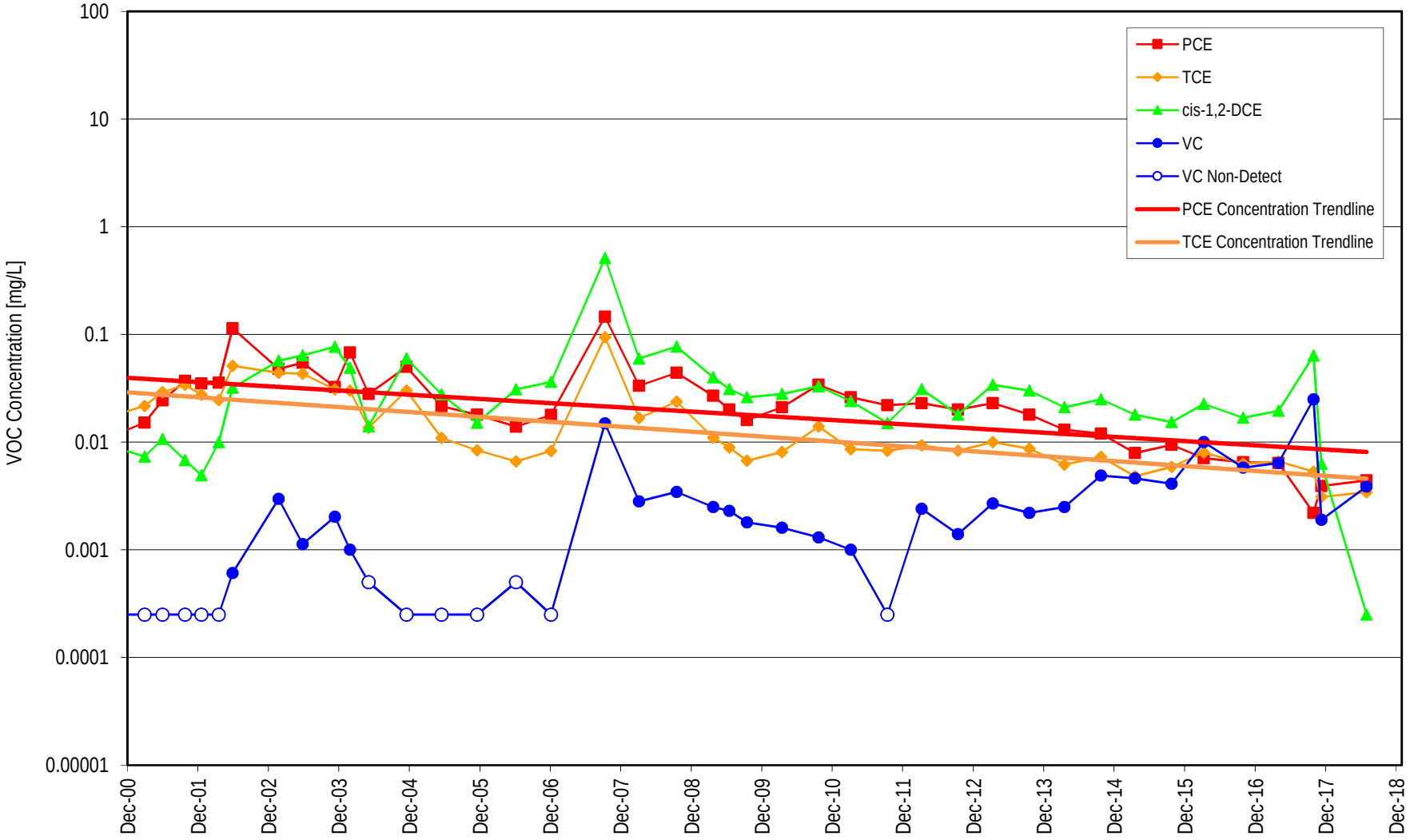
VOC Concentrations in MGMS2-110



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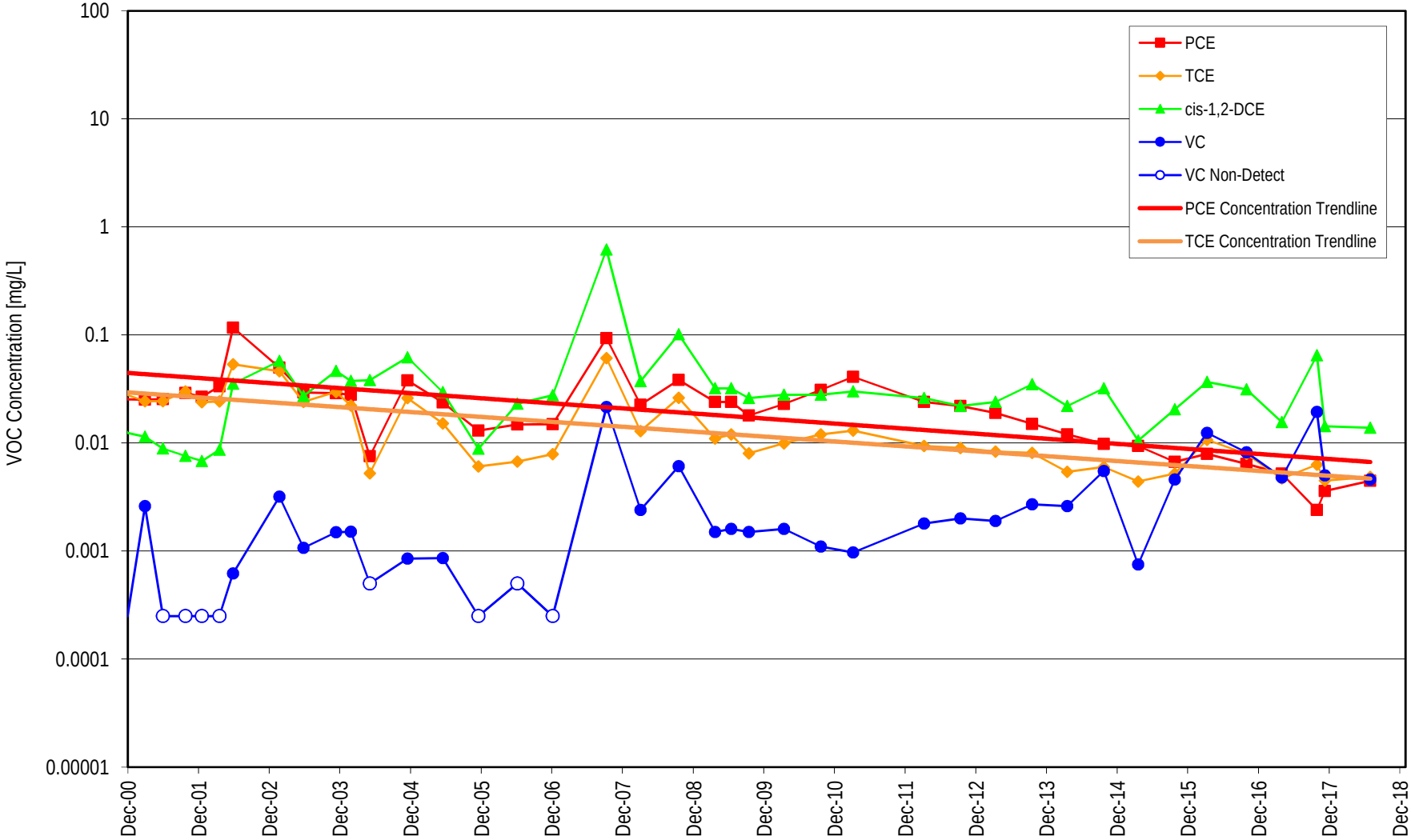
VOC Concentrations in MGMS2-132



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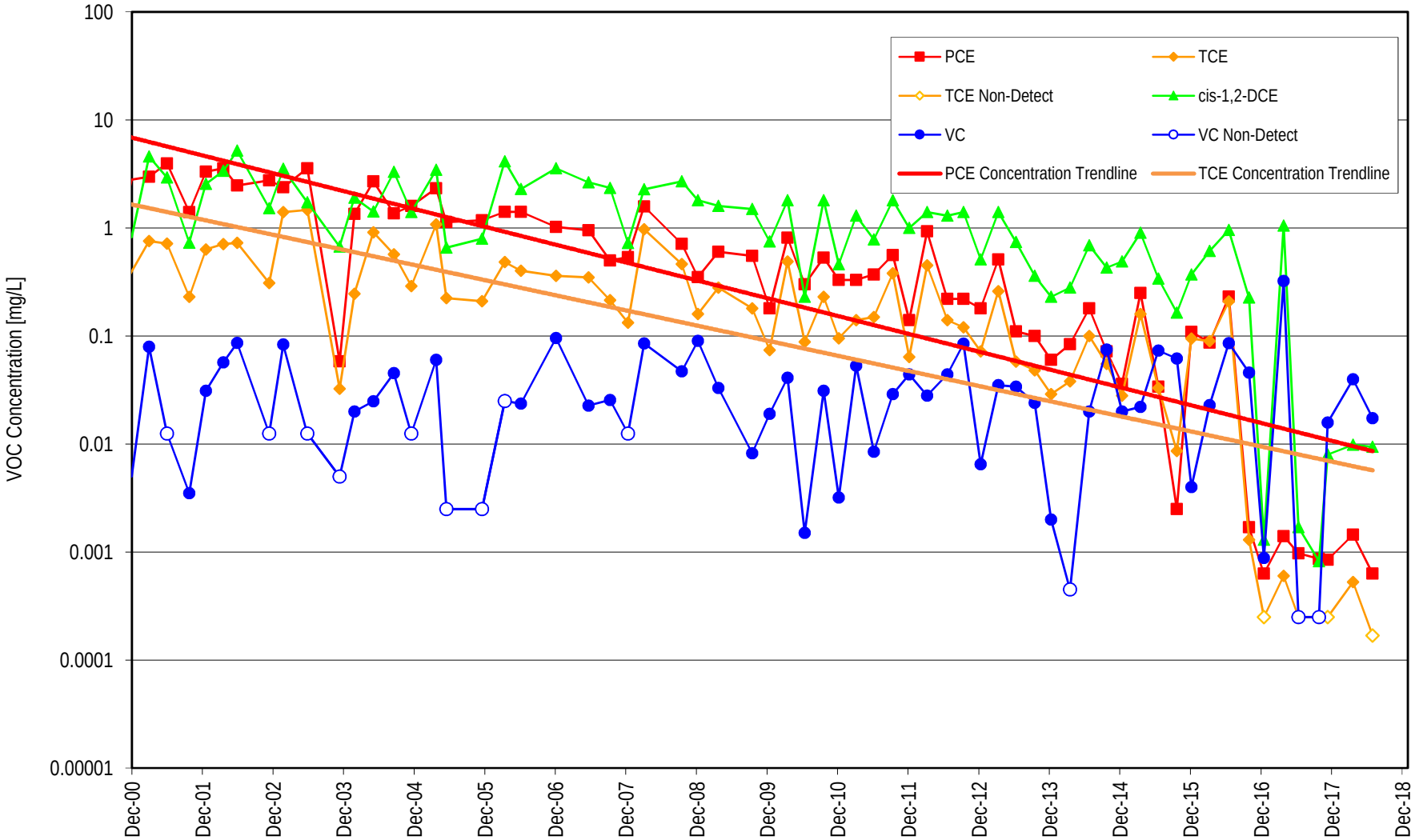
VOC Concentrations in MGMS3-40



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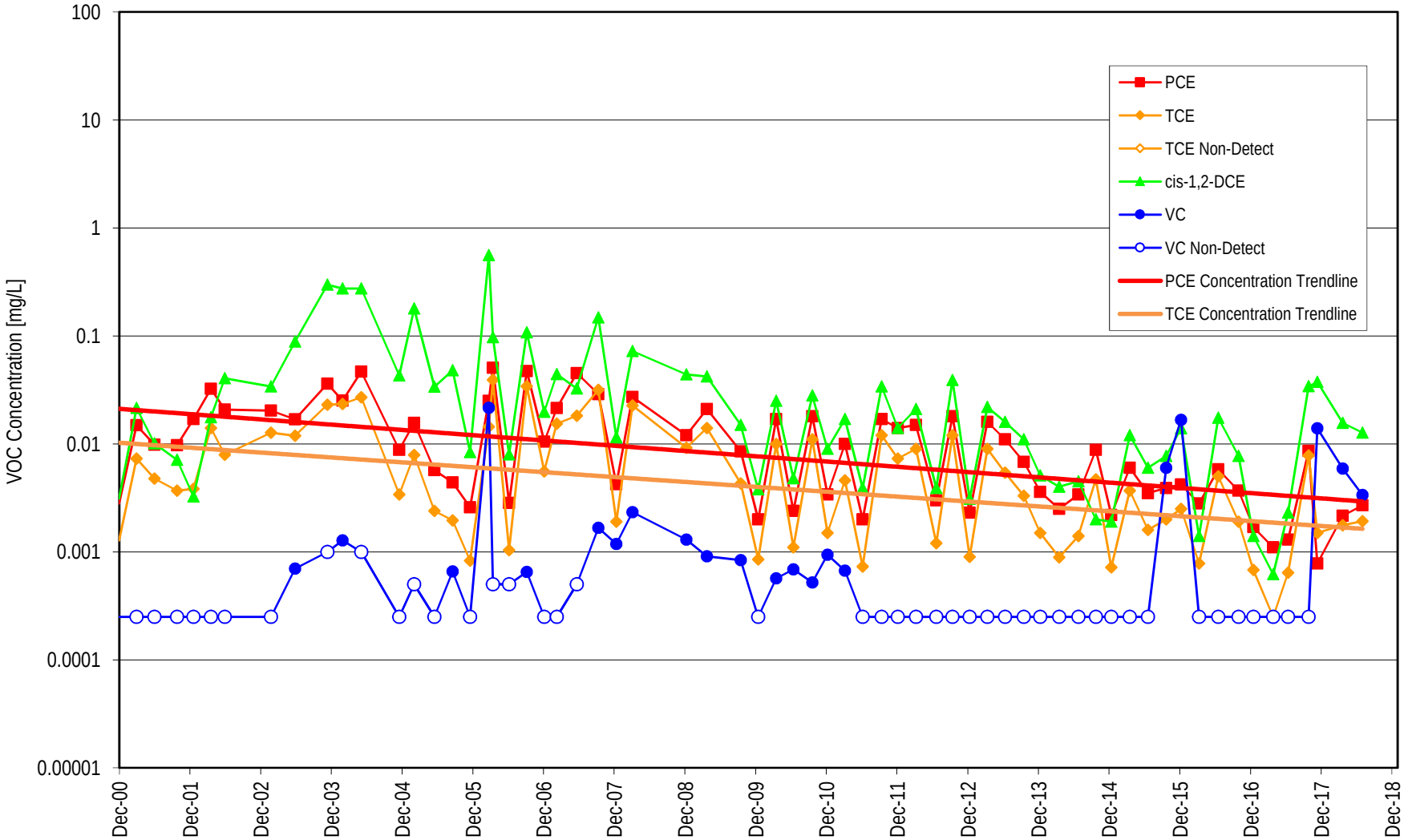
VOC Concentrations in MGMS3-60



