Bentley Mall East Satellite
2017 Soil Gas and Groundwater Assessment Report

April 20, 2018

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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31-1-20047-006

2017 SOIL GAS AND GROUNDWATER ASSESSMENT REPORT BENTLEY MALL EAST SATELLITE FAIRBANKS, ALASKA ADEC FILE NO. 102.38.122

April 20, 2018

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
ADEC	Alaska Department of Environmental Conservation
BMES	Bentley Mall East Satellite
COPC	contaminant of potential concern
COC	chain of custody
CSM	conceptual site model
1,2-DCE	1,2-dichlorethene
EPA	United States Environmental Protection Agency
Eurofins	Eurofins Air Toxics
GAC	granular activated carbon
IDW	investigation derived waste
LOD	limit of detection
LOQ	limit of quantitation
$\mu g/m^3$	micrograms per cubic meter
PCE	tetrachloroethene
QA	quality assurance
QC	quality control
RPD	relative percent difference
SGS	SGS North America, Inc.
SVE	Soil vapor extraction
TCE	trichloroethene
VOC	volatile organic compound

BENTLEY MALL EAST SATELLITE
SOIL GAS AND GROUNDWATER ASSESSMENT
FINAL REPORT

FAIRBANKS, ALASKA
ADEC FILE NO. 102.38.122

1.0 INTRODUCTION

This report summarizes our Fall 2017 assessment efforts related to the chlorinated-solvent plume and potential vapor intrusion reportedly associated with the Bentley Mall East Satellite (BMES) building, located at 20 College Road in Fairbanks, Alaska. The BMES building is listed by the Alaska Department of Environmental Conservation (ADEC) as a contaminated site (ADEC File 102.38.122), as a result of chlorinated-solvent contamination having been detected in soil and groundwater at the site. Chlorinated solvents are present in the groundwater extending west through the Charles Slater residential subdivision. Assessment work was performed under our Standard Master Services Agreement No. KCI-2016.

1.1 Project Objectives

We understand this report will be used to evaluate groundwater quality in the area downgradient (west) of the BMES building and assess the potential for vapor intrusion into homes and buildings within the affected area. Our objective was to obtain additional information on soil-gas, indoor-air and groundwater conditions downgradient of the site and evaluate potential human-health exposures.

1.2 Scope of Services

Our scope of services included implementing our *Soil Gas and Groundwater Assessment Work Plan* (Work Plan) and preparing this summary report. Prior to assessment activities, the Work Plan was approved by the ADEC's Project Manager, James Fish on October 3, 2017.

Soil-gas and groundwater characterization activities included:

- Collecting groundwater samples from the existing monitoring-well network.
- Collecting soil-gas samples from previously-installed soil-gas ports located on private properties in the Charles Slater subdivision.
- Collecting sub-slab air samples from private residences in the Charles Slater subdivision.
- Collecting indoor-air samples from private and commercial properties within the groundwater plume extent.

This report includes a summary of field activities, analytical laboratory results, conclusions, and recommendations relevant to future management of the site. We have also updated the conceptual site model (CSM) presented in the work plan and included it as Appendix A; both the scoping and graphic forms are provided.

The authorized scope of services was based on the Work Plan. Our scope of services did not include:

- Performing an audit for regulatory compliance.
- Evaluating the presence of contaminants or naturally occurring materials, other than those for which our analyses were performed.

If a service is not specifically indicated in this report, do not assume that it was performed.

This report was prepared for the exclusive use of KE Bentley One, LLC and KGC Bentley Two, LLC. (Owner) and their representatives for evaluating the BMES site. This report should not be used for other purposes without our review, and it should not be used without our approval if any of the following occurs:

- Conditions change due to natural forces or human activity under, at, or adjacent to the site.
- Assumptions stated in this report have changed.
- Project details change or new information becomes available such that our conclusions may be affected.
- The site ownership or land use has changed.
- Regulations, laws, or cleanup levels change.
- The site's regulatory status has changed.

If any of these occurs, we should be retained to review the applicability of our recommendations.

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 Site Description

The BMES building is located at 20 College Road in Fairbanks, Alaska, situated on the southeast corner of the Bentley Mall property (parcel 93181; Figure 1). Tetrachloroethene (PCE) and trichloroethene (TCE) have been detected in the groundwater at and downgradient of the BMES property. The ADEC considers the BMES site to be a source of this contamination, although other suspected sources have also been identified, including VIP Cleaners (Figure 1) directly upgradient from BMES. The groundwater-contaminant plume extends west of the site into the Charles Slater residential subdivision; public water and sewer service serve the area. Based on

previous site-specific groundwater investigations, groundwater flow direction has been found to be to the west and northwest.

2.2 Background

The BMES site was added to the ADEC's Contaminated Sites Database in April 2003 following detections of PCE and TCE in soil and groundwater samples collected as part of a Phase II Environmental Site Assessment. The Phase II report noted a dry cleaner in operation at the BMES building for several years in the 1980s; however, the investigation was unable to pinpoint the PCE and TCE source area due to physical proximity to an upgradient dry cleaning facility known to use products containing PCE. An August 2003 soil-gas survey indicated the historical dry cleaning operation at the BMES building appeared to be the source of PCE and TCE at the BMES property. The results of the survey also indicated the wastewater line from the BMES building may be a preferential pathway of PCE. In April 2005, indoor-air samples were collected from the BMES building and Wells Fargo Bank; PCE and TCE were detected above target levels at that time. Thirteen monitoring wells (MW-1 to MW-13) were installed and sampled in fall 2005; sample results suggested a PCE and TCE plume extending off-site in a westerly direction.

Soil vapor extraction (SVE) systems were installed around the BMES and Wells Fargo Bank buildings in September 2006 and remained active for five years. PCE and TCE concentrations in the source area decreased during this time and in August 2011, ADEC approved ERG's request to shut down the SVE systems citing approval of a groundwater-monitoring schedule.

ERG collected 30 passive soil gas samples along the Noyes Street sewer line in October 2010. ERG indicated relatively low levels of PCE were detected and appeared to be in a clustered formation near 620 and 640 Noyes Street. They concluded it may be indicative of a leaking sewer or storm drain.

In February 2013, ADEC met with ERG to discuss the fall 2012 results that showed increasing concentrations of PCE in MW-1. ADEC subsequently followed up with letters to the owners of VIP cleaners (Figure 1) and the BMES. In the BMES letter dated April 22, 2013, ADEC reopened BMES as a contaminated site and required further evaluation of vapor intrusion risks associated with the groundwater plume.

ERG collected 11 soil-gas samples in September 2015 from the Charles Slater subdivision to assess whether further investigation at the residences was necessary. Soil-gas samples were collected from seven private properties in the Charles Slater subdivision in March 2016. Soil-gas sample results for four of the private property exceeded or nearly exceeded ADEC target levels for PCE, TCE or 1,2-dichlorethene (1,2-DCE). ERG also collected indoor-air samples from 120

Ina Street in November 2015 and January 2016; chlorinated solvents were not detected above ADEC target levels in these samples.

The Owner retained Shannon & Wilson, Inc. in 2016 as their environmental consultant. Shannon & Wilson collected additional soil-gas samples in December 2016 and January 2017 from the Charles Slater subdivision, using the same sampling ports as previous sampling events. ADEC target levels for PCE and TCE were not exceeded during this sampling event. In June 2017, ADEC requested additional samples be collected from the sampling ports to verify the lower concentrations.

2.3 Contaminants of Potential Concern and Cleanup Levels

Contaminants of potential concern (COPCs) associated with the site are PCE, TCE, and 1,2-dichloroethene (1,2-DCE). Additionally, ADEC requested in 2017 chloroform be added to the contaminants of concern for the site.

To evaluate groundwater sample concentrations, we compared the analytical data to 18 AAC 75.341 Table C Groundwater Cleanup Levels for groundwater analytes (January 2017).

Since the approval of our work plan, ADEC promulgated new 18 AAC 75 regulations for COPCs in air. We have included the updated target levels in this report and in our evaluation of the data. To evaluate indoor air-sample concentrations, we compared the analytical data to ADEC target levels listed in Appendix D: DEC Indoor Air Target Levels from ADECs Vapor Intrusion Guidance (November 2017). We also compared *cis*-1,2-DCE and *trans*-1,2-DCE to the site-specific indoor-air target levels provided by ADEC in a September 20, 2017 email. To evaluate soil-gas air-sample concentrations, we compared the analytical data to ADEC target levels listed in Appendix E: DEC Soil Gas Target Levels from ADECs Vapor Intrusion Guidance (November 2017).

3.0 FIELD ACTIVITIES

This section summarizes field activities performed to implement the ADEC-approved work plan between October 17, 2017 and November 10, 2017. Our Sample Collection Logs are included in Appendix B (groundwater) and Appendix C (air). Appendix C also includes building surveys for new indoor-air sample locations.

Our observations are specific to the locations, depths, and times noted on the logs and may not be applicable to all areas of the site. No amount of sampling can precisely predict the characteristics, quality, or distribution of subsurface and site conditions. Potential sources of variation include, but are not limited to:

- The different conditions between sampling locations.
- Variations in the presence, distribution, and concentration of contaminants at our sampling locations; our tests may not represent the highest contaminant concentrations at the site.
- The passage of time or intervening causes (natural and manmade) may result in changes to site and subsurface conditions.
- Contaminant concentrations may change in response to natural conditions, chemical reactions, and/or other events.

If substantial time has elapsed between submission of this report and the start of activities or action based upon it, we should be retained to review the applicability of the conclusions and recommendations, considering the lapsed time or changed conditions.

3.1 Groundwater Sampling

On October 26, 27, and 30, 2017, Shannon & Wilson staff visited each of the site's thirteen monitoring wells. We collected thirteen groundwater samples and two field duplicates (*MW-101* and *MW-108*) from the monitoring wells and analyzed them for volatile organic compounds (VOCs). Sample logs associated with the monitoring-well sampling event are included in Appendix B.

We calculated the groundwater gradient for the October 2017 sampling event using the most recent survey data (December 2016) and depth to water information shown in Table 1. We utilized the Environmental Protection Agency (EPA) online groundwater hydraulic gradient tool to complete the groundwater gradient calculations. Based on the elevation data, we estimate the groundwater flow direction was west with a gradient of about 0.0005 foot/foot at the time of sampling.

3.2 Indoor-Air Sampling

Shannon & Wilson's representative Sheila Hinckley collected air samples associated with this project. Indoor-air VOC samples were collected over a 24-hour period using a 6-liter (L) canister with flow controllers supplied by the analytical laboratory. We collected the samples from high-use areas within the breathing zone (3 to 5 feet off the ground) under building normal conditions.

3.2.1 Commercial Properties

We collected indoor-air VOC samples from two commercial properties within the affected area to assess the effectiveness of the mitigation systems in place at each location (BMES and AutoZone; Figure 1).

To further assess the effectiveness of the vapor intrusion mitigation system (Geo-Seal® vent and barrier) in place at AutoZone, we collected air samples from the below-slab passive vent for VOCs and radon. We collected the VOC sample by deploying sample tubing down the sub-slab vent via the roof riser; sample tubing was set at approximately 5 feet below the top of the roof riser due to an obstruction in the pipe. We collected the sample from the northern vent, and sealed the southern vent to prevent ambient air from being drawn in. We collected the air for VOC analysis into a 1L air canister, as is the practice for sampling the residential soil-gas ports. The indoor-air sample was collected for analysis of VOCs from inside AutoZone at the same time the sample was collected from the vent.

Due to the method needed for sample collection from the passive vent (tubing) and the nature of analytical radon samplers (passive samplers designed for indoor use), we were unable to collect an analytical sample from the sub-slab vent for radon analysis. However, we utilized a RAD7 radon detector to collect continuous radon measurements from November 8, 2017 to November 10, 2017. An analytical indoor-air sample was collected from inside AutoZone for analysis of radon during the same time as the vent sample was collected. The indoor-air radon sample was collected per EMSL Analytical, Inc. (EMSL) instructions.

Sample logs and building surveys associated with the commercial indoor-air sampling event are included in Appendix C.

3.2.2 Private Properties

We collected indoor-air samples from three private properties: 120 Ina Street, 201 Ellingson Street, and 611 Noyes Street (samples *IA4*, *IA5*, and *CS1* respectively) in the Charles Slater subdivision. We were unable to collect samples from SVR3 because the owner/property representative did not respond to our sampling attempts this year. Sample *CS1* was collected from a ground-exposed crawlspace/basement. Sample logs and building surveys associated with the private indoor-air sampling event are also included in Appendix C.

3.3 Soil-Gas Sampling at Private Properties

Our project team attempted to gain access and locate each of the previously-installed soil-gas ports on private properties SVR1 through SVR6 and Monroe High School. We collected samples from the soil-gas ports installed at 311 Noyes Street, 120 Ina Street, 201 Ellingson Street, and 236 Ina Street (SVR1, SVR4, SVR5, and SVR6). We were unable to collect soil-gas samples from SVR2 and SVR3 because the owner/property representative did not respond to our sampling attempts this year. We also collected samples from soil-gas ports SV-13, SV-14, and SV-15 installed at Monroe High School. Additionally, we installed a replacement soil-gas port

near the previous SV-12 location, and collected a sample (*SV-12R*). Samples logs associated with the soil-gas sampling are included in Appendix C.

3.4 Sub-slab Sampling at Private Properties

Our project team gained access to 518 Fulton Street (SS1) to collect samples from the previously-installed sub-slab soil-gas ports. We also gained access and permission for 631 Noyes Street (SS2) to install and sample a sub-slab sampling port. Samples logs associated with the sub-slab soil-gas sampling are included in Appendix C.

3.5 Deviations from Work Plan – Sub-slab Sampling

In general, we conducted our field services in accordance with our approved Work Plan, dated September 2017. The following are the deviations from our scope of services.

The work plan called for installing and sampling sub-slab soil-gas ports at two new private properties in the Charles Slater subdivision. We collected samples at one sub-slab soil-gas location and one indoor-air location (ground-exposed crawlspace).

Due to an oversight, we did not have Design Alaska survey the top-of-casing elevations for each monitoring well following the October 2017 groundwater sampling event. However, it is Shannon & Wilson's standard practice to collect top-of-casing measurements with respect to the ground surface each time a monitoring well is visited. We compared the previous sampling event measurements to the current sampling event measurements and the results were generally the same.

3.6 Investigation-Derived Waste (IDW) Management

Sampling equipment that encountered groundwater was decontaminated prior to use and reuse. We collected monitoring-well purge water during groundwater sampling and treated the water on-site using our portable granular activated carbon (GAC) water-treatment system. We also treated decontamination fluids using our GAC water-treatment system.

Other IDW consisted of disposable sampling equipment (nitrile gloves, plastic bags, etc.), which was disposed at the Fairbanks North Star Borough landfill.

3.7 Sample Custody, Storage, and Transport

After collection, we wrapped the groundwater samples in bubble wrap and placed them in hard-plastic coolers with adequate quantities of frozen ice-substitute to maintain sample temperatures between 0 °C and 6 °C until the samples reached the laboratory. We placed a "temperature

blank" with the samples. Shannon & Wilson maintained custody of the samples until submitting them to the laboratory for analysis. We delivered the water samples to the SGS North America, Inc. (SGS) receiving office in Fairbanks. Water samples were delivered on October 30, 2017.

After air-sample collection, we completed a chain of custody (COC) form and placed it inside the box of canisters for shipment. We placed custody seals on the box of canisters and shipped the samples to Eurofins Air Toxics (Eurofins) via FedEx.

VOC air samples were collected over the course of the project and shipped to Eurofins in seven work orders: 1710563, 1711095A, 1711095B, 1711115A, 1711115B, 1711272A, and 1711272B. The indoor-air radon sample was submitted to EMSL under work order 381710279.

4.0 ANALYTICAL RESULTS

We compared the groundwater analytical results with those listed in Alaska's 18 AAC 75.345 Table C – *Groundwater Cleanup Levels*. Cleanup levels are noted in Table 2 alongside the analytical results. We also compared the groundwater sample results to the groundwater target levels listed in the ADEC *Vapor Intrusion Guidance* (November 2017).

We compared air-sample results with those listed in the ADEC *Vapor Intrusion Guidance*. We used the values listed in Appendix E: DEC Soil Gas Target Levels and Appendix D: DEC Indoor Air Target Levels. Target levels associated with air-sample results are shown on Tables 3 through 6.

A summary of the analytical results for the groundwater samples, soil-gas and sub-slab samples, and indoor-air samples are presented in Tables 2 through 6. The analytical laboratory reports and ADEC data-review checklists are included in Appendices D and E, respectively.

4.1 Groundwater Samples

During the groundwater-sampling event, we collected thirteen analytical samples and two field-duplicate samples from the monitoring wells associated with the project site. The samples were analyzed for VOCs; results are presented on Table 2 and shown on Figures 2 (PCE), 3 (TCE), and 4 (chloroform). Several samples yielded analytical results greater than the applicable ADEC groundwater cleanup levels for PCE, TCE, 1,2-dichloroethane (EDC), and chloroform. Several samples also yielded analytical results less than the applicable ADEC groundwater cleanup levels but greater than the laboratory's detection limit for benzene, chloroform, cis-1,2-DCE, trans-1,2-DCE, EDC, PCE, TCE, and trichlorofluoromethane (Table 2). PCE samples collected

from MW-5 and MW-6 and TCE samples collected from MW-5, MW-6, and MW-10 yield results greater than their associated Vapor Intrusion Groundwater Target Level (Table 2).

4.2 Indoor-Air Samples

We collected four indoor-air samples and one field-duplicate from two commercial properties (Table 3) and two private properties (Table 4) for the analysis of VOCs. PCE and chloroform were detected below the ADEC target levels in each of the project samples. TCE and trans-1,2-DCE were also detected below ADEC target limits sample *CIA01*; these analytes were not detected in the other indoor-air samples. None of the other reported analytes were detected above the laboratory's reporting limit in the indoor-air samples. See Tables 3 and 4 and Figure 5 (PCE) for individual results.

4.2.1 AutoZone Vent Samples

We collected one analytical sample for a limited set of VOCs from the sub-slab passive vent at AutoZone (Table 3). PCE and 1,2-DCE were detected in the sample AZVentN at concentrations below the ADEC target limits. We also collected radon concentrations using a continuous radon monitor. Radon concentrations peaked around 287 picoCuries per liter or air (pCi/L) approximately 18 hours into the three-day monitoring (Appendix D). We collected an analytical radon sample and field duplicate from inside AutoZone during the same timeframe as the continuous radon monitoring of the vent. Radon was detected at 0.8 pCi/L in the indoor-air sample and field-duplicate.

4.3 Ground-exposed Crawlspace Sample

We collected one indoor-air sample from a private property with a ground-exposed crawlspace. The sample *CS1* is shown on Table 4. PCE was detected in the sample at concentrations below the associated residential indoor-air target level. None of the other requested analytes were detected above the laboratory's reporting limit in sample *CS1*.

4.4 Soil-Gas Samples

We collected nine soil-gas samples and two field duplicates from four private properties; these samples were analyzed for a limited set of VOCs (Table 5). Results for the project samples were below ADEC target limits for the detected analytes or not detected above the laboratory reporting limit, with the following exceptions. PCE and TCE were detected above residential soil-gas target levels in sample *SVR4B* and the associated field-duplicate sample *SVR40B.* Chloroform was detected above residential target soil-gas target levels in sample *SV-13.* See Table 5 for individual results.

4.5 Sub-Slab Samples

We collected three sub-slab samples from two private properties in the affected area; these samples were analyzed for a limited set of VOCs (Table 6). PCE was detected below the established ADEC target level in each of the sub-slab samples (*SS1A, SS1B* and *SS2*). Chloroform, 1,1,1-trichloroethane, and TCE were also detected in sample *SS2* below the associated target levels for sub-slab samples. Chloroform was also detected above the associated sub-slab target level in sample *SS1A.* None of the other requested analytes were detected above the laboratory reporting limit for these project samples. See Table 6 for individual results.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

We reviewed the analytical results provided by SGS for laboratory quality control (QC) samples and also conducted our own quality assurance (QA) assessment for this project. Our QA-review procedures allow us to document accuracy and precision of the analytical data and check that the analyses were sufficiently sensitive to detect analytes at levels less than regulatory standards. Our QA/QC assessment is detailed in Appendix F.

By working in general accordance with our scope of services, we consider the samples we collected to represent site conditions at the locations and times they were obtained. Based on our QA review, no data were rejected as unusable due to QC failures, and completeness objectives were met. In general, the quality of the analytical data for this project does not appear to have been compromised by analytical irregularities, and the results are valid for interpreting groundwater and air quality at the BMES site at the times and locations the samples were collected. Individual data results affected by QA/QC failures are “flagged” on Tables 2 through 6, where applicable. Details regarding the QA/QC failures are presented in Appendix F.

6.0 DISCUSSION & RECOMMENDATIONS

6.1 Discussion

6.1.1 PCE/TCE Vapor Intrusion in Charles Slater Subdivision

PCE and TCE exceeded ADEC target levels for soil gas in the samples collected from SVR4B; chloroform exceed ADEC target levels for soil gas in the sample collected from SV-13 and the sub-slab sample collected from SS1A. None of the other COPC analytes exceeded ADEC target levels for the soil-gas, sub-slab, or residential indoor-air samples collected during the fall 2017 sampling event (Tables 3 through 6). Sample results for the fall 2017 samples were comparable to the winter 2016-2017 samples event, which were generally lower than the March 2016 samples, where comparable.

We were able to collect indoor-air samples during the fall 2017 event from SVR4 and SVR5 (*IA4* and *IA5*, respectively), known to be in an area with exceedances for soil-gas and groundwater concentrations. PCE and chloroform were detected in the indoor-air samples, but at concentrations below target levels, despite exceedances in soil-gas concentrations. PCE, where detected in residential indoor-air samples, was less than one tenth of the residential indoor-air target level. According to the ADEC Vapor Intrusion Guidance for Contaminated Sites, no additional indoor-air samples are necessary to investigate variability and seasonal trends for PCE. The exposure across this pathway is considered insignificant for the Charles Slater subdivision and in our opinion no further evaluation of this pathway is necessary at this time.

Based on Shannon & Wilson's evaluation of the available soil-gas, sub-slab, and residential indoor-air sample results for the Charles Slater Subdivision, we conclude that vapor intrusion from the BMES PCE groundwater plume has not resulted in indoor-air concentrations greater than target ADEC screening levels.

6.1.2 Chloroform Vapor Intrusion in Charles Slater Subdivision

The chloroform concentration detected in the sample collected at SS1A exceeded the ADEC sub-slab target level of 12 µg/m^3. None of the other COPCs for the site exceeded target levels in the sample collected at SS1A.

6.1.3 Indoor-air Sampling at Commercial Properties

We collected indoor-air samples from two businesses near and downgradient from the BMES building (Table 3; Figure 5). PCE and chloroform were detected in each of the commercial indoor-air samples at concentrations less than the ADEC indoor-air target level for commercial properties.

Samples were collected at the BMES building from the newly-renovated Wild Wings restaurant (*CIA08*/*CIA108*). Results were comparable to the samples collected from BMES at Alaska Ammo during the 2016-2017 sampling event. These results suggest the vapor barrier remains effective and unaffected by renovations.

Samples were collected from AutoZone in approximately the same location as the 2016-2017 winter sampling event. PCE and chloroform were detected below the ADEC target levels in the sample. AutoZone is a relatively new building that was constructed using a Geo-Seal® vapor intrusion barrier. We understand AutoZone stores chemicals known to contain PCE, such as various brake parts cleaners known to contain up to 98 percent by weight PCE. It is possible other sources of PCE may be present there and contributed to the high PCE result observed

during the previous sampling event. Furthermore, radon was used as a tracer/surrogate for vapor intrusion assessment at the AutoZone property. Results suggest vapor intrusion is not likely occurring and the mitigation system is functioning. In our opinion, the elevated concentration of PCE in indoor air reported during the 2016-2017 sampling event is not attributable to vapor intrusion. It is likely that an alternate source, such as a commercial product in the store's inventory, contributed to the anomalous result.

6.1.4 Groundwater Sampling

We conducted Mann-Kendall trend analysis for PCE and TCE on the historical monitoring well results using the EPA ProUCL software. Due to the large percentage of not-detect results for 1,2-DCE, we did not complete trend analysis for these analytes (*cis* and *trans*). The Mann-Kendall trend analysis is a non-parametric assessment of the data set that tests whether the data exhibit an increasing or decreasing trend. A summary of the ProUCL output for the Mann-Kendall trend test (95-percent significance level) is presented in Table 7. An updated table of the historical results used for Mann-Kendall analysis and graphical representations of the historical data are included as Appendix G. Results of the Mann-Kendall analysis are the same as the previous sampling event, as shown below. We were unable to assess seasonal effects using Mann-Kendall analysis due to the lack of available data throughout each quarter in the recent data sets.

The Mann-Kendall test indicated there was evidence of trends for PCE and TCE as follows:

- a decreasing trend for PCE in MW-2, MW-3, MW-4, MW-7, MW-10 and MW-13;
- an increasing trend for PCE in MW-1, MW-8, and MW-11;
- a decreasing trend for TCE in MW-2, MW-4, MW-7, and MW-10; and
- an increasing trend for TCE in MW-1, MW-8, and MW-11.

The increasing trends observed for PCE and TCE in MW-8 and MW-11 are likely due to expected movement at the plume front. Despite increasing PCE trends in MW-8 and MW-11, the current groundwater results for PCE in MW-8 and MW-11 are below ADEC cleanup levels (41 µg/L). The increasing trend observed for TCE in MW-8 and MW-11 are likely attributable to degradation of PCE. The current TCE result for MW-11 is above the ADEC cleanup level of 2.8 µg/L at 2.84 µg/L.

The time-series plot of PCE concentrations over time show significant increases of PCE concentrations in MW-1 starting in 2010. However, concentrations in MW-1 have generally decreased since the 2012 sampling event. Results from groundwater sampling in July 2013 indicate PCE in MW-1 is isotopically different from other areas of the plume and likely related

to an active dry cleaner located upgradient of MW-1, who is known to use PCE. Dry cleaning operations at the BMES building ceased in the early 1980s.

6.2 Recommendations

Based on our field observations and analytical sample results, we recommend the following:

- Continue current annual groundwater sampling frequency, per previous site closure plan.
- Follow-up vapor intrusion assessment of chloroform at 518 Fulton Street with another round of soil-gas and indoor-air sampling. It is likely vapor intrusion is not a complete pathway at this location; however, an indoor-air sample has not been collected from this location.
- Investigate upgradient and outside sources of chloroform that may have contributed to the current chloroform detections. This should include speaking with ADEC about other sources in the area and sampling of upgradient monitoring wells.
- Follow-up vapor intrusion assessment with another round of soil-gas and indoor-air sampling in October 2020 from each of the sampling locations that have been part of the project in the past. If sample results continue to decrease or show indoor-air results below ADEC target levels, move to sampling on a three-year frequency, until groundwater-sample results for monitoring wells in the Charles Slater subdivision decline below ADEC groundwater clean-up levels. Details regarding future sampling events should be submitted in a work plan to ADEC.
- Request that ADEC confirm our conclusion that vapor intrusion is likely not the cause of elevated 2016 PCE concentration in indoor air at the AutoZone store.
- Request that ADEC send additional communications to VIP Cleaners to complete assessment of their own property to determine whether they may be contributing to the spike of PCE, TCE and chloroform in MW-1.

7.0 CLOSURE

This report was prepared for the use of KE Bentley One, LLC and KGC Bentley Two, LLC., ADEC, and their representatives for evaluating remaining chlorinated-solvent contamination near the BMES building in Fairbanks, Alaska. Our conclusions and recommendations are based on:

- The limitations of our approved scope, schedule, and budget described in our proposal dated October 9, 2017.
- Our understanding of the project and information provided by the ADEC and the Owner.

- Site conditions we observed during our visits between October and November 2017.
- The results of testing performed on water and air samples we collected.
- The requirements in Alaska's 18 AAC 75.345 Table C – *Groundwater Cleanup Levels* and ADEC Vapor Intrusion Guidance.
- The November 2016 *Soil Gas and Groundwater Assessment Work Plan* approved by ADEC on November 18, 2016.

State and/or federal agencies may require reporting of the information included in this report. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore has not, and will not, disclose the results of this study unless specifically requested and authorized by KE Bentley One, LLC and KGC Bentley Two, LLC., or as required by law. Regulatory agencies may reach different conclusions than Shannon & Wilson. We have prepared the attachment, *Important Information about Your Geotechnical/Environmental Report,* in Appendix H to assist you and others in understanding the uses and limitations of our reports.

8.0 REFERENCES

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TABLE 1
OCTOBER 2017 GROUNDWATER ELEVATION SUMMARY

Monitoring Well	Date Measured	Depth to Water (feet below TOC)	Measured Depth of Well (feet below TOC)	TOC Elevation † (feet above MSL)	Groundwater Elevation † (feet above MSL)	Northing	Easting
MW-1	10/26/2017	15.53	19.50	446.39	430.86	3968802.33	1375863.73
MW-2	10/26/2017	15.65	19.06	445.92	430.27	3968843.16	1375711.63
MW-3	10/26/2017	15.44	45.65	446.13	430.69	3968845.70	1375708.45
MW-4	10/26/2017	15.55	18.45	444.38	428.83	3968953.67	1375712.01
MW-5	10/27/2017	17.62	29.41	447.72	430.10	3969118.40	1374819.90
MW-6	10/27/2017	17.45	21.29	447.56	430.11	3969124.45	1374818.59
MW-7	10/27/2017	19.74	23.80	449.69	429.95	3969410.57	1374417.21
MW-8	10/30/2017	11.94	20.20	441.60	429.66	3969218.39	1373663.25
MW-9	10/27/2017	11.68	20.46	441.48	429.80	3969203.76	1374201.91
MW-10	10/27/2017	12.96	20.97	442.93	429.97	3968967.07	1374612.88
MW-11	10/30/2017	12.04	20.22	441.82	429.78	3968941.18	1374060.37
MW-12	10/26/2017	15.39	20.83	445.72	430.33	3968917.64	1375316.66
MW-13	10/27/2017	15.75	21.00	446.16	430.41	3968766.05	1375576.75

Notes: We calculated the groundwater gradient using the most recent survey data (December 2016) and information shown above. We estimate the groundwater flow direction was west with a gradient of about 0.0005 foot/foot. Hydraulic groundwater gradient was calculated using monitoring wells MW-1, MW-2, MW-3, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, and MW-13.

TOC Top of Casing

MSL Mean Sea Level

bgs Below Ground Surface

† Wells were surveyed on December 20, 2016.

-- Not Applicable

TABLE 2
SUMMARY OF GROUNDWATER-SAMPLE RESULTS

Analytical Method	Analyte	ADEC Groundwater Cleanup Level	Residential Vapor Intrusion Groundwater Target Level	Commercial Vapor Intrusion Groundwater Target Level	Units	*MW-1*	*MW-101 (dup of MW-1)*	*MW-2*	*MW-3*	*MW-4*	*MW-5*	*MW-6*	*MW-7*	*MW-8*	*MW-108 (dup of MW-8)*	*MW-9*	*MW-10*	*MW-11*	*MW-12*	*MW-13*
SW8260C	1,2,3-Trichloropropane	0.0075	22	94	µg/L	**<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**	**<0.500**	**<0.500**
	1,2-Dichloroethane	1.7	22	98	µg/L	**2.80**	**3.28**	<0.250	0.580	0.270 J	0.540	0.420 J	0.280 J	<0.250	<0.250	<0.250	0.540	<0.250	0.390 J	0.270 J
	Benzene	4.6	16	69	µg/L	<0.200	<0.200	<0.200	0.270 J	<0.200	0.190 J	0.120 J	<0.200	<0.200	<0.200	<0.200	0.220 J	<0.200	0.130 J	<0.200
	Chloroform	2.2	8.1	36	µg/L	**14.2**	**15.9**	2.15	<0.500	<0.500	1.66	1.54	<0.500	0.440 J	0.460 J	0.730 J	0.630 J	<0.500	0.550 J	2.07
	cis-1,2-Dichloroethene	36	N/A	N/A	µg/L	<0.500	<0.500	1.38	0.400 J	0.480 J	1.70	1.67	2.22	0.900 J	0.940 J	4.06	2.58	1.75	1.81	<0.500
	Tetrachloroethene (PCE)	41	58	240	µg/L	**131**	**159**	**85.3**	<0.500	40.5	**98.2**	**77.8**	7.04	2.67	2.79	11.6	**44.9**	7.88	**146**	21.1
	trans-1,2-Dichloroethene	360	N/A	N/A	µg/L	<0.500	<0.500	<0.500	<0.500	1.83	0.340 J	<0.500	<0.500	10.8	11.0	8.53	<0.500	23.6	<0.500	<0.500
	Trichloroethene (TCE)	2.8	5.0	21	µg/L	0.780 J	0.960 J	1.09	<0.500	2.60	**13.6**	**8.19**	2.69	1.16	1.22	**4.04**	**8.54**	**2.84**	**6.47**	<0.500
	Trichlorofluoromethane	5,200	N/A	N/A	µg/L	30.5	38.1	11.4	1.89	5.93	7.83	5.34	<0.500	<0.500	<0.500	<0.500	0.980 J	5.51	1.87	2.13

Notes:
ADEC Groundwater-Cleanup Levels from 18 AAC 75.345, Table C.
MW-1, MW-2, MW-3, MW-4, MW-12, and MW-13 are compared to the Commercial Vapor Intrusion Groundwater Target Level.
MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11 are compared to the Residential Vapor Intrusion Groundwater Target Level.
Samples were collected between October 26 and 30, 2017.
Sample number *MW-101* is a field-duplicate of sample *MW-1* .
Sample number *MW-108* is a field-duplicate of sample *MW-8* .

ADEC Alaska Department of Environmental Conservation
µg/L micrograms per liter
VOC volatile organic compounds
bold Reporting limit (LOD) or detected concentration exceeds regulatory limit.
BOLD Detected concentration exceeds regulatory limit.
BOLD Detected concentration exceeds groundwater cleanup level and associated Vapor Intrusion Groundwater Target Level.
-- No ADEC Cleanup Level is established for this analyte
< Analyte not detected above the limit of quantitation (LOQ); reported as less than the LOQ. Flag applied by the laboratory.
J Estimated concentration reported below the LOQ. Flag applied by the laboratory.

TABLE 3
SUMMARY OF COMMERCIAL INDOOR-AIR RESULTS

Analytical Method	Analyte	CAS Number	ADEC Commercial Indoor-Air Target Levels *	Units	Wild Wings		AutoZone	AutoZone
					CIA08	CIA108	CIA01	AZventN †
					11/10/2017	11/10/2017	11/9/2017	11/8/2017
TO-15 (VOCs)	Tetrachloroethene (PCE)	127-18-4	41	µg/m^3	14	15	13	22
	Chloroform	67-66-3	5.3	µg/m^3	1.1	1.0	0.28	<2.4
	1,1,1-Trichloroethane	71-55-6	3,800	µg/m^3	<0.19	<0.20	<0.16	<2.6
	Vinyl Chloride	75-01-4	28	µg/m^3	<0.044	<0.046	<0.039	<1.2
	1,1-Dichloroethene	75-35-4	79	µg/m^3	<0.068	<0.072	<0.060	<1.9
	trans-1,2-Dichloroethene	156-60-5	350 ‡	µg/m^3	<0.68	<0.72	0.98	12
	1,1-Dichloroethane	75-34-3	77	µg/m^3	<0.14	<0.15	<0.12	<2.0
	cis-1,2-Dichloroethene	156-59-2	35 ‡	µg/m^3	<0.14	<0.14	<0.12	<1.9
	Trichloroethene (TCE)	79-01-6	2.2	µg/m^3	<0.18	<0.19	0.29	<2.6
	Radon	10043-92-2	--	pCi/L	--	--	0.8	287 §

Notes: Refer to the Eurofins Air Toxics, Ltd. report for additional details (Work Orders 1711272A and 1711272B).
Samples were analyzed by Method TO-15.
Sample number *CIA108* is a field duplicate of *CIA08.*

ADEC Alaska Department of Environmental Conservation
* ADEC Commercial Indoor-Air Target Level Updated from January 2017 Vapor Intrusion Guidance for Contaminated Sites (Appendix D).
‡ Site-specific cleanup level provided by ADEC in September 20, 2017 email.
µg/m^3 microgram per cubic meter
pCi/L picoCuries per liter of air
† Sample collected from below-slab vent and does not represent indoor-air concentrations.
§ Peak result noted at approximately 18 hours into sample collection. See Appendix D for associated graph.
-- Not applicable
< Analyte not detected; reporting limit shown.

TABLE 4

SUMMARY OF RESIDENTIAL INDOOR-AIR RESULTS

Analytical Method	Analyte	CAS Number	ADEC Residential Indoor-Air Target Levels *	Units	120 Ina Street	201 Ellingson Street	611 Noyes Street
				Sample	IA4	IA5	CS1
				Date	11/5/2017	10/18/2017	10/31/2017
TO-15 (VOCs)	Tetrachloroethene (PCE)	127-18-4	41	µg/m^3	1.8	1.6	0.93
	Chloroform	67-66-3	1.2	µg/m^3	0.64	0.54	<0.15
	1,1,1-Trichloroethane	71-55-6	3,800	µg/m^3	<0.16	<0.18	<0.17
	Vinyl Chloride	75-01-4	1.7	µg/m^3	<0.038	<0.042	<0.039
	1,1-Dichloroethene	75-35-4	79	µg/m^3	<0.058	<0.065	<0.061
	trans-1,2-Dichloroethene	156-60-5	83.4 ‡	µg/m^3	<0.58	<0.65	<0.61
	1,1-Dichloroethane	75-34-3	18	µg/m^3	<0.12	<0.13	<0.12
	cis-1,2-Dichloroethene	156-59-2	8.3 ‡	µg/m^3	<0.12	<0.13	<0.12
	Trichloroethene (TCE)	79-01-6	2.0	µg/m^3	<0.16	0.26	<0.16

Notes: Refer to the Eurofins Air Toxics, Ltd. report for additional details (Work Orders 1711095A and 1711115B).

ADEC Alaska Department of Environmental Conservation

* ADEC Residential Indoor-Air Target Level Updated from November 2017 Vapor Intrusion Guidance for Contaminated Sites (Appendix D).

‡ Site-specific cleanup level provided by ADEC in September 20, 2017 email.

µg/m^3 microgram per cubic meter

< Analyte not detected; reporting limit shown.

TABLE 5
SUMMARY OF RESIDENTIAL SOIL-GAS RESULTS

Analytical Method	Analyte	CAS Number	ADEC Residential Soil Gas Target Levels *	Units	311 Noyes Street		120 Ina Street			201 Ellingson Street	615 Monroe Street				
				Sample Date	SVR1A 10/16/2017	SVR1B 10/16/2017	SVR4A 11/4/2017	SVR4B 11/4/2017	SVR40B (Dup of SVR4B) 11/4/2017	SVR5 10/17/2017	SV12R 10/18/2017	SV-13† 10/16/2017	SV14 10/17/2017	SV140 10/17/2017	SV15 10/18/2017
TO-15 (VOCs)	Tetrachloroethene (PCE)	127-18-4	410	µg/m^3	6.2	16	180	**1,500**	**1,500**	100	17	1.8	2.5	2.5	56
	Chloroform	67-66-3	12	µg/m^3	5.2	1.4	**<25**	<3.9	<3.8	<1.2	1.7	**57**	<1.2	<1.2	<1.2
	1,1,1-Trichloroethane	71-55-6	52,000	µg/m^3	<1.4	<1.4	<28	<4.3	<4.2	19	3.6	<1.2	<1.3	<1.3	<1.3
	Vinyl Chloride	75-01-4	17	µg/m3	<0.64	<0.65	<13	<2.0	<2.0	<0.65	<0.65	<0.57	<0.62	<0.62	<0.63
	1,1-Dichloroethene	75-35-4	2,100	µg/m^3	<0.99	<1.0	<20	<3.1	<3.1	<1.0	<1.0	<0.89	<0.96	<0.96	<0.97
	trans-1,2-Dichloroethene	156-60-5	N/A	µg/m^3	19	<1.0	8,200	65	65	<1.0	<1.0	<0.89	<0.96	<0.96	<0.97
	1,1-Dichloroethane	75-34-3	180	µg/m^3	<1.0	<1.0	<21	<3.2	<3.1	<1.0	<1.0	<0.91	<0.98	<0.98	<0.99
	cis-1,2-Dichloroethene	156-59-2	N/A	µg/m^3	<0.99	<1.0	<20	<3.1	<3.1	<1.0	<1.0	<0.89	<0.96	<0.96	<0.97
	Trichloroethene (TCE)	79-01-6	20	µg/m3	<1.3	<1.4	**<27**	**150**	**150**	15	<1.4	<1.2	<1.3	<1.3	<1.3

Notes: Refer to the Eurofins Air Toxics, Ltd. report for additional details (Work Orders 1710563, 1711095B, and 171115A).
Samples were analyzed by Method TO-15.
ADEC Alaska Department of Environmental Conservation
* ADEC Residential Soil Gas Target Level Updated from November 2017 Vapor Intrusion Guidance for Contaminated Sites (Appendix E).
Bold Reporting limit exceeds the associated Residential Soil Gas Target Level.
Bold Result exceeds the ADEC Residential Soil Gas Target Level.
N/A cleanup level not applicable
µg/m^3 microgram per cubic meter
< Analyte not detected; reporting limit shown.

TABLE 6
SUMMARY OF RESIDENTIAL SUB-SLAB SOIL-GAS RESULTS

Analytical Method	Analyte	CAS Number	Residential Sub-Slab Target Levels (NOV 2017)	Units	518 Fulton Street		631 Noyes Street
					SS1A	SS1B	SS2
					10/18/2017	10/18/2017	10/27/2017
TO-15 (VOCs)	Tetrachloroethene (PCE)	127-18-4	410	µg/m^3	2.8	4.3	130
	Chloroform	67-66-3	12	µg/m^3	**13**	3.8	3.0
	1,1,1-Trichloroethane	71-55-6	52,000	µg/m^3	<1.5	<1.4	5.6
	Vinyl Chloride	75-01-4	17	µg/m^3	<0.69	<0.64	<0.63
	1,1-Dichloroethene	75-35-4	2,100	µg/m^3	<1.1	<0.99	<0.97
	trans-1,2-Dichloroethene	156-60-5	N/A	µg/m^3	<1.1	<0.99	<0.97
	1,1-Dichloroethane	75-34-3	180	µg/m^3	<1.1	<1.0	<0.99
	cis-1,2-Dichloroethene	156-59-2	N/A	µg/m^3	<1.1	<0.99	<0.97
	Trichloroethene (TCE)	79-01-6	20	µg/m^3	<1.4	<1.3	12

Notes: Refer to the Eurofins Air Toxics, Ltd. report for additional details (Work Orders 1710563 and 1711095B).
Samples were analyzed by Method TO-15.
ADEC Alaska Department of Environmental Conservation
* ADEC Residential Sub-Slab Soil Gas Target Level Updated from November 2017 Vapor Intrusion Guidance for Contaminated Sites (Appendix E).
Bold Result exceeds the ADEC Residential Sub-slab Target Level.
N/A cleanup level not applicable
µg/m^3 microgram per cubic meter
< Analyte not detected; reporting limit shown

TABLE 7
MANN-KENDALL TREND ANALYSIS - PCE AND TCE

Well	PCE Trend	TCE Trend
MW-1	Increasing*	Increasing*
MW-2	Decreasing	Decreasing
MW-3	Decreasing	No Trend †
MW-4	Decreasing	Decreasing
MW-5	No Trend †	No Trend †
MW-6	No Trend †	No Trend †
MW-7	Decreasing	Decreasing
MW-8	Increasing	Increasing
MW-9	No Trend †	No Trend †
MW-10	Decreasing	Decreasing
MW-11	Increasing	Increasing
MW-12	No Trend †	No Trend †
MW-13	Decreasing	No Trend †

Notes:
Mann-Kendall Trend analysis was conducted using the EPA ProUCL Version 5.1 Statistics Software.

EPA Environmental Protection Agency
PCE tetrachloroethene
TCE trichloroethene
† Insufficient evidence to identify a trend at the specified level of significance.
* A spike was detected in 09/2012. Results appear to be decreasing since spike.

LEGEND

- Bentley Mall Properties
- Monitoring Wells
- Indoor-Air and Soil-Gas Property
- Soil-Gas Property
- Soil-Gas Property - Access Not Granted
- Indoor-Air Property
- Subslab Soil-Gas Property

0 50 100 200 300 400 500

Feet

N

Bentley Mall East Satellite
Fairbanks, Alaska

Site Map

April 2018

31-1-20047-001

SHANNON & WILSON, INC.
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Figure 1

Legend

- PCE not detected
- Detected below cleanup level
- Detected above cleanup level
- Bentley Mall Properties

0 50 100 200 300 400 500

Feet

N

Bentley Mall East Satellite
Fairbanks, Alaska

GROUNDWATER SAMPLING RESULTS OCTOBER 2017 PCE

April 2018 31-1-20047-006

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Figure 2

Legend

- TCE not detected
- TCE detected below cleanup level
- TCE detected above cleanup level
- Bentley Mall Properties

0 50 100 200 300 400 500

Feet

N

Bentley Mall East Satellite
Fairbanks, Alaska

GROUNDWATER SAMPLING RESULTS OCTOBER 2017 TCE

April 2018 31-1-20047-006

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Figure 3

Legend

- Chloroform not detected
- Chloroform detected below cleanup level
- Chloroform detected above cleanup level
- Bentley Mall Properties

0 50 100 200 300 400 500

Feet

N

Bentley Mall East Satellite
Fairbanks, Alaska

GROUNDWATER SAMPLING RESULTS OCTOBER 2017 CHLOROFORM

April 2018 31-1-20047-006

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Figure 4

LEGEND

Commercial Indoor Air	Commercial Soil Vapor (Vent)	Soil Vapor	PCE Result Above Target Level
Residential Indoor Air	Residential Soil Vapor	Residential Subslab	Bentley Mall Properties

Note:
Air-sample concentrations in micrograms per cubic meter are shown below location name, where samples were collected.

0 250 500
Feet

N

Bentley Mall East Satellite
Fairbanks, Alaska

Air-Sample Results-PCE

April 2018 31-1-20047-006

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Figure 5

APPENDIX A

CONCEPTUAL SITE MODEL FORM

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Bentley Mall East Satellite
ADEC File No. 102.38.122

Completed By: Kristen Freiburger/Shannon & Wilson, Inc.
Date Completed: February 9, 2018

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Current & Future Receptors

Media	Transport Mechanisms	Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ Surface Soil (0-2 ft bgs)	☑ Direct release to surface soil (check soil) ☑ Migration to subsurface (check soil) ☑ Migration to groundwater (check groundwater) ☑ Volatilization (check air) ☐ Runoff or erosion (check surface water) ☐ Uptake by plants or animals (check biota) ☐ Other (list):	☑ soil	☑ Incidental Soil Ingestion				C/F			
			☐ Dermal Absorption of Contaminants from Soil							
			☐ Inhalation of Fugitive Dust							
☑ Subsurface Soil (2-15 ft bgs)	☑ Direct release to subsurface soil (check soil) ☑ Migration to groundwater (check groundwater) ☑ Volatilization (check air) ☐ Uptake by plants or animals (check biota) ☐ Other (list):	☑ groundwater	☑ Ingestion of Groundwater	C/F	C/F		C/F			
			☑ Dermal Absorption of Contaminants in Groundwater	C/F	C/F		C/F			
			☐ Inhalation of Volatile Compounds in Tap Water							
☑ Ground-water	☑ Direct release to groundwater (check groundwater) ☑ Volatilization (check air) ☐ Flow to surface water body (check surface water) ☐ Flow to sediment (check sediment) ☐ Uptake by plants or animals (check biota) ☐ Other (list):	☑ air	☑ Inhalation of Outdoor Air	C/F	C/F	C/F	C/F			
			☑ Inhalation of Indoor Air	I	C/F	C/F	C/F			
			☐ Inhalation of Fugitive Dust							
☐ Surface Water	☐ Direct release to surface water (check surface water) ☐ Volatilization (check air) ☐ Sedimentation (check sediment) ☐ Uptake by plants or animals (check biota) ☐ Other (list):	☐ surface water	☐ Ingestion of Surface Water							
			☐ Dermal Absorption of Contaminants in Surface Water							
			☐ Inhalation of Volatile Compounds in Tap Water							
☐ Sediment	☐ Direct release to sediment (check sediment) ☐ Resuspension, runoff, or erosion (check surface water) ☐ Uptake by plants or animals (check biota) ☐ Other (list):	☐ sediment	☐ Direct Contact with Sediment							
		☐ biota	☐ Ingestion of Wild or Farmed Foods							

Revised, 10/01/2010

Print Form

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name: Bentley Mall East Satellite

File Number: ADEC File No. 102.38.122

Completed by: Kristen Freiburger / Shannon & Wilson, inc.

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources *(check potential sources at the site)*

- ☐ USTs
- ☐ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☒ Other: Dry cleaning waste disposal

Release Mechanisms *(check potential release mechanisms at the site)*

- ☐ Spills
- ☐ Leaks
- ☐ Direct discharge
- ☐ Burning
- ☒ Other: Undocumented releases

Impacted Media *(check potentially-impacted media at the site)*

- ☒ Surface soil (0-2 feet bgs*)
- ☒ Subsurface soil (>2 feet bgs)
- ☒ Air
- ☐ Sediment
- ☒ Groundwater
- ☐ Surface water
- ☐ Biota
- ☐ Other:

Receptors *(check receptors that could be affected by contamination at the site)*

- ☒ Residents (adult or child)
- ☒ Commercial or industrial worker
- ☒ Construction worker
- ☐ Subsistence harvester (i.e. gathers wild foods)
- ☐ Subsistence consumer (i.e. eats wild foods)
- ☒ Site visitor
- ☒ Trespasser
- ☐ Recreational user
- ☐ Farmer
- ☒ Other: Down gradient private-well users, if any.

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

If the box is checked, label this pathway complete: Complete

Comments:

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future? ☒

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the ground-water is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350. ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

Area is serviced by municipal water supply; however, pathway is marked complete to account for unknown wells, likely for garden use, that may be present in area.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future? ☐

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities). ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods? ☐

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)? ☐

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.) ☐

If all of the boxes are checked, label this pathway complete: Incomplete

Comments:

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Are the contaminants in soil volatile (see Appendix D in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminted soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures) ☒

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

Chemical concentrations are below ADEC screening levels (1/10th of DEC health-based cleanup levels specific to that pathway) in indoor-air samples collected from residential locations down gradient from the source area. The exposure across this pathway is considered insignificant for the Charles Slater subdivision and no further evaluation of this pathway is necessary.

3. **Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

Check the box if further evaluation of this pathway is needed: ☒

Comments:

TCE, PCE, 1,2-dichloroethane, and chloroform are present above ADEC cleanup levels in groundwater samples collected from monitoring wells at the source area and down gradient (west) of the property.

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

Check the box if further evaluation of this pathway is needed: ☒

Comments:

Down gradient private-well users, if any. However, previous studies have determined there are no private drinking-water wells in the area.