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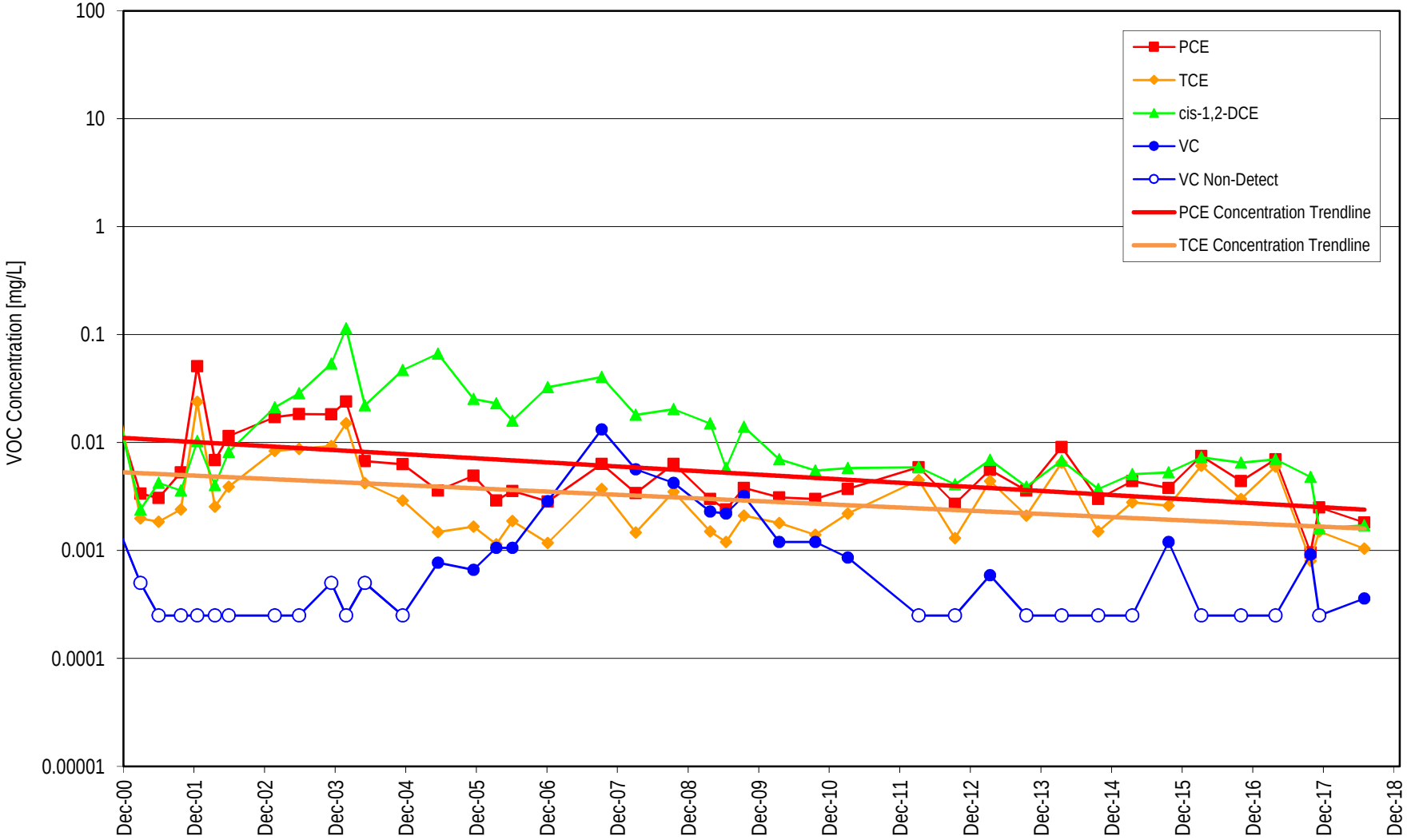
VOC Concentrations in MGMS3-101



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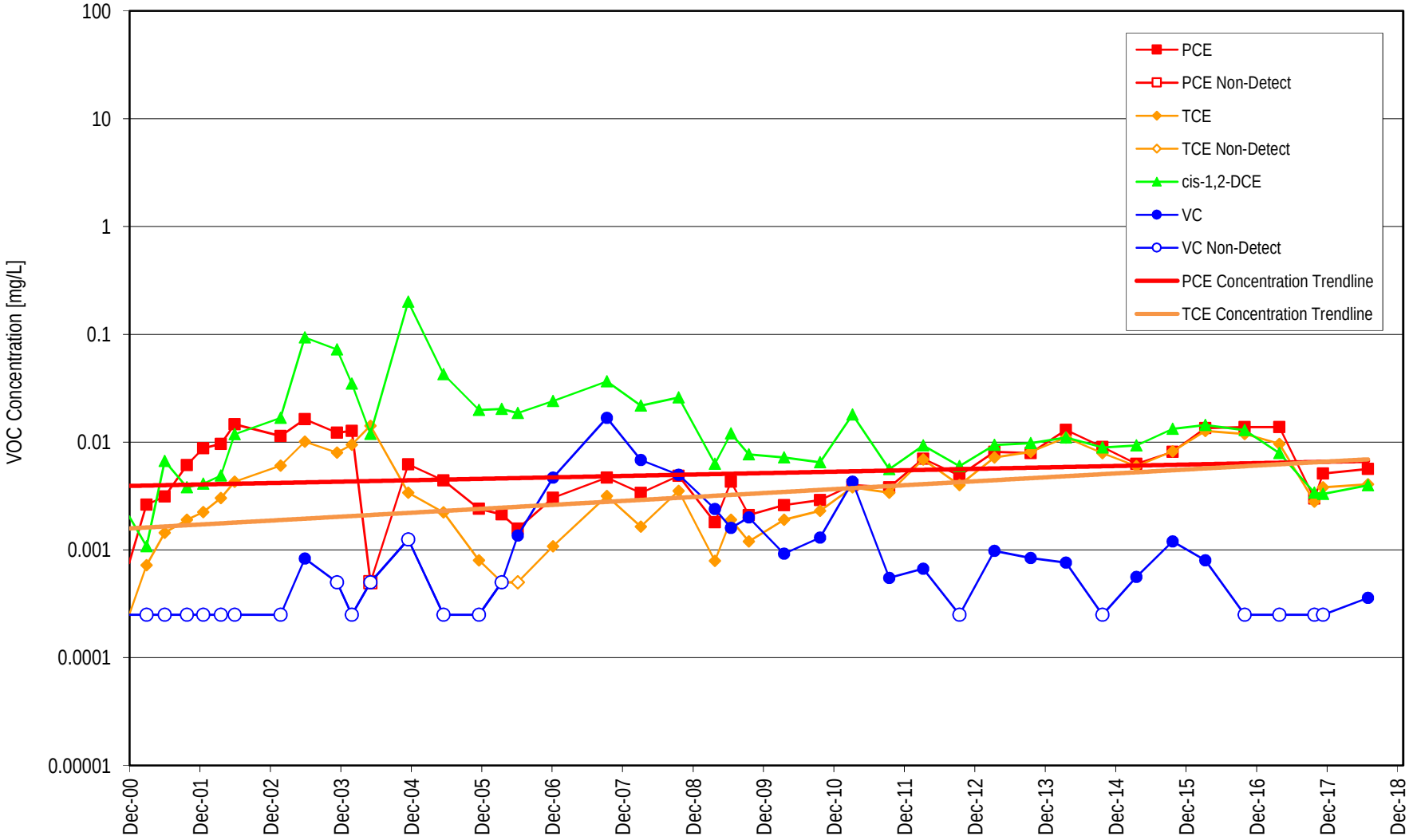
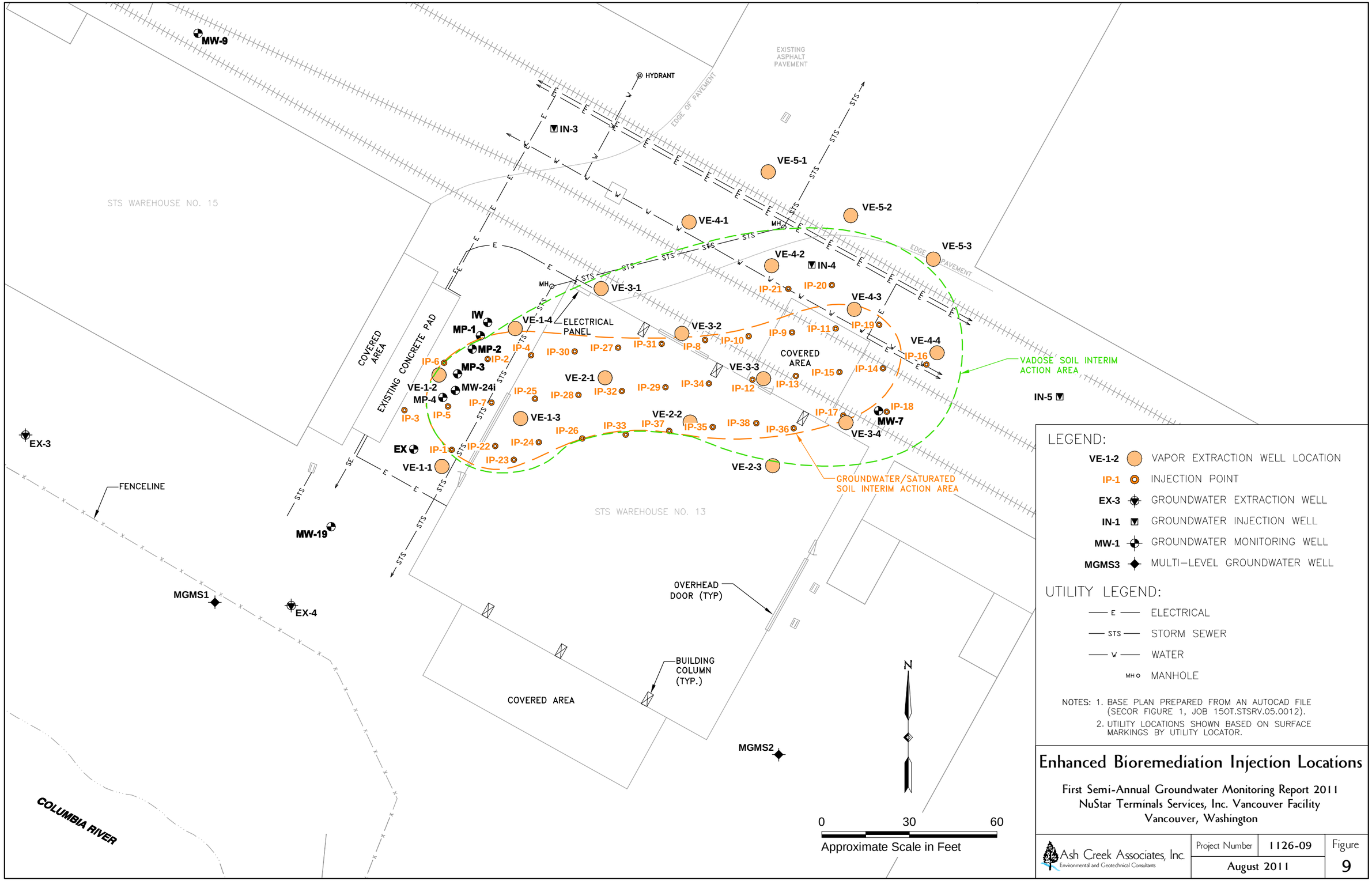
VOC Concentrations in MGMS3-132



Note: Not detected values plotted at 1/2 the reporting limit.

APPENDIX E

2008 – SVE AND BIOREMEDIATION INJECTION LAYOUT AND HISTORICAL MONITORING TABLES



LEGEND:

VE-1-2	VAPOR EXTRACTION WELL LOCATION
IP-1	INJECTION POINT
EX-3	GROUNDWATER EXTRACTION WELL
IN-1	GROUNDWATER INJECTION WELL
MW-1	GROUNDWATER MONITORING WELL
MGMS3	MULTI-LEVEL GROUNDWATER WELL

UTILITY LEGEND:

E	ELECTRICAL
STS	STORM SEWER
W	WATER
MH	MANHOLE

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.

Enhanced Bioremediation Injection Locations

First Semi-Annual Groundwater Monitoring Report 2011
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
August 2011		9

SOIL VAPOR EXTRACTION SYSTEM
(SEE FIGURES 7 and 8)

ELECTRICAL SERVICE
INSTALLED FROM EXISTING
BUILDING SERVICE

VAPOR EXTRACTION
PIPING IN TRENCH
(TYPICAL OF 5
ZONES).

WELL VAULT INSTALLED
AT EACH WELLHEAD
(TYPICAL OF 18).

VADOSE SOIL INTERIM
ACTION AREA

SOIL VAPOR
EXTRACTION WELL
(TYPICAL OF 18;
NUMBER REPRESENTS
MANIFOLD ZONE).

IN-1
IN-2
IN-3
IN-4
IN-5
MW-9
MW-13
EX-3
MW-19
EX-4
MGMS1
EX-5
MW-12
MGMS2
MW-7
MW-24i
MP-1
MP-2
MP-3
MP4
IW
EX
VE-1-1
VE-1-2
VE-1-3
VE-1-4
VE-2-1
VE-2-2
VE-2-3
VE-3-1
VE-3-2
VE-3-3
VE-3-4
VE-4-1
VE-4-2
VE-4-3
VE-4-4
VE-5-1
VE-5-2
VE-5-3
STS WAREHOUSE NO. 15
STS WAREHOUSE NO. 13
COVERED AREA
EXISTING CONCRETE PAD
ELECTRICAL PANEL
COVERED AREA
EXISTING ASPHALT PAVEMENT
EDGE OF PAVEMENT
EDGE OF GRAVEL
HYDRANT
OVERHEAD DOOR (TYP)
BUILDING COLUMN (TYP.)
COVERED AREA
COLUMBIA RIVER

N

0 40 80
Approximate Scale in Feet

LEGEND:

- VE-1-2 — VAPOR EXTRACTION WELL LOCATION
- EX-3 — GROUNDWATER EXTRACTION WELL
- IN-1 — GROUNDWATER INJECTION WELL
- MW-1 — GROUNDWATER MONITORING WELL
- MGMS3 — MULTI-LEVEL GROUNDWATER WELL

UTILITY LEGEND:

- E — ELECTRICAL
- SS — STORM SEWER
- W — WATER
- MH — MANHOLE

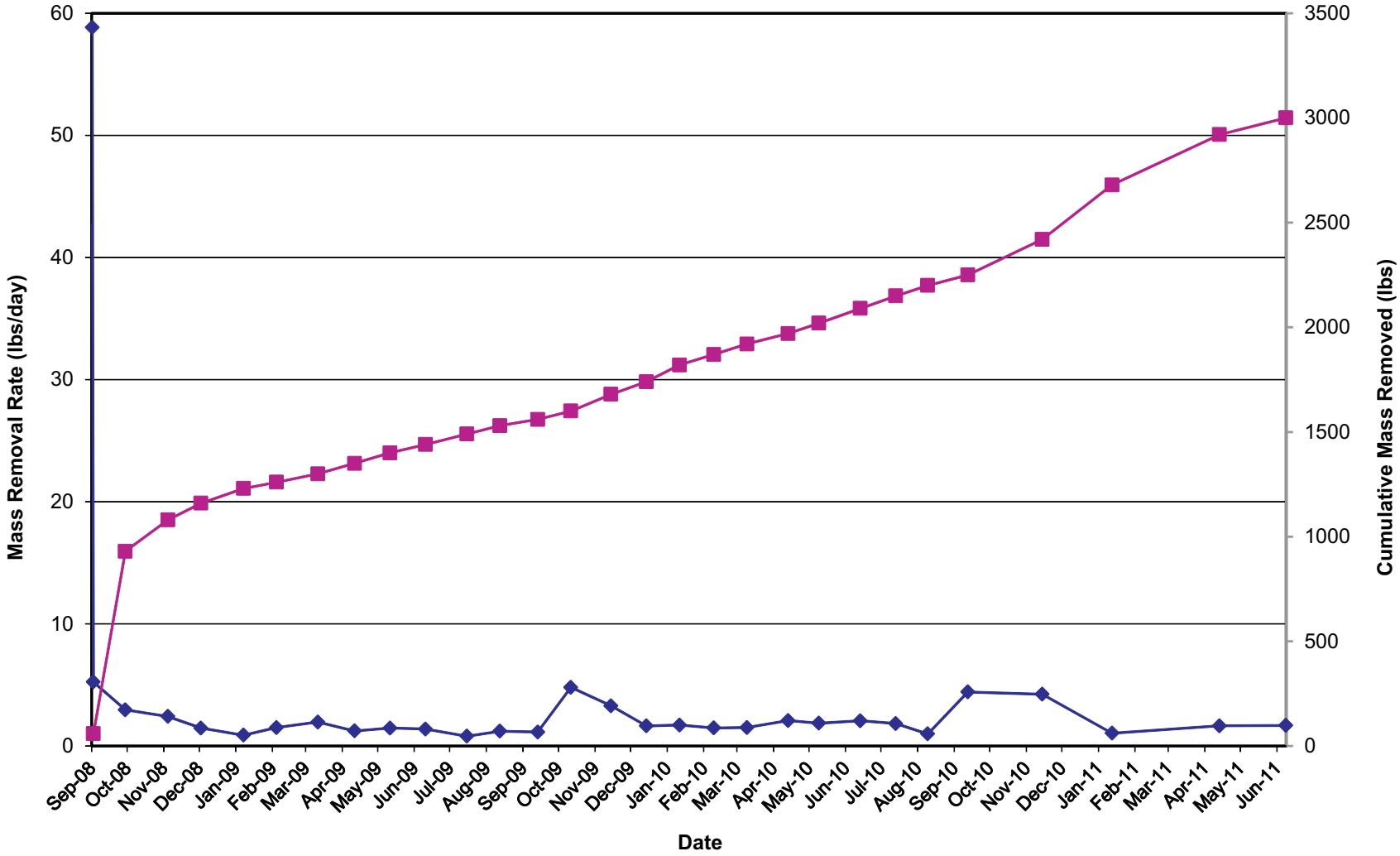
NOTES:
1. BASE PLAN PREPARED FROM AN AUTOCAD FILE (SECOR FIGURE 1, JOB 150T.STSRV.05.0012).
2. UTILITY LOCATIONS SHOWN BASED ON SURFACE MARKINGS BY UTILITY LOCATOR.
3. INJECTION LOCATIONS BASED ON FIELD MEASUREMENTS TO EXISTING SITE STRUCTURES.

Soil Vapor Extraction System Site Plan

First Semi-Annual Groundwater Monitoring Report 2011
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1126-09	Figure
August 2011		10



Legend:

Removal Rate (lbs/day)

Cumulative Mass Removal

2008 SVE System - VOC Mass Removal

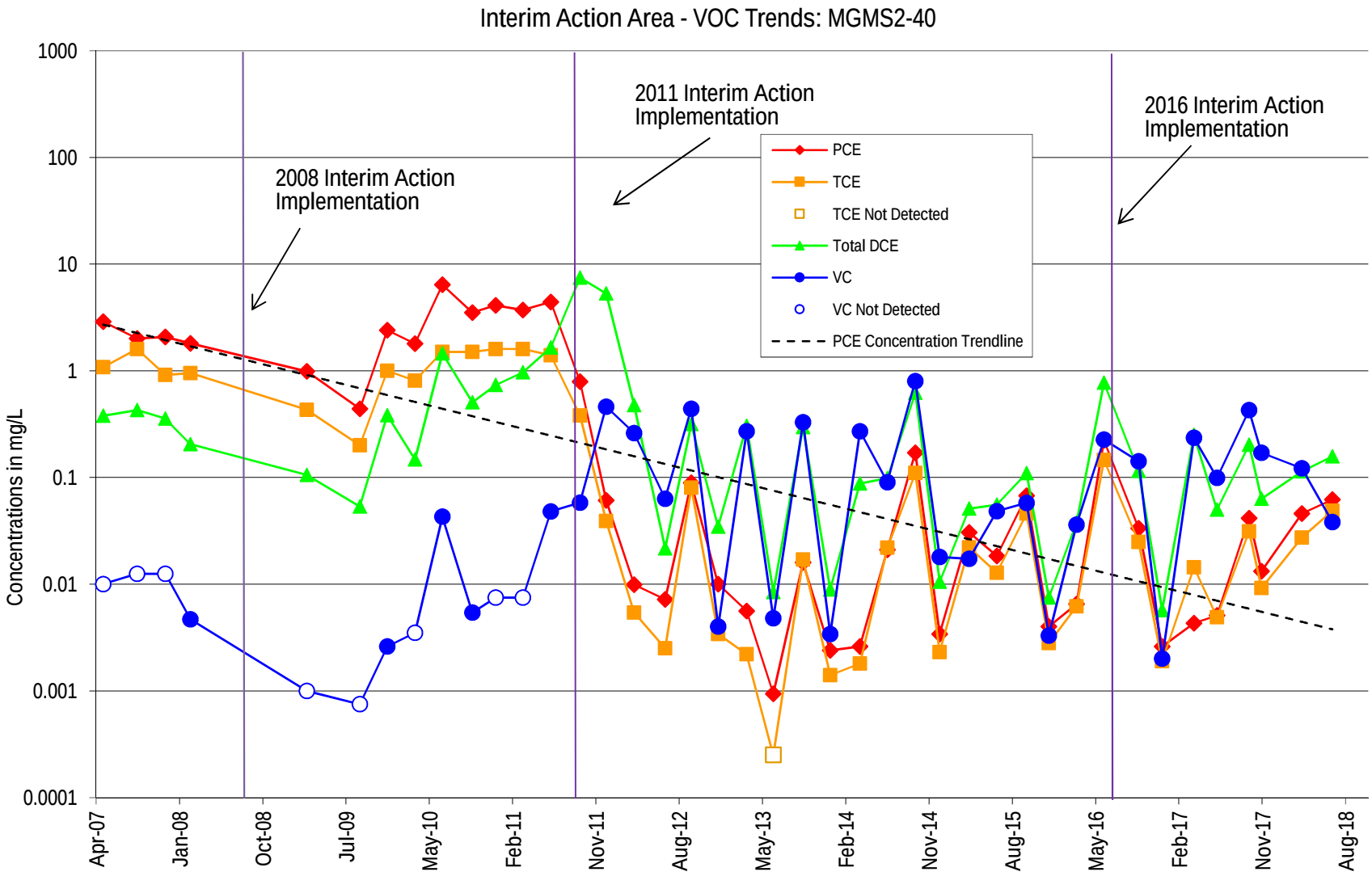
Second Semi-Annual Groundwater Monitoring Report 2011
NuStar Terminals Services, Inc. Vancouver Facility
Vancouver, Washington

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

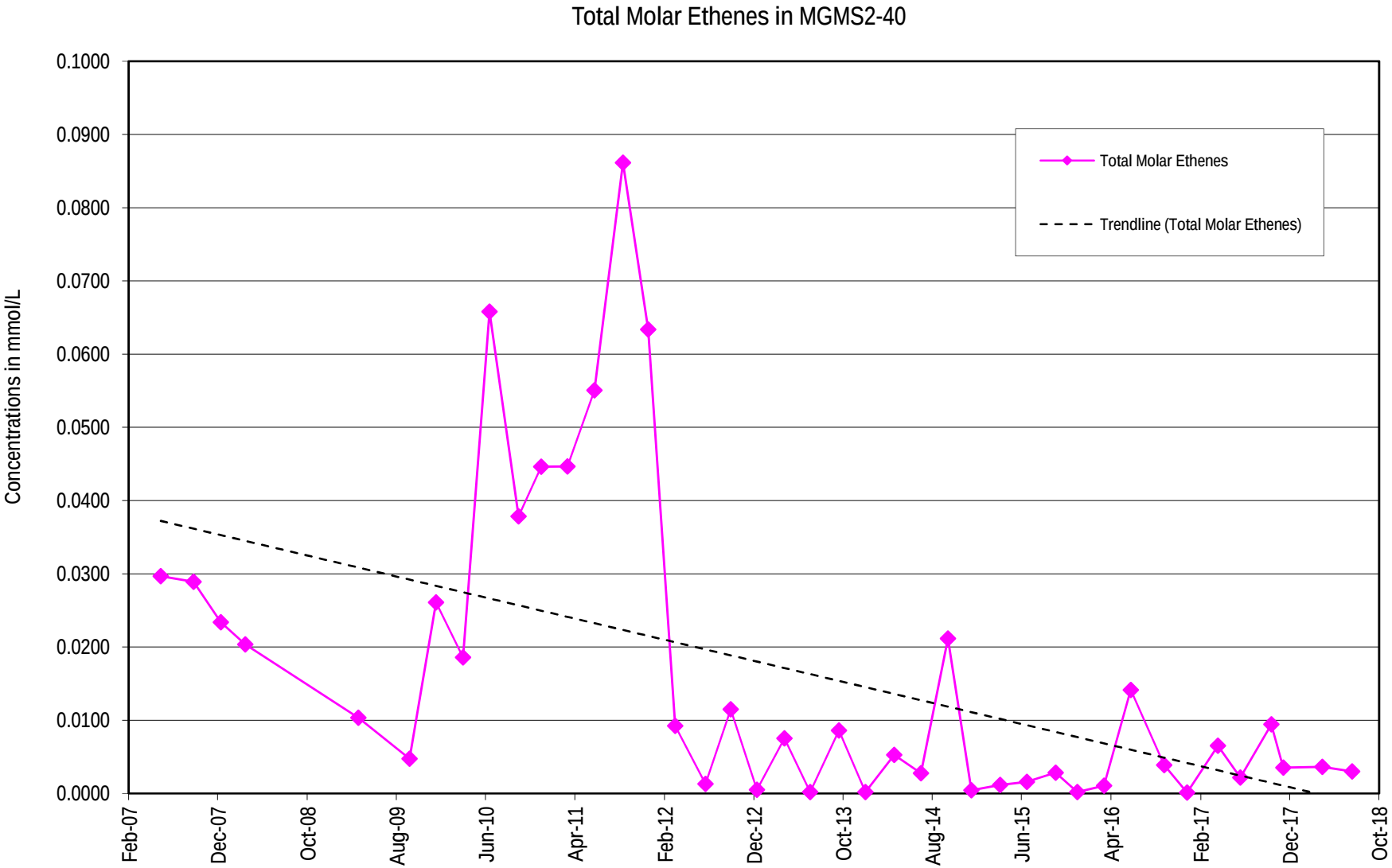
Project Number	1126-09	Figure
January 2012		11