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM_{10}). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

APPENDIX B

SAMPLE COLLECTION LOGS - GROUNDWATER SAMPLES

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location Bently Mall
Sampling Personnel APW
Weather Conditions Cloudy Air Temp. (°F) 30

Project No. 31-1-20047
Date 10/26/17
Well MW-1
Time started 12:20
Time completed 13:10

Sample No. MW-1 Time 12:59
Duplicate MW-101 Analysis: VOCs Time 12:49
Equipment Blank (EB) - Analysis: - Time -

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale G / Controller B2
Purging Method (portable) / dedicated pump
Pumping Start 12:32
Purge Rate (gal./min.) ~1
Pumping End 13:02

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) 20
Measured Total Depth of Well Below MP (ft.) 19.50
Depth to Water Below MP (ft.) 15.53
Depth to Ice (if frozen) Below MP (ft.) -
Feet of Water in Well 3.97
Gallons per foot 0.17
Gallons in Well 0.675
Gallons in Well x3 = 2.02
(also enter on back) Total Gallons Purged _____
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Pump Set Depth Below MP (ft.) ~17
KuriTec Tubing (ft.) ~25
TruPoly Tubing (ft.) -
Silicone Tubing (ft.) -

Monument Condition Good
Casing Condition Good
Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)
Monument type: Stickup (Flushmount)
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.15
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): RT-100 GW WL-16 AT-200 LT-700 LT-500 Other: _____ HOBO
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / N
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.01057	0.08	0.17	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: *Pro Plus* B OR *Rental #* ___ *Handheld s/n:* ___

Parameter Criteria: Circle One: *Parameters stabilized* OR *> 3 well volumes purged*

Total Gallons purged: ~27 Gallons needed for 3WV: ~2.0

Water observations: Clear

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
12:32	Purging start time					
12:35	8.8	6.30	747	6.68	47.3	Clear
12:38	8.8	6.14	741	6.66	54.9	Clear
12:41	8.8	5.99	729	6.66	61.3	Clear
12:44	8.9	5.83	712	6.66	66.6	Clear
12:47	8.8	5.79	712	6.66	71.1	Clear
12:50	8.9	5.62	695	6.66	74.9	Clear
12:53	8.9	5.64	691	6.66	78.4	Clear
12:56	8.9	5.60	686	6.66	81.5	Clear
12:59	sample	time				

Laboratory *SGS*

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	*Sulfolane (1625B)*	*2x 1-Liter amber bottle*	*none*	☐	☐
☐	*BTEX (8260B)*	*3x 40-mL amber VOA vials*	*HCl*	☐	☐
☐	*Geochem*	*Multiple (see proposal)*	*Multiple*	☐	☐
☐	*COPC*	*Multiple (see proposal)*	*Multiple*	☐	☐
☑	VOCs			☑	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location Bently Mall
Sampling Personnel APW
Weather Conditions cloudy Air Temp. (°F) 30

Project No. 31-1-20047
Date 10/26/2017
Well MW-2
Time started 10:25
Time completed 11:20

Sample No. MW-2 Time 11:11
Duplicate - Analysis: - Time -
Equipment Blank (EB) - Analysis: - Time -

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller whale C / controller B2
Purging Method (portable) / dedicated pump
Pumping Start 10:47
Purge Rate (gal./min.) ~1
Pumping End 11:13

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) 19
Measured Total Depth of Well Below MP (ft.) 19.06
Depth to Water Below MP (ft.) 15.65
Depth to Ice (if frozen) Below MP (ft.) -
Feet of Water in Well 3.41
Gallons per foot 0.17
Gallons in Well 0.58
Gallons in Well x3 = 1.74
(also enter on back) Total Gallons Purged ~24
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Pump Set Depth Below MP (ft.) ~17
KuriTec Tubing (ft.) ~30
TruPoly Tubing (ft.) -
Silicone Tubing (ft.) -

Monument Condition Good

Casing Condition Good

Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)
Monument type: Stickup (Flushmount)
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.13
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): RT-100 GW WL-16 AT-200 LT-700 LT-500 Other: _____ HOBO
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / N
☑ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes _____

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.01057	0.08	0.17	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: *Pro Plus* B OR *Rental #* ___ *Handheld s/n:* ___

Parameter Criteria: Circle One: *Parameters stabilized* OR *> 3 well volumes purged*

Total Gallons purged: ~24 Gallons needed for 3WV: ~2.0

Water observations: very turbid with black color

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
10:47	Purging start time					
10:50	6.6	0.57	536	6.75	80.1	turbid
10:53	6.7	0.33	543	6.77	67.1	slightly turbid
10:56	6.7	0.61	487.3	6.78	61.8	clear
10:59	6.7	0.57	493.8	6.76	61.2	clear
11:02	6.6	0.39	512	6.74	62.8	clear
11:05	6.6	0.42	506	6.73	64.0	clear
11:08	6.6	0.37	501	6.73	64.8	clear
11:11	sample	time				

Laboratory *SGS*

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	*Sulfolane (1625B)*	*2x 1-Liter amber bottle*	*none*	☐	☐
☐	*BTEX (8260B)*	*3x 40-mL amber VOA vials*	*HCl*	☐	☐
☐	*Geochem*	*Multiple (see proposal)*	*Multiple*	☐	☐
☐	*COPC*	*Multiple (see proposal)*	*Multiple*	☐	☐
☑	VOCs			☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location Bently Mall
Sampling Personnel APW
Weather Conditions Cloudy Air Temp. (°F) 30

Project No. 31-1-20047
Date 10/26/2017
Well MW-3
Time started 11:30
Time completed 12:10

Sample No. MW-3 Time 11:57
Duplicate - Analysis: - Time -
Equipment Blank (EB) - Analysis: - Time -

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale G / controller B2
Purging Method (portable) / dedicated pump
Pumping Start 11:39
Purge Rate (gal./min.) ~1
Pumping End 12:00

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) 46
Measured Total Depth of Well Below MP (ft.) 45.65
Depth to Water Below MP (ft.) 15.44
Depth to Ice (if frozen) Below MP (ft.) -
Feet of Water in Well 30.21
Gallons per foot 0.17
Gallons in Well 5.14
Gallons in Well x3 = 15.41
(also enter on back) Total Gallons Purged ~18
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Pump Set Depth Below MP (ft.) ~43
KuriTec Tubing (ft.) ~55
TruPoly Tubing (ft.) -
Silicone Tubing (ft.) -

Monument Condition Good
Casing Condition Good
Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)
Monument type: Stickup / (Flushmount)
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.35
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): RT-100 GW WL-16 AT-200 LT-700 LT-500 Other: _____ HOBO
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / (N)
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	(2)	3	4	6	8
Gallons per lineal foot	0.01057	0.08	(0.17)	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: Pro Plus B OR Rental # ___ Handheld s/n: ___

Parameter Criteria: Circle One: Parameters stabilized OR > 3 well volumes purged

Total Gallons purged: ~18 Gallons needed for 3WV: ~15.5

Water observations:

Notes: very turbid at pump start

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
11:39	Purging start time					
11:42	5.1	0.32	357.2	6.87	45.5	very turbid
11:45	4.9	0.24	355.7	6.87	38.5	very turbid
11:48	4.7	0.15	353.6	6.87	33.3	turbid
11:51	4.7	0.14	354.2	6.86	29.7	slightly turbid
11:54	4.7	0.12	354.4	6.87	26.2	clear
11:57	Sample	time				

Laboratory SGS

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	Sulfolane (1625B)	2x 1-Liter amber bottle	none	☐	☐
☐	BTEX (8260B)	3x 40-mL amber VOA vials	HCl	☐	☐
☐	Geochem	Multiple (see proposal)	Multiple	☐	☐
☐	COPC	Multiple (see proposal)	Multiple	☐	☐
☑	VOCs			☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location Bently Mall
Sampling Personnel APW
Weather Conditions Cloudy Air Temp. (°F) 30

Project No. 31-1-20047
Date 10/26/17
Well MW-4
Time started 13:45
Time completed 14:25

Sample No. MW-4 Time 14:12
Duplicate - Analysis: - Time -
Equipment Blank (EB) - Analysis: - Time -

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale G / controller B2
Purging Method (portable) / dedicated pump
Pumping Start 13:54
Purge Rate (gal./min.) ~1
Pumping End 14:15

Pump Set Depth Below MP (ft.) ~16
KuriTec Tubing (ft.) ~25
TruPoly Tubing (ft.) -
Silicone Tubing (ft.) -

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) -
Measured Total Depth of Well Below MP (ft.) 18.45
Depth to Water Below MP (ft.) 15.55
Depth to Ice (if frozen) Below MP (ft.) -
Feet of Water in Well 2.9
Gallons per foot 0.17
Gallons in Well 0.49
Gallons in Well x3 = 1.48
(also enter on back) Total Gallons Purged ~18
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Monument Condition Good
Casing Condition Good
Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)
Monument type: Stickup / (Flushmount)
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.50
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): RT-100 GW WL-16 AT-200 LT-700 LT-500 Other: _____ HOBO
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / (N)
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	(2)	3	4	6	8
Gallons per lineal foot	0.01057	0.08	(0.17)	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: Pro Plus B OR Rental # ___ Handheld s/n: ___

Parameter Criteria: Circle One: Parameters stabilized OR > 3 well volumes purged

Total Gallons purged: ~18 Gallons needed for 3WV: ~1.5

Water observations: very turbid at pump start with an orange

Notes: rust color

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
13:54	Purging start time					
13:57	6.2	1.60	655	6.74	110.3	turbid
14:00	6.3	1.03	664	6.75	110.3	slightly turbid
14:03	6.3	0.95	664	6.76	110.1	clear
14:06	6.4	0.87	665	6.76	109.8	clear
14:09	6.4	0.89	664	6.76	109.6	clear
14:12	Sample time					

Laboratory SGS

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	Sulfolane (1625B)	2x 1-Liter amber bottle	none	☐	☐
☐	BTEX (8260B)	3x 40-mL amber VOA vials	HCl	☐	☐
☐	Geochem	Multiple (see proposal)	Multiple	☐	☐
☐	COPC	Multiple (see proposal)	Multiple	☐	☐
☑	VOCs			☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location Key Bank Parking area
Sampling Personnel APW
Weather Conditions Cloudy Air Temp. (°F) 30

Project No. 31-1-20047
Date 10/27/17
Well MW-5
Time started 12:30
Time completed 13:15

Sample No. MW-5 Time 13:08
Duplicate - Analysis: - Time -
Equipment Blank (EB) - Analysis: - Time -

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale 6 / Controller B2
Purging Method (portable) / dedicated pump
Pumping Start 12:47
Purge Rate (gal./min.) ~1
Pumping End 13:10

Pump Set Depth Below MP (ft.) ~27
KuriTec Tubing (ft.) ~40
TruPoly Tubing (ft.) -
Silicone Tubing (ft.) -

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) 30
Measured Total Depth of Well Below MP (ft.) 29.41
Depth to Water Below MP (ft.) 17.62
Depth to Ice (if frozen) Below MP (ft.) -
Feet of Water in Well 11.79
Gallons per foot 0.17
Gallons in Well 2.00
Gallons in Well x3 = 6.01
(also enter on back) Total Gallons Purged ~21
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Monument Condition Good
Casing Condition Good
Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)
Monument type: (Stickup) / Flushmount
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.53
Monument to ground surface (ft.) 2.35

Datalogger Type (circle): RT-100 GW WL-16
AT-200 LT-700 LT-500
Other: _____ HOBO
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / (N)
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	(2)	3	4	6	8
Gallons per lineal foot	0.01057	0.08	0.17	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: Pro Plus B OR Rental # ___ Handheld s/n: ___

Parameter Criteria: Circle One: (Parameters stabilized) OR > 3 well volumes purged

Total Gallons purged: ~21 Gallons needed for 3WV: ~6

Water observations: turbid at pump start

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
12:47	Purging start time					
12:50	4.3	0.71	491.6	6.75	50.5	clear
12:53	4.3	0.41	493.4	6.75	51.4	clear
12:56	4.3	0.28	494.5	6.76	51.1	clear
12:59	4.3	0.21	495.5	6.76	50.5	clear
13:02	4.3	0.18	496.3	6.76	50.1	clear
13:05	4.3	0.17	496.7	6.76	48.9	clear
13:08	sample time					

Laboratory SGS

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	Sulfolane (1625B)	2x 1-Liter amber bottle	none	☐	☐
☐	BTEX (8260B)	3x 40-mL amber VOA vials	HCl	☐	☐
☐	Geochem	Multiple (see proposal)	Multiple	☐	☐
☐	COPC	Multiple (see proposal)	Multiple	☐	☐
☑	VOCs			☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location Key Bank parking area
Sampling Personnel APW
Weather Conditions Cloudy Air Temp. (°F) 30

Project No. 31-1-20047
Date 10/27/17
Well MW-6
Time started 13:15
Time completed 13:50

Sample No. MW-6 Time 13:38
Duplicate - Analysis: - Time -
Equipment Blank (EB) - Analysis: - Time -

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale G / Controller B2
Purging Method (portable) / dedicated pump
Pumping Start 13:17
Purge Rate (gal./min.) ~1
Pumping End 13:40

Pump Set Depth Below MP (ft.) ~19
KuriTec Tubing (ft.) ~25
TruPoly Tubing (ft.) -
Silicone Tubing (ft.) -

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) 21
Measured Total Depth of Well Below MP (ft.) 21.29
Depth to Water Below MP (ft.) 17.45
Depth to Ice (if frozen) Below MP (ft.) -
Feet of Water in Well 3.84
Gallons per foot 0.17
Gallons in Well 0.65
Gallons in Well x3 = 1.96
(also enter on back) Total Gallons Purged ~21
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Monument Condition Good

Casing Condition Good

Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)
Monument type: (Stickup) / Flushmount
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.43
Monument to ground surface (ft.) 2.20

Datalogger Type (circle): RT-100 GW WL-16
AT-200 LT-700 LT-500
Other: HOBO
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / (N)
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	(2)	3	4	6	8
Gallons per lineal foot	0.01057	0.08	(0.17)	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: *Pro Plus B* OR *Rental #* ___ *Handheld s/n:* ___

Parameter Criteria: Circle One: *Parameters stabilized* OR *> 3 well volumes purged*

Total Gallons purged: ~21 Gallons needed for 3WV: ~2

Water observations: clear

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
13:17	Purging start time					
13:20	4.9	0.71	522	6.79	47.6	clear
13:23	4.9	0.94	530	6.78	50.7	clear
13:26	4.9	1.04	534	6.78	53.7	clear
13:29	4.9	1.14	536	6.78	56.1	clear
13:32	4.9	1.18	538	6.78	58.5	clear
13:35	4.9	1.20	539	6.78	60.5	clear
13:38	sample	time				

Laboratory *SGS*

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	*Sulfolane (1625B)*	*2x 1-Liter amber bottle*	*none*	☐	☐
☐	*BTEX (8260B)*	*3x 40-mL amber VOA vials*	*HCl*	☐	☐
☐	*Geochem*	*Multiple (see proposal)*	*Multiple*	☐	☐
☐	*COPC*	*Multiple (see proposal)*	*Multiple*	☐	☐
☑	VOCs			☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location Beatty Mall
Sampling Personnel APW
Weather Conditions Cloudy Air Temp. (°F) 30

Project No. 31-1-20047
Date 10/27/17
Well MW-7
Time started 11:00
Time completed 11:55

Sample No. MW-7 Time 11:42
Duplicate - Analysis: - Time -
Equipment Blank (EB) - Analysis: - Time -

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale 6 / Controller B2
Purging Method (portable) / dedicated pump
Pumping Start 11:21
Purge Rate (gal./min.) ~1
Pumping End 11:44

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) -
Measured Total Depth of Well Below MP (ft.) 23.80
Depth to Water Below MP (ft.) 19.74
Depth to Ice (if frozen) Below MP (ft.) -
Feet of Water in Well 4.06
Gallons per foot 0.17
Gallons in Well 0.69
Gallons in Well x3 = 2.07
(also enter on back) Total Gallons Purged ~21
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Pump Set Depth Below MP (ft.) ~21
KuriTec Tubing (ft.) ~30
TruPoly Tubing (ft.) -
Silicone Tubing (ft.) -

Monument Condition Good

Casing Condition Good

Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)
Monument type: (Stickup) / Flushmount
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.35
Monument to ground surface (ft.) 2.85

Datalogger Type (circle): RT-100 GW WL-16
AT-200 LT-700 LT-500
Other: _____ HOBO
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / (N)
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	(2)	3	4	6	8
Gallons per lineal foot	0.01057	0.08	(0.17)	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: *Pro Plus* B OR *Rental #* ___ *Handheld s/n:* ___

Parameter Criteria: Circle One: (*Parameters stabilized*) OR *> 3 well volumes purged*

Total Gallons purged: ~21 Gallons needed for 3WV: ~2

Water observations: clear

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
11:21	Purging start time					
11:24	4.5	0.45	390.0	6.79	103.6	clear
11:27	4.5	0.36	385.2	6.82	85.7	clear
11:30	4.6	0.41	385.4	6.83	75.5	clear
11:33	4.6	0.39	383.2	6.83	69.3	clear
11:36	4.6	0.40	384.7	6.84	64.1	clear
11:39	4.6	0.42	383.4	6.84	60.5	clear
11:42	Sample time					

Laboratory *SGS*

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	*Sulfolane (1625B)*	*2x 1-Liter amber bottle*	*none*	☐	☐
☐	*BTEX (8260B)*	*3x 40-mL amber VOA vials*	*HCl*	☐	☐
☐	*Geochem*	*Multiple (see proposal)*	*Multiple*	☐	☐
☐	*COPC*	*Multiple (see proposal)*	*Multiple*	☐	☐
☑	VOCs			☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location Monroe Catholic School
Sampling Personnel APW
Weather Conditions Rain, black ice Air Temp. (°F) 34°

Project No. 31-1-20047
Date 10/30/17
Well MW-8
Time started 10:30
Time completed 11:35

Sample No. MW-8 Time 11:21
Duplicate MW-108 Analysis: VOCs Time 11:11
Equipment Blank (EB) – Analysis: – Time –

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale G / controller B2
Purging Method (portable) / dedicated pump
Pumping Start 10:54
Purge Rate (gal./min.) ~1
Pumping End 11:23

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) –
Measured Total Depth of Well Below MP (ft.) 20.20
Depth to Water Below MP (ft.) 11.94
Depth to Ice (if frozen) Below MP (ft.) –
Feet of Water in Well 8.26
Gallons per foot 0.17
Gallons in Well 1.40
Gallons in Well x3 = 4.21
(also enter on back) Total Gallons Purged ~27
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Pump Set Depth Below MP (ft.) ~18
KuriTec Tubing (ft.) ~30
TruPoly Tubing (ft.) –
Silicone Tubing (ft.) –

Monument Condition Good

Casing Condition Good

Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)
Monument type: Stickup (Flushmount)
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.45
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): RT-100 GW WL-16 AT-200 LT-700 LT-500 Other: _____ HOBO
Datalogger serial #: _____
Measured cable length (ft) _____

☑ Frost-jacking? Y / (N)
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)
Temperature Logger Present (TidBit)? Y / N

Notes Heavy rain, well monument flooded. Depth to water measurement was likely influenced.

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	(2)	3	4	6	8
Gallons per lineal foot	0.01057	0.08	(0.17)	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: *Pro Plus* B OR *Rental #* ___ *Handheld s/n:* ___

Parameter Criteria: Circle One: *Parameters stabilized* OR *> 3 well volumes purged*

Total Gallons purged: ~ 27 Gallons needed for 3WV: ~ 4.5

Water observations: Slightly turbid at pump start.

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
10:54	Purging start time					
10:57	6.3	6.82	583	6.77	237.9	Clear
11:00	6.5	5.17	591	6.82	237.7	Clear
11:03	6.8	4.23	596	6.84	237.5	Clear
11:06	6.9	3.76	599	6.85	237.5	Clear
11:09	7.1	3.30	601	6.85	237.4	Clear
11:12	7.2	3.08	601	6.86	237.4	Clear
11:15	7.2	3.11	605	6.86	237.1	Clear
11:18	7.2	3.16	608	6.86	236.9	Clear
11:21	sample	time				

Laboratory *SGS*

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	*Sulfolane (1625B)*	*2x 1-Liter amber bottle*	*none*	☐	☐
☐	*BTEX (8260B)*	*3x 40-mL amber VOA vials*	*HCl*	☐	☐
☐	*Geochem*	*Multiple (see proposal)*	*Multiple*	☐	☐
☐	*COPC*	*Multiple (see proposal)*	*Multiple*	☐	☐
☑	VOCs	3x 40mL amber VOA	HCl	☑	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location Noyes St
Sampling Personnel APW
Weather Conditions Cloudy Air Temp. (°F) 35

Project No. 31-1-20047
Date 10/27/17
Well MW-9
Time started 15:00
Time completed 15:55

Sample No. MW-9 Time 15:45
Duplicate — Analysis: — Time —
Equipment Blank (EB) — Analysis: — Time —

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller whale G / controller B2
Purging Method (portable) / dedicated pump
Pumping Start 15:21
Purge Rate (gal./min.) ~1
Pumping End 15:47

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) —
Measured Total Depth of Well Below MP (ft.) 20.46
Depth to Water Below MP (ft.) 11.68
Depth to Ice (if frozen) Below MP (ft.) —
Feet of Water in Well 8.78
Gallons per foot 0.17
Gallons in Well 1.49
Gallons in Well x3 = 4.48
(also enter on back) Total Gallons Purged ~24
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Pump Set Depth Below MP (ft.) ~18
KuriTec Tubing (ft.) ~30
TruPoly Tubing (ft.) —
Silicone Tubing (ft.) —

Monument Condition Good

Casing Condition Good

Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)

Monument type: Stickup / (Flushmount)
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.71
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): RT-100 GW WL-16 AT-200 LT-700 LT-500 Other: _____ HOBO
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / (N)
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.01057	0.08	0.17	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: Pro Plus B OR Rental # ___ Handheld s/n: ___

Parameter Criteria: Circle One: Parameters stabilized OR (> 3 well volumes purged)

Total Gallons purged: ~24 Gallons needed for 3WV: ~4.5

Water observations: Clear

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
15:21	Purging start time					
15:24	4.7	5.04	568	6.91	98.3	Clear
15:27	4.7	4.29	556	6.92	98.5	Clear
15:30	4.7	3.96	549	6.92	98.8	Clear
15:33	4.7	3.73	542	6.92	99.1	Clear
15:36	4.7	3.53	537	6.92	99.2	Clear
15:39	4.7	3.36	535	6.92	98.9	Clear
15:42	4.7	3.24	533	6.92	98.6	Clear
15:45	Sample time					

Laboratory SGS

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	Sulfolane (1625B)	2x 1-Liter amber bottle	none	☐	☐
☐	BTEX (8260B)	3x 40-mL amber VOA vials	HCl	☐	☐
☐	Geochem	Multiple (see proposal)	Multiple	☐	☐
☐	COPC	Multiple (see proposal)	Multiple	☐	☐
☒	VOCs			☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____ Project No. 31-1-20047
Location Noyes st Date 10/27/17
Sampling Personnel APW Well MW-10
Weather Conditions Cloudy Air Temp. (°F) 35 Time started 16:00
Time completed 16:45

Sample No. MW-10 Time 16:36
Duplicate – Analysis: – Time – Depth to Water (ft.) _____
Equipment Blank (EB) – Analysis: – Time – Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale G / controller B2
Purging Method (portable) / dedicated pump Diameter and Type of Casing 2"
Pumping Start 16:15 Approximate Total Depth of Well Below MP (ft.) –
Purge Rate (gal./min.) ~1 Measured Total Depth of Well Below MP (ft.) 20.97
Pumping End 16:38 Depth to Water Below MP (ft.) 12.96
Depth to Ice (if frozen) Below MP (ft.) –

Pump Set Depth Below MP (ft.) ~18 Feet of Water in Well 8.01
KuriTec Tubing (ft.) ~30 Gallons per foot 0.17
TruPoly Tubing (ft.) – Gallons in Well 1.36
Silicone Tubing (ft.) – Gallons in Well x3 = 4.09
(also enter on back) Total Gallons Purged ~21
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Monument Condition Good

Casing Condition Good

Wiring Condition N/A
(dedicated pumps) _____

Measuring Point (MP) Top of Casing (TOC) Monument type: Stickup (Flushmount)
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.67
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): RT-100 GW WL-16
AT-200 LT-700 LT-500
Other: _____ HOBO
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / N
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.01057	0.08	0.17	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: *Pro Plus* B OR *Rental #* ___ *Handheld s/n:* ___

Parameter Criteria: Circle One: *Parameters stabilized* OR *> 3 well volumes purged*

Total Gallons purged: ~21 Gallons needed for 3WV: ~4

Water observations: slight orange color for first few minutes

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
16:15	Purging start time					
16:18	5.3	0.49	408.4	6.90	22.7	slightly turbid
16:21	5.3	0.27	406.5	6.91	10.2	slightly turbid
16:24	5.3	0.20	405.9	6.91	1.1	Clear
16:27	5.3	0.16	406.1	6.91	-4.7	Clear
16:30	5.4	0.15	406.5	6.91	-9.1	Clear
16:33	5.4	0.13	406.4	6.91	-12.1	Clear
16:36	Sample time					

Laboratory *SGS*

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	*Sulfolane (1625B)*	*2x 1-Liter amber bottle*	*none*	☐	☐
☐	*BTEX (8260B)*	*3x 40-mL amber VOA vials*	*HCl*	☐	☐
☐	*Geochem*	*Multiple (see proposal)*	*Multiple*	☐	☐
☐	*COPC*	*Multiple (see proposal)*	*Multiple*	☐	☐
☑	VOCs			☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client
Location Ina st.
Sampling Personnel APW
Weather Conditions Rain, Black ice Air Temp. (°F) 34

Project No. 31-1-20047
Date 10/30/17
Well MW-11
Time started 11:45
Time completed 12:35

Sample No. MW-11 Time 12:25
Duplicate - Analysis: - Time -
Equipment Blank (EB) - Analysis: - Time -

Depth to Water (ft.)
Depth to LNAPL (ft.)
NAPL Thickness (ft.)
Method of NAPL Measurement

Pump/Controller Whale G / Controller B2
Purging Method (portable) / dedicated pump
Pumping Start 12:07
Purge Rate (gal./min.) ~1
Pumping End 12:27

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) -
Measured Total Depth of Well Below MP (ft.) 20.22
Depth to Water Below MP (ft.) 12.04
Depth to Ice (if frozen) Below MP (ft.) -
Feet of Water in Well 8.18
Gallons per foot 0.17
Gallons in Well 1.39
Gallons in Well x3 = 4.17
(also enter on back) Total Gallons Purged ~18
Purge Water Disposal City of N. P. manhole near NPR Gate 1

Pump Set Depth Below MP (ft.) ~18
KuriTec Tubing (ft.) ~30
TruPoly Tubing (ft.) -
Silicone Tubing (ft.) -

Monument Condition Good
Casing Condition Good
Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)
Monument type: Stickup / (Flushmount)
Measurement method: Tape measure

Top-of-casing to monument (ft.) 0.68
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): RT-100 GW WL-16 AT-200 LT-700 LT-500 Other: HOBO
Datalogger serial #:
Measured cable length (ft)
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / (N)
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes Monument flooded due to heavy rainfall. Depth to water measurement may be impacted.

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	(2)	3	4	6	8
Gallons per lineal foot	0.01057	0.08	(0.17)	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: Pro Plus B OR Rental # ___ Handheld s/n: ___

Parameter Criteria: Circle One: (Parameters stabilized) OR > 3 well volumes purged

Total Gallons purged: ~18 Gallons needed for 3WV: ~4.5

Water observations: clear

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
12:07	Purging start time					
12:10	7.6	1.91	576	6.73	226.7	clear
12:13	7.6	1.74	568	6.74	225.6	clear
12:16	7.6	1.58	565	6.74	225.0	clear
12:19	7.6	1.54	567	6.74	224.6	clear
12:22	7.6	1.49	567	6.75	224.3	clear
12:25	sample	time				

Laboratory SGS

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	Sulfolane (1625B)	2x 1-Liter amber bottle	none	☐	☐
☐	BTEX (8260B)	3x 40-mL amber VOA vials	HCl	☐	☐
☐	Geochem	Multiple (see proposal)	Multiple	☐	☐
☐	COPC	Multiple (see proposal)	Multiple	☐	☐
☑	VOCs	3 x 40 mL amber VOAs	HCl	☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location REI Parking Lot
Sampling Personnel APW
Weather Conditions Cloudy Air Temp. (°F) 30

Project No. 31-1-20047
Date 10/26/17
Well MW-12
Time started 14:45
Time completed 15:40

Sample No. MW-12 Time 15:24
Duplicate — Analysis: — Time —
Equipment Blank (EB) — Analysis: — Time —

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale 6 / Controller B2
Purging Method (portable) / dedicated pump
Pumping Start 14:57
Purge Rate (gal./min.) ~1
Pumping End 15:27

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) —
Measured Total Depth of Well Below MP (ft.) 20.83
Depth to Water Below MP (ft.) 15.39
Depth to Ice (if frozen) Below MP (ft.) —
Feet of Water in Well 5.44
Gallons per foot 0.17
Gallons in Well 0.925
Gallons in Well x3 = 2.77
(also enter on back) Total Gallons Purged ~27

Pump Set Depth Below MP (ft.) ~18
KuriTec Tubing (ft.) ~25
TruPoly Tubing (ft.) —
Silicone Tubing (ft.) —

Purge Water Disposal *City of N. P. manhole near NPR Gate 1*

Monument Condition Good, slightly sunken in asphalt
Casing Condition Good
Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) *Top of Casing (TOC)*
Monument type: *Stickup* / (*Flushmount*)
Measurement method: *Tape measure*

Top-of-casing to monument (ft.) 0.17
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): *RT-100* *GW-WL-16* *AT-200* *LT-700* *LT-500* *Other:* _____ *HOBO*
Datalogger serial #: _____
Measured cable length (ft) _____

☑ Frost-jacking? Y / (N)
Temperature Logger Present (TidBit)? Y / N
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	(2)	3	4	6	8
Gallons per lineal foot	0.01057	0.08	0.17	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: *Pro Plus* B OR *Rental #* *Handheld s/n:*

Parameter Criteria: Circle One: *Parameters stabilized* OR *(> 3 well volumes purged)*

Total Gallons purged: ~27 Gallons needed for 3WV: ~3

Water observations: Turbid and rust colored at pump start

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
14:57	Purging start time					
15:00	5.7	2.62	1255	6.61	118.9	Clear
15:03	5.7	1.91	1185	6.63	117.6	Clear
15:06	5.7	1.56	1111	6.65	116.8	Clear
15:09	5.7	1.33	1066	6.65	116.3	Clear
15:12	5.7	1.13	1023	6.66	115.9	Clear
15:15	5.7	1.00	992	6.66	115.3	Clear
15:18	5.7	0.89	960	6.67	114.8	Clear
15:21	5.7	0.91	947	6.67	114.3	Clear
15:24	Sample time					

Laboratory *SGS*

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	*Sulfolane (1625B)*	*2x 1-Liter amber bottle*	*none*	☐	☐
☐	*BTEX (8260B)*	*3x 40-mL amber VOA vials*	*HCl*	☐	☐
☐	*Geochem*	*Multiple (see proposal)*	*Multiple*	☐	☐
☐	*COPC*	*Multiple (see proposal)*	*Multiple*	☐	☐
☑	VOCs			☐	☐
☐				☐	☐

MONITORING WELL SAMPLING LOG

Owner/Client _____
Location REI Parking lot
Sampling Personnel APW
Weather Conditions Cloudy Air Temp. (°F) 30

Project No. 31-1-20047
Date 10/27/17
Well MW-13
Time started 10:00
Time completed 11:00

Sample No. MW-13 Time 10:48
Duplicate - Analysis: - Time -
Equipment Blank (EB) - Analysis: - Time -

Depth to Water (ft.) _____
Depth to LNAPL (ft.) _____
NAPL Thickness (ft.) _____
Method of NAPL Measurement _____

Pump/Controller Whale G / controller B2
Purging Method *portable / dedicated pump*
Pumping Start 10:24
Purge Rate (gal./min.) ~1
Pumping End 10:50

Diameter and Type of Casing 2"
Approximate Total Depth of Well Below MP (ft.) -
Measured Total Depth of Well Below MP (ft.) 21.00
Depth to Water Below MP (ft.) 15.75
Depth to Ice (if frozen) Below MP (ft.) -
Feet of Water in Well 5.25
Gallons per foot 0.17
Gallons in Well 0.89
Gallons in Well x3 = 2.68
(also enter on back) Total Gallons Purged ~24
Purge Water Disposal *City of N. P. manhole near NPR Gate 1*

Pump Set Depth Below MP (ft.) ~19
KuriTec Tubing (ft.) ~30
TruPoly Tubing (ft.) -
Silicone Tubing (ft.) -

Monument Condition Good
Casing Condition Good
Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) *Top of Casing (TOC)*
Monument type: *Stickup* / *Flushmount*
Measurement method: *Tape measure*

Top-of-casing to monument (ft.) 0.16
Monument to ground surface (ft.) 0.0

Datalogger Type (circle): *RT-100* *GW WL-16* *AT-200* *LT-700* *LT-500* *Other:* _____ *HOBO*
Datalogger serial #: _____
Measured cable length (ft) _____
Temperature Logger Present (TidBit)? Y / N

☑ Frost-jacking? Y / N
☐ Lock present and operational
☐ Well name legible on outside of well (stickup) or inside of well (flushmount)

Notes None

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.01057	0.08	0.17	0.38	0.66	1.5	2.6

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: *Pro Plus B* OR *Rental #* ___ *Handheld s/n:* ___

Parameter Criteria: Circle One: (*Parameters stabilized*) OR *> 3 well volumes purged*

Total Gallons purged: ~24 Gallons needed for 3WV: ~3.0

Water observations: Some sand in purge water

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C)	Dissolved Oxygen (mg/L) [± 0.10 mg/L]	Conductivity (µS/cm) [± 3%]	pH [± 0.10]	ORP (mV) [± 10 mV]	Water Clarity (visual)
10:24	Purging start time					
10:27	5.6	0.95	666	6.47	225.2	clear
10:30	5.9	0.59	663	6.47	224.9	clear
10:33	5.9	0.47	653	6.49	224.5	clear
10:36	5.9	0.38	651	6.51	224.4	clear
10:39	5.9	0.36	631	6.52	224.2	clear
10:42	5.9	0.32	626	6.53	224.0	clear
10:45	5.9	0.32	624	6.54	223.9	clear
10:48	Sample time					

Laboratory *SGS*

	Analysis	Sample Containers	Preservatives	Dup	EB
☐	*Sulfolane (1625B)*	*2x 1-Liter amber bottle*	*none*	☐	☐
☐	*BTEX (8260B)*	*3x 40-mL amber VOA vials*	*HCl*	☐	☐
☐	*Geochem*	*Multiple (see proposal)*	*Multiple*	☐	☐
☐	*COPC*	*Multiple (see proposal)*	*Multiple*	☐	☐
☑	VOCs			☐	☐
☐				☐	☐

APPENDIX C

SAMPLE COLLECTION LOGS AND BUILDING SURVEYS - AIR SAMPLES

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Mikayla Dennis
Location: 311 Noyes Street
same as physical
Weather: 28°F ; SW 2 mph
Humidity/Pressure: 89% / 29.7 in Hg

Project number: 20047-003
Project name: BMES
Date: 10/16/17
Time: 1205
Sampling personnel: SMH

Sample No.: SVR1A
Time (start) 1235 Time (end) 1307

Duplicate: —
Time (start) — Time (end) —

Soil-gas port type: Teflon
Installation depth: 8 feet bgs

Date installed: March 2016
Time installed: unknown

Canister ID: 1L2403
Canister volume (L): 1

Laboratory: eurofins Air Toxics
Analysis: TO-15 modified

Initial canister vacuum: -30 in. Hg
Final canister vacuum: -6 in. Hg

Notes: Probe location: South side of home.

Leak Detection Tests: (Pass) / Fail

Shut-in test:
- Vacuum applied to sample train: -25 in. Hg
- Drop in vacuum after one minute: 0 in. Hg

Tracer test:
- Helium applied at probe interface: 40,000 ppm
- Probe and sampling line purge rate: 200 mL/min.
- Sample train length: 11 ft
- Sample train volume: 46.45 mL

Time	Helium (ppm)
12:30:00	0
12:30:10	0
12:30:20	0
12:30:30	0
12:30:40	0
12:30:50	0
12:31:00	0

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Mikayla Dennis
Location: 311 Noyes Street
same as physical
Weather: 28°F ; SW 2mph
Humidity/Pressure: 89% / 29.7 in Hg

Project number: 20047-003
Project name: BMES
Date: 10/16/17
Time: 1330
Sampling personnel: SMH

Sample No.: SVB1B
Time (start): 1355 Time (end): 1426

Duplicate: —
Time (start): — Time (end): —

Soil-gas port type: Teflon
Installation depth: 8 feet bgs

Date installed: March 2016
Time installed: unknown

Canister ID: 1L1642
Canister volume (L): 1

Laboratory: eurofins Air Toxics
Analysis: TO-15 modified

Initial canister vacuum: -26 in. Hg
Final canister vacuum: -6 in. Hg

Notes: Port location: west side of home.

Leak Detection Tests: (Pass) / Fail

Shut-in test:
Vacuum applied to sample train: -25 in. Hg
Drop in vacuum after one minute: 0 in. Hg

Tracer test:
Helium applied at probe interface: 30,000 ppm
Probe and sampling line purge rate: ~200 mL/min.
Sample train length: 11 ft
Sample train volume: 46.45 mL

Time	Helium (ppm)
13:53:00	0
13:53:10	0
13:53:20	0
13:53:30	0
13:53:40	0
13:53:50	0
13:54:00	0

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Alejandra Barragan
Location: 120 Ina St.
Weather: 28°F; NE 7mph; 30 in Hg

Project number: 20047-003
Project name: BMES
Date and time: 1/04/17 @ 1310
Sampling personnel: SMH

Sample No.: SVR4A
Time (start): 1344 Time (end): 1415

Duplicate: —
Time (start): — Time (end): —

Soil-gas port type: Teflon
Installation depth: 8 feet bgs

Date installed: March 2016
Time installed: unknown

Canister ID: 1L3021
Canister volume (L): 1

Laboratory: eurofins Air Toxics
Analysis: TO-15

Initial canister vacuum (in. Hg): -29
Final canister vacuum (in. Hg): -6

Notes: Port location: south side of home

Home owner came home during set up. Discussed project.

Leak Detection Tests: (Pass) / Fail

Shut-in test:
- Vacuum applied to sample train: -28 in. Hg
- Drop in vacuum after one minute: <0.5 in. Hg

Tracer test:
- Helium applied at probe interface: 100,000 ppm
- Probe and sampling line purge rate: ~200 mL/min.
- Sample train length: 12 ft
- Sample train volume: 50.67 mL

×3 ≈ 152
×5 ≈ 253

Time	Helium (ppm)
13:42:00	0
13:42:10	0
13:42:20	0
13:42:30	0
13:42:40	0
13:42:50	0
13:43:00	0

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Alejandra Barragan
Location: 120 Inez St.
Weather: 28°F; NE 7 mph; 30.4 in Hg

Project number: 20047-003
Project name: BMES
Date and time: 11/04/17 at 1150
Sampling personnel: Sheila

Sample No.: SVR4B — Time (start) 1242 Time (end) 1318

Duplicate: SVR40B — Time (start) 1232 Time (end) 1308

Soil-gas port type: Teflon
Installation depth: 8 feet bgs

Date installed: March 2016
Time installed: unknown

Canister ID: 1L1765 / 1L2348
Canister volume (L): 1 / 1

Laboratory: eurofins Air Toxics
Analysis: TO-15

Initial canister vacuum (in. Hg): -30 / -27
Final canister vacuum (in. Hg): -9 / -6

Notes: Port location: west side of home

Leak Detection Tests: (Pass) / Fail

Shut-in test:
- Vacuum applied to sample train: -27 in. Hg
- Drop in vacuum after one minute: <0.5 in. Hg

Tracer test:
- Helium applied at probe interface: 30,000 ppm
- Probe and sampling line purge rate: ~200 mL/min.
- Sample train length: 12 ft
- Sample train volume: 5067 mL

Time	Helium (ppm)	
12:40:00	25	x5 = 152
12:40:10	0	x5 = 253
12:40:20	0	
12:40:30	0	
12:40:40	0	
12:40:50	0	
12:41:00	0	

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Neta and Michael
Location: 201 Ellingson, Fairbanks, Ak.
Weather: 28°F; E 2 mph; 29.5 in Hg

Project number: 20047-003
Project name: BMES
Date and time: 10/17/17 @ 1090
Sampling personnel: Sheila

Sample No.: 5VR5
Time (start): 1115 Time (end): 1150

Duplicate: —
Time (start): — Time (end): —

Soil-gas port type: Teflon
Installation depth: 8 feet bgs

Date installed: March 2016
Time installed: unknown

Canister ID: 1L2977
Canister volume (L): 1

Laboratory: Eurofins Air-Toxics
Analysis: TO-15 modified

Initial canister vacuum (in. Hg): -28
Final canister vacuum (in. Hg): -7

Notes: Port location: west side of home.

Leak Detection Tests: (Pass) / Fail

Shut-in test:

Vacuum applied to sample train: -25 in. Hg
Drop in vacuum after one minute: <0.5 in. Hg

Tracer test:

Helium applied at probe interface: 100,000 ppm
Probe and sampling line purge rate: ~200 mL/min.

Time	Helium (ppm)
11:13:00	25
11:13:10	0
11:13:20	0
11:13:30	0
11:13:40	0
11:13:50	0
11:13:00	0

Monroe Cathd School

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Diocese of Northern Alaska Endowment Fund
Location: 615 Monroe Street or 718 Betty St.
Weather: 28°F; SSW 4 mph; 29.3 in Hg

Project number: 20047-003
Project name: BMES
Date and time: 10/18/17 @ 1615
Sampling personnel: Sheila

Sample No.: SV12B
Time (start): 1647 Time (end): 1717

Duplicate: —
Time (start): — Time (end): —

Soil-gas port type: Teflon
Installation depth: 5 feet bgs

Date installed: 10/17/17
Time installed: 1800

Canister ID: 1L2526
Canister volume (L): 1

Laboratory: Eurofins Air Toxics
Analysis: TO-15 Modified

Initial canister vacuum (in. Hg): -28
Final canister vacuum (in. Hg): -6

Leak Detection Tests: (Pass) / Fail

Shut-in test:

Vacuum applied to sample train: -26 in. Hg
Drop in vacuum after one minute: 0 in. Hg

Tracer test:

Helium applied at probe interface: 100,000 ppm
Probe and sampling line purge rate: 200 mL/min.

Time	Helium (ppm)
16:45:00	50
16:45:05	50
16:45:10	50
16:45:15	50
16:45:20	50
16:45:25	50
16:45:30	50

Notes: The original sample port (installed by ERM) was destroyed.

This replacement sample port installed within two feet of orginal port.

Monroe Catholic School

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Diocese of Northern Alaska Endowment Fund
Location: 615 Monroe Street or 718 Betty St.
Weather: 30°F; WSW 4 mph; 29.6 in Hg; snow
Project number: 20047-003
Project name: BMES
Date and time: 10/16/17 @ 1640
Sampling personnel: SMH

Sample No.: SV13
Time (start): 1652 Time (end): 1734

Duplicate: —
Time (start): — Time (end): —

Soil-gas port type: Teflon
Installation depth: 5 feet bgs
Date installed: March 2016
Time installed: unknown

Canister ID: 121941
Canister volume (L): 1 L
Laboratory: eurofins Air Toxics
Analysis: TO-15 modified

Initial canister vacuum (in. Hg): -26
Final canister vacuum (in. Hg): -5

Notes: 11 ft. of sample train

Probe location: west side of school in front of the sanctuary.

Leak Detection Tests: (Pass) / Fail

Shut-in test:
- Vacuum applied to sample train: -25 in. Hg
- Drop in vacuum after one minute: 0 in. Hg

Tracer test:
- Helium applied at probe interface: 10% 100000 ppm
- Probe and sampling line purge rate: 200 mL/min.

Time	Helium (ppm)
16:50:00	0
16:50:10	0
16:50:20	0
16:50:30	0
16:50:40	0
16:50:50	250
16:51:00	75

Monroe Catholic School

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Diocese of Northern Alaska Endowment Fund
Location: 615 Monroe Street or 718 Betty St.
Weather: 31 °F ; ENE 3 mph ; 29.4 in Hg

Project number: 20047-003
Project name: IBMES
Date and time: 10/17/17 @ 1430
Sampling personnel: Sheila

Sample No.: SV14
Time (start): 1500 Time (end): 1533

Duplicate: SV140
Time (start): 1450 Time (end): 1523

Soil-gas port type: Teflon
Installation depth: 5 feet bgs

Date installed: March 2016
Time installed: unknown

Canister ID: 1L2347 / 00000003916
Canister volume (L): 1 / 1

Laboratory: eurofins Air Toxics
Analysis: TO-15 Modified

Initial canister vacuum (in. Hg): -26 / -26
Final canister vacuum (in. Hg): -7 / -6

Notes: sample train length = 8 ft. ⇒ 133.78 mL

Leak Detection Tests: (Pass) / Fail

Shut-in test: 1455
Vacuum applied to sample train: -25 in. Hg
Drop in vacuum after one minute: <2.5 in. Hg

Tracer test:
Helium applied at probe interface: 60,000 ppm
Probe and sampling line purge rate: 200 mL/min.

Time	Helium (ppm)
14:57:00	0
14:57:10	0
14:57:20	0
14:57:30	0

Monroe Catholic School

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Diocese of Northern Alaska Endowment Fund
Location: 615 Monroe Street or 718 Betty St.
Weather: 28°F; SSW 4 mph; 29.3 in Hg

Project number: 20647-003
Project name: BMES
Date and time: 10/18/19 @1510
Sampling personnel: Sheila

Sample No.: SV15
Time (start): 1540 Time (end): 1610

Duplicate: —
Time (start): — Time (end): —

Soil-gas port type: Teflon
Installation depth: 5 feet bgs

Date installed: March 2016
Time installed: unknown

Canister ID: 1L1745
Canister volume (L): 1

Laboratory: Eurofins Air Toxics
Analysis: TO-15 modified

Initial canister vacuum (in. Hg): -25
Final canister vacuum (in. Hg): -5

Notes: Port location: south eastern side of parcel

Leak Detection Tests: (Pass) / Fail

Shut-in test:

Vacuum applied to sample train: 25 in. Hg
Drop in vacuum after one minute: <0.5 in. Hg

Tracer test:

Helium applied at probe interface: 100,000 ppm
Probe and sampling line purge rate: 200 mL/min.

Time	Helium (ppm)
15:38:00	0
15:38:05	0
15:38:10	0
15:38:15	0
15:38:20	0
15:38:25	0
15:38:30	0

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Dana
Location: 518 Fulton St.
Weather: 28°F; WSW 5mph; 29.7 in Hg

Project number: 20047-003
Project name: BMES
Date and time: 10/18/17 @ 1310
Sampling personnel: SMH

Sample No.: SS1A
Time (start): 1318 Time (end): 1350

Duplicate: —
Time (start): — Time (end): —

Soil-gas port type: Teflon
Installation depth: 0.41 feet bgs

Date installed: 1/16/17
Time installed: 1250

Canister ID: 1L23227
Canister volume (L): 1

Laboratory: eurofins Air Toxics
Analysis: TO-15 Modified

Initial canister vacuum (in. Hg): -26
Final canister vacuum (in. Hg): -6

Notes: sample train = 3 feet
sample train Volume = 12.669 mL

Leak Detection Tests: (Pass) / Fail

Shut-in test: 1314
Vacuum applied to sample train: -26 in. Hg
Drop in vacuum after one minute: <0.5 in. Hg

Tracer test:
Helium applied at probe interface: 150,000 ppm
Probe and sampling line purge rate: 200 mL/min.

Time	Helium (ppm)
13:17:00	0
13:17:05	0
13:17:10	0
13:17:15	0
13:17:20	0
13:17:25	0

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: Dana
Location: 518 Fulton St.
Weather: 28°F; WSW 5mph; 29.3 inHg; snow
Sample No.: SS1B
Duplicate: —

Project number: 20047-003
Project name: BMES
Date and time: 10/18/17 1200
Sampling personnel: Sheila
Time (start): 1229 Time (end): 1304
Time (start): — Time (end): —

Soil-gas port type: Teflon
Installation depth: 0.41 feet bgs
Canister ID: 1L2842
Canister volume (L): 1

Date installed: 1/16/17
Time installed: 1145
Laboratory: Eurofins Air Toxics
Analysis: TO-15 Modified

Initial canister vacuum (in. Hg): -28
Final canister vacuum (in. Hg): -6

Notes: sample train = 3 feet
volume in sample train = 12.669 mL

Leak Detection Tests: (Pass) / Fail

Shut-in test:

Vacuum applied to sample train: -26 in. Hg
Drop in vacuum after one minute: <0.5 in. Hg

Tracer test:

Helium applied at probe interface: 60,000 ppm
Probe and sampling line purge rate: 200 mL/min.

Time	Helium (ppm)
12:27:00	0
12:27:05	0
12:27:10	0
12:27:15	0
12:27:20	50
12:27:25	25

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: David Samuelson
Location: 631 Noyes St.
(907) 799-5107
Weather: 35°F; 0 mph; 29.5 inHg Cloudy

Project number: 20047-003
Project name: BMES
Date and time: 10/27/17 @ 1000
Sampling personnel: Sheila

Sample No.: SS2
Time (start): 1052 Time (end): 1132

Duplicate: —
Time (start): — Time (end): —

Soil-gas port type: Teflon
Installation depth: 0.33 feet bgs

Date installed: 10/26/17
Time installed: 1000

Canister ID: 11620
Canister volume (L): 1

Laboratory: Eurofins Air Toxics
Analysis: TO-15 Modified

Initial canister vacuum (in. Hg): -30
Final canister vacuum (in. Hg): -6

Leak Detection Tests: (Pass) / Fail

Shut-in test:

Vacuum applied to sample train: -27 in. Hg
Drop in vacuum after one minute: 0 in. Hg (1046-1049)

Tracer test:

Helium applied at probe interface: 70,000 ppm
Probe and sampling line purge rate: ~200 mL/min.

Time	Helium (ppm)
10:51:00	0
10:51:05	0
10:51:10	0
10:51:15	0
10:51:20	0
10:51:25	0

Notes: Sample train length 3 feet = 12.669 mL
3 volumes = 38.00 mL
5 volumes = 63.34 mL

Sample port location: at bottom of stairs and approximately six feet from eastern wall. Next to dryer.

SHANNON & WILSON, INC.

INDOOR-AIR SAMPLING FORM

Address 120 Ina St.
Owner/Occupant Alejandra Barragan
Mailing address same as physical
Telephone 907.347.7960
Relative Humidity 96%

Project Number 20047-003
Project Name BMES
Date 11/04/17
Time 1400
Geo/Eng SMH
Barometric Pressure 30.36

Sample Location Inside toddler room, 4 feet off of ground surface

Sample Number IA4
Duplicate —
Canister ID 6L1034
Flow Controller ID —
Purge Rate ~3.8 mL/min
Analysis TO-15

11/04/17 11/05/17
Time 1410 – 1408
Time —

Lab Eurofins AirToxics

Initial Vacuum -29
Final Pressure -4
Desired Flow Rate 3.8 mL/min
Actual Flow Rate ~3.8 mL/min

Notes:

SHANNON & WILSON, INC.

INDOOR-AIR SAMPLING FORM

Address 201 Ellingson
Owner/Occupant Neta & Michael
Mailing address Same as physical

Telephone 541-290-3750
Relative Humidity 91% / 89%

Project Number 20047-003
Project Name BMES
Date 10/17/17 - 10/18/17
Time 1000
Geo/Eng SmH
Barometric Pressure 29.5 in Hg / 29.3

Sample Location Downstairs living room / kitchen
see photo

Sample Number IA5
Duplicate —
Canister ID 6L0731
Flow Controller ID N/A
Purge Rate ~3.5
Analysis TO-15 modified

10/17 - 10/18
Time 1032 - 1043
Time —

Lab Eurofins Air Toxics

Initial Vacuum -29 in Hg
Final Pressure -5
Desired Flow Rate 3.5
Actual Flow Rate ~3.5

Notes:

Dirt Basement

SHANNON & WILSON, INC.

INDOOR-AIR SAMPLING FORM

Address 633 Noyes St.
Owner/Occupant Sue Samuelson
Mailing address 631 Noyes St. (Brother David)
Telephone 907 · 322 · 1007
Relative Humidity 100%

Project Number 20047-003
Project Name BMES
Date 10/30/17
Time 1150
Geo/Eng SMH
Barometric Pressure 29.87 in Hg

Sample Location In basement (access in arctic entryway) see photos: canister set on ground surface of dirt basement

10/30/17 - 10/31/17

Sample Number C31
Duplicate —
Canister ID 00 00 0318
Flow Controller ID —
Purge Rate 100 - 200
Analysis Modified TO-15

Time 1218 - 1220
Time —

Lab eurofins Air Toxics

Initial Vacuum -29
Final Pressure - 6
Desired Flow Rate 3.8
Actual Flow Rate ~3.8

Notes: Rain; 34°F

SHANNON & WILSON, INC.

INDOOR AIR SAMPLING LOG

Owner/Occupant: BMES
Location: Wild Wings 'N Things 20 College Rd. #8 Fairbanks
Mailing Address: same as above
Weather: Light snow ; 15° F

Project number: 20047-004
Project name: BMES
Date: 11/9/17
Time: 0930
Sampling personnel: SMH

Sample No.: CIA08
Date (start) 11/9/17 Time (start) 0948
Date (end) 11/10/17 Time (end) 0955

Duplicate: CIA108
Date (start) 11/9/17 Time (start) 0938
Date (end) 11/10/17 Time (end) 0945

Sample Location: North wall of business in between the dining area and hallway to bathrooms.
* see back of form

Sample height (ft.) 3 Above ground surface

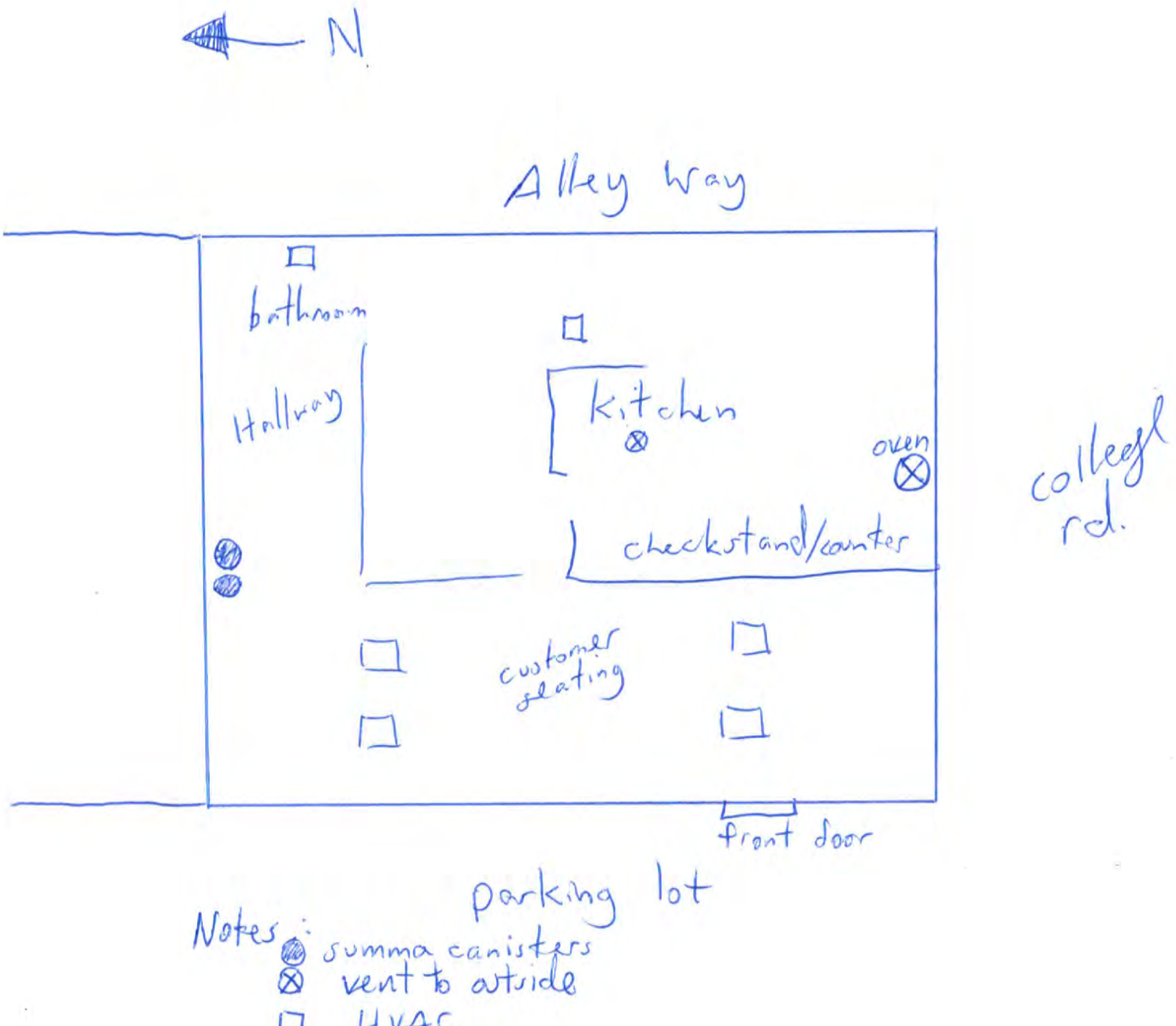
Canister ID 6L1024 / 00000 3143
Canister volume (L) 6 / 6

Relative humidity 87%
Barometric pressure 29.78 in Hg.

Canister vacuum (in. Hg) -29 / -30 Initial
Canister vacuum (in. Hg) -7 / -8 Final

Laboratory Eurofins Air Toxics
Analysis TO-15

Notes: Restaurant occupies the middle of the BMES building.
The owner of the restaurant would like a copy of the results mailed to Wild Wings.


N
Alley way
bathroom
Hallway
kitchen
oven
checkstand/counter
college rd.
customer seating
front door
parking lot
Notes:
summa canisters
vent to outside
HVAC

SHANNON & WILSON, INC.

INDOOR AIR SAMPLING LOG

Owner/Occupant: BMES
Location: Aut. Zone, 38 College Rd. Fairbanks
Mailing Address:
Weather: snow ; ~10°F

Project number: 20047-004
Project name: BMES
Date: 11/8/17
Time: 0930
Sampling personnel: SMH

Sample No.: CIA01
Date (start) 11/8/17 Time (start) 0949
Date (end) 11/9/17 Time (end) 0955

Duplicate: —
Date (start) Time (start)
Date (end) Time (end)

Sample Location: south west corner of building in parts and supplies area. Close to the same location as previous indoor air sample.

Sample height (ft.) 4 Above ground surface

Canister ID 6L1050
Canister volume (L) 6

Relative humidity 90%
Barometric pressure 30.13 in Hg

Canister vacuum (in. Hg) -30 Initial
Canister vacuum (in. Hg) -5 Final

Laboratory Eurofins Air Toxics
Analysis TO-15

Notes:

SHANNON & WILSON, INC.