APPENDIX F

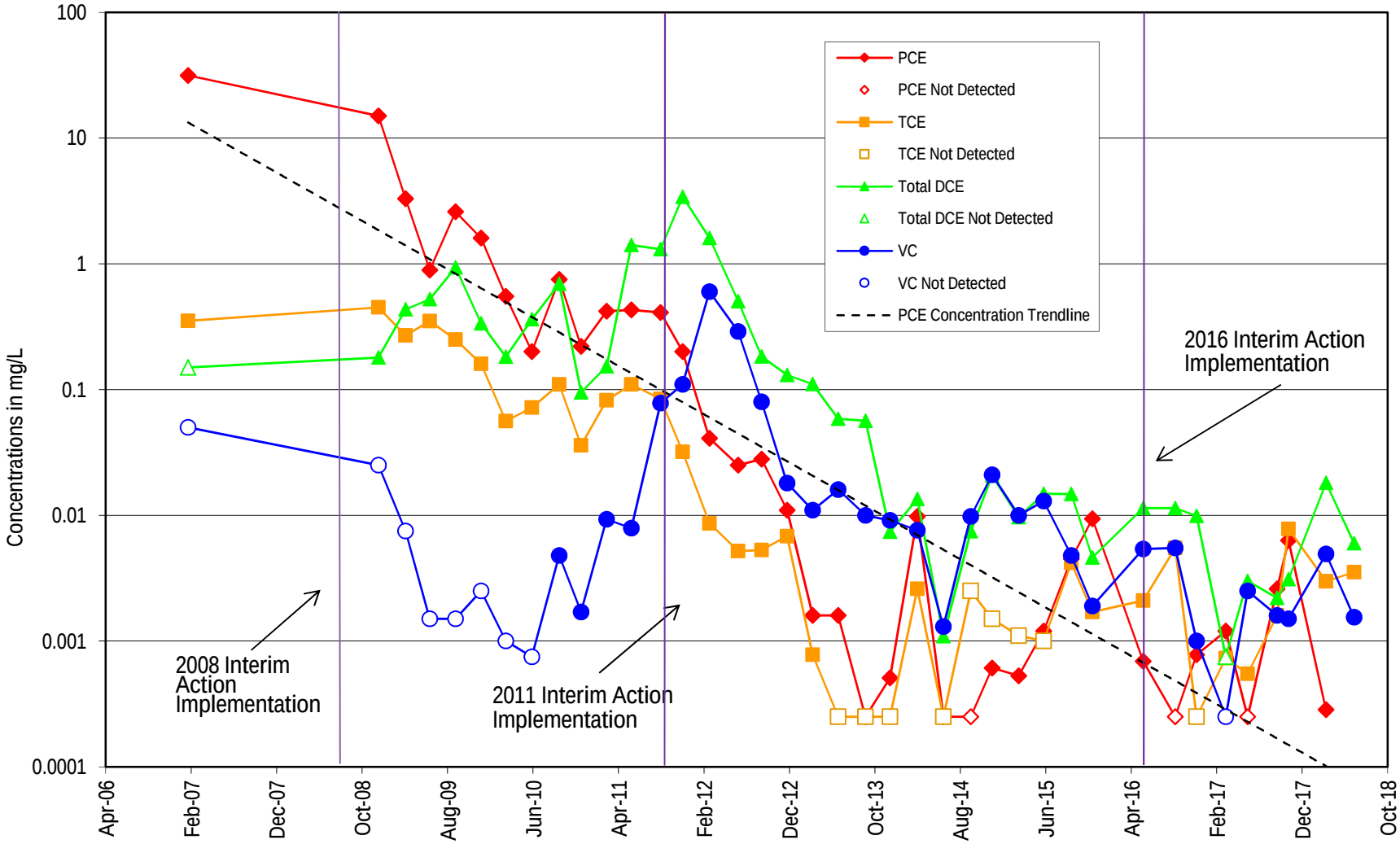
MOLAR CONCENTRATION TREND PLOTS –
INTERIM ACTION WELLS



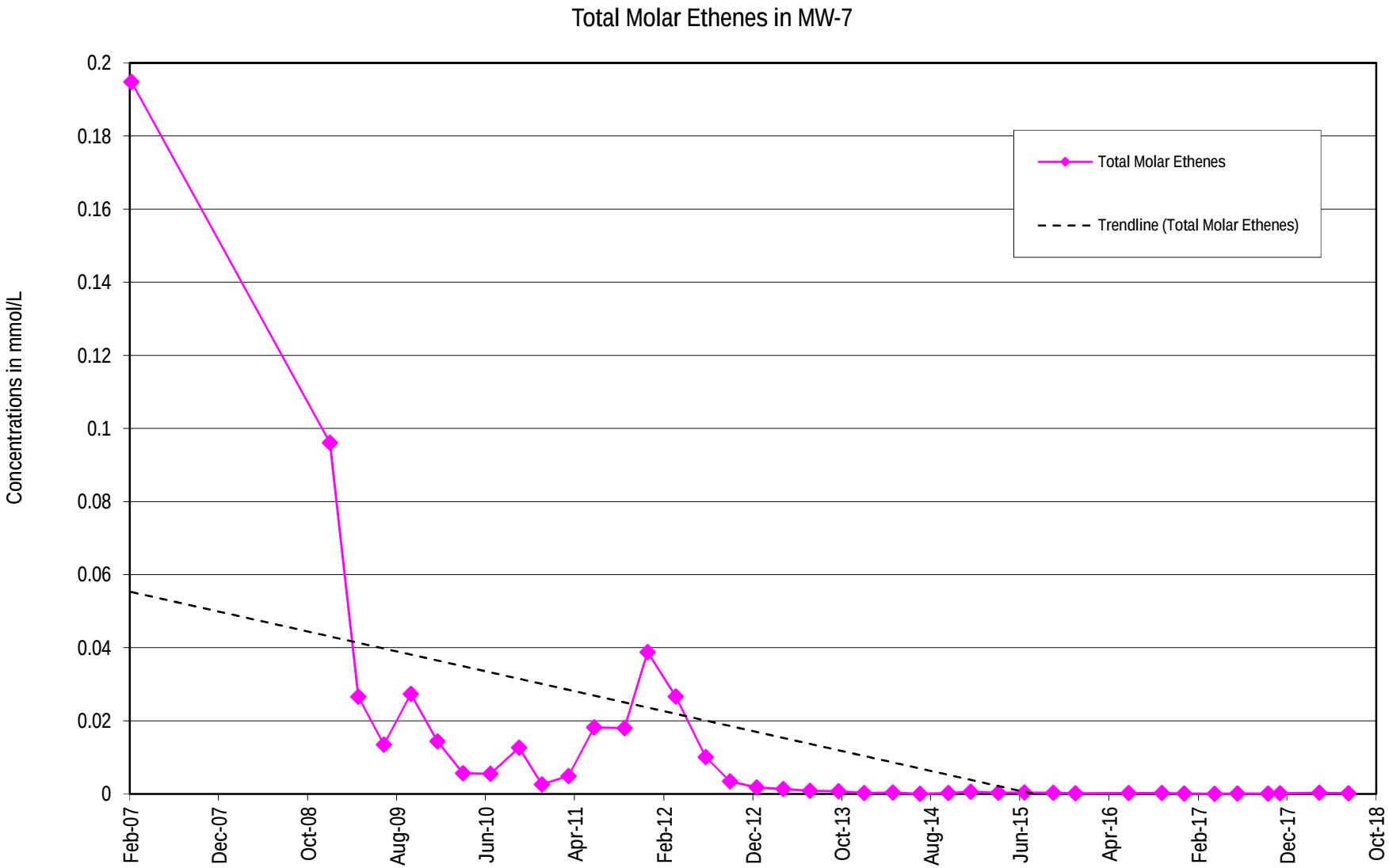
Note: Not detected values plotted at 1/2 the reporting limit.

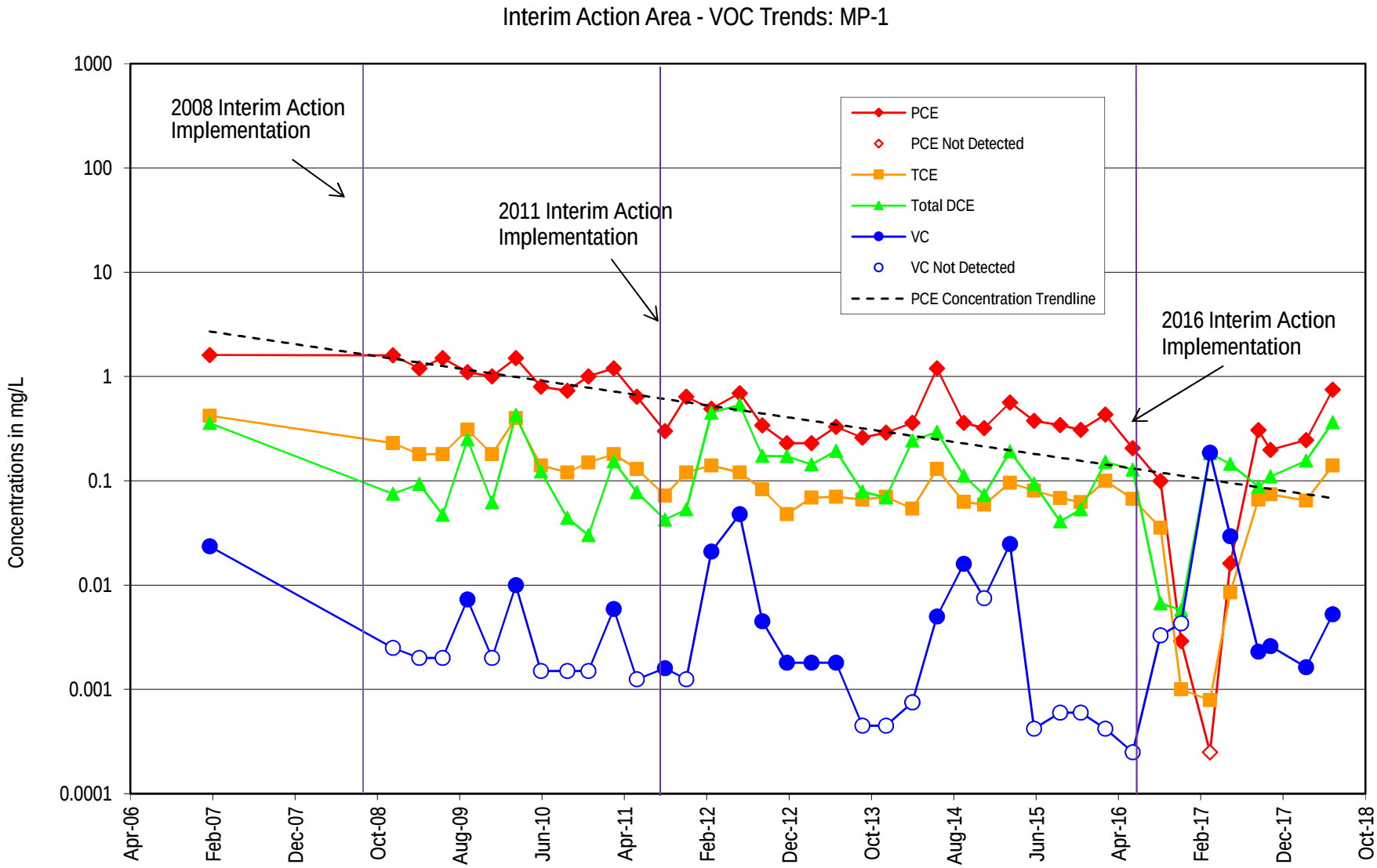

Total Molar Ethenes in MGMS2-40
Concentrations in mmol/L
0.1000
0.0900
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18
Total Molar Ethenes
Trendline (Total Molar Ethenes)

Interim Action Area - VOC Trends: MW-7

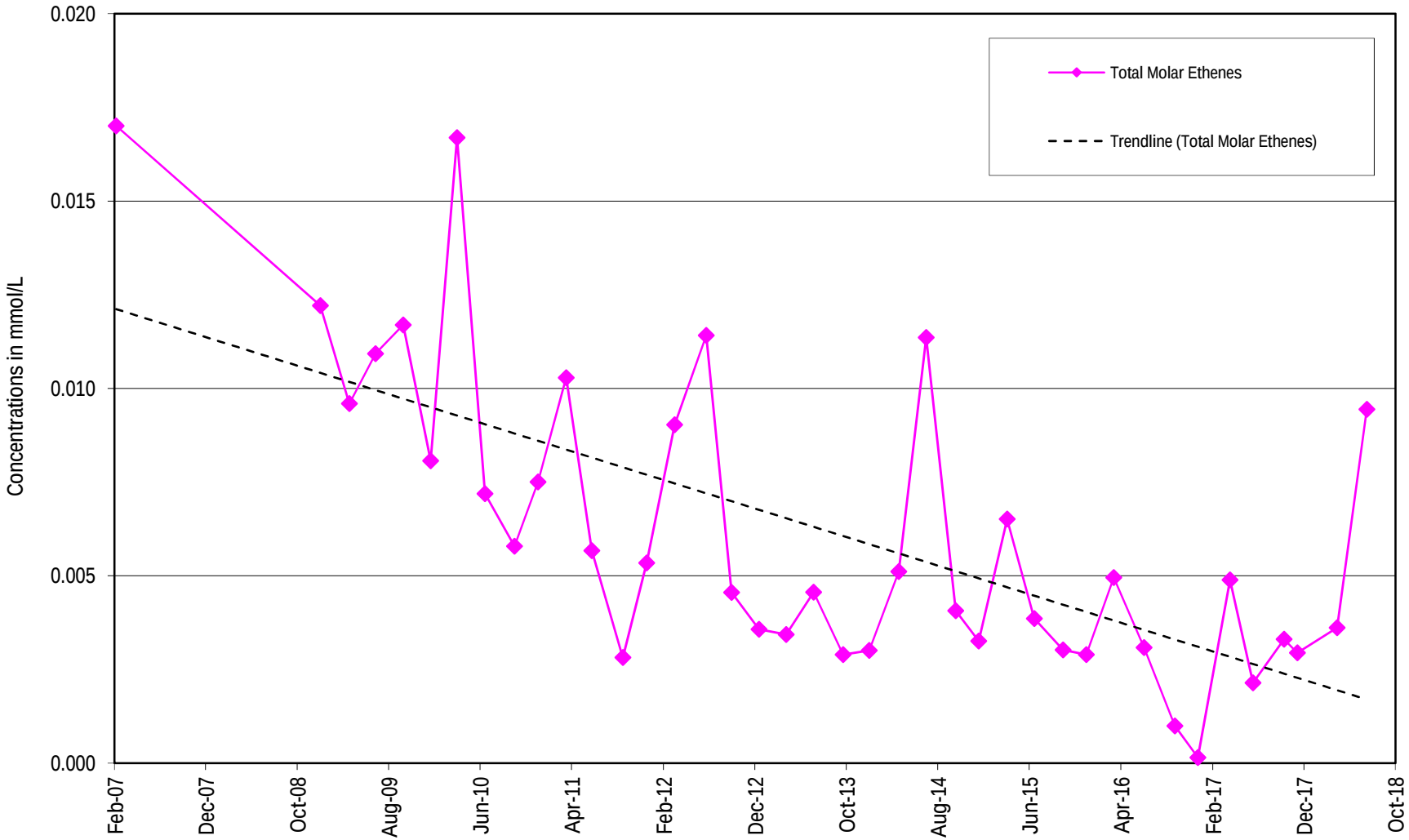


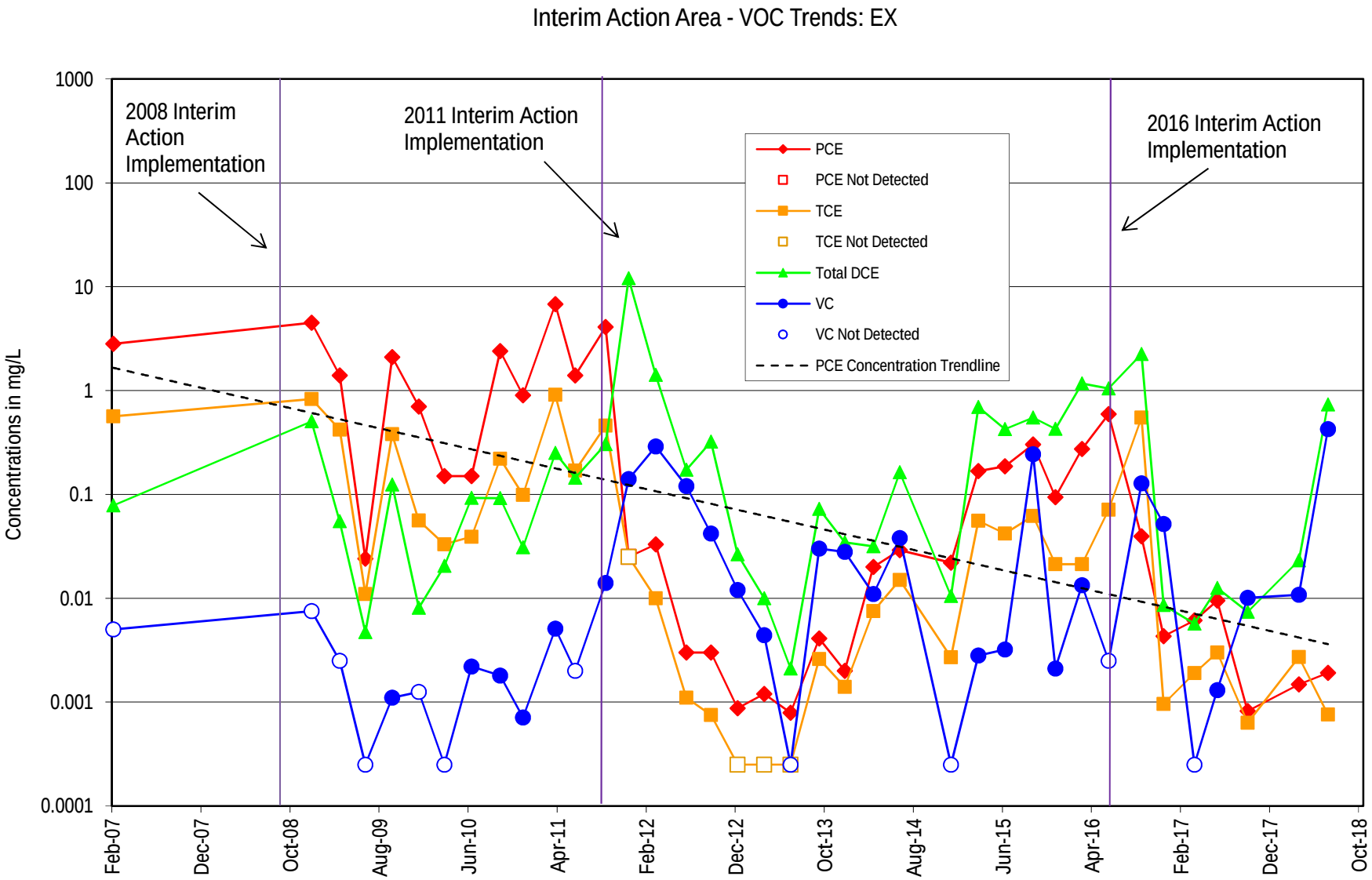
Notes: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MW-7
Concentrations in mmol/L
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18
Total Molar Ethenes
Trendline (Total Molar Ethenes)

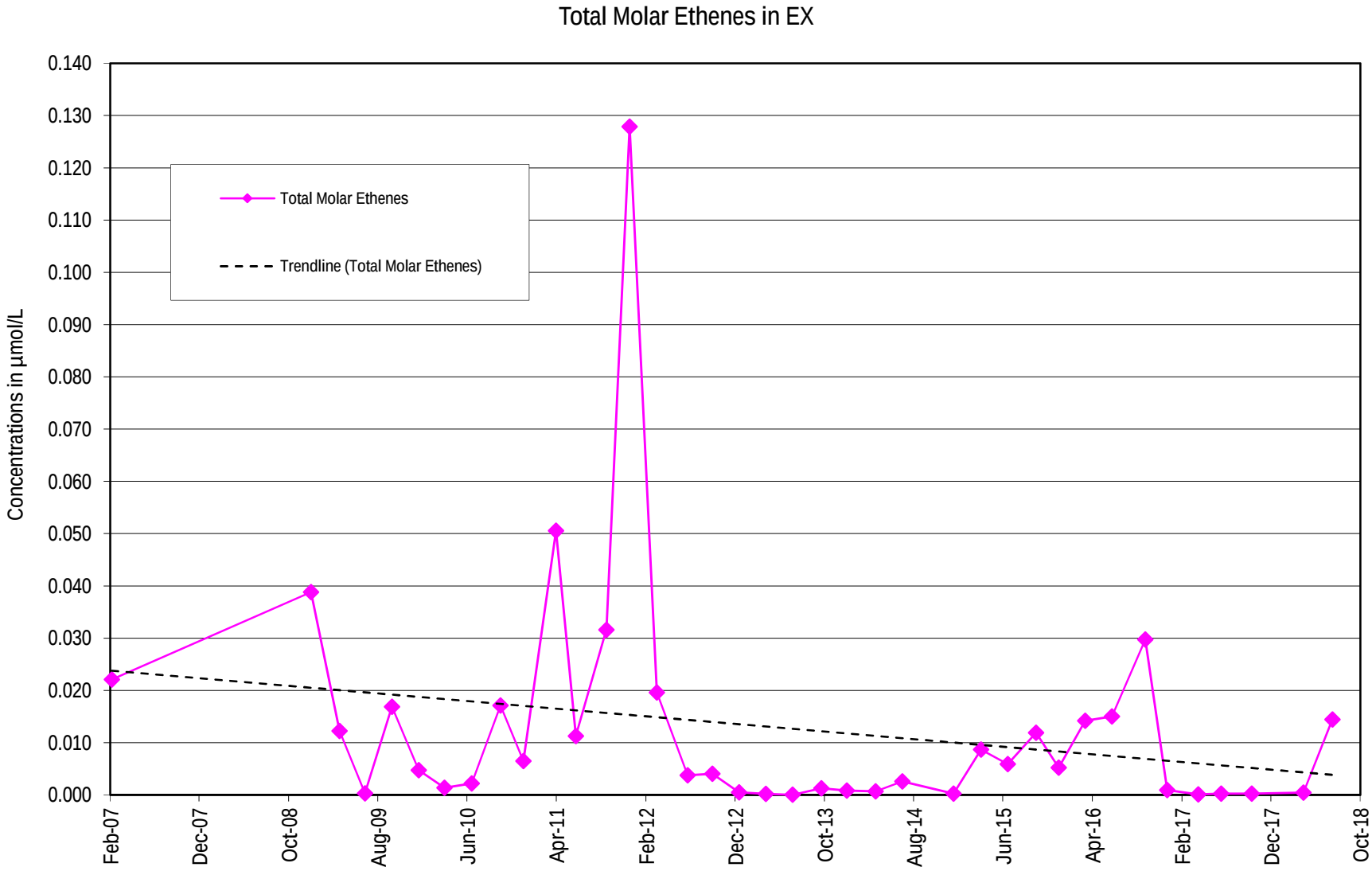


Note: Not detected values plotted at 1/2 the reporting limit.

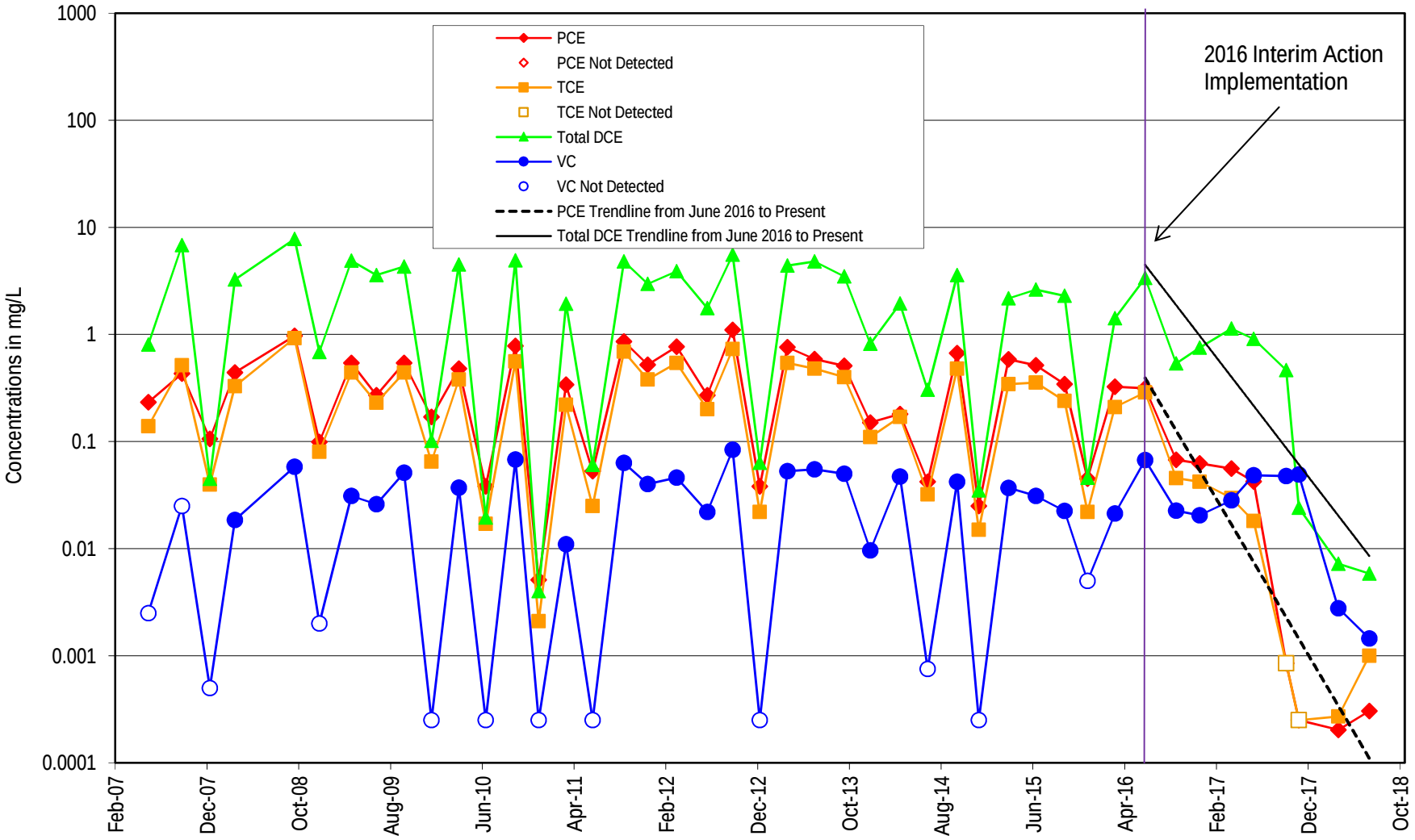

Total Molar Ethenes in MP-1
Concentrations in mmol/L
0.020
0.015
0.010
0.005
0.000
Total Molar Ethenes
Trendline (Total Molar Ethenes)
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18



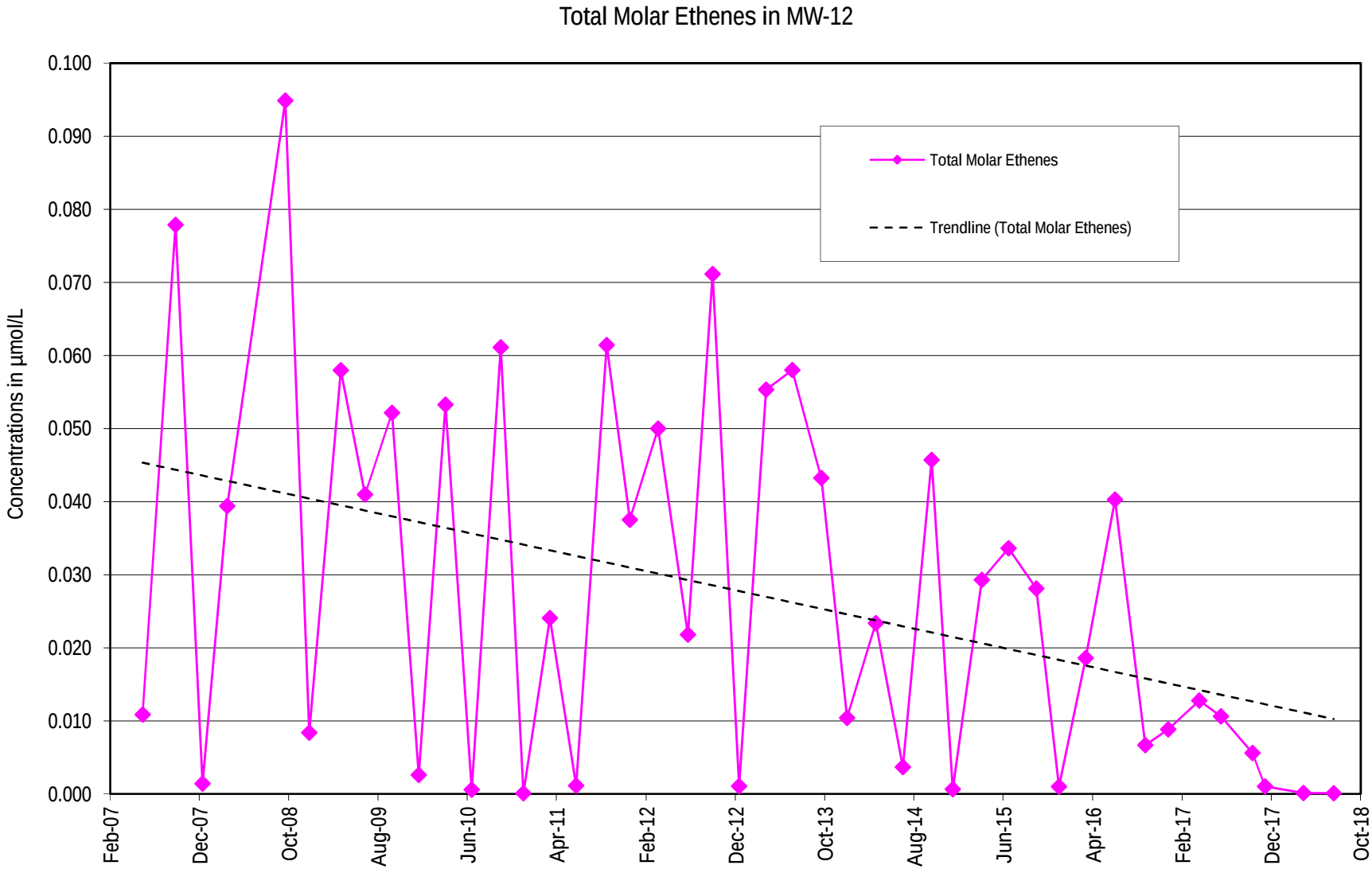
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in EX
Concentrations in µmol/L
0.140
0.130
0.120
0.110
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
Total Molar Ethenes
Trendline (Total Molar Ethenes)
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18