SUB-SLAB SOIL-GAS SAMPLING LOG

Owner/Occupant: BMES
Location: AutoZone 38 College Rd. Fairbanks
Weather: Snow ; ~10°F

Project number: 20047-004
Project name: BMES
Date and time: 11/08/17 @ 0830
Sampling personnel: SMH / KLC

Sample No.: AZ vent N
Time (start) 1021 Time (end) 1055

Duplicate: —
Time (start) — Time (end) —

~~Soil-gas~~ port type: vent sample
Installation depth: 5 ft. (below roof of building) ~~feet bgs~~

Canister ID: 1L1627
Canister volume (L): 1

Date installed:
Time installed:

Laboratory: eurofins Air Toxics
Analysis: TO-15

Initial canister vacuum (in. Hg): -29
Final canister vacuum (in. Hg): -7

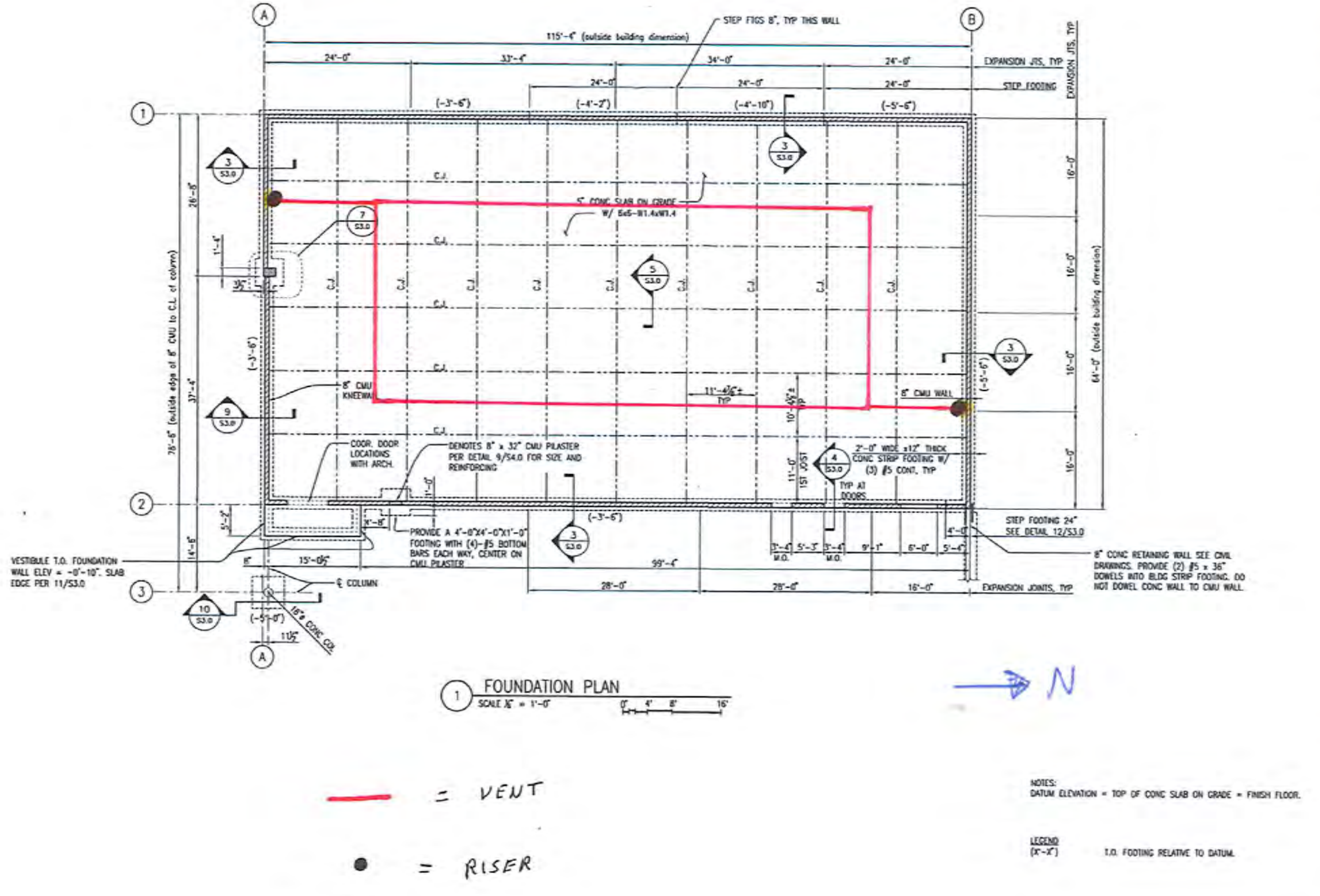
Leak Detection Tests: ~~Pass / Fail~~

Shut-in test:
- Vacuum applied to sample train: ____ in. Hg
- Drop in vacuum after one minute: ____ in. Hg

Tracer test:
- Helium applied at probe interface: — ppm
- Probe and sampling line purge rate: ~200 mL/min.
- Sample train length: 25 ft
- Sample train volume: 105.57 mL

Time	Helium (ppm)

Notes:
- AutoZone roof is 20 feet tall.
- Unable to deploy sample tubing the full 20 feet due to a bend in the riser vent at five feet below the roof
- vent sample came from the north side riser. The south side riser opening was sealed with a plastic bag upon arrival at the site (on the roof).
- 180 mL of dead space was removed from the sample train using a 60 mL syringe (prior to sampling).



1 FOUNDATION PLAN
SCALE 1/8" = 1'-0"

NOTES:
DATUM ELEVATION = TOP OF CONC SLAB ON GRADE = FINISH FLOOR.

LEGEND
(X'-X") T.O. FOOTING RELATIVE TO DATUM.

Architects Alaska.

Reid Middleton

AUTOZONE
STORE NO. 6108
COLLEGE ROAD
FAIRBANKS, AK

Revisions		
No.	Description	Date

Drawn by DCP	Date 05/07/2014
Checked EA	Job No. 422014.010

Sheet Contents: FOUNDATION PLAN

Category	Sheet No.
S	1.0

OrderID: 381710279

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
Tel: 800-220-3675 • Fax: 856-786-0327
www.radontestinglab.com

SHWL60
3 Day

DOM: 9/15/2017
EXP: 9/15/2018

M#4

*Priority

2017 NOV 13 P 12:59

Radon In Air Data Sheet

381710279

Send Written Report To:

Name Shannon & Wilson, Inc.
Address 2355 Hill Road
City Fairbanks State AK Zip 99709
Phone 907.458.3151 Fax
Email smh@shanwil.com
Technician Name Sheila
Technician Certification #
Technician Signature

1ST RED VIAL # 303292

LOCATION

☐ Basement ☒ First Floor ☐ Bedroom ☐ Den
☐ Living Room ☐ Other
☒ Location in Room Southwest corner - stockroom

2ND RED VIAL # 303308
(If Purchased)

The device has been scientifically tested to provide reliable indoor radon measurements when exposed to temperatures between 60 and 80 degrees F; temperatures outside this range will invalidate the test results.

Kit # 175445 (Outside of Box)

Property Tested:

Name Auto Zone
Address 38 College Road
City Fairbanks
Municipality — County —
State Alaska Zip 99701
☐ Check here if this is a Post Mitigation test.
Technician Name Sheila
Technician Certification #
Technician Signature

INDOOR CONDITIONS

Temperature 64 °F Humidity 30 %

EXPOSURE PERIOD

Beginning Date: 11 / 08 / 17
Time: 1420 AM / (PM) (Circle)

Ending Date: 11 / 10 / 17
Time: 1425 AM / (PM) (Circle)

The test device must remain open for 48 to 96 hours • Return this section with the test device to the laboratory

Tear Here

ALASKA DEPARTMENT OF ENVIRONMENAL CONSERVATION
BUILDING INVENTORY AND INDOOR AIR SAMPLING QUESTIONNAIRE

This form should be prepared by a person familiar with indoor air assessments with assistance from a person knowledgeable about the building. Complete this form for each building in which interior samples (e.g., indoor air, crawl space, or subslab soil gas samples) will be collected. Section I of this form should be used to assist in choosing an investigative strategy during workplan development. Section II should be used to assist in identification of complicating factors during a presampling building walkthrough.

Preparer's Name Sheila Hinckley Date/Time Prepared 10/27/17@1130

Preparer's Affiliation Shannon & Wilson, Inc. Phone No. 907-458-3151

Purpose of Investigation Vapor Intrusion

SECTION I: BUILDING INVENTORY

1. **OCCUPANT OR BUILDING PERSONNEL:**

Interviewed: Y / N

Last Name Samuelson First Name David

Address 631 Noyes st. Fairbanks

County FNSB

Phone No. 907.799.5107

Number of Occupants/persons at this location 1 Age of Occupants

2. **OWNER or LANDLORD:** (Check if same as occupant ✓)

Interviewed: Y / N

Last Name Samuelson First Name David - for dad (the owner, Moses)

Address 631 Noyes St Fairbanks 99701-3048

County FNSB

Phone No. 907.799.5107

3. **BUILDING CHARACTERISTICS**

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other 2-story

If multiple units, how many? _____

If the property is commercial, type?

Business Types(s) N/A

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors 2 Building age 1945

Is the building insulated? (Y) / N How air tight? Tight / Average / (Not Tight)

Have occupants noticed chemical odors in the building? Y / (N)

If yes, please describe: No

4. AIRFLOW

Use air current tubes, tracer smoke, or knowledge about the building to evaluate airflow patterns and qualitatively describe:

Airflow between floors
open stair case

Airflow in building near suspected source
source area is not on this property

Outdoor air infiltration
Bathroom (upstairs) window is cracked (has cracked glass)

Infiltration into air ducts
no

5. **BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply)

a. Above grade construction:	wood frame	log	concrete	brick
	constructed on pilings with enclosed air space		constructed on pilings with open air space	
b. Basement type:	full	crawlspace	slab-on-grade	other_____
c. Basement floor:	concrete	dirt	stone	other_____
d. Basement floor:	unsealed	sealed	sealed with_____	
e. Foundation walls:	poured	block	stone	other_____
f. Foundation walls:	unsealed	sealed	sealed with_____	
g. The basement is:	wet	damp	dry	
h. The basement is:	finished	unfinished	partially finished	
i. Sump present?	Y / N			
j. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade 6.5 (feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

non-structural cracks

6. **HEATING, VENTING and AIR CONDITIONING** (Circle all that apply)

Type of heating system(s) used in this building: (Circle all that apply – not primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other_____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by elect

Boiler/furnace located in: Basement Outdoors Main Floor Other_____

Do any of the heating appliances have cold-air intakes? Y / N

Type of air conditioning or ventilation used in this building:

Central Air	Window units	Open Windows	None

Commercial HVAC Heat-recovery system Passive air system

Are there air distribution ducts present? Y / (N)

Describe the ventilation system in the building, its condition where visible, and the tightness of duct joints. Indicate the locations of air supply and exhaust points on the floor plan.

_____

_____

_____

_____

Is there a radon mitigation system for the building/structure? Y / (N) Date of Installation_____

Is the system active or passive? Active/Passive

7. **OCCUPANCY**

Is basement/lowest level occupied? (Full-time) Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g. family room, bedroom, laundry, workshop, storage)**
Basement	bedrooms (two). Laundry / utility room.
1st Floor	kitchen. Bathroom. Living room. Arctic entry
2nd Floor	—
3rd Floor	—

8. **WATER AND SEWAGE**

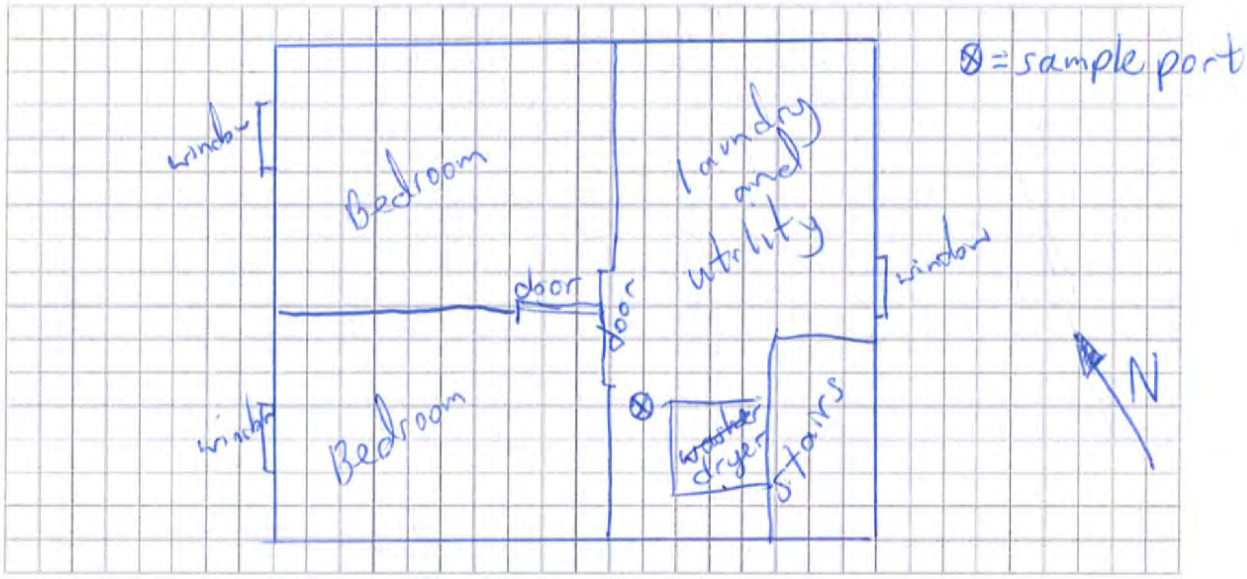
Water Supply: (Public Water) Drilled Well Driven Well Dug Well Other_____

Sewage Disposal: (Public Sewer) Septic Tank Leach Field Dry Well Other_____

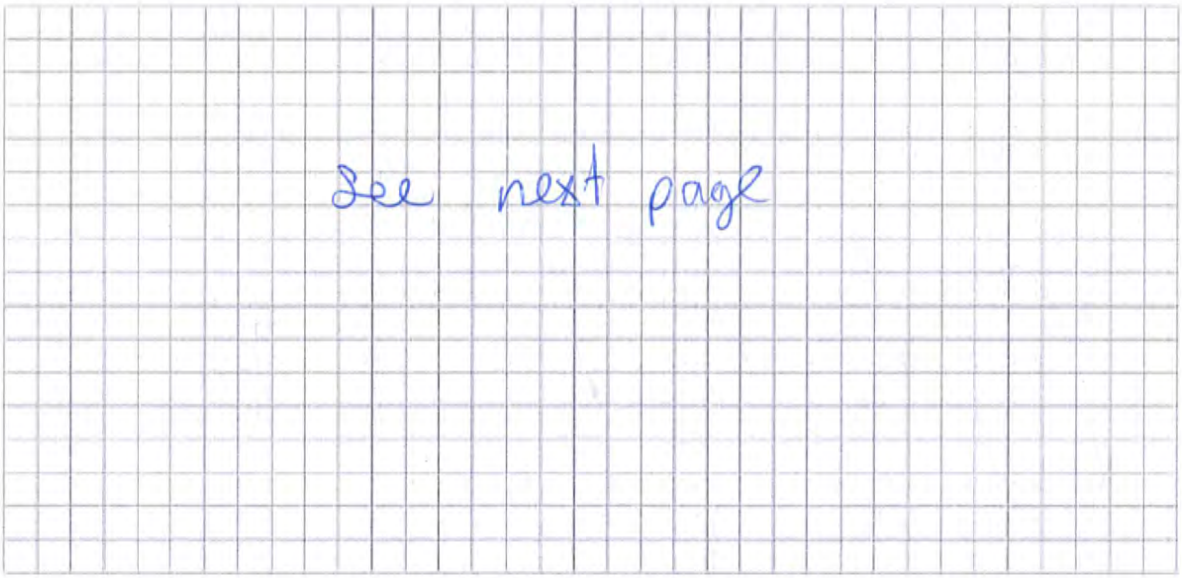
9. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



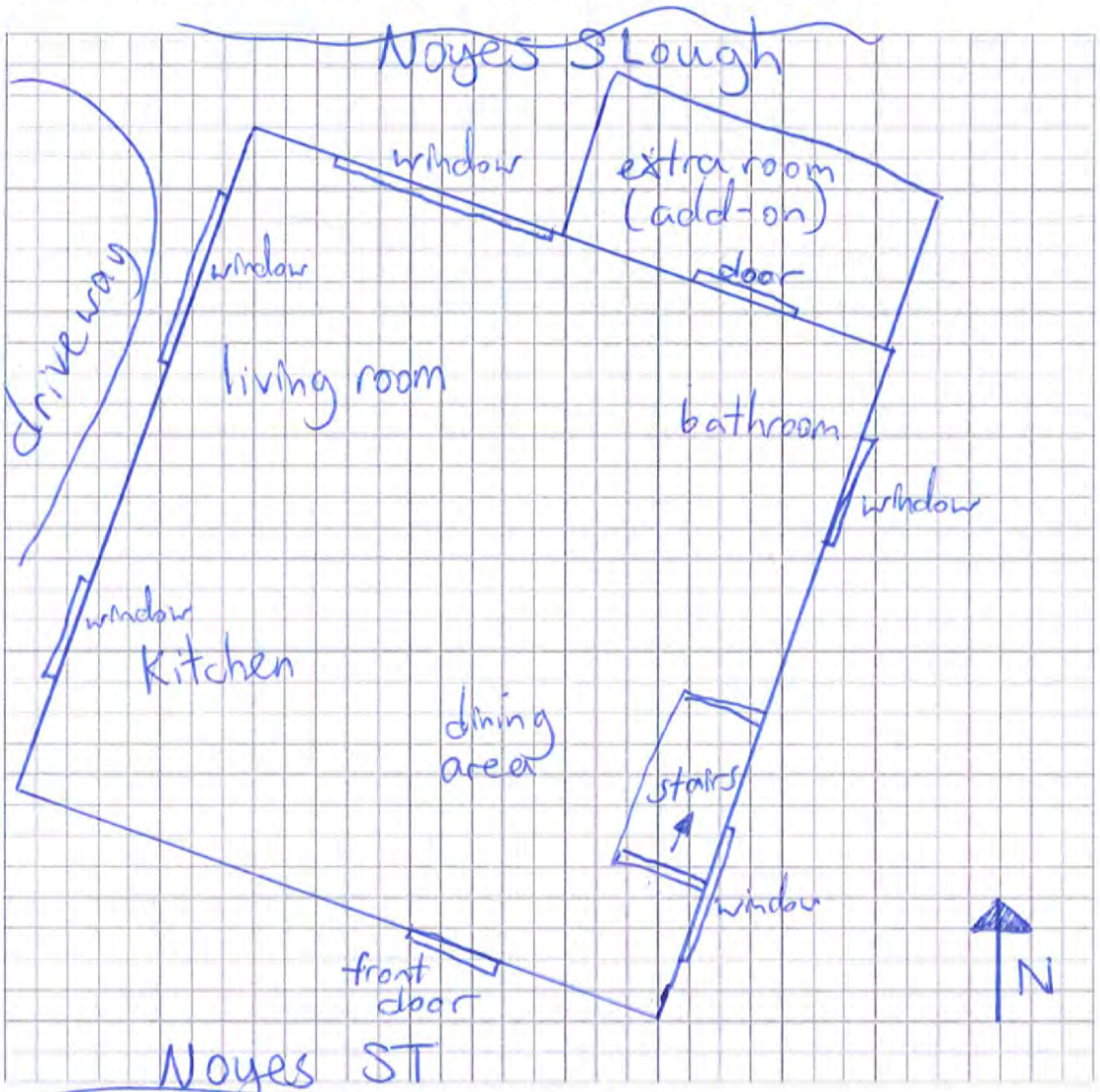
First Floor:



10. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



566 square feet (according to FNSB GIS)

SECTION II: INDOOR AIR SAMPLING QUESTIONNAIRE

This section should be completed during a presampling walkthrough. If indoor air sources of COCs are identified and removed, consider ventilating the building prior to sampling. However, ventilation and heating systems should be operating normally for 24 hours prior to sampling.

a) **1. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY**

Is there an attached garage? Y / (N)

Does the garage have a separate heating unit? Y / N / NA

Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, ATV, car) Y / N / (NA)

Please specify_____

Has the building ever had a fire? Y / (N) When?_____

Is a kerosene or unvented gas space heater present? Y / (N) Where?_____

Is there a workshop or hobby/craft area? Y / (N) Where & Type_____

Is there smoking in the building? Y / (N) How frequently?_____

Has painting/staining been done in the last 6 months? Y / (N) Where & When?_____

Is there new carpet, drapes or other textiles? Y / (N) Where & When?_____

Is there a kitchen exhaust fan? (Y) / N If yes, where vented?_____

Is there a bathroom exhaust fan? (Y) / N If yes, where vented?_____

Is there a clothes dryer? (Y) / N If yes, is it vented outside? (Y) / N

Are cleaning products, cosmetic products, or pesticides used that could interfere with indoor air sampling? Y / N

If yes, please describe_____

_____

_____

Do any of the building occupants use solvents at work? Y / (N)

(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? laundry soaps & household cleaners

If yes, are their clothes washed at work? Y / (N)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No

Yes, use dry-cleaning infrequently (monthly or less) Unknown

Yes, work at a dry-cleaning services

2. **PRODUCT INVENTORY FORM** (For use during building walkthrough)

Make & Model of field instrument used_____

List specific products found in the residence that have the potential to affect indoor air quality:

Location	Product Description	Site (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N

* Describe the condition of the product containers **as Unopened (UO), Used (U),** or **Deteriorated (D)**

** Photographs of the front and back of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

This form modified from:

ITRC (Interstate Technology & Regulatory Council). 2007. *Vapor Intrusion Pathway: A Practical Guideline.* VI-1. Washington, D.C.: Interstate Technology & Regulatory Council, Vapor Intrusion Team. www.itrcweb.org.

ALASKA DEPARTMENT OF ENVIRONMENAL CONSERVATION
BUILDING INVENTORY AND INDOOR AIR SAMPLING QUESTIONNAIRE

This form should be prepared by a person familiar with indoor air assessments with assistance from a person knowledgeable about the building. Complete this form for each building in which interior samples (e.g., indoor air, crawl space, or subslab soil gas samples) will be collected. Section I of this form should be used to assist in choosing an investigative strategy during workplan development. Section II should be used to assist in identification of complicating factors during a presampling building walkthrough.

Preparer's Name Sheila Hinckley Date/Time Prepared 10/30/17 @ 1230

Preparer's Affiliation Shannon & Wilson, Inc. Phone No. 907.479.0600

Purpose of Investigation Vapor Intrusion

SECTION I: BUILDING INVENTORY

1. **OCCUPANT OR BUILDING PERSONNEL:**

Interviewed: (Y) / N

Last Name Samuelson First Name Sue

Address 633 Noyes Street

County FNSB

Phone No. N/A

Number of Occupants/persons at this location 1 Age of Occupants 50+

2. **OWNER or LANDLORD:** (Check if same as occupant X)

Interviewed: (Y) / N

Last Name Samuelson First Name David (for owner Moses - dad)

Address 633 Noyes Street

County FNSB

Phone No. 907.322.1007

3. **BUILDING CHARACTERISTICS**

Type of Building: (Circle appropriate response)

(Residential)	School	Commercial/Multi-use
Industrial	Church	Other

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other_____

If multiple units, how many?_____

If the property is commercial, type?

Business Types(s) N/A

Does it include residences (i.e., multi-use)? Y / N If yes, how many?_____

Other characteristics:

Number of floors 1 Building age 1946

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

Have occupants noticed chemical odors in the building? Y / N

If yes, please describe:_____

4. AIRFLOW

Use air current tubes, tracer smoke, or knowledge about the building to evaluate airflow patterns and qualitatively describe:

Airflow between floors
floor ducts for unused heating vents are covered with plastic

Airflow in building near suspected source
N/A

Outdoor air infiltration
doors and windows

Infiltration into air ducts
see "Airflow between floors"

5. **BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply)

a. Above grade construction:	wood frame	log	concrete	brick
	constructed on pilings with enclosed air space		constructed on pilings with open air space	
b. Basement type:	full	crawlspace	slab-on-grade	other_____
c. Basement floor:	concrete	dirt	stone	other_____
d. Basement floor:	unsealed	sealed	sealed with_____	
e. Foundation walls:	poured	block	stone	other wood
f. Foundation walls:	unsealed	sealed	sealed with_____	
g. The basement is:	wet	damp	dry	
h. The basement is:	finished	unfinished	partially finished	
i. Sump present?	Y / N			
j. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade n 6 (feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

6. **HEATING, VENTING and AIR CONDITIONING** (Circle all that apply)

Type of heating system(s) used in this building: (Circle all that apply – not primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other Floor ducts existing - not operating

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by_____

Boiler/furnace located in: Basement Outdoors Main Floor Other_____

Do any of the heating appliances have cold-air intakes? Y / N

Type of air conditioning or ventilation used in this building:

Central Air	Window units	Open Windows	None

Commercial HVAC Heat-recovery system Passive air system

Are there air distribution ducts present? (Y) / N

Describe the ventilation system in the building, its condition where visible, and the tightness of duct joints. Indicate the locations of air supply and exhaust points on the floor plan.

_____

_____

_____

_____

Is there a radon mitigation system for the building/structure? Y / (N) Date of Installation_____

Is the system active or passive? Active/Passive

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom (Almost Never)

Level	**General Use of Each Floor (e.g. family room, bedroom, laundry, workshop, storage)**
Basement	storage
1st Floor	Bedroom (2), bathroom, kitchen, living room
2nd Floor	—
3rd Floor	—

8. WATER AND SEWAGE

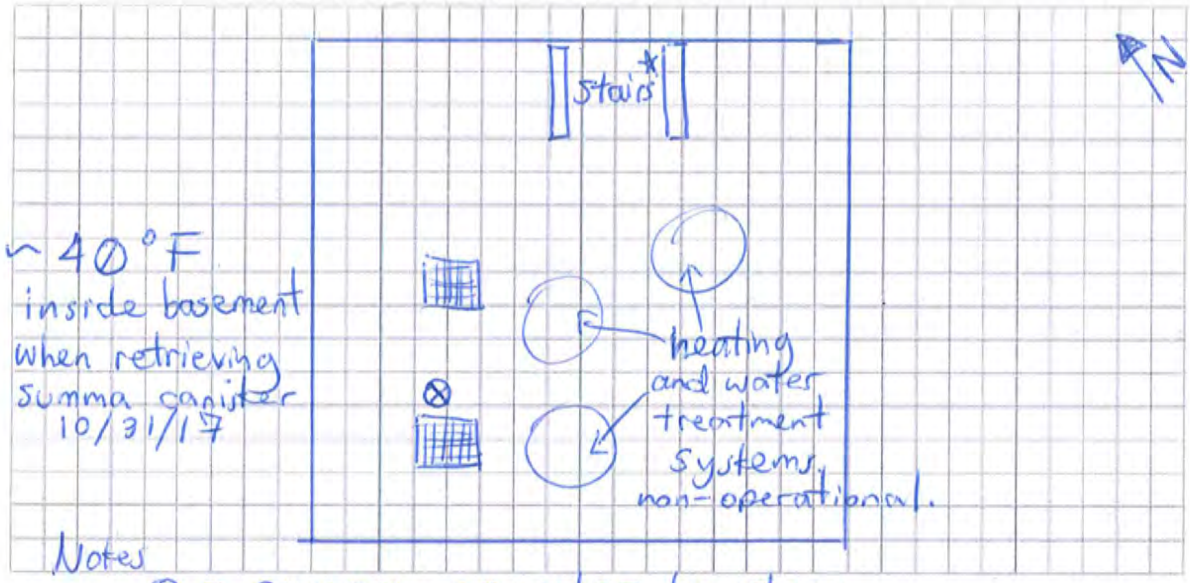
Water Supply: (Public Water) Drilled Well Driven Well Dug Well Other_____

Sewage Disposal: (Public Sewer) Septic Tank Leach Field Dry Well Other_____

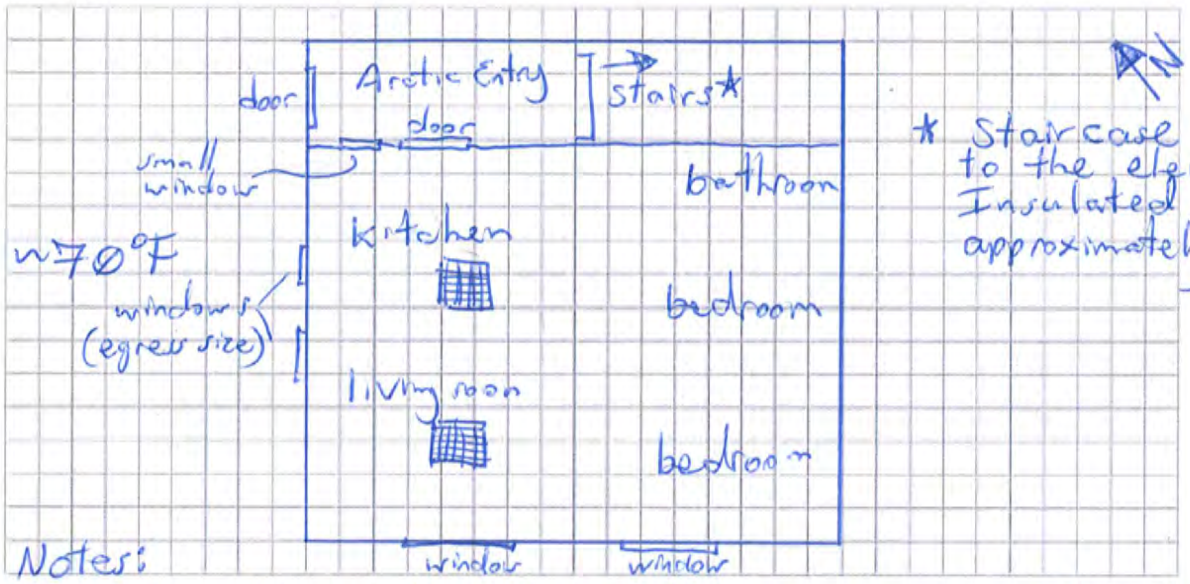
9. **FLOOR PLANS**

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



First Floor:

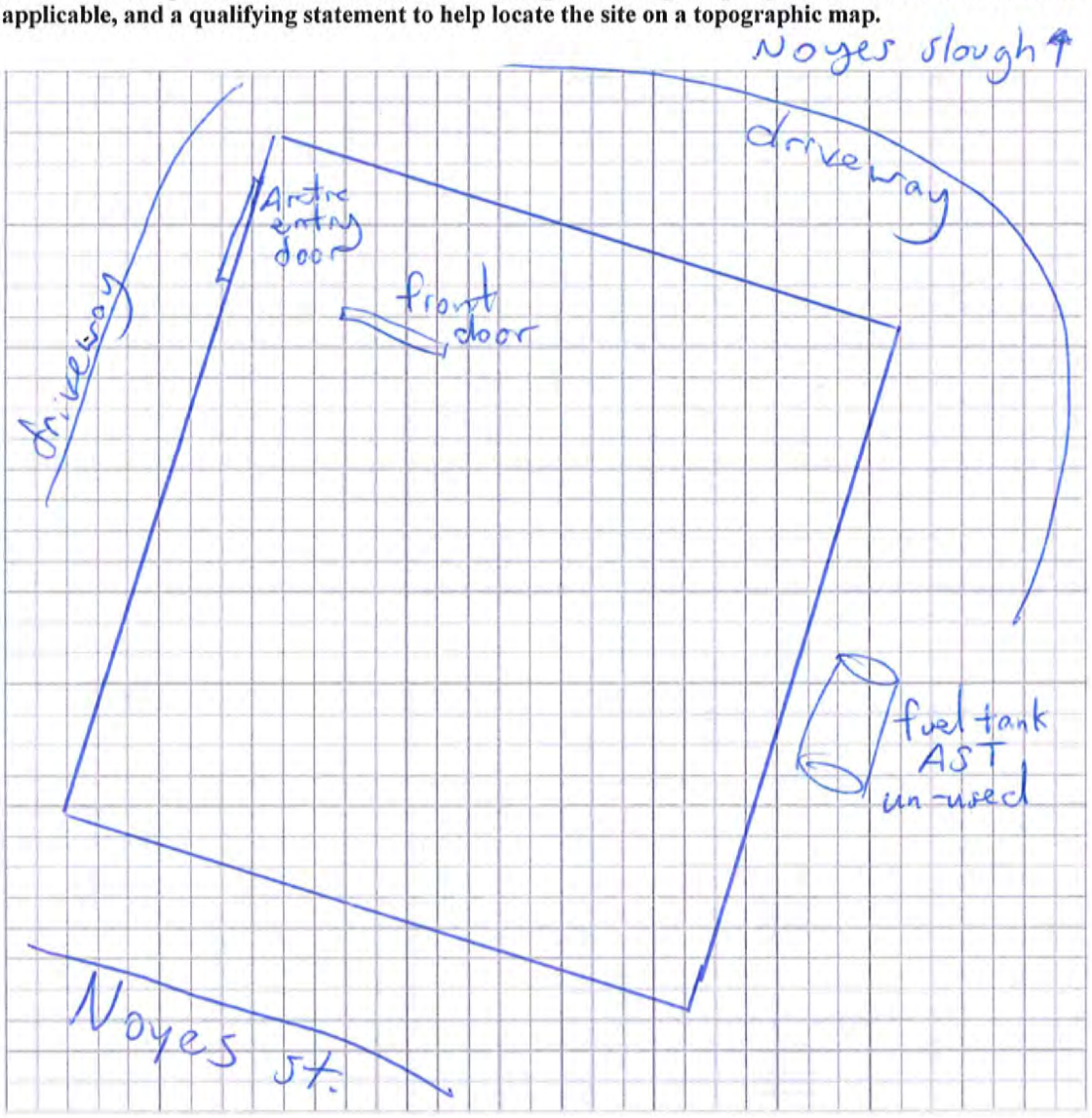


▦ = floor duct (heating) vents. Non-operational. Open to basement. covered with plastic in the kitchen and living room. Size: approximately 2 feet by 2 feet each.

10. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



SECTION II: INDOOR AIR SAMPLING QUESTIONNAIRE

This section should be completed during a presampling walkthrough. If indoor air sources of COCs are identified and removed, consider ventilating the building prior to sampling. However, ventilation and heating systems should be operating normally for 24 hours prior to sampling.

a) 1. **FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY**

Is there an attached garage? Y / (N)

Does the garage have a separate heating unit? Y / N / (NA)

Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, ATV, car) Y / N / (NA)

Please specify_____

Has the building ever had a fire? Y / (N) When?_____

Is a kerosene or unvented gas space heater present? Y / (N) Where?_____

Is there a workshop or hobby/craft area? Y / (N) Where & Type_____

Is there smoking in the building? (Y) / N How frequently?_____

Has painting/staining been done in the last 6 months? Y / (N) Where & When?_____

Is there new carpet, drapes or other textiles? Y / (N) Where & When?_____

Is there a kitchen exhaust fan? Y / N If yes, where vented?_____

Is there a bathroom exhaust fan? Y / (N) If yes, where vented?_____

Is there a clothes dryer? Y / (N) If yes, is it vented outside? Y / N

Are cleaning products, cosmetic products, or pesticides used that could interfere with indoor air sampling? Y / (N)

If yes, please describe_____

_____

_____

Do any of the building occupants use solvents at work? ~~Y / N~~ N/A - does not work

(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used?_____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) (No)

Yes, use dry-cleaning infrequently (monthly or less) Unknown

Yes, work at a dry-cleaning services

2. **PRODUCT INVENTORY FORM** (For use during building walkthrough)

Make & Model of field instrument used_____

List specific products found in the residence that have the potential to affect indoor air quality:

Location	Product Description	Site (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N
kitchen	dish soap		U			N
kitchen	lysol		U			N

* Describe the condition of the product containers **as Unopened (UO), Used (U),** or **Deteriorated (D)**

** Photographs of the front and back of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

This form modified from:

ITRC (Interstate Technology & Regulatory Council). 2007. *Vapor Intrusion Pathway: A Practical Guideline.* VI-1. Washington, D.C.: Interstate Technology & Regulatory Council, Vapor Intrusion Team. www.itrcweb.org.

APPENDIX D

ANALYTICAL LABORATORY REPORTS

WORK ORDERS
1178570
1710563
1711095A
1711098B
1711115A
1711115B
1711272A
1711272B
381710279

GRAPH OF RAD7

WORK ORDER 1178570

SGS

Laboratory Report of Analysis

To: Shannon & Wilson-Fairbanks
2355 Hill Rd.
Fairbanks, AK 99701
(907)479-0600

Report Number: **1178570**

Client Project: **32-1-20047-005 2017 BMES**

Dear Kristen Freiburger,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Stephen C. Ede
Alaska Division Technical Director

Stephen Ede
2017.11.10
09:05:05 -09'00'

Jennifer Dawkins
Project Manager
Jennifer.Dawkins@sgs.com

Date

Print Date: 11/09/2017 5:07:51PM

Case Narrative

SGS Client: Shannon & Wilson-Fairbanks

SGS Project: 1178570

Project Name/Site: 32-1-20047-005 2017 BMES

Refer to sample receipt form for information on sample condition.

* QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to the associated field samples.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

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SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are **AK00971 DW Chemistry (Provisionally Certified as of 10/12/2017) & Microbiology (Provisionally Certified as of 9/21/2017)** & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
MW-2	1178570001	10/26/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-3	1178570002	10/26/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-1	1178570003	10/26/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-101	1178570004	10/26/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-4	1178570005	10/26/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-12	1178570006	10/26/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-13	1178570007	10/27/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-7	1178570008	10/27/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-5	1178570009	10/27/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-6	1178570010	10/27/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-9	1178570011	10/27/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-10	1178570012	10/27/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-8	1178570013	10/30/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-108	1178570014	10/30/2017	10/31/2017	Water (Surface, Eff., Ground)
MW-11	1178570015	10/30/2017	10/31/2017	Water (Surface, Eff., Ground)
Trip Blank	1178570016	10/30/2017	10/31/2017	Water (Surface, Eff., Ground)

Method	Method Description
SW8260C	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **MW-2**
Lab Sample ID: 1178570001
Volatile GC/MS

Parameter	Result	Units
Chloroform	2.15	ug/L
cis-1,2-Dichloroethene	1.38	ug/L
Tetrachloroethene	85.3	ug/L
Trichloroethene	1.09	ug/L
Trichlorofluoromethane	11.4	ug/L

Client Sample ID: **MW-3**
Lab Sample ID: 1178570002
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	0.580	ug/L
Benzene	0.270J	ug/L
cis-1,2-Dichloroethene	0.400J	ug/L
Trichlorofluoromethane	1.89	ug/L

Client Sample ID: **MW-1**
Lab Sample ID: 1178570003
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	2.80	ug/L
Chloroform	14.2	ug/L
Tetrachloroethene	131	ug/L
Trichloroethene	0.780J	ug/L
Trichlorofluoromethane	30.5	ug/L

Client Sample ID: **MW-101**
Lab Sample ID: 1178570004
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	3.28	ug/L
Chloroform	15.9	ug/L
Tetrachloroethene	159	ug/L
Trichloroethene	0.960J	ug/L
Trichlorofluoromethane	38.1	ug/L

Client Sample ID: **MW-4**
Lab Sample ID: 1178570005
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	0.270J	ug/L
cis-1,2-Dichloroethene	0.480J	ug/L
Tetrachloroethene	40.5	ug/L
trans-1,2-Dichloroethene	1.83	ug/L
Trichloroethene	2.60	ug/L
Trichlorofluoromethane	5.93	ug/L

Client Sample ID: **MW-12**
Lab Sample ID: 1178570006
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	0.390J	ug/L
Benzene	0.130J	ug/L
Chloroform	0.550J	ug/L
cis-1,2-Dichloroethene	1.81	ug/L
Tetrachloroethene	146	ug/L
Trichloroethene	6.47	ug/L
Trichlorofluoromethane	1.87	ug/L

Detectable Results Summary

Client Sample ID: **MW-13**
Lab Sample ID: 1178570007
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	0.270J	ug/L
Chloroform	2.07	ug/L
Tetrachloroethene	21.1	ug/L
Trichlorofluoromethane	2.13	ug/L

Client Sample ID: **MW-7**
Lab Sample ID: 1178570008
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	0.280J	ug/L
cis-1,2-Dichloroethene	2.22	ug/L
Tetrachloroethene	7.04	ug/L
Trichloroethene	2.69	ug/L

Client Sample ID: **MW-5**
Lab Sample ID: 1178570009
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	0.540	ug/L
Benzene	0.190J	ug/L
Chloroform	1.66	ug/L
cis-1,2-Dichloroethene	1.70	ug/L
Tetrachloroethene	98.2	ug/L
trans-1,2-Dichloroethene	0.340J	ug/L
Trichloroethene	13.6	ug/L
Trichlorofluoromethane	7.83	ug/L

Client Sample ID: **MW-6**
Lab Sample ID: 1178570010
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	0.420J	ug/L
Benzene	0.120J	ug/L
Chloroform	1.54	ug/L
cis-1,2-Dichloroethene	1.67	ug/L
Tetrachloroethene	77.8	ug/L
Trichloroethene	8.19	ug/L
Trichlorofluoromethane	5.34	ug/L

Client Sample ID: **MW-9**
Lab Sample ID: 1178570011
Volatile GC/MS

Parameter	Result	Units
Chloroform	0.730J	ug/L
cis-1,2-Dichloroethene	4.06	ug/L
Tetrachloroethene	11.6	ug/L
trans-1,2-Dichloroethene	8.53	ug/L
Trichloroethene	4.04	ug/L

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Detectable Results Summary

Client Sample ID: **MW-10**
Lab Sample ID: 1178570012
Volatile GC/MS

Parameter	Result	Units
1,2-Dichloroethane	0.540	ug/L
Benzene	0.220J	ug/L
Chloroform	0.630J	ug/L
cis-1,2-Dichloroethene	2.58	ug/L
Tetrachloroethene	44.9	ug/L
Trichloroethene	8.54	ug/L
Trichlorofluoromethane	0.980J	ug/L

Client Sample ID: **MW-8**
Lab Sample ID: 1178570013
Volatile GC/MS

Parameter	Result	Units
Chloroform	0.440J	ug/L
cis-1,2-Dichloroethene	0.900J	ug/L
Tetrachloroethene	2.67	ug/L
trans-1,2-Dichloroethene	10.8	ug/L
Trichloroethene	1.16	ug/L

Client Sample ID: **MW-108**
Lab Sample ID: 1178570014
Volatile GC/MS

Parameter	Result	Units
Chloroform	0.460J	ug/L
cis-1,2-Dichloroethene	0.940J	ug/L
Tetrachloroethene	2.79	ug/L
trans-1,2-Dichloroethene	11.0	ug/L
Trichloroethene	1.22	ug/L

Client Sample ID: **MW-11**
Lab Sample ID: 1178570015
Volatile GC/MS

Parameter	Result	Units
cis-1,2-Dichloroethene	1.75	ug/L
Tetrachloroethene	7.88	ug/L
trans-1,2-Dichloroethene	23.6	ug/L
Trichloroethene	2.84	ug/L
Trichlorofluoromethane	5.51	ug/L

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Results of **MW-2**

Client Sample ID: **MW-2**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570001
Lab Project ID: 1178570

Collection Date: 10/26/17 11:11
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:54
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:54
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 22:54
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:54
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 22:54
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:54
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:54
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:54
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:54
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:54
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:54
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 22:54
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:54
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 22:54
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:54
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:54
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54

Print Date: 11/09/2017 5:07:55PM

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Results of **MW-2**

Client Sample ID: **MW-2**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570001
Lab Project ID: 1178570

Collection Date: 10/26/17 11:11
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	2.15		1.00	0.310	ug/L	1		11/06/17 22:54
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
cis-1,2-Dichloroethene	1.38		1.00	0.310	ug/L	1		11/06/17 22:54
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:54
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:54
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:54
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 22:54
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:54
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 22:54
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Tetrachloroethene	85.3		1.00	0.310	ug/L	1		11/06/17 22:54
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:54
Trichloroethene	1.09		1.00	0.310	ug/L	1		11/06/17 22:54
Trichlorofluoromethane	11.4		1.00	0.310	ug/L	1		11/07/17 22:23
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:54
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 22:54
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 22:54
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	1		11/06/17 22:54
4-Bromofluorobenzene (surr)	96.4		85-114		%	1		11/06/17 22:54
Toluene-d8 (surr)	97		89-112		%	1		11/06/17 22:54

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J flagging is activated

Results of **MW-2**

Client Sample ID: **MW-2**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570001
Lab Project ID: 1178570

Collection Date: 10/26/17 11:11
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17427
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/07/17 22:23
Container ID: 1178570001-A

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/07/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 22:54
Container ID: 1178570001-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-3**

Client Sample ID: **MW-3**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570002
Lab Project ID: 1178570

Collection Date: 10/26/17 11:57
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:11
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:11
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:11
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:11
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 19:11
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,2-Dichloroethane	0.580		0.500	0.150	ug/L	1		11/06/17 19:11
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:11
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:11
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:11
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:11
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:11
Benzene	0.270	J	0.400	0.120	ug/L	1		11/06/17 19:11
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:11
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 19:11
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:11
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:11
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11

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Results of **MW-3**

Client Sample ID: **MW-3**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570002
Lab Project ID: 1178570

Collection Date: 10/26/17 11:57
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
cis-1,2-Dichloroethene	0.400	J	1.00	0.310	ug/L	1		11/06/17 19:11
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:11
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:11
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:11
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 19:11
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:11
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 19:11
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:11
Trichlorofluoromethane	1.89		1.00	0.310	ug/L	1		11/07/17 22:39
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:11
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 19:11
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 19:11
Surrogates								
1,2-Dichloroethane-D4 (surr)	110		81-118		%	1		11/06/17 19:11
4-Bromofluorobenzene (surr)	98		85-114		%	1		11/06/17 19:11
Toluene-d8 (surr)	97.2		89-112		%	1		11/06/17 19:11

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J flagging is activated

Results of **MW-3**

Client Sample ID: **MW-3**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570002
Lab Project ID: 1178570

Collection Date: 10/26/17 11:57
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 19:11
Container ID: 1178570002-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17427
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/07/17 22:39
Container ID: 1178570002-A

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/07/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-1**

Client Sample ID: **MW-1**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570003
Lab Project ID: 1178570

Collection Date: 10/26/17 12:59
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/08/17 03:09
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/08/17 03:09
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/08/17 03:09
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/08/17 03:09
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/08/17 03:09
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,2-Dichloroethane	2.80		0.500	0.150	ug/L	1		11/08/17 03:09
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/08/17 03:09
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/08/17 03:09
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/08/17 03:09
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/08/17 03:09
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/08/17 03:09
Benzene	0.200	U	0.400	0.120	ug/L	1		11/08/17 03:09
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/08/17 03:09
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/08/17 03:09
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/08/17 03:09
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/08/17 03:09
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/08/17 03:09

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Results of **MW-1**

Client Sample ID: **MW-1**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570003
Lab Project ID: 1178570

Collection Date: 10/26/17 12:59
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	14.2		1.00	0.310	ug/L	1		11/08/17 03:09
Chloromethane	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		11/08/17 03:09
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		11/08/17 03:09
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
Freon-113	5.00 U		10.0	3.10	ug/L	1		11/08/17 03:09
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		11/08/17 03:09
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		11/08/17 03:09
Naphthalene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
o-Xylene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		11/08/17 03:09
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
Styrene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
Tetrachloroethene	131		1.00	0.310	ug/L	1		11/08/17 03:09
Toluene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		11/08/17 03:09
Trichloroethene	0.780 J		1.00	0.310	ug/L	1		11/08/17 03:09
Trichlorofluoromethane	30.5		1.00	0.310	ug/L	1		11/08/17 03:09
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		11/08/17 03:09
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		11/08/17 03:09
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		11/08/17 03:09
Surrogates								
1,2-Dichloroethane-D4 (surr)	96		81-118		%	1		11/08/17 03:09
4-Bromofluorobenzene (surr)	103		85-114		%	1		11/08/17 03:09
Toluene-d8 (surr)	98.6		89-112		%	1		11/08/17 03:09

Results of **MW-1**

Client Sample ID: **MW-1**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570003
Lab Project ID: 1178570

Collection Date: 10/26/17 12:59
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17427
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/08/17 03:09
Container ID:

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/07/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-101**

Client Sample ID: **MW-101**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570004
Lab Project ID: 1178570

Collection Date: 10/26/17 12:49
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:26
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:26
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:26
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:26
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 19:26
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,2-Dichloroethane	3.28		0.500	0.150	ug/L	1		11/06/17 19:26
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:26
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:26
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:26
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:26
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:26
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:26
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:26
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 19:26
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:26
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:26
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:26

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J flagging is activated

Results of **MW-101**

Client Sample ID: **MW-101**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570004
Lab Project ID: 1178570

Collection Date: 10/26/17 12:49
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	15.9		1.00	0.310	ug/L	1		11/06/17 19:26
Chloromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		11/06/17 19:26
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		11/06/17 19:26
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
Freon-113	5.00 U		10.0	3.10	ug/L	1		11/06/17 19:26
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		11/06/17 19:26
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		11/06/17 19:26
Naphthalene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
o-Xylene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		11/06/17 19:26
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
Styrene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
Tetrachloroethene	159		1.00	0.310	ug/L	1		11/06/17 19:26
Toluene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:26
Trichloroethene	0.960 J		1.00	0.310	ug/L	1		11/06/17 19:26
Trichlorofluoromethane	38.1		1.00	0.310	ug/L	1		11/08/17 00:14
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		11/06/17 19:26
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		11/06/17 19:26
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		11/06/17 19:26
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		11/06/17 19:26
4-Bromofluorobenzene (surr)	99.6		85-114		%	1		11/06/17 19:26
Toluene-d8 (surr)	102		89-112		%	1		11/06/17 19:26

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Results of **MW-101**

Client Sample ID: **MW-101**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570004
Lab Project ID: 1178570

Collection Date: 10/26/17 12:49
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17427
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/08/17 00:14
Container ID: 1178570004-A

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/07/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 19:26
Container ID: 1178570004-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570005
Lab Project ID: 1178570

Collection Date: 10/26/17 14:12
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:42
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:42
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:42
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:42
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 19:42
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,2-Dichloroethane	0.270	J	0.500	0.150	ug/L	1		11/06/17 19:42
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:42
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:42
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:42
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:42
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:42
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:42
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:42
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 19:42
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:42
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:42
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:42

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Results of **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570005
Lab Project ID: 1178570

Collection Date: 10/26/17 14:12
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
Chloromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
cis-1,2-Dichloroethene	0.480 J		1.00	0.310	ug/L	1		11/06/17 19:42
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		11/06/17 19:42
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		11/06/17 19:42
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
Freon-113	5.00 U		10.0	3.10	ug/L	1		11/06/17 19:42
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		11/06/17 19:42
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		11/06/17 19:42
Naphthalene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
o-Xylene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		11/06/17 19:42
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
Styrene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
Tetrachloroethene	40.5		1.00	0.310	ug/L	1		11/06/17 19:42
Toluene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
trans-1,2-Dichloroethene	1.83		1.00	0.310	ug/L	1		11/06/17 19:42
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		11/06/17 19:42
Trichloroethene	2.60		1.00	0.310	ug/L	1		11/06/17 19:42
Trichlorofluoromethane	5.93		1.00	0.310	ug/L	1		11/07/17 22:55
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		11/06/17 19:42
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		11/06/17 19:42
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		11/06/17 19:42
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		81-118		%	1		11/06/17 19:42
4-Bromofluorobenzene (surr)	98.5		85-114		%	1		11/06/17 19:42
Toluene-d8 (surr)	98.5		89-112		%	1		11/06/17 19:42

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Results of **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570005
Lab Project ID: 1178570

Collection Date: 10/26/17 14:12
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 19:42
Container ID: 1178570005-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17427
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/07/17 22:55
Container ID: 1178570005-A

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/07/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-12**

Client Sample ID: **MW-12**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570006
Lab Project ID: 1178570

Collection Date: 10/26/17 15:24
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:58
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:58
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:58
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:58
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 19:58
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,2-Dichloroethane	0.390	J	0.500	0.150	ug/L	1		11/06/17 19:58
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:58
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:58
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:58
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:58
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:58
Benzene	0.130	J	0.400	0.120	ug/L	1		11/06/17 19:58
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:58
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 19:58
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:58
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:58
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58

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Results of **MW-12**

Client Sample ID: **MW-12**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570006
Lab Project ID: 1178570

Collection Date: 10/26/17 15:24
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.550	J	1.00	0.310	ug/L	1		11/06/17 19:58
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
cis-1,2-Dichloroethene	1.81		1.00	0.310	ug/L	1		11/06/17 19:58
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:58
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:58
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:58
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 19:58
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:58
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 19:58
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Tetrachloroethene	146		1.00	0.310	ug/L	1		11/06/17 19:58
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:58
Trichloroethene	6.47		1.00	0.310	ug/L	1		11/06/17 19:58
Trichlorofluoromethane	1.87		1.00	0.310	ug/L	1		11/07/17 23:10
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:58
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 19:58
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 19:58
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	1		11/06/17 19:58
4-Bromofluorobenzene (surr)	97.9		85-114		%	1		11/06/17 19:58
Toluene-d8 (surr)	101		89-112		%	1		11/06/17 19:58

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Results of **MW-12**

Client Sample ID: **MW-12**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570006
Lab Project ID: 1178570

Collection Date: 10/26/17 15:24
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 19:58
Container ID: 1178570006-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17427
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/07/17 23:10
Container ID: 1178570006-A

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/07/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-13**

Client Sample ID: **MW-13**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570007
Lab Project ID: 1178570

Collection Date: 10/27/17 10:48
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:14
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:14
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 20:14
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:14
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 20:14
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,2-Dichloroethane	0.270	J	0.500	0.150	ug/L	1		11/06/17 20:14
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:14
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:14
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:14
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:14
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:14
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 20:14
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:14
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 20:14
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:14
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:14
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:14

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Results of **MW-13**

Client Sample ID: **MW-13**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570007
Lab Project ID: 1178570

Collection Date: 10/27/17 10:48
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	2.07		1.00	0.310	ug/L	1		11/06/17 20:14
Chloromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		11/06/17 20:14
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		11/06/17 20:14
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
Freon-113	5.00 U		10.0	3.10	ug/L	1		11/06/17 20:14
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		11/06/17 20:14
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		11/06/17 20:14
Naphthalene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
o-Xylene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		11/06/17 20:14
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
Styrene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
Tetrachloroethene	21.1		1.00	0.310	ug/L	1		11/06/17 20:14
Toluene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		11/06/17 20:14
Trichlorofluoromethane	2.13		1.00	0.310	ug/L	1		11/07/17 23:26
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		11/06/17 20:14
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		11/06/17 20:14
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		11/06/17 20:14
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		81-118		%	1		11/06/17 20:14
4-Bromofluorobenzene (surr)	96.8		85-114		%	1		11/06/17 20:14
Toluene-d8 (surr)	97.8		89-112		%	1		11/06/17 20:14

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Results of **MW-13**

Client Sample ID: **MW-13**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570007
Lab Project ID: 1178570

Collection Date: 10/27/17 10:48
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 20:14
Container ID: 1178570007-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17427
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/07/17 23:26
Container ID: 1178570007-A

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/07/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570008
Lab Project ID: 1178570

Collection Date: 10/27/17 11:42
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:30
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:30
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 20:30
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:30
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 20:30
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,2-Dichloroethane	0.280	J	0.500	0.150	ug/L	1		11/06/17 20:30
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:30
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:30
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:30
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:30
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:30
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 20:30
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:30
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 20:30
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:30
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:30
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30

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Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570008
Lab Project ID: 1178570

Collection Date: 10/27/17 11:42
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
cis-1,2-Dichloroethene	2.22		1.00	0.310	ug/L	1		11/06/17 20:30
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:30
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:30
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:30
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 20:30
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:30
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 20:30
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Tetrachloroethene	7.04		1.00	0.310	ug/L	1		11/06/17 20:30
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Trichloroethene	2.69		1.00	0.310	ug/L	1		11/06/17 20:30
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:30
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:30
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 20:30
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 20:30
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		81-118		%	1		11/06/17 20:30
4-Bromofluorobenzene (surr)	95.2		85-114		%	1		11/06/17 20:30
Toluene-d8 (surr)	97.5		89-112		%	1		11/06/17 20:30

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Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570008
Lab Project ID: 1178570

Collection Date: 10/27/17 11:42
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 20:30
Container ID: 1178570008-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570009
Lab Project ID: 1178570

Collection Date: 10/27/17 13:08
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:22
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:22
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 22:22
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:22
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 22:22
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,2-Dichloroethane	0.540		0.500	0.150	ug/L	1		11/06/17 22:22
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:22
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:22
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:22
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:22
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:22
Benzene	0.190	J	0.400	0.120	ug/L	1		11/06/17 22:22
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:22
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 22:22
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:22
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:22
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:22

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Results of **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570009
Lab Project ID: 1178570

Collection Date: 10/27/17 13:08
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	1.66		1.00	0.310	ug/L	1		11/06/17 22:22
Chloromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
cis-1,2-Dichloroethene	1.70		1.00	0.310	ug/L	1		11/06/17 22:22
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		11/06/17 22:22
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		11/06/17 22:22
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
Freon-113	5.00 U		10.0	3.10	ug/L	1		11/06/17 22:22
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		11/06/17 22:22
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		11/06/17 22:22
Naphthalene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
o-Xylene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		11/06/17 22:22
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
Styrene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
Tetrachloroethene	98.2		1.00	0.310	ug/L	1		11/06/17 22:22
Toluene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
trans-1,2-Dichloroethene	0.340 J		1.00	0.310	ug/L	1		11/06/17 22:22
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:22
Trichloroethene	13.6		1.00	0.310	ug/L	1		11/06/17 22:22
Trichlorofluoromethane	7.83		1.00	0.310	ug/L	1		11/07/17 23:42
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		11/06/17 22:22
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		11/06/17 22:22
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		11/06/17 22:22
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		11/06/17 22:22
4-Bromofluorobenzene (surr)	96.5		85-114		%	1		11/06/17 22:22
Toluene-d8 (surr)	101		89-112		%	1		11/06/17 22:22

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Results of **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570009
Lab Project ID: 1178570