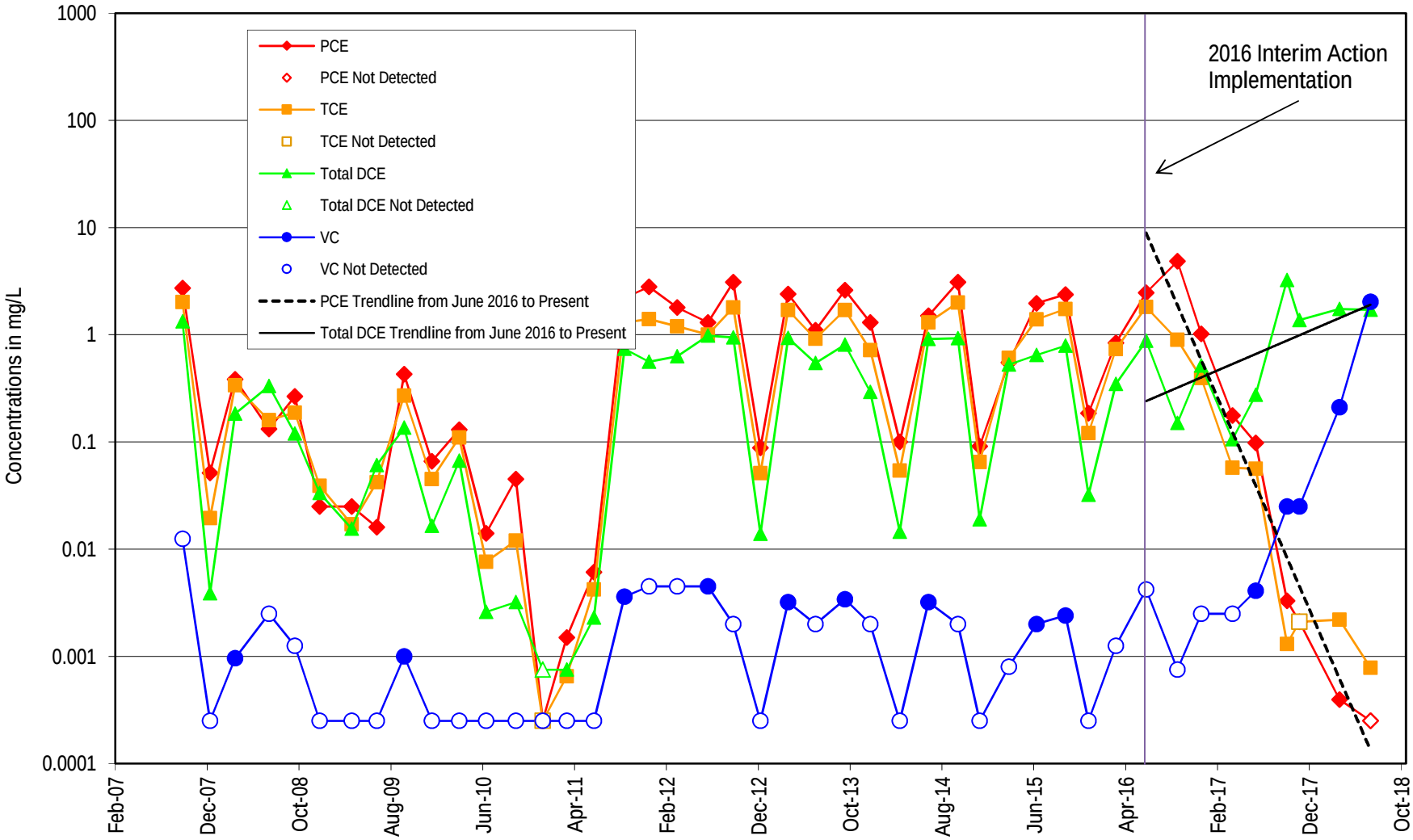
Interim Action Area - VOC Trends: MW-12



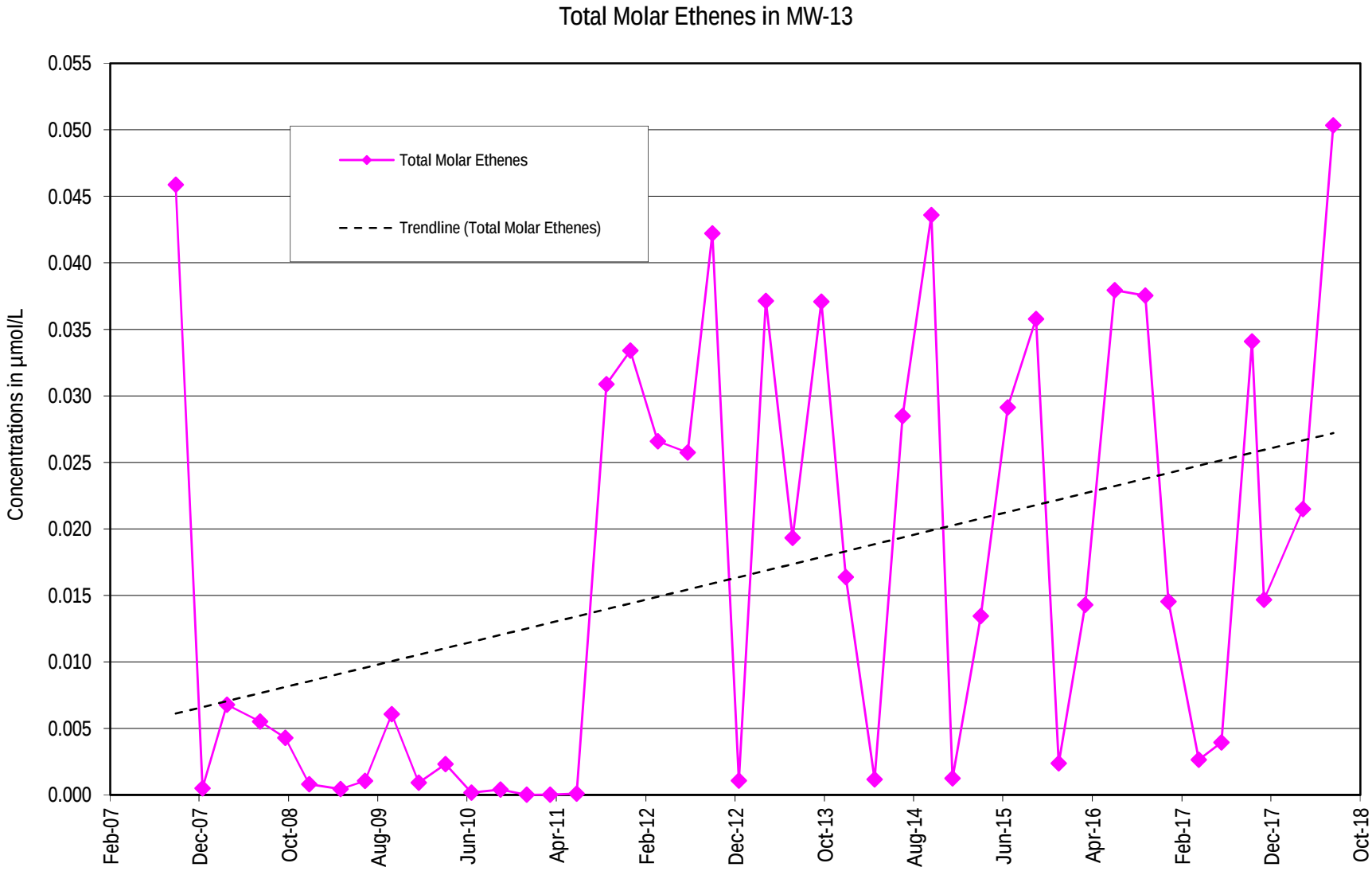
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MW-12
Concentrations in µmol/L
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18
Total Molar Ethenes
Trendline (Total Molar Ethenes)

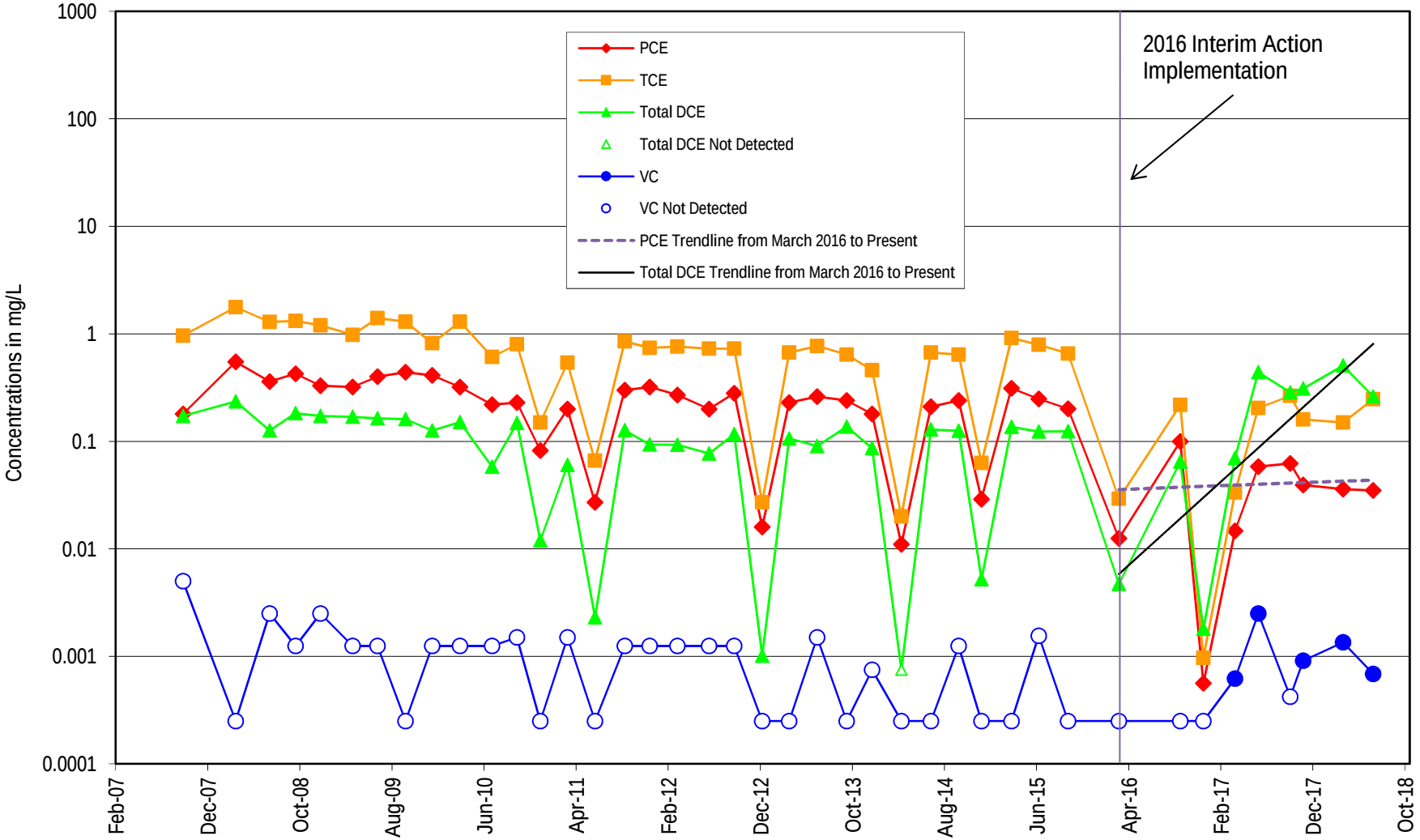
Interim Action Area - VOC Trends: MW-13



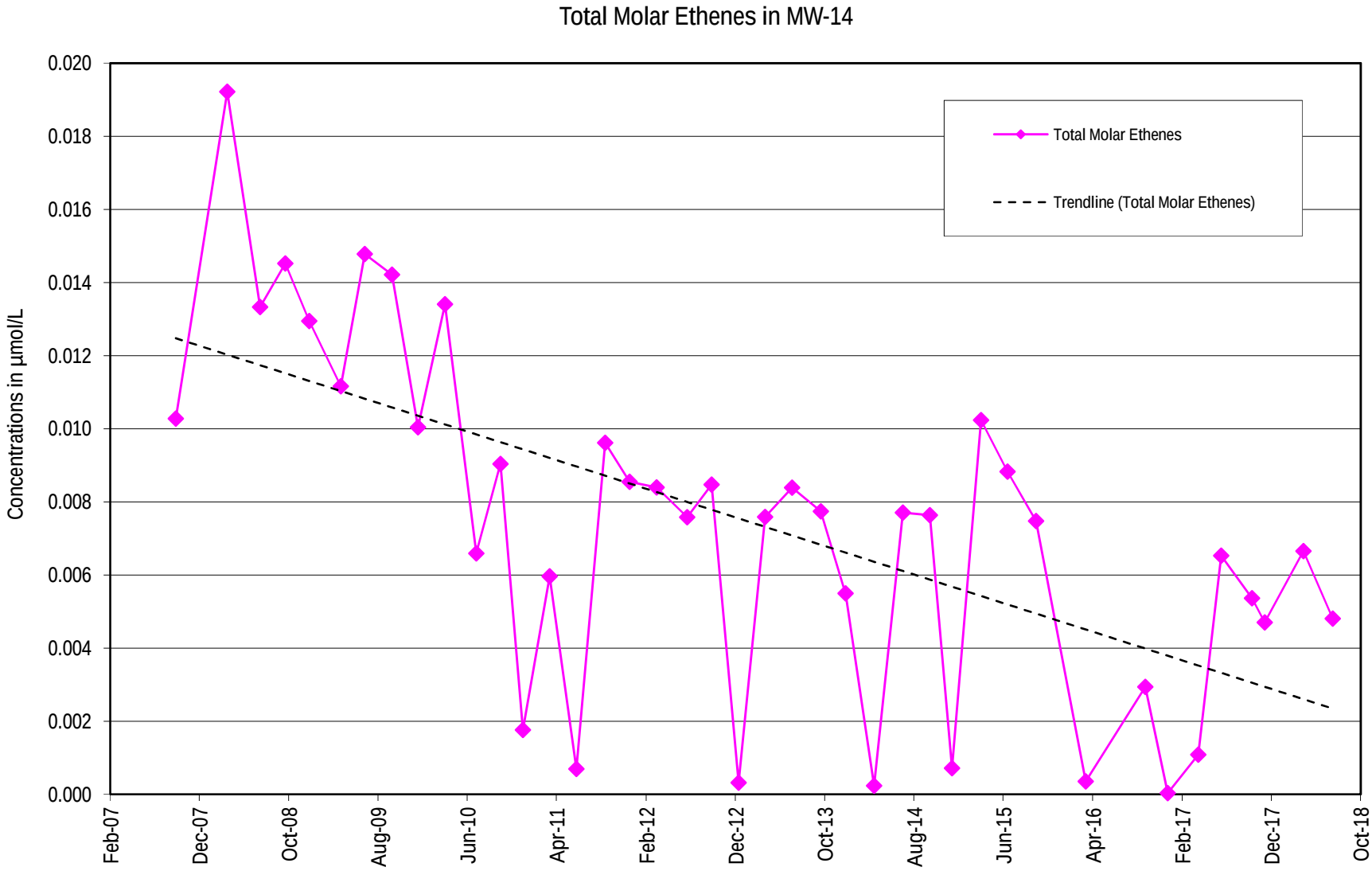
Note: Not detected values plotted at 1/2 the reporting limit.