Collection Date: 10/27/17 13:08
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 22:22
Container ID: 1178570009-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17427
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/07/17 23:42
Container ID: 1178570009-A

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/07/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570010
Lab Project ID: 1178570

Collection Date: 10/27/17 13:38
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:38
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:38
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 22:38
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:38
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 22:38
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,2-Dichloroethane	0.420	J	0.500	0.150	ug/L	1		11/06/17 22:38
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:38
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:38
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:38
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:38
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:38
Benzene	0.120	J	0.400	0.120	ug/L	1		11/06/17 22:38
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:38
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 22:38
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 22:38
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 22:38
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 22:38

Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570010
Lab Project ID: 1178570

Collection Date: 10/27/17 13:38
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	1.54		1.00	0.310	ug/L	1		11/06/17 22:38
Chloromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
cis-1,2-Dichloroethene	1.67		1.00	0.310	ug/L	1		11/06/17 22:38
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		11/06/17 22:38
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		11/06/17 22:38
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
Freon-113	5.00 U		10.0	3.10	ug/L	1		11/06/17 22:38
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		11/06/17 22:38
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		11/06/17 22:38
Naphthalene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
o-Xylene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		11/06/17 22:38
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
Styrene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
Tetrachloroethene	77.8		1.00	0.310	ug/L	1		11/06/17 22:38
Toluene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		11/06/17 22:38
Trichloroethene	8.19		1.00	0.310	ug/L	1		11/06/17 22:38
Trichlorofluoromethane	5.34		1.00	0.310	ug/L	1		11/07/17 23:58
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		11/06/17 22:38
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		11/06/17 22:38
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		11/06/17 22:38
Surrogates								
1,2-Dichloroethane-D4 (surr)	103		81-118		%	1		11/06/17 22:38
4-Bromofluorobenzene (surr)	97.5		85-114		%	1		11/06/17 22:38
Toluene-d8 (surr)	100		89-112		%	1		11/06/17 22:38

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Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570010
Lab Project ID: 1178570

Collection Date: 10/27/17 13:38
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 22:38
Container ID: 1178570010-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17427
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/07/17 23:58
Container ID: 1178570010-A

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/07/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-9**

Client Sample ID: **MW-9**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570011
Lab Project ID: 1178570

Collection Date: 10/27/17 15:45
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:46
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:46
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 20:46
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:46
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 20:46
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:46
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:46
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:46
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:46
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:46
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:46
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 20:46
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:46
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 20:46
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:46
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:46
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46

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Results of **MW-9**

Client Sample ID: **MW-9**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570011
Lab Project ID: 1178570

Collection Date: 10/27/17 15:45
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.730	J	1.00	0.310	ug/L	1		11/06/17 20:46
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
cis-1,2-Dichloroethene	4.06		1.00	0.310	ug/L	1		11/06/17 20:46
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:46
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 20:46
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:46
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 20:46
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:46
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 20:46
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Tetrachloroethene	11.6		1.00	0.310	ug/L	1		11/06/17 20:46
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
trans-1,2-Dichloroethene	8.53		1.00	0.310	ug/L	1		11/06/17 20:46
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Trichloroethene	4.04		1.00	0.310	ug/L	1		11/06/17 20:46
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 20:46
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 20:46
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 20:46
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 20:46
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		81-118		%	1		11/06/17 20:46
4-Bromofluorobenzene (surr)	96.8		85-114		%	1		11/06/17 20:46
Toluene-d8 (surr)	98.9		89-112		%	1		11/06/17 20:46

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Results of **MW-9**

Client Sample ID: **MW-9**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570011
Lab Project ID: 1178570

Collection Date: 10/27/17 15:45
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 20:46
Container ID: 1178570011-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-10**

Client Sample ID: **MW-10**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570012
Lab Project ID: 1178570

Collection Date: 10/27/17 16:36
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:02
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:02
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 21:02
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:02
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 21:02
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,2-Dichloroethane	0.540		0.500	0.150	ug/L	1		11/06/17 21:02
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:02
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:02
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:02
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:02
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:02
Benzene	0.220	J	0.400	0.120	ug/L	1		11/06/17 21:02
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:02
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 21:02
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:02
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:02
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02

Results of **MW-10**

Client Sample ID: **MW-10**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570012
Lab Project ID: 1178570

Collection Date: 10/27/17 16:36
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.630	J	1.00	0.310	ug/L	1		11/06/17 21:02
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
cis-1,2-Dichloroethene	2.58		1.00	0.310	ug/L	1		11/06/17 21:02
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:02
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:02
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:02
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 21:02
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:02
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 21:02
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Tetrachloroethene	44.9		1.00	0.310	ug/L	1		11/06/17 21:02
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:02
Trichloroethene	8.54		1.00	0.310	ug/L	1		11/06/17 21:02
Trichlorofluoromethane	0.980	J	1.00	0.310	ug/L	1		11/08/17 18:38
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:02
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 21:02
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 21:02
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		81-118		%	1		11/06/17 21:02
4-Bromofluorobenzene (surr)	98.8		85-114		%	1		11/06/17 21:02
Toluene-d8 (surr)	98.5		89-112		%	1		11/06/17 21:02

Print Date: 11/09/2017 5:07:55PM

J flagging is activated

Results of **MW-10**

Client Sample ID: **MW-10**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570012
Lab Project ID: 1178570

Collection Date: 10/27/17 16:36
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17428
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/08/17 18:38
Container ID: 1178570012-A

Prep Batch: VXX31691
Prep Method: SW5030B
Prep Date/Time: 11/08/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 21:02
Container ID: 1178570012-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-8**

Client Sample ID: **MW-8**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570013
Lab Project ID: 1178570

Collection Date: 10/30/17 11:21
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:18
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:18
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 21:18
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:18
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 21:18
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:18
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:18
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:18
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:18
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:18
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:18
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 21:18
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:18
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 21:18
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:18
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:18
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18

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J flagging is activated

Results of **MW-8**

Client Sample ID: **MW-8**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570013
Lab Project ID: 1178570

Collection Date: 10/30/17 11:21
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.440	J	1.00	0.310	ug/L	1		11/06/17 21:18
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
cis-1,2-Dichloroethene	0.900	J	1.00	0.310	ug/L	1		11/06/17 21:18
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:18
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:18
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:18
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 21:18
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:18
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 21:18
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Tetrachloroethene	2.67		1.00	0.310	ug/L	1		11/06/17 21:18
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
trans-1,2-Dichloroethene	10.8		1.00	0.310	ug/L	1		11/06/17 21:18
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Trichloroethene	1.16		1.00	0.310	ug/L	1		11/06/17 21:18
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:18
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:18
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 21:18
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 21:18
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		81-118		%	1		11/06/17 21:18
4-Bromofluorobenzene (surr)	98.2		85-114		%	1		11/06/17 21:18
Toluene-d8 (surr)	98.6		89-112		%	1		11/06/17 21:18

Print Date: 11/09/2017 5:07:55PM

J flagging is activated

Results of **MW-8**

Client Sample ID: **MW-8**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570013
Lab Project ID: 1178570

Collection Date: 10/30/17 11:21
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 21:18
Container ID: 1178570013-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-108**

Client Sample ID: **MW-108**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570014
Lab Project ID: 1178570

Collection Date: 10/30/17 11:11
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:34
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:34
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 21:34
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:34
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 21:34
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:34
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:34
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:34
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:34
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:34
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:34
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 21:34
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:34
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 21:34
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:34
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:34
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34

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Results of **MW-108**

Client Sample ID: **MW-108**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570014
Lab Project ID: 1178570

Collection Date: 10/30/17 11:11
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.460	J	1.00	0.310	ug/L	1		11/06/17 21:34
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
cis-1,2-Dichloroethene	0.940	J	1.00	0.310	ug/L	1		11/06/17 21:34
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:34
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 21:34
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:34
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 21:34
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:34
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 21:34
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Tetrachloroethene	2.79		1.00	0.310	ug/L	1		11/06/17 21:34
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
trans-1,2-Dichloroethene	11.0		1.00	0.310	ug/L	1		11/06/17 21:34
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Trichloroethene	1.22		1.00	0.310	ug/L	1		11/06/17 21:34
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 21:34
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 21:34
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 21:34
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 21:34
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		81-118		%	1		11/06/17 21:34
4-Bromofluorobenzene (surr)	97.4		85-114		%	1		11/06/17 21:34
Toluene-d8 (surr)	99		89-112		%	1		11/06/17 21:34

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Results of **MW-108**

Client Sample ID: **MW-108**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570014
Lab Project ID: 1178570

Collection Date: 10/30/17 11:11
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 21:34
Container ID: 1178570014-A

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **MW-11**

Client Sample ID: **MW-11**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570015
Lab Project ID: 1178570

Collection Date: 10/30/17 12:25
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:49
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:49
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:49
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:49
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 19:49
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:49
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:49
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:49
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:49
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:49
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:49
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:49
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:49
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 19:49
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:49
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:49
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49

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Results of **MW-11**

Client Sample ID: **MW-11**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570015
Lab Project ID: 1178570

Collection Date: 10/30/17 12:25
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
cis-1,2-Dichloroethene	1.75		1.00	0.310	ug/L	1		11/06/17 19:49
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:49
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:49
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:49
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 19:49
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:49
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 19:49
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Tetrachloroethene	7.88		1.00	0.310	ug/L	1		11/06/17 19:49
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
trans-1,2-Dichloroethene	23.6		1.00	0.310	ug/L	1		11/06/17 19:49
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:49
Trichloroethene	2.84		1.00	0.310	ug/L	1		11/06/17 19:49
Trichlorofluoromethane	5.51		1.00	0.310	ug/L	1		11/06/17 19:49
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:49
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 19:49
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 19:49
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	1		11/06/17 19:49
4-Bromofluorobenzene (surr)	106		85-114		%	1		11/06/17 19:49
Toluene-d8 (surr)	98.1		89-112		%	1		11/06/17 19:49

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Results of **MW-11**

Client Sample ID: **MW-11**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570015
Lab Project ID: 1178570

Collection Date: 10/30/17 12:25
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17422
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 19:49
Container ID: 1178570015-A

Prep Batch: VXX31683
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570016
Lab Project ID: 1178570

Collection Date: 10/30/17 12:25
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:01
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:01
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:01
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:01
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		11/06/17 19:01
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:01
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:01
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:01
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:01
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:01
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:01
Benzene	0.200	U	0.400	0.120	ug/L	1		11/06/17 19:01
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:01
Bromoform	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Bromomethane	2.50	U	5.00	1.50	ug/L	1		11/06/17 19:01
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:01
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:01
Chloroethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570016
Lab Project ID: 1178570

Collection Date: 10/30/17 12:25
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Chloromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:01
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		11/06/17 19:01
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Freon-113	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:01
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		11/06/17 19:01
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:01
Naphthalene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/06/17 19:01
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Styrene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Toluene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		11/06/17 19:01
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		11/06/17 19:01
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		11/06/17 19:01
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/06/17 19:01
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	1		11/06/17 19:01
4-Bromofluorobenzene (surr)	103		85-114		%	1		11/06/17 19:01
Toluene-d8 (surr)	99.6		89-112		%	1		11/06/17 19:01

Print Date: 11/09/2017 5:07:55PM

J flagging is activated

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **32-1-20047-005 2017 BMES**
Lab Sample ID: 1178570016
Lab Project ID: 1178570

Collection Date: 10/30/17 12:25
Received Date: 10/31/17 08:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17422
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 11/06/17 19:01
Container ID: 1178570016-A

Prep Batch: VXX31683
Prep Method: SW5030B
Prep Date/Time: 11/06/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1771699 [VXX/31683]
Blank Lab ID: 1424595

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570015, 1178570016

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

Method Blank

Blank ID: MB for HBN 1771699 [VXX/31683]
Blank Lab ID: 1424595

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570015, 1178570016

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	107	81-118		%
4-Bromofluorobenzene (surr)	108	85-114		%
Toluene-d8 (surr)	101	89-112		%

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Method Blank

Blank ID: MB for HBN 1771699 [VXX/31683]
Blank Lab ID: 1424595

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570015, 1178570016

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS17422
Analytical Method: SW8260C
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: FDR
Analytical Date/Time: 11/6/2017 2:56:00PM

Prep Batch: VXX31683
Prep Method: SW5030B
Prep Date/Time: 11/6/2017 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31683]
Blank Spike Lab ID: 1424596
Date Analyzed: 11/06/2017 15:53

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31683]
Spike Duplicate Lab ID: 1424597
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570015, 1178570016

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	26.3	88	30	29.9	100	(78-124)	12.70	(< 20)
1,1,1-Trichloroethane	30	28.8	96	30	28.7	96	(74-131)	0.59	(< 20)
1,1,2,2-Tetrachloroethane	30	31.0	103	30	31.5	105	(71-121)	1.60	(< 20)
1,1,2-Trichloroethane	30	29.2	97	30	31.5	105	(80-119)	7.50	(< 20)
1,1-Dichloroethane	30	26.7	89	30	26.4	88	(77-125)	1.00	(< 20)
1,1-Dichloroethene	30	28.7	96	30	28.3	94	(71-131)	1.30	(< 20)
1,1-Dichloropropene	30	30.5	102	30	30.8	103	(79-125)	0.98	(< 20)
1,2,3-Trichlorobenzene	30	30.8	103	30	35.2	117	(69-129)	13.40	(< 20)
1,2,3-Trichloropropane	30	30.5	102	30	31.0	103	(73-122)	1.70	(< 20)
1,2,4-Trichlorobenzene	30	31.0	103	30	33.2	111	(69-130)	7.10	(< 20)
1,2,4-Trimethylbenzene	30	28.1	94	30	28.5	95	(79-124)	1.30	(< 20)
1,2-Dibromo-3-chloropropane	30	34.4	115	30	36.2	121	(62-128)	5.20	(< 20)
1,2-Dibromoethane	30	28.4	95	30	30.9	103	(77-121)	8.30	(< 20)
1,2-Dichlorobenzene	30	30.0	100	30	30.6	102	(80-119)	1.90	(< 20)
1,2-Dichloroethane	30	30.1	100	30	29.8	99	(73-128)	0.93	(< 20)
1,2-Dichloropropane	30	29.8	99	30	29.8	99	(78-122)	0.13	(< 20)
1,3,5-Trimethylbenzene	30	29.2	97	30	30.2	101	(75-124)	3.20	(< 20)
1,3-Dichlorobenzene	30	29.8	99	30	30.6	102	(80-119)	2.70	(< 20)
1,3-Dichloropropane	30	29.4	98	30	31.6	105	(80-119)	7.20	(< 20)
1,4-Dichlorobenzene	30	29.4	98	30	30.2	101	(79-118)	2.90	(< 20)
2,2-Dichloropropane	30	29.3	98	30	28.7	96	(60-139)	1.80	(< 20)
2-Butanone (MEK)	90	83.4	93	90	88.2	98	(56-143)	5.60	(< 20)
2-Chlorotoluene	30	31.6	105	30	32.0	107	(79-122)	1.30	(< 20)
2-Hexanone	90	83.2	93	90	91.5	102	(57-139)	9.50	(< 20)
4-Chlorotoluene	30	30.8	103	30	31.7	106	(78-122)	2.90	(< 20)
4-Isopropyltoluene	30	29.3	98	30	30.5	102	(77-127)	3.90	(< 20)
4-Methyl-2-pentanone (MIBK)	90	78.6	87	90	86.3	96	(67-130)	9.30	(< 20)
Benzene	30	28.9	97	30	29.3	98	(79-120)	1.20	(< 20)
Bromobenzene	30	29.5	98	30	29.1	97	(80-120)	1.30	(< 20)
Bromochloromethane	30	27.9	93	30	27.3	91	(78-123)	2.20	(< 20)
Bromodichloromethane	30	30.4	101	30	29.9	100	(79-125)	1.80	(< 20)
Bromoform	30	27.8	93	30	31.4	105	(66-130)	12.20	(< 20)
Bromomethane	30	26.1	87	30	26.6	89	(53-141)	1.70	(< 20)
Carbon disulfide	45	43.0	96	45	42.0	93	(64-133)	2.40	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31683]
Blank Spike Lab ID: 1424596
Date Analyzed: 11/06/2017 15:53

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31683]
Spike Duplicate Lab ID: 1424597
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570015, 1178570016

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	30.5	102	30	30.2	101	(72-136)	0.89	(< 20)
Chlorobenzene	30	29.0	97	30	29.9	100	(82-118)	3.40	(< 20)
Chloroethane	30	30.5	102	30	33.3	111	(60-138)	9.00	(< 20)
Chloroform	30	27.3	91	30	27.0	90	(79-124)	1.10	(< 20)
Chloromethane	30	27.3	91	30	26.5	89	(50-139)	3.00	(< 20)
cis-1,2-Dichloroethene	30	26.6	89	30	26.4	88	(78-123)	0.42	(< 20)
cis-1,3-Dichloropropene	30	30.9	103	30	30.7	102	(75-124)	0.71	(< 20)
Dibromochloromethane	30	28.4	95	30	30.2	101	(74-126)	6.30	(< 20)
Dibromomethane	30	27.8	93	30	27.3	91	(79-123)	1.80	(< 20)
Dichlorodifluoromethane	30	26.4	88	30	26.1	87	(32-152)	1.40	(< 20)
Ethylbenzene	30	29.4	98	30	30.3	101	(79-121)	2.90	(< 20)
Freon-113	45	44.8	99	45	44.3	99	(70-136)	0.94	(< 20)
Hexachlorobutadiene	30	30.5	102	30	31.9	106	(66-134)	4.40	(< 20)
Isopropylbenzene (Cumene)	30	31.7	106	30	33.4	111	(72-131)	5.30	(< 20)
Methylene chloride	30	28.2	94	30	27.9	93	(74-124)	1.20	(< 20)
Methyl-t-butyl ether	45	45.2	100	45	45.4	101	(71-124)	0.51	(< 20)
Naphthalene	30	30.6	102	30	35.6	119	(61-128)	15.30	(< 20)
n-Butylbenzene	30	30.1	100	30	30.9	103	(75-128)	2.40	(< 20)
n-Propylbenzene	30	31.6	105	30	32.1	107	(76-126)	1.40	(< 20)
o-Xylene	30	28.6	95	30	30.8	103	(78-122)	7.30	(< 20)
P & M -Xylene	60	57.4	96	60	61.3	102	(80-121)	6.70	(< 20)
sec-Butylbenzene	30	31.2	104	30	31.4	105	(77-126)	0.61	(< 20)
Styrene	30	31.0	103	30	33.0	110	(78-123)	6.10	(< 20)
tert-Butylbenzene	30	30.9	103	30	31.4	105	(78-124)	1.40	(< 20)
Tetrachloroethene	30	28.3	94	30	32.9	110	(74-129)	15.10	(< 20)
Toluene	30	28.0	93	30	30.0	100	(80-121)	6.80	(< 20)
trans-1,2-Dichloroethene	30	28.7	96	30	28.3	94	(75-124)	1.40	(< 20)
trans-1,3-Dichloropropene	30	28.9	96	30	30.8	103	(73-127)	6.40	(< 20)
Trichloroethene	30	29.4	98	30	29.6	99	(79-123)	0.92	(< 20)
Trichlorofluoromethane	30	30.9	103	30	30.4	101	(65-141)	1.60	(< 20)
Vinyl acetate	30	33.6	112	30	32.3	108	(54-146)	3.70	(< 20)
Vinyl chloride	30	29.0	97	30	30.0	100	(58-137)	3.40	(< 20)
Xylenes (total)	90	86.0	96	90	92.1	102	(79-121)	6.90	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31683]
Blank Spike Lab ID: 1424596
Date Analyzed: 11/06/2017 15:53

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31683]
Spike Duplicate Lab ID: 1424597
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570015, 1178570016

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	97.2	97	30	94.3	94	(81-118)	3.00	
4-Bromofluorobenzene (surr)	30	98.9	99	30	97.3	97	(85-114)	1.70	
Toluene-d8 (surr)	30	99.8	100	30	104	104	(89-112)	4.50	

Batch Information

Analytical Batch: **VMS17422**
Analytical Method: **SW8260C**
Instrument: **VSA Agilent GC/MS 7890B/5977A**
Analyst: **FDR**

Prep Batch: **VXX31683**
Prep Method: **SW5030B**
Prep Date/Time: **11/06/2017 00:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Matrix Spike Summary

Original Sample ID: 1424598
MS Sample ID: 1424599 MS
MSD Sample ID: 1424600 MSD

Analysis Date: 11/06/2017 21:10
Analysis Date: 11/06/2017 23:50
Analysis Date: 11/07/2017 0:06
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570015, 1178570016

Results by **SW8260C**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	0.250U	30.0	31.4	105	30.0	31.0	103	78-124	1.40	(< 20)
1,1,1-Trichloroethane	0.500U	30.0	28.1	94	30.0	28.1	94	74-131	0.00	(< 20)
1,1,2-Trichloroethane	3.28	30.0	34.6	104	30.0	33.4	100	80-119	3.70	(< 20)
1,1-Dichloroethane	0.460J	30.0	26.4	87	30.0	26.3	86	77-125	0.65	(< 20)
1,1-Dichloroethene	0.500U	30.0	28.1	94	30.0	27.9	93	71-131	0.39	(< 20)
1,1-Dichloropropene	0.500U	30.0	30.7	102	30.0	30.4	101	79-125	0.98	(< 20)
1,2,3-Trichlorobenzene	0.500U	30.0	33.7	112	30.0	33.5	112	69-129	0.65	(< 20)
1,2,3-Trichloropropane	0.500U	30.0	33	110	30.0	33.3	111	73-122	1.00	(< 20)
1,2,4-Trichlorobenzene	0.500U	30.0	33.1	110	30.0	33.1	110	69-130	0.09	(< 20)
1,2,4-Trimethylbenzene	0.500U	30.0	30.2	101	30.0	30.9	103	79-124	2.30	(< 20)
1,2-Dibromo-3-chloropropane	5.00U	30.0	33.8	113	30.0	33.5	112	62-128	0.98	(< 20)
1,2-Dibromoethane	0.0375U	30.0	30.6	102	30.0	29.6	99	77-121	3.40	(< 20)
1,2-Dichlorobenzene	0.500U	30.0	31.6	105	30.0	31.3	104	80-119	0.92	(< 20)
1,2-Dichloroethane	0.840	30.0	30.5	99	30.0	30.5	99	73-128	0.03	(< 20)
1,2-Dichloropropane	0.500U	30.0	29.8	99	30.0	29.7	99	78-122	0.37	(< 20)
1,3,5-Trimethylbenzene	0.500U	30.0	31	103	30.0	31.2	104	75-124	0.77	(< 20)
1,3-Dichlorobenzene	0.500U	30.0	31.5	105	30.0	32.4	108	80-119	3.00	(< 20)
1,3-Dichloropropane	0.250U	30.0	31.7	106	30.0	30.6	102	80-119	3.60	(< 20)
1,4-Dichlorobenzene	0.250U	30.0	31.4	105	30.0	32.2	107	79-118	2.50	(< 20)
2,2-Dichloropropane	0.500U	30.0	26.7	89	30.0	26.8	90	60-139	0.71	(< 20)
2-Butanone (MEK)	5.00U	90.0	78.9	88	90.0	76.0	84	56-143	3.80	(< 20)
2-Chlorotoluene	0.500U	30.0	33.1	110	30.0	33.4	111	79-122	0.75	(< 20)
2-Hexanone	5.00U	90.0	88.8	99	90.0	84.7	94	57-139	4.60	(< 20)
4-Chlorotoluene	0.500U	30.0	32.8	109	30.0	33.1	110	78-122	0.76	(< 20)
4-Isopropyltoluene	0.500U	30.0	31.6	105	30.0	32.1	107	77-127	1.50	(< 20)
4-Methyl-2-pentanone (MIBK)	5.00U	90.0	83.2	92	90.0	81.8	91	67-130	1.60	(< 20)
Benzene	0.700	30.0	30.4	99	30.0	29.9	98	79-120	1.70	(< 20)
Bromobenzene	0.500U	30.0	31.2	104	30.0	31.9	106	80-120	2.10	(< 20)
Bromochloromethane	0.500U	30.0	26.9	90	30.0	26.9	90	78-123	0.15	(< 20)
Bromodichloromethane	0.250U	30.0	29.5	98	30.0	29.8	99	79-125	1.00	(< 20)
Bromoform	0.500U	30.0	31.1	104	30.0	30.2	101	66-130	2.90	(< 20)
Bromomethane	2.50U	30.0	19.7	66	30.0	23.4	78	53-141	17.30	(< 20)
Carbon disulfide	5.00U	45.0	42.1	94	45.0	42.0	93	64-133	0.17	(< 20)
Carbon tetrachloride	0.500U	30.0	29.1	97	30.0	29.2	97	72-136	0.31	(< 20)
Chlorobenzene	0.250U	30.0	30.8	103	30.0	30.1	100	82-118	2.40	(< 20)
Chloroethane	0.500U	30.0	30.4	101	30.0	29.9	100	60-138	1.50	(< 20)
Chloroform	0.500U	30.0	26.9	90	30.0	26.9	90	79-124	0.04	(< 20)

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Matrix Spike Summary

Original Sample ID: 1424598
MS Sample ID: 1424599 MS
MSD Sample ID: 1424600 MSD

Analysis Date: 11/06/2017 21:10
Analysis Date: 11/06/2017 23:50
Analysis Date: 11/07/2017 0:06
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570015, 1178570016

Results by **SW8260C**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloromethane	0.500U	30.0	26.9	90	30.0	26.9	90	50-139	0.04	(< 20)
cis-1,2-Dichloroethene	66.6	30.0	82.8	54 *	30.0	82.7	54 *	78-123	0.19	(< 20)
cis-1,3-Dichloropropene	0.250U	30.0	30.5	102	30.0	30.3	101	75-124	0.79	(< 20)
Dibromochloromethane	0.250U	30.0	29.7	99	30.0	28.8	96	74-126	3.10	(< 20)
Dibromomethane	0.500U	30.0	27	90	30.0	27.1	90	79-123	0.37	(< 20)
Dichlorodifluoromethane	1.02	30.0	27	86	30.0	26.9	86	32-152	0.37	(< 20)
Ethylbenzene	0.500U	30.0	30	100	30.0	29.3	98	79-121	2.20	(< 20)
Freon-113	5.00U	45.0	43.2	96	45.0	43.1	96	70-136	0.14	(< 20)
Hexachlorobutadiene	0.500U	30.0	32.6	109	30.0	32.8	109	66-134	0.73	(< 20)
Isopropylbenzene (Cumene)	0.500U	30.0	32.8	109	30.0	31.4	105	72-131	4.60	(< 20)
Methylene chloride	2.50U	30.0	27.3	91	30.0	27.2	91	74-124	0.44	(< 20)
Methyl-t-butyl ether	5.00U	45.0	44.2	98	45.0	43.7	97	71-124	0.93	(< 20)
Naphthalene	0.500U	30.0	33.3	111	30.0	32.8	109	61-128	1.50	(< 20)
n-Butylbenzene	0.500U	30.0	31.7	106	30.0	32.3	108	75-128	2.10	(< 20)
n-Propylbenzene	0.500U	30.0	34	113	30.0	34.2	114	76-126	0.38	(< 20)
o-Xylene	0.500U	30.0	30.1	100	30.0	29.2	97	78-122	3.20	(< 20)
P & M -Xylene	1.00U	60.0	60.4	101	60.0	57.5	96	80-121	4.90	(< 20)
sec-Butylbenzene	0.500U	30.0	32.7	109	30.0	33.0	110	77-126	0.91	(< 20)
Styrene	0.500U	30.0	32.4	108	30.0	31.5	105	78-123	2.80	(< 20)
tert-Butylbenzene	0.500U	30.0	32.8	109	30.0	33.0	110	78-124	0.76	(< 20)
Tetrachloroethene	1.36	30.0	34	109	30.0	33.1	106	74-129	2.50	(< 20)
Toluene	0.500U	30.0	31	103	30.0	30.2	101	80-121	2.70	(< 20)
trans-1,2-Dichloroethene	18.7	30.0	43.9	84	30.0	43.6	83	75-124	0.66	(< 20)
trans-1,3-Dichloropropene	0.500U	30.0	30.6	102	30.0	29.4	98	73-127	4.00	(< 20)
Trichloroethene	107	30.0	132	85	30.0	132	85	79-123	0.04	(< 20)
Trichlorofluoromethane	0.500U	30.0	29.4	98	30.0	29.2	97	65-141	0.55	(< 20)
Vinyl acetate	5.00U	30.0	30.7	102	30.0	30.3	101	54-146	1.20	(< 20)
Vinyl chloride	0.0750U	30.0	30.7	102	30.0	30.4	101	58-137	1.10	(< 20)
Xylenes (total)	1.50U	90.0	90.5	101	90.0	86.7	96	79-121	4.30	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	27.4	91	30.0	27.6	92	81-118	0.87	
4-Bromofluorobenzene (surr)		30.0	29.8	99	30.0	30.6	102	85-114	2.70	
Toluene-d8 (surr)		30.0	32.2	107	30.0	31.5	105	89-112	2.20	

Print Date: 11/09/2017 5:07:59PM

Matrix Spike Summary

Original Sample ID: 1424598
MS Sample ID: 1424599 MS
MSD Sample ID: 1424600 MSD

QC for Samples: 1178570015, 1178570016

Analysis Date:
Analysis Date: 11/06/2017 23:50
Analysis Date: 11/07/2017 0:06
Matrix: Water (Surface, Eff., Ground)

Results by **SW8260C**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS17422
Analytical Method: SW8260C
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: FDR
Analytical Date/Time: 11/6/2017 11:50:00PM

Prep Batch: VXX31683
Prep Method: Volatiles Extraction 8240/8260 FULL
Prep Date/Time: 11/6/2017 12:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 11/09/2017 5:07:59PM

Method Blank

Blank ID: MB for HBN 1771717 [VXX/31687]
Blank Lab ID: 1424650

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570001, 1178570002, 1178570004, 1178570005, 1178570006, 1178570007, 1178570008, 1178570009, 1178570010, 1178570011, 1178570012, 1178570013, 1178570014

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

Method Blank

Blank ID: MB for HBN 1771717 [VXX/31687]
Blank Lab ID: 1424650

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570001, 1178570002, 1178570004, 1178570005, 1178570006, 1178570007, 1178570008, 1178570009, 1178570010, 1178570011, 1178570012, 1178570013, 1178570014

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	109	81-118		%
4-Bromofluorobenzene (surr)	97.1	85-114		%
Toluene-d8 (surr)	99.6	89-112		%

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Method Blank

Blank ID: MB for HBN 1771717 [VXX/31687]
Blank Lab ID: 1424650

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570001, 1178570002, 1178570004, 1178570005, 1178570006, 1178570007, 1178570008, 1178570009, 1178570010, 1178570011, 1178570012, 1178570013, 1178570014

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS17424
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: FDR
Analytical Date/Time: 11/6/2017 1:08:00PM

Prep Batch: VXX31687
Prep Method: SW5030B
Prep Date/Time: 11/6/2017 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31687]
Blank Spike Lab ID: 1424651
Date Analyzed: 11/06/2017 14:23

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31687]
Spike Duplicate Lab ID: 1424652
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570001, 1178570002, 1178570004, 1178570005, 1178570006, 1178570007, 1178570008, 1178570009, 1178570010, 1178570011, 1178570012, 1178570013, 1178570014

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	31.3	104	30	30.8	103	(78-124)	1.50	(< 20)
1,1,1-Trichloroethane	30	31.5	105	30	31.5	105	(74-131)	0.10	(< 20)
1,1,2,2-Tetrachloroethane	30	30.5	102	30	30.1	100	(71-121)	1.40	(< 20)
1,1,2-Trichloroethane	30	30.7	102	30	30.9	103	(80-119)	0.68	(< 20)
1,1-Dichloroethane	30	31.1	104	30	31.2	104	(77-125)	0.55	(< 20)
1,1-Dichloroethene	30	33.5	112	30	34.0	113	(71-131)	1.60	(< 20)
1,1-Dichloropropene	30	32.3	108	30	32.0	107	(79-125)	0.87	(< 20)
1,2,3-Trichlorobenzene	30	29.4	98	30	26.0	87	(69-129)	12.10	(< 20)
1,2,3-Trichloropropane	30	30.4	101	30	30.0	100	(73-122)	1.50	(< 20)
1,2,4-Trichlorobenzene	30	30.2	101	30	27.8	93	(69-130)	8.30	(< 20)
1,2,4-Trimethylbenzene	30	30.7	102	30	30.1	100	(79-124)	2.10	(< 20)
1,2-Dibromo-3-chloropropane	30	29.2	97	30	27.4	91	(62-128)	6.50	(< 20)
1,2-Dibromoethane	30	29.5	98	30	29.9	100	(77-121)	1.30	(< 20)
1,2-Dichlorobenzene	30	29.8	99	30	30.1	100	(80-119)	1.10	(< 20)
1,2-Dichloroethane	30	30.3	101	30	30.3	101	(73-128)	0.00	(< 20)
1,2-Dichloropropane	30	33.1	110	30	33.0	110	(78-122)	0.33	(< 20)
1,3,5-Trimethylbenzene	30	30.6	102	30	29.6	99	(75-124)	3.30	(< 20)
1,3-Dichlorobenzene	30	30.6	102	30	30.4	101	(80-119)	0.56	(< 20)
1,3-Dichloropropane	30	30.7	102	30	30.7	102	(80-119)	0.03	(< 20)
1,4-Dichlorobenzene	30	30.1	100	30	30.1	100	(79-118)	0.07	(< 20)
2,2-Dichloropropane	30	30.2	101	30	30.6	102	(60-139)	1.50	(< 20)
2-Butanone (MEK)	90	86.3	96	90	79.8	89	(56-143)	7.80	(< 20)
2-Chlorotoluene	30	30.6	102	30	29.4	98	(79-122)	4.00	(< 20)
2-Hexanone	90	91.0	101	90	86.9	97	(57-139)	4.60	(< 20)
4-Chlorotoluene	30	30.3	101	30	30.0	100	(78-122)	0.86	(< 20)
4-Isopropyltoluene	30	30.7	102	30	30.5	102	(77-127)	0.65	(< 20)
4-Methyl-2-pentanone (MIBK)	90	94.3	105	90	90.6	101	(67-130)	4.00	(< 20)
Benzene	30	30.9	103	30	31.1	104	(79-120)	0.71	(< 20)
Bromobenzene	30	29.7	99	30	29.8	99	(80-120)	0.37	(< 20)
Bromochloromethane	30	30.8	103	30	31.2	104	(78-123)	1.20	(< 20)
Bromodichloromethane	30	31.4	105	30	32.0	107	(79-125)	2.00	(< 20)
Bromoform	30	31.3	104	30	32.0	107	(66-130)	2.50	(< 20)
Bromomethane	30	35.3	118	30	42.6	142	* (53-141)	18.60	(< 20)
Carbon disulfide	45	46.0	102	45	47.2	105	(64-133)	2.60	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31687]
Blank Spike Lab ID: 1424651
Date Analyzed: 11/06/2017 14:23

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31687]
Spike Duplicate Lab ID: 1424652
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570001, 1178570002, 1178570004, 1178570005, 1178570006, 1178570007, 1178570008, 1178570009, 1178570010, 1178570011, 1178570012, 1178570013, 1178570014

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	30.8	103	30	31.5	105	(72-136)	2.00	(< 20)
Chlorobenzene	30	29.9	100	30	29.9	100	(82-118)	0.20	(< 20)
Chloroethane	30	37.8	126	30	38.1	127	(60-138)	0.79	(< 20)
Chloroform	30	30.8	103	30	30.9	103	(79-124)	0.49	(< 20)
Chloromethane	30	33.7	112	30	36.6	122	(50-139)	8.30	(< 20)
cis-1,2-Dichloroethene	30	30.6	102	30	31.2	104	(78-123)	2.20	(< 20)
cis-1,3-Dichloropropene	30	30.9	103	30	31.1	104	(75-124)	0.55	(< 20)
Dibromochloromethane	30	30.7	102	30	31.0	103	(74-126)	1.10	(< 20)
Dibromomethane	30	30.7	102	30	31.4	105	(79-123)	2.20	(< 20)
Dichlorodifluoromethane	30	33.4	111	30	35.8	119	(32-152)	6.90	(< 20)
Ethylbenzene	30	30.6	102	30	29.6	99	(79-121)	3.30	(< 20)
Freon-113	45	50.9	113	45	51.9	115	(70-136)	1.90	(< 20)
Hexachlorobutadiene	30	30.6	102	30	29.7	99	(66-134)	2.90	(< 20)
Isopropylbenzene (Cumene)	30	31.0	103	30	30.3	101	(72-131)	2.20	(< 20)
Methylene chloride	30	31.2	104	30	32.6	109	(74-124)	4.40	(< 20)
Methyl-t-butyl ether	45	44.9	100	45	45.1	100	(71-124)	0.31	(< 20)
Naphthalene	30	29.1	97	30	25.6	85	(61-128)	13.10	(< 20)
n-Butylbenzene	30	30.7	102	30	30.9	103	(75-128)	0.84	(< 20)
n-Propylbenzene	30	30.9	103	30	30.3	101	(76-126)	1.70	(< 20)
o-Xylene	30	29.6	99	30	29.6	99	(78-122)	0.17	(< 20)
P & M -Xylene	60	61.2	102	60	60.8	101	(80-121)	0.64	(< 20)
sec-Butylbenzene	30	30.6	102	30	30.5	102	(77-126)	0.39	(< 20)
Styrene	30	30.7	102	30	30.6	102	(78-123)	0.59	(< 20)
tert-Butylbenzene	30	30.6	102	30	30.2	101	(78-124)	1.50	(< 20)
Tetrachloroethene	30	31.2	104	30	30.8	103	(74-129)	1.40	(< 20)
Toluene	30	30.9	103	30	30.2	101	(80-121)	2.40	(< 20)
trans-1,2-Dichloroethene	30	30.3	101	30	30.6	102	(75-124)	0.92	(< 20)
trans-1,3-Dichloropropene	30	30.7	102	30	30.6	102	(73-127)	0.23	(< 20)
Trichloroethene	30	31.6	105	30	31.6	105	(79-123)	0.06	(< 20)
Trichlorofluoromethane	30	36.3	121	30	37.6	125	(65-141)	3.50	(< 20)
Vinyl acetate	30	30.2	101	30	29.9	100	(54-146)	1.00	(< 20)
Vinyl chloride	30	34.9	116	30	36.9	123	(58-137)	5.30	(< 20)
Xylenes (total)	90	90.8	101	90	90.4	100	(79-121)	0.49	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31687]
Blank Spike Lab ID: 1424651
Date Analyzed: 11/06/2017 14:23

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31687]
Spike Duplicate Lab ID: 1424652
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570001, 1178570002, 1178570004, 1178570005, 1178570006, 1178570007, 1178570008, 1178570009, 1178570010, 1178570011, 1178570012, 1178570013, 1178570014

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	100	100	30	101	101	(81-118)	1.00	
4-Bromofluorobenzene (surr)	30	98.1	98	30	96.6	97	(85-114)	1.60	
Toluene-d8 (surr)	30	98.6	99	30	96	96	(89-112)	2.60	

Batch Information

Analytical Batch: **VMS17424**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **FDR**

Prep Batch: **VXX31687**
Prep Method: **SW5030B**
Prep Date/Time: **11/06/2017 00:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1771782 [VXX/31690]
Blank Lab ID: 1424753

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570001, 1178570002, 1178570003, 1178570004, 1178570005, 1178570006, 1178570007, 1178570009, 1178570010

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

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Method Blank

Blank ID: MB for HBN 1771782 [VXX/31690]
Blank Lab ID: 1424753

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570001, 1178570002, 1178570003, 1178570004, 1178570005, 1178570006, 1178570007, 1178570009, 1178570010

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	107	81-118		%
4-Bromofluorobenzene (surr)	106	85-114		%
Toluene-d8 (surr)	98.3	89-112		%

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Method Blank

Blank ID: MB for HBN 1771782 [VXX/31690]
Blank Lab ID: 1424753

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570001, 1178570002, 1178570003, 1178570004, 1178570005, 1178570006, 1178570007, 1178570009, 1178570010

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS17427
Analytical Method: SW8260C
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: FDR
Analytical Date/Time: 11/7/2017 6:39:00PM

Prep Batch: VXX31690
Prep Method: SW5030B
Prep Date/Time: 11/7/2017 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31690]
Blank Spike Lab ID: 1424754
Date Analyzed: 11/07/2017 18:55

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31690]
Spike Duplicate Lab ID: 1424755
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570001, 1178570002, 1178570003, 1178570004, 1178570005, 1178570006, 1178570007, 1178570009, 1178570010

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	28.2	94	30	26.1	87	(78-124)	7.70	(< 20)
1,1,1-Trichloroethane	30	28.6	95	30	28.9	96	(74-131)	1.00	(< 20)
1,1,2,2-Tetrachloroethane	30	30.1	100	30	29.0	97	(71-121)	3.70	(< 20)
1,1,2-Trichloroethane	30	30.3	101	30	29.8	99	(80-119)	1.80	(< 20)
1,1-Dichloroethane	30	26.7	89	30	27.0	90	(77-125)	1.10	(< 20)
1,1-Dichloroethene	30	30.7	102	30	30.5	102	(71-131)	0.59	(< 20)
1,1-Dichloropropene	30	30.7	102	30	31.1	104	(79-125)	1.20	(< 20)
1,2,3-Trichlorobenzene	30	32.4	108	30	30.8	103	(69-129)	5.20	(< 20)
1,2,3-Trichloropropane	30	29.9	100	30	28.3	94	(73-122)	5.40	(< 20)
1,2,4-Trichlorobenzene	30	31.4	105	30	30.7	102	(69-130)	2.40	(< 20)
1,2,4-Trimethylbenzene	30	28.2	94	30	28.7	96	(79-124)	1.70	(< 20)
1,2-Dibromo-3-chloropropane	30	34.3	114	30	32.4	108	(62-128)	5.70	(< 20)
1,2-Dibromoethane	30	29.7	99	30	28.8	96	(77-121)	3.00	(< 20)
1,2-Dichlorobenzene	30	30.0	100	30	29.9	100	(80-119)	0.33	(< 20)
1,2-Dichloroethane	30	29.8	99	30	30.2	101	(73-128)	1.10	(< 20)
1,2-Dichloropropane	30	29.5	98	30	29.6	99	(78-122)	0.37	(< 20)
1,3,5-Trimethylbenzene	30	29.7	99	30	29.8	99	(75-124)	0.27	(< 20)
1,3-Dichlorobenzene	30	30.3	101	30	30.6	102	(80-119)	0.72	(< 20)
1,3-Dichloropropane	30	30.4	101	30	29.9	100	(80-119)	1.60	(< 20)
1,4-Dichlorobenzene	30	30.4	101	30	30.3	101	(79-118)	0.46	(< 20)
2,2-Dichloropropane	30	29.3	98	30	29.2	97	(60-139)	0.17	(< 20)
2-Butanone (MEK)	90	81.8	91	90	78.5	87	(56-143)	4.10	(< 20)
2-Chlorotoluene	30	32.5	108	30	33.1	110	(79-122)	1.70	(< 20)
2-Hexanone	90	85.8	95	90	86.0	96	(57-139)	0.20	(< 20)
4-Chlorotoluene	30	32.1	107	30	32.4	108	(78-122)	1.10	(< 20)
4-Isopropyltoluene	30	30.4	101	30	30.1	100	(77-127)	0.73	(< 20)
4-Methyl-2-pentanone (MIBK)	90	78.7	88	90	78.4	87	(67-130)	0.37	(< 20)
Benzene	30	29.2	98	30	29.1	97	(79-120)	0.48	(< 20)
Bromobenzene	30	29.6	99	30	30.0	100	(80-120)	1.40	(< 20)
Bromochloromethane	30	27.4	91	30	28.3	94	(78-123)	3.30	(< 20)
Bromodichloromethane	30	29.7	99	30	30.0	100	(79-125)	0.87	(< 20)
Bromoform	30	29.0	97	30	27.9	93	(66-130)	4.10	(< 20)
Bromomethane	30	33.8	113	30	32.0	107	(53-141)	5.50	(< 20)
Carbon disulfide	45	49.1	109	45	49.0	109	(64-133)	0.18	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31690]
Blank Spike Lab ID: 1424754
Date Analyzed: 11/07/2017 18:55

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31690]
Spike Duplicate Lab ID: 1424755
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570001, 1178570002, 1178570003, 1178570004, 1178570005, 1178570006, 1178570007, 1178570009, 1178570010

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	29.9	100	30	30.3	101	(72-136)	1.40	(< 20)
Chlorobenzene	30	28.9	97	30	28.7	96	(82-118)	0.87	(< 20)
Chloroethane	30	33.6	112	30	31.9	106	(60-138)	5.30	(< 20)
Chloroform	30	26.9	90	30	27.5	92	(79-124)	2.40	(< 20)
Chloromethane	30	25.9	86	30	26.5	88	(50-139)	2.00	(< 20)
cis-1,2-Dichloroethene	30	26.5	88	30	27.1	90	(78-123)	2.10	(< 20)
cis-1,3-Dichloropropene	30	30.3	101	30	30.3	101	(75-124)	0.13	(< 20)
Dibromochloromethane	30	29.0	97	30	28.5	95	(74-126)	1.80	(< 20)
Dibromomethane	30	27.5	92	30	27.7	92	(79-123)	0.58	(< 20)
Dichlorodifluoromethane	30	25.1	84	30	25.5	85	(32-152)	1.70	(< 20)
Ethylbenzene	30	30.4	101	30	30.0	100	(79-121)	1.40	(< 20)
Freon-113	45	47.3	105	45	46.9	104	(70-136)	0.79	(< 20)
Hexachlorobutadiene	30	30.1	100	30	30.4	101	(66-134)	0.93	(< 20)
Isopropylbenzene (Cumene)	30	33.4	111	30	33.5	112	(72-131)	0.36	(< 20)
Methylene chloride	30	28.4	95	30	28.9	96	(74-124)	1.80	(< 20)
Methyl-t-butyl ether	45	44.9	100	45	44.9	100	(71-124)	0.02	(< 20)
Naphthalene	30	32.8	109	30	30.6	102	(61-128)	6.70	(< 20)
n-Butylbenzene	30	30.1	100	30	30.5	102	(75-128)	1.40	(< 20)
n-Propylbenzene	30	32.7	109	30	32.9	110	(76-126)	0.61	(< 20)
o-Xylene	30	30.2	101	30	31.0	103	(78-122)	2.60	(< 20)
P & M -Xylene	60	61.2	102	60	61.7	103	(80-121)	0.85	(< 20)
sec-Butylbenzene	30	31.7	106	30	31.9	106	(77-126)	0.82	(< 20)
Styrene	30	32.5	108	30	33.1	110	(78-123)	1.90	(< 20)
tert-Butylbenzene	30	31.4	105	30	32.0	107	(78-124)	1.90	(< 20)
Tetrachloroethene	30	30.6	102	30	28.8	96	(74-129)	6.00	(< 20)
Toluene	30	28.4	95	30	28.0	93	(80-121)	1.50	(< 20)
trans-1,2-Dichloroethene	30	28.9	96	30	29.1	97	(75-124)	0.72	(< 20)
trans-1,3-Dichloropropene	30	29.7	99	30	29.2	97	(73-127)	1.60	(< 20)
Trichloroethene	30	29.4	98	30	29.5	98	(79-123)	0.27	(< 20)
Trichlorofluoromethane	30	29.7	99	30	29.2	97	(65-141)	1.70	(< 20)
Vinyl acetate	30	29.4	98	30	27.6	92	(54-146)	6.30	(< 20)
Vinyl chloride	30	29.2	97	30	29.6	99	(58-137)	1.30	(< 20)
Xylenes (total)	90	91.4	102	90	92.7	103	(79-121)	1.40	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31690]
Blank Spike Lab ID: 1424754
Date Analyzed: 11/07/2017 18:55

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31690]
Spike Duplicate Lab ID: 1424755
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570001, 1178570002, 1178570003, 1178570004, 1178570005, 1178570006, 1178570007, 1178570009, 1178570010

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	95.2	95	30	95.7	96	(81-118)	0.56	
4-Bromofluorobenzene (surr)	30	101	101	30	102	102	(85-114)	1.60	
Toluene-d8 (surr)	30	101	101	30	98.5	99	(89-112)	2.50	

Batch Information

Analytical Batch: **VMS17427**
Analytical Method: **SW8260C**
Instrument: **VSA Agilent GC/MS 7890B/5977A**
Analyst: **FDR**

Prep Batch: **VXX31690**
Prep Method: **SW5030B**
Prep Date/Time: **11/07/2017 00:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Matrix Spike Summary

Original Sample ID: 1424756
MS Sample ID: 1424757 MS
MSD Sample ID: 1424758 MSD

Analysis Date: 11/08/2017 0:46
Analysis Date: 11/08/2017 3:41
Analysis Date: 11/08/2017 3:57
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570001, 1178570002, 1178570003, 1178570004, 1178570005, 1178570006, 1178570007, 1178570009, 1178570010

Results by **SW8260C**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	2.50U	300	294	98	300	289	96	78-124	1.50	(< 20)
1,1,1-Trichloroethane	5.00U	300	290	97	300	290	97	74-131	0.00	(< 20)
1,1,2,2-Tetrachloroethane	696	300	1010	105	300	976	93	71-121	3.70	(< 20)
1,1,2-Trichloroethane	5.30	300	314	103	300	315	103	80-119	0.44	(< 20)
1,1-Dichloroethane	5.00U	300	272	91	300	273	91	77-125	0.26	(< 20)
1,1-Dichloroethene	5.00U	300	316	105	300	310	103	71-131	2.10	(< 20)
1,1-Dichloropropene	5.00U	300	315	105	300	313	104	79-125	0.54	(< 20)
1,2,3-Trichlorobenzene	5.00U	300	314	105	300	322	107	69-129	2.20	(< 20)
1,2,3-Trichloropropane	5.00U	300	306	102	300	295	98	73-122	3.50	(< 20)
1,2,4-Trichlorobenzene	5.00U	300	314	105	300	315	105	69-130	0.16	(< 20)
1,2,4-Trimethylbenzene	5.00U	300	295	98	300	294	98	79-124	0.37	(< 20)
1,2-Dibromo-3-chloropropane	50.0U	300	315	105	300	325	108	62-128	3.40	(< 20)
1,2-Dibromoethane	0.375U	300	301	100	300	304	101	77-121	1.20	(< 20)
1,2-Dichlorobenzene	5.00U	300	305	102	300	303	101	80-119	0.53	(< 20)
1,2-Dichloroethane	2.50U	300	306	102	300	305	102	73-128	0.13	(< 20)
1,2-Dichloropropane	5.00U	300	299	100	300	296	99	78-122	0.84	(< 20)
1,3,5-Trimethylbenzene	5.00U	300	304	101	300	303	101	75-124	0.43	(< 20)
1,3-Dichlorobenzene	5.00U	300	312	104	300	311	104	80-119	0.16	(< 20)
1,3-Dichloropropane	2.50U	300	316	105	300	316	105	80-119	0.10	(< 20)
1,4-Dichlorobenzene	2.50U	300	308	103	300	306	102	79-118	0.85	(< 20)
2,2-Dichloropropane	5.00U	300	278	93	300	282	94	60-139	1.60	(< 20)
2-Butanone (MEK)	50.0U	900	748	83	900	776	86	56-143	3.60	(< 20)
2-Chlorotoluene	5.00U	300	329	110	300	325	108	79-122	1.40	(< 20)
2-Hexanone	50.0U	900	874	97	900	866	96	57-139	0.97	(< 20)
4-Chlorotoluene	5.00U	300	326	109	300	327	109	78-122	0.46	(< 20)
4-Isopropyltoluene	5.00U	300	305	102	300	305	102	77-127	0.03	(< 20)
4-Methyl-2-pentanone (MIBK)	50.0U	900	812	90	900	796	89	67-130	1.90	(< 20)
Benzene	2.00U	300	298	99	300	306	102	79-120	2.60	(< 20)
Bromobenzene	5.00U	300	301	100	300	298	99	80-120	1.10	(< 20)
Bromochloromethane	5.00U	300	280	93	300	283	94	78-123	1.30	(< 20)
Bromodichloromethane	2.50U	300	300	100	300	299	100	79-125	0.43	(< 20)
Bromoform	5.00U	300	293	98	300	293	98	66-130	0.00	(< 20)
Bromomethane	25.0U	300	303	101	300	306	102	53-141	1.10	(< 20)
Carbon disulfide	50.0U	450	511	114	450	501	111	64-133	2.10	(< 20)
Carbon tetrachloride	5.00U	300	300	100	300	300	100	72-136	0.13	(< 20)
Chlorobenzene	2.50U	300	299	100	300	293	98	82-118	2.20	(< 20)
Chloroethane	5.00U	300	314	105	300	349	116	60-138	10.70	(< 20)

Print Date: 11/09/2017 5:08:05PM

Matrix Spike Summary

Original Sample ID: 1424756
MS Sample ID: 1424757 MS
MSD Sample ID: 1424758 MSD

Analysis Date: 11/08/2017 0:46
Analysis Date: 11/08/2017 3:41
Analysis Date: 11/08/2017 3:57
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570001, 1178570002, 1178570003, 1178570004, 1178570005, 1178570006, 1178570007, 1178570009, 1178570010

Results by **SW8260C**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroform	5.00U	300	275	92	300	277	92	79-124	0.83	(< 20)
Chloromethane	5.00U	300	270	90	300	268	89	50-139	0.82	(< 20)
cis-1,2-Dichloroethene	66.2	300	327	87	300	332	89	78-123	1.50	(< 20)
cis-1,3-Dichloropropene	2.50U	300	301	100	300	301	100	75-124	0.00	(< 20)
Dibromochloromethane	2.50U	300	295	98	300	296	99	74-126	0.44	(< 20)
Dibromomethane	5.00U	300	277	92	300	279	93	79-123	0.79	(< 20)
Dichlorodifluoromethane	5.00U	300	259	86	300	255	85	32-152	1.40	(< 20)
Ethylbenzene	5.00U	300	301	100	300	303	101	79-121	0.79	(< 20)
Freon-113	50.0U	450	479	106	450	470	104	70-136	1.90	(< 20)
Hexachlorobutadiene	5.00U	300	313	104	300	311	104	66-134	0.38	(< 20)
Isopropylbenzene (Cumene)	5.00U	300	329	110	300	336	112	72-131	2.20	(< 20)
Methylene chloride	25.0U	300	292	97	300	295	98	74-124	0.89	(< 20)
Methyl-t-butyl ether	50.0U	450	446	99	450	447	99	71-124	0.27	(< 20)
Naphthalene	5.00U	300	296	99	300	306	102	61-128	3.20	(< 20)
n-Butylbenzene	5.00U	300	314	105	300	303	101	75-128	3.40	(< 20)
n-Propylbenzene	5.00U	300	332	111	300	330	110	76-126	0.76	(< 20)
o-Xylene	5.00U	300	307	102	300	314	105	78-122	2.10	(< 20)
P & M -Xylene	10.0U	600	614	102	600	622	104	80-121	1.40	(< 20)
sec-Butylbenzene	5.00U	300	323	108	300	321	107	77-126	0.56	(< 20)
Styrene	5.00U	300	331	110	300	337	112	78-123	1.90	(< 20)
tert-Butylbenzene	5.00U	300	324	108	300	323	108	78-124	0.37	(< 20)
Tetrachloroethene	5.00U	300	325	108	300	320	107	74-129	1.70	(< 20)
Toluene	5.00U	300	308	103	300	302	101	80-121	2.00	(< 20)
trans-1,2-Dichloroethene	16.1	300	312	99	300	311	98	75-124	0.35	(< 20)
trans-1,3-Dichloropropene	5.00U	300	299	100	300	304	101	73-127	1.50	(< 20)
Trichloroethene	91.9	300	404	104	300	400	103	79-123	0.92	(< 20)
Trichlorofluoromethane	5.00U	300	298	99	300	300	100	65-141	0.74	(< 20)
Vinyl acetate	50.0U	300	271	90	300	280	93	54-146	3.50	(< 20)
Vinyl chloride	0.750U	300	304	101	300	299	100	58-137	1.70	(< 20)
Xylenes (total)	15.0U	900	921	102	900	936	104	79-121	1.60	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		300	281	94	300	286	95	81-118	1.80	
4-Bromofluorobenzene (surr)		300	301	100	300	302	101	85-114	0.63	
Toluene-d8 (surr)		300	314	105	300	313	104	89-112	0.35	

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1424756
MS Sample ID: 1424757 MS
MSD Sample ID: 1424758 MSD

Analysis Date:
Analysis Date: 11/08/2017 3:41
Analysis Date: 11/08/2017 3:57
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570001, 1178570002, 1178570003, 1178570004, 1178570005, 1178570006, 1178570007, 1178570009, 1178570010

Results by **SW8260C**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS17427
Analytical Method: SW8260C
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: FDR
Analytical Date/Time: 11/8/2017 3:41:00AM

Prep Batch: VXX31690
Prep Method: Volatiles Extraction 8240/8260 FULL
Prep Date/Time: 11/7/2017 12:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 11/09/2017 5:08:05PM

Method Blank

Blank ID: MB for HBN 1771832 [VXX/31691]
Blank Lab ID: 1424966

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1178570012

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	107	81-118		%
4-Bromofluorobenzene (surr)	107	85-114		%
Toluene-d8 (surr)	98.8	89-112		%

Batch Information

Analytical Batch: VMS17428
Analytical Method: SW8260C
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: FDR
Analytical Date/Time: 11/8/2017 12:23:00PM

Prep Batch: VXX31691
Prep Method: SW5030B
Prep Date/Time: 11/8/2017 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1178570 [VXX31691]
Blank Spike Lab ID: 1424967
Date Analyzed: 11/08/2017 12:39

Spike Duplicate ID: LCSD for HBN 1178570 [VXX31691]
Spike Duplicate Lab ID: 1424968
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1178570012

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Trichlorofluoromethane	30	29.9	100	30	30.1	100	(65-141)	0.57	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	94	94	30	94.9	95	(81-118)	1.00	
4-Bromofluorobenzene (surr)	30	99.9	100	30	99.3	99	(85-114)	0.57	
Toluene-d8 (surr)	30	103	103	30	104	104	(89-112)	0.51	

Batch Information

Analytical Batch: **VMS17428**
Analytical Method: **SW8260C**
Instrument: **VSA Agilent GC/MS 7890B/5977A**
Analyst: **FDR**

Prep Batch: **VXX31691**
Prep Method: **SW5030B**
Prep Date/Time: **11/08/2017 00:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
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1178570

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Page 1 of 2

Laboratory SGS

Attn:

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2255 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	VOCs (SW8260)						Total Number of Containers	Remarks/Matrix
MW-2	1 A-C	11:11	10/26/17		X	X						3	Groundwater
MW-3	2 A-C	11:57			X	X						3	
MW-1	3 A-C	12:59			X	X						3	
MW-101	4 A-C	12:49			X	X						3	
MW-4	5 A-C	14:12			X	X						3	
MW-12	6 A-C	15:24			X	X						3	
MW-13	7 A-C	10:48	10/27/17		X	X						3	
MW-7	8 A-C	11:42			X	X						3	
MW-5	9 A-C	13:08			X	X						3	
MW-6	10 A-C	13:38			X	X						3	

Project Information	Sample Receipt
Project Number: 31-1-20047-005	Total Number of Containers
Project Name: 2017 BMES	COC Seals/Intact? Y/N/NA
Contact: KRF	Received Good Cond./Cold
Ongoing Project? Yes ☑ No ☐	Delivery Method:
Sampler: APW	(attach shipping bill, if any)

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 14:00	Signature: Time: 16:20	Signature: Time:
Printed Name: Adam Wyborny Date: 10/30/17	Printed Name: Nicole Warner Date: 10/30/17	Printed Name: Date:
Company: Shannon & Wilson	Company: SGS	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1400	Signature: Time:	Signature: Time: 845
Printed Name: Nicole Warner Date: 10/30/17	Printed Name: Date:	Printed Name: Annie Collie Date: 10/31/17
Company: SGS	Company:	Company: SGS ANC TB 1.4 D36

Instructions
Requested Turnaround Time: Standard
Special Instructions: Bill to Shannon & Wilson, Inc.