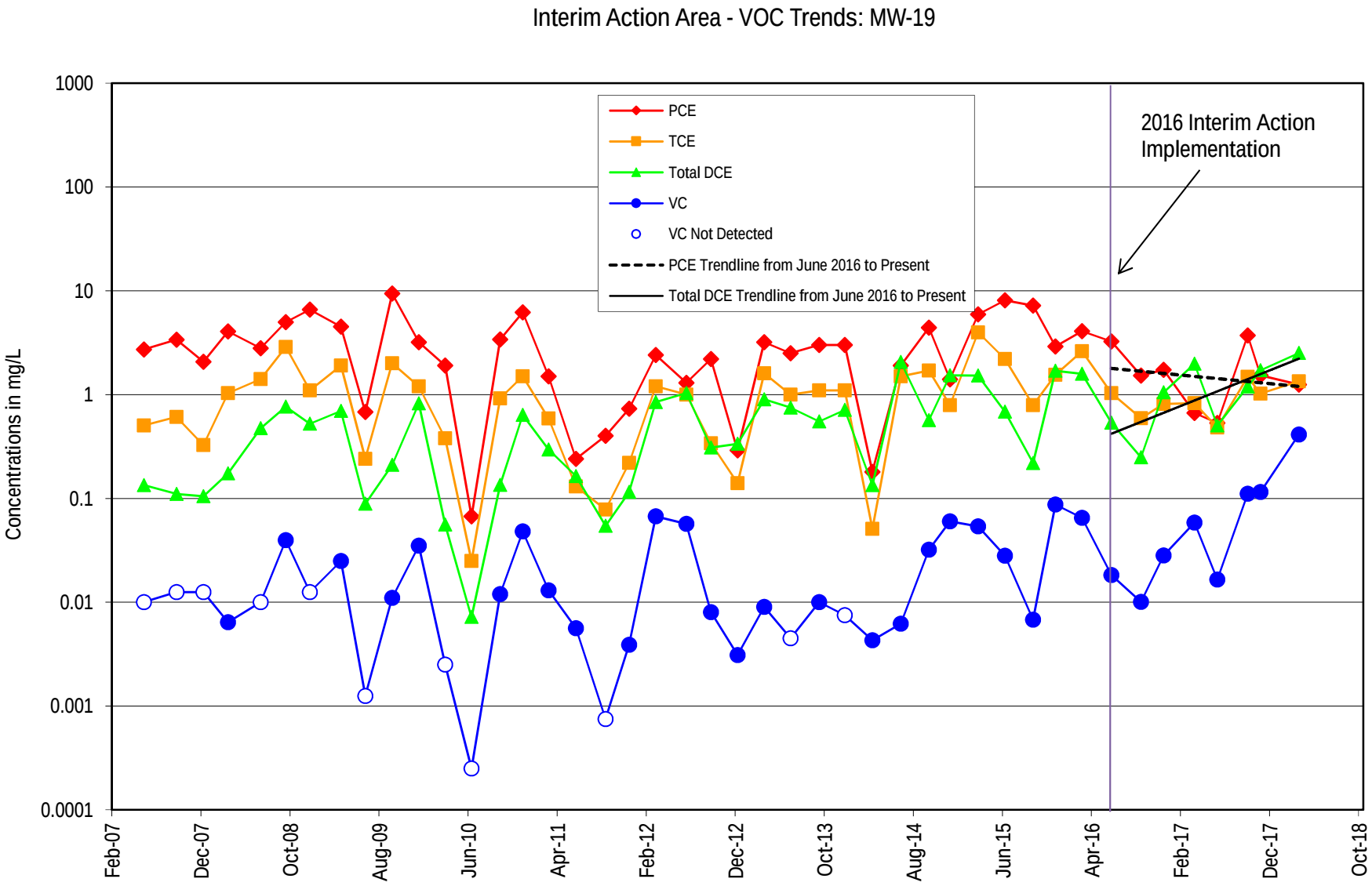

Total Molar Ethenes in MW-13
Concentrations in µmol/L
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Total Molar Ethenes
Trendline (Total Molar Ethenes)
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18

Interim Action Area - VOC Trends: MW-14

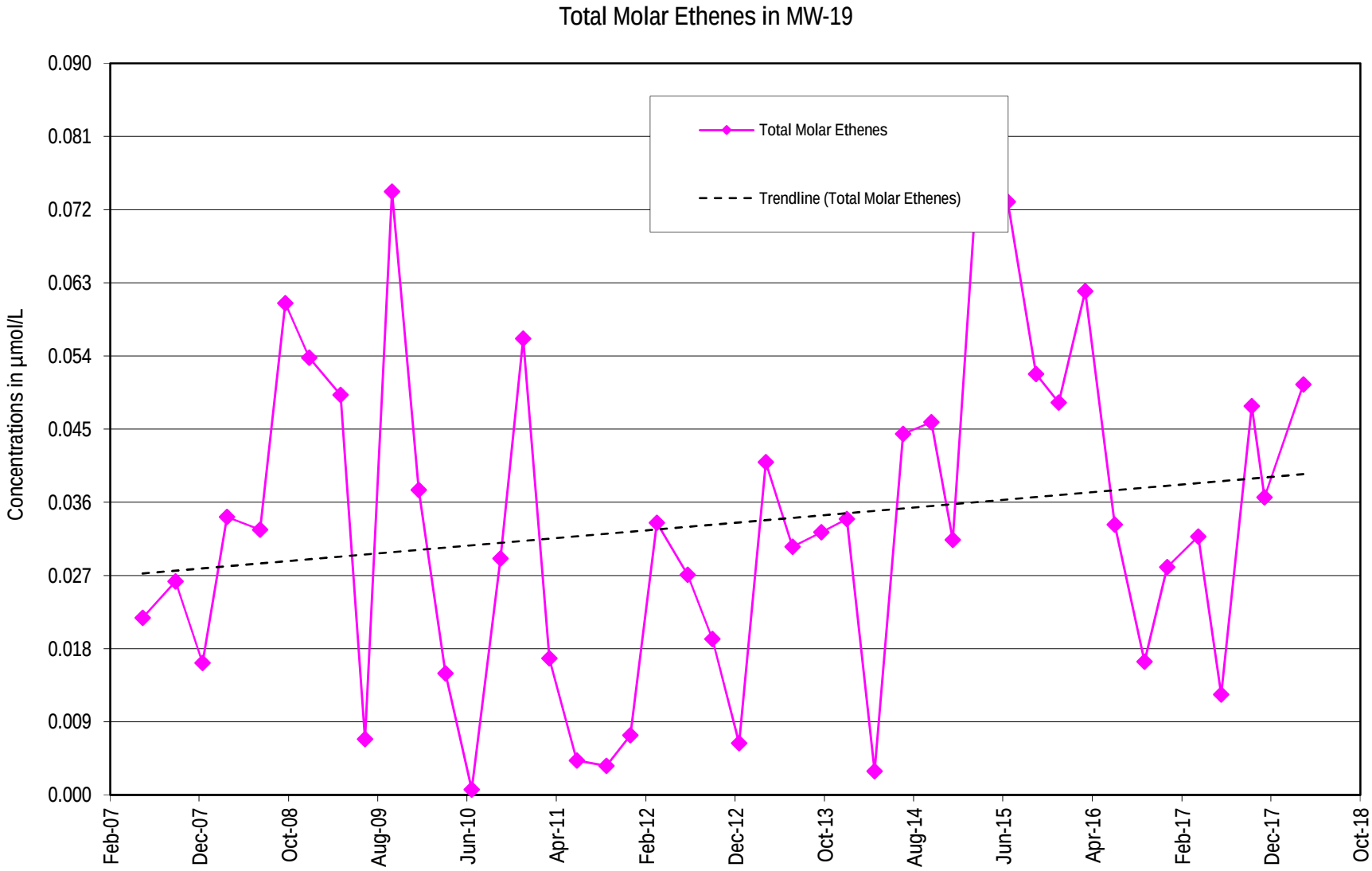


Note: Not detected values plotted at 1/2 the reporting limit.

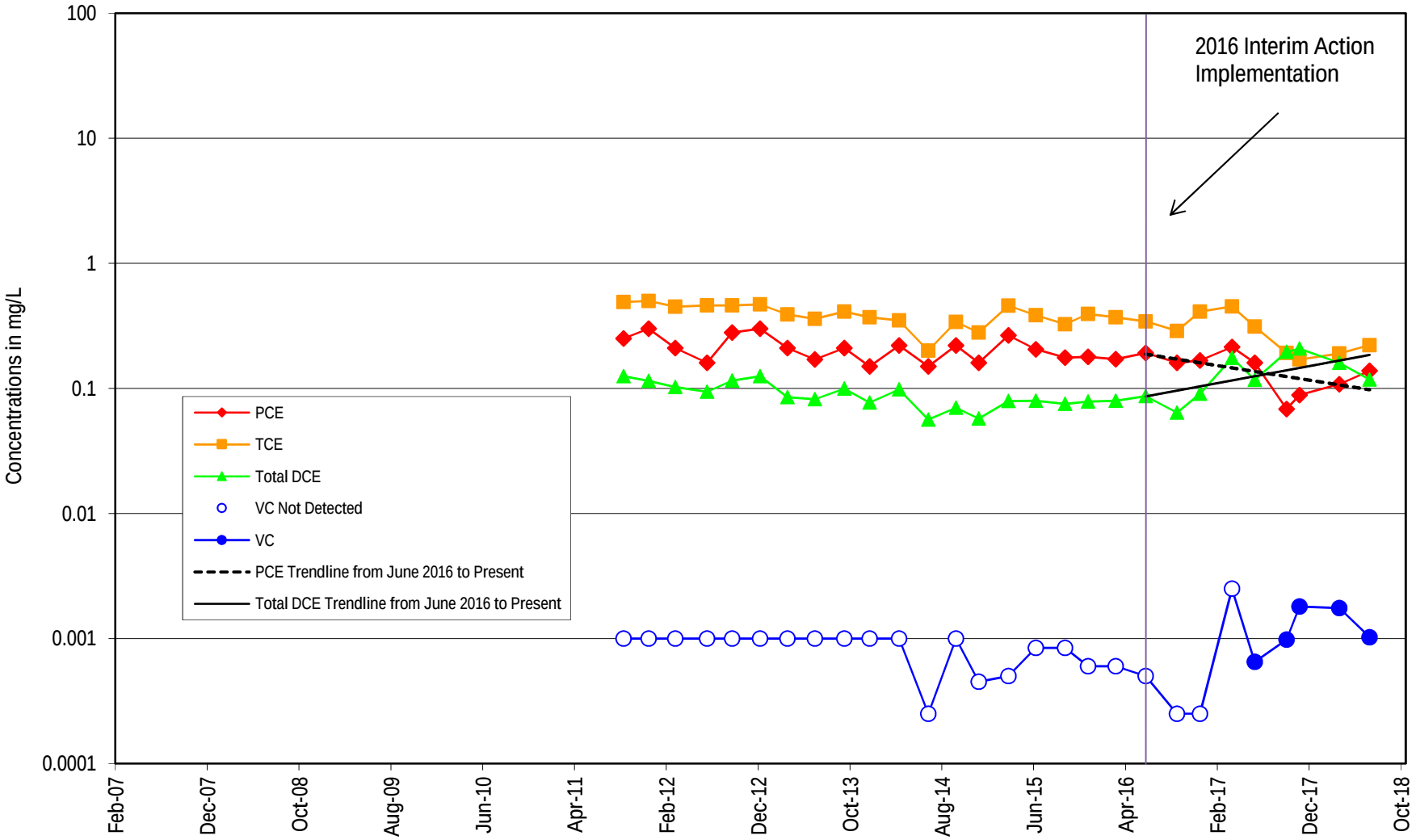

Total Molar Ethenes in MW-14
Concentrations in µmol/L
0.020
0.018
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18
Total Molar Ethenes
Trendline (Total Molar Ethenes)



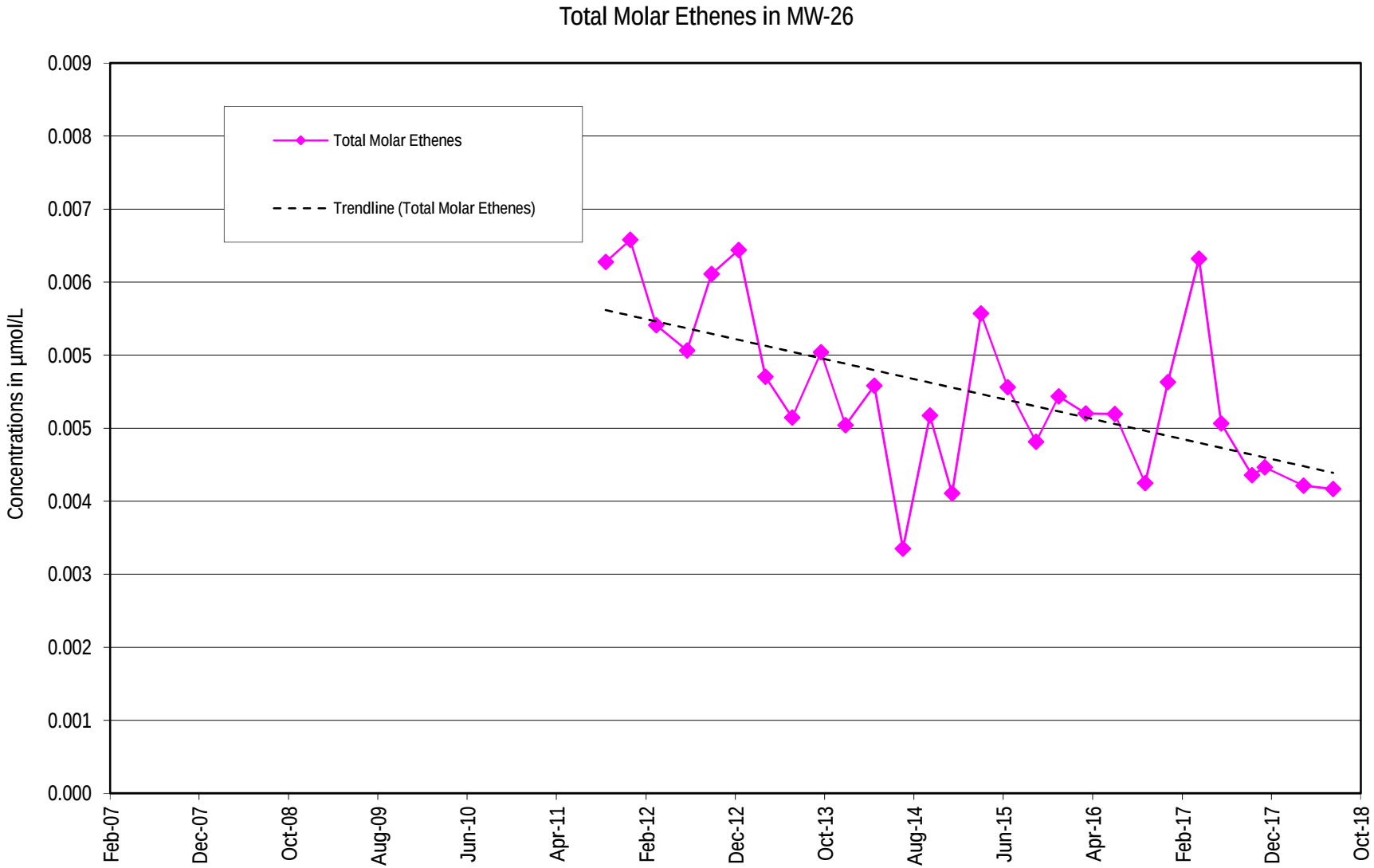
Note: Not detected values plotted at 1/2 the reporting limit.