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

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TB 0.0

CS 1F 4B No. 34717

1178570

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory SGS
Attn:

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
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(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	VOCs (SW8260)						Total Number of Containers	Remarks/Matrix
MW-9	(11) A-C	15:45	10/27/17		X	X						3	Groundwater
MW-10	(12) A-C	16:36	↓		X	X						3	
MW-8	(13) A-C	11:21	10/30/17		X	X						3	
MW-108	(14) A-C	11:11			X	X						3	
MW-11	(15) A-C	12:25	↓		X	X						3	↓
Trip Blank	(16) A-C					X						3	Laboratory Supplied

Project Information		Sample Receipt	
Project Number:		Total Number of Containers	
Project Name:		COC Seals/Intact? Y/N/NA	
Contact:		Received Good Cond./Cold	
Ongoing Project? Yes ☐ No ☐		Delivery Method:	
Sampler:		(attach shipping bill, if any)	

Instructions
Requested Turnaround Time:
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 14:00	Signature: Time: 1600	Signature: Time:
Printed Name: Adam Wyborny Date: 10/30/17	Printed Name: Nicole Warner Date: 10/30/17	Printed Name: Date:
Company: Shannon & Wilson	Company: SGS	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1400	Signature: Time:	Signature: Time: 845
Printed Name: Nicole Warner Date: 10/30/17	Printed Name: Date:	Printed Name: Annie Collie Date: 10/31/17
Company: SGS	Company:	Company: SGS ANC TB1.4 D30

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

Trip blank accompanied the samples at all times.
TB 0.0

CS 1F TB

No. 34716

SGS

1178570

~~SGS WO#~~

FAIRBANKS SAMPLE RECEIPT FORM

Note: This form is to be completed by Fairbanks Receiving Staff for all samples

Review Criteria:	Condition:	Comments/Actions Taken
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No ~~N/A~~ Yes No N/A	☐*Exemption permitted if sampler hand carries/delivers.*
Temperature blank compliant* (i.e., 0-6°C) *If >6°C, were samples collected <8 hours ago?* *If <0°C, were all sample containers ice free?* Cooler ID: 1 @ 0.0 w/Therm. ID: D23 Cooler ID:____ @____ w/Therm. ID:____ Cooler ID:____ @____ w/Therm. ID:____ Cooler ID:____ @____ w/Therm. ID:____ Cooler ID:____ @____ w/Therm. ID:____ If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank and "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note ambient ( ) or chilled ( ). Please check one.	Yes No Yes No ~~N/A~~ Yes No ~~N/A~~	☐*Exemption permitted if chilled & collected <8hrs ago* ***Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.***
Delivery Method: Client (hand carried) Other:____	Tracking/AB# : Or see attached ~~Or N/A~~	
→For samples received with payment, note amount ($) and whether cash / check / CC (**circle one**) was received.		
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:____	Yes No N/A	***Note: some samples are sent to Anchorage without inspection by SGS Fairbanks personnel.***
Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	Yes No N/A	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No ~~N/A~~ Yes No N/A	

Additional notes (if applicable):

Profile #: 347128

Note to Client: any "no" circled above indicates non-compliance with standard procedures and may impact data quality.

SGS

Cooler Packing Form For Fairbanks

Cooler ID 1 Cooler Temperature 1.4 D36

Please list the WOs and associated samples packed in this Cooler

WO #	Samples	Special Notes
1178570	All Samples	
1178567	MW-334-15 R-35R : 1 Jar MW-344-15 MW-444-15 : 1 Jar MW-345-15 : Sulfolane	

e-Sample Receipt Form

SGS Workorder #: **1178570**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		N/A Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1 Front 1 Back
COC accompanied samples?	Yes	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 1.4 °C Therm. ID: D36
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	Yes	
		N/A ***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1178570001-A	HCL to pH < 2	OK	1178570015-A	HCL to pH < 2	OK
1178570001-B	HCL to pH < 2	OK	1178570015-B	HCL to pH < 2	OK
1178570001-C	HCL to pH < 2	OK	1178570015-C	HCL to pH < 2	OK
1178570002-A	HCL to pH < 2	OK	1178570016-A	HCL to pH < 2	OK
1178570002-B	HCL to pH < 2	OK	1178570016-B	HCL to pH < 2	OK
1178570002-C	HCL to pH < 2	OK	1178570016-C	HCL to pH < 2	OK
1178570003-A	HCL to pH < 2	OK			
1178570003-B	HCL to pH < 2	OK			
1178570003-C	HCL to pH < 2	OK			
1178570004-A	HCL to pH < 2	OK			
1178570004-B	HCL to pH < 2	OK			
1178570004-C	HCL to pH < 2	OK			
1178570005-A	HCL to pH < 2	OK			
1178570005-B	HCL to pH < 2	OK			
1178570005-C	HCL to pH < 2	OK			
1178570006-A	HCL to pH < 2	OK			
1178570006-B	HCL to pH < 2	OK			
1178570006-C	HCL to pH < 2	OK			
1178570007-A	HCL to pH < 2	OK			
1178570007-B	HCL to pH < 2	OK			
1178570007-C	HCL to pH < 2	OK			
1178570008-A	HCL to pH < 2	OK			
1178570008-B	HCL to pH < 2	OK			
1178570008-C	HCL to pH < 2	OK			
1178570009-A	HCL to pH < 2	OK			
1178570009-B	HCL to pH < 2	OK			
1178570009-C	HCL to pH < 2	OK			
1178570010-A	HCL to pH < 2	OK			
1178570010-B	HCL to pH < 2	OK			
1178570010-C	HCL to pH < 2	OK			
1178570011-A	HCL to pH < 2	OK			
1178570011-B	HCL to pH < 2	OK			
1178570011-C	HCL to pH < 2	OK			
1178570012-A	HCL to pH < 2	OK			
1178570012-B	HCL to pH < 2	OK			
1178570012-C	HCL to pH < 2	OK			
1178570013-A	HCL to pH < 2	OK			
1178570013-B	HCL to pH < 2	OK			
1178570013-C	HCL to pH < 2	OK			
1178570014-A	HCL to pH < 2	OK			
1178570014-B	HCL to pH < 2	OK			
1178570014-C	HCL to pH < 2	OK			

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

WORK ORDER 1710563

eurofins | Air Toxics

11/6/2017
Ms. Sheila Hinckley
Shannon & Wilson, Inc.
2355 Hill Road

Fairbanks AK 99709

Project Name: Bentley Mall
Project #: 20047-003
Workorder #: 1710563

Dear Ms. Sheila Hinckley

The following report includes the data for the above referenced project for sample(s) received on 10/26/2017 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1710563

Work Order Summary

CLIENT:	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709	**BILL TO:**	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709
PHONE:	907-479-0600	**P.O. #**	
FAX:	907-479-5691	**PROJECT #**	20047-003 Bentley Mall
DATE RECEIVED:	10/26/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/06/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SVR1A	Modified TO-15	5.7 "Hg	14.9 psi
02A	SVR1B	Modified TO-15	6.1 "Hg	14.9 psi
03A	SV13	Modified TO-15	3.1 "Hg	14.9 psi
04A	SVR5	Modified TO-15	6.3 "Hg	15 psi
05A	SV14	Modified TO-15	5.1 "Hg	14.9 psi
06A	SV140	Modified TO-15	5.1 "Hg	14.9 psi
07A	SS1B	Modified TO-15	5.7 "Hg	14.9 psi
08A	SS1A	Modified TO-15	7.6 "Hg	15 psi
09A	Lab Blank	Modified TO-15	NA	NA
10A	CCV	Modified TO-15	NA	NA
11A	LCS	Modified TO-15	NA	NA
11AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/06/17

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified TO-15
Shannon & Wilson, Inc.
Workorder# 1710563

Eight 1 Liter Summa Canister (100% Certified) samples were received on October 26, 2017. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Initial Calibration	</=30% RSD with 2 compounds allowed out to < 40% RSD	</=30% RSD with 4 compounds allowed out to < 40% RSD
Blank and standards	Zero Air	UHP Nitrogen provides a higher purity gas matrix than zero air

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

Client Sample ID: SVR1A

Lab ID#: 1710563-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
trans-1,2-Dichloroethene	0.25	4.8	0.99	19
Chloroform	0.25	1.0	1.2	5.2
Tetrachloroethene	0.25	0.91	1.7	6.2

Client Sample ID: SVR1B

Lab ID#: 1710563-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.25	0.28	1.2	1.4
Tetrachloroethene	0.25	2.3	1.7	16

Client Sample ID: SV13

Lab ID#: 1710563-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.22	12	1.1	57
Tetrachloroethene	0.22	0.26	1.5	1.8

Client Sample ID: SVR5

Lab ID#: 1710563-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.26	3.6	1.4	19
Trichloroethene	0.26	2.9	1.4	15
Tetrachloroethene	0.26	15	1.7	100

Client Sample ID: SV14

Lab ID#: 1710563-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.24	0.37	1.6	2.5

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

Client Sample ID: SV140

Lab ID#: 1710563-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.24	0.36	1.6	2.5

Client Sample ID: SS1B

Lab ID#: 1710563-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.25	0.77	1.2	3.8
Tetrachloroethene	0.25	0.64	1.7	4.3

Client Sample ID: SS1A

Lab ID#: 1710563-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.27	2.6	1.3	13
Tetrachloroethene	0.27	0.41	1.8	2.8

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Client Sample ID: SVR1A

Lab ID#: 1710563-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103008**	**Date of Collection: 10/16/17 1:07:00 PM**	
Dil. Factor:	**2.49**	**Date of Analysis: 10/30/17 03:32 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.25	Not Detected	0.64	Not Detected
1,1-Dichloroethene	0.25	Not Detected	0.99	Not Detected
trans-1,2-Dichloroethene	0.25	4.8	0.99	19
1,1-Dichloroethane	0.25	Not Detected	1.0	Not Detected
cis-1,2-Dichloroethene	0.25	Not Detected	0.99	Not Detected
Chloroform	0.25	1.0	1.2	5.2
1,1,1-Trichloroethane	0.25	Not Detected	1.4	Not Detected
Trichloroethene	0.25	Not Detected	1.3	Not Detected
Tetrachloroethene	0.25	0.91	1.7	6.2

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: SVR1B

Lab ID#: 1710563-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103009**	**Date of Collection: 10/16/17 2:26:00 PM**	
Dil. Factor:	**2.53**	**Date of Analysis: 10/30/17 04:10 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.25	Not Detected	0.65	Not Detected
1,1-Dichloroethene	0.25	Not Detected	1.0	Not Detected
trans-1,2-Dichloroethene	0.25	Not Detected	1.0	Not Detected
1,1-Dichloroethane	0.25	Not Detected	1.0	Not Detected
cis-1,2-Dichloroethene	0.25	Not Detected	1.0	Not Detected
Chloroform	0.25	0.28	1.2	1.4
1,1,1-Trichloroethane	0.25	Not Detected	1.4	Not Detected
Trichloroethene	0.25	Not Detected	1.4	Not Detected
Tetrachloroethene	0.25	2.3	1.7	16

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SV13

Lab ID#: 1710563-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103010**	**Date of Collection: 10/16/17 5:24:00 PM**	
Dil. Factor:	**2.24**	**Date of Analysis: 10/30/17 04:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.22	Not Detected	0.57	Not Detected
1,1-Dichloroethene	0.22	Not Detected	0.89	Not Detected
trans-1,2-Dichloroethene	0.22	Not Detected	0.89	Not Detected
1,1-Dichloroethane	0.22	Not Detected	0.91	Not Detected
cis-1,2-Dichloroethene	0.22	Not Detected	0.89	Not Detected
Chloroform	0.22	12	1.1	57
1,1,1-Trichloroethane	0.22	Not Detected	1.2	Not Detected
Trichloroethene	0.22	Not Detected	1.2	Not Detected
Tetrachloroethene	0.22	0.26	1.5	1.8

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: SVR5

Lab ID#: 1710563-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103011**	**Date of Collection:**	**10/17/17 11:50:00 A**
Dil. Factor:	**2.56**	**Date of Analysis:**	**10/30/17 05:20 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.26	Not Detected	0.65	Not Detected
1,1-Dichloroethene	0.26	Not Detected	1.0	Not Detected
trans-1,2-Dichloroethene	0.26	Not Detected	1.0	Not Detected
1,1-Dichloroethane	0.26	Not Detected	1.0	Not Detected
cis-1,2-Dichloroethene	0.26	Not Detected	1.0	Not Detected
Chloroform	0.26	Not Detected	1.2	Not Detected
1,1,1-Trichloroethane	0.26	3.6	1.4	19
Trichloroethene	0.26	2.9	1.4	15
Tetrachloroethene	0.26	15	1.7	100

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: SV14

Lab ID#: 1710563-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103014**	**Date of Collection:**	**10/17/17 3:33:00 PM**
Dil. Factor:	**2.43**	**Date of Analysis:**	**10/30/17 07:04 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.24	Not Detected	0.62	Not Detected
1,1-Dichloroethene	0.24	Not Detected	0.96	Not Detected
trans-1,2-Dichloroethene	0.24	Not Detected	0.96	Not Detected
1,1-Dichloroethane	0.24	Not Detected	0.98	Not Detected
cis-1,2-Dichloroethene	0.24	Not Detected	0.96	Not Detected
Chloroform	0.24	Not Detected	1.2	Not Detected
1,1,1-Trichloroethane	0.24	Not Detected	1.3	Not Detected
Trichloroethene	0.24	Not Detected	1.3	Not Detected
Tetrachloroethene	0.24	0.37	1.6	2.5

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: SV140

Lab ID#: 1710563-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103013**	**Date of Collection:**	**10/17/17 3:23:00 PM**
Dil. Factor:	**2.43**	**Date of Analysis:**	**10/30/17 06:29 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.24	Not Detected	0.62	Not Detected
1,1-Dichloroethene	0.24	Not Detected	0.96	Not Detected
trans-1,2-Dichloroethene	0.24	Not Detected	0.96	Not Detected
1,1-Dichloroethane	0.24	Not Detected	0.98	Not Detected
cis-1,2-Dichloroethene	0.24	Not Detected	0.96	Not Detected
Chloroform	0.24	Not Detected	1.2	Not Detected
1,1,1-Trichloroethane	0.24	Not Detected	1.3	Not Detected
Trichloroethene	0.24	Not Detected	1.3	Not Detected
Tetrachloroethene	0.24	0.36	1.6	2.5

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: SS1B

Lab ID#: 1710563-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103015**	**Date of Collection:**	**10/18/17 1:04:00 PM**
Dil. Factor:	**2.49**	**Date of Analysis:**	**10/30/17 07:44 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.25	Not Detected	0.64	Not Detected
1,1-Dichloroethene	0.25	Not Detected	0.99	Not Detected
trans-1,2-Dichloroethene	0.25	Not Detected	0.99	Not Detected
1,1-Dichloroethane	0.25	Not Detected	1.0	Not Detected
cis-1,2-Dichloroethene	0.25	Not Detected	0.99	Not Detected
Chloroform	0.25	0.77	1.2	3.8
1,1,1-Trichloroethane	0.25	Not Detected	1.4	Not Detected
Trichloroethene	0.25	Not Detected	1.3	Not Detected
Tetrachloroethene	0.25	0.64	1.7	4.3

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: SS1A

Lab ID#: 1710563-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103016**	**Date of Collection: 10/18/17 1:50:00 PM**	
Dil. Factor:	**2.70**	**Date of Analysis: 10/30/17 08:19 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.27	Not Detected	0.69	Not Detected
1,1-Dichloroethene	0.27	Not Detected	1.1	Not Detected
trans-1,2-Dichloroethene	0.27	Not Detected	1.1	Not Detected
1,1-Dichloroethane	0.27	Not Detected	1.1	Not Detected
cis-1,2-Dichloroethene	0.27	Not Detected	1.1	Not Detected
Chloroform	0.27	2.6	1.3	13
1,1,1-Trichloroethane	0.27	Not Detected	1.5	Not Detected
Trichloroethene	0.27	Not Detected	1.4	Not Detected
Tetrachloroethene	0.27	0.41	1.8	2.8

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	89	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1710563-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103006**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/30/17 12:41 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.10	Not Detected	0.26	Not Detected
1,1-Dichloroethene	0.10	Not Detected	0.40	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
1,1-Dichloroethane	0.10	Not Detected	0.40	Not Detected
cis-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
Chloroform	0.10	Not Detected	0.49	Not Detected
1,1,1-Trichloroethane	0.10	Not Detected	0.54	Not Detected
Trichloroethene	0.10	Not Detected	0.54	Not Detected
Tetrachloroethene	0.10	Not Detected	0.68	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: CCV

Lab ID#: 1710563-10A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103002**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/30/17 08:27 AM**	

Compound	%Recovery
Vinyl Chloride	98
1,1-Dichloroethene	99
trans-1,2-Dichloroethene	101
1,1-Dichloroethane	97
cis-1,2-Dichloroethene	97
Chloroform	97
1,1,1-Trichloroethane	98
Trichloroethene	98
Tetrachloroethene	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCS

Lab ID#: 1710563-11A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/30/17 09:33 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	109	70-130
1,1-Dichloroethene	103	70-130
trans-1,2-Dichloroethene	90	70-130
1,1-Dichloroethane	100	70-130
cis-1,2-Dichloroethene	110	70-130
Chloroform	99	70-130
1,1,1-Trichloroethane	100	70-130
Trichloroethene	103	70-130
Tetrachloroethene	104	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCSD

Lab ID#: 1710563-11AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**v103004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/30/17 10:24 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	110	70-130
1,1-Dichloroethene	108	70-130
trans-1,2-Dichloroethene	93	70-130
1,1-Dichloroethane	104	70-130
cis-1,2-Dichloroethene	116	70-130
Chloroform	104	70-130
1,1,1-Trichloroethane	104	70-130
Trichloroethene	102	70-130
Tetrachloroethene	104	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	96	70-130

WORK ORDER 1711095A

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11/17/2017
Ms. Sheila Hinckley
Shannon & Wilson, Inc.
2355 Hill Road

Fairbanks AK 99709

Project Name: Bentley Mall
Project #: 20047-003
Workorder #: 1711095A

Dear Ms. Sheila Hinckley

The following report includes the data for the above referenced project for sample(s) received on 11/6/2017 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1711095A

Work Order Summary

CLIENT:	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709	**BILL TO:**	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709
PHONE:	907-479-0600	**P.O. #**	
FAX:	907-479-5691	**PROJECT #**	20047-003 Bentley Mall
DATE RECEIVED:	11/06/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/17/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	IA5	Modified TO-15 SIM	5.3 "Hg	5.1 psi
02A	Lab Blank	Modified TO-15 SIM	NA	NA
03A	CCV	Modified TO-15 SIM	NA	NA
04A	LCS	Modified TO-15 SIM	NA	NA
04AA	LCSD	Modified TO-15 SIM	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/17/17

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified TO-15 SIM
Shannon & Wilson, Inc.
Workorder# 1711095A

One 6 Liter Summa Canister (SIM Certified) sample was received on November 06, 2017. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the SIM acquisition mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM

Client Sample ID: IA5

Lab ID#: 1711095A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.033	0.11	0.16	0.54
Trichloroethene	0.033	0.049	0.18	0.26
Tetrachloroethene	0.033	0.23	0.22	1.6

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Client Sample ID: IA5

Lab ID#: 1711095A-01A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110721sim**	**Date of Collection: 10/18/17 10:43:00 A**	
Dil. Factor:	**1.64**	**Date of Analysis: 11/8/17 06:43 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.016	Not Detected	0.042	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.065	Not Detected
trans-1,2-Dichloroethene	0.16	Not Detected	0.65	Not Detected
1,1-Dichloroethane	0.033	Not Detected	0.13	Not Detected
cis-1,2-Dichloroethene	0.033	Not Detected	0.13	Not Detected
Chloroform	0.033	0.11	0.16	0.54
1,1,1-Trichloroethane	0.033	Not Detected	0.18	Not Detected
Trichloroethene	0.033	0.049	0.18	0.26
Tetrachloroethene	0.033	0.23	0.22	1.6

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	109	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1711095A-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110705sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/7/17 10:56 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
1,1-Dichloroethene	0.010	Not Detected	0.040	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
1,1-Dichloroethane	0.020	Not Detected	0.081	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Chloroform	0.020	Not Detected	0.098	Not Detected
1,1,1-Trichloroethane	0.020	Not Detected	0.11	Not Detected
Trichloroethene	0.020	Not Detected	0.11	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	111	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	114	70-130

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Client Sample ID: CCV

Lab ID#: 1711095A-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110702sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/7/17 08:20 AM**	

Compound	%Recovery
Vinyl Chloride	91
1,1-Dichloroethene	96
trans-1,2-Dichloroethene	93
1,1-Dichloroethane	95
cis-1,2-Dichloroethene	97
Chloroform	89
1,1,1-Trichloroethane	93
Trichloroethene	92
Tetrachloroethene	87

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	95	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	124	70-130

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Client Sample ID: LCS

Lab ID#: 1711095A-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110703sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/7/17 09:09 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	85	70-130
1,1-Dichloroethene	86	70-130
trans-1,2-Dichloroethene	74	70-130
1,1-Dichloroethane	86	70-130
cis-1,2-Dichloroethene	97	70-130
Chloroform	81	70-130
1,1,1-Trichloroethane	85	70-130
Trichloroethene	81	70-130
Tetrachloroethene	80	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	122	70-130

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Client Sample ID: LCSD

Lab ID#: 1711095A-04AA

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110704sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/7/17 10:01 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	84	70-130
1,1-Dichloroethene	86	70-130
trans-1,2-Dichloroethene	73	70-130
1,1-Dichloroethane	86	70-130
cis-1,2-Dichloroethene	96	70-130
Chloroform	81	70-130
1,1,1-Trichloroethane	85	70-130
Trichloroethene	80	70-130
Tetrachloroethene	77	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	124	70-130

WORK ORDER 1711095B

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11/17/2017
Ms. Sheila Hinckley
Shannon & Wilson, Inc.
2355 Hill Road

Fairbanks AK 99709

Project Name: Bentley Mall
Project #: 20047-003
Workorder #: 1711095B

Dear Ms. Sheila Hinckley

The following report includes the data for the above referenced project for sample(s) received on 11/6/2017 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1711095B

Work Order Summary

CLIENT:	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709	**BILL TO:**	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709
PHONE:	907-479-0600	**P.O. #**	
FAX:	907-479-5691	**PROJECT #**	20047-003 Bentley Mall
DATE RECEIVED:	11/06/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/17/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
02A	SV15	Modified TO-15	5.3 "Hg	14.9 psi
03A	SV12R	Modified TO-15	6.3 "Hg	15 psi
04A	SS2	Modified TO-15	5.1 "Hg	15.2 psi
05A	Lab Blank	Modified TO-15	NA	NA
06A	CCV	Modified TO-15	NA	NA
07A	LCS	Modified TO-15	NA	NA
07AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/17/17

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified TO-15
Shannon & Wilson, Inc.
Workorder# 1711095B

Three 1 Liter Summa Canister (100% Certified) samples were received on November 06, 2017. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Initial Calibration	</=30% RSD with 2 compounds allowed out to < 40% RSD	</=30% RSD with 4 compounds allowed out to < 40% RSD
Blank and standards	Zero Air	UHP Nitrogen provides a higher purity gas matrix than zero air

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

Client Sample ID: SV15

Lab ID#: 1711095B-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.24	8.3	1.7	56

Client Sample ID: SV12R

Lab ID#: 1711095B-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.26	0.35	1.2	1.7
1,1,1-Trichloroethane	0.26	0.66	1.4	3.6
Tetrachloroethene	0.26	2.5	1.7	17

Client Sample ID: SS2

Lab ID#: 1711095B-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.24	0.62	1.2	3.0
1,1,1-Trichloroethane	0.24	1.0	1.3	5.6
Trichloroethene	0.24	2.3	1.3	12
Tetrachloroethene	0.24	20	1.7	130

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Client Sample ID: SV15

Lab ID#: 1711095B-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20110818**	**Date of Collection: 10/18/17 4:10:00 PM**	
Dil. Factor:	**2.45**	**Date of Analysis: 11/8/17 10:55 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.24	Not Detected	0.63	Not Detected
1,1-Dichloroethene	0.24	Not Detected	0.97	Not Detected
trans-1,2-Dichloroethene	0.24	Not Detected	0.97	Not Detected
1,1-Dichloroethane	0.24	Not Detected	0.99	Not Detected
cis-1,2-Dichloroethene	0.24	Not Detected	0.97	Not Detected
Chloroform	0.24	Not Detected	1.2	Not Detected
1,1,1-Trichloroethane	0.24	Not Detected	1.3	Not Detected
Trichloroethene	0.24	Not Detected	1.3	Not Detected
Tetrachloroethene	0.24	8.3	1.7	56

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	112	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SV12R

Lab ID#: 1711095B-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20110819**	**Date of Collection: 10/18/17 5:17:00 PM**	
Dil. Factor:	**2.56**	**Date of Analysis: 11/9/17 06:48 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.26	Not Detected	0.65	Not Detected
1,1-Dichloroethene	0.26	Not Detected	1.0	Not Detected
trans-1,2-Dichloroethene	0.26	Not Detected	1.0	Not Detected
1,1-Dichloroethane	0.26	Not Detected	1.0	Not Detected
cis-1,2-Dichloroethene	0.26	Not Detected	1.0	Not Detected
Chloroform	0.26	0.35	1.2	1.7
1,1,1-Trichloroethane	0.26	0.66	1.4	3.6
Trichloroethene	0.26	Not Detected	1.4	Not Detected
Tetrachloroethene	0.26	2.5	1.7	17

Container Type: 1 Liter Summa Canister (100% Certified)

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

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Client Sample ID: SS2

Lab ID#: 1711095B-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20110820**	**Date of Collection: 10/27/17 11:32:00 A**	
Dil. Factor:	**2.45**	**Date of Analysis: 11/9/17 07:27 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.24	Not Detected	0.63	Not Detected
1,1-Dichloroethene	0.24	Not Detected	0.97	Not Detected
trans-1,2-Dichloroethene	0.24	Not Detected	0.97	Not Detected
1,1-Dichloroethane	0.24	Not Detected	0.99	Not Detected
cis-1,2-Dichloroethene	0.24	Not Detected	0.97	Not Detected
Chloroform	0.24	0.62	1.2	3.0
1,1,1-Trichloroethane	0.24	1.0	1.3	5.6
Trichloroethene	0.24	2.3	1.3	12
Tetrachloroethene	0.24	20	1.7	130

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1711095B-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20110807**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/17 01:02 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.10	Not Detected	0.26	Not Detected
1,1-Dichloroethene	0.10	Not Detected	0.40	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
1,1-Dichloroethane	0.10	Not Detected	0.40	Not Detected
cis-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
Chloroform	0.10	Not Detected	0.49	Not Detected
1,1,1-Trichloroethane	0.10	Not Detected	0.54	Not Detected
Trichloroethene	0.10	Not Detected	0.54	Not Detected
Tetrachloroethene	0.10	Not Detected	0.68	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	111	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: CCV

Lab ID#: 1711095B-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20110802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/17 09:24 AM**	

Compound	%Recovery
Vinyl Chloride	109
1,1-Dichloroethene	101
trans-1,2-Dichloroethene	103
1,1-Dichloroethane	103
cis-1,2-Dichloroethene	102
Chloroform	88
1,1,1-Trichloroethane	97
Trichloroethene	101
Tetrachloroethene	105

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCS

Lab ID#: 1711095B-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20110803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/17 10:12 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	111	70-130
1,1-Dichloroethene	103	70-130
trans-1,2-Dichloroethene	91	70-130
1,1-Dichloroethane	102	70-130
cis-1,2-Dichloroethene	114	70-130
Chloroform	81	70-130
1,1,1-Trichloroethane	99	70-130
Trichloroethene	103	70-130
Tetrachloroethene	103	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCSD

Lab ID#: 1711095B-07AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20110804**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/17 10:51 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	119	70-130
1,1-Dichloroethene	111	70-130
trans-1,2-Dichloroethene	96	70-130
1,1-Dichloroethane	110	70-130
cis-1,2-Dichloroethene	122	70-130
Chloroform	96	70-130
1,1,1-Trichloroethane	107	70-130
Trichloroethene	106	70-130
Tetrachloroethene	111	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	102	70-130

WORK ORDER 1711115A

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11/20/2017
Ms. Sheila Hinckley
Shannon & Wilson, Inc.
2355 Hill Road

Fairbanks AK 99709

Project Name: Bentley Mall
Project #: 20047-003
Workorder #: 1711115A

Dear Ms. Sheila Hinckley

The following report includes the data for the above referenced project for sample(s) received on 11/7/2017 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1711115A

Work Order Summary

CLIENT:	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709	**BILL TO:**	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709
PHONE:	907-479-0600	**P.O. #**	
FAX:	907-479-5691	**PROJECT #**	20047-003 Bentley Mall
DATE RECEIVED:	11/07/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/20/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SVR4B	Modified TO-15	4.3 "Hg	15.3 psi
02A	SVR4A	Modified TO-15	6.5 "Hg	14.8 psi
04A	SVR40B	Modified TO-15	3.7 "Hg	15.2 psi
05A	Lab Blank	Modified TO-15	NA	NA
05B	Lab Blank	Modified TO-15	NA	NA
06A	CCV	Modified TO-15	NA	NA
06B	CCV	Modified TO-15	NA	NA
07A	LCS	Modified TO-15	NA	NA
07AA	LCSD	Modified TO-15	NA	NA
07B	LCS	Modified TO-15	NA	NA
07BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/20/17

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified TO-15
Shannon & Wilson, Inc.
Workorder# 1711115A

Three 1 Liter Summa Canister (100% Certified) samples were received on November 07, 2017. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Initial Calibration	</=30% RSD with 2 compounds allowed out to < 40% RSD	</=30% RSD with 4 compounds allowed out to < 40% RSD
Blank and standards	Zero Air	UHP Nitrogen provides a higher purity gas matrix than zero air

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

A dilution was performed on all samples due to the presence of high level target species.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

Client Sample ID: SVR4B

Lab ID#: 1711115A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
trans-1,2-Dichloroethene	0.79	16	3.1	65
Trichloroethene	0.79	28	4.3	150
Tetrachloroethene	0.79	220	5.4	1500

Client Sample ID: SVR4A

Lab ID#: 1711115A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
trans-1,2-Dichloroethene	5.1	2100	20	8200
Tetrachloroethene	5.1	27	34	180

Client Sample ID: SVR40B

Lab ID#: 1711115A-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
trans-1,2-Dichloroethene	0.77	16	3.1	65
Trichloroethene	0.77	28	4.2	150
Tetrachloroethene	0.77	220	5.2	1500

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Client Sample ID: SVR4B

Lab ID#: 1711115A-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**21110914**	**Date of Collection: 11/4/17 1:18:00 PM**	
Dil. Factor:	**7.93**	**Date of Analysis: 11/9/17 06:05 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.79	Not Detected	2.0	Not Detected
1,1-Dichloroethene	0.79	Not Detected	3.1	Not Detected
trans-1,2-Dichloroethene	0.79	16	3.1	65
1,1-Dichloroethane	0.79	Not Detected	3.2	Not Detected
cis-1,2-Dichloroethene	0.79	Not Detected	3.1	Not Detected
Chloroform	0.79	Not Detected	3.9	Not Detected
1,1,1-Trichloroethane	0.79	Not Detected	4.3	Not Detected
Trichloroethene	0.79	28	4.3	150
Tetrachloroethene	0.79	220	5.4	1500

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: SVR4A

Lab ID#: 1711115A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a111310**	**Date of Collection: 11/4/17 2:15:00 PM**	
Dil. Factor:	**10.2**	**Date of Analysis: 11/13/17 05:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	5.1	Not Detected	13	Not Detected
1,1-Dichloroethene	5.1	Not Detected	20	Not Detected
trans-1,2-Dichloroethene	5.1	2100	20	8200
1,1-Dichloroethane	5.1	Not Detected	21	Not Detected
cis-1,2-Dichloroethene	5.1	Not Detected	20	Not Detected
Chloroform	5.1	Not Detected	25	Not Detected
1,1,1-Trichloroethane	5.1	Not Detected	28	Not Detected
Trichloroethene	5.1	Not Detected	27	Not Detected
Tetrachloroethene	5.1	27	34	180

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	92	70-130

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Client Sample ID: SVR40B

Lab ID#: 1711115A-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**21110915**	**Date of Collection: 11/4/17 1:08:00 PM**	
Dil. Factor:	**7.73**	**Date of Analysis: 11/9/17 06:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.77	Not Detected	2.0	Not Detected
1,1-Dichloroethene	0.77	Not Detected	3.1	Not Detected
trans-1,2-Dichloroethene	0.77	16	3.1	65
1,1-Dichloroethane	0.77	Not Detected	3.1	Not Detected
cis-1,2-Dichloroethene	0.77	Not Detected	3.1	Not Detected
Chloroform	0.77	Not Detected	3.8	Not Detected
1,1,1-Trichloroethane	0.77	Not Detected	4.2	Not Detected
Trichloroethene	0.77	28	4.2	150
Tetrachloroethene	0.77	220	5.2	1500

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	116	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	125	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1711115A-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**21110905**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/17 10:45 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.10	Not Detected	0.26	Not Detected
1,1-Dichloroethene	0.10	Not Detected	0.40	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
1,1-Dichloroethane	0.10	Not Detected	0.40	Not Detected
cis-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
Chloroform	0.10	Not Detected	0.49	Not Detected
1,1,1-Trichloroethane	0.10	Not Detected	0.54	Not Detected
Trichloroethene	0.10	Not Detected	0.54	Not Detected
Tetrachloroethene	0.10	Not Detected	0.68	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	118	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	116	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1711115A-05B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a111307**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/13/17 01:31 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	91	70-130

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Client Sample ID: CCV

Lab ID#: 1711115A-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**21110902**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/17 08:07 AM**	

Compound	%Recovery
Vinyl Chloride	100
1,1-Dichloroethene	96
trans-1,2-Dichloroethene	96
1,1-Dichloroethane	100
cis-1,2-Dichloroethene	99
Chloroform	96
1,1,1-Trichloroethane	99
Trichloroethene	90
Tetrachloroethene	86

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	122	70-130

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Client Sample ID: CCV

Lab ID#: 1711115A-06B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a111304**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/13/17 11:48 AM**	

Compound	%Recovery
Vinyl Chloride	90
1,1-Dichloroethene	98
trans-1,2-Dichloroethene	98
1,1-Dichloroethane	89
cis-1,2-Dichloroethene	95
Chloroform	94
1,1,1-Trichloroethane	94
Trichloroethene	102
Tetrachloroethene	102

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: LCS

Lab ID#: 1711115A-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**21110903**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/17 09:08 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	93	70-130
1,1-Dichloroethene	90	70-130
trans-1,2-Dichloroethene	77	70-130
1,1-Dichloroethane	90	70-130
cis-1,2-Dichloroethene	101	70-130
Chloroform	88	70-130
1,1,1-Trichloroethane	89	70-130
Trichloroethene	82	70-130
Tetrachloroethene	80	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	118	70-130

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Client Sample ID: LCSD

Lab ID#: 1711115A-07AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**21110904**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/17 09:53 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	89	70-130
1,1-Dichloroethene	88	70-130
trans-1,2-Dichloroethene	74	70-130
1,1-Dichloroethane	88	70-130
cis-1,2-Dichloroethene	97	70-130
Chloroform	85	70-130
1,1,1-Trichloroethane	85	70-130
Trichloroethene	80	70-130
Tetrachloroethene	78	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	125	70-130

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Client Sample ID: LCS

Lab ID#: 1711115A-07B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a111305**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/13/17 12:13 PM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	94	70-130
1,1-Dichloroethene	97	70-130
trans-1,2-Dichloroethene	84	70-130
1,1-Dichloroethane	91	70-130
cis-1,2-Dichloroethene	106	70-130
Chloroform	93	70-130
1,1,1-Trichloroethane	96	70-130
Trichloroethene	101	70-130
Tetrachloroethene	97	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	92	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCSD

Lab ID#: 1711115A-07BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a111306**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/13/17 12:38 PM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	98	70-130
1,1-Dichloroethene	98	70-130
trans-1,2-Dichloroethene	87	70-130
1,1-Dichloroethane	94	70-130
cis-1,2-Dichloroethene	106	70-130
Chloroform	96	70-130
1,1,1-Trichloroethane	98	70-130
Trichloroethene	103	70-130
Tetrachloroethene	97	70-130

Container Type: NA - Not Applicable

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

WORK ORDER 1711115B

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11/20/2017
Ms. Sheila Hinckley
Shannon & Wilson, Inc.
2355 Hill Road

Fairbanks AK 99709

Project Name: Bentley Mall
Project #: 20047-003
Workorder #: 1711115B

Dear Ms. Sheila Hinckley

The following report includes the data for the above referenced project for sample(s) received on 11/7/2017 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1711115B

Work Order Summary

CLIENT:	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709	**BILL TO:**	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709
PHONE:	907-479-0600	**P.O. #**	
FAX:	907-479-5691	**PROJECT #**	20047-003 Bentley Mall
DATE RECEIVED:	11/07/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/20/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
03A	IA4	Modified TO-15 SIM	2.4 "Hg	5.1 psi
05A	CS1	Modified TO-15 SIM	3.9 "Hg	5 psi
06A	Lab Blank	Modified TO-15 SIM	NA	NA
07A	CCV	Modified TO-15 SIM	NA	NA
08A	LCS	Modified TO-15 SIM	NA	NA
08AA	LCSD	Modified TO-15 SIM	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/20/17

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified TO-15 SIM
Shannon & Wilson, Inc.
Workorder# 1711115B

Two 6 Liter Summa Canister (SIM Certified) samples were received on November 07, 2017. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the SIM acquisition mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM

Client Sample ID: IA4

Lab ID#: 1711115B-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.029	0.13	0.14	0.64
Tetrachloroethene	0.029	0.27	0.20	1.8

Client Sample ID: CS1

Lab ID#: 1711115B-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.031	0.14	0.21	0.93

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Client Sample ID: IA4

Lab ID#: 1711115B-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110912sim**	**Date of Collection: 11/5/17 2:08:00 PM**	
Dil. Factor:	**1.47**	**Date of Analysis: 11/9/17 04:51 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.015	Not Detected	0.038	Not Detected
1,1-Dichloroethene	0.015	Not Detected	0.058	Not Detected
trans-1,2-Dichloroethene	0.15	Not Detected	0.58	Not Detected
1,1-Dichloroethane	0.029	Not Detected	0.12	Not Detected
cis-1,2-Dichloroethene	0.029	Not Detected	0.12	Not Detected
Chloroform	0.029	0.13	0.14	0.64
1,1,1-Trichloroethane	0.029	Not Detected	0.16	Not Detected
Trichloroethene	0.029	Not Detected	0.16	Not Detected
Tetrachloroethene	0.029	0.27	0.20	1.8

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	112	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	121	70-130

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Client Sample ID: CS1

Lab ID#: 1711115B-05A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110913sim**	**Date of Collection: 10/31/17 12:20:00 P**	
Dil. Factor:	**1.54**	**Date of Analysis: 11/9/17 05:31 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.015	Not Detected	0.039	Not Detected
1,1-Dichloroethene	0.015	Not Detected	0.061	Not Detected
trans-1,2-Dichloroethene	0.15	Not Detected	0.61	Not Detected
1,1-Dichloroethane	0.031	Not Detected	0.12	Not Detected
cis-1,2-Dichloroethene	0.031	Not Detected	0.12	Not Detected
Chloroform	0.031	Not Detected	0.15	Not Detected
1,1,1-Trichloroethane	0.031	Not Detected	0.17	Not Detected
Trichloroethene	0.031	Not Detected	0.16	Not Detected
Tetrachloroethene	0.031	0.14	0.21	0.93

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	112	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	120	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1711115B-06A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110905sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/17 10:45 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
1,1-Dichloroethene	0.010	Not Detected	0.040	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
1,1-Dichloroethane	0.020	Not Detected	0.081	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Chloroform	0.020	Not Detected	0.098	Not Detected
1,1,1-Trichloroethane	0.020	Not Detected	0.11	Not Detected
Trichloroethene	0.020	Not Detected	0.11	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	114	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	116	70-130

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Client Sample ID: CCV

Lab ID#: 1711115B-07A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110902sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/17 08:07 AM**	

Compound	%Recovery
Vinyl Chloride	90
1,1-Dichloroethene	92
trans-1,2-Dichloroethene	91
1,1-Dichloroethane	94
cis-1,2-Dichloroethene	96
Chloroform	89
1,1,1-Trichloroethane	94
Trichloroethene	88
Tetrachloroethene	82

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	123	70-130

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Client Sample ID: LCS

Lab ID#: 1711115B-08A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110903sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/17 09:08 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	86	70-130
1,1-Dichloroethene	86	70-130
trans-1,2-Dichloroethene	73	70-130
1,1-Dichloroethane	86	70-130
cis-1,2-Dichloroethene	97	70-130
Chloroform	81	70-130
1,1,1-Trichloroethane	86	70-130
Trichloroethene	79	70-130
Tetrachloroethene	78	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	122	70-130

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Client Sample ID: LCSD

Lab ID#: 1711115B-08AA

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21110904sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/9/17 09:53 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	82	70-130
1,1-Dichloroethene	84	70-130
trans-1,2-Dichloroethene	71	70-130
1,1-Dichloroethane	84	70-130
cis-1,2-Dichloroethene	94	70-130
Chloroform	79	70-130
1,1,1-Trichloroethane	82	70-130
Trichloroethene	76	70-130
Tetrachloroethene	75	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	125	70-130

WORK ORDER 1711272A

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11/29/2017
Ms. Sheila Hinckley
Shannon & Wilson, Inc.
2355 Hill Road

Fairbanks AK 99709

Project Name: BMES
Project #: 20047-004
Workorder #: 1711272A

Dear Ms. Sheila Hinckley

The following report includes the data for the above referenced project for sample(s) received on 11/15/2017 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1711272A

Work Order Summary

CLIENT:	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709	**BILL TO:**	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709
PHONE:	907-479-0600	**P.O. #**	
FAX:	907-479-5691	**PROJECT #**	20047-004 BMES
DATE RECEIVED:	11/15/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/29/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AZventN	Modified TO-15	5.3 "Hg	14.7 psi
02A	Lab Blank	Modified TO-15	NA	NA
03A	CCV	Modified TO-15	NA	NA
04A	LCS	Modified TO-15	NA	NA
04AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/29/17

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified TO-15
Shannon & Wilson, Inc.
Workorder# 1711272A

One 1 Liter Summa Canister (100% Certified) sample was received on November 15, 2017. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Initial Calibration	</=30% RSD with 2 compounds allowed out to < 40% RSD	</=30% RSD with 4 compounds allowed out to < 40% RSD
Blank and standards	Zero Air	UHP Nitrogen provides a higher purity gas matrix than zero air

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on sample AZventN due to the presence of high level non-target species.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

Client Sample ID: AZventN

Lab ID#: 1711272A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
trans-1,2-Dichloroethene	0.49	2.9	1.9	12
Tetrachloroethene	0.49	3.3	3.3	22

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Client Sample ID: AZventN

Lab ID#: 1711272A-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20111720**	**Date of Collection: 11/8/17 10:55:00 AM**	
Dil. Factor:	**4.86**	**Date of Analysis: 11/18/17 06:55 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.49	Not Detected	1.2	Not Detected
1,1-Dichloroethene	0.49	Not Detected	1.9	Not Detected
trans-1,2-Dichloroethene	0.49	2.9	1.9	12
1,1-Dichloroethane	0.49	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.49	Not Detected	1.9	Not Detected
Chloroform	0.49	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.49	Not Detected	2.6	Not Detected
Trichloroethene	0.49	Not Detected	2.6	Not Detected
Tetrachloroethene	0.49	3.3	3.3	22

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1711272A-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20111706**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/17/17 01:25 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.10	Not Detected	0.26	Not Detected
1,1-Dichloroethene	0.10	Not Detected	0.40	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
1,1-Dichloroethane	0.10	Not Detected	0.40	Not Detected
cis-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
Chloroform	0.10	Not Detected	0.49	Not Detected
1,1,1-Trichloroethane	0.10	Not Detected	0.54	Not Detected
Trichloroethene	0.10	Not Detected	0.54	Not Detected
Tetrachloroethene	0.10	Not Detected	0.68	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	110	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	89	70-130

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Client Sample ID: CCV

Lab ID#: 1711272A-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20111702**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/17/17 08:48 AM**	

Compound	%Recovery
Vinyl Chloride	115
1,1-Dichloroethene	105
trans-1,2-Dichloroethene	110
1,1-Dichloroethane	109
cis-1,2-Dichloroethene	107
Chloroform	87
1,1,1-Trichloroethane	104
Trichloroethene	107
Tetrachloroethene	108

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: LCS

Lab ID#: 1711272A-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20111703**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/17/17 10:05 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	116	70-130
1,1-Dichloroethene	105	70-130
trans-1,2-Dichloroethene	95	70-130
1,1-Dichloroethane	107	70-130
cis-1,2-Dichloroethene	114	70-130
Chloroform	82	70-130
1,1,1-Trichloroethane	104	70-130
Trichloroethene	105	70-130
Tetrachloroethene	107	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCSD

Lab ID#: 1711272A-04AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**20111704**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/17/17 11:06 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	121	70-130
1,1-Dichloroethene	108	70-130
trans-1,2-Dichloroethene	96	70-130
1,1-Dichloroethane	110	70-130
cis-1,2-Dichloroethene	120	70-130
Chloroform	86	70-130
1,1,1-Trichloroethane	105	70-130
Trichloroethene	103	70-130
Tetrachloroethene	106	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	101	70-130

WORK ORDER 1711272B

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11/29/2017
Ms. Sheila Hinckley
Shannon & Wilson, Inc.
2355 Hill Road

Fairbanks AK 99709

Project Name: BMES
Project #: 20047-004
Workorder #: 1711272B

Dear Ms. Sheila Hinckley

The following report includes the data for the above referenced project for sample(s) received on 11/15/2017 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1711272B

Work Order Summary

CLIENT:	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709	**BILL TO:**	Ms. Sheila Hinckley Shannon & Wilson, Inc. 2355 Hill Road Fairbanks, AK 99709
PHONE:	907-479-0600	**P.O. #**	
FAX:	907-479-5691	**PROJECT #**	20047-004 BMES
DATE RECEIVED:	11/15/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/29/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
02A	CIA01	Modified TO-15 SIM	3.5 "Hg	5 psi
03A	CIA08	Modified TO-15 SIM	6.3 "Hg	5.2 psi
04A	CIA108	Modified TO-15 SIM	7.8 "Hg	5 psi
05A	Lab Blank	Modified TO-15 SIM	NA	NA
06A	CCV	Modified TO-15 SIM	NA	NA
07A	LCS	Modified TO-15 SIM	NA	NA
07AA	LCSD	Modified TO-15 SIM	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/29/17

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified TO-15 SIM
Shannon & Wilson, Inc.
Workorder# 1711272B

Three 6 Liter Summa Canister (SIM Certified) samples were received on November 15, 2017. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the SIM acquisition mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM

Client Sample ID: CIA01

Lab ID#: 1711272B-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
trans-1,2-Dichloroethene	0.15	0.25	0.60	0.98
Chloroform	0.030	0.058	0.15	0.28
Trichloroethene	0.030	0.054	0.16	0.29
Tetrachloroethene	0.030	1.9	0.21	13

Client Sample ID: CIA08

Lab ID#: 1711272B-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.034	0.22	0.17	1.1
Tetrachloroethene	0.034	2.0	0.23	14

Client Sample ID: CIA108

Lab ID#: 1711272B-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.036	0.20	0.18	1.0
Tetrachloroethene	0.036	2.3	0.24	15

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Client Sample ID: CIA01

Lab ID#: 1711272B-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21111711sim**	**Date of Collection: 11/9/17 9:55:00 AM**	
Dil. Factor:	**1.52**	**Date of Analysis: 11/17/17 03:39 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.015	Not Detected	0.039	Not Detected
1,1-Dichloroethene	0.015	Not Detected	0.060	Not Detected
trans-1,2-Dichloroethene	0.15	0.25	0.60	0.98
1,1-Dichloroethane	0.030	Not Detected	0.12	Not Detected
cis-1,2-Dichloroethene	0.030	Not Detected	0.12	Not Detected
Chloroform	0.030	0.058	0.15	0.28
1,1,1-Trichloroethane	0.030	Not Detected	0.16	Not Detected
Trichloroethene	0.030	0.054	0.16	0.29
Tetrachloroethene	0.030	1.9	0.21	13

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	110	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	112	70-130

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Client Sample ID: CIA08

Lab ID#: 1711272B-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21111712sim**	**Date of Collection:**	**11/10/17 9:55:00 AM**
Dil. Factor:	**1.72**	**Date of Analysis:**	**11/17/17 04:11 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.017	Not Detected	0.044	Not Detected
1,1-Dichloroethene	0.017	Not Detected	0.068	Not Detected
trans-1,2-Dichloroethene	0.17	Not Detected	0.68	Not Detected
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.14	Not Detected
Chloroform	0.034	0.22	0.17	1.1
1,1,1-Trichloroethane	0.034	Not Detected	0.19	Not Detected
Trichloroethene	0.034	Not Detected	0.18	Not Detected
Tetrachloroethene	0.034	2.0	0.23	14

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	112	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	111	70-130

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Client Sample ID: CIA108

Lab ID#: 1711272B-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21111714sim**	**Date of Collection:**	**11/10/17 9:45:00 AM**
Dil. Factor:	**1.81**	**Date of Analysis:**	**11/17/17 05:30 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.018	Not Detected	0.046	Not Detected
1,1-Dichloroethene	0.018	Not Detected	0.072	Not Detected
trans-1,2-Dichloroethene	0.18	Not Detected	0.72	Not Detected
1,1-Dichloroethane	0.036	Not Detected	0.15	Not Detected
cis-1,2-Dichloroethene	0.036	Not Detected	0.14	Not Detected
Chloroform	0.036	0.20	0.18	1.0
1,1,1-Trichloroethane	0.036	Not Detected	0.20	Not Detected
Trichloroethene	0.036	Not Detected	0.19	Not Detected
Tetrachloroethene	0.036	2.3	0.24	15

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	110	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1711272B-05A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21111705sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/17/17 10:23 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
1,1-Dichloroethene	0.010	Not Detected	0.040	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
1,1-Dichloroethane	0.020	Not Detected	0.081	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Chloroform	0.020	Not Detected	0.098	Not Detected
1,1,1-Trichloroethane	0.020	Not Detected	0.11	Not Detected
Trichloroethene	0.020	Not Detected	0.11	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	114	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	111	70-130

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Client Sample ID: CCV

Lab ID#: 1711272B-06A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21111702sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/17/17 08:48 AM**	

Compound	%Recovery
Vinyl Chloride	86
1,1-Dichloroethene	88
trans-1,2-Dichloroethene	88
1,1-Dichloroethane	90
cis-1,2-Dichloroethene	92
Chloroform	84
1,1,1-Trichloroethane	87
Trichloroethene	89
Tetrachloroethene	83

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	95	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	126	70-130

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Client Sample ID: LCS

Lab ID#: 1711272B-07A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21111703sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/17/17 09:18 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	84	70-130
1,1-Dichloroethene	83	70-130
trans-1,2-Dichloroethene	72	70-130
1,1-Dichloroethane	84	70-130
cis-1,2-Dichloroethene	94	70-130
Chloroform	78	70-130
1,1,1-Trichloroethane	82	70-130
Trichloroethene	80	70-130
Tetrachloroethene	79	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	124	70-130

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Client Sample ID: LCSD

Lab ID#: 1711272B-07AA

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**21111704sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/17/17 09:50 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	82	70-130
1,1-Dichloroethene	83	70-130
trans-1,2-Dichloroethene	72	70-130
1,1-Dichloroethane	84	70-130
cis-1,2-Dichloroethene	93	70-130
Chloroform	78	70-130
1,1,1-Trichloroethane	82	70-130
Trichloroethene	79	70-130
Tetrachloroethene	76	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	120	70-130

WORK ORDER 381710279

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax:(800) 220-3675 / (856) 786-0327
http://www.EMSL.com / cinnaminsonradonlab@emsl.com

EMSL Order: 381710279
Customer ID: SHWL60
Customer PO:
Project ID:

Attention: **Shannon & Wilson Inc**
Shannon & Wilson Inc
2355 Hill Road
Fairbanks, AK 99709

Phone: (907) 479-0600
Fax: (907) 479-5691
Received Date: 11/13/2017 12:59 PM
Analysis Date: 11/13/2017

Project: **Auto Zone / 38 College Road**

Test Site: **Auto Zone**
38 College Road
Fairbanks, AK 99701

Test Report: Radon in Air Test Results

Samples for EMSL Kit 175445

Liquid Scintillation	Location	Radon Activity pCi/L	Start	Stop	Temperature F	Humidity %	Sample Type
303292 381710279-0001	First Floor - Southwest Corner - Stockroom	0.8	11/08/2017 2:20:00 pm	11/10/2017 2:25:00 pm	64	30	Customer
Sample Notes:							
303308 381710279-0002	First Floor - Southwest Corner - Stockroom	0.8	11/08/2017 2:20:00 pm	11/10/2017 2:25:00 pm	64	30	Customer
Sample Notes:							

Summary for EMSL Kit 175445 **Average Radon Result: 0.8 pCi/L**

The results indicate that both testing devices registered below the United States Environmental Protection Agency (EPA) action level of 4.0 picoCuries per liter of air (pCi/L). The EPA recommends fixing your home if the average of two short-term tests taken in the lowest lived-in level of the home show radon levels that are equal to or greater than 4.0pCi/L. The radon test was performed using a liquid scintillation radon detector/ s and counted on a liquid scintillation counter using approved EPA testing protocols for Radon in Air testing.
The EPA recommends retesting your home every two years.
Please contact EMSL Analytical, Inc. or your State Health Department for further information.
All procedures used for generating this report are in complete accordance with the current EPA protocols for the analysis of Radon in Air . This test was performed using EPA device protocol EPA-402-R-92-004.

Report Notes:

Analyst(s):

Racquel Hafiz Radon (2)

Laura Freeman, Radon Laboratory Manager &
Peixue Ma, Ph.D, NJ Radon Measurement Specialist NJ MES 13502

Initial report from: 11/15/2017 14:56:43

Please visit www.radontestinglab.com

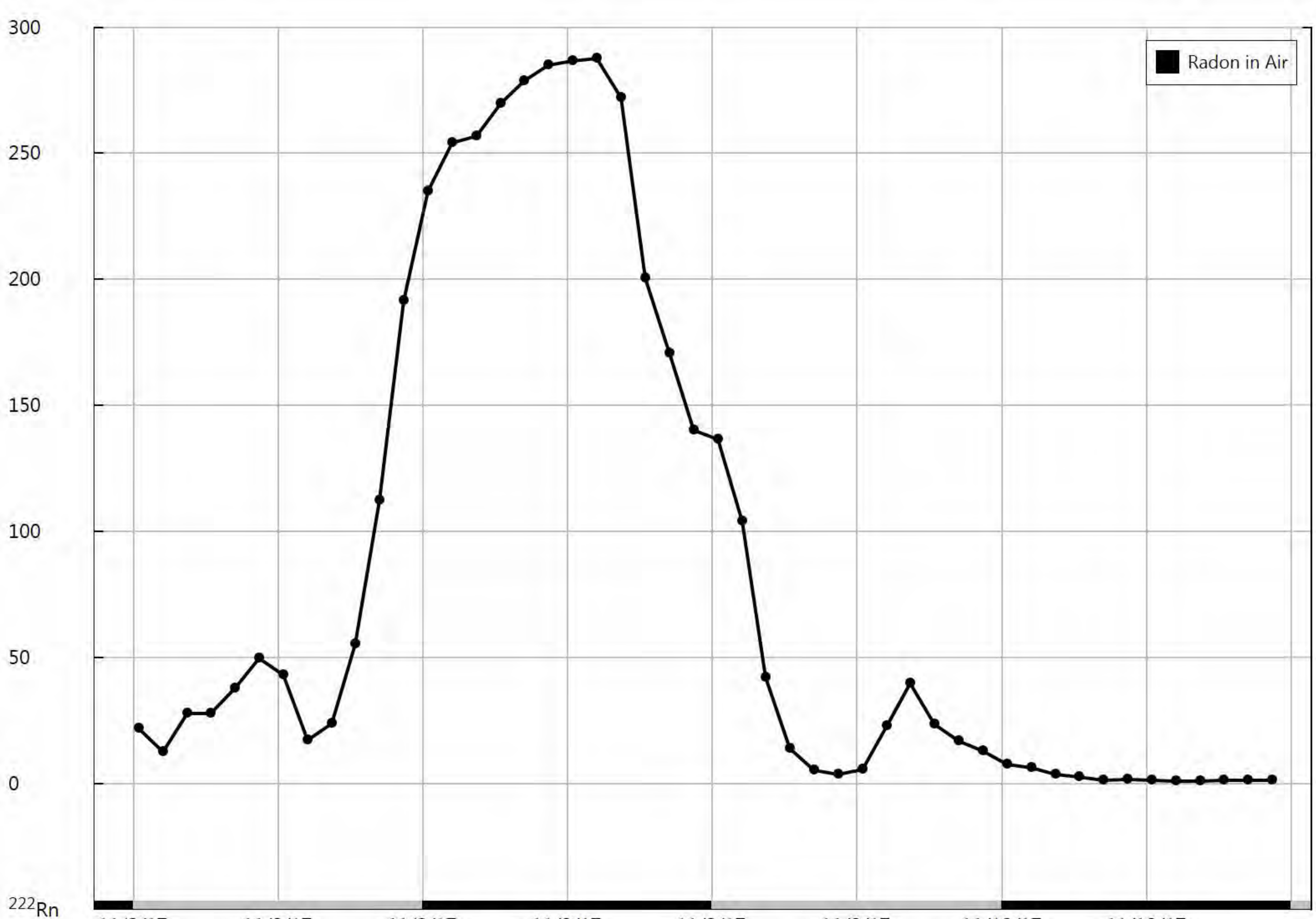
APPENDIX D

LABORATORY REPORTS

WORK ORDERS
1178570
1710563
1711095A
1711098B
1711115A
1711115B
1711272A
1711272B
381710279

GRAPH OF RAD7

GRAPH OF RADON 7


Radon in Air
300
250
200
150
100
50
0
222Rn
pCi/L
11/8/17
12:00
11/8/17
18:00
11/9/17
0:00
11/9/17
6:00
11/9/17
12:00
11/9/17
18:00
11/10/17
0:00
11/10/17
6:00

APPENDIX E

ADEC LABORATORY DATA REVIEW CHECKLISTS

LDRC 1178570

Laboratory Data Review Checklist

Completed By:

Adam Wyborny

Title:

Environmental Engineering Staff

Date:

December 15, 2017

CS Report Name:

31-1-20047-005 BMES

Report Date:

November 10, 2017

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

SGS North America Laboratories, Inc. (SGS)

Laboratory Report Number:

1178570

ADEC File Number:

102.38.122

Hazard Identification Number:

1178570

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   ☑ Yes ☐ No Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   ☐ Yes ☑ No Comments:

   Analyses were performed by SGS in Anchorage, AK.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   ☑ Yes ☐ No Comments:

   b. Correct Analyses requested?

   ☑ Yes ☐ No Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   ☑ Yes ☐ No Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   ☑ Yes ☐ No Comments:

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   ☑ Yes ☐ No Comments:

   The sample receipt form notes that the samples were received in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

☑ Yes ☐ No Comments:

There were no discrepancies noted in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

No; see above.

4. Case Narrative

a. Present and understandable?

☑ Yes ☐ No Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

☐ Yes ☑ No Comments:

There were no discrepancies, errors, or QC failures reported in the case narrative.

c. Were all corrective actions documented?

☐ Yes ☑ No Comments:

Corrective actions were not required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not specify an effect on data quality or usability. See section 6 for further assessment.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☑ Yes ☐ No Comments:

b. All applicable holding times met?

☑ Yes ☐ No Comments:

c. All soils reported on a dry weight basis?

☐ Yes ☒ No Comments:

Soil samples were not submitted with this work order.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

☐ Yes ☒ No Comments:

The reported limits of detection (LODs) were below the groundwater cleanup levels for the requested analytes with the exception of 1,2,3-trichloropropane.

e. Data quality or usability affected?

☒ Yes ☐ No Comments:

We cannot assess if 1,2,3-trichloropropane is present in the project sample at a concentration greater than the groundwater cleanup levels but less than the LOD.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

☒ Yes ☐ No Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

☒ Yes ☐ No Comments:

iii. If above LOQ, what samples are affected?

Comments:

None; VOCs were not detected in the method blank samples.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☒ No Comments:

N/A; no samples were affected.

v. Data quality or usability affected?

Comments:

No; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒ Yes ☐ No Comments:

LCS/LCSD and MS/MSD samples were reported for analysis of VOCs.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

☐ Yes ☒ No Comments:

Metals/Inorganics analyses were not requested with this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

☐ Yes ☒ No Comments:

The recovery of cis-1,2-dichloroethene was outside of laboratory limits (biased low) in the MS sample 1424599 and the associated MSD sample 1424600.

The recovery of bromomethane was outside of laboratory limits (biased high) in the LCSD 1424652 associated with QC Batch VXX31687.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☒ Yes ☐ No Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

The parent sample upon which MS 1424599 and MSD 1424600 were performed was not included with this project batch. Additionally, the spiking concentration was low relative to the native concentration in the parent sample. This contributed to significant uncertainty in the recovery calculations. The sample results are unaffected.

None of the samples associated with QC Batch VXX31687 contained detectable concentrations of bromomethane. The sample results are unaffected by the recovery failure in LCSD 1426831.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☒ No Comments:

Qualification of the results was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Yes; see above.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☑ Yes ☐ No Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☑ Yes ☐ No Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☑ No Comments:

N/A; there were no reported surrogate-recovery failures.

iv. Data quality or usability affected?

Comments:

No; see above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples?
(If not, enter explanation below.)

☑ Yes ☐ No Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☑ Yes ☐ No Comments:

iii. All results less than LOQ?

☒ Yes ☐ No Comments:

iv. If above LOQ, what samples are affected?

Comments:

None; project analytes were not detected in the trip blank.

v. Data quality or usability affected?

Comments:

No; see above.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No Comments:

ii. Submitted blind to lab?

☒ Yes ☐ No Comments:

The field-duplicate pairs *MW-1 / MW-101* and *MW-8 / MW-108* were submitted with this work order.

iii. Precision – All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☒ Yes ☐ No Comments:

The analytical precision demonstrated between the field-duplicate samples was within the project specific DQOs (30% for water samples), where calculable, for all analytes.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No; see above.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below).

☐ Yes ☐ No ☒ Not Applicable

Samples for this project were not collected with reusable equipment so there is no practical potential for equipment based sample cross-contamination.

i. All results less than LOQ?

☒ Yes ☐ No Comments:

An equipment blank was not required.

ii. If above LOQ, what samples are affected?

Comments:

An equipment blank was not required.

iii. Data quality or usability affected?

Comments:

No; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

☐ Yes ☒ No Comments:

Additional data flags or qualifiers are not required.

Reviewed By KRF

LDRC 1710563

Laboratory Data Review Checklist for Air Samples

Completed by:	Adam Wyborny		
Title:	Environmental Engineering Staff	Date:	Dec 14, 2017
CS Report Name:	Bentley Mall 20047-003	Report Date:	Nov 6, 2017
Consultant Firm:	Shannon & Wilson, Inc. (Shannon & Wilson)		
Laboratory Name:	Eurofins Air Toxics, Inc (Eurofins)	Laboratory Report Number:	1710563
ADEC File Number:	102.38.122	ADEC Haz ID:	22862

1. Laboratory

a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

( ) Yes ( ) No (•) NA (Please explain.) Comments:

Samples were analyzed by Eurofins of Folsom, CA; a NELAP certified laboratory.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Documentation of the sample condition was not provided in a sample receipt form. However, the case narrative noted that the samples were received in good condition and in the appropriate containers.

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/ preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

○ Yes ○ No ◉ NA (Please explain) Comments:

A sample receipt form was not provided but the laboratory noted that the samples were received in good condition and in the appropriate containers.

c. Data quality or usability affected? (Please explain.)

○ Yes ◉ No ○ NA (Please explain) Comments:

See above.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain) Comments:

There were no analytical discrepancies, errors, or QC failures noted in the case narrative.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

Corrective actions were not required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

None; see above.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

◉ Yes ○ No ○ NA (Please explain) Comments:

The reported PQLs are less than the ADEC Target Screening Levels for Soil Vapor - Residential Limits for non-detect results.

d. Data quality or usability affected?

Comments:

No; see above.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

None; project analytes were not detected in the method blank.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Project analytes were not detected in the method blank.

v. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The RPDs were calculated by Shannon & Wilson and were less than 20% as recommended for the method by the National Functional Guidelines.

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

○ Yes ○ No ◉ NA (Please explain) Comments:

The analytical accuracy and precision were demonstrated to be within acceptance criteria.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Qualification was not required; see above.

vi. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

There were no surrogate recovery failures associated with this work order.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain) Comments:

The field-duplicate samples SV14 and SV140 were submitted with this work order.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The analytical precision between the field-duplicate samples was within the recommended DQO of 20% for all analytes.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

e. Field Blank (If not used explain why).

( ) Yes ( ) No (•) NA (Please explain) Comments:

Samples for this project were not collected with reusable equipment, so there is no practical potential for equipment based cross-contamination.

i. All results less than PQL?

( ) Yes ( ) No (•) NA (Please explain) Comments:

A field blank sample was not required for this project.

ii. If above PQL, what samples are affected?

Comments:

N/A; a field blank sample was not required for this project.

iii. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Additional data flags or qualifiers are not required.

Reset Form

LDRC 1711095A

Laboratory Data Review Checklist for Air Samples

Completed by:	Adam Wyborny		
Title:	Environmental Engineering Staff	Date:	Dec 15, 2017
CS Report Name:	Bentley Mall 20047-003	Report Date:	Nov 17, 2017
Consultant Firm:	Shannon & Wilson, Inc. (Shannon & Wilson)		
Laboratory Name:	Eurofins Air Toxics, Inc (Eurofins)	Laboratory Report Number:	1711095A
ADEC File Number:	102.38.122	ADEC Haz ID:	22862

1. Laboratory

a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

( ) Yes ( ) No (•) NA (Please explain.) Comments:

Samples were analyzed by Eurofins of Folsom, CA; a NELAP certified laboratory.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Documentation of the sample condition was not provided in a sample receipt form. However, the case narrative noted that the samples were received in good condition and in the appropriate containers.

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/ preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

○ Yes ○ No ◉ NA (Please explain) Comments:

A sample receipt form was not provided but the laboratory noted that the samples were received in good condition and in the appropriate containers.

c. Data quality or usability affected? (Please explain.)

○ Yes ◉ No ○ NA (Please explain) Comments:

See above.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain) Comments:

There were no analytical discrepancies, errors, or QC failures noted in the case narrative.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

Corrective actions were not required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

None; see above.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

◉ Yes ○ No ○ NA (Please explain) Comments:

The reported PQLs are less than the ADEC Target Screening Levels for Indoor Air - Residential Limits for non-detect results.

d. Data quality or usability affected?

Comments:

No; see above.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

None; project analytes were not detected in the method blank.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Project analytes were not detected in the method blank.

v. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The RPDs were calculated by Shannon & Wilson and were less than 20% as recommended for the method by the National Functional Guidelines.

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

○ Yes ○ No ◉ NA (Please explain) Comments:

The analytical accuracy and precision were demonstrated to be within acceptance criteria.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Qualification was not required; see above.

vi. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

There were no surrogate recovery failures associated with this work order.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

○ Yes ○ No ◉ NA (Please explain) Comments:

A field-duplicate pair was not submitted with this work order. However, field-duplicate samples are submitted with the appropriate frequency for the overall project.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

○ Yes ○ No ◉ NA (Please explain) Comments:

Field-duplicate samples were not submitted with this work order.

iv. Data quality or usability affected? (Please explain.) Comments:

No; see above.

e. Field Blank (If not used explain why).

○ Yes ○ No ◉ NA (Please explain) Comments:

Samples for this project were not collected with reusable equipment, so there is no practical potential for equipment based cross-contamination.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

A field blank sample was not required for this project.

ii. If above PQL, what samples are affected? Comments:

N/A; a field blank sample was not required for this project.

iii. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain) Comments:

Additional data flags or qualifiers are not required.

Reset Form

LDRC 1711095B

Laboratory Data Review Checklist for Air Samples

Completed by:	Adam Wyborny		
Title:	Environmental Engineering Staff	Date:	Dec 15, 2017
CS Report Name:	Bentley Mall 20047-003	Report Date:	Nov 17, 2017
Consultant Firm:	Shannon & Wilson, Inc. (Shannon & Wilson)		
Laboratory Name:	Eurofins Air Toxics, Inc (Eurofins)	Laboratory Report Number:	1711095B
ADEC File Number:	102.38.122	ADEC Haz ID:	22862

1. Laboratory

a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

( ) Yes ( ) No (•) NA (Please explain.) Comments:

Samples were analyzed by Eurofins of Folsom, CA; a NELAP certified laboratory.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Documentation of the sample condition was not provided in a sample receipt form. However, the case narrative noted that the samples were received in good condition and in the appropriate containers.

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/ preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

○ Yes ○ No ◉ NA (Please explain) Comments:

A sample receipt form was not provided but the laboratory noted that the samples were received in good condition and in the appropriate containers.

c. Data quality or usability affected? (Please explain.)

○ Yes ◉ No ○ NA (Please explain) Comments:

See above.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain) Comments:

There were no analytical discrepancies, errors, or QC failures noted in the case narrative.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

Corrective actions were not required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

None; see above.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

◉ Yes ○ No ○ NA (Please explain) Comments:

The reported PQLs are less than the ADEC Target Screening Levels for Soil Vapor and Indoor Air - Residential Limits, where appropriate, for non-detect results.

d. Data quality or usability affected?

Comments:

No; see above.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

None; project analytes were not detected in the method blank.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Project analytes were not detected in the method blank.

v. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The RPDs were calculated by Shannon & Wilson and were less than 20% as recommended for the method by the National Functional Guidelines.

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

○ Yes ○ No ◉ NA (Please explain) Comments:

The analytical accuracy and precision were demonstrated to be within acceptance criteria.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Qualification was not required; see above.

vi. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

There were no surrogate recovery failures associated with this work order.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

○ Yes ○ No ◉ NA (Please explain) Comments:

A field-duplicate pair was not submitted with this work order. However, field-duplicate samples are submitted with the appropriate frequency for the overall project.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

○ Yes ○ No ◉ NA (Please explain) Comments:

Field-duplicate samples were not submitted with this work order.

iv. Data quality or usability affected? (Please explain.) Comments:

No; see above.

e. Field Blank (If not used explain why).

○ Yes ○ No ◉ NA (Please explain) Comments:

Samples for this project were not collected with reusable equipment, so there is no practical potential for equipment based cross-contamination.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

A field blank sample was not required for this project.

ii. If above PQL, what samples are affected? Comments:

N/A; a field blank sample was not required for this project.

iii. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain) Comments:

Additional data flags or qualifiers are not required.

Reset Form

LDRC 1711115A

Laboratory Data Review Checklist for Air Samples

Completed by:	Adam Wyborny		
Title:	Environmental Engineering Staff	Date:	Dec 15, 2017
CS Report Name:	Bentley Mall 20047-003	Report Date:	Nov 20, 2017
Consultant Firm:	Shannon & Wilson, Inc. (Shannon & Wilson)		
Laboratory Name:	Eurofins Air Toxics, Inc (Eurofins)	Laboratory Report Number:	1711115A
ADEC File Number:	102.38.122	ADEC Haz ID:	22862

1. Laboratory

a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

( ) Yes ( ) No (•) NA (Please explain.) Comments:

Samples were analyzed by Eurofins of Folsom, CA; a NELAP certified laboratory.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Documentation of the sample condition was not provided in a sample receipt form. However, the case narrative noted that the samples were received in good condition and in the appropriate containers.

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/ preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

○ Yes ○ No ◉ NA (Please explain) Comments:

A sample receipt form was not provided but the laboratory noted that the samples were received in good condition and in the appropriate containers.

c. Data quality or usability affected? (Please explain.)

○ Yes ◉ No ○ NA (Please explain) Comments:

See above.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain) Comments:

There were no analytical discrepancies, errors, or QC failures noted in the case narrative.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

Corrective actions were not required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

None; see above.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

○ Yes ◉ No ○ NA (Please explain) Comments:

The reporting limits are less than the ADEC Target Screening Levels for Soil Vapor - Residential Limits for non-detect results, except for the following. The reporting limits for soil-gas sample SVR4A exceeded the associated ADEC residential soil gas target levels for chloroform and TCE.

d. Data quality or usability affected?

Comments:

We cannot determine whether these VOC analytes may have been present in the sample SVR4A at concentrations between regulatory limits and analytical reporting limits.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

None; project analytes were not detected in the method blank.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Project analytes were not detected in the method blank.

v. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The RPDs were calculated by Shannon & Wilson and were less than 20% as recommended for the method by the National Functional Guidelines.

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

○ Yes ○ No ◉ NA (Please explain) Comments:

The analytical accuracy and precision were demonstrated to be within acceptance criteria.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Qualification was not required; see above.

vi. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

There were no surrogate recovery failures associated with this work order.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain) Comments:

The field-duplicate samples SVR4B and SVR40B were submitted with this work order.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The analytical precision between the field-duplicate samples was within the recommended DQO of 20% for all analytes.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

e. Field Blank (If not used explain why).

( ) Yes ( ) No (•) NA (Please explain) Comments:

Samples for this project were not collected with reusable equipment, so there is no practical potential for equipment based cross-contamination.

i. All results less than PQL?

( ) Yes ( ) No (•) NA (Please explain) Comments:

A field blank sample was not required for this project.

ii. If above PQL, what samples are affected?

Comments:

N/A; a field blank sample was not required for this project.

iii. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Additional data flags or qualifiers are not required.

Reset Form

LDRC 1711115B

Laboratory Data Review Checklist for Air Samples

Completed by:	Adam Wyborny		
Title:	Environmental Engineering Staff	Date:	Dec 15, 2017
CS Report Name:	Bentley Mall 20047-003	Report Date:	Nov 20, 2017
Consultant Firm:	Shannon & Wilson, Inc. (Shannon & Wilson)		
Laboratory Name:	Eurofins Air Toxics, Inc (Eurofins)	Laboratory Report Number:	1711115B
ADEC File Number:	102.38.122	ADEC Haz ID:	22862

1. Laboratory

a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

( ) Yes ( ) No (•) NA (Please explain.) Comments:

Samples were analyzed by Eurofins of Folsom, CA; a NELAP certified laboratory.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Documentation of the sample condition was not provided in a sample receipt form. However, the case narrative noted that the samples were received in good condition and in the appropriate containers.

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/ preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

○ Yes ○ No ◉ NA (Please explain) Comments:

A sample receipt form was not provided but the laboratory noted that the samples were received in good condition and in the appropriate containers.

c. Data quality or usability affected? (Please explain.)

○ Yes ◉ No ○ NA (Please explain) Comments:

See above.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain) Comments:

There were no analytical discrepancies, errors, or QC failures noted in the case narrative.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

Corrective actions were not required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

None; see above.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

◉ Yes ○ No ○ NA (Please explain) Comments:

The reported PQLs are less than the ADEC Target Screening Levels for Indoor Air - Residential Limits for non-detect results.

d. Data quality or usability affected?

Comments:

No; see above.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

None; project analytes were not detected in the method blank.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Project analytes were not detected in the method blank.

v. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The RPDs were calculated by Shannon & Wilson and were less than 20% as recommended for the method by the National Functional Guidelines.

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

○ Yes ○ No ◉ NA (Please explain) Comments:

The analytical accuracy and precision were demonstrated to be within acceptance criteria.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Qualification was not required; see above.

vi. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

There were no surrogate recovery failures associated with this work order.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

○ Yes ○ No ◉ NA (Please explain) Comments:

A field-duplicate pair was not submitted with this work order. However, field-duplicate samples are submitted with the appropriate frequency for the overall project.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

○ Yes ○ No ◉ NA (Please explain) Comments:

Field-duplicate samples were not submitted with this work order.

iv. Data quality or usability affected? (Please explain.) Comments:

No; see above.

e. Field Blank (If not used explain why).

○ Yes ○ No ◉ NA (Please explain) Comments:

Samples for this project were not collected with reusable equipment, so there is no practical potential for equipment based cross-contamination.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

A field blank sample was not required for this project.

ii. If above PQL, what samples are affected? Comments:

N/A; a field blank sample was not required for this project.

iii. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain) Comments:

Additional data flags or qualifiers are not required.

Reset Form

LDRC 1711272A

Laboratory Data Review Checklist for Air Samples

Completed by:	Adam Wyborny		
Title:	Environmental Engineering Staff	Date:	Dec 15, 2017
CS Report Name:	BMES 20047-004	Report Date:	Nov 29, 2017
Consultant Firm:	Shannon & Wilson, Inc. (Shannon & Wilson)		
Laboratory Name:	Eurofins Air Toxics, Inc (Eurofins)	Laboratory Report Number:	1711272A
ADEC File Number:	102.38.122	ADEC Haz ID:	22862

1. Laboratory

a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

( ) Yes ( ) No (•) NA (Please explain.) Comments:

Samples were analyzed by Eurofins of Folsom, CA; a NELAP certified laboratory.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Documentation of the sample condition was not provided in a sample receipt form. However, the case narrative noted that the samples were received in good condition and in the appropriate containers.

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/ preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

○ Yes ○ No ◉ NA (Please explain) Comments:

A sample receipt form was not provided but the laboratory noted that the samples were received in good condition and in the appropriate containers.

c. Data quality or usability affected? (Please explain.)

○ Yes ◉ No ○ NA (Please explain) Comments:

See above.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain) Comments:

The case narrative notes that the sample AZventN was diluted due to the presence of high levels of non-target species.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

Corrective actions were not required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

None; see above.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

◉ Yes ○ No ○ NA (Please explain) Comments:

The reported PQLs are less than the ADEC Target Screening Levels for Indoor Air - Commercial Limits for non-detect results.

d. Data quality or usability affected?

Comments:

No; see above.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

None; project analytes were not detected in the method blank.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Project analytes were not detected in the method blank.

v. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The RPDs were calculated by Shannon & Wilson and were less than 20% as recommended for the method by the National Functional Guidelines.

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

○ Yes ○ No ◉ NA (Please explain) Comments:

The analytical accuracy and precision were demonstrated to be within acceptance criteria.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Qualification was not required; see above.

vi. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

There were no surrogate recovery failures associated with this work order.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

○ Yes ○ No ◉ NA (Please explain) Comments:

A field-duplicate pair was not submitted with this work order. However, field-duplicate samples are submitted with the appropriate frequency for the overall project.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

○ Yes ○ No ◉ NA (Please explain) Comments:

Field-duplicate samples were not submitted with this work order.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

e. Field Blank (If not used explain why).

○ Yes ○ No ◉ NA (Please explain) Comments:

Samples for this project were not collected with reusable equipment, so there is no practical potential for equipment based cross-contamination.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

A field blank sample was not required for this project.

ii. If above PQL, what samples are affected?

Comments:

N/A; a field blank sample was not required for this project.

iii. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain) Comments:

Additional data flags or qualifiers are not required.

Reset Form

LDRC 1711272B

Laboratory Data Review Checklist for Air Samples

Completed by:	Adam Wyborny		
Title:	Environmental Engineering Staff	Date:	Dec 15, 2017
CS Report Name:	BMES 20047-004	Report Date:	Nov 29, 2017
Consultant Firm:	Shannon & Wilson, Inc. (Shannon & Wilson)		
Laboratory Name:	Eurofins Air Toxics, Inc (Eurofins)	Laboratory Report Number:	1711272B
ADEC File Number:	102.38.122	ADEC Haz ID:	22862

1. Laboratory

a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

( ) Yes ( ) No (•) NA (Please explain.) Comments:

Samples were analyzed by Eurofins of Folsom, CA; a NELAP certified laboratory.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

Documentation of the sample condition was not provided in a sample receipt form. However, the case narrative noted that the samples were received in good condition and in the appropriate containers.

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/ preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

○ Yes ○ No ◉ NA (Please explain) Comments:

A sample receipt form was not provided but the laboratory noted that the samples were received in good condition and in the appropriate containers.

c. Data quality or usability affected? (Please explain.)

○ Yes ◉ No ○ NA (Please explain) Comments:

See above.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain) Comments:

There were no analytical discrepancies, errors, or QC failures noted in the case narrative.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

Corrective actions were not required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

None; see above.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

◉ Yes ○ No ○ NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

◉ Yes ○ No ○ NA (Please explain) Comments:

The reported PQLs are less than the ADEC Target Screening Levels for Indoor Air - Commercial Limits for non-detect results.

d. Data quality or usability affected?

Comments:

No; see above.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. All method blank results less than PQL?

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. If above PQL, what samples are affected?

Comments:

None; project analytes were not detected in the method blank.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Project analytes were not detected in the method blank.

v. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

The RPDs were calculated by Shannon & Wilson and were less than 20% as recommended for the method by the National Functional Guidelines.

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

○ Yes ○ No ◉ NA (Please explain) Comments:

The analytical accuracy and precision were demonstrated to be within acceptance criteria.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Qualification was not required; see above.

vi. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

◉ Yes ○ No ○ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

There were no surrogate recovery failures associated with this work order.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain) Comments:

The field-duplicate samples CIA08 and CIA108 were submitted with this work order.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

(•) Yes ( ) No ( ) NA (Please explain) Comments:

The analytical precision between the field-duplicate samples was within the recommended DQO of 20% for all analytes.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

e. Field Blank (If not used explain why).

( ) Yes ( ) No (•) NA (Please explain) Comments:

Samples for this project were not collected with reusable equipment, so there is no practical potential for equipment based cross-contamination.

i. All results less than PQL?

( ) Yes ( ) No (•) NA (Please explain) Comments:

A field blank sample was not required for this project.

ii. If above PQL, what samples are affected?

Comments:

N/A; a field blank sample was not required for this project.

iii. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Additional data flags or qualifiers are not required.

Reset Form

APPENDIX F

QUALITY ASSURANCE AND QUALITY CONTROL ASSESSMENT

QUALITY ASSURANCE AND QUALITY CONTROL ASSESSMENT

QA/Quality Control (QC) procedures assist in producing data of acceptable quality and reliability. We reviewed the analytical results for laboratory QC samples, and also conducted our own QA assessment for this project. Our QA-review procedures allowed us to document the accuracy and precision of the analytical data, and check that the analyses were sufficiently sensitive to detect analytes at levels below regulatory standards. For this report, we reviewed the groundwater-sample data report for SGS work order (WO) 1178570 and Eurofins WOs 1710563, 1711095A, 1711095B, 1711115A, 1711115B, 1711272A, and 1711272B. The laboratory reports contain a case narrative and forms documenting sample-receipt conditions. We also reviewed the EMSL Analytical report 381710279 for radon analysis; however, these results are not reported with the associated QC data. Details regarding the results of our QA review are presented below.

Sample Handling

We hand-delivered the groundwater samples to the SGS sample-receiving office in Fairbanks on October 30, 201. SGS then shipped them to their analytical laboratory in Anchorage, where they arrived in good condition, following proper chain-of-custody (COC) procedures. We reviewed the COC records and laboratory sample-receipt forms and found the samples were kept properly chilled during shipping from Fairbanks to Anchorage.

We shipped the air samples to the Eurofins laboratory via FedEx. We reviewed the COC records and laboratory sample-receipt forms and found proper COC procedures were in place during shipment. The laboratory noted that each of the samples were received in good condition

There were no sample-handling anomalies identified that would adversely affect data quality for this project.

Analytical Sensitivity

The reporting limits (limits of detection [LOD]) for the groundwater samples were generally less than the ADEC groundwater-cleanup levels, except for 1,2,3-trichloropropane (Table 3). LODs for this analyte exceeded the ADEC groundwater-clean up level. Additionally, the reporting limits for soil-gas sample *SVR4A* exceeded the associated ADEC residential soil gas target levels for chloroform and TCE. We cannot determine whether these VOC analytes may have been present in the samples at concentrations between regulatory limits and analytical reporting limits.

Laboratory method blanks were analyzed in association with samples collected for this project to check for contributions to the analytical results possibly attributable to laboratory-based

contamination. None of the project analytes were detected in the groundwater or air-sample method blanks.

We submitted trip blanks with water samples for analysis of VOCs to determine if cross-contamination among samples or contamination from an outside source may have occurred during shipment or storage. No project analytes were detected in the trip blank.

Accuracy

The laboratory assessed the accuracy of their analytical procedure by analyzing laboratory control samples (LCSs) and LCS duplicates (LCSDs) and matrix spike samples (MS) and MS duplicates (MSD). These QC samples allow the laboratory to evaluate their ability to recover analytes added to clean-aqueous and project-sample matrices. LCS and LCSD recoveries were within laboratory-control limits for the groundwater and air-sample analyses. Additionally, there were no MS or MSD recovery failures that affected the project sample results. Please see the checklists for additional information.

Accuracy was also evaluated for each groundwater and air sample by assessing the recovery of analyte surrogates added to individual project samples. Recoveries of the VOC surrogates were within limits for the project samples.

There were no QC-sample or surrogate-recovery failures associated with the project samples. The sample results for the groundwater and air sampling events are considered accurate, based on LCS/LCSD and surrogate recoveries.

Precision

We collected field-duplicate samples at a frequency of 10 percent of the total samples to evaluate the precision of analytical measurements and reproducibility of our sampling technique. To evaluate the precision of the data, we calculated the relative percent difference (RPD; difference between the sample and its duplicate divided by the mean of the two).

The groundwater field-duplicate samples were *MW-1* and *MW-101*, and *MW-8* and *MW-108* and the air-sample field-duplicates were *CIA08* and *CIA108* (indoor-air), and *SV14* and *SV140* (soil-gas). RPDs were within QC goals for each detected analyte.

Laboratory analytical precision can also be evaluated by RPD calculations. The LCS/LCSD and MS/MSD RPDs provide information regarding the reproducibility of laboratory procedures, and are therefore a measure of analytical precision. The RPDs associated with the groundwater analyses were within laboratory-control limits.

The sample results for the October/November 2017 sampling events are considered precise, based on LCS/LCSD, MS/MSD and/or field-duplicate RPD calculations.

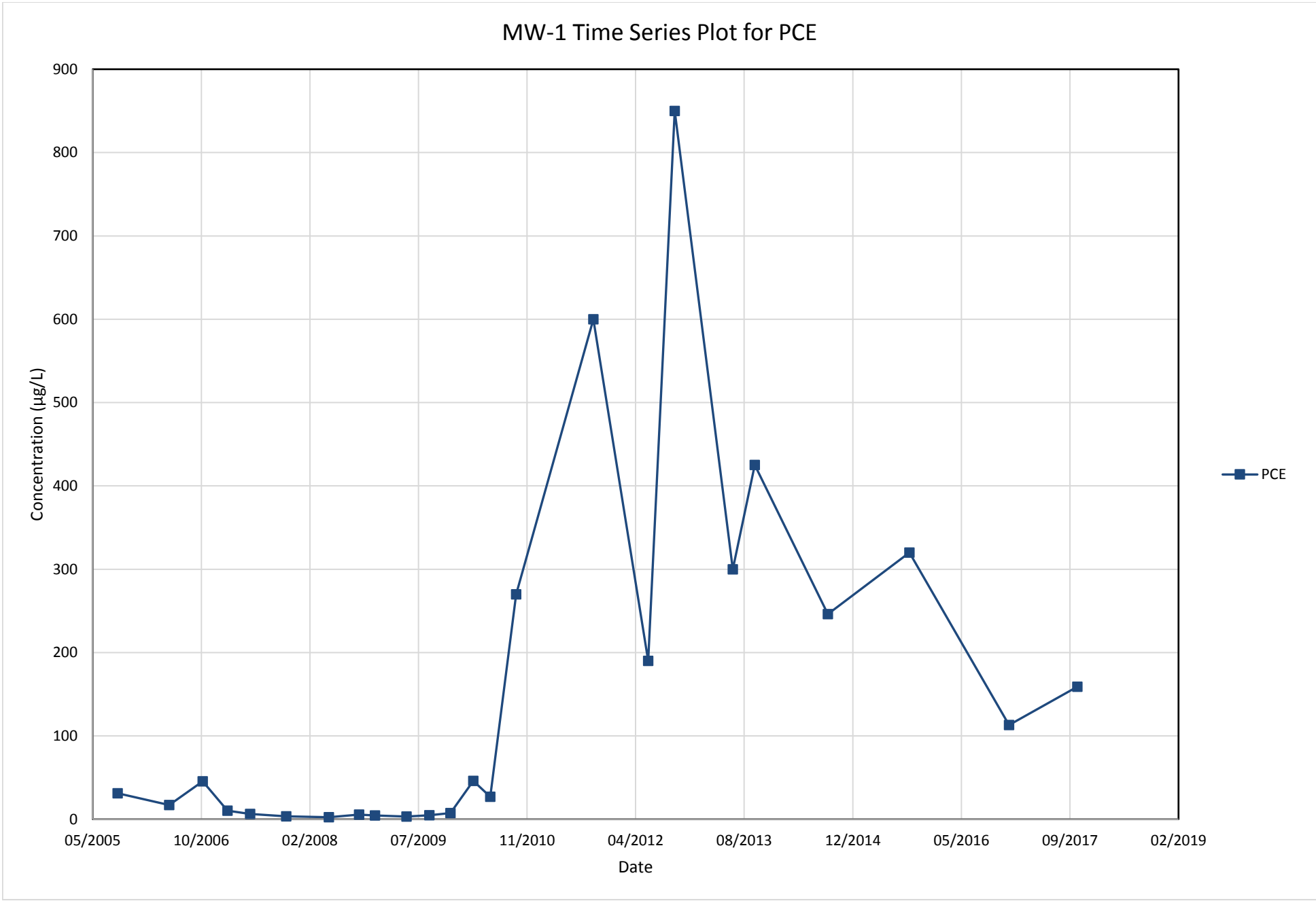
Data Quality Summary

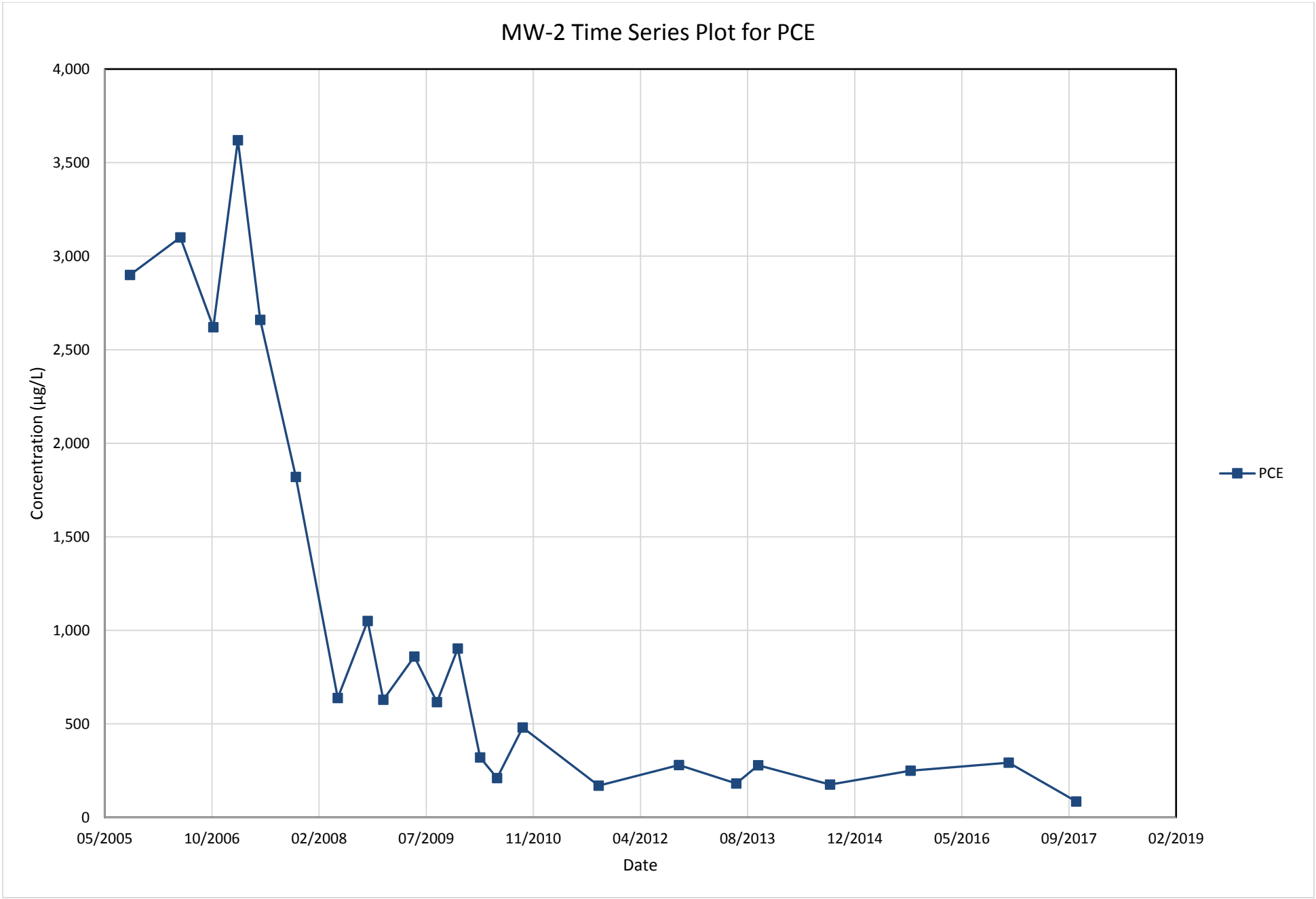
By working in general accordance with our scope of services, we consider the samples we collected to represent site conditions at the locations and times they were obtained. Based on our QA review, no samples were rejected as unusable due to QC failures, and our completeness goal was met.

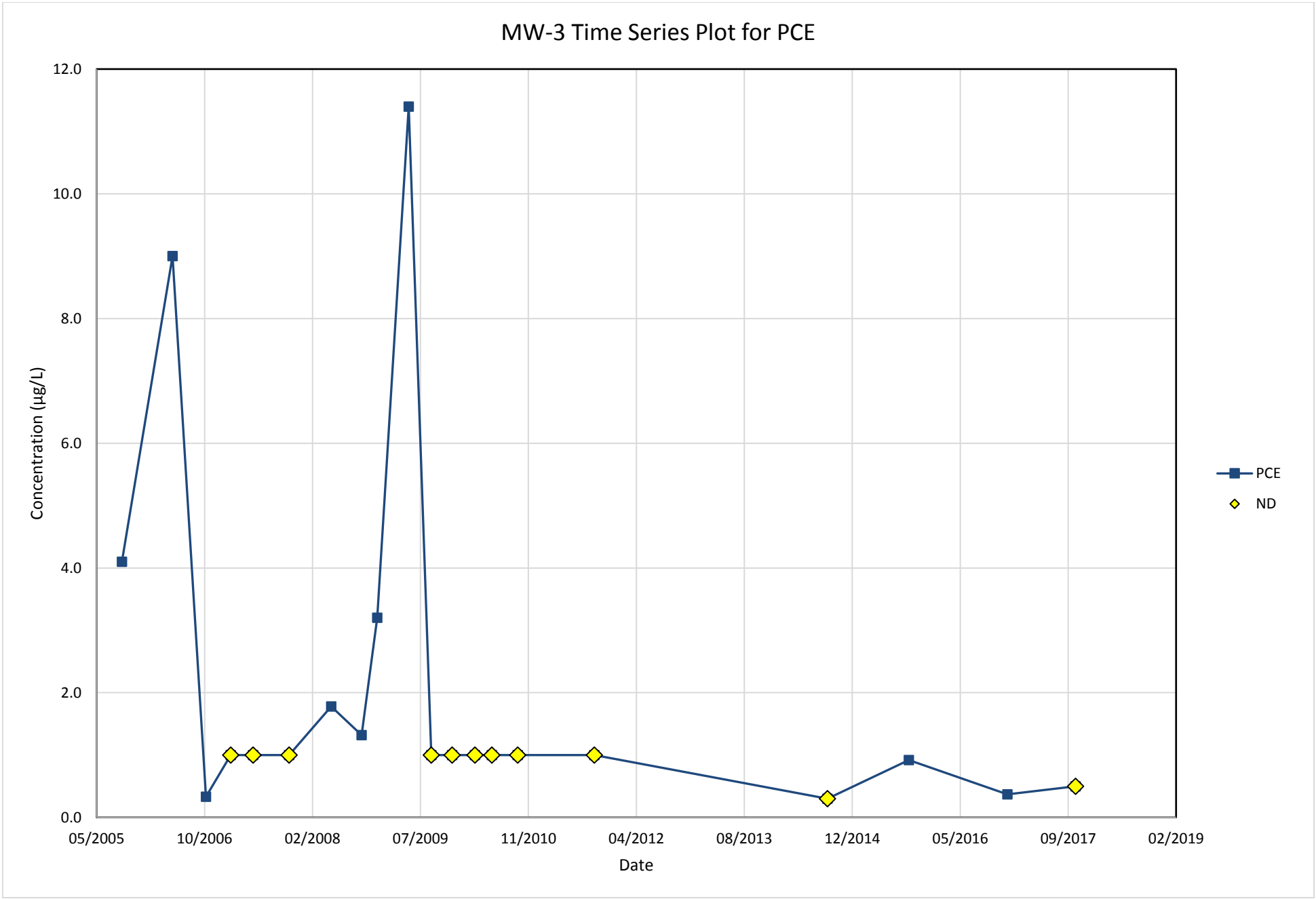
In general, the quality of the analytical data for this project does not appear to have been compromised by analytical irregularities, and the results are valid for interpreting groundwater quality at the BMES site. The laboratory reports and ADEC data-review checklists are provided in Appendix D and E, respectively.

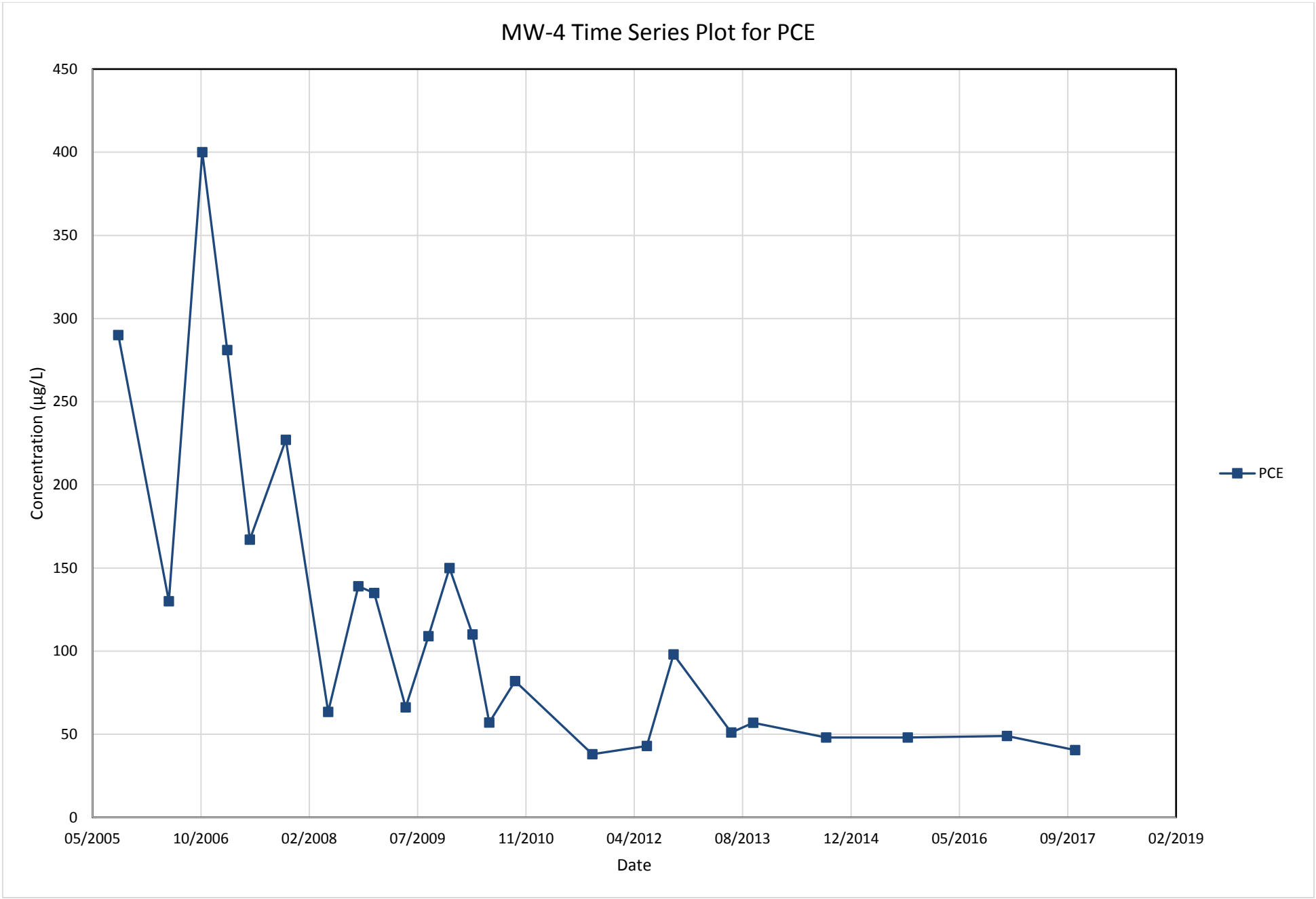
APPENDIX G

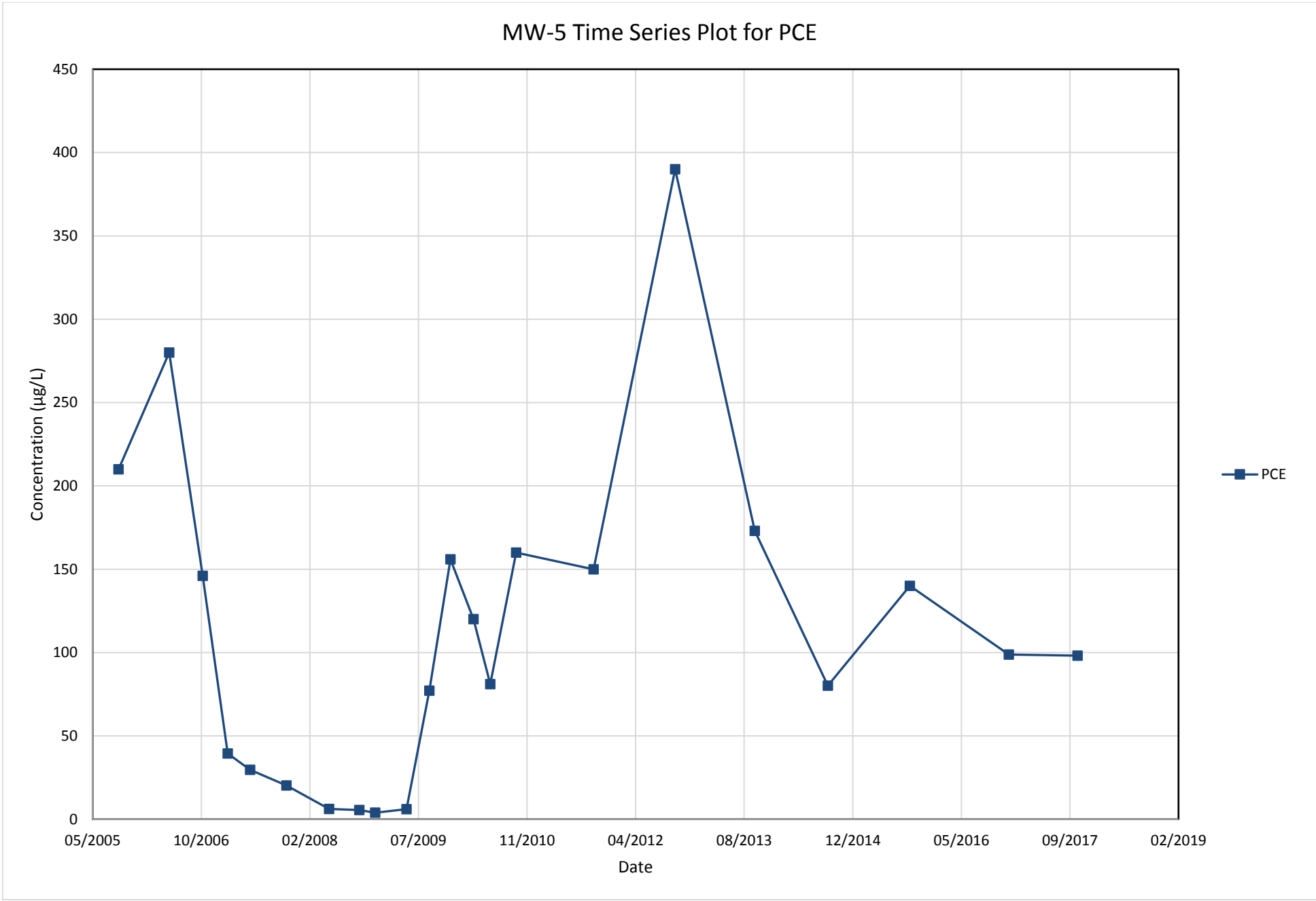
MONITORING WELL TIME-SERIES PLOTS AND HISTORICAL DATA TABLE

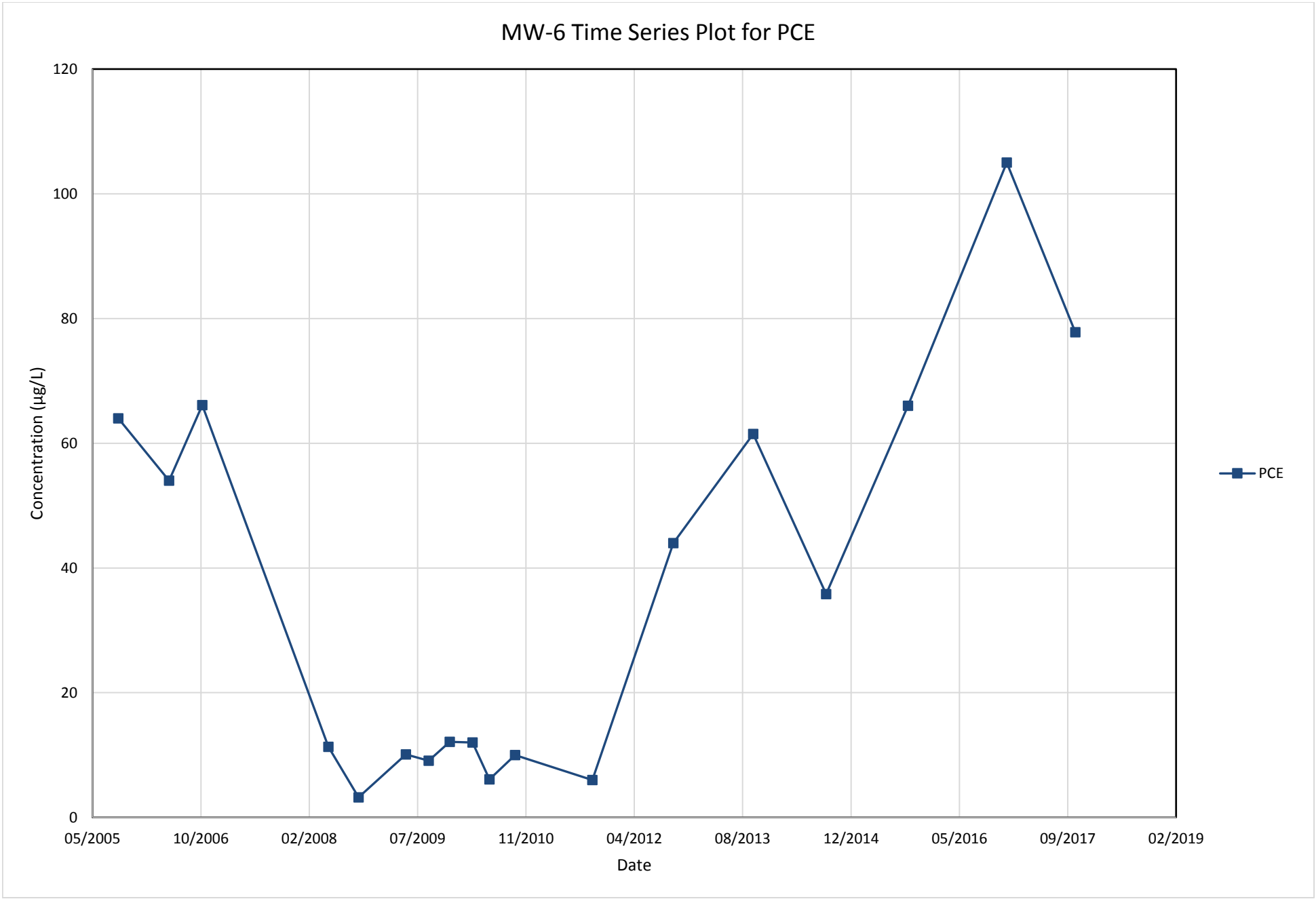

MW-1 Time Series Plot for PCE
900
800
700
600
500
400
300
200
100
0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