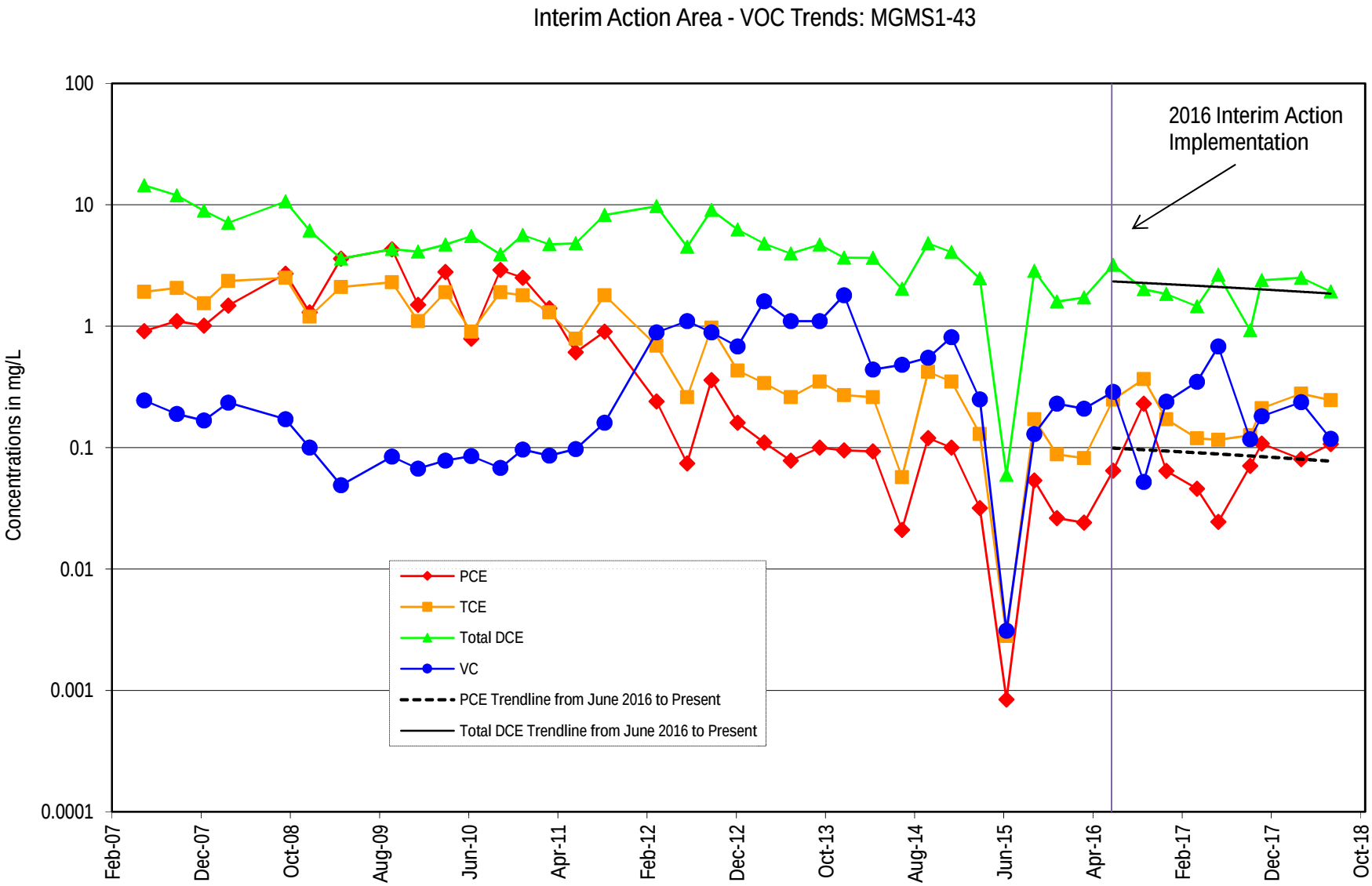

Total Molar Ethenes in MW-19
Concentrations in µmol/L
0.090
0.081
0.072
0.063
0.054
0.045
0.036
0.027
0.018
0.009
0.000
Total Molar Ethenes
Trendline (Total Molar Ethenes)
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18

Interim Action Area - VOC Trends: MW-26

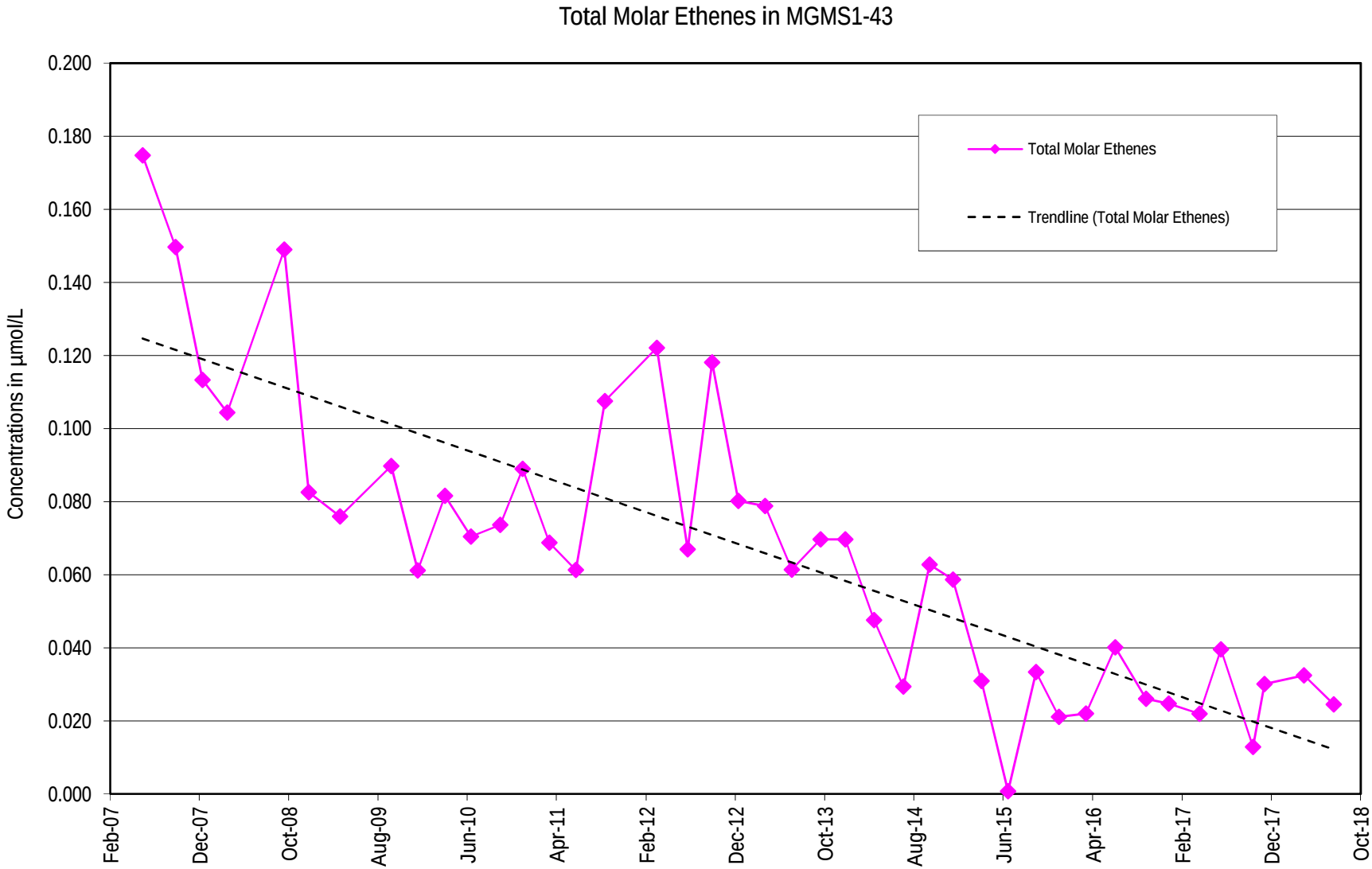


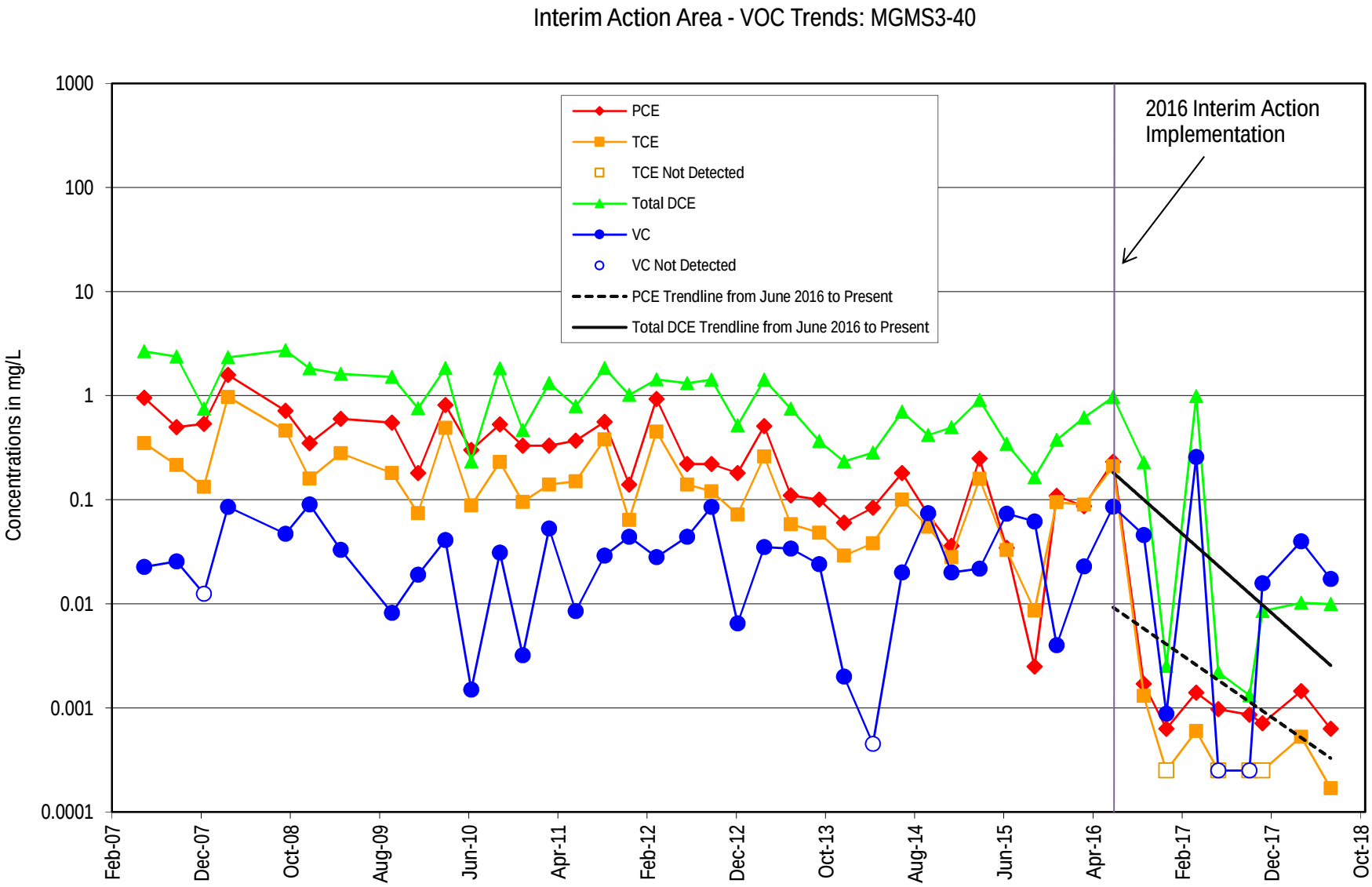
Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MW-26
Total Molar Ethenes
Trendline (Total Molar Ethenes)
Concentrations in µmol/L
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18

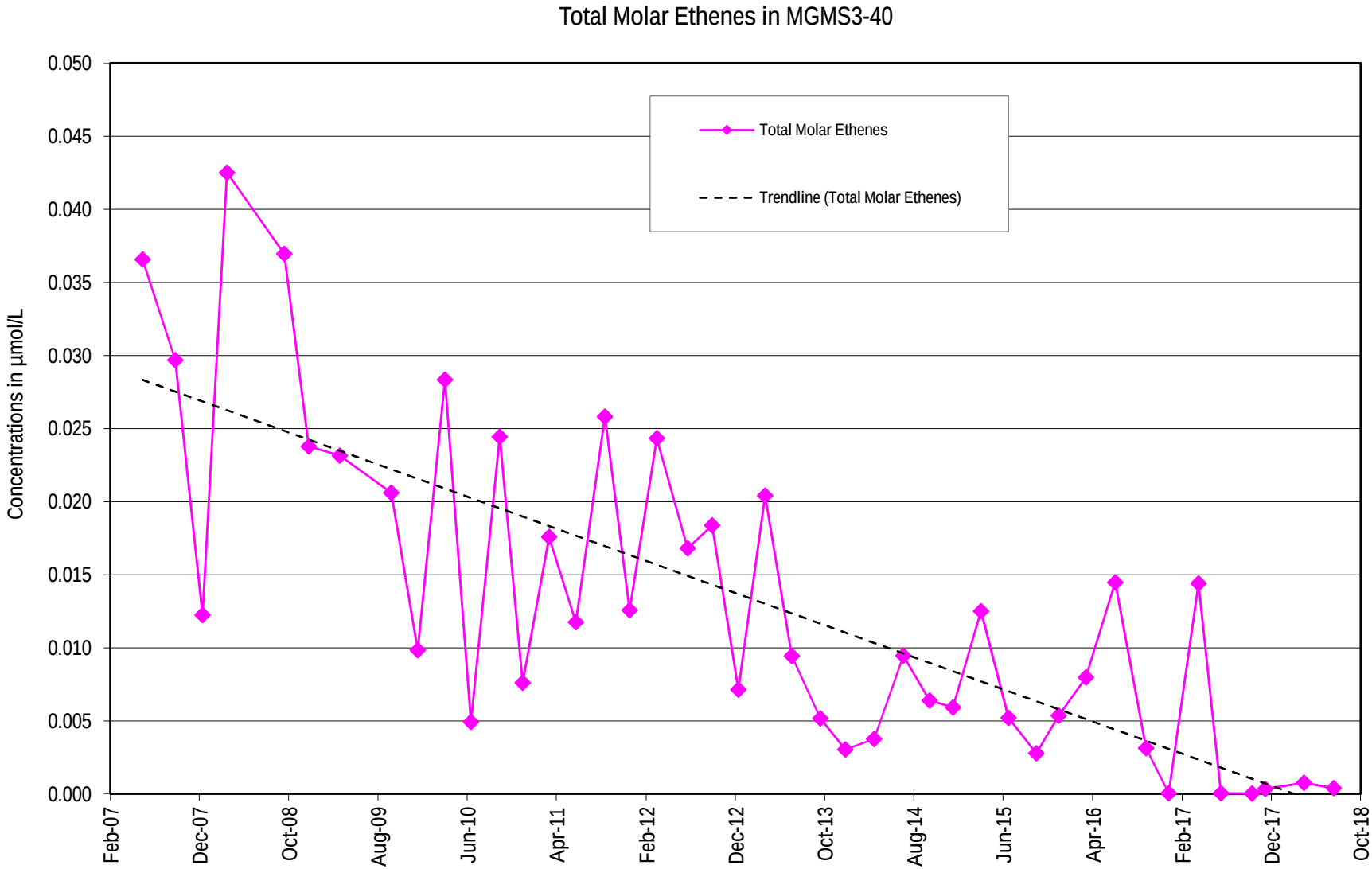


Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MGMS1-43
Concentrations in µmol/L
0.200
0.180
0.160
0.140
0.120
0.100
0.080
0.060
0.040
0.020
0.000
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18
Total Molar Ethenes
Trendline (Total Molar Ethenes)



Note: Not detected values plotted at 1/2 the reporting limit.


Total Molar Ethenes in MGMS3-40
Concentrations in µmol/L
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Total Molar Ethenes
Trendline (Total Molar Ethenes)
Feb-07
Dec-07
Oct-08
Aug-09
Jun-10
Apr-11
Feb-12
Dec-12
Oct-13
Aug-14
Jun-15
Apr-16
Feb-17
Dec-17
Oct-18


Cascadia
Associates, LLC