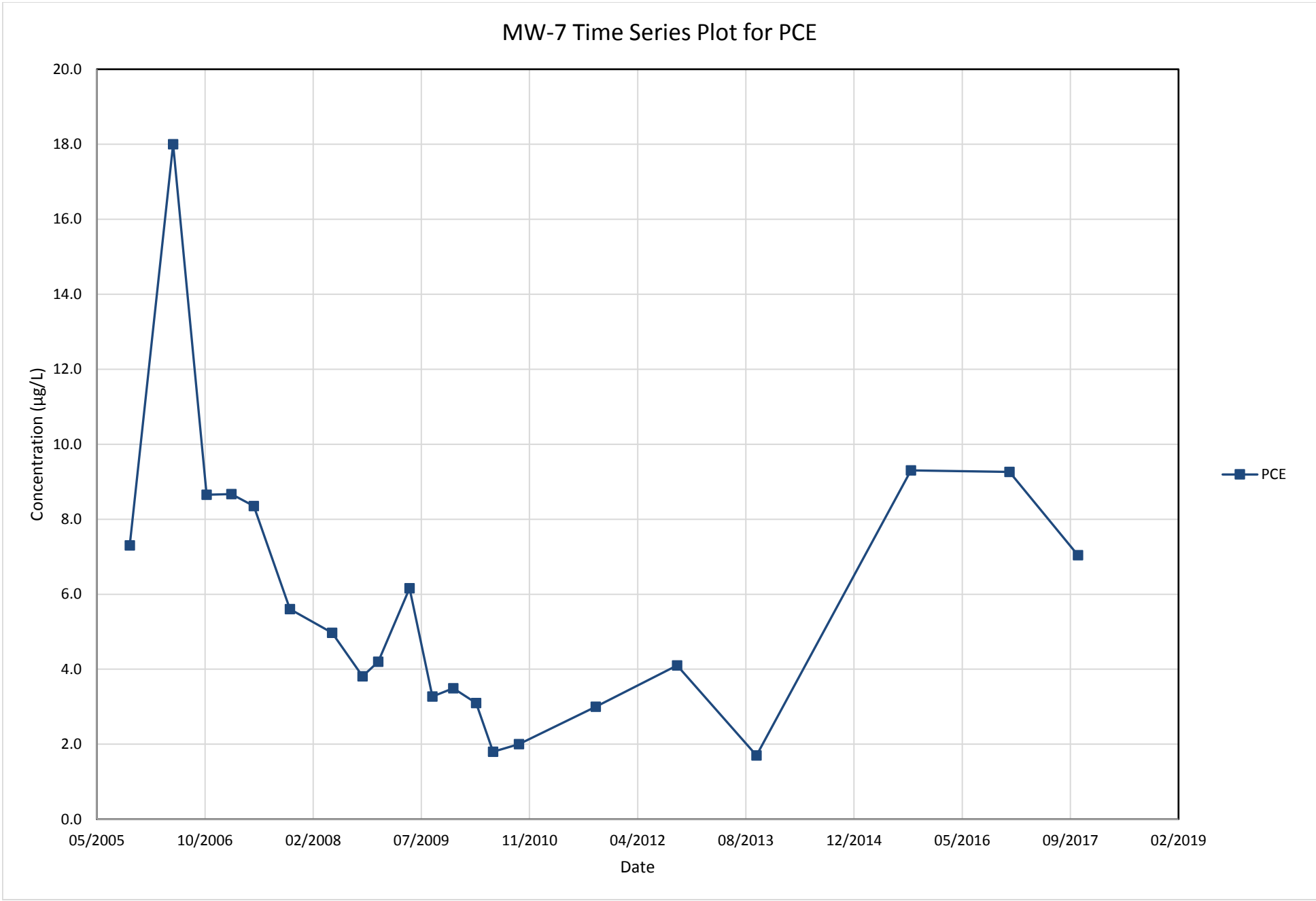

MW-2 Time Series Plot for PCE
Concentration (µg/L)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

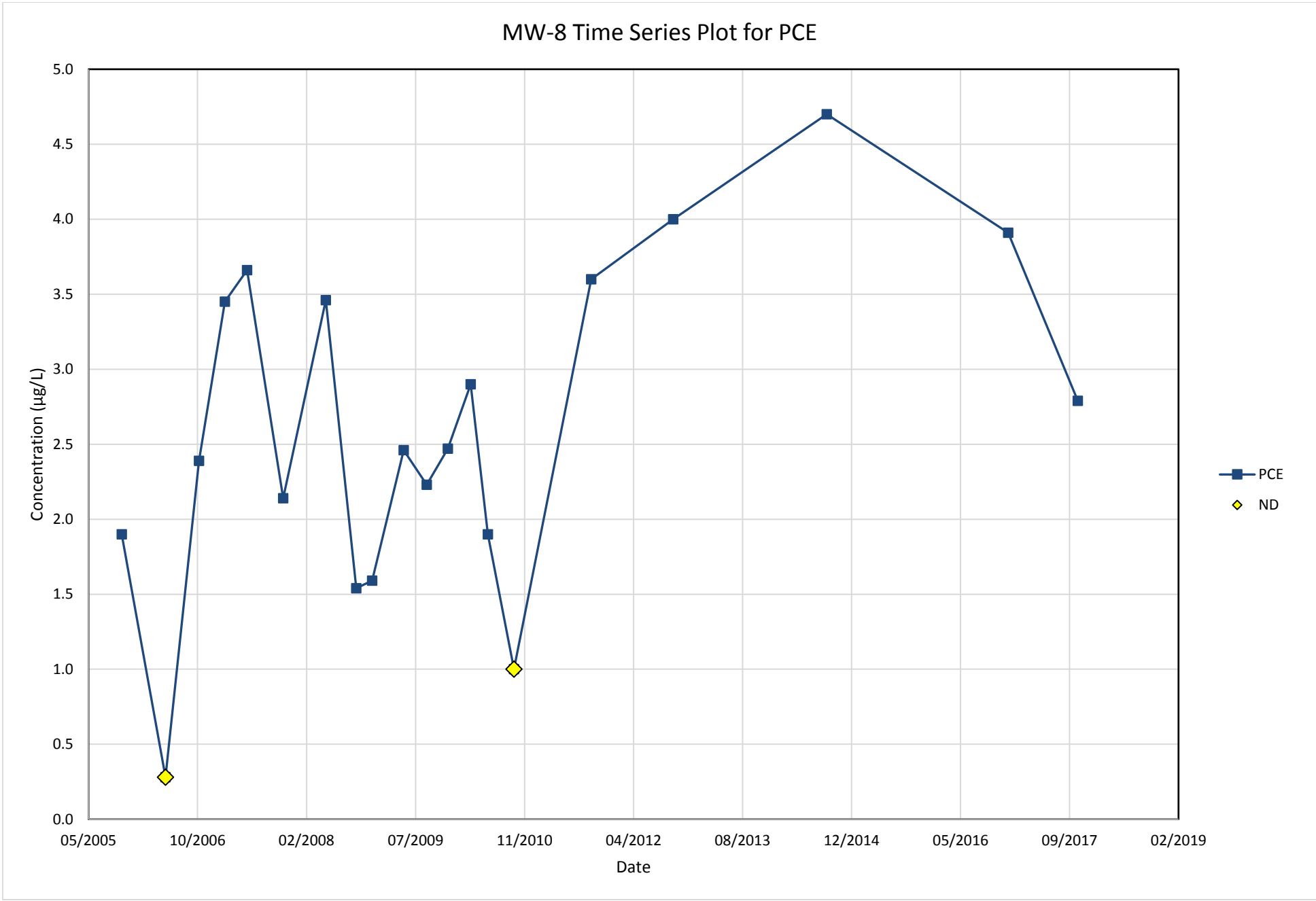

MW-3 Time Series Plot for PCE
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE
ND

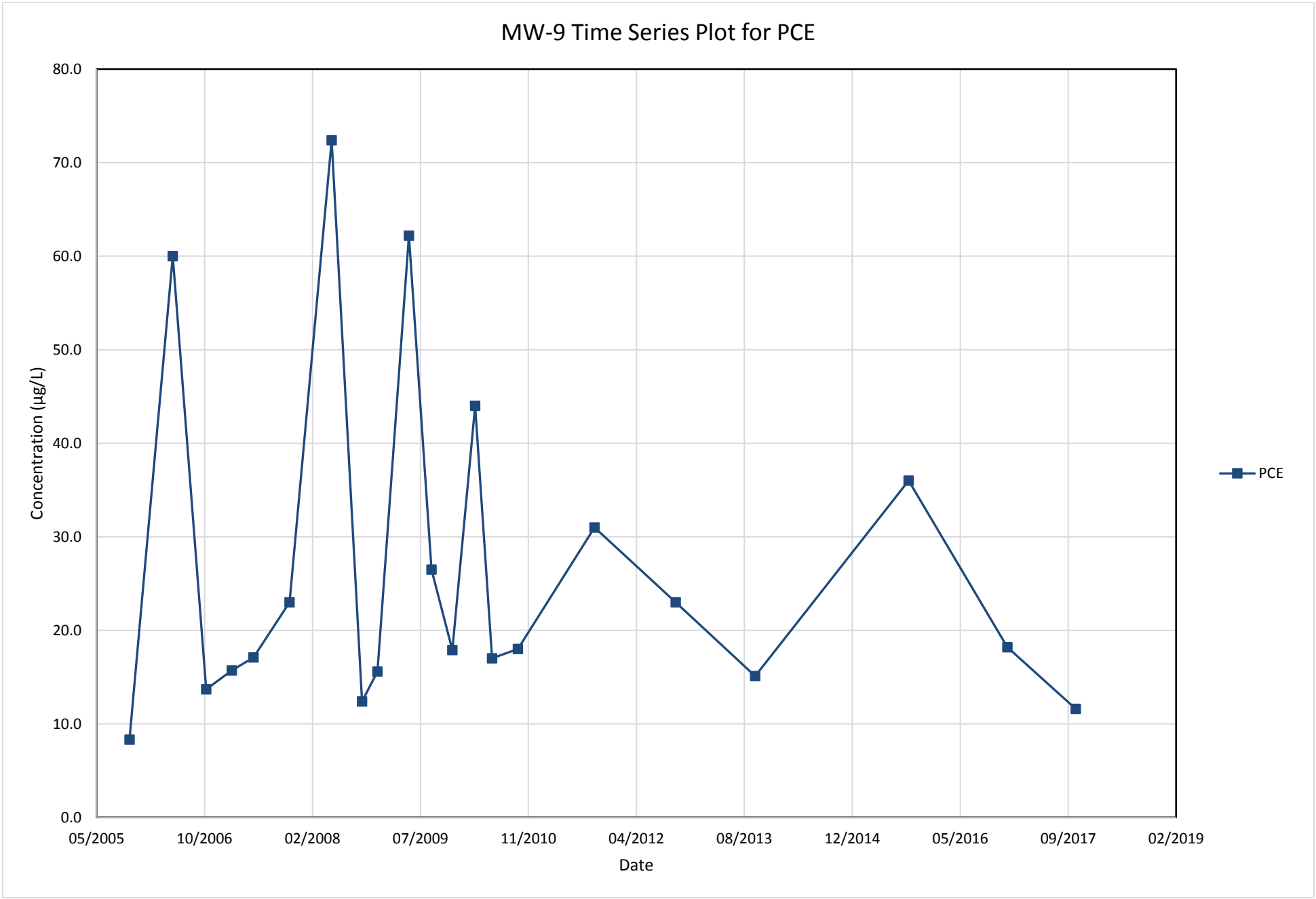

MW-4 Time Series Plot for PCE
Concentration (µg/L)
450
400
350
300
250
200
150
100
50
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

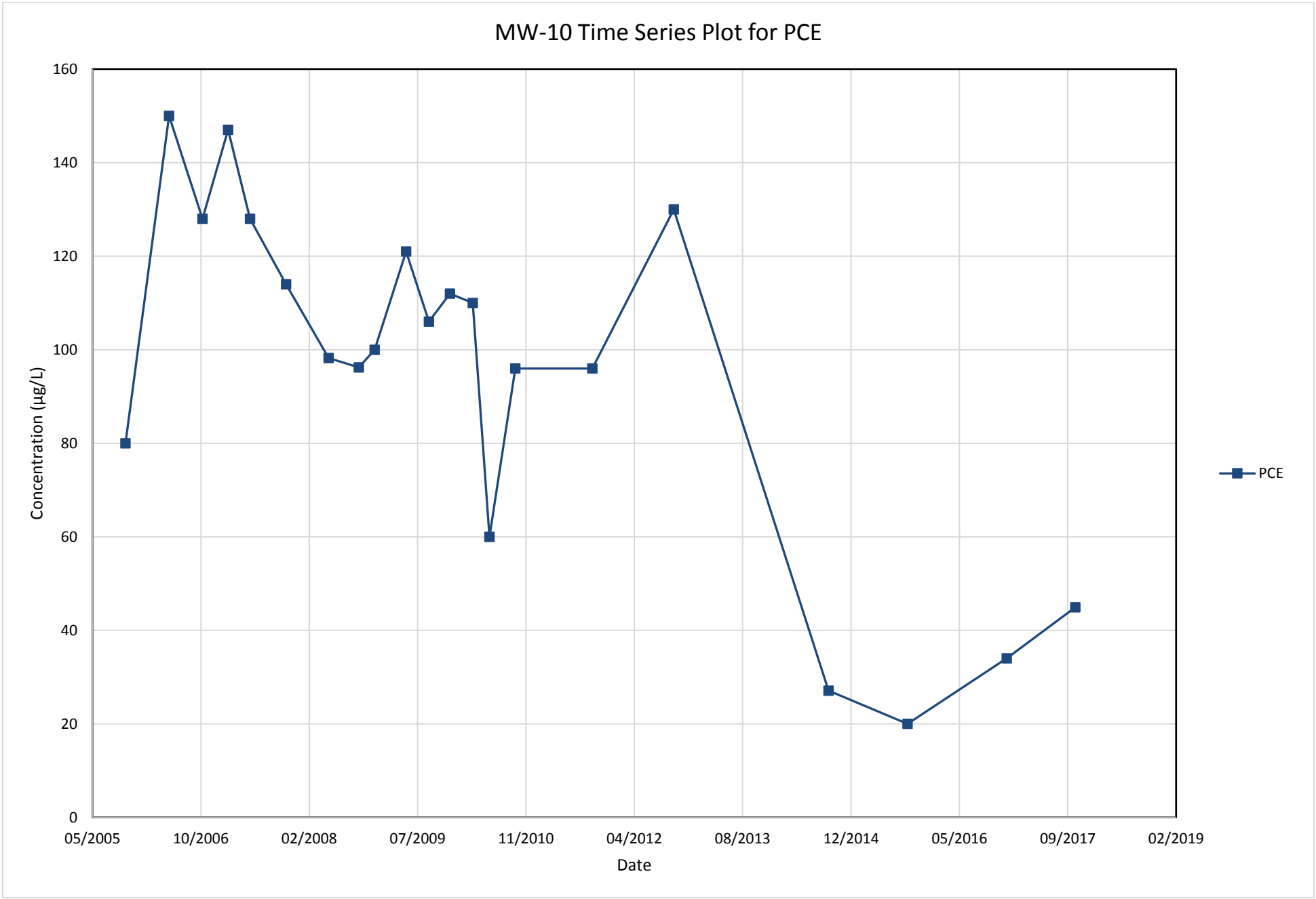

MW-5 Time Series Plot for PCE
Concentration (µg/L)
450
400
350
300
250
200
150
100
50
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

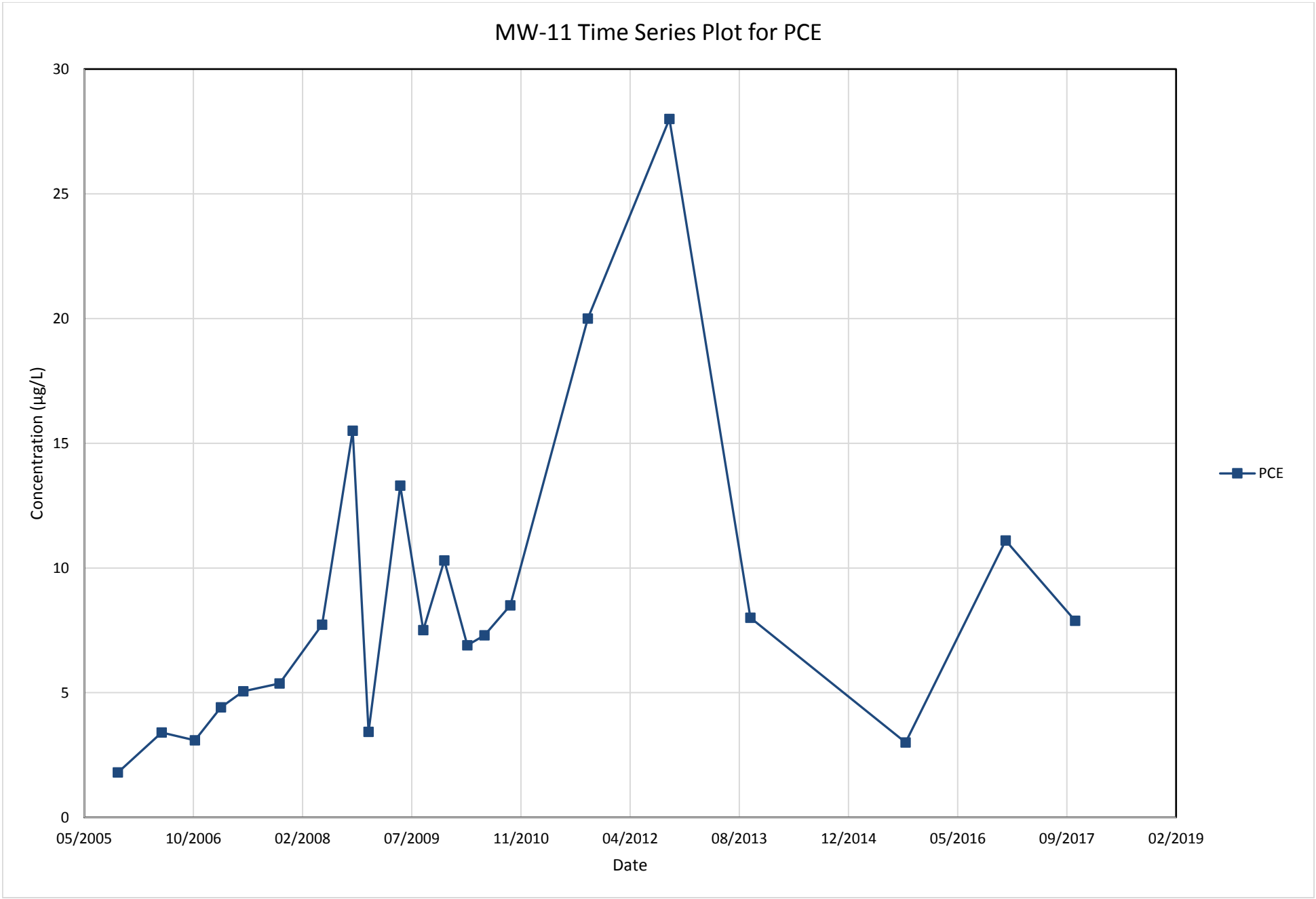

MW-6 Time Series Plot for PCE
120
100
80
60
40
20
0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

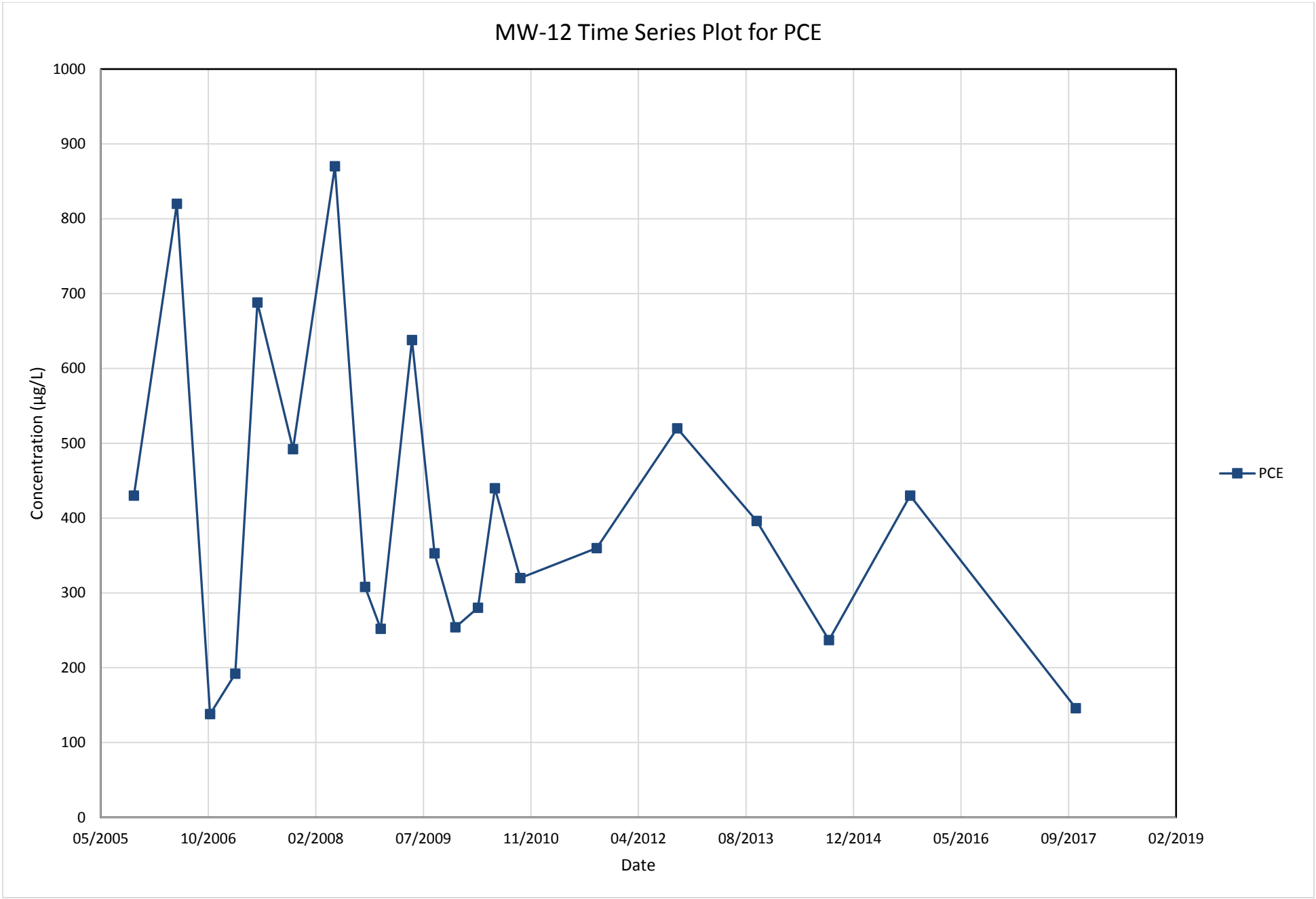

MW-7 Time Series Plot for PCE
Concentration (µg/L)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

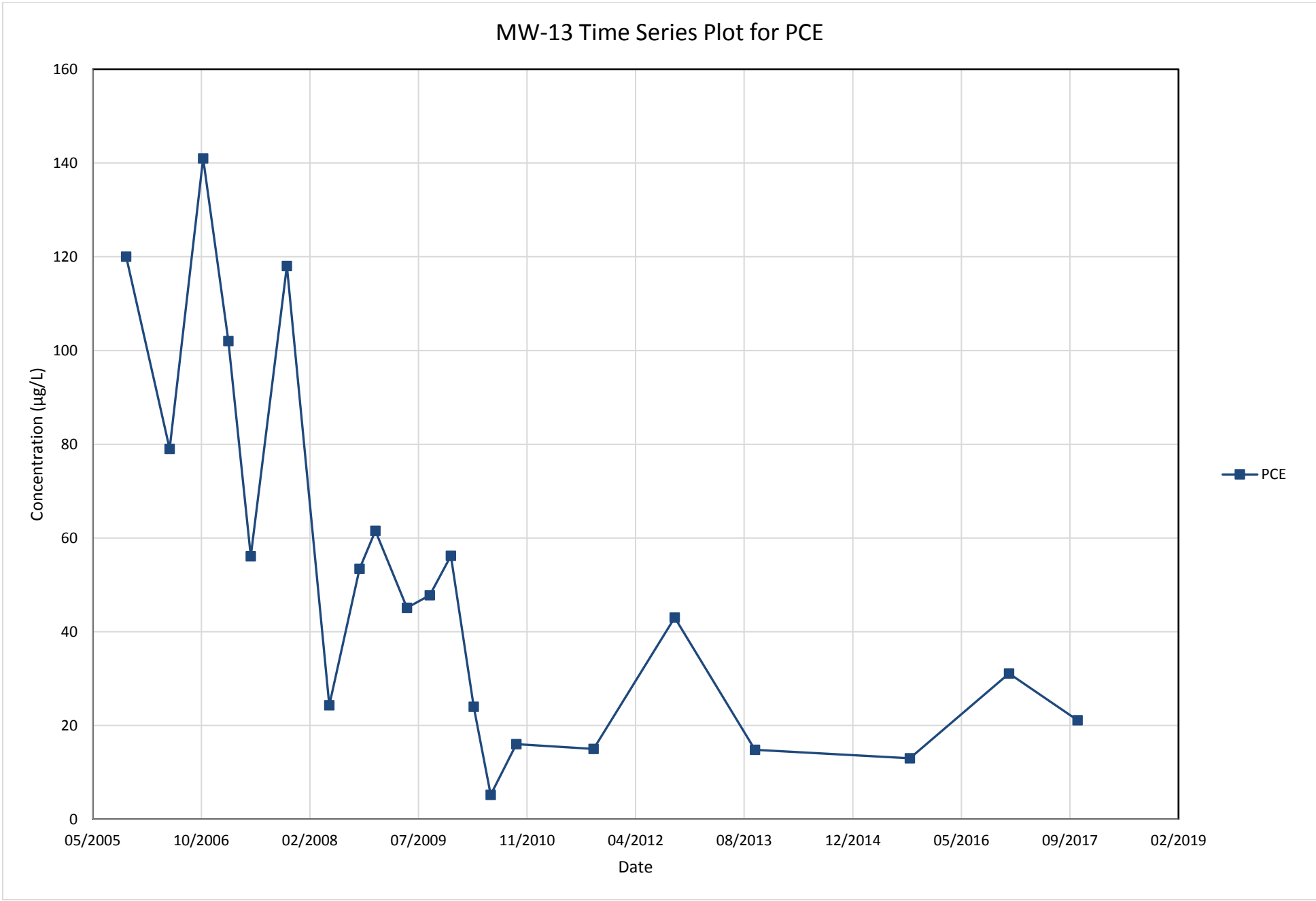

MW-8 Time Series Plot for PCE
Concentration (µg/L)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE
ND

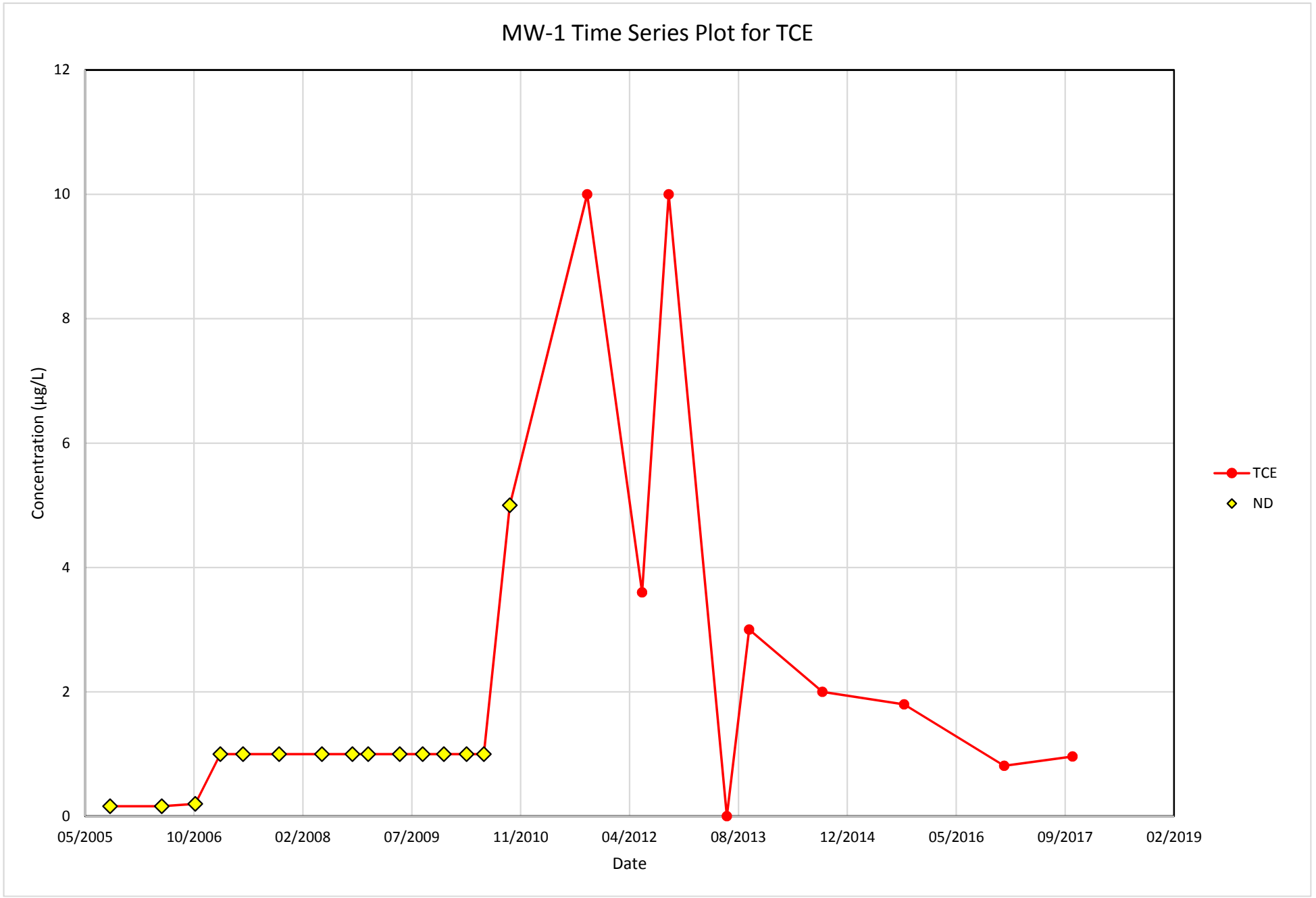

MW-9 Time Series Plot for PCE
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

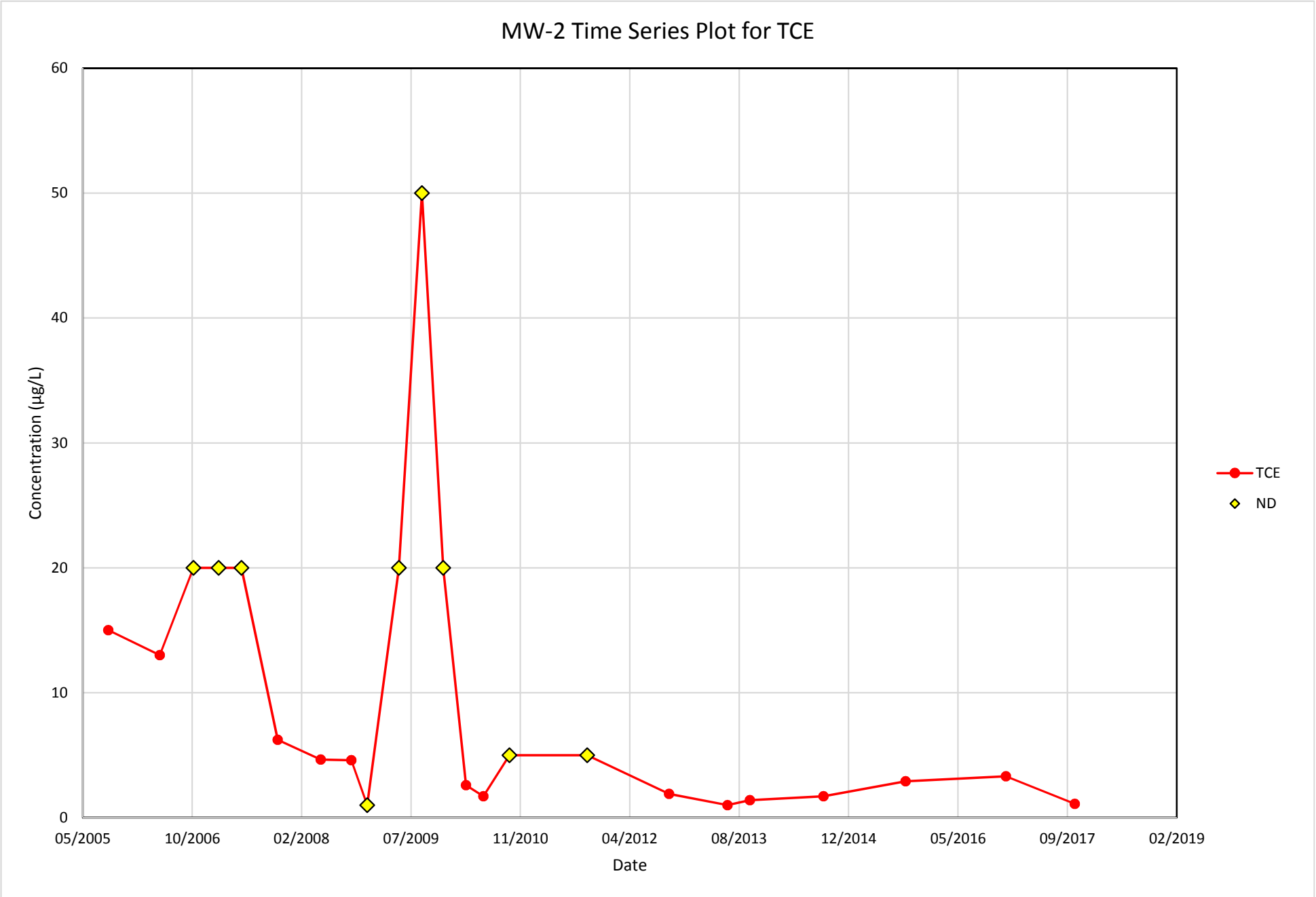

MW-10 Time Series Plot for PCE
160
140
120
100
80
60
40
20
0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

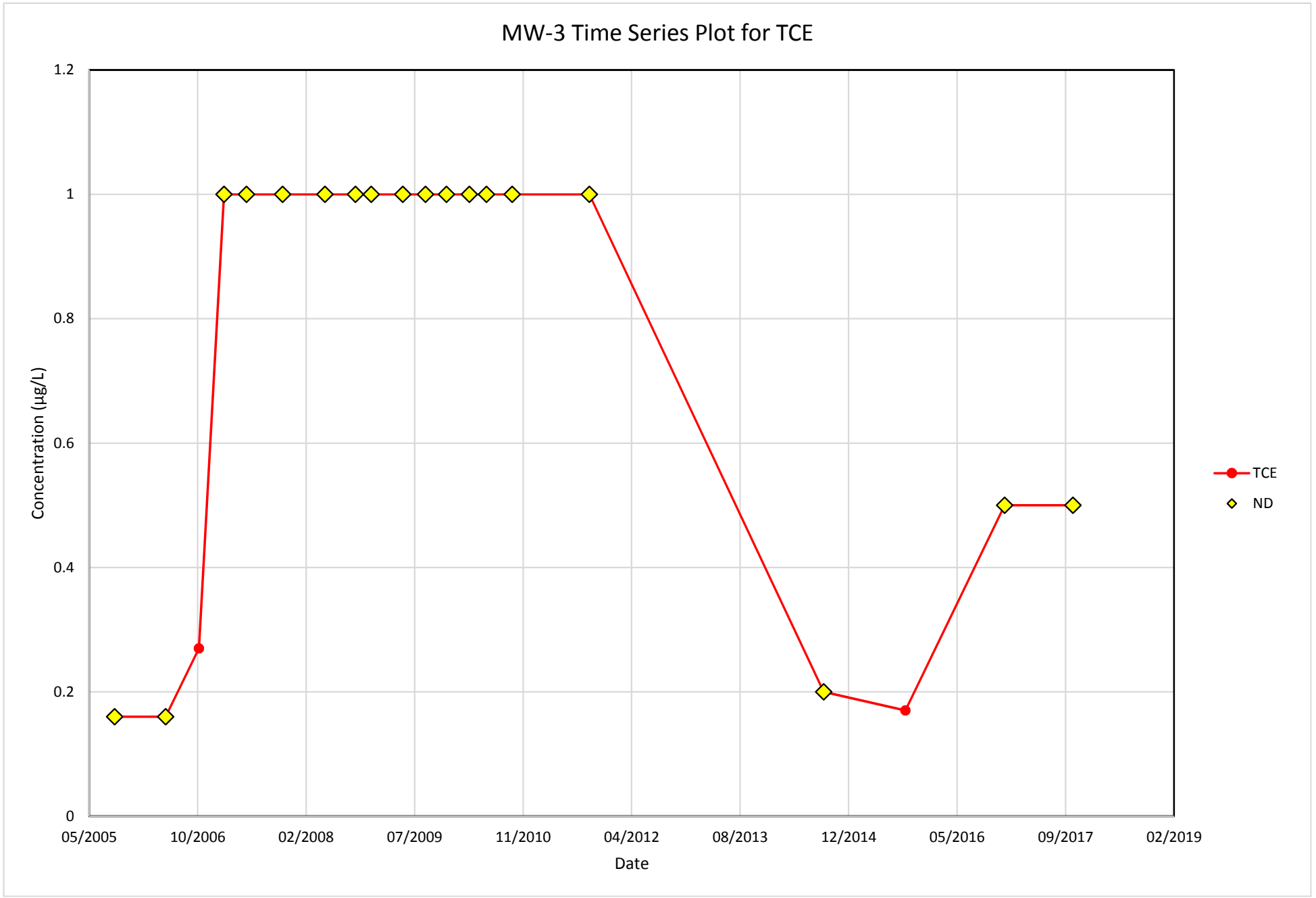

MW-11 Time Series Plot for PCE
Concentration (µg/L)
30
25
20
15
10
5
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

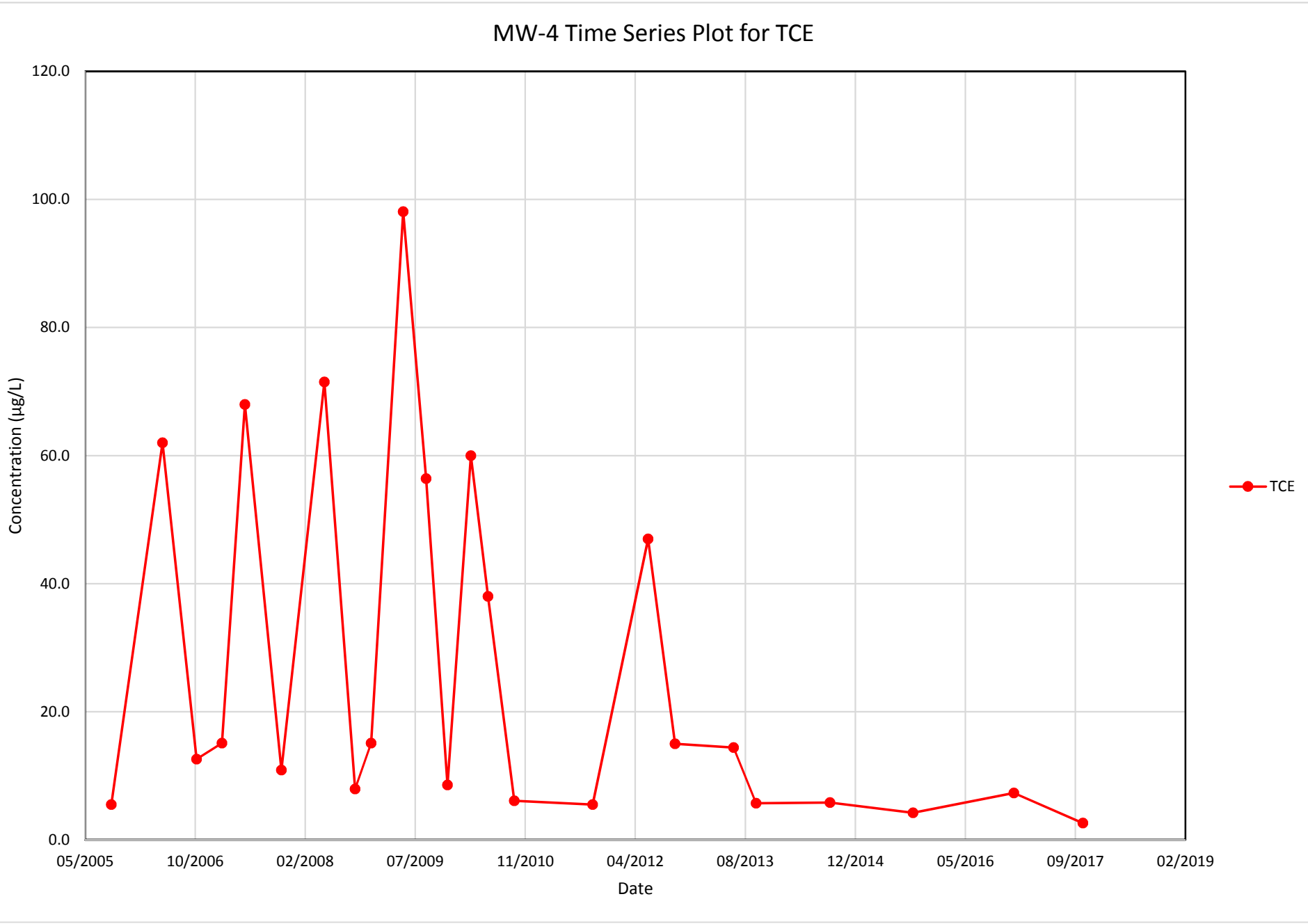

MW-12 Time Series Plot for PCE
Concentration (µg/L)
1000
900
800
700
600
500
400
300
200
100
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

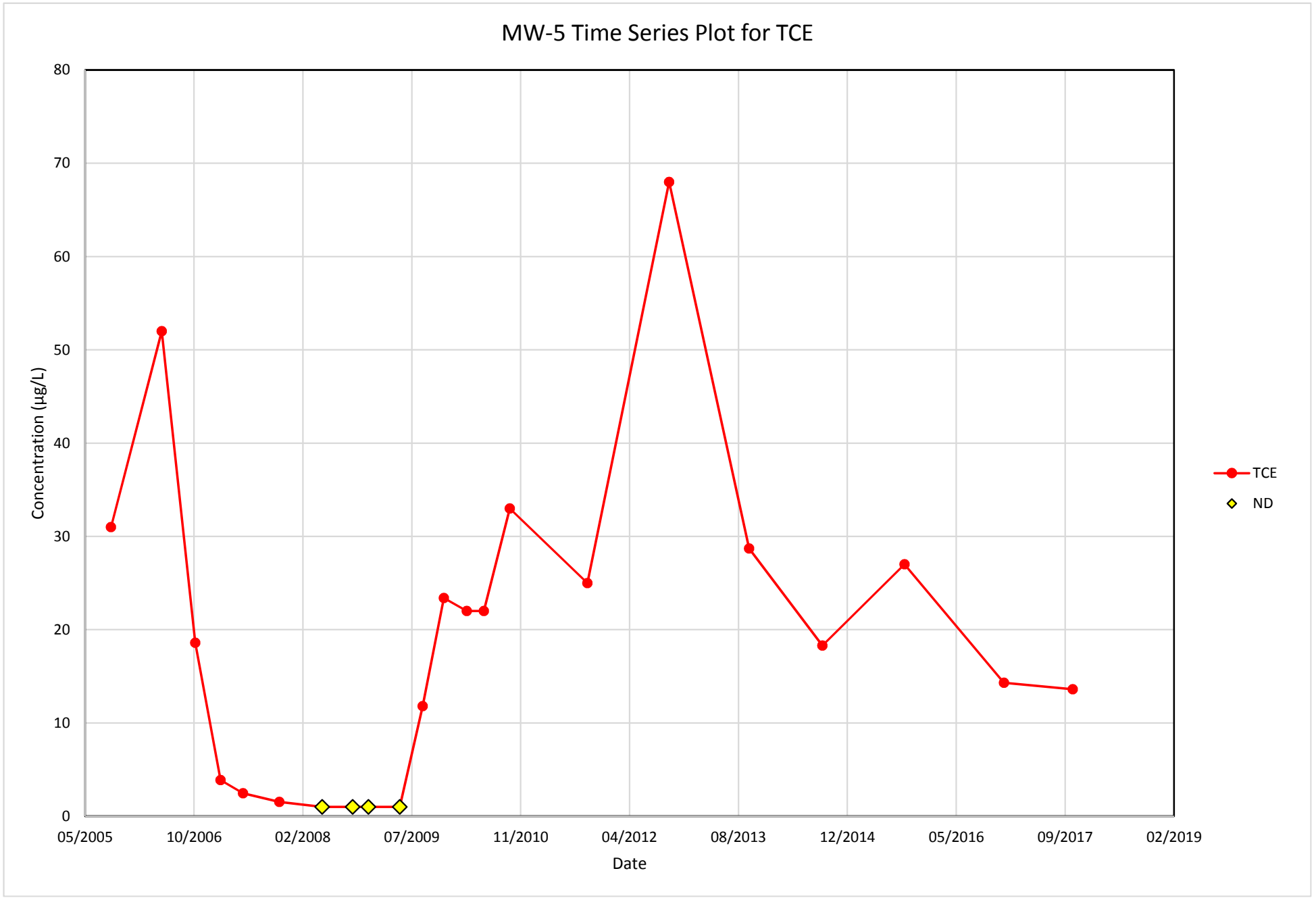

MW-13 Time Series Plot for PCE
160
140
120
100
80
60
40
20
0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
PCE

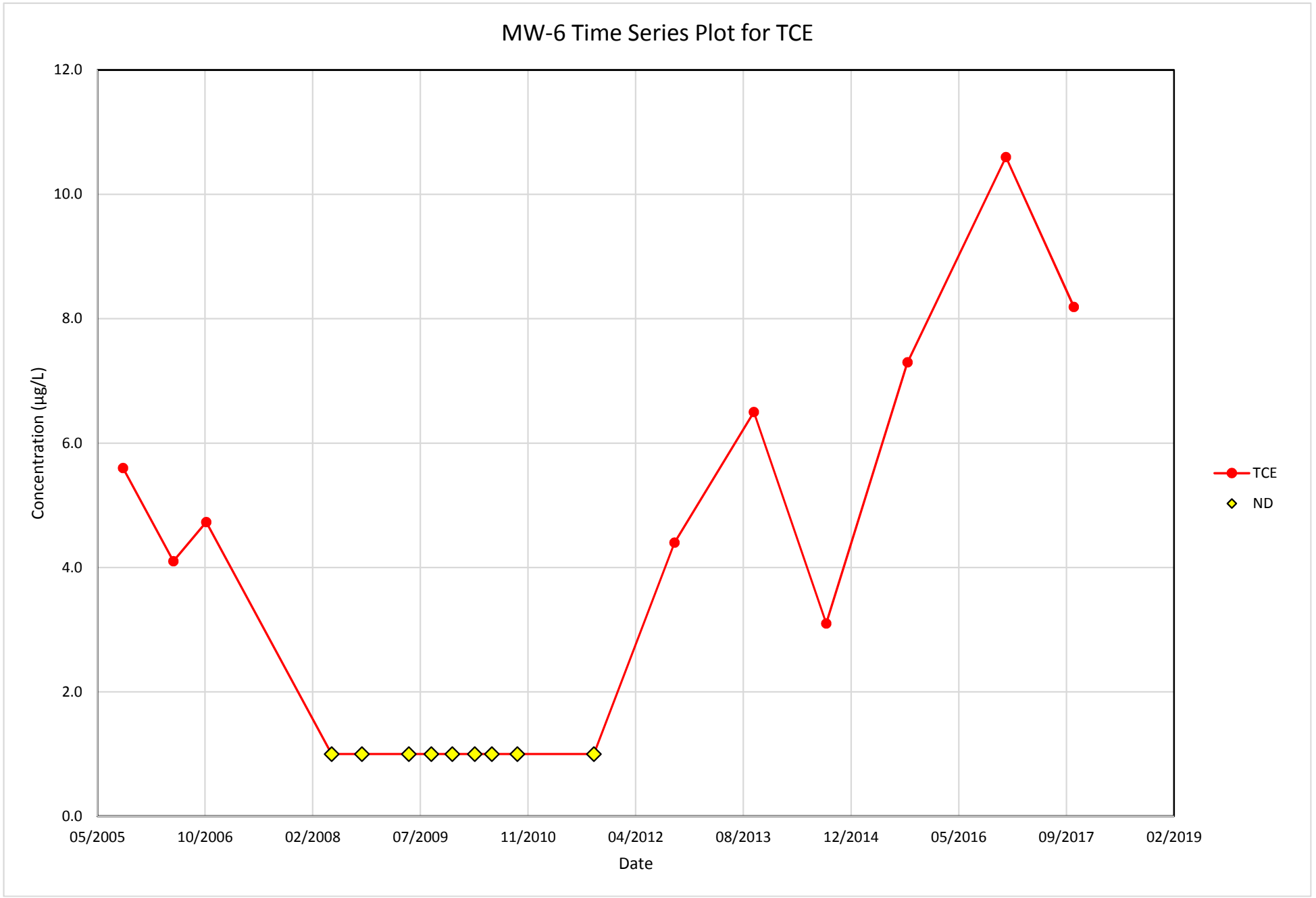

MW-1 Time Series Plot for TCE
Concentration (µg/L)
12
10
8
6
4
2
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE
ND

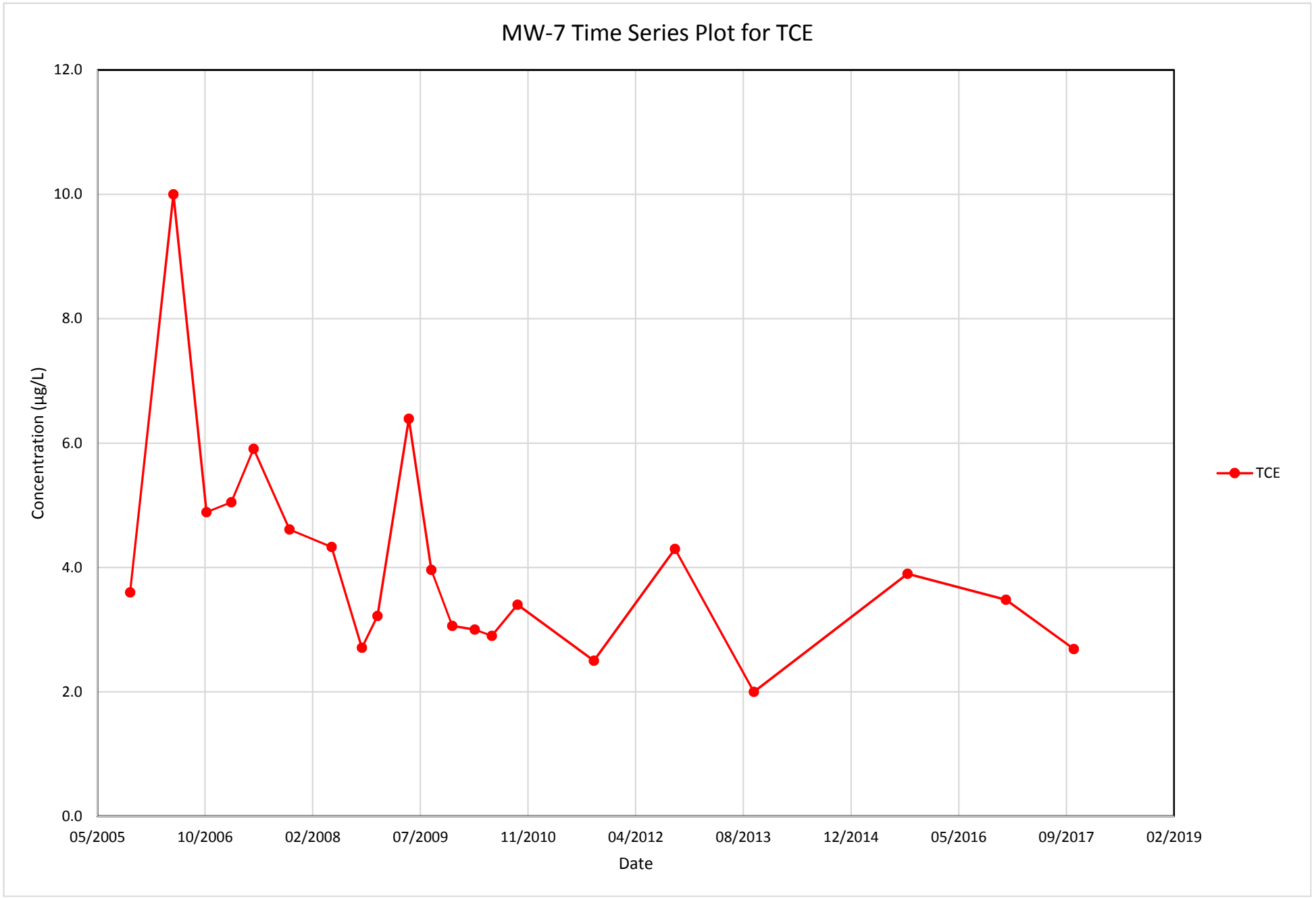

MW-2 Time Series Plot for TCE
60
50
40
30
20
10
0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE
ND

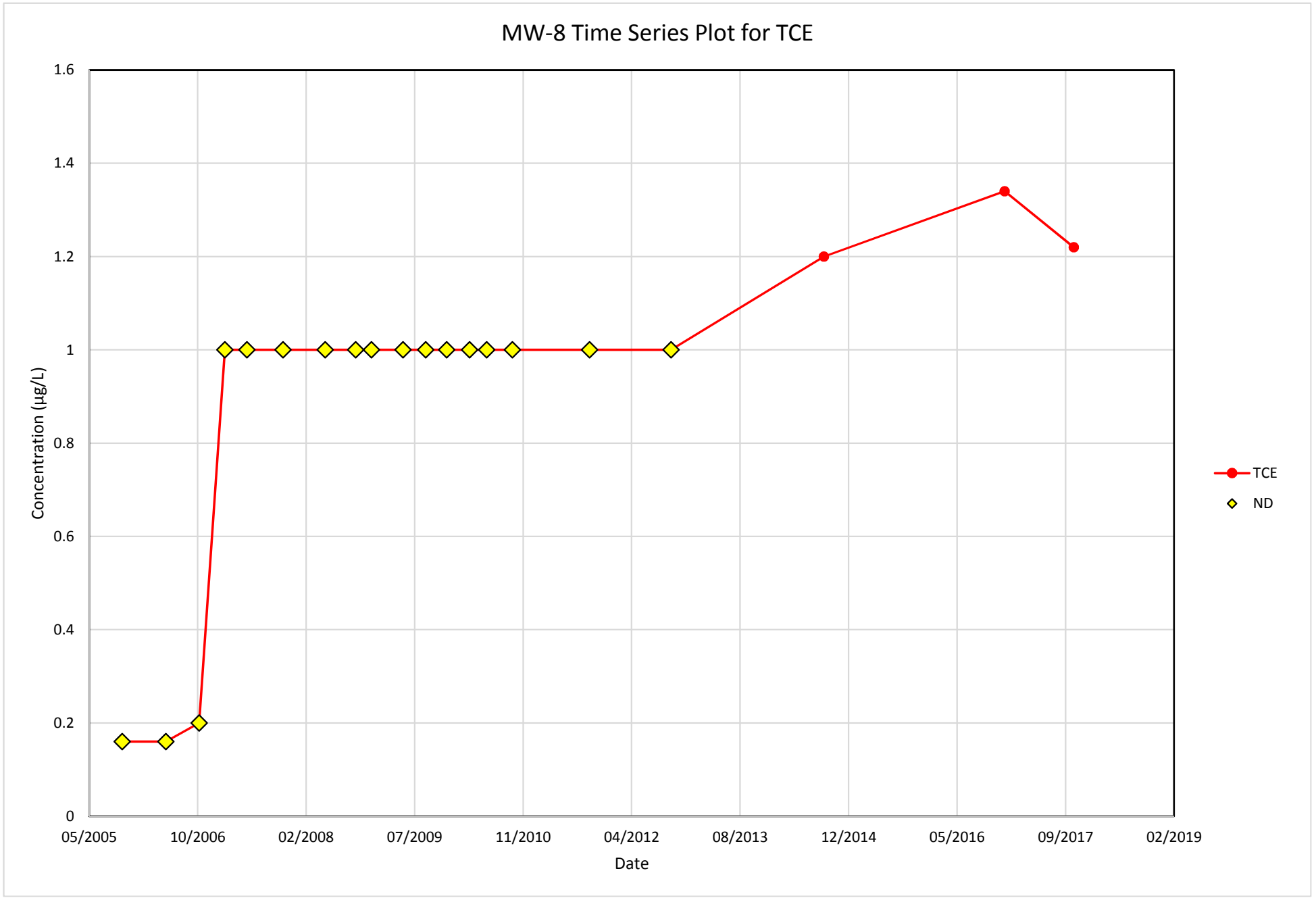

MW-3 Time Series Plot for TCE
Concentration (µg/L)
1.2
1
0.8
0.6
0.4
0.2
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE
ND

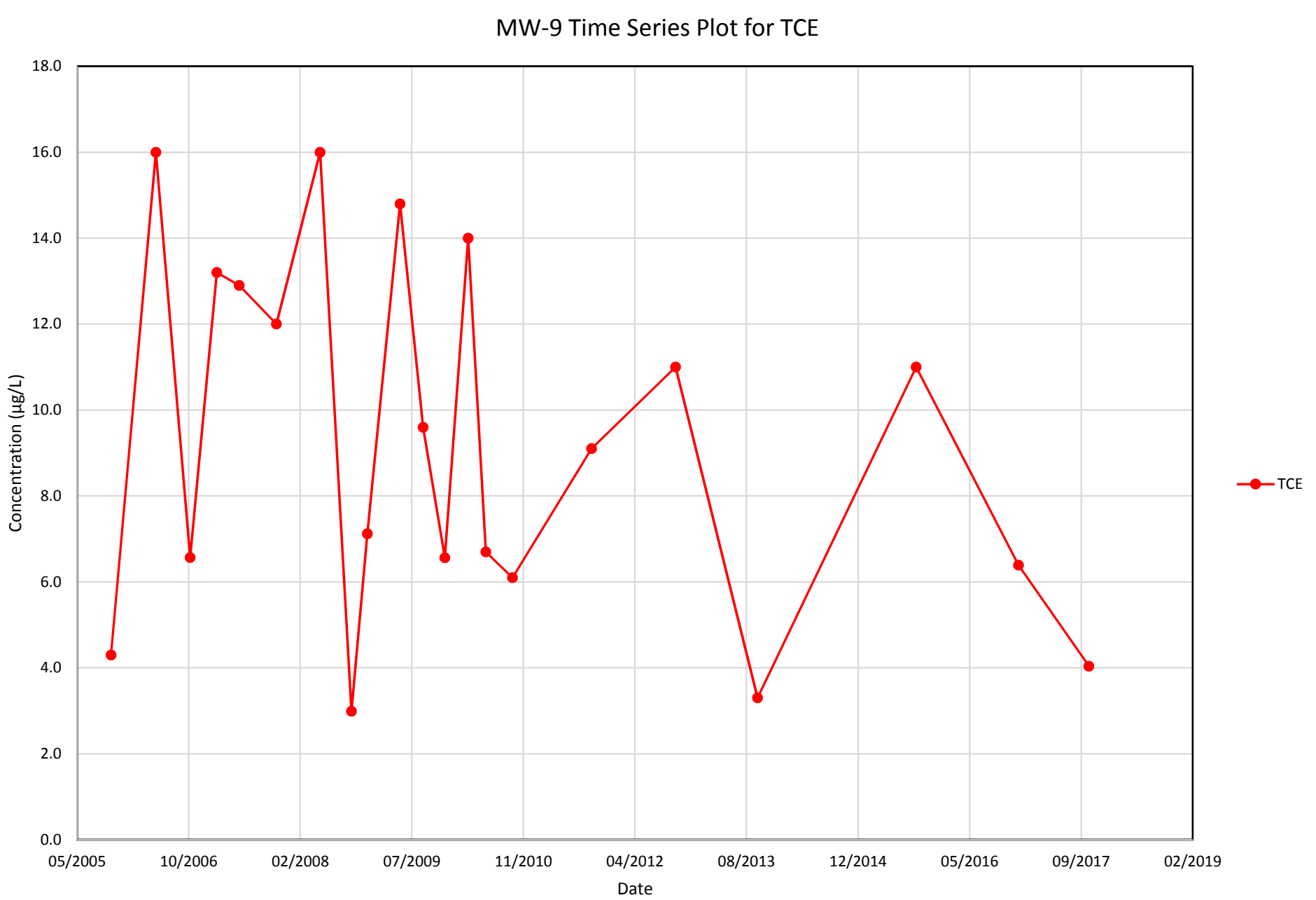

MW-4 Time Series Plot for TCE
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE

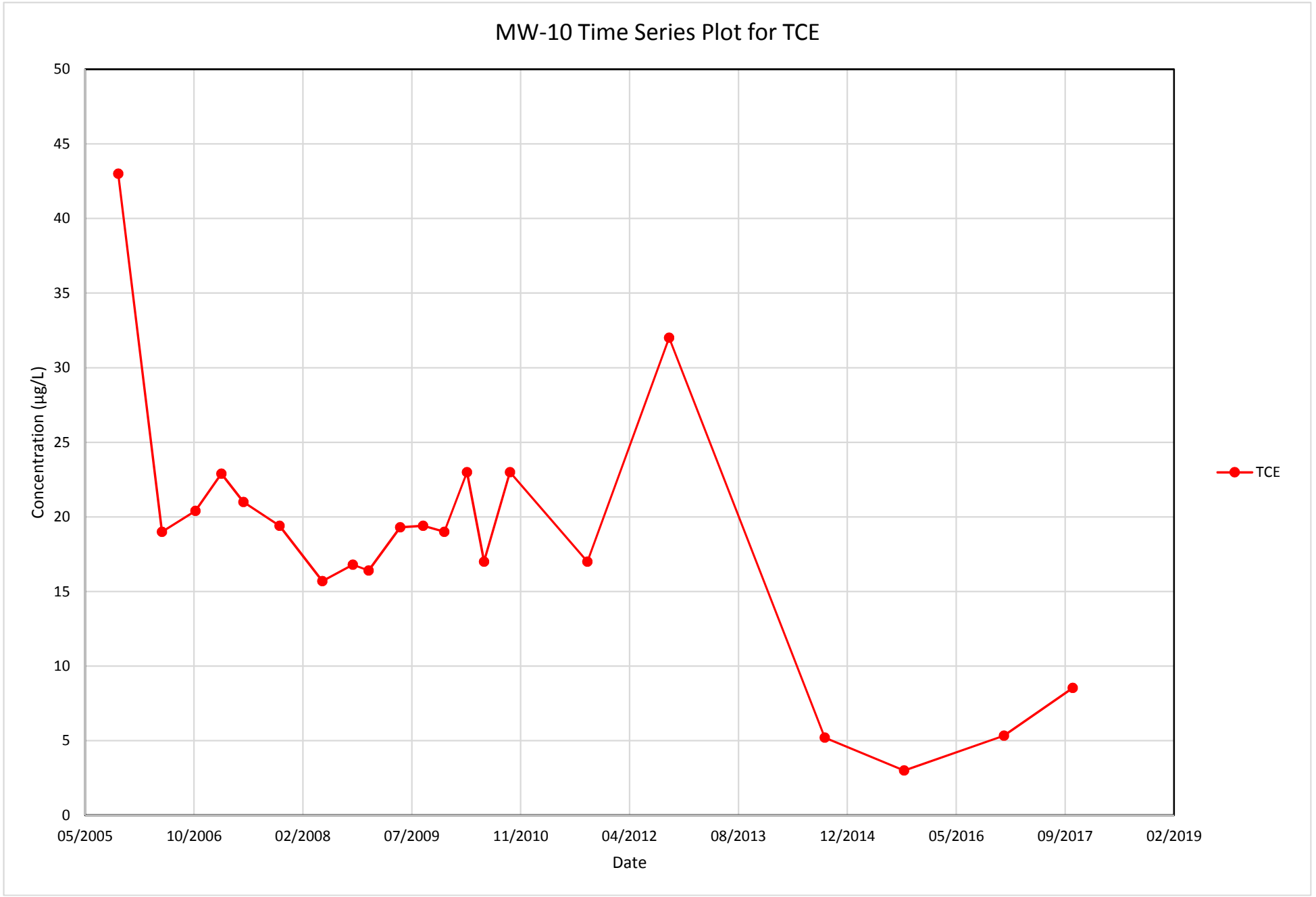

MW-5 Time Series Plot for TCE
Concentration (µg/L)
80
70
60
50
40
30
20
10
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE
ND

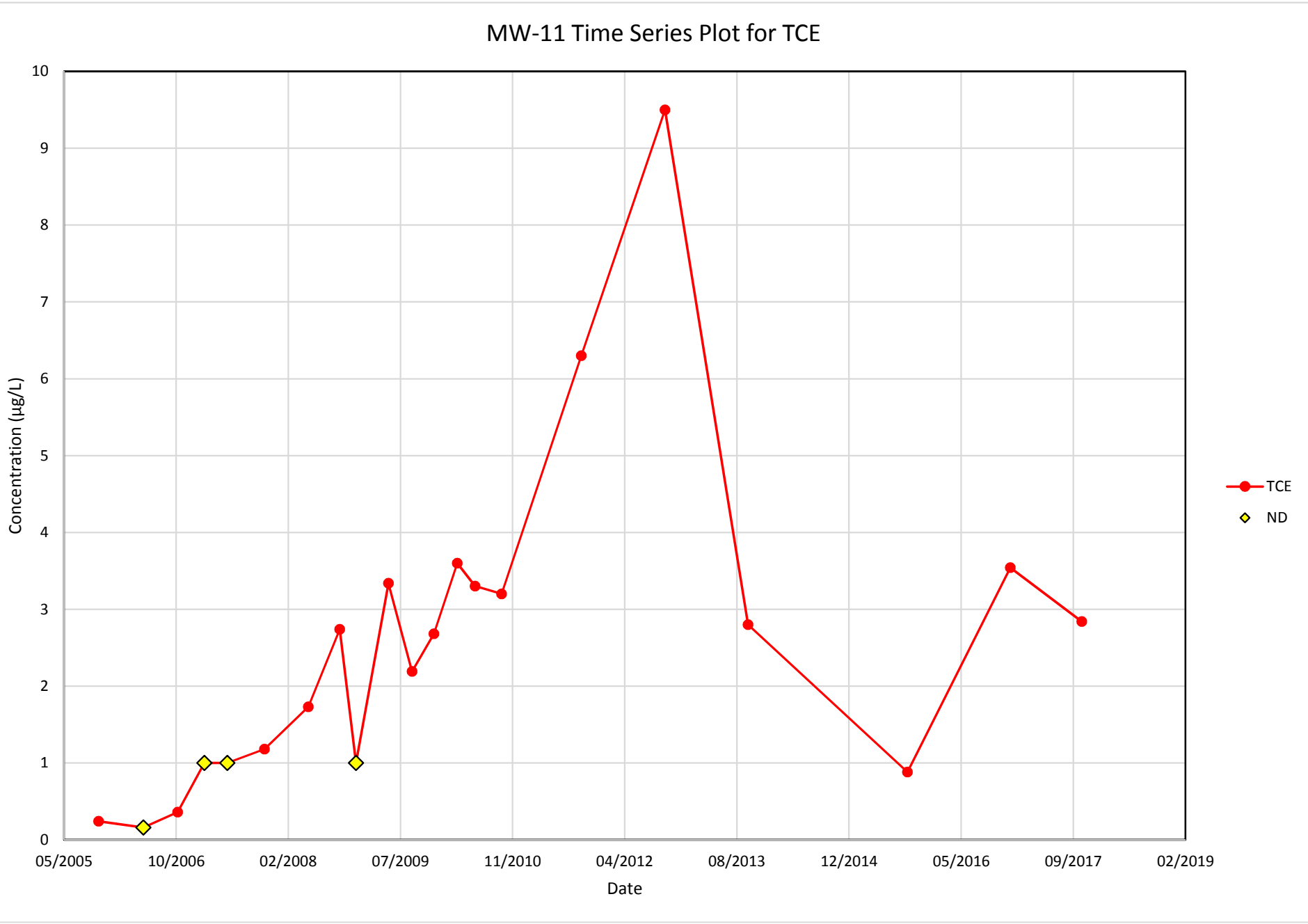

MW-6 Time Series Plot for TCE
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE
ND

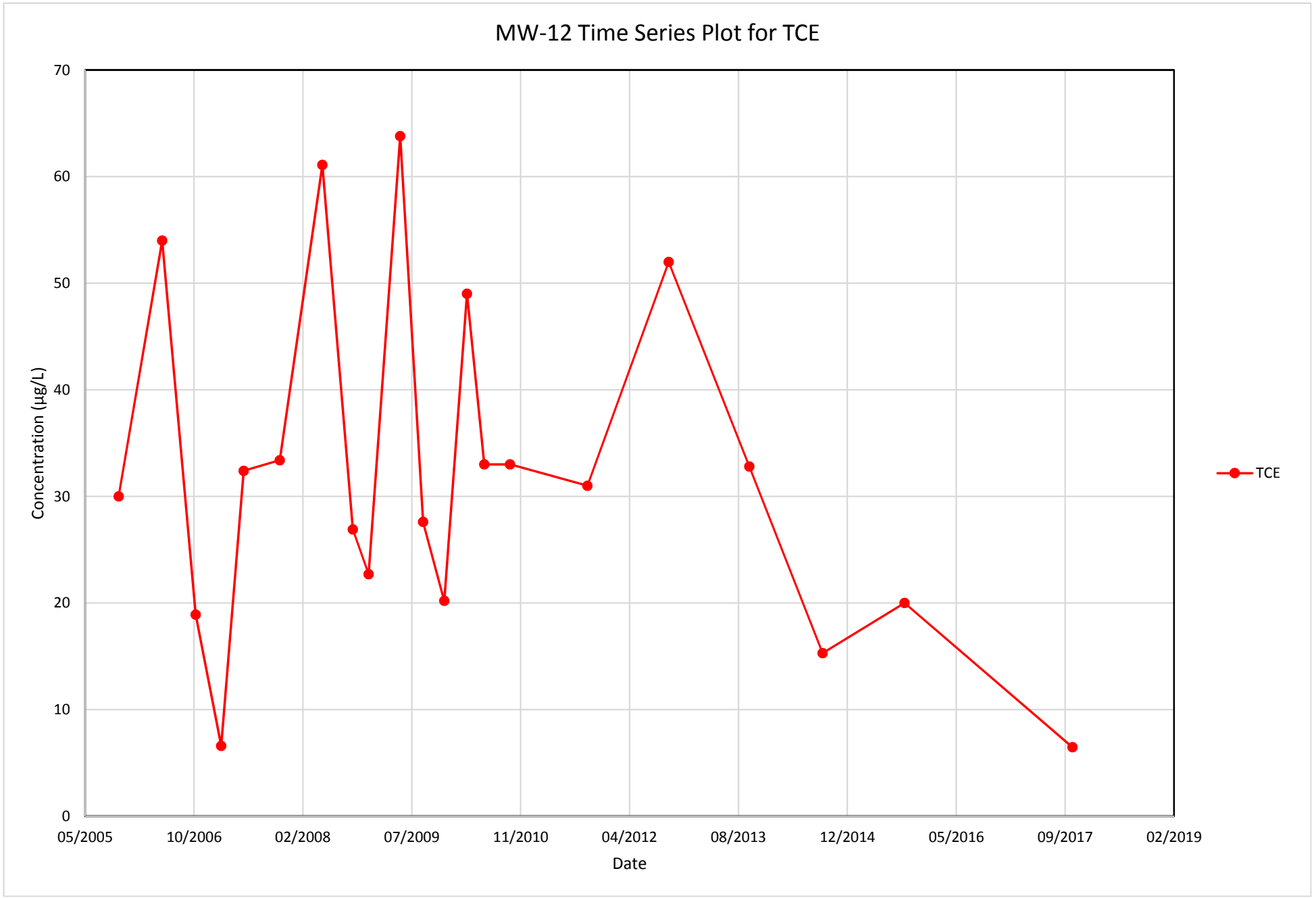

MW-7 Time Series Plot for TCE
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Concentration (µg/L)
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE

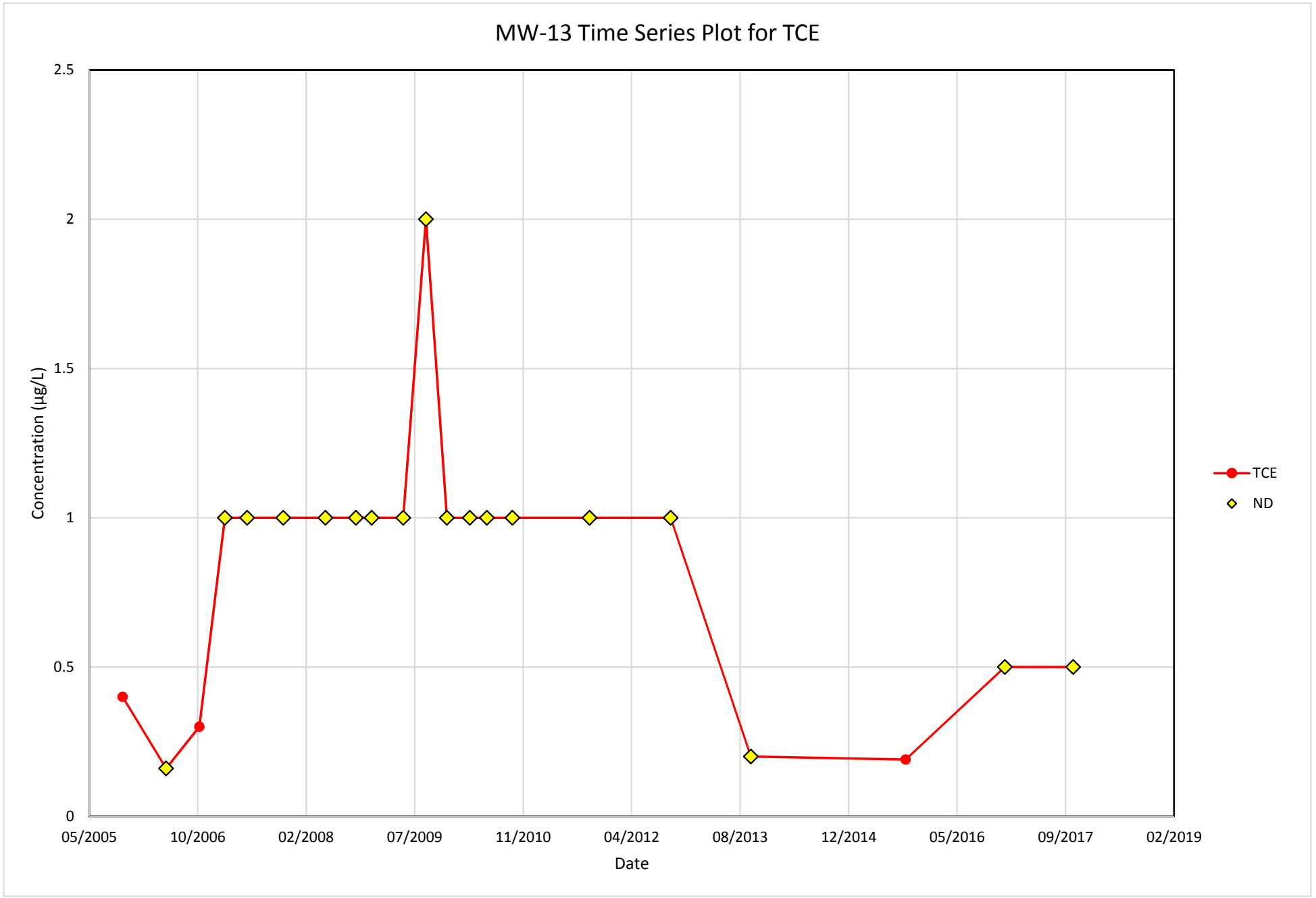

MW-8 Time Series Plot for TCE
Concentration (µg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE
ND


MW-9 Time Series Plot for TCE
Concentration (µg/L)
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE


MW-10 Time Series Plot for TCE
Concentration (µg/L)
50
45
40
35
30
25
20
15
10
5
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE


MW-11 Time Series Plot for TCE
Concentration (µg/L)
0
1
2
3
4
5
6
7
8
9
10
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE
ND


MW-12 Time Series Plot for TCE
Concentration (µg/L)
70
60
50
40
30
20
10
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE


MW-13 Time Series Plot for TCE
Concentration (µg/L)
2.5
2
1.5
1
0.5
0
05/2005
10/2006
02/2008
07/2009
11/2010
04/2012
08/2013
12/2014
05/2016
09/2017
02/2019
Date
TCE
ND

HISTORICAL ANALYTICAL MONITORING WELL RESULTS

Well	Sample Date	PCE	TCE	cis 1,2-DCE	trans 1,2-DCE	1,2-DCA	Chloro-form	1,1-DCE	Vinyl Chloride
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ADEC Cleanup Levels		41	2.8	36	360	1.7	2.2	280	0.19
MW-1	9/20/05	31	<0.16	<0.33	<0.48	**2.0**	**17**	<0.29	**<0.36**
	5/15/06	17	<0.16	<0.33	<0.48	<0.20	**35**	<0.29	**<0.36**
	10/16/06	**45.6**	<0.200	<0.200	<0.200	**3.01**	**14.4**	<0.200	**<0.200**
	2/8/07	10.2	<1.00	<1.00	<1.00	<1.00	**27.7**	<1.00	**<1.00**
	5/23/07	6.37	<1.00	<1.00	<1.00	<1.00	**22.9**	<1.00	**<1.00**
	11/5/07	3.53	<1.00	<1.00	<1.00	<1.00	**14.1**	<1.00	**<0.200**
	5/19/08	2.4	<1.00	<1.00	<1.00	<1.00	**38.0**	<1.00	**<1.00**
	10/6/08	5.54	<1.00	<1.00	<1.00	<1.00	**7.52**	<1.00	**<1.00**
	12/18/08	4.51	<1.00	<1.00	<1.00	<1.00	**14.3**	<1.00	**<1.00**
	5/12/09	3.32	<1.00	<1.00	<1.00	<1.00	**36.4**	<1.00	**<1.00**
	8/25/09	4.80	<1.00	<1.00	<1.00	<1.00	**24.5**	<1.00	**<1.00**
	11/30/09	7.28	<1.00	<1.00	<1.00	<1.00	**22.6**	<1.00	**<1.00**
	3/15/10	**46**	<1.0	<1.0	<1.0	<1.0	**33**	<1.0	**<1.0**
	6/2/10	27	<1.0	<1.0	<1.0	<1.0	**33**	<1.0	**<1.0**
DUP	6/2/10	27	<1.0	<1.0	<1.0	<1.0	**34**	<1.0	**<1.0**
	9/29/10	**270**	**<5.0**	NA	NA	NA	NA	NA	NA
	9/19/11	**600**	**10**	NA	NA	NA	NA	NA	NA
	5/29/12	**190**	**3.6**	4.8	<1.0	<0.50	**34**	<1.0	**<1.0**
	9/28/12	**850**	**10**	5.5	<1.0	<0.50	**21**	<1.0	**<1.0**
DUP	9/28/12	**730**	**9.2**	5.0	<1.0	1.6	**20**	<1.0	**<1.0**
	6/22/13	**300**	2.2 J	<1.0	<1.0	NA	**13.3**	NA	**<1.0**
DUP	6/22/13	**255**	2.1 J	<1.0	<1.0	NA	**13.1**	NA	**<1.0**
	10/2/13	**425**	2.9 J	<1.0	<1.0	NA	**14.6**	NA	**<1.0**
DUP	10/2/13	**365**	3.0 J	<1.0	<1.0	NA	**15.1**	NA	**<1.0**
	9/3/14	**246**	2.0 J	<1.0	<1.0	**2.7 J**	**8.6**	1.7 J	**<1.0**
	9/14/15	**320**	1.8	<1.0	<1.0	**3.3**	**15**	0.37 J	**< 1.0**
	12/16/16	**113**	0.810J	<0.500	<0.500	<0.250	**15.2**	<0.5	**<0.500**
	10/26/17	**159**	0.960J	<0.500	<0.500	**3.28**	**15.9**	<0.500	<0.0750
MW-2	9/22/05	**2,900**	15	21	<0.48	<0.2	0.40 J	<0.29	**<0.36**
	5/15/06	**3,100**	13	12	<0.48	<0.20	<0.30	<0.29	**<0.36**
	10/16/06	**2,620**	**<20.0**	<20.0	<20.0	**<20.0**	<20.0	<20.0	**<20.0**
	2/8/07	**3,040**	**<20.0**	<20.0	<20.0	**<20.0**	<20.0	<20.0	**<20.0**
DUP	2/8/07	**3,620**	**<20.0**	<20.0	<20.0	**<20.0**	<20.0	<20.0	**<20.0**
	5/23/07	**2,660**	**<20.0**	<20.0	<20.0	**<20.0**	<20.0	<20.0	**<20.0**
	11/5/07	**1,820**	**5.94**	7.29	<1.00	<1.00	1.95	<1.00	**<1.00**
DUP	11/5/07	**1,250**	**6.23**	6.94	<1.00	<1.00	1.91	<1.00	**<1.00**
	5/19/08	**638**	**4.65**	5.54	<1.00	<1.00	1.43	<1.00	**<1.00**
	10/6/08	**1,050**	**4.59**	6.43	<1.00	<1.00	**4.77**	<1.00	**<1.00**

HISTORICAL ANALYTICAL MONITORING WELL RESULTS

Well	Sample Date	PCE	TCE	cis 1,2-DCE	trans 1,2-DCE	1,2-DCA	Chloro-form	1,1-DCE	Vinyl Chloride
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ADEC Cleanup Levels		41	2.8	36	360	1.7	2.2	280	0.19
	12/18/08	**629**	<1.00	3.97	<1.00	<1.00	1.52	<1.00	**<1.00**
	5/12/09	**860**	**<20.0**	<20.0	<20.0	**<20.0**	**<20.0**	<20.0	**<20.0**
	8/25/09	**616**	**<50.0**	**<50.0**	<50.0	**<50.0**	**<50.0**	<50.0	**<50.0**
	11/30/09	**902**	**<20.0**	<20.0	<20.0	**<20.0**	**<20.0**	<20.0	**<20.0**
DUP	11/30/09	**873**	**<20.0**	<20.0	<20.0	**<20.0**	**<20.0**	<20.0	**<20.0**
	3/15/10	**320**	2.4	4.7	<1.0	<1.0	**5.6**	<1.0	**<1.0**
DUP	3/15/10	**300**	2.6	4.7	<1.0	<1.0	**5.8**	<1.0	**<1.0**
	6/2/10	**210**	1.7	3.9	<1.0	<1.0	**4.9**	<1.0	**<1.0**
	9/29/10	**480**	**<5.0**	NA	NA	NA	NA	NA	NA
DUP	9/29/10	**450**	**<5.0**	NA	NA	NA	NA	NA	NA
	9/19/11	**170**	**<5.0**	NA	NA	NA	NA	NA	NA
	9/28/12	**280**	1.9	2.2	<1.0	<0.50	**2.6**	<1.0	**<1.0**
	6/22/13	**173**	1.0 J	3.2	<0.40	NA	**3.5**	NA	**<0.40**
DUP	6/22/13	**181**	1.0 J	3.2	<0.40	NA	**3.6**	NA	**<0.40**
	10/2/13	**279**	1.4 J	<1.0	<1.0	NA	**10.9**	NA	**<1.0**
	9/3/14	**175**	1.7 J	7.10	<0.8	<0.8	**4.5**	1.4 J	**<0.8**
	9/14/15	**250**	2.9	8.50	0.42 J	< 1.0	**5**	0.46 J	**< 1.0**
	12/15/16	**293**	**3.30**	7.31	0.490 J	<0.250	**2.80**	<0.5	**<0.500**
	10/26/17	**85.3**	1.09	1.38	<0.500	<0.250	2.15	<0.500	<0.0750
MW-3	9/22/05	4.1	<0.16	<0.33	<0.48	0.74 J	**2.9**	<0.29	**<0.36**
	5/15/06	9.0	<0.16	<0.33	<0.48	<0.20	<0.30	<0.29	**<0.36**
	10/16/06	0.330	0.270	0.510	<0.200	0.690	<0.200	<0.200	**<0.200**
	2/8/07	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/23/07	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	11/5/07	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<0.200**
	5/19/08	1.78	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	10/6/08	1.32	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/18/08	3.20	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/12/09	9.52	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
DUP	5/12/09	11.4	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	8/25/09	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	11/30/09	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	3/15/10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**<1.0**
	6/2/10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**<1.0**
	9/29/10	<1.0	<1.0	NA	NA	NA	NA	NA	NA
	9/19/11	<1.0	<1.0	NA	NA	NA	NA	NA	NA
	9/3/14	<0.30	<0.20	0.27 J	<0.20	0.43 J	0.21 J	0.96 J	**<0.20**
	9/15/15	0.92 J	0.17 J	0.24 J	<1.0	0.47 J	0.46 J	0.58 J	**<1.0**

HISTORICAL ANALYTICAL MONITORING WELL RESULTS

Well	Sample Date	PCE	TCE	cis 1,2-DCE	trans 1,2-DCE	1,2-DCA	Chloro-form	1,1-DCE	Vinyl Chloride
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ADEC Cleanup Levels		41	2.8	36	360	1.7	2.2	280	0.19
DUP	9/15/15	0.72 J	0.15 J	<1.0	<1.0	0.52 J	0.46 J	0.62 J	**<1.0**
	12/15/16	0.370J	<0.500	0.400 J	<0.500	<0.250	<0.500	<0.5	**<0.500**
	10/26/17	<0.500	<0.500	0.400 J	<0.500	0.580	<0.500	<0.500	<0.0750
MW-4	9/24/05	**290**	**5.5**	<0.33	<0.48	<0.20	<0.30	<0.29	**<0.36**
	5/15/06	**130**	**62**	<0.33	<0.48	<0.20	<0.30	<0.29	**<0.36**
	10/16/06	**400**	**12.6**	<2.00	<2.00	**<2.00**	<2.00	<2.00	**<2.00**
	2/9/07	**281**	**15.1**	<2.00	<2.00	**<2.00**	<2.00	<2.00	**<2.00**
	5/24/07	**113**	**68.0**	2.97	<1.00	<1.00	<1.00	<1.00	**<1.00**
DUP	5/24/07	**167**	**33.6**	1.58	<1.00	<1.00	<1.00	<1.00	**<1.00**
	11/6/07	**227**	**10.9**	<1.00	<1.00	<1.00	<1.00	<1.00	**<0.200**
	5/19/08	**63.4**	**71.5**	2.86	<1.00	<1.00	<1.00	<1.00	**<1.00**
	10/6/08	**139**	**7.94**	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/18/08	**128**	**11.9**	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
DUP	12/18/08	**135**	**15.1**	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/12/09	**66.2**	**98.1**	<2.00	<2.00	**<2.00**	<2.00	<2.00	**<2.00**
	8/25/09	**109**	**56.4**	<5.00	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
DUP	8/25/09	**109**	**54.7**	<5.00	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
	11/30/09	**150**	**8.55**	<5.00	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
	3/16/10	**110**	**58**	1.2	<1.0	<1.0	<1.0	1.0	**<1.0**
DUP	3/16/10	**110**	**60**	1.2	<1.0	<1.0	<1.0	1.0	**<1.0**
	6/2/10	**57**	**38**	2.0	1.6	<1.0	<1.0	<1.0	**<1.0**
	9/29/10	**82**	**6.1**	NA	NA	NA	NA	NA	NA
	9/20/11	38	**5.5**	NA	NA	NA	NA	NA	NA
	5/29/12	**43**	**47**	11	33	<0.50	<1.0	<1.0	**<1.0**
	9/29/12	**98**	**15**	<1.0	<1.0	<0.50	<1.0	<1.0	**<1.0**
	6/22/13	**51.0**	**14.4**	2.9	7.5	NA	<0.20	NA	**<0.20**
	10/2/13	**56.9**	**5.7**	0.7	1.1	NA	<0.20	NA	**<0.20**
	9/3/14	**47.1**	**5.8**	1.1	1.9	<0.20	<0.20	2.0	**<0.20**
DUP	9/3/14	**48.0**	**4.6**	0.84 J	1.6	<0.20	<0.20	2.1	**<0.20**
	9/15/15	**48.0**	**4.2**	0.97 J	3.8	0.30 J	<1.0	0.99 J	**<1.0**
	12/16/16	**48.9**	**7.30**	1.61	5.34	<0.250	<0.500	<0.5	**<0.500**
	10/26/17	40.5	2.60	0.480 J	1.83	0.270 J	<0.500	<0.500	<0.0750
MW-5	9/24/05	**210**	**31**	4.0	<0.48	0.57 J	<0.30	<0.29	**<0.36**
	5/15/06	**210**	**52**	3.0	<0.48	<0.20	<0.30	<0.29	**<0.36**
DUP	5/15/06	**280**	**34**	<3.3	<4.8	**<2.0**	<3.0	<2.9	**<3.6**
	10/16/06	**146**	**18.6**	2.52	<0.800	<0.800	<0.800	<0.800	**<0.800**
	2/9/07	39.4	**3.87**	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/23/07	29.6	2.47	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**

HISTORICAL ANALYTICAL MONITORING WELL RESULTS

Well	Sample Date	PCE	TCE	cis 1,2-DCE	trans 1,2-DCE	1,2-DCA	Chloro-form	1,1-DCE	Vinyl Chloride
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ADEC Cleanup Levels		41	2.8	36	360	1.7	2.2	280	0.19
	11/6/07	20.3	1.54	<1.00	<1.00	<1.00	<1.00	<1.00	**<0.200**
	5/20/08	6.21	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	10/7/08	5.57	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/19/08	3.89	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
DUP	12/19/08	3.82	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/12/09	6.04	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	8/25/09	**77.1**	**11.8**	<5.00	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
DUP	8/25/09	**74.9**	**11.5**	<5.00	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
	11/30/09	**153**	**23.3**	5.35	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
DUP	11/30/09	**156**	**23.4**	5.55	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
	3/16/10	**120**	**22**	4.2	<1.0	<1.0	**3.9**	<1.0	**<1.0**
	6/2/10	**81**	**22**	4.4	<1.0	<1.0	**5.0**	<1.0	**<1.0**
	9/29/10	**150**	**30**	NA	NA	NA	NA	NA	NA
DUP	9/29/10	**160**	**33**	NA	NA	NA	NA	NA	NA
	9/20/11	**150**	**25**	NA	NA	NA	NA	NA	NA
	9/30/12	**310**	**67**	8.2	<1.0	<0.50	**5.1**	<1.0	**<1.0**
DUP	9/30/12	**390**	**68**	6.4	<1.0	<0.50	**4.5**	<1.0	**<1.0**
	10/2/13	**173**	**28.7**	3.2	<0.40	NA	**3.7**	NA	**<0.40**
	9/3/14	**80.1**	**18.3**	2.7	0.35 J	0.62 J	1.2	1.8	**<0.2**
	9/16/15	**140**	**27.0**	2.5	0.35 J	0.62 J	1.7	0.91 J	**<1.0**
	12/15/16	**98.8**	**14.3**	2.18	0.370 J	<0.250	1.75	<0.5	**<0.500**
	10/27/17	**98.2**	**13.6**	1.70	0.340 J	0.540	1.66	<0.500	<0.0750
MW-6	9/24/05	**64**	**5.6**	1.3 J	<0.48	<0.20	<0.30	<0.29	**<0.36**
DUP	9/24/05	**57**	**5.3**	1.5 J	<0.48	<0.20	<0.30	<0.29	**<0.36**
	5/16/06	**54**	**4.1**	<0.33	<0.48	<0.20	<0.30	<0.29	**<0.36**
	10/16/06	**66.1**	**4.73**	1.16	<0.200	<0.200	<0.200	<0.200	**<0.200**
	5/20/08	11.3	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	10/7/08	3.22	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/13/09	10.1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
DUP	5/13/09	6.30	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	8/26/09	9.10	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/1/09	12.1	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	3/16/10	12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**<1.0**
	6/3/10	6.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**<1.0**
	9/29/10	10	<1.0	NA	NA	NA	NA	NA	NA
	9/20/11	6.0	<1.0	NA	NA	NA	NA	NA	NA
	9/28/12	**44**	**4.4**	6.3	<1.0	<0.50	1.1	<1.0	**<1.0**
	10/2/13	**61.5**	**6.5**	6.3	<0.20	NA	**3.1**	NA	**<0.20**

HISTORICAL ANALYTICAL MONITORING WELL RESULTS

Well	Sample Date	PCE	TCE	cis 1,2-DCE	trans 1,2-DCE	1,2-DCA	Chloro-form	1,1-DCE	Vinyl Chloride
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ADEC Cleanup Levels		41	2.8	36	360	1.7	2.2	280	0.19
	9/3/14	35.8	**3.1**	0.88 J	<0.20	0.21 J	1.2	1.00	**<1.0**
	9/16/15	**66**	**7.3**	2.3	0.19 J	0.53 J	1.3	0.88 J	**<1.0**
	12/15/16	**105**	**10.6**	2.29	<0.500	<0.250	1.43	<0.5	**<0.500**
	10/27/17	**77.8**	**8.19**	1.67	<0.500	0.420 J	1.54	<0.500	<0.0750
MW-7	10/27/05	7.3	**3.6**	1.7 J	<0.48	<0.20	<0.30	<0.29	**<0.36**
	5/16/06	18.0	**10**	9.5	<0.48	<0.20	<0.30	<0.29	**<0.36**
	10/17/06	8.65	**4.89**	8.54	0.500	0.250	<0.200	<0.200	**<0.200**
	2/9/07	8.67	**5.05**	14.2	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/24/07	8.35	**5.91**	16.6	<1.00	<1.00	<1.00	<1.00	**<1.00**
	11/6/07	5.60	**4.61**	9.65	<1.00	<1.00	<1.00	<1.00	**<0.200**
	5/20/08	4.97	**4.33**	10.4	<1.00	<1.00	<1.00	<1.00	**<1.00**
	10/7/08	3.81	2.71	6.57	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/19/08	4.20	**3.22**	9.46	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/13/09	6.16	**6.39**	14.2	<1.00	<1.00	<1.00	<1.00	**<1.00**
	8/26/09	3.27	**3.96**	11.5	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/1/09	3.49	**3.06**	11.8	<1.00	<1.00	<1.00	<1.00	**<1.00**
	3/16/10	3.1	**3.0**	8.2	<1.0	<1.0	<1.0	<1.0	**<1.0**
	6/3/10	1.8	2.9	7.5	<1.0	<1.0	<1.0	<1.0	**<1.0**
DUP	6/3/10	1.6	2.7	6.8	<1.0	<1.0	<1.0	<1.0	**<1.0**
	9/30/10	2.0	**3.4**	NA	NA	NA	NA	NA	NA
	9/20/11	3.0	2.5	NA	NA	NA	NA	NA	NA
	9/30/12	4.1	**4.3**	8.0	<1.0	<0.50	<1.0	<1.0	**<1.0**
	10/2/13	1.7	2.0	4.3	<0.20	NA	<0.20	NA	**0.20 J**
	9/16/15	9.30	**3.9**	3.3	0.33 J	0.44 J	<1.0	0.44 J	**<1.0**
	12/15/16	9.26	**3.48**	2.15	<0.500	<0.250	<0.500	<0.5	**<0.500**
	10/27/17	7.04	2.69	2.22	<0.500	0.280 J	<0.500	<0.500	<0.0750
MW-8	10/27/05	1.9	<0.16	<0.33	<0.48	<0.20	<0.30	<0.29	**<0.36**
	5/16/06	<0.28	<0.16	<0.33	<0.48	<0.20	<0.20	<0.29	**<0.36**
	10/17/06	2.39	<0.200	<0.200	<0.200	<0.200	0.210	<0.200	**<0.200**
	2/12/07	3.45	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/25/07	3.66	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	11/7/07	2.14	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<0.200**
	5/20/08	3.46	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	10/7/08	1.54	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/19/08	1.59	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/13/09	2.46	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	8/26/09	2.23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/1/09	2.47	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**

HISTORICAL ANALYTICAL MONITORING WELL RESULTS

Well	Sample Date	PCE	TCE	cis 1,2-DCE	trans 1,2-DCE	1,2-DCA	Chloro-form	1,1-DCE	Vinyl Chloride
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ADEC Cleanup Levels		41	2.8	36	360	1.7	2.2	280	0.19
	3/16/10	2.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**<1.0**
	6/3/10	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**<1.0**
	9/30/10	<1.0	<1.0	NA	NA	NA	NA	NA	NA
	9/20/11	3.6	<1.0	NA	NA	NA	NA	NA	NA
	9/30/12	4.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	**<1.0**
	9/4/14	4.7	1.20	1.60	9.80	0.23 J	0.34 J	0.22 J	**<0.2**
	12/15/16	3.91	1.34	1.10	11.10	<0.250	0.550 J	<0.5	**<0.500**
	10/30/17	2.79	1.22	0.940 J	11.0	<0.250	0.460 J	<0.500	<0.0750
MW-9	10/27/05	8.3	**4.3**	1.1 J	1.4 J	<0.20	<0.30	<0.29	**<0.36**
	5/16/06	**60.0**	**16**	<0.33	<0.48	<0.20	<0.30	<0.29	**<0.36**
	10/17/06	13.7	**6.57**	2.00	1.40	<0.200	<0.200	<0.200	**<0.200**
	2/13/07	15.7	**13.2**	3.94	3.59	<1.00	<1.00	<1.00	**<1.00**
	5/25/07	17.1	**12.9**	3.98	3.15	<1.00	<1.00	<1.00	**<1.00**
	11/7/07	23.0	**12.0**	3.18	1.89	<1.00	<1.00	<1.00	**<0.200**
	5/21/08	**72.4**	**16.0**	6.64	2.00	<1.00	<1.00	<1.00	**<1.00**
	10/8/08	12.4	2.99	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
DUP	10/8/08	10.8	2.74	<1.00	<1.00	<1.00	1.07	<1.00	**<1.00**
	12/19/08	15.6	**7.12**	3.35	3.13	<1.00	<1.00	<1.00	**<1.00**
	5/14/09	**62.2**	**14.8**	10.8	8.27	<1.00	<1.00	<1.00	**<1.00**
	8/26/09	26.5	**9.6**	4.9	2.59	<1.00	<1.00	<1.00	**<1.00**
	12/1/09	17.9	**6.56**	3.49	2.48	<1.00	<1.00	<1.00	**<1.00**
	3/16/10	**44**	**14**	11	6.9	<1.0	<1.0	<1.0	**<1.0**
	6/3/10	17	**6.7**	3.5	1.7	<1.0	<1.0	<1.0	**<1.0**
	9/30/10	18	**6.1**	NA	NA	NA	NA	NA	NA
	9/20/11	31	**9.1**	NA	NA	NA	NA	NA	NA
	9/30/12	23	**11**	9.8	8.0	<0.50	<1.0	<1.0	**<1.0**
	10/3/13	15.1	**3.3**	1.4	0.61 J	NA	0.22 J	NA	**<0.20**
	9/14/15	36	**11**	2.8	1.7	0.32 J	**3.9**	0.45 J	**<1.0**
	12/15/16	18.2	**6.39**	5.30	3.44	<0.250	1.09	<0.5	**<0.500**
	10/27/17	11.6	**4.04**	4.06	8.53	<0.250	0.730 J	<0.500	<0.0750
MW-10	10/27/05	**80**	**43**	4.3	<0.48	0.76 J	<0.30	<0.29	**<0.36**
	5/16/06	**150**	**19**	1.1	<0.48	<0.20	<0.30	<0.29	**<0.36**
	10/17/06	**128**	**20.4**	4.64	<0.800	<0.800	<0.800	<0.800	**<0.800**
	2/13/07	**147**	**22.9**	6.34	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/25/07	**128**	**21.0**	6.65	<1.00	<1.00	<1.00	<1.00	**<1.00**
	11/7/07	**114**	**19.4**	4.70	<1.00	<1.00	<1.00	<1.00	**<0.200**
	5/21/08	**94.0**	**15.5**	4.06	<1.00	<1.00	<1.00	<1.00	**<1.00**
DUP	5/21/08	**98.2**	**15.7**	4.00	<1.00	<1.00	<1.00	<1.00	**<1.00**

HISTORICAL ANALYTICAL MONITORING WELL RESULTS

Well	Sample Date	PCE	TCE	cis 1,2-DCE	trans 1,2-DCE	1,2-DCA	Chloro-form	1,1-DCE	Vinyl Chloride
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ADEC Cleanup Levels		41	2.8	36	360	1.7	2.2	280	0.19
	10/8/08	**96.2**	**16.8**	4.95	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/20/08	**100**	**16.4**	4.50	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/14/09	**121**	**19.3**	4.42	<2.00	**<2.00**	<2.00	<2.00	**<2.00**
	8/27/09	**106**	**19.4**	<5.00	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
	12/2/09	**112**	**19.0**	6.72	<2.00	**<2.00**	<2.00	<2.00	**<2.00**
	3/17/10	**110**	**23**	6.1	<1.0	<1.0	<1.0	<1.0	**<1.0**
	6/3/10	**60**	**17**	4.5	<1.0	<1.0	<1.0	<1.0	**<1.0**
	9/30/10	**96**	**23**	NA	NA	NA	NA	NA	NA
	9/20/11	**95**	**16**	NA	NA	NA	NA	NA	NA
DUP	9/20/11	**96**	**17**	NA	NA	NA	NA	NA	NA
	9/30/12	**130**	**32**	10	<1.0	<0.50	<1.0	<1.0	**<1.0**
	9/14/14	27.1	**5.2**	0.93 J	<1.0	0.31 J	0.23 J	1.20	**<1.0**
	9/14/15	20.0	**3**	<1.0	<1.0	0.37 J	<1.0	0.44 J	**<1.0**
	12/15/16	34.0	**5.34**	0.900 J	<0.500	<0.250	<0.500	<0.5	**<0.500**
	10/27/17	**44.9**	**8.54**	2.58	<0.500	0.540	0.630 J	<0.500	<0.0750
MW-11	10/29/05	1.8 J	0.24 J	<0.33	<0.48	<0.20	<0.30	<0.29	**<0.36**
	5/17/06	3.4	<0.16	<0.33	<0.48	<0.20	<0.30	<0.29	**<0.36**
	10/17/06	3.09	0.360	0.460	<0.200	<0.200	<0.200	<0.200	**<0.200**
	2/13/07	4.41	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/26/07	5.06	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	11/8/07	5.37	1.18	<1.00	<1.00	<1.00	<1.00	<1.00	**<0.200**
	5/21/08	7.73	1.73	1.48	<1.00	<1.00	<1.00	<1.00	**<1.00**
	10/8/08	15.5	2.74	1.02	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/20/08	3.43	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/14/09	13.3	**3.34**	1.98	<1.00	<1.00	<1.00	<1.00	**<1.00**
	8/27/09	7.51	2.19	1.29	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/2/09	10.3	2.68	1.80	<1.00	<1.00	<1.00	<1.00	**<1.00**
	3/17/10	6.9	**3.6**	1.8	<1.0	<1.0	<1.0	<1.0	**<1.0**
	6/4/10	7.3	**3.3**	2.2	<1.0	<1.0	<1.0	<1.0	**<1.0**
	9/30/10	8.5	**3.2**	NA	NA	NA	NA	NA	NA
	9/20/11	20	**6.3**	NA	NA	NA	NA	NA	NA
	9/28/12	28	**9.5**	2.7	<1.0	<0.50	1.2	<1.0	**<1.0**
	10/3/13	8	2.8	1.1	<0.20	NA	<0.20	NA	**<0.20**
	9/14/15	3	0.88 J	<1.0	0.69 J	<1.0	2.1	<1.0	**<1.0**
	12/15/16	11.1	**3.54**	1.99	17.7	<0.250	<0.500	<0.5	**<0.500**
	10/30/17	7.88	**2.84**	1.75	23.6	<0.250	<0.500	<0.500	<0.0750
MW-12	10/29/05	**430**	**30**	4.3	<0.48	0.46 J	0.49 J	<0.29	**<0.36**
DUP	10/29/05	**400**	**27**	3.7	<0.48	0.41 J	0.46 J	<0.29	**<0.36**

HISTORICAL ANALYTICAL MONITORING WELL RESULTS

Well	Sample Date	PCE	TCE	cis 1,2-DCE	trans 1,2-DCE	1,2-DCA	Chloro-form	1,1-DCE	Vinyl Chloride
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ADEC Cleanup Levels		41	2.8	36	360	1.7	2.2	280	0.19
	5/17/06	**820**	**54**	3.2	<0.48	<0.20	1.4	<0.29	**<0.36**
	10/18/06	**138**	**4.08**	<0.800	<0.800	<0.800	<0.800	<0.800	**<0.800**
DUP	10/18/06	**119**	**18.9**	3.92	<0.800	<0.800	<0.800	<0.800	**<0.800**
	2/12/07	**192**	**6.6**	<2.00	<2.00	**<2.00**	<2.00	<2.00	**<2.00**
	5/26/07	**688**	**32.4**	<5.00	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
	11/8/07	**492**	**33.4**	2.26	<1.00	<1.00	<1.00	<1.00	**<0.200**
	5/21/08	**851**	**60.7**	3.04	<1.00	<1.00	**2.28**	<1.00	**<1.00**
DUP	5/21/08	**870**	**61.1**	2.97	<1.00	<1.00	**2.30**	<1.00	**<1.00**
	10/8/08	**308**	**26.9**	1.97	<1.00	<1.00	<1.00	<1.00	**<1.00**
	12/20/08	**252**	**22.7**	4.98	<1.00	<1.00	<1.00	<1.00	**<1.00**
	5/14/09	**638**	**63.8**	<20.0	<20.0	**<20.0**	**<20.0**	<20.0	**<20.0**
	8/27/09	**353**	**27.6**	<20.0	<20.0	**<20.0**	**<20.0**	<20.0	**<20.0**
	12/2/09	**254**	**20.2**	<5.00	<5.00	**<5.00**	**<5.00**	<5.00	**<5.00**
	3/17/10	**280**	**49**	3.5	<1.0	<1.0	1.5	<1.0	**<1.0**
	6/4/10	**440**	**33**	2.1	<1.0	<1.0	1.5	<1.0	**<1.0**
	9/30/10	**320**	**33**	NA	NA	NA	NA	NA	NA
	9/20/11	**330**	**31**	NA	NA	NA	NA	NA	NA
DUP	9/20/11	**360**	**31**	NA	NA	NA	NA	NA	NA
	9/28/12	**520**	**52**	2.7	<1.0	<0.50	1.3	<1.0	**<1.0**
	10/3/13	**396**	**32.8**	1.8 J	<1.0	NA	1.7 J	NA	**<1.0**
	9/4/14	**237**	**15.3**	1.1 J	<5.0	**<5.0**	1.2 J	2.1 J	**<5.0**
	9/16/15	**430**	**20**	1.2	0.12 J	0.40 J	1.6	0.81 J	**<1.0**
DUP	9/16/15	**420**	**20**	1.2	<1.0	0.46 J	1.7	0.93 J	**<1.0**
	12/15/16	*No sample - well was frozen during sampling.*							
	10/26/17	**146**	**6.47**	1.81	<0.500	0.390 J	0.550 J	<0.500	<0.0750
MW-13	10/29/05	**120**	0.40 J	<0.33	<0.48	0.43 J	**2.8**	<0.29	**<0.36**
	5/17/06	**79**	<0.16	<0.33	<0.48	<0.20	**3.4**	<0.29	**<0.36**
	10/18/06	**138**	<2.00	<2.00	<2.00	**<2.00**	**3.50**	<2.00	**<0.200**
DUP	10/18/06	**141**	0.300	<0.200	<0.200	0.41	**3.77**	<0.200	**<0.200**
	2/12/07	**102**	<1.00	<1.00	<1.00	<1.00	**3.75**	<1.00	**<1.00**
	5/26/07	**56.1**	<1.00	<1.00	<1.00	<1.00	**3.57**	<1.00	**<1.00**
	11/8/07	**118**	<1.00	<1.00	<1.00	<1.00	**2.58**	<1.00	**<0.200**
	5/21/08	24.3	<1.00	<1.00	<1.00	<1.00	1.56	<1.00	**<1.00**
	10/8/08	**52.1**	<1.00	<1.00	<1.00	<1.00	**3.12**	<1.00	**<1.00**
DUP	10/8/08	**53.4**	<1.00	<1.00	<1.00	<1.00	**2.69**	<1.00	**<1.00**
	12/20/08	**61.5**	<1.00	<1.00	<1.00	<1.00	2.09	<1.00	**<1.00**
	5/14/09	**45.1**	<1.00	<1.00	<1.00	<1.00	1.21	<1.00	**<1.00**
	8/27/09	**47.8**	<2.00	<2.00	<2.00	**<2.00**	2.00	<2.00	**<2.00**

HISTORICAL ANALYTICAL MONITORING WELL RESULTS

Well	Sample Date	PCE	TCE	cis 1,2-DCE	trans 1,2-DCE	1,2-DCA	Chloro-form	1,1-DCE	Vinyl Chloride
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ADEC Cleanup Levels		41	2.8	36	360	1.7	2.2	280	0.19
	12/2/09	**56.2**	<1.00	<1.00	<1.00	<1.00	1.80	<1.00	**<1.00**
	3/17/10	24	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**<1.0**
	6/4/10	5.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**<1.0**
	9/30/10	16	<1.0	NA	NA	NA	NA	NA	NA
	9/20/11	15	<1.0	NA	NA	NA	NA	NA	NA
	9/28/12	**43**	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	**<1.0**
	10/3/13	13.8	<0.20	<0.20	<0.20	NA	0.67 J	NA	**<0.20**
DUP	10/3/13	14.8	<0.20	<0.20	<0.20	NA	0.77 J	NA	**<0.20**
	9/16/15	13.0	0.19 J	<1.0	<1.0	0.34 J	1.3	0.80 J	**<1.0**
	12/16/16	31.1	<0.500	<0.500	<0.500	<0.250	**2.34**	<0.5	**<0.500**
	10/27/17	21.1	<0.500	<0.500	<0.500	0.270 J	2.07	<0.500	<0.0750

Notes: Groundwater cleanup levels from Alaska Department of Environmental Conservation Oil and Other Hazardous Substances Pollution Control, 18 AAC 75 , Table C, revised November 2016.

µg/L micrograms per liter

Bold Sample result exceeds ADEC Groundwater Cleanup Level.

DUP Field-duplicate sample

< Analyte not detected; reporting limit shown.

J Estimated result due to detection below practical quantitation limit or limit of quanititation, or due to quality control failures.

NA not analyzed

PCE tetrachloroethene

TCE trichloroethene

DCE dichloroethene

DCA dichloroethane

APPENDIX H

Important Information about your Geotechnical/Environmental Report

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 31-1-20047-006

Date: April 20, 2018
To: KE Bentley One, LLC and KGC Bentley Two, LLC.
Re: BMES 2017 Soil Gas and Groundwater Assessment Final Report, Fairbanks, AK

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland